

EASY – PLAIN – ACCESSIBLE

Giulia Pedrini

Medical communication between *Plain Language* and *Einfache Sprache*

**A corpus analysis of layperson summaries
of clinical trials in English, German, and Italian**

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Silvia Hansen-Schirra/Christiane Maaß (eds.)

Easy – Plain – Accessible

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To Vittoria, Riccardo, and Marzia

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1 Introduction

1.1 Language in the medical field: challenges and outlook

Medizin und Sprache – kaum zwei Bereiche (auch Wissenschaften) sind so eng miteinander verwoben wie diese beiden. Medizin ohne Sprache wäre nicht nur sprachlos, sie wäre inhaltsleer. Sie wäre nicht möglich, weil die Verständigung in der Medizin und auch diejenige über die Medizin nur sprachgebunden funktionieren können. (Bechmann 2017: 17)

This citation clearly shows the interconnection between medicine and language. If this intrinsic link is considered, the importance of sensitivity towards language highlighted, among others, by Busch-Lauer (2001: 849) is even more apparent: “[m]edicine is one of the highly competitive international fields of research and practice where knowledge transfer and effective communication require a particular sensitivity of specialists towards language [both L1 and Lx], culture, individuum, and community”.

Medical language belongs to LSPs (Languages for Specific Purposes) or special languages. One of the many definitions provided for this concept is the following: “languages used for particular and restricted types of communication [...] and which contain lexical, grammatical, and other linguistic features which are different from ordinary language” (Richards et al. 1985: 159). However, as will be shown also in the present book, these features are not different. According to Hoffmann (1985: 53, my translation), LSPs consist of “the set of linguistic resources that are used in a specific communication field in order to guarantee comprehension among people who work in that sector”. This set of linguistic resources is not only some sort of inventory of phonetic, morphological, and lexical elements as well as syntactic rules, but also their functional interaction in all communicative acts that are possible in said field. These resources used to belong to general language, but

now represent a functional unit in LSPs (ibid.). In this definition, features of LSPs are therefore not separated from general language. Another important aspect concerns communication participants. While according to Hoffmann LSPs are used to guarantee comprehension among experts of a certain field, in another definition they are said to be used by people while they perform activities related to their jobs: “targeted and informative (monolingual and bilingual, oral and written) communicative acts with specialized content that are carried out by means of optimized communicative resources by people who are conducting their professional activities” (Schubert 2007: 210, my translation). The difference may seem slight, but it is significant: here, third parties are not expressly excluded.

This distinction is paramount for the purposes of the present book. As occurs, for instance, in the legal field, people’s contact with the medical sector is unavoidable and has a strong impact on their lives. Such contact is ascribable to the *domain-external* type of communication as opposed to *domain-internal* communication (cf. Engberg et al. 2018: XI), or, using Schröder’s terms, to *external special communication* rather than to *internal special communication* (1991: 9). These are attempts to translate the terms common in German-speaking literature, i.e., *fachinterne* and *fachexterne Kommunikation*, with a third field, *interfachliche Kommunikation*, in the trichotomy put forward by Möhn (1978: 79). The first term refers to communication between experts of a certain field, the second to communication between experts and non-experts of that field, while the third denotes communication between experts of different fields. Until approximately the ’80s, research in specialized communication focused predominantly on domain-internal communication and only then increasingly began to consider aspects of domain-external communication (Niederhauser 1999: 57). The vital role of this latter domain is now clear and the amount of research in the field is remarkable (cf. *inter alia* ibid.; Wichter 1994; Roelcke 2014; Heller & Engberg 2017; Engberg 2017, 2020, 2021; Luttermann & Engberg 2018, 2023; Garzone 2020; Engberg & Heller 2020).

Expert-lay communication, particularly in the medical field, has been researched widely. Some instances are the studies by Löning and Rehbein (1993), Eckkrammer (1996, 1998, 2002, 2016), Becker (2001), Peters (2008), Magris (2009, 2016), as well as Orletti and Iovino (2018).

In doctor-patient communication, the social asymmetry between the two participants presents the first obstacle, since only doctors have institutional authority. A second type of asymmetry is of epistemic nature, based on different levels of specialized knowledge between communication participants (Heritage 2012). In this situation, language can become an instrument used by doctors to highlight their “ritual territory” (Goffman 1967), which, needless to say, negatively affects communication and comprehensibility.¹

Thus, if doctor-patient-communication is not handled correctly, patients will likely be confronted with – at least – two types of barriers, i.e., the expert knowledge barrier and the expert language barrier. These barriers are included in the systematization of communication barriers put forward by Rink (2019, building on Schubert 2016 and Jekat et al. 2014), with the other categories being the sensory, cognitive, motor, language, cultural, and media barriers.² A text can constitute an expert knowledge barrier if it presupposes specialized knowledge in a field that the recipient is not familiar with, while it can represent an expert language barrier if it is full of technical terms that are unknown to readers. These two barriers are clearly connected and can often appear together, but they are theoretically independent from each other, since a text can present highly specialized content but be formulated so that it is easily accessible to recipients, or, on the contrary, it can have quite simple content that is expressed in such an obscure way that it is not understandable.

-
- 1 The concept of patient empowerment (or patient autonomy, cf. *inter alia* Schulz & Hartung 2014) which has developed over the last decades goes against this attitude.
 - 2 A text can represent a sensory barrier if it is written and the recipient has a visual impairment, or if it is oral and the recipient has a hearing impairment; it can represent a cognitive barrier if it is too abstract for the reader to easily understand it; it can represent a motor barrier if its physical shape makes it unsuitable for certain recipients, for instance if an online page cannot be navigated without a computer mouse; it can constitute a language barrier if it is written in a language unknown to the reader; it can represent a cultural barrier if it expresses concepts that are culture-bound and not easily understandable or acceptable for readers with another cultural background; it can constitute a media barrier if, for instance, it is only accessible online and recipients do not know how to access such content or do not have the chance to do so (e.g., senior citizens). Finally, an additional barrier put forward by Lang (2021) is the motivational barrier, which is found, for instance, when the text is discouraging and impolite, or when the recipient had a negative experience with the same text type in the past.

More specific barriers in the medical-pharmaceutical field have been pointed out by Schindler (2019: 659): actuality of information, laws and regulatory requirements, emotional state of the recipient, high level of complexity, high frequency of technical terms and numbers.

Language simplification can be a useful tool to overcome such obstacles. The following subchapter will deal with this concept.

1.2 Accessible communication and language simplification

In the homonymous dictionary by Hansen-Schirra et al. (2021: 118), accessible communication is defined as a “form of communication that is accessible and usable for people with different communication needs”. Some instances of accessible communication are sign language interpreting (Benner & Herrmann 2019), audiodescription (Perego 2014; Maszerowska et al. 2014), speech-to-text interpreting (Platter 2015, 2022; Witzel 2019), braille use and other tactile alphabets (Adam 2009), as well as augmentative and alternative communication (Beukelmann & Mirenda 1998). Language simplification is also a subtype of accessible communication, as it enables people with different backgrounds, knowledge, and cognitive abilities, to have access to information. It can be seen as a continuum, since simplified language varieties have shifting borders and partially overlap, as described by Hansen-Schirra and Maaß (2020: 18):

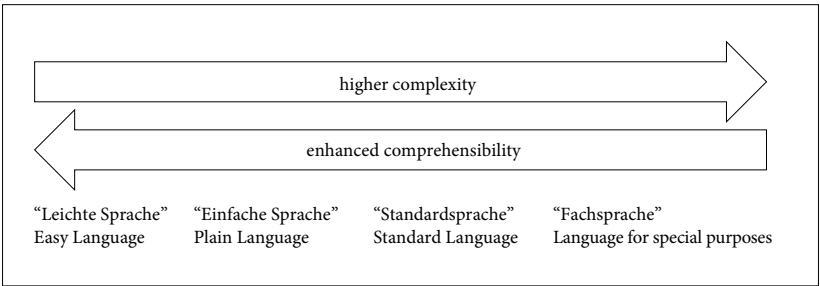


Fig. 1: Continuum of language simplification according to Hansen-Schirra and Maaß (2020: 18)

As shown in Fig. 1, LSPs are the prototype of the most complex language variant, more difficult than standard language. Then, going left from standard language, we find the continuum of simplification, with different degrees of variance and linguistic richness depending on the target. Here, Easy Language (or *Leichte Sprache*) is meant primarily for people with cognitive and intellectual disabilities and is the most simplified variant. Plain Language (or *Einfache Sprache*) tends more towards standard language and has a wider target audience. The latter is often employed in expert-lay communication: for instance, to make legal and medical content more understandable to non-experts. This is clearly a rough outline, as various languages and countries have different traditions, different names, and different categorizations.³ The blurriness of these concepts is highlighted also in the *Handbook of Easy Languages in Europe* (Lindholm & Vanhatalo 2021), which, in the attempt to define Easy Language, states that:

[t]he expression *Easy Language* is more of an umbrella term for different language varieties than the name for one uniform concept. It refers to modified forms of standard languages, which aim to facilitate reading and language comprehension, resulting in, for example, *Easy Slovenian*, *Easy Spanish*, *Easy French*, or *Easy Latvian*. (ibid.: 11)

A few lines later, the authors also point out that “at the time of writing, that is, 2021, a commonly agreed, official definition of Easy Language has yet to be established” (ibid.: 12). European practices also vary with respect to target readers; generally, the target audience includes – as mentioned above – “people with clear cognitive impairments (e.g., developmental disabilities, memory disorders)” (ibid.: 14). In several countries, people with learning difficulties, neurocognitive disorders (such as ADHD and autism spectrum disorders), and functional illiteracy are also considered. Second language speakers

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3 For example, in Dutch and German an intermediate level between Easy Language and Plain Language has been proposed “on the search for a trade-off between perceptibility, comprehensibility, and acceptability” (Maaß 2020: 231): *taal voor allemaal* + and *Leichte Sprache* +, respectively. In German, the denomination *Klare Sprache* has also been proposed (Lutterman 2017).

are regarded as part of the primary target group in some countries (e.g., in Germany, where simplified texts are regarded as a temporary aid for people who are learning the language; cf. Bredel & Maaß 2016a: 139–171),⁴ while in other countries immigrants are expected to learn the standard language with no simplified language intermediate stage. Children are traditionally not considered among primary target readers, but Easy Language content is sometimes suggested for them in cases like custody proceeding documents, medical records, and treatment instructions. In some countries such as Austria, particular situations like fatigue, illness, and accidents, are considered to be contexts where even adults with normal language skills may need Easy Language (Lindholm & Vanhatalo 2021: 14). Another aspect to be considered is denominative variation, which occurs both on a national and international level. For instance, Lindholm and Vanhatalo (ibid.: 17) list the following terminological candidates: *Easy Language*, *easy-to-read language*, *easy-to-understand language*, *easy read*, *easy-read*, *clear language*, *simplified language*, and *simple language*. These are just the variants that can be found in English; if more languages are considered, the number of names increases greatly.

These aspects clearly show a complex picture in the field of language simplification, with many different variables requiring consideration to fully understand each language variant in different countries. However, regardless of the individual differences, what has been stated above with respect to the language continuum still holds true: there is a variant at the end of the continuum that aims at achieving the highest possible degree of comprehensibility, with a reduced linguistic set, and then there is the “somewhat more enriched, complex form”, with less specific rules (Maaß 2020: 50). A similar definition has been provided by Perego (2021: 194): “Plain Language covers the area between Easy Language and standard or even specialised language, and is meant to make the message (of specialized texts) readily available to all (i.e., non-specialist users)”.

In Section 1.2.1 we will focus on some definitory and terminological matters concerning language simplification, then in Section 1.2.2 we will delve into the topic of simplification in the three languages of the present book, i.e., English, German, and Italian. In Section 1.2.3 the focus will lie on studies concerning

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4 However, it should be noted that they are not legally entitled to *Leichte Sprache* texts.

accessibility in the medical field and in Section 1.2.4 on interlingual translation of simplified language variants, in order to gradually outline a theoretical framework for the present analysis.

1.2.1 Language simplification as intralingual translation

In the language simplification field, the question of what this activity should be called often arises. It is frequently debated in conferences and workshops, with scholars presenting opposing points of view. These debates also raise interesting points from both a methodological and operational viewpoint. This issue is also thematized by Lindholm and Vanhatalo (2021), who, in their handbook introduction, wonder as follows: “What should we call the process of making standard language Easy Language – *modifying, (intralanguage) translating, or adapting?*” (ibid.: 20).

Language simplification can be regarded as an instance of intralingual translation, if the well-known tripartition of translation put forward by Jakobson (1959: 233) is considered. According to him, translation can be either:

- 1) interlingual (“translation proper”), i.e., from a source language to a target language;
- 2) intralingual (“rewording”), i.e., within the same language;
- 3) intersemiotic (“transmutation”), i.e., an adaptation in the same language as the source text, or, using Jakobson’s words, “an interpretation of verbal signs by means of other signs of the same language”. (ibid.)

For definition purposes, the dichotomy “translation”/“adaptation” (originally ‘Übersetzung’/‘Bearbeitung’) put forward by Schreiber (1993) is also noteworthy. According to this approach, translation is based on an invariance requirement, with the only changing variable being language. Adaptation, on the contrary, is based solely on variance requirements, apart from a single text characteristic which should be maintained as it occurs in the source text (ibid.: 125). Schreiber (ibid.: 263–316) distinguishes between several types of adaptation: augmentative, adaptating, and diminutive adaptation (originally ‘augmentative Bearbeitung’, ‘adaptierende Bearbeitung’, and ‘diminutive Bearbeitung’). In this

categorization, language simplification belongs to diminutive adaptation (ibid.: 294). However, this label is not particularly flattering, since it seems to imply that the final, adapted version is somehow inferior to the source text. This impression is confirmed by the classification of augmentative and diminutive adaptation proposed by Schreiber. For each subtype of adaptation, he lists five categories in opposition to each other: so, augmentative adaptation may be *Surtraduction*, *Verbesserung* ('improvement'), *Erweiterung* ('expansion'), *Poetisierung* ('poetization'), and *Purifizierung* ('purification'). The opposite subcategories of diminutive adaptation are *Nivellierung* ('leveling'), *Verzerrung* ('deformation'), *Zusammenfassung* ('summarization'), *Entpoetisierung* ('depoetization'), and *Vulgarisierung* ('vulgarization'). Augmentative adaptation makes the target text better than the source text in some way. For example, in *surtraduction*, some features of the source text are enhanced. Additionally, in improvement some flaws are eliminated, while in expansion explanations or additions are inserted. In poetization the source text, which is a text in prose, is versified, and finally, in purification indecent or unacceptable features are omitted to comply with moral, religious, ideological, or commercial expectations. Conversely, in leveling – which, according to Schreiber, includes language simplification – some features of the source text are leveled, flattened, or eliminated. Deformation (for instance, parody) makes the source text worse by ridiculing it, while summarization reduces the amount of information provided in the source text. Finally, in depoetization a poem is turned into a text in prose, and vulgarization turns a “decent” text into an “indecent”, obscene one. Although Schreiber does not criticize language simplification openly, the fact that it is listed along with less “noble” types of adaptation is quite problematic if the risks of stigmatization already associated with language simplification and its perception by the public – or at the very least by some detractors – are considered. In fact, it should be taken into account that even the widespread denominations of simplified language variants (*Easy Language* and *Plain Language*, *Leichte Sprache* and *Einfache Sprache*, as well as *lingua facile* and *lingua semplice*, etc.) are connotated and may be perceived by the public as belittling, related to a translation activity that is, in itself, not complex, and the target readers may in turn be stigmatized (cf. *inter alia* Bock 2014: 34; Luttermann 2017: 223; Maaß 2020: 50–52; Crestani 2022a: 118). It is therefore

paramount to avoid using terminology and classifications that may carry even more stigma.

For this reason, the more classic terminology proposed by Jakobson will be followed in the present book and the term *intralingual translation* will be used. One of the main criticisms of this term referring to language simplification is that, while translating into Easy and Plain Language (and all other variants), information is deleted or added depending on the communication needs and text layout is often changed. Because of this, it is said that the target texts differ too much from the source texts in standard language to still be considered mere translations. However, it can be argued that omissions, additions, and generally remarkable changes can also be found in traditional interlingual translations (for instance, if culture-bound terms which are clear to the source text readers need to be explained to the target text readers). In addition, the term *intralingual translation* is well established in literature discussing language simplification (see for instance Maaß et al. 2014; Maaß 2019; Deilen et al. 2021; Rocco 2022).

1.2.2 Language simplification in English, German, and Italian

Discourse around the necessity for clarity in communication is not a recent phenomenon, and in fact dates back to centuries ago. By 46 BC, Cicero had already highlighted the need to use clear, simple language in his *Orator* (cf. Orletti & Iovino 2018: 16). In the 14th century, Chaucer wrote what is likely to be the first technical treatise on how to operate an astrolabe “clearly and in plain English”, with a ten-year-old who did not know Latin as a target reader (cf. Perego 2020b: 22). These instances suffice to show that discourse around comprehensibility has deep roots. We will not further discuss its history and development, as that would go beyond the scope of the present study, which is of synchronic nature. For this reason, we will merely focus on the current practice of language simplification in the three languages of analysis. As has been mentioned at the beginning of Section 1.2, text simplification presents differences in various languages, which depend not only on structural discrepancies (potentially different levels of overall complexity and different linguistic features that may cause understanding issues for readers), but also on different traditions and legislative systems in various countries.

In the anglophone world, the Plain Language concept formed in the UK and then spread in the USA (Orletti & Iovino 2018: 18). In 1979, the UK Plain English Campaign (PEC), an organization advocating for consumers and service users and trying to tackle unnecessarily complex and misleading public information, was launched by Christine Maher and Martin Cutts. The movement has continued to advance ever since, as illustrated by Chinn and Buell (2021). In 1990, the PEC introduced the Crystal Mark, a seal of approval of clarity in a text. Nowadays there are two commercial organizations that grant a certificate of document accreditation, i.e., the PEC and the Plain Language Commission. The latter awards the Clear English Standard (ibid.). The language variant used for people with intellectual disabilities is called Easy Read in the UK and Easy-to-Read in other anglophone countries, such as the USA or Australia (Chinn & Buell 2021: 624). The most important work in the field of language simplification is arguably the *Oxford Guide to Plain English* (Cutts 2020), which was first published in 1993 as *The Plain English Guide* and then as *The Quick Reference Plain English Guide* (1999).

Of the three languages considered in the present book, German has the richest tradition with Easy Language, *Leichte Sprache*, particularly thanks to the BITV (*Barrierefreie-Informationstechnik-Verordnung*) regulation in its amended version of 2011, known as BITV 2.0 (with the version of 2002 known as BITV 1.0). Its importance lies in the fact that it is Germany's first legal text by a government body to expressly mention *Leichte Sprache*. It requires federal agencies to provide explanations in *Leichte Sprache* (along with sign language) of standard language content on their websites (see BITV 2.0 Paragraph 4). The impact of this regulation on the language simplification field has been commented as follows:

The BITV 2.0 has been ground-breaking for Easy Language in official contexts in Germany. It has boosted the development of a market activity in Easy Language translation (Plain Language much less [...]). As a result of the BITV 2.0, now every single Federal ministry website in Germany has an Easy Language section (as restricted as this offer may be). (Maaß 2020: 60)

Language simplification within a German-speaking context has also received a boost in terms of theoretical and academic activity. In 2014, the Research Centre for Easy Language (*Forschungsstelle Leichte Sprache*) was founded in Hildesheim. In the same year, the LeiSA (*Leichte Sprache im Arbeitsleben*) project started at the University of Leipzig. Other projects on the topic are the *Einfach komplex – Leichte Sprache* project of the Johannes Gutenberg University Mainz and *Einfach leicht verständlich! Leichte Sprache am Beispiel Erwachsenenschutz* of the University of Applied Sciences and Arts Northwestern Switzerland. Another clear signal of the importance of *Leichte Sprache* in a German-speaking context is given by the publication of three volumes on the topic by Duden (Bredel & Maaß 2016a, 2016b, 2016c). Nonetheless, “[t]here is still a general lack of research and theoretical modelling for PL [Plain Language] in Germany” (Hansen-Schirra & Maaß 2020: 20).

As for the Italian language, “Easy and Plain Language in Italy have a relatively short tradition” (Perego 2021: 277), with work in the field being initiated in the ’80s and ’90s.⁵ The situation is also very different from that of German from a legislative point of view:

It is difficult to define the current status of Easy Language in Italy, where sparse initiatives exist but clear legislation on the matter, or consistent use of this minimal language variety, is still lacking. Viale (2010 [...]), for instance, lists a series of key legislative milestones relating to communication accessibility and inclusion in the administrative realm, but they relate more to Plain Language than to Easy Language. The list shows that the concern for transparency in the quest for efficacy [...] in administrative communication began to appear in formal documents and laws around the 2000s – quite late compared to other countries. However, [...] Easy Language is never explicitly referred to, although appeals to clarity are made. (Perego 2021: 282–283)

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 5 For a detailed historical overview see for instance Perego (2021) as well as Orletti and Iovino (2018: 9–24).

More progress is visible in the trilingual Trentino Alto Adige (one of the five autonomous regions of Italy), due to its strong connections with the German-speaking countries (cf. also Magris 2022). This region has an Easy Language office: *okay – l’ufficio per un linguaggio facile*. In addition, on 14 July 2015, the self-governing Province of Bolzano (commonly known as South Tyrol – Alto Adige) issued Law 7/2015, “Participation and Inclusion of People with Disabilities” (‘Teilhabe und Inklusion von Menschen mit Behinderungen’/‘Partecipazione e inclusione delle persone con disabilità’/ ‘Partecipaziun y inclujun dles porsones cun handicap’).⁶ This law has been translated in Easy Language (in German and then Italian) and requires information concerning people with disabilities to be written also in Easy Language.

Interest in language simplification is also growing in the academic field, as shown by the participation of Italian universities in ERASMUS+ projects like EASIT (Easy Access for Social Inclusion Training) and SELSI (Spoken Easy Language for Social Inclusion). Another academic research project led to the writing of a manual containing guidelines for Italian Easy Language, *italiano facile da leggere e da capire* (Sciumbata 2022). A further set of guidelines worth mentioning is that for Plain Language written by Fortis (2003).

Other important aspects, highlighted by a survey conducted in the EASIT project, are that Easy Language is the most often produced variant in Italy, while “Plain Language seems to be overlooked when it comes to professionally producing content” (Perego 2021: 285).

As for terminology, a much wider array of denominations is used than is the case in German and English, since research and practice in the Italian-speaking area are not as deep-rooted (cf. *ibid.*: 280–282; Crestani 2022b: 589). The terms listed by Crestani (*ibid.*) for Italian Easy Language are the following: *lingua facile* (used in South Tyrol and in Switzerland), *linguaggio facile* (used in South Tyrol), *linguaggio facile da leggere* (used in the rest of Italy), *linguaggio facile da leggere e da capire* (Sciumbata 2020, 2022), and *linguaggio semplice da leggere e da capire* (Magris & Ross 2015: 13). Other terms that can be added to this list are *lingua facile da leggere e da capire* (cf. Perego 2021: 280), *EtR*, *easy-to-read*, and *easy-read* (Sciumbata 2020). As for Plain Language, the terms

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6 German, Italian, and Ladin denomination of the law.

listed by Crestani (2022b: 589) are *lingua semplice* and *linguaggio semplificato*.⁷ Perego (2021: 281) highlights the frequent use of the anglicism *plain language*, and also mentions the terms *linguaggio chiaro e semplice* and *semplificazione linguistica*: “both the English loan word *Plain Language* and the expression *semplificazione linguistica* (language simplification) are used to refer to this variety [Plain Language] or to simplified texts in which it is not necessary to make a sharp distinction between Easy and Plain Language” (ibid.).

1.2.3 Language simplification and accessibility in health care

Increasing attention has been devoted to the intersection between accessible communication and health care over the last years, and this can be seen in numerous instances. Maaß and Rink (2017, 2018) highlighted the importance of intralingual translation of medical content in Easy Language to tackle medical-patient knowledge asymmetries. Perego (2020a) analyzed leaflets about depression found on mental-health related websites written in Easy Language.⁸ Luttermann and Rawinsky (2020: 154–158) dealt with text simplification *sensu lato* and in the medical field, especially with respect to living wills. Ahrens et al. (2020) first describe the relevance of accessibility in the medical field, then focus on different studies conducted by the BK-Med (*Barrierefreie Medizinkommunikation*) research group of the University of Hildesheim: Kröger researches the accessibility of online health information texts, conducting a corpus analysis of German standard language texts and their comprehensibility-enhanced versions from the online pages of the website *Apotheken Umschau*. Hernández Garrido conducts a corpus-driven study of multimedial and multimodal material concerning COVID-19 in Colombia. Ahrens focuses on comprehensibility-enhanced medical texts for women with a migration background. Schulz conducts an empirical study on how medical

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7 In this respect, she points out that a document of the Swiss Confederation uses the term *linguaggio semplificato* to refer to *Leichte Sprache* and *linguaggio semplice* to indicate *einfache Sprache*. Parpan-Blaser et al. (2021: 579) highlight that *lingua facile* and *linguaggio semplificato* are used without distinguishing between Easy and Plain Language.

8 This work was part of a project called “Strumenti linguistici per favorire la comunicazione nell’ambito della salute” (‘Linguistic resources to foster communication in healthcare’, 2020–2021) of the University of Trieste, which also focused on developing countries.

information is understood and retained among some target group subjects of simplified language and Keller attempts at determining which features of Easy and Plain Language medical texts make them acceptable for elderly people. Jacobi (2020) considers various aspects of accessibility besides text simplification in the medical field, including sign language, braille and assistive technologies, augmentative and alternative communication. Ross and Magris (2022) examined institutional communication in Plain and Easy Language regarding COVID-19 in the Netherlands and Germany. In addition, a whole anthology has been recently published on the topic of accessible communication in health care: *Accessibility – Health Literacy – Health Information. Interdisciplinary Approaches to an Emerging Field of Communication* (Ahrens et al. 2022). The role played by intralingual translation in the health care field is well thematized here and can be summarized as follows:

Health communication is an area of specialised communication that includes experts and non-experts in the medical field. As such, successful communication is reliant on comprehensibility-enhanced texts that help to bridge the gap between experts and non-experts. (ibid.: 10)

1.2.4 Interlingual translation of simplified language variants

Interlingual translation of simplified language variants is still an under researched field. In some areas, such translations are quite usual: in Finland, for instance, texts written in Finnish Easy Language, *selkokieli*, are then translated into Swedish, *lättläst*, in light of its minority language status (Bredel & Maaß 2016a: 66). Another case of interlingual translation concerns the abovementioned Italian region Trentino Alto Adige, where German and Italian versions of *Leichte Sprache/lingua facile* coexist. Scholars like Crestani (2022a: 158–165) and Rocco (2022: 248–251) have written briefly on the topic. However, no detailed studies on this field of translation are available to date.

One of the aims of the present book is therefore to delve into this topic in light of the growing interest it is attracting – on the translation market as well as in the academic field – both due to multilingual areas where translations are necessary and to European legislation (which will be thematized in Section 1.3). The translation of simplified texts may seem trivial, but, on the contrary, it is a

complex task (as will be shown in the analysis of the translated texts of the present book). Translators should not only be proficient in both languages, but also be aware of language simplification rules in each of them. They should acknowledge that there may be differences between the rules of the source language and target language, requiring specific strategies in order to guarantee an adequate result in the target language. They should also be aware of the existence of the Universal of Simplification⁹ in translation (see for instance Baker 1993; Mauranen & Kujamäki 2004), which is not related only to the field of language simplification, and rather leads to generally simpler target texts in *any* field of translation.

1.3 Clinical Trials Regulation (No. 536/2014) and layperson summaries

1.3.1 Clinical studies and trials

In order to adequately explore this topic, a brief description of clinical studies as a practice is required, although everyone knows approximately what clinical studies are, especially after the COVID-19 pandemic. One definition is the following: “A clinical study involves research using human volunteers (also called participants) that is intended to add to medical knowledge” (ClinicalTrials.gov n.d.). Clinical studies can be divided into two main categories: observational studies and interventional studies. In the *Dictionary for Clinical Trials* (Day 1999), the former lemma is defined as: “study that has no experimental intervention but just observes what happens to a group of subjects” (ibid.: 124). *Intervention study* is listed as an antonym. Under the lemma *intervention study* the only explanation found is: “an alternative term for a clinical trial” (ibid.: 90). The lemma *clinical trial* (or just *trial*, ibid.: 200) is defined as “any systematic study of the effects of a treatment in human subjects” (ibid.: 25). The phases of trials (Phase I, Phase II, Phase III, and Phase IV) are mentioned. The

9 This phenomenon is the tendency to use simpler language in the target texts than in the source texts from a lexical and syntactic point of view, which is shown among others by a lower lexical richness and density, by the use of hypernyms instead of hyponyms, and by the tendency to make sentences shorter (Ondelli 2020: 34).

dictionary entry also points out that “although randomisation and blinding, for example, are considered as some of the essential features of good clinical trials, these are not requirements” (ibid.). Another definition of clinical trial, found on the WHO website, is the following: “a type of research that studies new tests and treatments and evaluates their effects on human health outcomes. People volunteer to take part in clinical trials to test medical interventions including drugs, cells and other biological products, surgical procedures, radiological procedures, devices, behavioural treatments and preventive care” (WHO n.d.).

Fig. 2 graphically illustrates the categorization of clinical studies.¹⁰

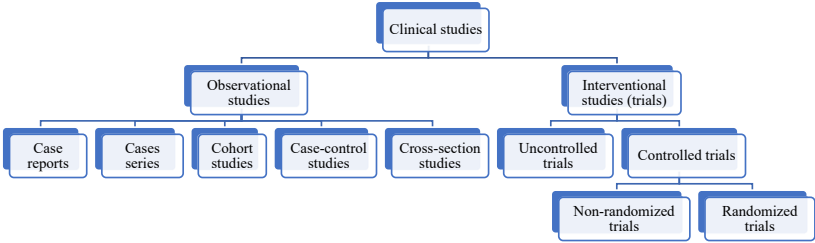


Fig. 2: Categorization of clinical studies

In summary, the difference between observational and interventional studies is that, in the former, researchers only examine what occurs or occurred in a study, without altering its conditions. In some cases, this happens for ethical reasons: for instance, when factors under examination are unhealthy habits, like smoking, which certainly cannot be encouraged by medical personnel. In interventional studies (or trials), researchers not only monitor what occurs in the study, but actively alter its conditions in order to test drugs *et similia*. They do so, for instance, by comparing two different groups, one receiving the drug being studied and the other receiving a placebo (controlled trials).

Since interventional studies have an impact on participants’ health, they are strictly regulated, both for safety and for ethical reasons. Specific procedures

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 10 For more information about the various types of studies that are not described in detail here see for instance De Riu et al. (2013), Trampisch and Windeler (2013), Benesch and Steiner (2018), Bacchieri and Della Cioppa (2004).

must be followed: authorizations are required, particular conditions need to be respected, and specific documents need to be produced. Different countries have diverse procedures and authorities; for instance, in the USA the authority that regulates clinical trials is the FDA (Food and Drug Administration), in Switzerland Swissmedic, and in the European Union the EMA (European Medicines Agency). In the present study, we will be focusing on the latter case.

1.3.2 Regulation No. 536/2014 and the layperson summaries of clinical trial results

The legislation currently in force in the EU is Regulation No. 536/2014 of the European Parliament and of the Council of 16 April 2014 on clinical trials on medicinal products for human use repealing Directive 2001/20/EC (“Clinical Trials Directive”),¹¹ also known as the “Clinical Trials Regulation” (EMA n.d.). This regulation entered into application on 31 January 2022 (cf. EMA n.d.); on this date, it repealed both the aforementioned directive and national implementing legislation in the Member States. The directive had “aimed at harmonizing requirements and ensuring data quality for clinical trials across all EU member states” and “stipulated the creation of an EU-wide database, later called EUDRA CT, in which clinical trials conducted in the EU had to be registered” (Brauburger et al. 2015: 60). However, its legislative nature brought about some setbacks; being a directive, it could set out a common goal, but Member States had to devise their own laws on how to implement it. This led to “disharmony in CT [clinical trial] application procedures including the documentation required, approval timelines, and assessments performed”, due to the different interpretation of the directive itself (Gillow 2015: 205–206). This “logistical nightmare” (ibid.) was evaluated by the European Commission in 2009, when

an assessment [...] of the impact of the EU directive revealed that the operational requirements imposed had resulted in an increased

11 Directive 2001/20/EC of the European Parliament and of the Council of 4 April 2001 on the approximation of the laws, regulations and administrative provisions of the Member States relating to the implementation of good clinical practice in the conduct of clinical trials on medicinal products for human use.

administrative burden and higher expenses for sponsors and that, because of this, the number of clinical trials conducted in the EU had decreased. (Brauburger et al. 2015: 60)

The Clinical Trials Regulation's goal is to improve this situation and "ensure the EU offers an attractive and favourable environment for carrying out clinical research on a large scale, with high standards of public transparency and safety for clinical trial participants" (EMA n.d.).¹² It pursues this goal by harmonizing the processes for assessment and supervision of clinical trials conducted in the EU. In the past, in order to obtain an authorization, trial sponsors had to submit applications separately to national competent authorities and ethics committees in each single country taking part in the trial. The Clinical Trials Regulation, on the other hand, makes conducting clinical trials in several EU countries easier, as it allows sponsors to submit one single application for a multinational clinical trial approval on a single platform, the Clinical Trials Information System (CTIS). EU Member States are consequently able to evaluate and authorize such applications more effectively via the same platform.

A transition period for sponsors has been foreseen by legislation, so that for the first year of implementation (from 31 January 2022 until 30 January 2023) sponsors could choose whether to apply to start a clinical trial via the CTIS or under the Clinical Trials Directive. From 31 January 2025, all trials approved under the Clinical Trials Directive which are still running will also have to comply with the Regulation.

Discussing in greater detail all innovative procedures and steps (authorization, conduct, monitoring of trials, etc.) introduced by the Clinical Trials Regulation would go beyond the scope of this study. The focus of the present book is the need for transparency expressed in the Regulation and, consequently, the documents that pharmaceutical companies are required to

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12 Recital 82 of the Regulation also highlights its purposes: "It [the Regulation] aims at achieving an internal market as regards clinical trials and medicinal products for human use, taking as a base a high level of protection of health. At the same time, this Regulation sets high standards of quality and safety for medicinal products in order to meet common safety concerns as regards these products. Both objectives are being pursued simultaneously. These two objectives are inseparably linked and one is not secondary to another" (Regulation 536/2014).

produce. At the end of a clinical trial, sponsors should publish both a document illustrating the results of the trial itself for medical personnel and a version for non-experts in the medical field, i.e., the layperson summary. This is specified in recital 39 of the Regulation, which reads as follows:

(39) The sponsor should submit a summary of the results of the clinical trial together with a summary that is understandable to a layperson, and the clinical study report, where applicable, within the defined timelines.¹³ Where it is not possible to submit the summary of the results within the defined timelines for scientific reasons, for example when the clinical trial is still ongoing in third countries and data from that part of the trial are not available, which makes a statistical analysis not relevant, the sponsor should justify this in the protocol and specify when the results are going to be submitted.

Article 37 also specifies as follows:

[...] Irrespective of the outcome of a clinical trial, within one year from the end of a clinical trial in all Member States concerned, the sponsor shall submit to the EU database a summary of the results of the clinical trial. The content of that summary is set out in Annex IV.

It shall be accompanied by a summary written in a manner that is understandable to laypersons. The content of that summary is set out in Annex V.

Annex V of the Regulation, “Content of the summary of the results of the clinical trial for laypersons”, lists the following ten points:¹⁴

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- 13 The defined timelines are made explicit in Article 37: “In accordance with international standards, the results of the clinical trial should be reported within one year from the end of the clinical trial”. It should be noted that the deadline differs for pediatric trials and non-therapeutic Phase 1 trials, as results have to be reported within six months and 30 months from trial end, respectively (cf. *inter alia* GLSP 2021: 6).
 - 14 While such a list may seem trivial, it is quite innovative: “[a]lthough discussions about returning summary results of clinical trials to patients and the public have been ongoing for some years

1. Clinical trial identification (including title of the trial, protocol number, EU trial number and other identifiers);
2. Name and contact details of the sponsor;
3. General information about the clinical trial (including where and when the trial was conducted, the main objectives of the trial and an explanation of the reasons for conducting it);
4. Population of subjects (including information on the number of subjects included in the trial in the Member State concerned, in the Union and in third countries; age group breakdown and gender breakdown; inclusion and exclusion criteria);
5. Investigational medicinal products used;
6. Description of adverse reactions and their frequency;
7. Overall results of the clinical trial;
8. Comments on the outcome of the clinical trial;
9. Indication if follow up clinical trials are foreseen;
10. Indication where additional information could be found.

The importance of the Regulation and of the layperson summaries have been immediately acknowledged in the medical field (cf. *inter alia* Brauburger et al. 2015; Sroka-Saidi et al. 2015; Gillow 2015; Schindler 2018, 2019; Barnes & Patrick 2019; Wilcox et al. 2020), with plenty of denominations coined for the summaries: lay summaries, plain language summaries, lay language summaries, simple summaries, and trial results summaries¹⁵ (Barnes & Patrick 2019: 261). Prior to the Regulation, there were some registers where clinical trial results could be accessed (e.g., clinicaltrials.gov and clinicaltrialsregister.eu), but these texts were aimed at experts and they were extremely difficult to understand for other people (Schindler 2019: 667). The Clinical Trials Regulation was the first EU legislation to foresee the publication of trial results in a public-friendly format (*ibid.*).

in the United States and the EU, this is the first time that a list of items that should be included in such a document has been given by a regulatory agency" (Brauburger et al. 2015: 61).

15 The latter denomination is quite ambiguous, as it is often used to refer to summaries for experts.

By being more easily accessible, “lay summaries may aid in the transparency of a sponsor’s clinical study results, thereby promoting trust, partnership, and patient engagement throughout the clinical study process” (Barnes & Patrick 2019: 261). In other words, providing summaries of clinical trials “written specifically for study participants and the general public who have an interest in clinical study results, but who may have limited health literacy¹⁶ or scientific expertise” (ibid.) helps to “demystify the clinical study process” (ibid.: 262). The reasons why the general audience may want to access such information are listed by Gillow (2015: 205):

People want to access trial results for various reasons. As participants, they may want feedback on the scientific research to which they have contributed. They may seek information to decide whether or not to start or continue with a treatment, interpret symptoms, or find an alternative treatment.¹⁷ Others may want to find out if a trial exists in which they could participate, or seek information to inform others (loved ones, doctors etc.).

Another important point raised by Gillow (ibid.) is that the lack of comprehensible clinical trial results can severely impact research itself, since patients who do not understand the results of the trial they took part in can be discouraged from participating in further studies, which, in turn, may result in less research data available:

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- 16 Health literacy can be defined as the ability of patients to understand medical information to a degree that enables them to resort to the health system adequately and to make decisions to improve their own health (Schulz & Hartung 2014: 25). A health literacy study conducted by the World Health Organization in 2013 found that 48% of adults have problematic or insufficient health literacy (Barnes & Patrick 2019: 264).
 - 17 It should be noted that this statement is controversial. As pointed out in layperson summaries, the information therein contained ought not be used to make important decisions about treatment without seeking medical advice.

There is evidence¹⁸ to show that unless patients are informed about results they may not participate in future trials, and that at the end of a trial they no longer feel valued. Informing patients of trial results may not only provide a more positive experience for patients but also improve low clinical trial (CT) recruitment rates (ibid.).

Now, in accordance with Regulation 536/2014 (Article 29), the existence of the layperson summaries is communicated to trial participants in the informed consent that they sign before taking part in the trial itself:

The subject shall be informed that the summary of the results of the clinical trial and a summary presented in terms understandable to a layperson will be made available in the EU database, referred to in Article 81 (the ‘EU data base’), pursuant to Article 37(4), irrespective of the outcome of the clinical trial, and, to the extent possible, when the summaries become available.

In the database, all documents concerning the trial will be linked together: the technical summary, the layperson summary, the protocol, the clinical study report (CSR), and data from other clinical trials using the same investigational product (Recital 67). By doing so, retrievability of information is increased.

Overall, it can be said that layperson summaries represent a very innovative text type and a milestone in language simplification in the healthcare field. While there certainly are other documents belonging to expert-lay communication in medicine, like package leaflets and informed consents, this is the only text type that is intertwined with the concept of simplification such that it sometimes entails the name “Plain Language” in its denomination. It is also a text type that is very interesting from a translational point of view (both in a theoretical and more practical perspective), since it has to be translated in a series of languages (as will be illustrated in Section 1.4).

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18 See Sood et al. (2009).

1.4 Layperson summaries' guidelines

The present section deals with the guidelines written for layperson summaries: chronologically, these are the Recommendations of the Expert Group on Clinical Trials and the Good Lay Summary Practice. The former is a brief document with some suggestions and a template, and the latter a far more detailed guidance which not only expands on the Recommendations but also illustrates the whole production process of the summaries. In 1.4.1 and 1.4.2, not all linguistic suggestions will be discussed, as they will be illustrated in greater detail in the respective theoretical sections of the book (i.e., Chapter 3 and Chapter 8).

1.4.1 Recommendations of the Expert Group on Clinical Trials

In 2017, a document containing guidelines on how to write the layperson summaries was produced by the EU CT Expert Group (Expert Group on Clinical Trials), i.e., “a working group of the European Commission representing Ethics Committees and National Competent Authorities (NCA)” (GLSP 2021: 1). These guidelines are the “Recommendations of the expert group on clinical trials for the implementation of Regulation (EU) No 536/2014 on clinical trials on medicinal products for human use”, revised in 2018.

The purpose of the Recommendations is clearly stated at the beginning of the document:

Annex V of the EU CT Regulation sets out ten elements that must be addressed in the lay summaries. This document includes guidance and templates to help authors writing these lay summaries. Consistency in the way trial results are presented will help improve familiarity and comprehension by the general public, participants, patients, and others. (Recommendations of the Expert Group on Clinical Trials 2018: 3)

So, the target of the Recommendations consists of sponsors and investigators. The target readers of the layperson summaries are also mentioned:

The general public are expected to be the primary audience for the lay summaries. The lay summaries may also be accessed by others, such as research participants, healthcare professionals, and academics. Given this wide audience, the summaries will need to take into account the average literacy level of the general population, provide simple explanations, and apply other measures to support health literacy. (ibid.)

The general principles for writing layperson summaries stated at the beginning of the Recommendations (ibid.: 3–4) are the following:

- 1) Developing the layperson summary for a general audience, without assuming any prior scientific knowledge in the field of clinical research and medicine.
- 2) Targeting the text at a general audience with a suitable layout and content in terms of style, language, and literacy level.
- 3) Writing a short summary, without just copying content from the technical summary.
- 4) Providing unambiguous, factual information.
- 5) Not including promotional content.
- 6) Following health literacy and numeracy principles.
- 7) If possible, involving patients, advocates or members of the public to assess the layperson summaries. Medical writers with experience in plain language writing for the public can also play a role in the process.

The subsequent subchapters provide concrete suggestions on how to write the summaries from different perspectives, also going into more detail regarding some of the points mentioned in the general principles. These subchapters are named Health Literacy Principles and Writing Style, Readability and use of plain language, Numeracy, and Visuals.

While these suggestions are a good starting point for writers, they are sometimes confused and not well organized. In subchapter 5, “Health Literacy Principles and Writing Style” (ibid.: 4–5), the literacy level of target readers is thematized. According to the Recommendations, layperson summaries should

be suitable for “people with a low to average level of literacy”. The average proficiency level in Europe is here considered to be 2–3 on a scale from 1 to 5 (the International Adult Literacy Survey, IALS, where 1 is the lowest score and 5 the highest score). A proficiency level of 2 is “defined as being able to identify words and numbers in a context and being able to respond with simple information, such as being able to fill in a form”, and a proficiency level of 3 as “being able to identify, understand, synthesize and respond to information, be able to match given information that corresponds to a question” (ibid.: 4). According to the Recommendations, this latter level corresponds roughly with high school completion levels (ibid.). Layperson summaries should therefore be aimed at an audience with a 2–3 literacy level.

In the same subchapter many linguistic suggestions are given, beginning with the syntactic level: “avoid long and complex sentences that include many clauses as these are difficult to understand”. This is followed by lexical and terminological recommendations: “Use simple vocabulary familiar to non-medical people”, further specified as avoiding jargon, technical, medical or scientific language (for instance, “hypertension” should be substituted with “high blood pressure”), removing unnecessary or complex words (“use” should be preferred to “utilise”), being consistent in the use of terms/words and defining them, ensuring that the underlying concepts are clear and easy to understand, and explaining them if necessary, as well as avoiding ambiguous words and phrases (like “felt badly”). A suggestion concerning the morphosyntactic level is then provided: “Use active, rather than passive, voice”. The next recommendations concern some textual and graphical aspects, which are dealt with together: for instance, using headings and descriptive subheadings to organize information, presenting general information before details, using white spacing and 12-point font, as well as resorting to visuals. The recommendations then go back to the lexical and terminological level, suggesting avoidance of the use of “acronyms, abstract, medical/technical, or multisyllabic words (such as, ‘unanticipated’, ‘hematopoietic’), or to define them by adding clear language and putting them between brackets if they are strictly necessary (as in “cancer that has spread to another part of the body [metastases]”). Respectful and empowering language is also mentioned:

For example, words such as “demented” in dementia research should be avoided. Similarly, avoid using the words “sufferers” or “victims” that have negative connotations. A preferable term is “people living with ...” or “people affected by ...” (ibid.: 5)

Finally, the length of the texts is thematized: while there is no limit placed on the size of the layperson summary, the text should be “as succinct as possible while relaying the required information in a form that is readily understandable”. The fact that adding explanations of technical terms and complex concepts in a simple language makes a text more verbose than a mere technical term is also highlighted.

In subchapter 6, “Readability and use of plain language”, some recommendations are repeated: writing short sentences, being factual and objective, and avoiding promotional language. The use of readability tests to evaluate texts is encouraged, along with testing with some patients.

Subchapters 7 and 8, “Numeracy” and “Visuals”, again provide more concrete suggestions on how to improve layperson summaries’ comprehensibility. As for numeracy, the suggestions are to “present absolute numbers”, to “consider conveying numerical information in other ways such as a percentage, rather than relative risks, odds ratios etc.” (ibid.: 6), and to “use whole numbers rather than decimals” where possible. As for visuals, one instance of the recommendations is to “[a]void using overly complex images, such as graphs showing several relationships, since they can be easily misinterpreted” (ibid.: 7).

Subchapter 9, “Language”, points out that the layperson summaries should be provided at least in the local language of each of the EU Member States where the trial took place (and, possibly, also in English if the trial was not conducted in the Republic of Ireland or Malta, since this *lingua franca* would allow greater accessibility in the EU and worldwide). In addition, it states that:

Where translation is required for multi-country trials, care should be taken to ensure that the original meaning and non-promotional nature of the summary are maintained. Translated summaries should also take into account the cultural validity of the medical or technical terminology used. (ibid.)

Finally, subchapter 10 points out that pharmaceutical companies, although not required to do so, can “provide trial results to investigators or third parties to feedback to patients who have taken part in their trials, along with an acknowledgment of their contribution and an expression of appreciation, rather than solely directing them to the lay summaries on the EU portal” (ibid.: 8).

The Recommendations include three annexes. Annex I provides templates with example wording, which, as pointed out, is not mandatory, although a consistent approach is likely to make summaries more accessible. The ten elements listed in Annex V of Regulation 536/2014 are reworded in more understandable headings, like “Who sponsored this study?” instead of “Name and contact of sponsor”. Suggested wording is also provided for difficult concepts or technical terms, like trial phases, “randomization”, “blinding”, endpoints such as “dose escalation” and “surrogate”. Some instances (for “dose escalation” and “blinding”, respectively) are: “This trial was undertaken to find the highest [dose/amount] of treatment that people could safely take [or use] without having severe side effects” and “This trial was single-blind. This means that the patient did not know who was given which treatment they were given [sic] but the doctor did know”.

Annex 2 is a “neutral language guidance in describing results”, with neutral rewordings of statements that may be considered promotional: for example, “This trial proved... [...]” should be modified to “This trial found that... [...] This does not mean that everyone in that group had these results”.

Annex 3 lists examples of readability tests for different languages (Dutch, English, French, German, Italian, Spanish, and Swedish).

1.4.2 Good Lay Summary Practice

The Good Lay Summary Practice (GLSP) is a guidance on the topic of layperson summaries developed in 2021 and constituting the final result of

a roadmap and consultation process integrating the experience and recommendations from more than 60 industry, academia, patient and not for profit organisations from within and outside of the EU in collaboration with Competent Authority and Ethics Committee representatives of the EU Commission Expert Group on Clinical

Trials, which are committed to clinical trial result transparency and the development and dissemination of factual, non-promotional, and reader-friendly lay summaries. (GLSP 2021: 7)

The GLSP expands on the Recommendations of the Expert Group on Clinical Trials. Its target readers are “professionals who have been assigned the responsibility to plan, develop, review, translate, disseminate and/or upload LS to the EU Database, as well as stakeholders who wish to offer LS outside of the mandatory EU CTR requirements” (GLSP 2021: 17). Other initial specifications concern the texts that this guidance intends to address and their target readers. The GLSP points out that, while Regulation 536/2014 concerns only clinical trials with human participants and not non-interventional studies or medical device trials, its recommendations can be useful in the preparation of layperson summaries of these studies as well. Regarding the target audience of these texts, a definition of “layperson” is provided based on EU Regulation 745/2017 on medical devices (Article 2): “an individual who does not have formal education in a relevant field of healthcare or medical discipline”. More specifically, the GLSP lists three groups as main target audiences:

- 1) participants/people who took part in the clinical trial or care for a trial participant;
- 2) people from patient organisations who communicate with patients within specific disease areas, potentially with limited access to the Internet;
- 3) individual patients, their caregivers, relatives, friends or generally people who are interested in research results on treatments. (GLSP 2021: 18)

Other important preliminary points discussed in the GLSP concern terminology. It highlights that different organizations and sponsors use different terms, then

acknowledges that the EU CTR also refers to “layperson summary” but for consistency, the terms “lay summary” and “LS” are adopted and

applied throughout this document. Other terms applied include, but are not limited to, “Plain Language Summary”, “Trial Results Summary” and “Simple Language Summaries”. (GLSP 2021: 18)

The GLSP uses the term *lay language* synonymously with *plain language*. Since the former term has no globally agreed definition, the document adopts the definition of Plain Language proposed by the Plain Language Association International, i.e.: “[a] communication is in plain language if its wording, structure, and design are so clear that the audience can easily find what they need, understand what they find, and use that information”.

The GLSP describes the four steps of the layperson summary process, i.e., planning, development, translation, and dissemination. We will focus mainly on development and translation. As for planning, one interesting aspect highlighted in the guidelines (2021: 19) is that during the trial the layperson summary preparation should be aligned with that of other documents meant for patients, i.e., the Patient Information Sheet (PIS) and the Informed Consent Form (ICF). This coordinated approach aims at reducing duplication of effort or discrepant use of lay language terminology. It is also added that, if the documents are prepared by different writing teams, planning and collaboration between them should be enabled. Another important recommendation is to use a template, which “can aid efficient and consistent preparation of LS”. The suggestion is to “pre-fill the template with general information on the trial and the endpoint presentation structure, and hence create an outline ‘shell’ document, in advance of database upload and trial results availability”. This shell should then be filled in by a person experienced in clinical trial result presentation and lay language once trial data are available (ibid.: 20).

With respect to the development phase, many suggestions included in the Recommendations of the Expert Group on Clinical Trials are repeated and expanded on. The amount of information in the layperson summary should be reduced by focusing on the elements relevant for trial participants and the public; an abstract and a section to thank patients are both recommended, and, in addition, the layperson summary should be dated. The content of the layperson summaries is discussed, following the ten points listed in Annex V

of Regulation 536/2014 and the indications of the Recommendations of the Expert Group on Clinical Trials.

The competencies needed for writing a good layperson summary are listed as the following: scientific knowledge, familiarity with source documents, knowledge of disease and patient/trial participant population, knowledge of clinical research methodology, knowledge of safety of the intervention under investigation, statistical knowledge, communication and language skills (particularly in the field of communication with laypersons), skills for quality control and accuracy checks, legal and regulatory knowledge, visual and design skills, skills for validation of content, as well as collaboration skills.

The writing process is also addressed. Firstly, the necessity to pay attention to the target audience is highlighted.¹⁹ In particular, the differences between “scientific language” and “lay language” are listed through a series of opposing features. The former is characterized by “complex syntactical sentence structure, technical terminology, complex words, professional jargon, passive language, and impersonal tone of voice”, while the latter by “simple syntactical sentence structure, plain language, simple words, unambiguous language, active language, engaging tone of voice”. These descriptions contain a few inaccuracies. Firstly, while it is clear that here “active language” and “passive language” refer to verb choice, the terms have been incorrectly chosen. Secondly, “professional jargon” is not a very clear category; a few lines later, in the running text, “jargon” seems to refer to style, whereas in the list of opposing features the antonym of “professional jargon” is “unambiguous language”. Finally, the opposite of “technical terminology” is incorrectly stated as “plain language”, which instead describes the language variety, and is acknowledged as such at the beginning of the GLSP (which uses it synonymously with lay language).

After these initial clarifications, the subchapters that concern layperson summary writing are devoted to health literacy, readability formulas, length, health numeracy, and non-promotional language. The subchapter about

19 Although we will not focus on this aspect, the GLSP also pays particular attention to pediatric trials and some specific features of the layperson summaries for children, such as the use of cartoons and even simpler language than traditional layperson summaries (GLSP 2021: 36, 46–47, 70–74).

health literacy provides some linguistic suggestions, similar to those listed in the Recommendations of the Expert Group on Clinical Trials. Much like the Recommendations, these suggestions are listed in a somewhat random order, mixing features belonging to different linguistic levels. The suggestions start from the lexico-terminological level, go on to the morphosyntactic one, then go back to terminology and various other aspects such as consistency and respectful language, and eventually thematize terminology again:

- 1) Use simple everyday conversational language.
- 2) Use short words, sentences and paragraphs.
- 3) Use active voice rather than passive voice.
- 4) Do not use technical or scientific language.
- 5) Present medical terms in brackets.
- 6) Use neutral non-promotional language.
- 7) Do not use statistical terms.
- 8) Quantify words.
- 9) Use words and terms consistently.
- 10) Be respectful in your language.
- 11) Do not use Latin expressions.

The subchapter about health numeracy includes far more suggestions than the corresponding chapter of the Recommendations of the Expert Group on Clinical Trials. Firstly, it gives a definition of the concept, i.e., “the ability to understand, use and communicate quantitative health information, including the ability to understand information in text and non-text formats such as graphs” (GLSP 2021: 37). Secondly, it provides the following suggestions: using visuals for interpretation of numbers, using whole numbers, keeping denominators and units consistent, using percentages carefully, using numerals rather than words for numbers, and not leaving calculations to readers.

The subchapter about non-promotional language is also far more detailed than in the Recommendations of the Expert Group on Clinical Trials, which only contains some rewordings. Some examples are “Do not criticise or oppose competitors” and “Highlight both the positive and the negative” (ibid.: 38).

A separate chapter details layout and design. Some examples of the many suggestions include use of left-aligned text and bullets formatting.

Finally, some indications about how to make layperson summaries accessible to people with visual impairments are given and the topic of review and user testing of the summaries is thematized.

With respect to translation, the GLSP (2021: 49) acknowledges the importance of translated texts, pointing out that

[a]vailability of a LS in patients' native language is an important element of fair access to information. Translating LS into the official languages of all countries in which the trial took place is considered good practice since a primary objective of the LS is to communicate results in clear and understandable local language. (ibid.)

Some important specifications contained in the GLSP concern the timeline. While no timeframe for translated layperson summaries is defined in Regulation 536/2014, the GLSP recommends providing them “ideally in parallel with the release of the version of the official language of the trial” (ibid.: 49) in order to guarantee equal and fair access to information to trial participants from all countries. As for planning and preparation of translations, the GLSP suggests “set[ting] up a style guide for the writing and translation of the LS and [...] proactively develop[ing] a glossary of terms”, so as to “facilitate reviews and minimise the occurrence of preferential changes, time consuming queries and content inconsistencies” (ibid.). The translation process is also thematized. According to the GLSP, all translated layperson summaries should be based on a master layperson summary, so a successful translation depends on the high quality of the source text, which should be carefully reviewed and finalized before translation. Three resources to obtain a good translation are mentioned:

- 1) Human expertise: translations should be carried out by native or fluent translators²⁰ and checked by reviewers with expertise in clinical trial research and Plain Language communication.

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20 The practice of resorting to non-native translators is clearly controversial.

- 2) Controlled workflows, i.e., a well-defined process with quality checks.
- 3) Technology and automation tools: computer assisted translation, translation memories and revision tools can be used to increase language accuracy and consistency as well as to run automated checks for linguistic and formatting issues.

Human expertise and controlled workflows are deemed to be essential, while technology and automation tools “are no precondition if sponsor budgets are limited” (ibid.: 50).

The translation process suggested for the layperson summaries, which is “widely recognised as a [sic] gold standard for patient-friendly communication in clinical trials” (ibid.), is also illustrated step by step (ibid.: 75, Annex), with six phases: planning, forward translation, back translation (optional), comparative review (optional), final quality assurance inspection, delivery and certification. In the planning phase, the master layperson summary should be analyzed to identify areas of ambiguity, regulatory compliance, or risk of biased and promotional content. This analysis will enable the establishment of what will be necessary during translation: instructions, checklists, glossaries, reviews or tools. Forward translation, as mentioned above, should be carried out by native or fluent translators in the target language with experience in the medical field, possibly with clinical trials. Back translation, which consists of retranslating the target text into the original source language, aims at checking the quality of the translation, as it reveals potential discrepancies between the translation and the source text. The back translator is typically a native or fluent speaker of the source language and does not have access to the source text, which is done in order to guarantee an unbiased evaluation. A comparative review consists of a comparison between the back translation and the source text carried out by a third party (usually a native speaker of the source language); during this process, the forward translation may be revised to resolve the detected issues and obtain a more accurate translation. The quality of the document will be verified and, if the sponsor has worked with a language service provider, it will be delivered along with a translation certification. The GLSP (ibid.: 50, 75) specifies that the back translation and comparative review

phase can be replaced by a partial or full linguistic review of the translation against the source text. The choice between these two procedures depends on the complexity of the text and on the financial resources of the sponsor.

As far as dissemination is concerned, the GLSP (ibid.: 51) lists a series of technical distribution methods which can be used in addition to publication on the EU Database, if deemed adequate: these include emails, sponsor websites, and global open access portals providing support in various languages.

2 Research questions, corpus description, and methodology

The aim of the present book is the analysis of the texts described in Section 1.3, i.e., the layperson summaries of clinical trials. While other text types belonging to expert-lay communication in the medical field, like package leaflets, brochures, and informed consents have been frequently examined, both from a linguistic and translational perspective (cf. for instance Mentrup 1982; Eckkrammer 1998; Lyba 2001; Rovere 2001; Müller 2009; Leunikava 2011; Puato 2012; Giumelli 2013; Orletti & Iovino 2018), no such studies on the layperson summaries exist to date, due to their recent introduction. The author of the present book has already published a few brief articles on the topic (Pedrini 2022a, 2022b, 2023): two of them concern verb voice in a small corpus, one the contrastive analysis of two layperson summaries. Their content has been partially re-elaborated in the present book, and their analyses are referred to in a few cases in order to compare their findings to the results of the current analysis. The layperson summaries are particularly interesting not only due to their innovativeness, but also in light of the fact that they should be written in Plain Language and that they are the only ones of their kind with specific recommendations.

2.1 Research questions

The research questions that the present book aims at answering through the layperson summaries' analysis are illustrated here. Firstly, we will aim at establishing where these texts are situated in the continuum of language simplification, and whether they can be regarded as instances of Plain Language at all. Since language simplification is a continuum and Plain Language, unlike Easy Language, has no fixed rules, it is worthwhile determining towards which of the two a text might lean. Their linguistic features will be highlighted, in

order to specify the most problematic aspects. We will also aim at highlighting the peculiarities of the translated texts and, by so doing, establish whether translators jeopardize or optimize comprehensibility. We will examine whether the layperson summaries correspond to the guidelines' criteria, both with respect to general guidelines for language simplification and more specific recommendations (Recommendations of the Expert Group on Clinical Trials [2018] and the Good Lay Summary Practice [2021]). Finally, we will point out which parts of the existing specific guidelines for layperson summaries could be improved based on the analyzed texts.

2.2 Corpus description

For the purposes of the present book, a trilingual corpus of layperson summaries has been created. The source texts (master layperson summaries, from now on “STs”) are written in English, and the target texts (from now on “TTs”) in German and Italian, respectively. The aim was to build a parallel corpus in order to make results easier to interpret.

Here, a few terminological clarifications are necessary. An important distinction in corpus-based translation studies is the opposition between parallel and comparable corpora, which are both multilingual corpora. Parallel corpora

consist of a source text and its translation into one or more languages. They can be further characterised in terms of the direction of the translation. If a corpus consists of e. g. English texts translated into Swedish, it is unidirectional; on the other hand, if this corpus also contains translations into English, it is bidirectional. Very often parallel corpora are aligned, either by sentence or by word. (Aijmer 2008: 276)

Comparable corpora differ from parallel corpora since they do not include translations, but rather “texts from different languages which are similar or comparable with regard to a number of parameters such as text type, formality, subject-matter, time span, etc.” (ibid.). However, there is no full consensus in literature about the terminology to be used. Some scholars use the term

translation corpus in lieu of *parallel corpus* (see Johansson 1998, qtd. in Aijmer 2008: 277). According to Aijmer (ibid.), the term *translation corpus* with this meaning may lead to misunderstandings, as it is also used by translation scholars (see Baker 1995) to refer to collections of translated texts without their source texts.

A subtype of parallel corpora is given by multilingual parallel corpora, where

there is a core language which has translations into many different languages (note that most existing parallel corpora are bilingual). Multilingual parallel corpora allow comparisons between more than two languages using many translations of the same original text. Such corpora are obviously more difficult to build since we need to find translations into more than one language. However [sic] they open up the possibility of carrying out truly multilingual research and extended language research, thus revitalizing the old paradigm of translation comparison (Viberg 2002, 121). (Aijmer 2008: 277)

Based on this terminology, the present book entails the analysis of a parallel, multilingual, unidirectional corpus.

2.2.1 Pharmaceutical companies

The examined texts have been downloaded from the websites of the following pharmaceutical companies: Bayer,²¹ Novartis,²² GSK,²³ and Roche.²⁴ Fig. 3 and 4 show the starting page of two of these public portals:

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- 21 https://clinicaltrials.bayer.com/studies/?Keyword=&gender=&ageRange=&Status=&Latitude=&Longitude=&MileRadius=&page=0&SortField=Location_Distance&SortOrder=asc&conditions=&phases=&healthyVol=&studyType=&studyResult=ATTACHTYPE_LAY_LANGUAGE_SUMMARY&locationCountryInternal=
 - 22 <https://www.novctrd.com/#/trialsummariesforpatients?category=MedicalCondition>
 - 23 https://www.gsk-studyregister.com/en/results/?legacy=true&Keyword=&Status=&Latitude=&Longitude=&Conditions=&phases=&HasCTGovResult=&patientLevel=&gender=&ageRange=&studyType=&documents=ATTACHTYPE_PLAIN_LANGUAGE_SUMMARY&SponsorUnits=
 - 24 <https://forpatients.roche.com/en.html>

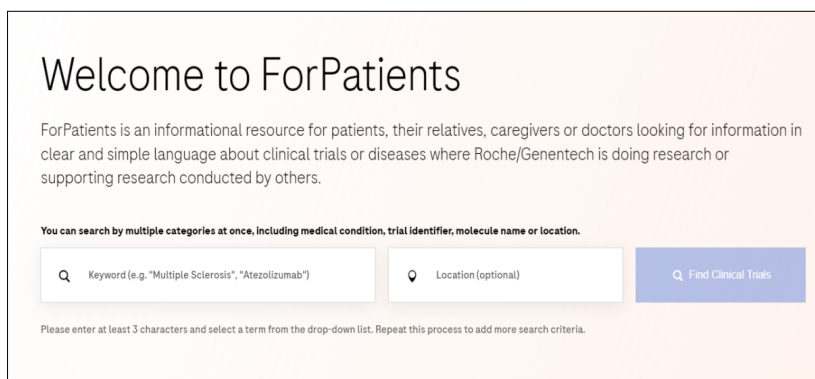


Fig. 3: Portal of the pharmaceutical company Roche

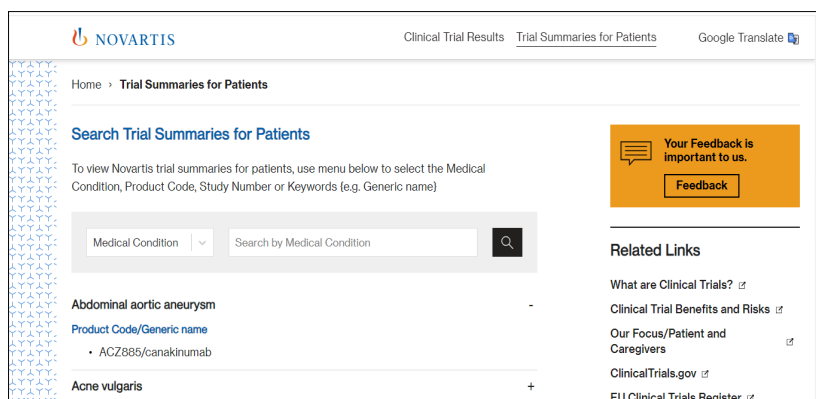


Fig. 4: Portal of the pharmaceutical company Novartis

Layperson summaries were selected from the portals of the abovementioned pharmaceutical companies since the Clinical Trial Information System (CTIS) had not yet been launched when the phase of text collection began (2020): as stated in 1.3.2, it was in fact implemented in 2022. At the time of writing, it still does not contain any layperson summaries, as trials that are recorded there are recent and have not been completed yet (their status is, for instance, “not authorised”, “authorised, not started”, “ongoing, recruiting”, “ongoing, not recruiting”, etc.). In the same period, however, many pharmaceutical companies

had already started producing layperson summaries and publishing them on their own websites, which made the present analysis possible.

While selecting the material for corpus construction, other pharmaceutical companies had also been taken into consideration, but they were eventually excluded due to the low number of documents they had uploaded or to the lack of translations in the languages needed for this analysis.

Table 1 shows the composition of the corpus with respect to pharmaceutical companies:

	English subcorpus	German subcorpus	Italian subcorpus	Tot. subcorpora
Bayer	33	33	33	99
GSK	11	11	11	33
Novartis	8	8	8	24
Roche	8	8	8	24
Tot.	60	60	60	180

Table 1: Pharmaceutical company texts in the subcorpora

In total, each subcorpus contains 60 texts, for an overall number of 180 texts. The single pharmaceutical companies show differences in numbers, with over half of the texts being written by Bayer. This is because at the time of text collection and corpus construction this was the pharmaceutical company with most translated layperson summaries (and with most translations in Italian and German of the same STs).

2.2.2 Diachronic and diatopic variables

The analyzed layperson summaries have been written – and translated – between 2016 and 2022. More information can be found in Table 2:

Year	Number of texts
2016	3
2017	3
2018	/
2019	12
2020	67
2021	87
2022	5
NI (2020, 2021 or 2022)	3

Table 2: Corpus period of reference

NI (“not indicated”) means that three texts do not signal when they were finalized: due to a mistake, only the first two digits of the year, “20”, are indicated.²⁵ In addition, translations of four layperson summaries did not indicate a date of finalization: in these cases, the same year of the ST was considered for the sake of simplicity, as most texts are translated in the same year they are written. This way, pharmaceutical companies follow the GLSP’s recommendation to provide translations “ideally in parallel with the release of the version of the official language of the trial” (ibid.: 49, mentioned in Section 1.4.2). These layperson summaries were dated 2019 (2 texts) and 2020 (6 texts). Overall, most texts (154, i.e., 85.56% of texts) were written and translated in 2020 and 2021. Texts finalized in 2022 are not particularly represented since data collection ended to allow corpus construction and analysis, and not due to a decrease in text production. This distribution shows that the practice of writing and translating layperson summaries has been becoming more and more frequent over time. With the launch of the Clinical Trial Information System, they are likely to gain even more momentum and importance on the translation market.

Another dimension of linguistic variation that should be considered in the description of the corpus is diatopia, since some pharmaceutical companies provide texts in different varieties of the languages under analysis. For example,

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²⁵ “This document was developed and approved by GSK on XX YYYY 20ZZ”.

in addition to American and British English, alternatives such as New Zealand English have been found on pharmaceutical companies' portals. Regarding German, versions for Germany, Austria, and Switzerland are sometimes provided. With respect to Italian, no differentiation between varieties was detected even in trials that took place in Switzerland (for these, a Swiss German and a Swiss French variant are sometimes found).

It should be noted that pharmaceutical companies' provision of layperson summaries in different language varieties is not consistent. In some cases, when a trial took place in various countries where the same language is spoken, the summary is provided in all varieties: for instance, in a trial that took place in Austria and Germany, both an Austrian German summary and a German summary are provided. In many cases, however, the choice of language variety is not determined by the countries that took part in the trial. All original texts by Bayer are written in American English, even if the trial took place in the UK.

With respect to the layperson summaries selected for the present analysis, 42 texts are written in American English and 18 in British English. More specifically, all texts by Bayer (see above) and Novartis are written in American English and all texts by Roche in British English. As for texts by GSK, one is written in American English and the others in British English.

Regarding the German subcorpus, three texts (by GSK, Novartis, and Roche) are written in Swiss German, and the others in the variant from Germany. As for Italian, as already mentioned, no specification is ever made as to which variant is used. It is arguably always the variant from Italy rather than from Switzerland, since pharmaceutical companies tend to indicate "German – Switzerland" or "Swiss German" and "French – Switzerland" or "Swiss French" in analogous cases where they want to signal that the layperson summary is written in a specific variety.

Overall, in most cases the pharmaceutical company portal only presented one layperson summary per language. There were two versions for only a small number of trials: these were American and British English (or other variants) and German as well as Austrian German. For the sake of consistency, the American English and German versions were selected in this case.

2.2.3 Corpus construction and lexicometric data

The selected layperson summaries have been aligned in order to build a trilingual parallel corpus suitable for analysis by means of Sketch Engine,²⁶ the most used tool for corpus analysis, especially when the corpora contain translated subcorpora. While preparing the aligned documents, the layperson summaries have been “cleaned” of unnecessary information, such as page numbers, footers with the title repetition, etc. Text segments have then been uploaded on Sketch Engine in a tabular format (.xlsx, i.e., through Excel spreadsheets); finally, the software proceeded to compile the subcorpora.

Table 3 shows the size of the corpus along with some lexicometric data.²⁷

	English subcorpus	German subcorpus	Italian subcorpus	Tot. subcorpora
Tokens	144,438	144,917	160,334	449,689
Types	4,996	7,395	6,394	/
TTR	3.45	5.10	3.98	/
Lexical density	0.612	0.574	0.614	/

Table 3: Lexicometric data

The corpus is not very big in absolute terms; however, the distinction between general and specialized corpora should be considered while evaluating its size:

In corpus linguistics, a corpus is often described as being either ‘general’ or ‘specialised’. General corpora are usually much bigger than specialised corpora. For example, the Bank of English is over 600 million words; COCA is more than 400 million words; and the BNC is 100 million words, and all are general corpora. Specialised corpora, on the other hand, can usually be measured in the thousands or low millions of words, although there are some that are very large. (Cheng 2012: 32)

.....
26 <https://www.sketchengine.eu/>

27 TTRs and lexical densities will be discussed in Chapter 11; here, the purpose is exclusively to show the size of the corpus.

Corpus size is also thematized by Bowker and Pearson (2002: 45–48), who highlight that

[a] corpus is often referred to as a ‘large’ collection of texts, but the adjective ‘large’ is rather vague. [...] It is very important, however, not to assume that bigger is always better. You may find that you can get more useful information from a corpus that is small but well designed than from one that is larger but is not customized to meet your needs.

For instance, in order to analyze the vocabulary of the LSP of manufacturing, a “10,000-word corpus containing catalogues, product descriptions and assembly/installation instructions from companies in the manufacturing industry” would be much better than a much larger LGP (language for general purposes) corpus, such as the British National Corpus (BNC) with 100 million tokens. In fact, according to Bowker and Pearson (*ibid.*: 46–48), a corpus of this size is more than enough to obtain information about a specific, restricted field of communication.

In addition to being a specialized corpus, the present collection is also what Cheng (2012: 169–171) calls a “genre-based study”, where only one – quite standardized – text type is examined. Similar corpus studies conducted on text types are, among others, those by Orletti and Iovino (2018) as well as by da Cunha and Montané (2019). The former analyzed 100 package leaflets, with a corpus of 189,315 tokens (*ibid.*: 69). The latter examined five administration-related textual genres, i.e., allegation, cover letter, letter of complaint, claim, and application. The corpus, consisting in total of 100 texts, was made up of subcorpora of 20 texts of the following sizes: 19,405, 3,550, 10,952, 11,498, and 3,283 tokens (with, in total, 48,688 tokens).

Overall, the size of the present corpus, which contains in total 449,689 tokens, may be therefore considered acceptable and adequate to at the very least detect some general tendencies related to a quite standardized text type.

2.3 Structure and methodology

As stated in Section 2.1, the purpose of the present book is to examine the layperson summaries both from a linguistic and translational perspective. Differences and similarities between the three languages will be stressed; in particular, we will be focusing on whether simplification is equally guaranteed in the STs and in the TTs or whether translators “jeopardize” or, conversely, optimize the attempts to achieve a higher degree of comprehensibility made by layperson summaries’ authors. For this reason, focus will be on aspects that have an impact on text understandability on a lexical, terminological, morphosyntactic, and textual level.

In particular, the aspects that will be considered are vocabulary and medical terminology, verb voice, nominalizations, tendency towards parataxis or hypotaxis, layout and multicodality, textuality, gender-inclusive language, and explication, each of which will be discussed in a specific chapter in the book. In addition, readability indices’ values and other data (including TTR and lexical density) will be taken into account.

Each chapter contains an introductory theoretical framework (generally including indications about the analyzed phenomena, also from a cross-linguistic and translational perspective, considerations concerning comprehensibility, and recommendations in the field of language simplification), a methodology section, the empirical analysis, and a discussion. The guidelines for language simplification that are taken as a reference are *The Oxford Guide to Plain English* (Cutts 2020), the Duden manual *Leichte Sprache. Theoretische Grundlagen, Orientierung für die Praxis* (Bredel & Maaß 2016a), *Manuale dell’italiano facile da leggere e da capire. Come scrivere testi semplici per persone con disabilità intellettive e difficoltà di lettura* (Sciumbata 2022), and *Il Plain language: quando le istituzioni si fanno capire* (Fortis 2003). In addition, suggestions contained in the Recommendations of the Expert Group on Clinical Trials (2018) and the Good Lay Summary Practice (2021) are considered. The manuals and guidelines for language simplification have been chosen based on their influence in the field and validity. In particular, the German manual (Bredel & Maaß 2016a) has been chosen (in spite of its primary focus on *Leichte Sprache* rather than *Einfache Sprache*) since it is the

most consulted and detailed volume on the topic of language simplification in the German-speaking area. As already mentioned in Section 1.2.2, *Leichte Sprache* has received far more attention than *Einfache Sprache* due to the BITV 2.0. In addition, since language simplification is a continuum with no clear-cut borders between varieties and overlapping features, the guidelines proposed for a variety can be useful, *mutatis mutandis*, also for other ones. Similarly, the guidelines on Plain Language by Fortis (2003), which are quite brief and were written about twenty years ago, have been integrated with the manual for *italiano facile da leggere e da capire* (Sciumbata 2022).

The analysis was generally conducted on the whole corpus (as described in Section 2.2.1) using Sketch Engine. In some cases (indicated in the respective methodology sections), where a quantitative analysis through this software was not possible, a smaller selection of texts belonging to the corpus was looked at and evaluated more qualitatively. This selection entails 30 texts: 10 English layperson summaries and the corresponding translations in German and Italian. These texts belong to all four pharmaceutical companies: 3 to Bayer as well as Novartis and 2 to Roche and GSK.

Beside Sketch Engine, other tools were sometimes used – as will be described in more detail in the corresponding chapters. These tools are Analyze My Writing, Ratte (Regensburger Analysetool für Texte), and DyLan TextTools.

After this theoretical introduction and brief corpus and method description, we will now move on to the chapters of analysis.

3 Terminology and vocabulary

The empirical analysis of the layperson summaries will start from the lexico-terminological level, since (as will be explained in greater detail in 3.1) this is the most distinctive aspect of LSPs and the one which causes more difficulties to laypeople.

3.1 Theoretical framework

According to Sager et al. (1980: 76–79), it is the degree of reference of both general and specific lexical elements of an LSP which differentiates them from one another. The lexical elements which are not specific to a certain discipline, with a vague or generalized reference, are called *words* and make up the *vocabulary* of a language. The lexical elements characterized by a special reference²⁸ within a specific discipline are called *technical terms* or just *terms* and make up the *terminology* of that LSP. A more precise definition of technical term is the following: “the smallest significant and at the same time freely usable linguistic unit of a specialized language system, which may occur in communication in texts within a specific field of human activity” (Roelcke 2010: 51–52, my translation). According to Borgwaldt and Sieradz (2018: 56, my translation), technical terms (or ‘*termini technici*’) “unambiguously denominate a concept precisely defined in a field and therefore possess an exact meaning in a certain special language. The set of terms in a special language is called terminology”. These scholars (ibid.: 57) also point out that specialized discourse is not only comprised of technical terms (although these stand out particularly in such texts) but also by words from general language which occur with the same meaning in everyday language (they mention the use of words

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28 *Special reference* means that the technical term belongs to the conceptual system of a certain discipline and that its paradigmatic relations cannot be modified or expanded by the context (Sager et al. 1980: 76–79).

such as *in*, *sondern*, and *wichtig*). Moreover, Klute (1975: 6) points out that the boundary between special languages and general language is not clear, as there are no LSPs that do not consist of lexical and syntactic elements belonging to the general language. He also stresses that general language is influenced by LSPs, as it sometimes also absorbs their terminology.

Overall, a lexico-terminological tripartition may be observed in LSPs: general vocabulary, general scientific vocabulary, and specific terminology (Hoffmann 1985: 126–127). For general scientific vocabulary, Hoffmann uses the term *allgemeinwissenschaftlicher Wortschatz*: it indicates those technical terms that occur in many – if not all – scientific disciplines. Another well-known denomination has been put forward by Ehlich (1999), who refers to this type of technical terms as *alltägliche Wissenschaftssprache*, starting from the concept of *ordinary language philosophy* (ibid.: 6–7). Some instances he provides are *Zusammenhang*, *Ansatz*, *Bedeutung*, *darstellen*, *zusammenfallen*, *Fuß fassen*, *Forschungsgegenstand*, *Mittel dazu*, and *Aufteilung* (ibid.: 12–21).

3.1.1 The role of vocabulary and terminology in LSPs

In her reflections about the language of medicine and medical translation, Magris (1992: 3) states that all scholars who discuss the medical language or LSPs in general agree that the lexical level is their most distinctive feature. She also points out that this corresponds with the two main aspects of the evolution of science and technology, i.e., the expansion and rationalization of human knowledge. In fact, the linguistic expression of such knowledge evolves in parallel with an ever-increasing vocabulary and a reduced syntax. Among the scholars who highlighted the importance of the lexical level – in some cases approximately 50 years ago, in others even before – are linguists such as Porzig (1957: 258), Seibicke (1959: 75), Buchmann (1960: 292), Jumpelt (1961: 3), and Hoffmann (1976: 259), while more recent considerations are made by Cortelazzo (1994: 7) and Scarpa (2002: 27–28). Cortelazzo states that it is lexicon that differentiates an LSP from both general language and from other LSPs. Scarpa points out that terminology is the most studied aspect of LSPs, since it represents the linguistic aspect that develops as a direct result of the necessity to describe and explain scientific and technical phenomena. However, Fluck (1996: 12) noted that the role of technical terms has long been

overestimated compared to the role of syntax: he admits that the essence of specialized discourse lies in its terms, not in its syntax, but points out that it is equally important to consider its syntactic features, without which LSPs would not be languages but mere listings of technical terms. In the same vein, Kalverkämper (1998: 48) notes that special language studies only encompassed the lexical and terminological level since their beginning in the '60s through the '70s and '80s, but that this approach started being criticized due to the ever-increasing influence of text linguistics. Also Hoffmann (1998a: 157) points out that LSPs were long equated with specialized vocabulary or terminology, adding that specialized vocabulary is frequently mentioned as a major issue in relation to specialized translation and that also translation studies often highlight terminological aspects. In discussing the fact that LSPs were long considered by linguists to be merely specialized vocabulary, Adamzik (2018: 28–29) points out that the number of technical terms is far higher than that of “normal vocabulary”, and that special languages are characterized by the highest formation of new words. In this respect, she reports some figures listed by Römer and Matzke (2010: 1), according to whom German has about 300,000 to 500,000 words belonging to normal vocabulary, while, if technical terms are also considered, the German lexicon encompasses 5 to 10 million items. On the whole, there is no consensus about the size of specialized vocabulary: for instance, Buhlman and Fearn (2000: 44) state that the specialized terminology of a certain discipline makes up between 15% and 50% of the vocabulary of specialized discourse.

3.1.2 Features of terminology

Specialized vocabulary is made up mainly by words belonging to open word classes, i.e., nouns, adjectives, and verbs, while technical terms are rarely found in closed word classes (Borgwaldt & Sieradz 2018: 58). The most important word class in LSPs is given by nouns, followed by adjectives with a differentiating function. Verbs and adverbs are less significant and characterized by a lower frequency. Pronouns, numbers, and prepositions may also occur in certain technical terms (Fluck 1991: 48–9).

One important phenomenon in the creation of specialized vocabulary is that of “terminologization”, which implies the transformation of a word

occurring in general language into a technical term of a specific field (ibid.: 50). An instance provided by Fluck is the term *Wurzel* in linguistics or dentistry: the word form does not change, as only the semantics²⁹ of the lexeme vary. Another interesting aspect highlighted by this scholar is that such terms, unlike general words, usually do not have any connotations. In this respect, Scarpa (2002: 27–28) highlights that the vocabulary and notably the terminology of LSPs are particularly influenced by the requirements of precision, non-emotionality, and economy.

Monosemy (or bi-univocity) is one of the main theoretical principles of traditional terminology. However, synonymy is actually a widespread phenomenon in many LSPs, especially in the medical field. For instance, Borgwaldt and Sieradz (2018: 56–57) point out that technical terms often have synonyms with a different origin. With respect to synonymy in terminology, an interesting article was written by Freixa (2006), who investigates the causes of “denominative variation in terminology” (ibid.: 51), which may be defined as

the phenomenon in which one and the same concept has different denominations; this is not just any formal variation (variation between a term and a periphrasis, or a definition, for example), but is restricted to variation among different denominations, i.e., lexicalized forms, with a minimum of stability and consensus among the users of units in a specialised domain. (ibid.)

Beside the preliminary causes of variation (i.e., linguistic redundancy and the arbitrariness of the linguistic sign), the author identifies other five types of variation: dialectal, functional, discursive, interlinguistic, and cognitive variation. Diatopic, diachronic, as well as diastratic variation are subsumable under the category of dialectal variation (ibid.: 54–56). Functional causes are related to different communicative registers (ibid.: 56–60), and may be summarized as adaptation to the level of language or to the level of specialization. Discursive causes are connected to rhetorical and stylistic needs. In particular, synonyms may be used in order to avoid repetition (ibid.: 60–62)

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29 In some cases, grammatical characteristics – such as the plural form – also change.

or to be emphatic, creative, or expressive (ibid.: 62). With respect to the need to avoid repetition, Freixa states that there are several types of denominative alternations, and that in highly specialized texts the typical ones consist of the use of acronyms and the “reductions of terms next to properly developed forms” (like the shortened form *MIC* and its extended form *methyl isocyanate*, or other types of morphosyntactic alternations, such as *microorganisms* and *microscopical organisms* – in this case a portmanteau, ibid.: 61–62).³⁰ She points out that these forms are characterized by a high degree of equivalence and contribute to linguistic economy as well as increasing textual coherence (ibid.: 62). The latter is true both for strictly anaphoric, non-lexicalizable reductions (as in *installation* after mentioning the specific concept *steam installation*, or *growth* after *economic growth*) and already lexicalized reductions (such as *stainless* for the phrase *stainless steel*, or *sulphuric* for the phrase *sulphuric acid*). Interlinguistic causes of variation (ibid.: 62–63) refer to the contact of a language with other languages, especially in terms of cultural closeness rather than geographical closeness. In this respect, the frequent cohabitation of a local term and a loanword is discussed. As for cognitive causes, Freixa (ibid.: 64–68) refers to the fact that different points of view or perceptions of reality may lead to the formation of synonymy in terminology. In particular, she states that

[i]mprecision of concepts and voluntary ideological distance are cognitive causes of synonymy, as are the different conceptualisations arising from different points of view and varying degrees of importance given to the constitutive elements of the concept in the process of denomination. (ibid.: 64)

Although there is lack of reliable data on the importance of the five classes of causes, Freixa (ibid.: 52), believes that discursive variation brings about more synonymy than the other categories of denominative variation, while “functional variation presents less divergence in specialised discourse than in general discourse” (ibid.: 57). However, functional variation remains

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 30 She also mentions recourse to other types of morphosyntactic alternations, as in *microorganisms* and *microscopical organisms* or *hydric pollution* and *contamination of waters* (ibid.: 62).

undoubtedly of interest in the analysis of expert-lay communication, as “[i]t is assumed that an author may express specialised knowledge in different ways according to the knowledge he presupposes in the recipient” (ibid.). She further states that

[i]n studies of a more descriptive terminological orientation, denominative variation produced by the adaptation to the level of specialisation of the recipients is an accepted fact. Sager et al. (1980) assert that we cannot address in the same way different audiences with differing knowledge of a subject, and that this is a cause of synonymy that does not admit textual replacements. In medicine, denominative variation according to patients’ level of comprehension is a common occurrence. The opposite intention has also been observed, i.e., when the specialist does not want the patient to understand what he says. In this case we could speak of *perverted adequacy*. (Freixa 2006: 57)

3.1.3 Medical terminology

This subchapter will focus specifically on medical terminology, from both a cross-linguistic and translational perspective. Terminological univocity in the medical field is often achieved with recourse to neologisms, the redefinition of meaning of already existing words, the formation of words through derivation and composition, calques and loanwords from foreign languages or Greek and Latin (Orletti & Iovino 2018: 38). In LSPs in general and in medicine in particular, the process of designation of concepts is far more aware than in general language. The methods of designation which are favored are those that allow to express complex concepts systematically. Therefore, words from general language are (nowadays) rarely adopted as technical terms (Magris 1992: 29–30).

The most used method is likely to be affixation, which encompasses mainly prefixes and suffixes of Greek and Latin origin (ibid.: 30–31). Suffixes in English, German, and Italian are characterized by more correspondences than prefixes, where more inequivalences may be observed (ibid.: 35, 38). Firstly, English, being a more synthetic language, uses more prefixes than Italian: an instance is *antelocation*, where *ante-* indicates a movement rather

than a position. The Italian translation would be a noun phrase, *spostamento in avanti* or *spostamento in direzione anteriore* (ibid.: 35). Furthermore, in English this prefix is used also to indicate *before*, while in Italian (and German) a preposition is favored in this context (ibid.: 31). In other cases, prefixes are even omitted: this often occurs with *hyper-* in English, but sometimes also in German (ibid.: 36), while in Italian it cannot be left out without any changes in meaning. Some instances of this discrepancy are the English term *proteinemia*, which can be translated in Italian as *proteinemia* (presence of proteins in blood) but also as *iperproteinemia* (excessive amount of proteins in blood), and the German term *Sensibilität*, which can be translated as *ipersensibilità* (Magris 1992: 36).

With respect to composition, English, German, and Italian show different tendencies. In German two or more lexemes are joined to create terms, while English and Italian are characterized by a higher presence of multiword terms³¹ (ibid.: 39). The most frequent patterns are NOUN + ADJECTIVE and NOUN + PREPOSITION + NOUN in Italian, ADJECTIVE + NOUN and NOUN + NOUN in English, and ADJECTIVE + NOUN in German (ibid.: 53). A peculiar case consists in multiword terms with proper names, i.e., eponyms. These are not problematic for translators, with the exception of cases where an eponym is used only in one language. This usually occurs in German (ibid.: 54; cf. also Puato 2011: 122).

As for borrowings and loanwords, nowadays English is undoubtedly the main donor language in medicine. While translating from and to languages other than English, attention should be paid to the degree of absorption of English terms in each of them. For instance, German tends to have more anglicisms than Italian. Furthermore, if the term is indeed used in both languages, one should consider whether the meaning is the same (ibid.: 58).

As mentioned above, Greek and Latin play a prominent role in medical terminology. In Italian, this is not so evident, as most lexical elements also of the general language have Greek and Latin origins. In English and German, both Germanic languages, this phenomenon is clearly more prominent. While

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 31 It should be noted that the classification of multiword terms is controversial. According to some scholars, such terms are subsumable under the category of composition, according to others to the category of compression (Magris 1992: 52).

this international medical terminology undoubtedly helps translators due to the equivalences between languages it causes, it is also potentially problematic, as it makes it harder to spot inequivalences (ibid.: 21–22). Some instances are given by the fact that English and, even more, German, often adopt terms of classical origin without any morphological changes, while Italian tends to modify them. At the same time, English and – again, even more so – German also have many calques from Latin and Greek with lexical elements of Germanic matrix (ibid.: 26–29), which are more understandable to a non-expert audience.

This concept is discussed widely also by Puato (2011: 117), who notes that the presence of these two strata³² of terms (of Latin/Greek and Germanic origin) in German creates some difficulties for translators, especially in expert-lay communication. This is due to the fact that there are register discrepancies between languages like Italian and German. Puato (ibid.: 119) goes as far as to talk about a “technical diglossia” in German, with the more specialized, less transparent terms of classical matrix being used among professionals and the “vulgarized” ones of Germanic origin being used in communication with non-experts. In Italian, instead, this second stratum of terms is missing. Translators should be aware of these interlinguistic differences³³ and employ the right strategies according to the translation direction.

3.1.4 Terminology and comprehensibility

The lexical and terminological level is particularly important in expert-lay communication. As highlighted by Niederhauser (1999: 171–172), laypeople

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32 In some cases there are actually three strata of terms, as for *Parotitis/Ohrrspeicheldrüsen-entzündung/Mumps*, where the third term has the lowest register.

33 English, German, and Italian are not the only languages where such differences are observable. Montalt Resurrecció and González Davies (2007: 242) point out that, while languages like English have a “double-layered medical vocabulary”, languages like Spanish and French do not have them or have them only to some extent, giving rise to a “register mismatch”. Jiménez-Crespo and Sánchez (2017: 406) also note that “[t]he adjustment of the level of register expected by target audiences represents a main issue in medical translation, since register considerations between languages is so important given that ‘difference in usage register can trigger variations in terminology and style’ (Wright 2011: 246)”. They also point out that the use of some terms (e.g., *coagulation* or *appendicitis*) in Nordic languages (i.e., Danish and Swedish) would result in an even higher register than in English.

recognize their lack of expertise when they find unknown terminology. In the same vein, Jahr (1993) claims that “[b]oth expert language and the technical subject as well as expert and layperson face one another more intensively in a technical term” (ibid.: 10, my translation). Referring in particular to medical communication, Orletti and Iovino (2018: 9) state that patients have a hard time understanding specialized texts and discourse due to the presence of technical terms (as well as of words of a higher register). They go as far as to claim that medical terminology is often an insurmountable barrier between doctors and patients (ibid.: 35), an assertion reminiscent of the expert language barrier in the categorization of barriers proposed by Rink (2019: 30–31, see 1.1).

Other interesting considerations concerning terminology and comprehensibility are those by Wichter (1983: 74), who wonders “what makes difficult words so”, differentiating between the Saussurean levels of signifier and signified. According to him, difficulties arise for the signifier for a number of reasons: firstly, if the morphemes’ structure is too “foreign”, it can render them hard to identify. Secondly, for the same reason, semantic reference points may well get lost. The segmentation and hierarchization of such morphemes may also be almost impossible (e.g., for readers who do not have any basic knowledge of roots of classical origin). And finally, similar signifiers could be particularly easy to confuse. In his opinion, the signifier is the least problematic aspect; the signified entails a greater scope for difficulty, if the layperson cannot find the meaning associated with a certain word, or can do so only in a very confused way. These difficulties are worsened by the fact that laypeople often do not possess the prior knowledge necessary to correctly contextualize concepts. The author goes as far as to wonder whether the concept of “external special communication” is even sensible, since on the one side an asymmetry between the level of the communication partners is inevitable, while on the other the term *communication* implies an act characterized by reciprocal understanding between such partners.

Montalt Resurrecció and González Davies (2007) also discuss the issue of terminology in expert-lay communication in the medical field, and state that

[w]hen the context of communication of medical knowledge moves from the specialists in the source language to the general public in the target language, then new communication needs arise. [...] For the specialist, terms and other units of specialized knowledge (USK)³⁴ are a quick, clear, precise [sic], way of transmitting information. For the man in the street, the same terms hinder communication. (ibid.: 251)

Terms therefore need to be dealt with so that they may be understandable to non-expert readers, i.e., “de-terminologized”. According to Montalt Resurrecció and González Davies, de-terminologization³⁵ can occur as follows: 1] “scientific terms are kept and followed by explanations”, 2] “scientific terms are kept in brackets after the explanations”, 3] “scientific terms are replaced by popular terms”, 4] “scientific terms are completely avoided and replaced by explanations” (ibid.: 252–253). These approaches broadly correspond to the following recommendation by Gläser (1995: 171): “a very useful device to deal with the obscurity of technical terminology and/or medical jargon is to have them adequately defined and ‘interspersed with common core words’”. In the same line, Magris (2016: 195) points out that cautious recourse to specialized vocabulary and adequate de-terminologization strategies can contribute remarkably to enhancing comprehensibility. Similarly, in her *Communicative Theory of Terminology*, Cabré (1998: 74) highlights that the degree of specialization of communication of a text affects both its terminological density and the expressive variation used to refer to a concept. While a highly specialized text is normally precise and concise, with terminology tending towards monosemy and univocity, less specialized ones have features which bring them near to general discourse: “at the semantic level, conceptual

34 Montalt Resurrecció and González Davies (ibid.: 237) list abbreviations of medical terms, nucleic acids, chemical compounds, or research journals, as well as international system symbols, mathematical symbols, statistics symbols, vitamin symbols, chromosome symbols, or symbols of malign tumors as other interesting units of specialized knowledge.

35 In linguistics the denomination *determinologization* occurs also with a meaning different from the one described above. Meyer and Mackintosh (2000) or Nová (2018), for instance, use it to refer to a process in which technical terms migrate from special languages to general language. By doing so, these terms are sometimes subject to semantic variations.

variation, redundancy, ambiguity, lack of strict precision; at a formal level, lexicon-based synonymical variation, but above all extensive use of paraphrases which explain analytically the same concept which, at a specialized level, is explained synthetically” (ibid., translated by Freixa 2006: 58).

3.1.5 Vocabulary and terminology in guidelines for language simplification

In his guidelines for Plain English, Cutts (2020: 32–56) highlights the need to use plain words as opposed to talk in “Obscuranto” (ibid.: 34), also drawing some examples from the medical field: according to him, a doctor should not say that someone exhibits “xanthocromia and diaphoresis” if they are just “yellow and sweating”. If technical terms are essential (for instance when telling people the name of a disease they suffer from), clear explanations are necessary (ibid.: 36). In his book, a list of plain word recommendations and formulations is provided (ibid.: 47–54). Some instances of suggestions are to replace the use of *consequently* with *so*, *in lieu of* with *instead of*, and *reside* with *live*, and not to say *applicant* but *you*, where possible. He also recommends noting the frequency of a certain word in order to evaluate how familiar readers might be with it (ibid.: 54–56).

In the manual for *Leichte Sprache* by Bredel and Maaß (2016a), a distinction is made between content and function words (ibid.: 342–345). Content words consist of nouns, adjectives, and (most) verbs, and their main purpose is to code extralinguistic meaning. Function words encompass prepositions, conjunctions, articles, and pronouns and code syntactic relations. In literature, adverbs fall under both categories, depending on linguists’ choice and point of view; Bredel and Maaß analyze them among function words (ibid.: 342, 375–380), since they are interested in their role in the structure of texts. Function words are acquired later than content words, but, since they are paramount in building a stable syntax, single *lacunae* of knowledge in this category have more serious consequences on the linguistic competence of a speaker than gaps in the category of content words (ibid.: 343).

For the choice of words to use in *Leichte Sprache*, Bredel and Maaß (ibid.: 345–346) refer – among other things – to the prototype theory, according to which in a semantic field there is an expression that lies in the center,

while the others are (more or less) peripheral. An instance they provide is *sterben*, as opposed to synonyms like *ableben*, *abscheiden*, *einschlafen*, etc. In addition to high frequency of use, other criteria (ibid.: 347) listed for the selection of the right words in text simplification include wide discursive range, diamesic neutrality, denotative precision, connotative neutrality, stylistic neutrality, absence of metaphoricity, morphologic, graphematic as well as phonological simplicity, early acquisition, and late loss. According to the authors, phraseological expressions and *Funktionsverbgefüge* go against practically all these criteria.

They then discuss the topic of foreign words and technical terms. They consider a lexeme as a foreign word from a synchronic perspective if it diverges structurally from the canonical word structure of a language (ibid.: 347–349). This can occur on several levels: the most evident one is the phonological or graphematic level, followed by the morphological level. With respect to inflectional morphology, foreign nouns are often characterized by non-native plural forms (as in *Praktikum/Praktika*, or *Globus/Globen*), therefore their correct interpretation may be more difficult. Thus, in texts in *Leichte Sprache* an explanation of these plural forms may be necessary. As for derivational morphology, foreign roots often require foreign derivational morphemes (as in *real* and *Realität* vs **Realheit*). In language acquisition it has been observed that children tend to attach native derivational morphemes to foreign roots, while the opposite phenomenon (the use of foreign derivational morphemes with native roots) is practically inexistent. It can therefore be assumed that native word structures can be understood and elaborated more easily than foreign ones by native speakers. The morphological regularity of native words as opposed to the foreign ones also makes it easier for L2 language learners to acquire them and use them correctly.

As for technical terms (ibid.: 350–355), a distinction between *fachspezifische Lexeme* and *fachgeprägte Lexeme* is made. *Fachspezifische Lexeme* are used only in LSPs (for instance *Photosynthese* in biology), while *fachgeprägte Lexeme* also occur in general language but have another meaning in LSPs (for instance *Kopf* and *Fuß* in linguistics). The latter always need to be explained, as they obtain their meaning in the corresponding context in specialized discourse. This is particularly true when they seem to be easy and therefore accessible at first

glance, since they are reminiscent of everyday concepts and could therefore lead to misinterpretations. *Fachspezifische Lexeme* cannot be misunderstood in such a way, but they should clearly be explained, too.

Bredel and Maaß then analyze function words (ibid.: 360–380). They state that these types of words are more frequent than content words: if auxiliary and modal verbs are counted among function words, no content word can be found among the 50 most frequent words in German (ibid.: 360). Furthermore, they are usually quite short words. Because of these characteristics, function words are easier to understand. On the other hand, their perception requires particular attention because of their shortness and inconspicuous form; a functional misinterpretation can also make text comprehension far more difficult. Some important aspects raised by the scholars are that prepositions taking the genitive case are not allowed in *Leichte Sprache* due to the “ban” on this case (ibid.: 362) and that personal pronouns should also be avoided and replaced by the corresponding referent (ibid.: 369). Instead, demonstrative pronouns are used intensively: in particular, *das* is often used and accompanied by an indentation (ibid.: 375).

In his guidelines for Italian, Fortis (2003: 11–12) notes that Plain Language should use common words which are familiar to most people, i.e., it should use mainly words belonging to basic vocabulary. Outdated words, latinisms, expressions typical of the bureaucratic style should be avoided. In case of synonyms, the one of a lower register should be used (*andare* rather than *recarsi*, or *arrivare* rather than *giungere*). Concrete expressions are favored over abstract, vague or euphemistic ones (*impiegati* rather than *risorse umane*). Acronyms, initialisms, and abbreviations should not be overused; if they are used, the extended form should be indicated the first time they appear. Technical terms should be used as rarely as possible, and if they are absolutely necessary they should be explained with easy words.

Regarding word choice for *italiano facile da leggere e da capire*, Sciumbata (2022: 64–76) recommends consulting the dictionary with the 7,500 most frequent words, *Vocabolario di Base (VdB)*. She also suggests asking some readers from the target group whether a certain word is understandable enough. Once a word has been chosen, it is important not to vary it, in order to guarantee cohesion in the text. Concrete words should be used in lieu of

abstract, vague ones (for instance *clienti* and *pazienti* rather than *clientela* and *utenza*, respectively). If difficult words are absolutely necessary, they should be explained the first time they are introduced or even several times. Technical terms should be avoided or, yet again, explained in case they are fundamental. Words with prefixes and suffixes may be hard to understand, and the same goes for pseudo-prefixes and pseudo-suffixes of Latin/Greek origin. Acronyms, initialisms, abbreviations, as well as anglicisms and latinisms should be avoided.

Some of the abovementioned suggestions can be found also in the Good Lay Summary Practice, which firstly suggests using “short words, sentences, and paragraphs” (GLSP 2021: 12). It also recommends avoiding technical or scientific language, presenting medical terms in brackets, avoiding statistical terms, using words and terms consistently, and avoiding Latin expressions.

A figure showing the differences between scientific and lay language highlights that scientific language is characterized by the presence of “technical terminology, complex words, professional jargon”, while lay language by “plain language, simple words, unambiguous language” (ibid.: 34). The description of the latter is quite general and not totally clear.

A table (ibid.: 35) describing the principles of health literacy repeats the lexical and terminological suggestions presented above, specifying that words should be 1 or 2 syllables long. Some instances of technical/scientific language to be avoided are also provided along with their more acceptable variant: *hypertension* and *high blood pressure*, *contraception* and *birth control*. It is also suggested to use simple everyday conversational language (e.g., *use* instead of *utilize*, or *long term* rather than *chronic*). Finally, it is pointed out that

[t]he EU Expert Group on Clinical Trials recommends that the LS should be as short as possible, but also acknowledges that explaining technical information in simple language may require more words and result in a longer LS. Indeed, just translating medical terms into “simple” equivalents, without explanatory context, can be more misleading and confusing than technical language itself. (GLSP 2021: 37)

Some explanations of the main concepts, such as trial phases, placebo, trial types, and adverse reactions, are included later in the document (ibid.: 65–68).

For instance, the definition provided for “Phase 1 clinical trial” is “In phase 1 a small number of healthy people take the medicine to see if it is safe” (ibid.: 65).

In the Recommendations of the Expert Group on Clinical Trials (2018), the same points are highlighted. In addition, it is recommended to avoid using acronyms and abstract words (ibid.: 5). It is also stated that in some cases medical and technical words may be useful, i.e., when they “will also aid in finding other medically relevant information and referencing other documents”. In such cases, it is suggested to “add clear language to define the word followed by the term in parenthesis”. Another more specific aspect that is addressed is medical terminology referring to stages of a condition; according to these recommendations, “it may be helpful to express the stages as mild (stage I), moderate (stage II), severe (stage III) and very severe (stage IV) as appropriate”. Wording examples of certain concepts are provided in Annex 1. For instance, the following wording is appropriate to explain the concept of Phase 4 trial:

This trial was carried out after the new treatment had been approved for use (meaning that the treatment can already be prescribed by doctors). Researchers looked at the effect of the new treatments in a larger number of people. (Recommendations of the EU CT Expert Group 2018: 15)

3.1.6 Word frequency and dictionaries

Different resources can be used in the analyzed three languages to assess the frequency of use of a certain word.

For English, the most used frequency dictionary is *A Frequency Dictionary of Contemporary American English: Word Sketches, Collocates and Thematic Lists*. It is part of the Routledge Frequency Dictionaries series and has been edited by Davies and Gardner (2010). This dictionary entails the 5,000 most common words of the English language (more precisely, of the American English variant) based on the frequency of use observed in the COCA (Corpus of Contemporary American English), a 400-million-word corpus encompassing spoken discourse, fiction, magazines, newspapers, and academic texts (ibid.: 1–3).

The Routledge Frequency Dictionaries series also entails a frequency dictionary of German, i.e., *A Frequency Dictionary of German Core Vocabulary for Learners* (Tschirner & Möhring 2020). This dictionary contains the 5,000 (to be more precise, 5,009) most common words of the German language based on the New Leipzig Corpus of Contemporary German, a 20-million-word corpus entailing spoken language, literature, newspapers, and academic texts (ibid.: 1–2). The 5,009 words contained in this frequency dictionary make up 84 to 95% of the words in an average text. For this language, another tool is provided by Duden (n.d.), which indicates the frequency of lemmas based on a scale from 1 (rare) to 5 (very frequent).

For Italian, the most used dictionary is De Mauro's *Nuovo vocabolario di base della lingua italiana* or *NVdB* (2016), which entails the 7,500 basic words of Italian. This dictionary is divided into three categories: *Vocabolario Fondamentale* ('fundamental vocabulary') with around 2,000 words, *Vocabolario d'Alto Uso* ('high usage vocabulary') with around 3,000 words, and *Vocabolario di Alta Disponibilità* ('high availability vocabulary'), with around 2,500 words. A distinction must be made between these three groups: while *Vocabolario Fondamentale* and *Vocabolario d'Alto Uso* are those traditionally found in frequency dictionary and have been extracted through statistical analyses of texts or through a sample of texts that are representative for the language, *Vocabolario di Alta Disponibilità* is based on interviews and surveys of speakers, who point out which lemmas are not frequent in absolute terms but are still easy to understand because they are associated with daily activities. The *Vocabolario di Alta Disponibilità* of the old version of the dictionary, i.e., the *VdB*, has been updated by interviewing a group of university students in order to determine which lemmas were no longer perceived to be important and which ones could be added instead (De Mauro 2016). For this reason, it can be said that *Vocabolario Fondamentale* and *Vocabolario d'Alto Uso* together build the Italian equivalent of the English and German frequency dictionaries mentioned above.

Finally, another interesting multilingual resource is the Leipzig Corpora Collection (Goldhahn et al. 2012), which encompasses 997 corpus-based monolingual dictionaries for 293 languages, including English, German, and

Italian. For each word, a frequency class from 1 (very frequent) to over 20 (extremely rare) is indicated.

3.2 Methodology

This chapter is made up of three sections. Section 3.3.1 focuses on vocabulary, while Sections 3.3.2 and 3.3.3 are dedicated to terminology. In Section 3.3.1, the general frequency of the most used lemmas of the various subcorpora will be evaluated. In particular, the 100 most frequent lemmas of the following PoS (part of speech) categories will be considered: nouns, adjectives, verbs, and adverbs. These are so-called content words (or lexical words), as opposed to function words or grammatical words.³⁶ Overall, 400 lemmas for each language were considered. The selection was done by means of Sketch Engine, more specifically through its function “Wordlist”, which provides frequency lists of the following categories: words, lemmas, adjectives, adverbs, conjunctions, nouns, numerals, prepositions, pronouns, and verbs. The lists of the four selected PoS categories were extracted and then checked manually, as there are sometimes mistakes in the data provided by Sketch Engine due to an erroneous PoS tagging. For instance, the polysemous word *affetto*, which in the Italian subcorpus always occurs as an adjective in the expression *affetto da* (‘suffering from’), was listed among nouns (meaning ‘affection’, ‘attachment’) and not among adjectives. The results were corrected; if any of the 100 most frequent lemmas provided by Sketch Engine for a certain PoS category appeared in the false list, it was deleted and inserted in the right one. Also proper nouns, which were often recorded among the most frequent nouns, were deleted, as they could not possibly be found in frequency dictionaries, and they were not considered to play any role in this analysis. Some lemmas occurred in the English subcorpus in both the American and British orthographic variant (e.g., *anemia/anaemia* or *tumor/tumour*): their occurrences were calculated together rather than separately. When some lemmas were deleted from the list

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36 Bredele and Maaß (2016a: 342) point out that the categorization of adverbs is controversial, as some scholars regard them as function words and some as content words.

provided by Sketch Engine, the subsequent lemmas in the frequency list of that category were added in order to reach the number 100 again.

The dictionaries which were consulted are those described in Section 3.1.6: Davies and Gardner's *A Frequency Dictionary of Contemporary American English: Word Sketches, Collocates and Thematic Lists* (2010),³⁷ Tschirner and Möhring's *A Frequency Dictionary of German Core Vocabulary for Learners* (2020), as well as De Mauro's *Nuovo vocabolario di base della lingua italiana* or *NVdB* (2016). The main limit here was the different number of lemmas – indicated in Section 3.1.6 – reported in the three dictionaries. However, this was considered to be the best *modus operandi*, due to the fact that the three aforementioned reference works are the most important frequency dictionaries in the three languages. In addition, as mentioned in Section 3.1.6, *Vocabolario Fondamentale* (FO) and *Vocabolario d'Alto Uso* (AU) can be considered to correspond to the content of the English and German frequency dictionaries in question, since the *Vocabolario di Alta Disponibilità* (AD) is made up of lemmas which are based on speakers' perceptions and frequent only in relative terms. Furthermore, as will be shown in Section 3.3.1, the number of lemmas belonging to the AD vocabulary in Italian was limited. The discrepancy between the three dictionaries therefore did not have a particular impact on comparison and results. Another difference between the three frequency dictionaries is the way the lemmas are listed. While *NVdB* provides an alphabetical list of the around 7,500 most frequent lemmas in Italian and indicates whether they belong to FO, AU, or AD, the other two frequency dictionaries list lemmas according to a frequency ranking, without dividing them into subcategories. The subcategories in English and German were therefore added by the author of the present book, to make it easier to compare the results. English and German lemmas with a dictionary rank equal to or less than 2,000 were categorized as "FU" ('fundamental'), while those with a dictionary rank between 2,000 and 5,000 as "HU" ('high usage'). It was

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37 This dictionary was chosen due to the higher proportion of texts written in American English than in British English in the corpus. It is also assumed that there would not have been many differences if a frequency dictionary of the latter language variant had been consulted. As stated above, all lemmas with a different spelling in British English were looked at in the dictionary by changing the orthography to the American English one.

decided to highlight the fact that the division into *Vocabolario Fondamentale*, *Vocabolario d'Alto Uso*, and *Vocabolario di Alta Disponibilità* is found only in the Italian NVdB – and is traditionally not a feature of other dictionaries – by keeping the NVdB labels *FO* ('fondamentale'), *AU* ('alto uso'), and *AD* ('alta disponibilità') for Italian.

While Section 3.3.1 focuses more extensively on general vocabulary (although, as will be shown, some technical terms occur among the most frequent lemmas, too), Sections 3.3.2 and 3.3.3 are devoted to terminology. In Section 3.3.2, the origin of medical terms in the three languages was analyzed quantitatively by detecting prefixes, suffixes, and roots³⁸ of Greek/Latin matrix in the three subcorpora. Several scholars provide different lists of such morphemes;³⁹ here, the ones which were followed, as they analyze contrastively English, German, and Italian, are extremely detailed and also list the meaning of each morpheme, are those elaborated by Magris (1992: 31–50). The complete lists provided by this scholar are reported in the Appendix, in Table 47 (showing prefixes), Table 48 (showing suffixes), and Table 49 (showing roots); for the sake of concision, Section 3.3.2 will only indicate the morphemes which were found in the three subcorpora. The search was carried out through Sketch Engine, more specifically through the aforementioned “Wordlist” function, which allows to select lemmas according to four parameters: “all”, “starting with”, “ending with”, “containing”. These are particularly useful when analyzing morphemes like prefixes and suffixes, as they allow for a significant reduction in noise.

After providing the lists with all detected morphemes, these data will be discussed and analyzed by focusing on some of the most interesting findings and differences between the three subcorpora.

In Section 3.3.3, the definitions, explanations, and glosses with hypernyms and synonyms of terms provided in the layperson summaries are examined quantitatively. This was done by searching for verbs signaling explanations by means of Sketch Engine and removing the noise. These verbs are *mean*,

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38 Or pseudo-suffixes and pseudo-prefixes according to some scholars.

39 See *inter alia* Puato (2020: 643–645), Montalt Resurrecció and González Davies (2007: 267–287), as well as Piro (2022: 44–58).

call, know (as a past participle), *define, describe, denominate, refer, be*, and *consist in/of*. The subsequent step was to analyze the TT segments of these ST explanations in order to determine whether explanations are kept or not.⁴⁰

3.3 Analysis

3.3.1 Word frequency

Tables in the present section will show the 100 most frequent lemmas of each selected PoS category for English, German, and Italian. The column “No.” shows the rank of occurrence in the subcorpus, starting from the most frequent lemma to the least frequent one. The column “Occurrences” indicates how many times the lemma was found in the subcorpus. Tables for English and German have a column which is not presented in tables for Italian, i.e., “Dictionary rank”. There, the number of the frequency ranking of the corresponding dictionary is indicated. For words not found in the frequency dictionary, the abbreviation “NI” (“not indicated”) is provided. The column “Category” then categorizes these lemmas as “FU” or “HU” depending on the number found in the “Dictionary rank”. As already mentioned, lemmas with a dictionary rank equal to or less than 2,000 are “FU”, while those with a dictionary rank between 2,000 and 5,000 are “HU”. Tables for Italian only have the column “Category”, with the labels “FO”, “AU”, “AD”, and “NI”, since – as briefly explained in Section 3.2 – the *NVdB* does not list lemmas according to a frequency ranking like the other two dictionaries, but follows the alphabetical order and indicates whether they belong to FO, AU, or AD.

Firstly, it should be noted that the PoS category with the highest number of types is that of nouns, followed by adjectives and verbs, with similar numbers; finally, the last category consists of adverbs, with a limited number of types. This order will be followed in the following pages. Tables 4, 5, 6, and 7 will show English lemmas, Tables 8, 9, 10, and 11 German lemmas, while Tables 12, 13, 14, and 15 Italian lemmas.

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40 Explanations, definitions, and additional terms that were introduced by translators in the German and Italian TTs are examined in Chapter 10.

No.	Lemma	Occurrences	Dictionary rank	Category
1	participant	3,747	1,195	FU
2	trial	3,594	899	FU
3	treatment	1,796	787	FU
4	study	1,687	247	FU
5	result	1,273	374	FU
6	researcher	1,085	1,259	FU
7	event	1,068	537	FU
8	summary	818	3,885	HU
9	people	800	63	FU
10	reaction	797	1,418	FU
11	blood	707	715	FU
12	part	701	4,643	HU
13	doctor	673	569	FU
14	patient	625	639	FU
15	information	590	313	FU
16	group	574	167	FU
17	problem	463	170	FU
18	cancer	432	1,066	FU
19	effect	410	432	FU
20	week	384	193	FU
21	dose	371	3,704	HU
22	question	370	201	FU
23	number	359	206	FU
24	medicine	346	1,505	FU
25	side	342	252	FU
26	level	340	345	FU
27	placebo	322	NI	
28	research	312	3,808	HU
29	cell	263	949	FU
30	day	254	92	FU

No.	Lemma	Occurrences	Dictionary rank	Category
31	disease	229	797	FU
32	type	227	591	FU
33	drug	212	480	FU
34	body	212	320	FU
35	health	211	365	FU
36	safety	206	1,163	FU
37	website	200	NI	
38	tumor	196	4,925	HU
39	time	176	54	FU
40	chemotherapy	175	NI	
41	year	168	55	FU
42	amount	167	784	FU
43	lung	158	3,294	HU
44	pain	156	968	FU
45	end	153	284	FU
46	month	134	243	FU
47	kidney	131	NI	
48	symptom	126	2,421	HU
49	way	125	85	FU
50	period	123	616	FU
51	section	120	868	FU
52	protein	116	2,682	HU
53	staff	112	818	FU
54	datum	112	572	FU
55	sample	111	1,377	FU
56	change	109	361	FU
57	purpose	108	1,028	FU
58	risk	106	674	FU
59	chart	106	2,769	HU
60	site	104	547	FU

No.	Lemma	Occurrences	Dictionary rank	Category
61	table	102	324	FU
62	liver	101	4,767	HU
63	document	100	1,525	FU
64	public	99	846	FU
65	tablet	97	NI	
66	hemoglobin	96	NI	
67	infection	95	2,872	HU
68	report	93	478	FU
69	title	90	1,362	FU
70	vaccine	88	4,237	HU
71	track	88	1,086	FU
72	heart	88	471	FU
73	sponsor	86	4,658	HU
74	death	85	420	FU
75	detail	84	1,030	FU
76	antibody	83	NI	
77	thought	81	772	FU
78	system	81	192	FU
79	damage	77	1,520	FU
80	woman	74	114	FU
81	injection	72	NI	
82	form	71	526	FU
83	bleeding	70	NI	
84	hospitalization	68	NI	
85	MRI	67	NI	
86	baby	67	599	FU
87	life	67	115	FU
88	disability	66	2,601	HU
89	combination	66	1,818	FU
90	extension	64	3,217	HU

No.	Lemma	Occurrences	Dictionary rank	Category
91	hemophilia	63	NI	
92	eye	63	246	FU
93	organization	62	598	FU
94	total	61	2,397	HU
95	decision	61	485	FU
96	page	60	716	FU
97	sign	59	765	FU
98	anemia	59	NI	
99	help	58	901	FU
100	country	58	168	FU

Table 4: English nouns

No.	Lemma	Occurrences	Dictionary rank	Category
1	adverse	1,735	NI	
2	clinical	570	2,822	HU
3	serious	544	749	FU
4	medical	526	662	FU
5	other	477	76	FU
6	more	428	93	FU
7	related	311	3,413	HU
8	different	299	241	FU
9	important	259	270	FU
10	high	256	142	FU
11	many	229	101	FU
12	common	223	712	FU
13	main	220	890	FU
14	new	186	90	FU
15	safe	179	1,217	FU
16	low	177	371	FU

No.	Lemma	Occurrences	Dictionary rank	Category
17	good	170	111	FU
18	average	156	1,322	FU
19	available	146	622	FU
20	bad	133	290	FU
21	large	112	225	FU
22	last	98	131	FU
23	severe	90	2,361	HU
24	several	90	311	FU
25	full	90	513	FU
26	additional	88	1,349	FU
27	general	83	585	FU
28	small	83	207	FU
29	single	80	637	FU
30	scientific	77	1,611	FU
31	advanced	76	2,856	HU
32	immune	73	4,372	HU
33	much	72	147	FU
34	old	72	154	FU
35	due	67	2,469	HU
36	less	67	621	FU
37	white	66	308	FU
38	chronic	66	3,888	HU
39	non-profit	61	NI	
40	total	61	1,056	FU
41	open-label	61	NI	
42	first	57	88	FU
43	certain	56	576	FU
44	same	55	162	FU
45	renal	55	NI	
46	individual	51	984	FU

No.	Lemma	Occurrences	Dictionary rank	Category
47	platinum-based	50	NI	
48	similar	47	743	FU
49	possible	45	458	FU
50	complete	43	1,461	FU
51	few	43	191	FU
52	double-blind	42	NI	
53	able	42	388	FU
54	multiple	41	2,023	HU
55	overall	40	1,997	FU
56	non-serious	39	NI	
57	long	39	258	FU
58	nasal	36	NI	
59	independent	36	1,266	FU
60	current	35	699	FU
61	clear	34	563	FU
62	own	32	148	FU
63	short	32	632	FU
64	red	31	611	FU
65	healthy	31	1,515	FU
66	such	30	185	FU
67	daily	30	1,523	FU
68	sure	28	350	FU
69	life-threatening	27	NI	
70	previous	27	1,321	FU
71	involved	26	1,174	FU
72	further	26	NI	
73	moderate	26	3,323	HU
74	major	25	441	FU
75	long-term	25	1,844	FU
76	existing	24	2,167	HU

No.	Lemma	Occurrences	Dictionary rank	Category
77	next	24	222	FU
78	inflammatory	24	NI	
79	most	23	190	FU
80	regulatory	22	4,119	HU
81	ongoing	22	3,115	HU
82	detailed	22	3,131	HU
83	unwanted	21	NI	
84	enough	20	881	FU
85	uterine	20	NI	
86	accurate	20	2,730	HU
87	early	20	368	FU
88	abnormal	20	NI	
89	entire	20	879	FU
90	fat	20	2,381	HU
91	macular	20	NI	
92	unique	20	1,748	FU
93	regular	20	1,414	FU
94	cardiovascular	19	NI	
95	standard	18	1,788	FU
96	menstrual	18	NI	
97	lasting	18	NI	
98	open	18	589	FU
99	specific	17	987	FU
100	squamous	17	NI	

Table 5: English adjectives

No.	Lemma	Occurrences	Dictionary rank	Category
1	be	5,456	2	FU
2	have	1,693	8	FU
3	take	1,380	64	FU
4	happen	859	220	FU
5	do	757	18	FU
6	receive	689	509	FU
7	help	550	176	FU
8	find	532	97	FU
9	call	512	121	FU
10	know	392	49	FU
11	work	350	119	FU
12	include	338	300	FU
13	cause	326	602	FU
14	show	326	181	FU
15	learn	324	321	FU
16	need	285	134	FU
17	make	256	46	FU
18	get	249	41	FU
19	want	239	84	FU
20	use	239	94	FU
21	answer	230	831	FU
22	compare	227	844	FU
23	list	218	2,093	HU
24	look	195	87	FU
25	understand	193	326	FU
26	start	187	178	FU
27	affect	185	972	FU
28	give	173	98	FU
29	end	170	543	FU
30	treat	162	966	FU

No.	Lemma	Occurrences	Dictionary rank	Category
31	study	158	884	FU
32	mean	152	157	FU
33	measure	135	1,403	FU
34	provide	134	268	FU
35	check	133	830	FU
36	stop	128	334	FU
37	think	124	57	FU
38	thank	121	504	FU
39	consider	120	397	FU
40	see	115	58	FU
41	keep	112	161	FU
42	report	103	465	FU
43	put	99	153	FU
44	increase	99	659	FU
45	bleed	95	NI	
46	lead	89	319	FU
47	die	88	405	FU
48	ask	87	132	FU
49	decide	80	455	FU
50	require	79	453	FU
51	sponsor	79	3,462	HU
52	talk	79	169	FU
53	review	76	2,122	HU
54	live	74	219	FU
55	speak	74	341	FU
56	share	73	720	FU
57	collect	70	1,343	FU
58	bear	66	1,623	FU
59	base	66	544	FU
60	decrease	63	3,419	HU

No.	Lemma	Occurrences	Dictionary rank	Category
61	feel	62	136	FU
62	plan	62	694	FU
63	leave	56	152	FU
64	create	56	342	FU
65	spread	53	1,405	FU
66	participate	52	1,506	FU
67	follow	47	331	FU
68	join	46	514	FU
69	belong	46	1,653	FU
70	choose	45	605	FU
71	record	43	1,669	FU
72	hope	43	491	FU
73	approve	42	2,044	HU
74	calculate	42	3,074	HU
75	finish	41	923	FU
76	prepare	40	779	FU
77	contain	40	933	FU
78	reduce	38	705	FU
79	continue	36	305	FU
80	change	34	309	FU
81	conduct	33	1,191	FU
82	grow	33	356	FU
83	design	33	882	FU
84	involve	31	655	FU
85	prevent	31	1,100	FU
86	focus	31	704	FU
87	go	30	36	FU
88	recruit	28	3,376	HU
89	develop	28	488	FU
90	become	28	138	FU

No.	Lemma	Occurrences	Dictionary rank	Category
91	randomize	27	NI	
92	write	27	235	FU
93	visit	26	921	FU
94	educate	26	3,082	HU
95	kill	26	426	FU
96	inform	26	2,214	HU
97	assign	25	2,613	HU
98	advance	24	2,706	HU
99	attach	24	2,340	HU
100	determine	24	774	FU

Table 6: English verbs

No.	Lemma	Occurrences	Dictionary rank	Category
1	not	732	29	FU
2	also	451	89	FU
3	out	411	66	FU
4	well	229	100	FU
5	below	211	1,547	FU
6	most	203	145	FU
7	more	186	82	FU
8	about	176	182	FU
9	least	116	306	FU
10	only	113	102	FU
11	overall	108	4,004	HU
12	up	89	53	FU
13	as	84	130	FU
14	so	84	56	FU
15	later	84	297	FU
16	then	67	77	FU

No.	Lemma	Occurrences	Dictionary rank	Category
17	medically	65	NI	
18	please	52	4,089	HU
19	always	48	213	FU
20	above	46	1,606	FU
21	alone	43	1,115	FU
22	longer	40	NI	
23	even	39	107	FU
24	together	39	330	FU
25	sure	37	2,330	HU
26	there	36	117	FU
27	still	36	126	FU
28	randomly	36	NI	
29	previously	34	2,336	HU
30	further	34	NI	
31	early	34	522	FU
32	here	32	96	FU
33	too	30	133	FU
34	already	29	339	FU
35	once	27	303	FU
36	often	26	280	FU
37	fairly	20	2,160	HU
38	twice	20	1,430	FU
39	either	19	577	FU
40	sometimes	18	450	FU
41	all	18	227	FU
42	long	17	267	FU
43	very	16	105	FU
44	enough	16	380	FU
45	properly	15	2,908	HU
46	slightly	15	1,440	FU

No.	Lemma	Occurrences	Dictionary rank	Category
47	back	15	109	FU
48	worse	14	3,135	HU
49	before	14	707	FU
50	however	13	274	FU
51	usually	13	723	FU
52	currently	12	1,715	FU
53	safely	12	4,297	HU
54	otherwise	12	1,530	FU
55	less	11	481	FU
56	regularly	10	2,819	HU
57	away	10	272	FU
58	no	10	627	FU
59	around	9	332	FU
60	slowly	9	1,227	FU
61	first	8	NI	
62	poorly	8	NI	
63	suddenly	8	955	FU
64	quickly	8	678	FU
65	almost	7	295	FU
66	frequently	7	1,813	FU
67	yet	6	277	FU
68	worldwide	6	4,521	HU
69	lower	6	4,844	HU
70	sooner	6	3,906	HU
71	just	6	68	FU
72	again	6	187	FU
73	much	5	298	FU
74	mostly	5	1,352	FU
75	instead	5	1,023	FU
76	normally	5	2,606	HU

No.	Lemma	Occurrences	Dictionary rank	Category
77	therefore	5	1,165	FU
78	generally	5	1,212	FU
79	greatly	5	3,437	HU
80	strongly	4	2,398	HU
81	down	4	118	FU
82	naturally	4	2,800	HU
83	far	4	257	FU
84	commonly	4	3,778	HU
85	completely	4	1,189	FU
86	somewhat	3	1,869	FU
87	minimally	3	NI	
88	automatically	3	4,003	HU
89	now	3	72	FU
90	hard	3	929	FU
91	correctly	3	4,393	HU
92	inadequately	2	NI	
93	apart	2	1,974	FU
94	intramuscularly	2	NI	
95	approximately	2	2,378	HU
96	last	2	NI	
97	deep	2	2,152	HU
98	differently	2	NI	
99	mainly	2	2,789	HU
100	actually	2	402	FU

Table 7: English adverbs

No.	Lemma	Occurrences	Dictionary rank	Category
1	Teilnehmer	3,548	1,920	FU
2	Prüfung	2,731	1,827	FU
3	Studie	1,720	784	FU
4	Behandlung	1,526	1,870	FU
5	Nebenwirkung	1,102	NI	
6	Ergebnis	1,081	386	FU
7	Ereignis	1,006	1,067	FU
8	Wissenschaftler	866	1,522	FU
9	Zusammenfassung	832	3,001	HU
10	Patient	810	620	FU
11	Information	613	465	FU
12	Problem	431	210	FU
13	Gruppe	421	369	FU
14	Prüfarzt	414	NI	
15	Blut	408	851	FU
16	Teil	389	198	FU
17	Woche	350	219	FU
18	Person	335	357	FU
19	Medikament	296	2,257	HU
20	Placebo	290	NI	
21	Frage	276	157	FU
22	Anzahl	225	853	FU
23	Sicherheit	217	776	FU
24	Tag	215	111	FU
25	Ende	213	183	FU
26	Forschung	211	1,335	FU
27	Dosierung	203	NI	
28	Krebserkrankung	199	NI	
29	Verbindung	190	434	FU
30	Arzt	184	622	FU

No.	Lemma	Occurrences	Dictionary rank	Category
31	Menge	182	520	FU
32	Mensch	182	90	FU
33	Wirkung	178	849	FU
34	Jahr	175	53	FU
35	Teilnehmerin	161	1,920	FU
36	Chemotherapie	160	NI	
37	Rahmen	160	753	FU
38	Tumor	158	NI	
39	Körper	158	488	FU
40	Forscher	136	1,246	FU
41	Webseite	135	2,837	HU
42	Datum	133	3,203	HU
43	Art	131	260	FU
44	Monat	131	316	FU
45	Blutung	129	NI	
46	Ansicht	117	1,891	FU
47	Abschnitt	117	917	FU
48	Zusammenhang	116	525	FU
49	Öffentlichkeit	107	1,467	FU
50	Einnahme	107	2,874	HU
51	Tabelle	103	979	FU
52	Dokument	102	3,229	HU
53	Arzneimittel	99	NI	
54	Grafik	97	3,148	HU
55	Studienarzt	95	NI	
56	Blutkörperchen	93	NI	
57	Gesundheits- zustand	92	NI	
58	Protein	91	984	FU
59	Sponsor	90	4,739	HU

No.	Lemma	Occurrences	Dictionary rank	Category
60	Bericht	89	1,201	FU
61	Kind	89	133	FU
62	Beginn	86	845	FU
63	Vergleich	85	383	FU
64	Zeitraum	84	2,427	HU
65	Gesundheit	82	1,851	FU
66	Anwendung	82	1,258	FU
67	Frau	80	99	FU
68	Krankenhaus	79	1,529	FU
69	Studienteilnehmer	77	NI	
70	Schmerz	73	1,483	FU
71	Hauptfrage	73	NI	
72	Tod	73	540	FU
73	Behandlungs- methode	71	NI	
74	Untersuchung	71	860	FU
75	Behandlungs- gruppe	71	NI	
76	Kombination	70	1,895	FU
77	Immunsystem	68	3,995	HU
78	Studienergebnis	68	NI	
79	Geburt	67	2,096	HU
80	Behinderung	66	3,228	HU
81	Dosis	66	NI	
82	Einweisung	65	NI	
83	Website	65	NI	
84	Mahlzeit	65	3,434	HU
85	Organisation	65	1,113	FU
86	Infektion	64	4,082	HU
87	Prüfzentrum	64	NI	
88	Firma	64	686	FU

No.	Lemma	Occurrences	Dictionary rank	Category
89	Suche	64	1,508	FU
90	Antikörper	63	NI	
91	Hämophilie	63	NI	
92	Gesamtergebnis	63	NI	
93	Studienmedika- ment	62	NI	
94	Behandlungs- möglichkeit	62	NI	
95	Dank	60	597	FU
96	Blutprobe	59	NI	
97	Teilnahme	59	3,890	HU
98	Anämie	58	NI	
99	Land	58	134	FU
100	Symptom	58	3,030	HU

Table 8: German nouns

No.	Lemma	Occurrences	Dictionary rank	Category
1	klinisch	2,969	3,258	HU
2	unerwünscht	975	NI	
3	medizinisch	602	920	FU
4	schwerwiegend	574	NI	
5	weit	460	230	FU
6	andere	428	59	FU
7	folgend	334	NI	
8	gut	312	76	FU
9	wichtig	300	144	FU
10	hoch	220	118	FU
11	neu	211	84	FU
12	durchschnittlich	175	1,965	FU
13	notwendig	149	742	FU

No.	Lemma	Occurrences	Dictionary rank	Category
14	sicher	139	265	FU
15	niedrig	129	778	FU
16	vollständig	129	1,058	FU
17	verschieden	114	254	FU
18	allgemein	109	393	FU
19	wirksam	104	2,418	HU
20	unterschiedlich	101	345	FU
21	groß	98	67	FU
22	letzte	98	152	FU
23	zugänglich	97	3,013	HU
24	erforderlich	91	1,725	FU
25	fortgeschritten	90	NI	
26	gering	87	504	FU
27	bestimmt	86	280	FU
28	bekannt	86	319	FU
29	schwer	86	257	FU
30	wissenschaftlich	86	909	FU
31	lang	81	97	FU
32	offen	75	355	FU
33	einzelnen	75	308	FU
34	lebensgefährlich	66	NI	
35	weiß	66	472	FU
36	erhältlich	66	NI	
37	verfügbar	65	2,544	HU
38	erste	64	95	FU
39	gemeinnützig	60	NI	
40	chronisch	58	3,631	HU
41	weltweit	57	843	FU
42	zusätzlich	53	583	FU
43	möglich	53	171	FU

No.	Lemma	Occurrences	Dictionary rank	Category
44	klein	50	110	FU
45	platinbasiert	49	NI	
46	täglich	49	1,043	FU
47	unabhängig	47	751	FU
48	gesamt	46	557	FU
49	nachstehend	42	NI	
50	renal	42	NI	
51	nah	41	480	FU
52	generell	40	1,933	FU
53	sogenannt	40	549	FU
54	vereinigt	39	NI	
55	randomisiert	38	NI	
56	ähnlich	38	437	FU
57	leicht	37	311	FU
58	wertvoll	36	2,411	HU
59	individuell	33	1,343	FU
60	stark	32	178	FU
61	rot	31	477	FU
62	einzig	31	343	FU
63	vorzeitig	30	4,291	HU
64	eventuell	30	2,301	HU
65	oral	29	NI	
66	doppelblind	29	NI	
67	gesund	29	1,275	FU
68	deutlich	27	302	FU
69	kurz	27	176	FU
70	multizentrisch	25	NI	
71	genau	22	167	FU
72	unvoreingenommen	22	NI	

No.	Lemma	Occurrences	Dictionary rank	Category
73	alt	21	138	FU
74	normal	21	642	FU
75	nicht-kleinzellig	21	NI	
76	plötzlich	21	456	FU
77	schlecht	21	327	FU
78	entzündlich	21	NI	
79	intravenös	21	NI	
80	lebensbedrohlich	21	NI	
81	gesundheitlich	20	4,592	HU
82	vorliegend	20	NI	
83	regelmäßig	19	1,082	FU
84	früh	19	366	FU
85	regulär	19	4,114	HU
86	bestehend	17	NI	
87	squamös	17	NI	
88	langfristig	17	1,387	FU
89	kontrolliert	17	NI	
90	multipel	16	NI	
91	eindeutig	16	1,168	FU
92	derzeitig	16	4,459	HU
93	sonstig	16	2,989	HU
94	immuntolerant	16	NI	
95	vermindert	16	NI	
96	wöchentlich	15	NI	
97	behördlich	15	NI	
98	alleinig	14	NI	
99	anderweitig	14	NI	
100	stolz	14	1,372	FU

Table 9: German adjectives

No.	Lemma	Occurrences	Dictionary rank	Category
1	sein	2,544	4	FU
2	werden	1,880	8	FU
3	haben	1,260	6	FU
4	auftreten	1,204	654	FU
5	können	975	23	FU
6	erhalten	912	287	FU
7	führen	388	162	FU
8	helfen	383	338	FU
9	finden	347	103	FU
10	entsprechen	337	258	FU
11	einnehmen	312	1,860	FU
12	teilnehmen	280	1,714	FU
13	stehen	279	85	FU
14	nennen	258	191	FU
15	enthalten	253	562	FU
16	wollen	232	57	FU
17	erfahren	224	690	FU
18	untersuchen	214	886	FU
19	herausfinden	213	2,069	HU
20	nehmen	210	142	FU
21	verstehen	207	211	FU
22	zeigen	184	136	FU
23	durchführen	179	1,094	FU
24	beantworten	175	1,865	FU
25	handeln	150	299	FU
26	machen	142	58	FU
27	bedeuten	131	398	FU
28	geben	122	49	FU
29	sollen	122	60	FU
30	bezeichnen	119	405	FU

No.	Lemma	Occurrences	Dictionary rank	Category
31	überprüfen	117	1,616	FU
32	stellen	116	135	FU
33	aufführen	111	1,853	FU
34	verursachen	109	1,767	FU
35	wirken	106	401	FU
36	geschehen	105	623	FU
37	beeinflussen	102	1,364	FU
38	betrachten	99	485	FU
39	vergleichen	91	387	FU
40	dokumentieren	86	3,835	HU
41	verabreichen	85	NI	
42	beginnen	85	251	FU
43	verschlechtern	84	NI	
44	messen	84	896	FU
45	sehen	80	79	FU
46	behandeln	78	993	FU
47	wissen	77	78	FU
48	sprechen	74	161	FU
49	verwenden	72	538	FU
50	kommen	69	62	FU
51	ermitteln	68	1,130	FU
52	konsultieren	65	NI	
53	sterben	64	475	FU
54	entnehmen	62	2,915	HU
55	unterscheiden	61	607	FU
56	liegen	60	107	FU
57	enden	58	1,313	FU
58	müssen	56	43	FU
59	befinden	55	464	FU
60	leben	54	98	FU

No.	Lemma	Occurrences	Dictionary rank	Category
61	gehören	54	460	FU
62	erstellen	53	2,389	HU
63	bedürfen	52	2,522	HU
64	verhindern	52	939	FU
65	planen	49	579	FU
66	danken	48	1,276	FU
67	erfassen	48	1,672	FU
68	beziehen	48	878	FU
69	treffen	47	259	FU
70	gelangen	46	1,217	FU
71	verlassen	45	450	FU
72	lauten	45	1,014	FU
73	darstellen	44	402	FU
74	vornehmen	44	1,805	FU
75	aufnehmen	43	563	FU
76	zulassen	43	1,538	FU
77	bestehen	42	246	FU
78	dauern	42	744	FU
79	erhöhen	42	617	FU
80	entscheiden	41	414	FU
81	berichten	40	591	FU
82	leisten	40	693	FU
83	beenden	39	1,405	FU
84	sicherstellen	39	3,396	HU
85	hoffen	38	689	FU
86	beitragen	37	1,257	FU
87	mögen	35	168	FU
88	auflisten	35	NI	
89	leiden	34	942	FU
90	feststellen	33	757	FU

No.	Lemma	Occurrences	Dictionary rank	Category
91	bitten	33	491	FU
92	wenden	32	1,530	FU
93	ermöglichen	32	980	FU
94	berechnen	31	857	FU
95	passieren	31	381	FU
96	lassen	31	83	FU
97	bilden	29	315	FU
98	beteiligen	28	731	FU
99	zuweisen	28	4,538	HU
100	liefern	28	781	FU

Table 10: German verbs

No.	Lemma	Occurrences	Dictionary rank	Category
1	auch	421	18	FU
2	möglicherweise	261	1,428	FU
3	mehr	224	52	FU
4	mindestens	135	604	FU
5	etwa	116	181	FU
6	insgesamt	114	496	FU
7	so	108	28	FU
8	nur	101	39	FU
9	noch	88	33	FU
10	bitte	87	471	FU
11	weiter	87	221	FU
12	einmal	82	124	FU
13	allerdings	82	225	FU
14	inwiefern	73	NI	
15	unten	71	710	FU
16	jedoch	70	227	FU

No.	Lemma	Occurrences	Dictionary rank	Category
17	hierbei	54	1,906	FU
18	bereits	53	170	FU
19	oben	47	417	FU
20	lange	43	97	FU
21	allein	40	267	FU
22	zu	39	21	FU
23	hier	38	68	FU
24	zuvor	37	715	FU
25	stets	37	994	FU
26	dann	36	41	FU
27	lediglich	35	1,068	FU
28	weiterhin	33	827	FU
29	jeweils	32	609	FU
30	zusammen	32	533	FU
31	derzeit	30	676	FU
32	genauso	25	808	FU
33	also	22	71	FU
34	zweimal	20	1,836	FU
35	immer	19	64	FU
36	miteinander	19	716	FU
37	somit	17	792	FU
38	je	17	312	FU
39	weniger	14	102	FU
40	viel	14	56	FU
41	gleich	13	141	FU
42	ebenfalls	12	445	FU
43	sehr	12	81	FU
44	zwar	11	206	FU
45	genug	11	498	FU
46	manchmal	10	382	FU

No.	Lemma	Occurrences	Dictionary rank	Category
47	gegebenenfalls	10	3,128	HU
48	normalerweise	9	2,062	HU
49	oft	9	223	FU
50	ganz	8	69	FU
51	bisher	8	441	FU
52	höchst	7	NI	
53	ausschließlich	7	1,485	FU
54	folgendermaßen	7	NI	
55	wieder	6	74	FU
56	erst	6	132	FU
57	außerdem	6	424	FU
58	vermutlich	6	1,167	FU
59	alleine	6	267	FU
60	vorher	5	866	FU
61	meist	5	705	FU
62	ca.	5	NI	
63	zuerst	4	880	FU
64	mehrmals	4	2,868	HU
65	nahezu	4	2,070	HU
66	gar	4	165	FU
67	teilweise	4	1,121	FU
68	ggf.	4	NI	
69	anders	3	303	FU
70	dreimal	3	2,660	HU
71	dort	3	139	FU
72	üblicherweise	3	4,751	HU
73	durchaus	3	855	FU
74	möglichst	3	171	FU
75	fast	3	202	FU
76	beispielsweise	3	672	FU

No.	Lemma	Occurrences	Dictionary rank	Category
77	überhaupt	2	279	FU
78	insbesondere	2	655	FU
79	ebenso	2	535	FU
80	eher	2	322	FU
81	morgens	2	NI	
82	zunächst	2	373	FU
83	wiederum	2	1,006	FU
84	frühestens	2	NI	
85	rechts	2	829	FU
86	schon	2	61	FU
87	sogar	2	226	FU
88	womöglich	1	2,017	HU
89	hinten	1	1,159	FU
90	zumindest	1	612	FU
91	höchstens	1	2,362	HU
92	hin	1	712	FU
93	heraus	1	1,169	FU
94	überall	1	756	FU
95	inzwischen	1	534	FU
96	inwieweit	1	4,413	HU
97	dennoch	1	717	FU
98	jetzt	1	72	FU
99	eigentlich	1	151	FU
100	nie	1	186	FU

Table 11: German adverbs

No.	Lemma	Occurrences	Category
1	studio	4,973	FO
2	partecipante	3,695	AU
3	trattamento	1,909	FO
4	risultato	1,279	FO
5	ricercatore	1,121	AU
6	medico	1,113	FO
7	evento	1,015	FO
8	reazione	792	FO
9	informazione	684	FO
10	paziente	667	FO
11	persona	634	FO
12	riepilogo	590	NI
13	gruppo	584	FO
14	parte	533	FO
15	sangue	525	FO
16	problema	462	FO
17	farmaco	449	AU
18	numero	439	FO
19	effetto	421	FO
20	settimana	400	FO
21	domanda	364	FO
22	dose	346	AU
23	livello	345	FO
24	placebo	337	NI
25	modo	333	FO
26	ricerca	307	FO
27	tumore	283	AU
28	sicurezza	278	FO
29	tipo	270	FO
30	giorno	257	FO

No.	Lemma	Occurrences	Category
31	causa	245	FO
32	cancro	233	AU
33	sperimentazione	230	NI
34	quantità	222	FO
35	malattia	218	FO
36	sintesi	200	AU
37	web	194	FO
38	salute	194	FO
39	anno	184	FO
40	scopo	171	FO
41	efficacia	171	AU
42	chemioterapia	167	NI
43	cellula	167	FO
44	sito	161	FO
45	fine	158	FO
46	periodo	154	FO
47	volta	148	FO
48	dolore	146	FO
49	organismo	146	FO
50	seguito	146	FO
51	sintomo	141	AU
52	somministrazione	140	NI
53	mese	134	FO
54	termine	130	FO
55	dato	127	AU
56	sanguinamento	125	NI
57	personale	122	FO
58	sponsor	121	NI
59	fase	119	FO
60	emoglobina	116	NI

No.	Lemma	Occurrences	Category
61	soggetto	115	FO
62	proteina	113	AU
63	documento	113	FO
64	rischio	111	FO
65	campione	109	FO
66	tempo	107	FO
67	sezione	107	FO
68	tabella	107	AU
69	assunzione	105	AU
70	centro	103	FO
71	grafico	102	AU
72	corso	101	FO
73	età	101	FO
74	infezione	99	AU
75	stato	98	FO
76	vita	98	FO
77	bambino	97	FO
78	base	97	FO
79	compressa	96	NI
80	inizio	95	FO
81	globulo	94	NI
82	circolo	93	AU
83	medicinale	92	NI
84	stadio	91	AU
85	punto	90	FO
86	titolo	90	FO
87	vaccino	87	AD
88	fegato	86	AU
89	donna	82	FO
90	ricovero	82	AD

No.	Lemma	Occurrences	Category
91	risposta	81	FO
92	morte	81	FO
93	anticorpo	80	NI
94	aumento	80	FO
95	forma	79	FO
96	complesso	78	AU
97	polmone	78	AU
98	sistema	77	FO
99	iniezione	77	AD
100	rapporto	76	FO

Table 12: Italian nouns

No.	Lemma	Occurrences	Category
1	avverso	1,698	NI
2	grave	630	FO
3	clinico	573	AU
4	ulteriore	417	FO
5	diverso	398	FO
6	correlato	305	NI
7	seguinte	297	FO
8	principale	239	FO
9	necessario	227	FO
10	comune	223	FO
11	primo	221	FO
12	affetto	218	AU
13	loro	210	FO
14	importante	208	FO
15	nuovo	191	FO
16	efficace	184	AU

No.	Lemma	Occurrences	Category
17	indesiderato	182	NI
18	collaterale	182	AU
19	relativo	181	FO
20	medio	180	FO
21	presente	169	FO
22	grande	165	FO
23	basso	164	FO
24	disponibile	161	FO
25	medico	156	AU
26	alto	150	FO
27	possibile	129	FO
28	completo	125	FO
29	suo	116	FO
30	renale	115	NI
30	renale	115	NI
31	singolo	113	FO
31	singolo	113	FO
32	noto	112	FO
32	noto	112	FO
33	sicuro	106	FO
33	sicuro	106	FO
34	ultimo	96	FO
35	stesso	94	FO
36	generale	90	FO
37	proprio	89	FO
38	scientifico	87	FO
39	polmonare	83	NI
40	sanguigno	83	NI
41	avanzato	82	AU
42	aperto	76	FO

No.	Lemma	Occurrences	Category
43	inferiore	76	FO
44	ospedaliero	75	NI
45	cronico	73	AU
46	piccolo	72	FO
47	tumorale	70	NI
48	immunitario	70	NI
49	pubblico	69	FO
50	bianco	67	FO
51	rilevante	65	AU
52	lungo	65	FO
53	massimo	60	FO
54	precedente	52	FO
55	specifico	51	FO
56	sanitario	51	AU
57	simile	47	FO
58	cieco	46	AU
59	totale	45	FO
60	nasale	44	AU
61	ampio	44	FO
62	casuale	43	AU
63	lieve	40	AU
64	determinato	40	FO
65	elevato	38	AU
66	vasto	37	AU
67	indipendente	36	AU
68	esteso	35	NI
69	curante	35	NI
70	cardiaco	34	AU
71	assiale	34	NI
72	attuale	32	FO

No.	Lemma	Occurrences	Category
73	orale	31	AU
74	serio	31	FO
75	rosso	30	FO
76	sano	30	FO
77	mestruale	29	NI
78	mediano	28	NI
79	multiplo	28	AU
80	chirurgico	28	AU
81	superiore	28	FO
82	esistente	28	AU
83	respiratorio	27	NI
84	complessivo	27	AU
85	squamoso	26	NI
86	breve	26	FO
87	solo	26	FO
88	eventuale	26	FO
89	infiammatorio	25	NI
90	standard	25	AU
91	multicentrico	24	NI
92	letale	24	NI
93	intero	24	FO
94	positivo	22	FO
95	quotidiano	21	FO
96	successivo	21	FO
97	oculare	20	NI
98	sperimentale	20	NI
99	corporeo	20	NI
100	muscolare	20	AU

Table 13: Italian adjectives

No.	Lemma	Occurrences	Category
1	essere	6,702	FO
2	avere	4,390	FO
3	potere	1,094	FO
4	assumere	741	FO
5	verificare	735	FO
6	ricevere	468	FO
7	aiutare	368	FO
8	chiamare	347	FO
9	venire	319	FO
10	somministrare	281	NI
11	includere	265	AU
12	mostrare	255	FO
13	comprendere	254	FO
14	partecipare	244	FO
15	riportare	230	FO
16	trattare	224	FO
17	volere	220	FO
18	ritenere	217	FO
19	valutare	216	FO
20	rispondere	197	FO
21	condurre	190	FO
22	rilevare	163	AU
23	causare	161	FO
24	prendere	150	FO
25	indicare	145	FO
26	stare	144	FO
27	influire	144	NI
28	controllare	141	FO
29	utilizzare	137	FO
30	contenere	135	FO

No.	Lemma	Occurrences	Category
31	scoprire	133	FO
32	esaminare	132	AU
33	rendere	129	FO
34	manifestare	122	FO
35	sottoporre	121	FO
36	misurare	120	AU
37	produrre	113	FO
38	ottenere	110	FO
39	dovere	106	FO
40	iniziare	106	FO
41	agire	105	FO
42	significare	104	FO
43	studiare	104	FO
44	ridurre	103	FO
45	rivolgere	102	FO
46	richiedere	102	FO
47	considerare	99	FO
48	trovare	97	FO
49	monitorare	90	NI
50	portare	85	FO
51	consultare	85	AU
52	confrontare	84	AU
53	registrare	83	FO
54	pregare	80	FO
55	cercare	80	FO
56	seguire	78	FO
57	presentare	77	FO
58	fare	75	FO
59	decidere	75	FO
60	mettere	75	FO

No.	Lemma	Occurrences	Category
61	succedere	74	FO
62	condividere	74	FO
63	peggiore	72	AU
64	sapere	70	FO
65	prelevare	68	AU
66	reperire	67	NI
67	svolgere	64	FO
68	terminare	63	FO
69	aumentare	60	FO
70	funzionare	60	FO
71	impedire	59	FO
72	riferire	59	FO
73	rimanere	56	FO
74	assicurare	54	FO
75	stabilire	52	FO
76	eseguire	50	FO
77	vedere	50	FO
78	calcolare	48	AU
79	dire	48	FO
80	determinare	47	FO
81	sponsorizzare	46	NI
82	contribuire	46	AU
83	redigere	46	AU
84	abbandonare	45	FO
85	specificare	45	AU
86	consistere	45	AU
87	illustrare	44	AU
88	arruolare	44	NI
89	chiedere	43	FO
90	segnalare	43	FO

No.	Lemma	Occurrences	Category
91	coinvolgere	42	FO
92	unire	42	FO
93	assegnare	42	AU
94	completare	41	AU
95	morire	41	FO
96	scegliere	41	FO
97	interrompere	40	FO
98	augurare	40	AU
99	continuare	40	FO
100	approvare	39	AU

Table 14: Italian verbs

No.	Lemma	Occurrences	Category
1	più	952	FO
2	non	891	FO
3	anche/anch'	314	FO
4	prima	232	FO
5	meglio	179	FO
6	meno	161	FO
7	solo	157	FO
8	circa	123	FO
9	almeno	117	FO
10	vi	103	FO
11	inoltre	98	FO
12	tuttavia	94	FO
13	avanti	66	FO
14	quindi	56	FO
15	sempre	48	FO
16	insieme	48	FO

No.	Lemma	Occurrences	Category
17	così	45	FO
18	complessivamente	41	NI
19	già	37	FO
20	dopo	36	FO
21	sì	36	FO
22	ancora	30	FO
23	precedentemente	29	AU
24	successivamente	26	AU
25	qui	23	FO
26	potenzialmente	20	NI
27	molto	17	FO
28	sopra	16	FO
29	attualmente	14	FO
30	frequentemente	14	NI
31	leggermente	14	AU
32	ora	12	FO
33	pressoché	11	NI
34	troppo	10	FO
35	correttamente	10	AU
36	spesso	10	FO
37	no	9	FO
38	ben(e)	9	FO
39	altrimenti	8	FO
40	opportunamente	8	NI
41	scarsamente	8	NI
42	casualmente	8	NI
43	sufficientemente	8	NI
44	sotto	8	FO
45	probabilmente	7	FO
46	regolarmente	7	AU

No.	Lemma	Occurrences	Category
47	unicamente	7	NI
48	anticipatamente	7	NI
49	comunemente	7	NI
50	generalmente	7	AU
51	poco	6	FO
52	efficacemente	6	NI
53	significativamente	5	NI
54	rapidamente	5	AU
55	talvolta	5	AU
56	indipendentemente	5	AU
57	mediamente	5	NI
58	completamente	5	FO
59	normalmente	5	AU
60	oltre	5	FO
61	poi	5	FO
62	ulteriormente	5	AU
63	mai	5	FO
64	principalmente	5	AU
65	abbastanza	4	FO
66	tuttora	4	AU
67	diversamente	4	AU
68	naturalmente	4	FO
69	oralmente	4	NI
70	invece	4	FO
71	interamente	4	AU
72	finora	4	AU
73	tanto	4	FO
74	inizialmente	3	AU
75	infine	3	FO
76	secondariamente	3	NI

No.	Lemma	Occurrences	Category
77	anzitempo	3	NI
78	solitamente	3	AU
79	minimamente	3	NI
80	automaticamente	3	AU
81	lentamente	3	FO
82	chirurgicamente	2	NI
83	immediatamente	2	FO
84	improvvisamente	2	AU
85	soltanto	2	FO
86	solamente	2	FO
87	quasi	2	FO
88	telefonicamente	2	NI
89	nuovamente	2	AU
90	ecco	2	FO
91	effettivamente	2	FO
92	contemporaneamente	2	AU
93	perlopiù	2	NI
94	pericolosamente	2	NI
95	ci/c'	2	FO
96	pienamente	2	AU
97	precisamente	2	AU
98	chiaramente	2	FO
99	realmente	1	AU
100	semplicemente	1	FO

Table 15: Italian adverbs

We will now compare data concerning lemma extraction by means of graphs in order to make the differences shown in the previous tables immediately evident.

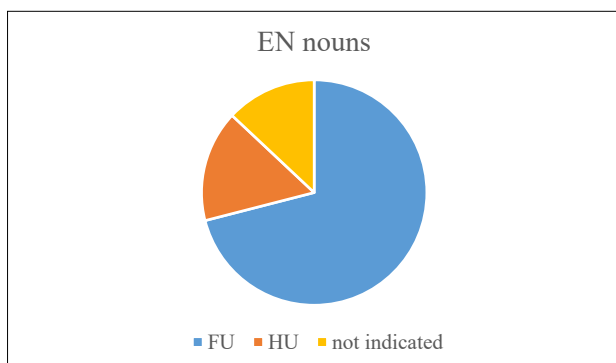


Fig. 5: Nouns in the English subcorpus

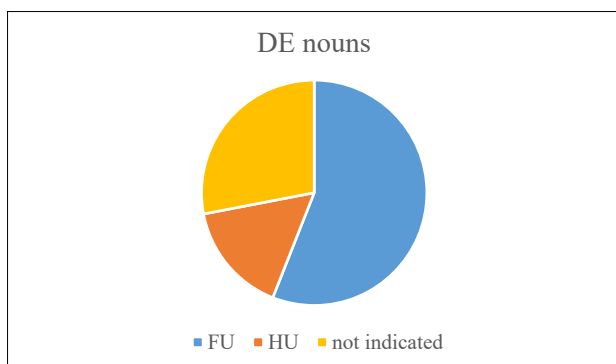


Fig. 6: Nouns in the German subcorpus

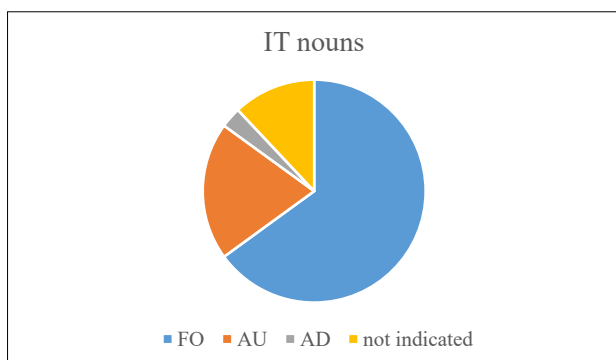


Fig. 7: Nouns in the Italian subcorpus

With respect to nouns, the English and Italian subcorpora show closer results. In the English subcorpus, 71 of the 100 most frequent nouns belong to the FU vocabulary, 16 to the HU vocabulary, and 13 are absent in the frequency dictionary. In the Italian subcorpus, 65 nouns belong to the FO vocabulary, 20 to the AU vocabulary, 3 to the AD vocabulary, and 12 are absent in the *NVdB*. In the German subcorpus, 56 nouns belong to the FO vocabulary, 16 to the HU vocabulary, and 28 are absent in the frequency dictionary. Overall, the nouns found in the frequency dictionaries are 87 for English, 88 for Italian, but only 72 for German. This is the only PoS category where the Italian subcorpus shows a higher number of lemmas indicated in the frequency dictionary than the English one, although the difference is given by a single lemma; it is also the PoS category with the highest difference between German and English. It should be noted that here a role has been played by compound nouns, such as *Prüfarzt*, *Studienarzt*, *Studienteilnehmer*, *Behandlungsmöglichkeit*, *Behandlungsmethode*, *Studienmedikament*, *Studienergebnis*, and *Gesamtergebnis*. In these instances, the frequency dictionary records the single constituents (*determinans* and *determinatum*), but not the compound nouns as such. Clearly, English and Italian are characterized by a different word morphology.

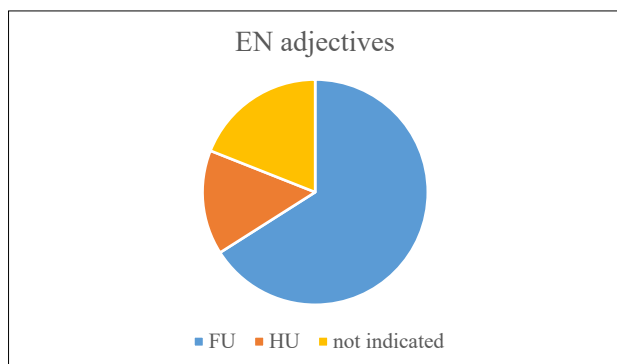


Fig. 8: Adjectives in the English subcorpus

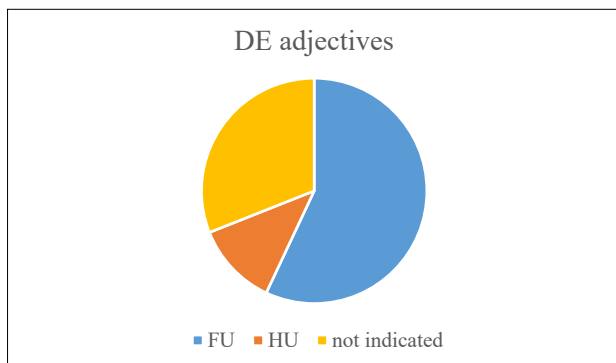


Fig. 9: Adjectives in the German subcorpus

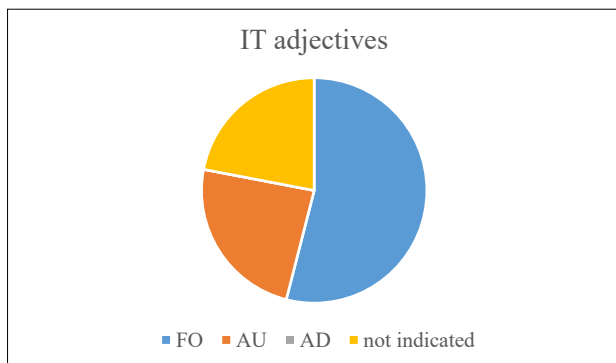


Fig. 10: Adjectives in the Italian subcorpus

The English and Italian subcorpora are more similar also with respect to adjective classification. In the English subcorpus, 66 adjectives belong to the FU vocabulary, 15 to the HU vocabulary, and 19 are absent in the frequency dictionary. In the Italian subcorpus, 54 adjectives belong to the FO vocabulary, 24 to the AU vocabulary, and 22 are absent in the frequency dictionary. In German, 57 adjectives belong to the FU vocabulary, 12 to the HU vocabulary, and 31 are absent in the frequency dictionary. Overall, 81 lemmas were found in the frequency dictionary for English, 78 for Italian, and only 69 for German. Unlike for nouns, this discrepancy is not due mainly to the presence of compound words in German. In many cases, the compound form

is found also in English: see, for instance, *platinbasiert* and *platinum-based*, *immuntolerant* and *immune-tolerant*, as well as *doppelblind* and *double-blind*. In other cases, the adjective is not a compound word and is simply not recorded in the frequency dictionary since it is a technical term, as occurs, for instance, with *oral*, *renal*, *squamös*, and *multipel* (in the pathonym *multiple Sklerose*).

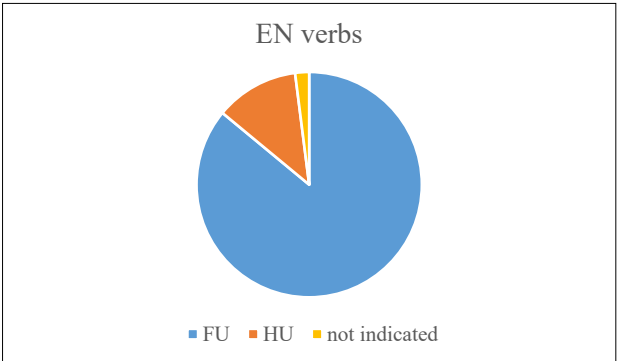


Fig. 11: Verbs in the English subcorpus

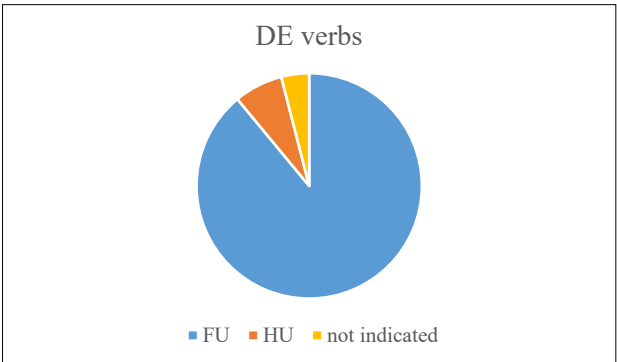


Fig. 12: Verbs in the German subcorpus

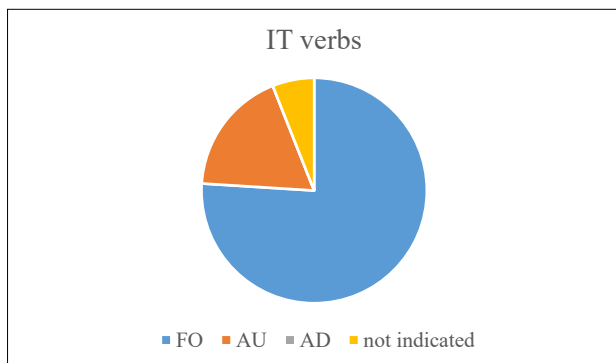


Fig. 13: Verbs in the Italian subcorpus

As for verbs, the English and German subcorpora show closer results. In the English subcorpus, 86 verbs belong to the FU vocabulary, 12 to the HU vocabulary, and only 2 are absent in the frequency dictionary. In the German subcorpus, 89 verbs belong to the FU vocabulary (thus with a slight increase compared to the English subcorpus), 7 to the HU vocabulary, and 4 are absent in the frequency dictionary. In Italian, only 76 verbs belong to the FO vocabulary, 18 to the AU vocabulary, and 6 are absent in the frequency dictionary. Overall, 98 lemmas were found in the frequency dictionary for English, 96 for German, and 94 for Italian.

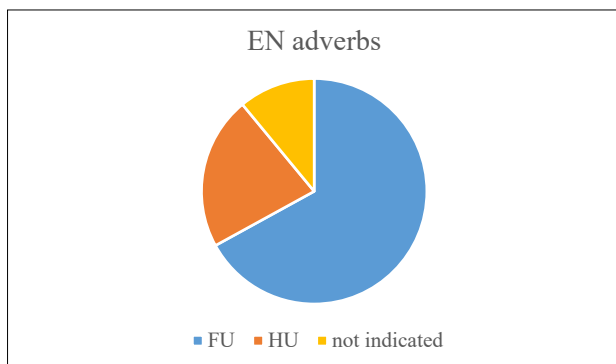


Fig. 14: Adverbs in the English subcorpus

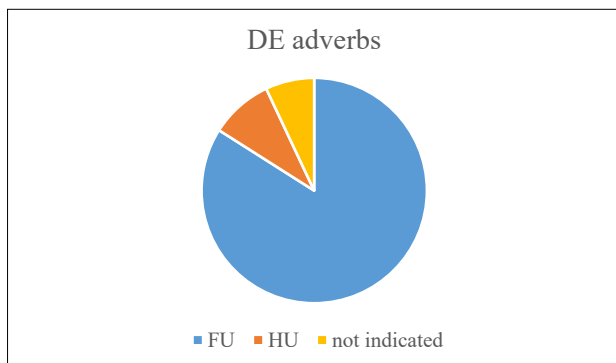


Fig. 15: Adverbs in the German subcorpus

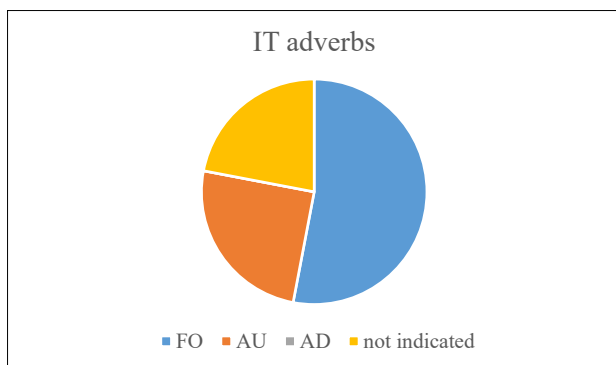


Fig. 16: Adverbs in the Italian subcorpus

Like verbs, adverbs are also characterized by closer values between the English and German subcorpora. As shown by the pie charts, this is actually the only PoS category in which the German subcorpus has a higher number of lemmas found in the frequency dictionary than the English one. In the English subcorpus, 67 adverbs are part of the FU vocabulary, 22 of the HU vocabulary, and 11 are absent in the frequency dictionary. In the German subcorpus, 84 adverbs belong to the FU vocabulary (thus with a quite remarkable increase compared to the English subcorpus), 9 to the HU vocabulary, and 7 are absent in the frequency dictionary. In Italian, only 53 adverbs belong to the FO vocabulary, 25 to the AU vocabulary, and 22 are absent in the frequency

dictionary. Overall, 89 lemmas were found in the frequency dictionary for English, 93 for German, and only 78 for Italian. This is the PoS category with the highest difference between English and Italian (as well as between German and Italian).

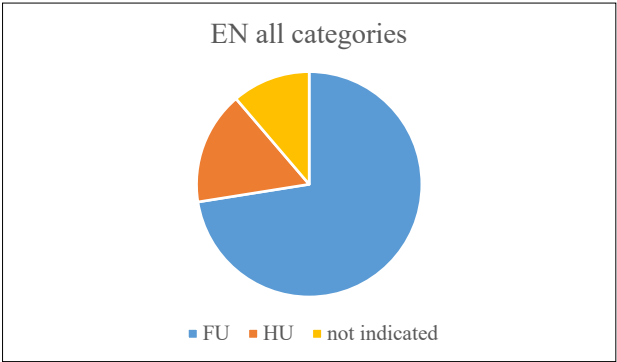


Fig. 17: The total of all four PoS categories in the English subcorpus

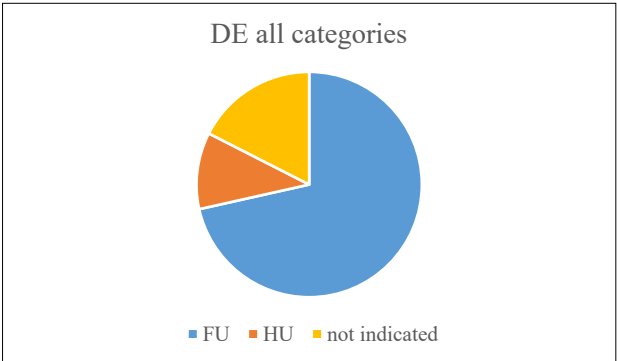


Fig. 18: The total of all four PoS categories in the German subcorpus

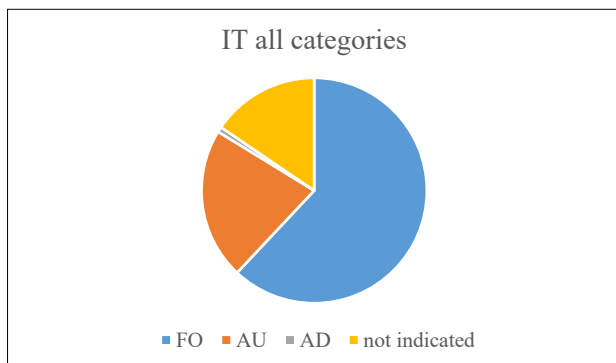


Fig. 19: The total of all four PoS categories in the Italian subcorpus

The chart pies depicting the total of all four PoS categories show an interesting finding. The English and German subcorpora are quite similar with respect to the number of lemmas belonging to the FU vocabulary, with 290 and 286 lemmas, respectively. Italian only has 248 lemmas belonging to the FO vocabulary. If lemmas belonging to the HU vocabulary are considered, though, English has 65 lemmas, while German only has 44 and Italian 87. For the Italian subcorpus, only 3 lemmas (more specifically, nouns) belonging to the AD vocabulary were found. Finally, 45 lemmas not indicated in the frequency dictionary were found for English, 70 for German, and 62 for Italian. Overall, English is the language with the highest number of lemmas indicated in the frequency dictionary (355), while this number decreases in translation. The German and Italian subcorpora show similar results, with 330 and 338 lemmas found in the frequency dictionaries, respectively.

It is also interesting to compare the number of lemmas found in the frequency dictionaries among the four different PoS categories. In all three subcorpora, the PoS category with most lemmas belonging to the FU vocabulary and found in the frequency dictionaries in general is that of verbs. The second PoS category is that of adverbs for English and German and that of nouns for Italian. It should be noted that, if only lemmas belonging to the FU vocabulary are considered, the second PoS category with the highest number of lemmas for English is that of nouns, as well. The third and fourth PoS category according to the number of lemmas found in the frequency dictionaries of English and

German is that of nouns and adjectives, respectively, while Italian shows the same number of *NVdB* lemmas in the adjective and adverb category. However, if only lemmas belonging to the FU vocabulary are considered, Italian adjectives show a slightly higher number than adverbs, while in German the number of adjectives slightly exceeds that of nouns.

Overall, English and German have more similarities, showing the same order of PoS categories based on the number of lemmas found in the frequency dictionaries. However, if only the number of lemmas belonging to the FU vocabulary is considered, English and Italian are more similar.

3.3.2 Morphemes of classical matrix

As mentioned in Section 3.2, after the analysis of the frequency of vocabulary we will now move on to terminology. Tables 16, 17, and 18 will show the technical terms with the morphemes of classical matrix that were detected in the three subcorpora.

Morpheme	EN	No.	DE	No.	IT	No.
a(n)-	anemia	58	Anämie	58	anemia	59
	anorexia	3	Anorexie	3	anomalo	7
	atrophy	2	anomal	2	anomalìa	3
	anaemia	1	Muskelatrophie	2	anoressia	3
	asthenia	1	Anämie-behandlung	1	atrofia	2
			Anomalie	1	astenia	1
			Asthenie	1		
	Tot.	65	Tot.	68	Tot.	75
ab-	abscess	1	Abnormität	1	aborto	1
			Analabszess	1		
	Tot.	1	Tot.	2	Tot.	1
ana-	analyse	10	analysieren	6	analizzare	19
	analysis	8	Analyse	5	analisi	9
			Anamnese	1		
			Zwischenanalyse	4		
	Tot.	18	Tot.	16	Tot.	28

Morpheme	EN	No.	DE	No.	IT	No.
anti-	antibody	83	Antikörper	63	anticorpo	80
	antiviral	12	antiviral	12	antivirale	12
	anti-mepolizumab	7	Anti-Mepolizumab-Antikörper	7	antitumorale	11
	antigen	3	Antikörperspiegel	4	anti-mepolizumab	7
	antihistamine	3	Antihistaminikum	3	antidolorifico	3
	antigen-positive	2	Antigen-positiv	2	antigene	3
	anti-angiogenic	1	Antikörper-antwort	1	antistaminico	3
	anti-cancer	1	Antikörper-reaktion	1	anti-BPCO	2
	anti-CD38	1	Antikörper-Wirkstoff-Konjugat	1	anticorpale	2
	anti-inflammatory	1	Anti-Krebs-Behandlung	1	anti-angiogenico	1
	anti-mesothelin	1	Anti-Mesothelin-Antikörper-Medikamenten-Konjugat	1	antiCD38	1
			Antirheumatikum	1	anticorpo-farmaco	1
					antinfiammatori	1
					anti-mesotelina	1
	Tot.	115	Tot.	97	Tot.	128
con-	conjugate	3	Antikörper-Wirkstoff-Konjugat	1	coniugato	3
	concomitant	1	Anti-Mesothelin-Antikörper-Medikamenten-Konjugat	1	concomitante	2
			Meningokokken-ACWY-Konjugat-impfstoff	1		
	Tot.	4	Tot.	3	Tot.	5
contra-	contraceptive	10	/	/	contraccettivo	10
	Tot.	10	Tot.	0	Tot.	10

Morpheme	EN	No.	DE	No.	IT	No.
de-	dehydration	3	Dehydrierung	2	/	/
	Tot.	3	Tot.	2	Tot.	0
di-	dichloride	5	Radium-223-Dichlorid	5	dicloruro	5
	Tot.	5	Tot.	5	Tot.	5
dia-	diabetes	57	Typ-2-Diabetes	32	diabete	57
	diarrhea	30	Diabetes	23	diarrea	39
	dialysis	16	Dialyse	8	dialisi	16
	diarrhoea	9	Peritonealdialyse	6	diagnosi	7
	diagnose	8	Diagnose	5	diagnostica	3
	diabetic	2	Diagramm	5	dializzare	2
	diagnosis	2	diagnostizieren	3	diabetico	1
	diagram	1	Diarrhö	2	diagnosticare	1
			Peritonealdialyse-Behandlung	2	diagnostico	1
			Diabetes-Arzneimittel	1	diagramma	1
			Diabetes-behandlung	1		
			diabetisch	1		
			Peritonealdialyse-Patient	1		
			Säulendiagramm	1		
	Tot.	125	Tot.	91	Tot.	128
dis-/dys-	disability	66	/	/	disabilità	66
	disorder	19			disidratazione	3
	discomfort	5			disfunzione	1
	Tot.	90	Tot.	0	Tot.	70
endo-	endometriosis	15	Endometriosis	13	endovenoso	18
	endothelial	2	endothelial	3	endometriosi	16
			Endometriosis-Symptom	2	endoteliale	2
	Tot.	17	Tot.	18	Tot.	36

Morpheme	EN	No.	DE	No.	IT	No.
ep(i)-	epilepsy	2	Epilepsie	2	epilessia	2
					epistassi	1
	Tot.	2	Tot.	2	Tot.	3
extra-	extravasation	1	/	/	/	/
	Tot.	1	Tot.	0	Tot.	0
hemi-	hemiparesis	1	Hemiparese	1	emicrania	1
					emiparesi	1
	Tot.	1	Tot.	1	Tot.	2
hyper-	hyperkalemia	7	Hyperkaliämie	7	ipereosinofilo	8
	hypereosino- philic	3	Hypereosinophilie- Syndrom	3	iperkaliemia	7
			Hyper- aldosteronismus	1	iperattivo	3
					ipertiroidismo	1
	Tot.	10	Tot.	11	Tot.	19
hypo-	/	/	/	/	ipoglicemizzante	1
	Tot.	0	Tot.	0	Tot.	1
in- (inside)	infection	95	Infektion	64	infezione	100
	injection	72	Injektion	49	iniezione	77
	infusion	31	Infusion	24	infusione	33
	inhaler	26	Inhalator	14	inalatore	31
	inhale	15	inhalieren	14	intestino	20
	inject	10	Injektionsstelle	14	inalatorio	10
	intestine	9	injizieren	13	iniettare	7
	infect	2	Lungeninfektion	9	infetto	2
	infected	1	Harnwegs- infektion	4	intestinale	2
	infectious	1	HBV-Infektion	3	infettare	1

Morpheme	EN	No.	DE	No.	IT	No.
in- (inside)	intestinal	1	infizieren	3	infettivo	1
			Pilzinfektion	3		
			infektionsbezogen	2		
			Atemwegs- infektion	1		
			Blutinfektion	1		
			Hautinfektion	1		
			Hefeinfektion	1		
			Hepatitis-B-Virus- Infektion	1		
			infusionsbedingt	1		
			Infusionsstelle	1		
			Inhalator- information	1		
			Leberinfektion	1		
			Meningokokken- Infektion	1		
			Vaginalinfektion	1		
	Tot.	263	Tot.	227	Tot.	284
in- (bereft of, without)	inactive	5	indolent	1	indesiderato	183
	indolent	1	inoperabel	1	insufficienza	19
			instabil	1	insufficiente	8
					inattivo	5
					inefficace	4
					intolleranza	2
					indolente	1
					indolore	1
					instabile	1
	Tot.	6	Tot.	3	Tot.	224
inter-	internal	6	interstitiell	4	interno	53
	interstitial	4	Interleukin-17A	1	interstiziale	4
	interleukin	1			interleuchina	1
	Tot.	11	Tot.	5	Tot.	58

Morpheme	EN	No.	DE	No.	IT	No.
intra-/ intro-	intravenous	14	intramuskulär	2	intravitreale	8
	intravitreal	8	intravenös	21	intrauterino	7
	intrauterine	7	intravitreal	8	intramuscolare	2
	intra- muscularly	2	intrauterin	6	intraoculare	2
			Intrauterinsystem	1		
	Tot.	31	Tot.	38	Tot.	19
meta-	metastatic	16	metastasiert	13	metastatico	16
	metastasis	1	metastasierend	2	metastasi	6
			Knochen- metastase	1		
			metastatisch	1		
			Metastase	1		
	Tot.	17	Tot.	18	Tot.	22
par(a)-	paralysis	2	Gastroparese	1	paralisi	2
			Hemiparese	1		
	Tot.	2	Tot.	2	Tot.	2
par(a)-	paranasal	1	Paravasat	1	paranasale	1
	Tot.	1	Tot.	1	Tot.	1
peri-	peritoneal	11	Peritonealdialyse	6	peritoneale	9
	peripheral	2	peripher	2	periferico	2
			peritoneal	2	peritoneo	2
			Peritonealdialyse- Behandlung	2		
			Peritonealdialyse- Patient	2		
	Tot.	13	Tot.	14	Tot.	13
post-	postherpetic	3	postherpetisch	4	posterpetico	4
	post-herpetic	1	Postnasal-Drip- Syndrom	1	post-nasale	1
	post-nasal	1			post-trattamento	1
	Tot.	5	Tot.	5	Tot.	6

Morpheme	EN	No.	DE	No.	IT	No.
pre-	prescribe	17	prämenopausal	1	prelevare	68
	pregnancy	11			prevenire	20
	pregnant	2			prescrivibile	18
	preliminary	1			prelievo	14
	pre-meno-pausal	1			prescrivere	4
	prevention	1			prevenzione	3
					prematurato	2
					prescrizione	2
					preliminare	1
					premenopausa	1
	Tot.	33	Tot.	1	Tot.	133
pro-	prophylaxis	9	Prophylaxe-behandlung	8	profilassi	10
	progesterone	3	Progesteron	3	progesterone	3
	prodromal	2	prodromal	2	prodromico	1
	prophylactic	1	Prophylaxe	1		
			Prophylaxe-Therapie	1		
	Tot.	15	Tot.	15	Tot.	14
sub-	subgroup	2	subkutan	1	sottocutaneo	5
	subcutaneous	1	subtherapeutisch	1	sottogruppo	2
	substudy	1			sottopelle	1
	sub-therapeutic	1			sottostudio	1
	subunit	1			sub-terapeutico	1
	Tot.	6	Tot.	2	Tot.	10
supra-	/	/	/	/	sovrappeso	2
					sovradossaggio	1
					sovraespressione	1
	Tot.	0	Tot.	0	Tot.	4

Morpheme	EN	No.	DE	No.	IT	No.
syn-	symptom	126	Symptom	58	sintomo	141
	syndrome	4	Hand-Fuß-Syndrom	5	sintomatico	17
	symptomatic	3	Hypereosino- philie-Syndrom	3	sindrome	9
			symptomatisch	3		
			Postnasal-Drip- Syndrom	1		
			Symptom- bewertung	1		
			Symptom- Fragebogen	1		
			Symptom- verschlechterung	1		
			Tumorlyse- Syndrom	1		
	Tot.	133	Tot.	74	Tot.	167
trans-	transplant	4	/	/	trapianto	4
	transaminase	1			trasmettere	3
	transition	1			transaminasi	1
	Tot.	6	Tot.	0	Tot.	8
ultra-	ultrasound	1	Ultraschall	1	ultrasuono	1
	Tot.	1	Tot.	1	Tot.	1
	TOT. EN	1,010	TOT. DE	722	TOT. IT	1,477

Table 16: List of prefixes

Morpheme	EN	No.	DE	No.	IT	No.
-ase	amino-transferase	19	Alanin-Amino-transferase	4	aminotransferasi	19
	amylase	3	Aspartat-Amino-transferase	4	amilasi	3
	lipase	3	Amylase	2	fosfatasi	2
	phosphatase	2	Glutamat-Pyruvat-Transaminase	2	lipasi	2
	transaminase	1	Aspartatamino-transferase	1	transaminasi	1
			Aspartat-Transaminase	1		
			Glutamat-Oxalacetat-Transaminase	1		
			Lipase	1		
			Phosphatase	1		
	Tot.	28	Tot.	17	Tot.	27
-ia	hemophilia	63	Hämophilie	63	emofilia	63
	anemia	58	Anämie	58	anemia	59
	pneumonia	13	Allergie	15	allergia	12
	hyperkalemia	7	Hyperkaliämie	7	iperkaliemia	7
	anorexia	3	Pneumonie	5	anoressia	3
	leukaemia	3	Allergiesymptom	3	leucemia	3
	alopecia	1	Anorexie	3	epilessia	2
	anemia	1	Leukämie	3	alopecia	1
	asthenia	1	Epilepsie	2	astenia	1
	pyrexia	1	Allergie-behandlung	1	embolia	1
			Alopezie	1	piressia	1
			Asthenie	1		
			Lungenembolie	1		
			Pyrexie	1		
	Tot.	151	Tot.	164	Tot.	153

Morpheme	EN	No.	DE	No.	IT	No.
-iasis	psoriasis	30	Psoriasis	15	psoriasi	28
	cholelithiasis	1	Psoriasis-Symptom	9	colecistiti	1
			Plaque-Psoriasis	4		
			Cholelithiasis	1		
			Plaque-Psoriasis-Medikament	1		
			Psoriasis-Medikament	1		
	Tot.	31	Tot.	31	Tot.	29
-(o)id	amyloid	9	Amyloid-Protein	6	amiloide	9
	myeloid	1	Amyloid	1	mieloide	1
			Amyloid-bedingt	1		
			Amyloid-Bildung	1		
			Amyloid-Plaque	1		
	Tot.	10	Tot.	10	Tot.	10
-ide	dichloride	5	Radium-223-Dichlorid	5	dicloruro	5
	Tot.	5	Tot.	5	Tot.	5
-in/-ine	protein	116	Protein	91	emoglobina	116
	hemoglobin	96	Hämoglobin	51	proteina	113
	metformin	48	Metformin	46	metformina	48
	darbepoetin	23	Hämoglobinmenge	25	vinorelbina	25
	rifampin	22	Vinorelbin	25	darbepoetina	23
	indomethacin	17	Darbepoetin	23	rifampicina	22
	insulin	6	Rifampin	23	bilirubina	21
	bilirubin	5	Hämoglobinwerte	17	indometacina	17
	mesothelin	5	Indomethacin	17	lamivudina	12
	doxorubicin	2	Lamivudin	12	alanina	11
	albumin	2	Insulin	5	mesotelina	7
	anti-mesothelin	1	Mesothelin	5	insulina	6
	fibrin	1	Amyloid-Protein	4	creatinina	3
	interleukin	1	PD-L1-Protein	4	istamina	3
	myelin	1	Bilirubinwerte	3	albumina	2

Morpheme	EN	No.	DE	No.	IT	No.
-in/-ine	vinorelbine	25	Hämoglobin- spiegel	3	doxorubicina	2
	lamivudine	13	Histamin	3	vincristina	2
	alanine	11	Albumin	2	anti-mesotelina	1
	antihistamine	3	Bilirubinspiegel	2	duloxetina	1
	creatinine	3	Doxorubicin	2	fibrina	1
	histamine	3	Kreatinin	2	gemcitabina	1
	vincristine	2	Mesothelin- exprimierend	2	interleuchina	1
	duloxetine	1	Metformin- Monotherapie	2	loratadina	1
	gemcitabine	1	Vincristin	2	mielina	1
	loratadine	1	Avastin	1		
			BCL-2-Protein	1		
			Duloxetin	1		
			Fibrin	1		
			Gemcitabin	1		
			Insulinproduktion	1		
			Loratadin	1		
			Myelin	1		
			PDL1-Protein	1		
			Pregabalin	1		
	Tot.	409	Tot.	381	Tot.	440
-ism	aldosteronism	1	Hyperaldostero- nismus	1	aldosteronismo	1
					ipertiroidismo	1
	Tot.	1	Tot.	1	Tot.	2
-itis	hepatitis	31	Hepatitis	28	spondiloartrite	34
	meningitis	9	Arthritis	4	epatite	26
	arthritis	5	Meningitis	4	polmonite	11
	spondyloar- thritis	4	Spondyloarthritis	4	meningite	9
	steatohepatitis	3	Steatohepatitis	4	dermatite	6

Morpheme	EN	No.	DE	No.	IT	No.
-itis	nasopharyngitis	2	Hepatitis-B-Hüllenantigen	2	artrite	5
	pancreatitis	2	Nasopharyngitis	2	steatoepatite	4
	pneumonitis	2	Pankreatitis	2	pancreatite	2
	rhinitis	2	Pneumonitis	2	rinite	2
	colitis	1	Rhinitis	2	cheratite	1
	keratitis	1	Colitis	1	colite	1
	osteoarthritis	1	Hepatitis-B-Oberflächenantigen	1	nasofaringite	1
	otitis	1	Hepatitis-B-Virus	1	osteoartrite	1
	sinusitis	1	Hepatitis-B-Virus-Infektion	1	otite	1
			Keratitis	1	rinofaringite	1
			Osteoarthritis	1	sinusite	1
			Otitis	1		
			Sinusitis	1		
	Tot.	65	Tot.	62	Tot.	106
-oma	lymphoma	42	Lungenkarzinom	31	linfoma	42
	myeloma	21	Non-Hodgkin-Lymphom	29	carcinoma	30
	melanoma	18	Myelom	20	fibroma	22
	mesothelioma	17	Uterus-Myom	20	mieloma	21
	carcinoma	8	Melanom	17	melanoma	17
	glioblastoma	3	Leberzellkarzinom	11	mesotelioma	17
			Pleuramesotheliom	9	glioblastoma	3
			B-Zell-Lymphom	6		
			Karzinom	3		
			Kolorektalkarzinom	3		
			Lymphom	2		
			Mesotheliom-Symptom	2		
			Myom	2		

Morpheme	EN	No.	DE	No.	IT	No.
-oma			Nierenzell-karzinom	2		
			Malignom	1		
			Non-Hodgkin-B-Zell-Lymphom	1		
			Plattenepithel-karzinom	1		
	Tot.	109	Tot.	160	Tot.	152
-ose	glucose	1	/	/	glucosio	2
	Tot.	1	Tot.	0	Tot.	2
-osis	endometriosis	15	Leberfibrose	5	endometriosi	16
	fibrosis	6	Zentralvenen-thrombose	5	fibrosi	7
	tuberculosis	3	Tuberkulose	2	tubercolosi	3
	polyposis	1	Lungentuberku-lose	1	poliposi	2
	psychosis	1	Mukoviszidose	1	psicosi	1
	vaginitis	1	Psychose	1	vaginosi	1
	Tot.	27	Tot.	15	Tot.	30
	TOT. EN	837	TOT. DE	846	TOT. IT	956

Table 17: List of suffixes

Morpheme	EN	No.	DE	No.	IT	No.
-algia	neuralgia	4	Neuralgie	4	nevralgia	4
					neuralgia	1
	Tot.	4	Tot.	4	Tot.	5
all(o)-	allergy	19	Allergie	15	allergico	18
	allergic	11	allergisch	11	allergia	12
			Allergiesymptom	3		
			Allergie-behandlung	1		
	Tot.	30	Tot.	30	Tot.	30

Morpheme	EN	No.	DE	No.	IT	No.
angi(o)-	anti-angiogenic	1	antiangiogen	1	anti-angiogenico	1
	Tot.	1	Tot.	1	Tot.	1
arthr(o)-	arthritis	5	Spondyloarthritis	4	spondiloartrite	34
	spondylo- arthritis	4	Arthritis	4	artrite	5
	osteoarthritis	1	Arthritis- medikament	1	osteoartrite	1
			Osteoarthritis	1		
	Tot.	10	Tot.	10	Tot.	40
auto-	autoantibody	4	Autoimmun- erkrankung	4	autoanticorpo	4
	autoimmune	4	Autoantikörper	3	autoimmune	4
	autoantibody- positive	1	Autoantikörper- positiv	1	autoanticorpi- positivo	1
			Autoimmunkörper	1	auto-iniettato	1
			autoimmun	1		
	Tot.	9	Tot.	10	Tot.	10
bio-	bioavailability	1	Leberbiopsie	2	biodisponibilità	1
	biodistribution	1	Bioäquivalenz	1	biodistribuzione	1
	bioequivalence	1	Biodistribution	1	bioequivalenza	1
	biopsy	1	Bioverfügbarkeit	1	biopsia	1
	Tot.	4	Tot.	5	Tot.	4
-blast/- plast	glioblastoma	3	Glioblastoma	3	glioblastoma	3
	Tot.	3	Tot.	3	Tot.	3
cardi(o)-	cardiovascular	20	Elektrokardio- gramm	3	cardiaco	34
	electrocardio- gram	4	kardiovaskulär	3	cardiovascolare	20
	myocardial	2	Myokardinfarkt	2	elettrocardio- gramma	4
	cardiac	1	nicht-kardial	1	miocardico	2
	non-cardiac	1			miocardio	1
	Tot.	28	Tot.	9	Tot.	61

Morpheme	EN	No.	DE	No.	IT	No.
cervic(o)-	cervical	1	/	/	cervice	1
	Tot.	1	Tot.	0	Tot.	1
chol(e)-	cholesterol	3	Cholesterinspiegel	3	colesterolo	3
	cholelithiasis	1	Cholelithiasis	1	coletitiasi	1
	cholestatic	1	cholestatisch	1	colestatico	1
	Tot.	5	Tot.	5	Tot.	5
cyst(o)-	cyst	4	Zyste	4	cisti	5
	cystic	1			cistico	1
					cistifellea	1
	Tot.	5	Tot.	4	Tot.	7
-cyte	lymphocyte	5	Lymphozyt	5	linfocito	6
	cytomegalo-virus	1	Thrombozyt	3	leucocita	1
	leukocyte	1	Granulozyt	2	linfocita	1
	lymphocytic	1	Cytomegalovirus	1		
			Leukozyt	1		
	Tot.	8	Tot.	12	Tot.	8
derm(ato)-	/	/	/	/	dermatite	6
	Tot.	0	Tot.	0	Tot.	6
-ectomy	hysterectomy	1	Hysterektomie	1	isterectomia	1
	myomectomy	1	Myomektomie	1	miomectomia	1
	Tot.	2	Tot.	2	Tot.	2
-(a)emia	anemia	58	Anämie	58	anemia	59
	hyperkalemia	7	Hyperkaliämie	7	iperkaliemia	7
	leukaemia	3	Leukämie	3	leucemia	3
	anaemia	1	Anämie-behandlung	1		
	Tot.	69	Tot.	69	Tot.	69
erythro-	erythropoiesis-stimulating	1	Erythropoese-stimulierend	14	eritropoiesi	9
			erythropoiesis-stimulating	8		
	Tot.	1	Tot.	22	Tot.	9

Morpheme	EN	No.	DE	No.	IT	No.
gastr(o)-	gastrointestinal	6	gastrointestinal	5	gastrointestinale	7
	gastroparesis	1	Gastroparese	1	gastroparesi	1
	Tot.	7	Tot.	6	Tot.	8
-gen	immuno-genicity	4	Immunogenität	4	immunogenicità	4
	antigen	3	Antigen-positiv	2	antigene	3
	antigen-positive	2	Hepatitis-B-Oberflächenantigen	1	reattogenicità	1
	reactogenicity	1	Reaktogenität	1		
	Tot.	10	Tot.	8	Tot.	8
gyn-/gyn(a)e(co)-	/	/	/	/	ginecologo	1
	Tot.	0	Tot.	0	Tot.	1
-graphy	tomography	4	Computer-tomographie	1	tomografia	1
			Magnetresonanztomographie	1		
			Magnetresonanztomographie-Aufnahme	1		
			Positronen-Emissions-Tomographie	1		
			Radionuklid-Ventrikulographie	1		
	Tot.	4	Tot.	5	Tot.	1
h(a)em(o)-/h(a)emat(o)-	hemoglobin	96	Hämophilie	63	emoglobina	116
	hemophilia	63	Hämoglobin	51	emofilia	63
	edema	14	Hämoglobin-menge	25	emorragia	17
	haemophilus	3	Hämoglobinwerte	17	edema	14
	haematoma	1	Hämoglobin-spiegel	3	ematoma	6
	haemorrhage	1	Hämatom	2		
	hematoma	1				
	Tot.	179	Tot.	161	Tot.	216

Morpheme	EN	No.	DE	No.	IT	No.
hepat(o)-	hepatitis	24	Hepatitis	21	epatite	26
	hepatocellular	5	Steatohepatitis	4	epatico	17
	steatohepatitis	3	Hepatitis-B-Hüllenantigen	2	epatocellulare	5
	hepatic	1	hepatozellulär	1	steatoepatite	4
	steatohepatitis	1	Hepatitis-B-Oberflächenantigen	1		
			Hepatitis-B-Virus	1		
			Hepatitis-B-Virus-Infektion	1		
	Tot.	34	Tot.	31	Tot.	52
hist-/hist(i)-	antihistamine	3	Antihistaminikum	3	istamina	3
	histamine	3	Histamin	3	antistaminico	2
					antistaminici	1
	Tot.	6	Tot.	6	Tot.	6
hyster(o)-	hysterectomy	1	Hysterektomie	1	isterectomia	1
	Tot.	1	Tot.	1	Tot.	1
kine-/kinesi(o)-/kinet(o)-	pharmacokinetics	8	Pharmakokinetik	14	farmacocinetica	14
	pharmacokinetic	7	pharmakokinetisch	1	farmacocinetico	1
	Tot.	15	Tot.	15	Tot.	15
leuc(o)-/leuk(o)-	leukaemia	3	Leukämie	3	leucemia	3
	interleukin	1	Interleukin-17A	1	interleuchina	1
	leukocyte	1	Leukozyt	1	leucocita	1
	Tot.	5	Tot.	5	Tot.	5
lip(o)-	lipase	3	Lipasewerte	2	lipasi	1
			Lipase	1		
	Tot.	3	Tot.	3	Tot.	1
lith(o)-	cholelithiasis	1	Cholelithiasis	1	colecitiasi	1
	Tot.	1	Tot.	1	Tot.	1

Morpheme	EN	No.	DE	No.	IT	No.
-lysis	dialysis	16	Dialyse	8	dialisi	16
	non-dialysis	3	Peritonealdialyse	6	lisi	1
	lysis	1	Peritonealdialyse-Behandlung	2		
			Peritonealdialyse-Patient	1		
			Tumorlyse-Syndrom	1		
	Tot.	20	Tot.	18	Tot.	17
men(o)-	menstrual	18	Menstruations-zyklus	4	premenopausa	1
	pre-meno-pausal	1	prämenopausal	1		
	Tot.	19	Tot.	5	Tot.	1
mer(o)-	oligomer	1	Oligomer	1	oligomero	1
	Tot.	1	Tot.	1	Tot.	1
metr(o)-	endometriosis	15	Endometriosis	13	endometriosi	16
			Endometriosis-Symptom	2		
	Tot.	15	Tot.	15	Tot.	16
myc(o)-	/	/	/	/	micotico	3
	Tot.	0	Tot.	0	Tot.	3
myel(o)-	myeloma	21	Myelom	21	mieloma	21
	myelin	1	Myelin	1	mielina	1
	myeloid	1	myeloisch	1	mieloide	1
	Tot.	23	Tot.	23	Tot.	23
my(o)-	myocardial	2	Uterus-Myom	20	miocardico	2
	cardio-myopathy	1	Myokardinfarkt	2	miocardio	1
	myomectomy	1	Myom	2	miomectomia	1
			Myomektomie	1		
	Tot.	4	Tot.	25	Tot.	4
neph(r)o-	/	/	/	/	nefropatia	1
	Tot.	0	Tot.	0	Tot.	1

Morpheme	EN	No.	DE	No.	IT	No.
neur(o)-	neuropathic	6	neuropathisch	6	neuropatico	6
	neuralgia	4	Neuralgie	4	neuropatia	2
	neuropathy	2	Neuropathie	2	neuralgia	1
	Tot.	12	Tot.	12	Tot.	9
osteo-	osteoarthritis	1	Osteoarthritis	1	osteoartrite	1
	Tot.	1	Tot.	1	Tot.	1
ot(o)-	otitis	1	Otitis	1	otite	1
	Tot.	1	Tot.	1	Tot.	1
path(o)-	neuropathic	6	neuropathisch	6	patologia	14
	neuropathy	2	Neuropathie	2	broncopneumopatia	9
	radiculopathy	1	Radikulopathie	1	neuropatico	6
					neuropatia	2
					nefropatia	1
					patologico	1
					radicolopatìa	1
	Tot.	9	Tot.	9	Tot.	34
phag(o)-	esophagus	1	/	/	esofago	1
	Tot.	1	Tot.	0	Tot.	1
phleb(o)-	/	/	/	/	flebo	5
	Tot.	0	Tot.	0	Tot.	5
-pasy/ -plasia	/	/	Neoplasie	1	neoplasia	4
	Tot.	0	Tot.	1	Tot.	4
pneum(o)-	pneumonia	13	Pneumonie	5	broncopneumopatia	9
	pneumonitis	2	Pneumonitis	2		
	Tot.	15	Tot.	7	Tot.	9
-poiesis	erythropoiesis-stimulating	11	Erythropoese-stimulierend	14	eritropoiesi	9
	Tot.	11	Tot.	14	Tot.	9
pseud(o)-	pseudomonal	1	Pseudomonas-Sepsis	1	pseudomonas	2
	Tot.	1	Tot.	1	Tot.	2

Morpheme	EN	No.	DE	No.	IT	No.
rhin(o)-	rhinitis	2	Rhinitis	2	rinite	2
					rinorrea	2
					rinofaringite	1
	Tot.	2	Tot.	2	Tot.	5
-rrhage/ -rrhagia	haemorrhage	1	/	/	emorragia	13
	Tot.	1	Tot.	0	Tot.	13
-rrh(o)ea	diarrhea	30	Diarrhö	2	diarrea	39
	diarrhoea	9			rinorrea	2
	Tot.	39	Tot.	2	Tot.	41
spir(o)-	respiratory	5	Exspirations- volumen	3	respiratorio	28
	spirometer	3	Spirometer	3	respiro	6
					respirazione	5
					espiratorio	3
					spirometro	3
	Tot.	8	Tot.	6	Tot.	45
spon- dyl(o)-	spondylo- arthritis	4	Spondyloarthritis	4	spondiloartrite	34
	Tot.	4	Tot.	4	Tot.	34
steat(o)-/ stear(o)	steatohepatitis	4	Steatohepatitis	4	steatoepatite	4
	Tot.	4	Tot.	4	Tot.	4
-trophy	atrophy	2	Muskelatrophie	2	atrofia	2
	Tot.	2	Tot.	2	Tot.	2
	TOT. EN	638	TOT. DE	581	TOT. IT	861

Table 18: List of roots

Overall, in the English subcorpus the morphemes of classical matrix are 2,485. This number decreases in the German subcorpus, where it only reaches 2,149, while it increases in the Italian subcorpus, where it reaches 3,294. More specifically, the number of morphemes of classical matrix increases in all cases (prefixes, suffixes, and roots) in Italian, while in German it decreases for prefixes and roots but increases slightly for suffixes.

The category with the highest number of morphemes of classical matrix is that of prefixes, followed by suffixes and roots.⁴¹ The category of prefixes is also the one with the highest increase in morphemes in Italian, but at the same time with the highest decrease in German (1,010 for English, 1,477 for Italian, and 722 for German).

With respect to prefixes, Italian shows an increase compared to English in 20 cases, a decrease in 5 cases, and shows no variation in 7 cases. German shows an increase in 5 cases, a decrease in 17 cases, and shows no variation in 10 cases. Some instances where the difference in use within the various languages is particularly manifest are the prefixes *contra-* and *dia-*, where the discrepancy is given by the terms *contraceptive* and *diarrhea*. The former does not have a Latin/Greek equivalent in German, where it can only be translated as *Verhütungsmittel*, while in Italian it is translated as *contraccettivo*. For the latter, both the Latin/Greek borrowing and the calque made up of Germanic morphemes exist, i.e., *Diarrhö* and *Durchfall*. Both are found in the German subcorpus, but with remarkably different frequencies: *Diarrhö* is used twice, while *Durchfall* occurs 39 times, which also corresponds to the occurrences in the English subcorpus (with 30 occurrences of the orthographic variant *diarrhea* and 9 occurrences of the variant *diarrhoea*) and in the Italian subcorpus. The only 2 occurrences of *Diarrhö* are between brackets, as a scientific term after the more popular variant *Durchfall*. In both instances, the English ST only contains the term *diarrhoea*, therefore this recourse to both terms was decided by the German translator. Another interesting aspect is that in 4 cases the popular variant *Durchfall* was presented as the technical term between brackets after an explanation, i.e., “Häufiger weicher, wässriger Stuhl (Durchfall)”, to translate “Frequent, loose watery stools (diarrhoea)”.

For Italian, the opposite phenomenon may be observed. Some interesting instances where the register is raised are the translation of *nose bleed* as *epistassi*, *headache* as *emicrania*, and *underactive thyroid* as *ipertiroidismo* (which should actually be the opposite in Italian, i.e., *ipotiroidismo*). These examples, although not frequent in the subcorpus, are discussed here as they are a perfect instantiation of register mismatch between the two languages.

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41 Only in German this order is different, as the category of suffixes presents the highest number.

German, instead, has the same register as English, with the terms *Nasenbluten*, *Kopfschmerzen*, and *Schilddrüsenunterfunktion*. In the case of *emicrania*, this term is not used alone – as occurs with the other two terms mentioned – but as a parenthetical construction, thus as a second de-terminologization strategy (Montalt Resurrecció & González Davies 2007: 252), in a table where adverse events are reported with the more popular term or an explanation followed by the more scientific term between brackets.⁴² The English ST presents the same pathonym twice, i.e., “Headache (headache)”. This is likely due to the fact that, while trial summaries usually indicate a technical term which is then accompanied by a more popular variant in the layperson summary, in this case the trial summary already contained the term *headache*. Due to this oversight, the layperson summary therefore ended up mentioning the same word twice. The same occurs in German with the repetition of *Kopfschmerzen*, while in Italian it was decided to differentiate between the two terms “Mal di testa (*emicrania*)”. However, *emicrania* is the direct translation of *migraine* and a specific hyponym, while here the right translation belonging to a higher register would have been *cefalea*. This indicates that the translator did indeed try to raise the register of the term *headache*, but chose the wrong term, either because of insufficient specialized competence or, again, an oversight.

In some cases, the differences were due to a different use of prefixes in the three languages. So, as pointed out by Magris (1992: 33, 36), *intra-/intro-* is often replaced by *endo-* in Italian. This explains why the number of occurrences of this prefix is lower in Italian – 19 occurrences – than in English and German, with 31 and 38 occurrences, respectively. As a matter of fact, there are 14 occurrences of the term *intravenous* in English, and 21 occurrences of its equivalent *intravenös* in German. On the other hand, the number of occurrences of the prefix *endo-* in Italian is more than twice as high as in English, and exactly twice as high as in German (36, 17, and 18 occurrences, respectively). This is due to the 18 occurrences of the term *endovenoso*. Another example is given by the prefix *de-*, with 3 occurrences in English, 2 in German, but none in Italian. The terms found in the two Germanic languages

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 42 This is quite frequent in tables reporting adverse events. Some instances are “Fever (Pyrexia)” and “Swelling of the nasal passages (Sinusitis)”.

are *dehydration* and *Dehydrierung*, while the prefix used in this case in Italian is *dis-* (*disidratazione*, 3 occurrences). In the German subcorpus, one of the 2 occurrences of *Dehydrierung* is a parenthetical construction following the more understandable term *Flüssigkeitsmangel*. As shown by the different number of occurrences in the three subcorpora, *dehydration* is translated differently in one case, i.e., as *Austrocknung*: “Wasserverlust (*Austrocknung*)” to signify “Loss of water (dehydration)”. As mentioned above with respect to the term *Durchfall*, here the non-specialized variant was chosen also where it would have made sense to have a technical term, i.e., in a parenthetical construction after an explanation, which corresponds to the second determinologization strategy. Another interesting difference in the use of prefixes, already highlighted by Magris (1992: 34, 36), is that *hyper-* is often omitted in English. This explains the increase in the occurrences of this prefix in German (11 occurrences vs 10 occurrences in English), as the English term *aldosteronism* is translated as *Hyperaldosteronismus*: this does not occur in Italian, though, where the equivalent *aldosteronismo* is found. The Italian subcorpus still shows an increase compared to the English subcorpus (with 19 occurrences), and this is due to the higher number of occurrences of the adjective *ipereosinofilo* (in the noun group *sindrome ipereosinofila*), which is found 8 times. The English equivalent *hypereosinophilic* (*syndrome*) and the German equivalent *Hypereosinophilie-Syndrom* only occur 3 times, as the abbreviation *HES* is tendentially preferred after being introduced along with the extended form the first time.

With respect to suffixes, Italian shows an increase compared to English in 7 cases, a decrease in 2 cases, and no variation in 2 cases. German shows an increase in 2 cases, a decrease in 5 cases, and no variation in 4 cases. The German suffix showing the most remarkable increase is *-om*, with 160 occurrences against the 109 occurrences of the equivalent *-oma* in English. Italian also shows an increase with respect to English, although not as high as in the German subcorpus (152 occurrences of *-oma*). This discrepancy is due mainly to the translation of *fibroids* as *Myome* (22 occurrences for both), as in the following examples:

En: Uterine fibroids are common, and many women do not have symptoms. But, in some women, uterine fibroids cause heavy or painful periods, stomach pain, lower back pain, and the need to urinate more often.

De: Uterus-Myome kommen häufig vor und viele Frauen haben keinerlei Symptome. Bei manchen Frauen verursachen Uterus-Myome allerdings eine starke oder schmerzhaftes Monatsblutung, Bauchschmerzen, Schmerzen im unteren Rückenbereich, sowie einen verstärkten Harndrang.

En: All the participants in this trial had surgery planned to remove fibroids from their uterus or to remove their uterus completely.

De: Für alle Teilnehmerinnen in dieser klinischen Prüfung war eine Operation zur Entfernung von Myomen vom Uterus oder dem Uterus komplett geplant.

The latter instance is quite interesting, as it shows the replacement of the terms *myomectomy* and *hysterectomy* (as well as *Myomektomie* and *Hysterektomie*) by their explanation in the running text, i.e., with recourse to the fourth determinologization strategy by Montalt Resurrecció and González Davies (2007: 253). These terms are found only in the full trial title, i.e.:

En: An open-label, parallel-group, multi-center study to investigate pharmacodynamic effects after daily administration of vilaprisan or ulipristal acetate for 8–12 weeks in patients with uterine fibroids for whom surgery (hysterectomy or myomectomy) is planned.

De: Vollständiger Titel der klinischen Prüfung: Eine offene multi-zentrische Parallelgruppen-Studie zur Untersuchung der pharmakodynamischen Wirkungen nach täglicher Verabreichung von Vilaprisan oder Ulipristalacetat für 8–12 Wochen bei Patientinnen mit Uterus-Myomen, für die eine Operation (Hysterektomie oder Myomektomie) geplant ist.

In the Italian subcorpus, *fibroid* was always translated as *fibroma* (either *dell'utero* or, more often, *uterino*):

En: There are treatments for people with uterine fibroids, but they do not work for all people and may cause medical problems.

It: Esistono dei trattamenti per le donne con fibromi uterini, tuttavia questi non sono efficaci su tutte le donne e potrebbero causare problemi medici.

En: They took tissue samples from either the inside of the uterus or from the uterine fibroids. This depended on the type of surgery the participants had.

It: I campioni di tessuto sono stati prelevati dall'interno dell'utero o dai fibromi dell'utero a seconda del tipo di intervento chirurgico al quale le partecipanti erano state sottoposte.

Another term which led to the discrepancy in suffix use is *Karzinom* in the compound terms *Lungenkarzinom*, *Leberzellkarzinom*, *Kolorektalkarzinom*, *Plattenepithelkarzinom*, and *Malignom*. The English equivalent of (*nicht-kleinzelliges*) *Lungenkarzinom* in the corpus is *non-small cell lung cancer*, for *Kolorektalkarzinom* it is *colorectal cancer*, for *Plattenepithelkarzinom* it is *squamous cell cancer*. *Leberzellkarzinom* is *hepatocellular carcinoma*, but in the English subcorpus the initialism *HCC* (11 occurrences) is often used instead of the extended form (5 occurrences). Finally, *Malignom* occurs once in the subcorpus to translate the English term *malignancy* in a trial title (in another case this term was translated as *Krebserkrankung*). The Italian subcorpus also has a higher frequency of the term *carcinoma* (30 occurrences) than English (8 occurrences). *Non-small cell lung cancer* is translated as *carcinoma polmonare non a piccole cellule* and *squamous cell cancer* as *carcinoma a cellule squamose*. However, *colorectal cancer* is translated as *cancro del colon-retto* (3 occurrences), and the acronym *CEC* (for *carcinoma epatocellulare*) is used frequently (11 occurrences), as occurs in English with *HCC*. Another interesting instance involving carcinoma is the following:

En: The doctors: took pictures of the participants' tumors using CT or MRI [...].

It: I medici hanno: acquisito immagini tramite procedure diagnostiche quali TC o risonanza magnetica dei carcinomi delle partecipanti.

Here, the register is generally raised, and *tumor* (referring to *breast cancer*, in Italian translated as *tumore della mammella* in this corpus) is translated as *carcinoma*.

The other suffix showing an increase in German is *-ie*. This suffix is deemed to be less interesting than *-om*, though, as the discrepancy between German and English is due to different suffix use, and not to the use of terms belonging to different registers. So, terms like *Allergie*, *Epilepsie*, and *Lungenembolie* have the English equivalents *allergy*, *epilepsy*, and *pulmonary embolism*. The same may be applied to the Italian terms *allergia*, *epilessia*, and *embolia polmonare*.

Another suffix with a remarkable increase (in this case only in Italian) which is worth discussing is *-ite*. This increase is due mainly to the higher frequency of the term *spondiloartrite* (34 occurrences) compared to the English *spondyloarthritis* (and also to the German *Spondyloarthritis*, with 4 occurrences each) as a component of the noun group *axial spondyloarthritis* (and *axiale Spondyloarthritis*). The two Germanic languages, unlike Italian, use the acronym *axSpA* in the running text after introducing the extended form. Another term that occurs in Italian but not in the other two languages is *dermatite*, which is part of the pathonym *dermatite mani-piedi*. English and German call this disease *hand-foot skin reaction* and *Hand-Fuß-Syndrom*. Finally, another difference between Italian and English is given by the term *polmonite*, used 10 times to translate *pneumonia* and once to translate *pneumonitis*. Curiously, another occurrence of *pneumonitis*, put between brackets as a second de-terminologization strategy (“Inflammation of the lungs [pneumonitis]”) is omitted in Italian, where only “*Infiammazione polmonare*” is kept. This choice is quite peculiar, as *polmonite* is a term extremely frequent also in general language and therefore understood without difficulties by laypeople.

As far as roots are concerned, Italian shows an increase compared to English in 23 cases, a decrease in 8 cases, and no variation in 22 cases. German shows an increase in 8 cases, a decrease in 14 cases, and no variation in 31 cases.

One of the roots with the highest increase in Italian is the root *emo-/emato-*. Here, part of the difference between Italian and English is due to the term *emorragia*, which is used to translate *bleeding* or *nosebleed* (in the latter case together with the adjective *nasale*). The only case where the Greek/Latin

equivalent *haemorrhage* is found in the English subcorpus is in the multiword term *cerebral haemorrhage*, accompanied by an explanation between brackets, i.e., “bleeding in the brain”. Similarly, the term *ematoma* is used to translate the Germanic popular term *bruising*. The Greek/Latin term *haematoma* is found only once in the English subcorpus, in the multiword term *cerebral haematoma*, accompanied by an explanation between brackets (“collection of blood within the skull”). The orthographic variant *hematoma* also occurs once and accompanies the more understandable variant, i.e., *bruising*. Finally, another term leading to this increase in frequency is *emoglobina*, which is often used in Italian in the noun group *emoglobina glicata* (19 occurrences) in cases where the English text favors the non-extended form *HbA1c*.

Another root with a remarkable increase in Italian is *cardi(o)-*. This is due to the frequent translation of the noun *heart* as *cardiaco* when it has an adjectival function in the terms *heartbeat*, *heart attack*, *heart failure*, *heart disease*, *heart muscle*, *heart rhythm*, and *heart imaging test*. These are translated as *battito cardiaco* (7 occurrences), *attacco cardiaco* (6 occurrences), *scompenso cardiaco*⁴³ or *insufficienza cardiaca* (5 and 3 occurrences, respectively), *malattia cardiaca* (2 occurrences), *muscolo cardiaco* (2 occurrences), *ritmo cardiaco* (2 occurrences), and *test di imaging cardiaco* (1 occurrence). In addition, *heart attack* is translated twice as *attacco di cuore* when it is used as an explanation of the term *myocardial infarction*, and *heart disease* is translated twice as *malattia del cuore* when the term *heart* is also accompanied by the term *liver* (“liver or heart disease”, in Italian “malattia del fegato o del cuore”). Another interesting instance, which unlike *attacco di cuore* and *malattia del cuore* implies an even higher register than *cardiaco* in Italian, is the translation of *heart muscle* as *miocardio* in a list of adverse events:

En: Lack of blood flow and oxygen to the heart muscle happened in 8.2% of participants. This was 4 out of 49 participants.

It: Mancanza di afflusso di sangue e ossigeno al miocardio verificatasi nell’8,2% dei partecipanti, ossia in 4 partecipanti su 49.

.....
43 This technical term is used when the English ST refers to *heart failure and preserved ejection fraction (HFpEF)*.

The adjective *cardiac* occurs only twice in the English subcorpus, in the terms *cardiac arrest* and *non-cardiac chest pain*. The second case is also determinologized with a reformulation that includes the Germanic word *heart*, i.e., “chest pain not related to the heart”. In German, the abovementioned terms *heartbeat*, *heart attack*, *heart failure*, *heart disease*, *heart muscle*, *heart rhythm*, and *heart imaging test* are translated with compound nouns involving the determinans *Herz*: *Herzschlag* (8 occurrences), *Herzinfarkt* or *Herzanfall* (6 occurrences and 1 occurrence, respectively), *Herzinsuffizienz* or *Herzversagen* (11 and 2 occurrences, respectively), *Herzerkrankung* or *Herzkrankheit* (3 and 4 occurrences, respectively), *Herzmuskel* (4 occurrences), *Herzrhythmus* (2 occurrences), and *Herztomografie* (1 occurrence).

For the root *pat(o)-*, the difference is mainly due to the use of the term *patologia* (or *condizioni patologiche*) to translate *condition* and *disease*. Other instances of register mismatch are given by the occurrences of *bronicopneumopatia*, used to translate *pulmonary disease* in the pathonym *bronicopneumopatia cronico ostruttiva* (*chronic obstructive pulmonary disease*). Finally, another instance where the register is raised in Italian is the translation of (*diabetic*) *kidney disease* as *nefropatia (diabetica)*. However, this only occurs twice in full trial titles, while in the rest of the Italian subcorpus the more popular equivalent *malattia renale* is found.

For the root *epat(o)-*, the discrepancy is given by the adjective *epatico*, which is frequently used to translate the English term *liver* in the pathonyms *insufficienza epatica* (7 occurrences)⁴⁴ and *fibrosi epatica* (5 occurrences), or in other noun groups such as *cellula epatica* (1 occurrence), *proteina epatica* (1 occurrence), or *funzionalità epatica* (1 occurrence). In German, these terms are translated

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44 This term occurs one more time in a full trial title as the equivalent of the English term *hepatic impairment*:

En: An open label Phase I study to evaluate the safety, tolerability, pharmacokinetics, and immunogenicity of anetumab ravtansine in subjects with mesothelin-expressing advanced solid cancers and different stages of concurrent hepatic or renal impairment.

It: Studio di fase I in aperto per valutare la sicurezza, la tollerabilità, la farmacocinetica e l'immunogenicità di anetumab ravtansine in soggetti con tumori solidi in stadio avanzato che esprimono mesotelina e concomitante insufficienza epatica o renale in stadi diversi.

with compound nouns that include the determinans *Leber*: *Leberversagen* (6 occurrences), *Leberfibrose* (5 occurrences), *Leberzelle* (2 occurrences), *Leberprotein* (2 occurrences), and *Leberfunktion* (1 occurrence).

Other interesting roots are *mic(o)-*, where the difference is due to the term *infezioni micotiche* (corresponding to *fungal infections* and *Pilzinfektionen* in the other two subcorpora, where the English term is of Latin origin, while the German compound word presents a *determinans* of Germanic origin), and *rin(o)-*, where the difference is caused by the presence of terms like *rinofaringite* and *rinorrea* to translate *nasopharyngitis* and *runny nose*, respectively. The latter also causes the increase in the frequency of the root *-rrea* and leads to a remarkable register mismatch, particularly if it is considered that it is not terminologized. The contexts of use are the following:

En: Allergy symptoms can include headache, sneezing, runny, or stuffy nose, and itchy and watery eyes.

It: I sintomi allergici possono includere: mal di testa, starnuti, congestione nasale o rinorrea, lacrimazione e prurito oculare.

En: These adverse events were: [...] having a runny nose and itchy eyes.

It: Questi eventi avversi erano: [...] rinorrea e prurito oculare.

In another text, *runny nose* is translated as *naso che cola*:

En: Nasal polyps are painless soft growths inside your nose that cause symptoms such as stuffy nose, runny nose, constant need to swallow [post-nasal drip], reduced sense of smell and, less commonly, facial pain.

It: I polipi nasali sono escrescenze molli indolori all'interno del naso che causano sintomi come naso chiuso, naso che cola, costante bisogno di deglutire (gocciolamento post-nasale), ridotto senso dell'olfatto e, meno comunemente, dolore facciale.

In the German subcorpus, there is no register discrepancy compared to the English one, as *runny nose* is always translated as *laufende Nase*.

Another root which, like *mic(o)-*, only occurs in the Italian subcorpus, is *gin-/gine(co)-*. Interestingly, here the discrepancy is not due to differences between term use in the three languages, but to an explicitation:

En: ‘Intrauterine’ means that the contraceptive is in the form of a device that is inserted into the woman’s womb by *her doctor*.

It: ‘Intrauterino’ significa che il contraccettivo è in forma di dispositivo che viene introdotto nell’utero della donna dal *suo ginecologo*.

Among the roots with the most remarkable decrease in German is the root *cardi(o)-/Kardi(o)*. Here, the discrepancy between English and German is due to the translation of the term *cardiovascular*. The Latin/Greek borrowing *kardiovaskulär* is used only 3 times. Of these, 2 occurrences are in a full scientific title:

En: An Open-label, Non-randomized, Phase 1 Study to Evaluate the Effect of (a) Itraconazole or Rifampin on the Pharmacokinetics of a Single Intravenous Dose of Copanlisib and (b) Copanlisib on Cardiovascular Safety in Subjects With Advanced Solid Tumors and Non-Hodgkin’s Lymphoma.

De: Eine offene, nicht-randomisierte Phase-1-Studie zur Untersuchung der Wirkung von (a) Itraconazol oder Rifampin auf die Pharmakokinetik einer intravenösen Einzeldosis Copanlisib und (b) Copanlisib auf die kardiovaskuläre Sicherheit bei Probanden mit fortgeschrittenen soliden Tumoren und Non-Hodgkin-Lymphom.

En: A long term, randomised, double-blind, placebo-controlled study to determine the effect of albiglutide, when added to standard blood glucose lowering therapies, on major cardiovascular events in patients with Type 2 diabetes mellitus.

De: Randomisierte, doppelblinde, placebokontrollierte Langzeitstudie zur Bestimmung der Wirkung von Albiglutid als zusätzliche Gabe zu blutzuckersenkenden Standardtherapien auf wichtige kardiovaskuläre Ereignisse bei Patienten mit Typ 2 Diabetes.

Interestingly, in the short title (lay title) of the latter study *cardiovascular* is translated with the equivalent term of Germanic origin:

En: A study to compare albiglutide with placebo on major cardiovascular problems when added to diabetes treatment.

De: Studie zum Vergleich der Wirkung von Albiglutid auf wichtige Herz-/Kreislaufprobleme, wenn es zusätzlich zu einer Diabetesbehandlung angewendet wird, mit Placebo.

This different translation clearly demonstrates the translator's ability to choose the term of the appropriate register in order to render the content more understandable to non-experts. Finally, the third occurrence of *kardiovaskulär* in the German subcorpus is not in a full scientific title, but in the running text: in this case the term of Latin/Greek origin is maintained because it is then de-terminologized through an explanation between brackets:

En: Patients with type 2 diabetes have an increased chance of getting cardiovascular disease (problems that affect the heart and/or the blood vessels).

De: Patienten mit Diabetes mellitus Typ 2 unterliegen einem erhöhten Risiko für kardiovaskuläre Erkrankungen (Probleme, die das Herz und/oder die Blutgefäße betreffen).

In the rest of the subcorpus, *cardiovascular* is always translated with terms of Germanic origin. So, the collocations *cardiovascular disease*, *cardiovascular problem*, and *cardiovascular death* are translated as *Herz-/Kreislauserkrankung*, *Herz-/Kreislaufproblem*, and *herz-/kreislaufbedingter Tod*.

Another root which clearly shows the difference between German and English is *pneum(o)-*. Here, the decrease in the frequency of the root in German is due to the term *pneumonia*, occurring 13 times in the English subcorpus but translated only 5 times as *Pneumonie* and as *Lungenentzündung* in the other cases. More specifically, the term *Pneumonie* is chosen only if it is accompanied by an explanation, as in "Eine Infektion in den Lungen namens Pneumonie" or "Infektion in der Lunge (Pneumonie)" to translate "An infection in the lungs

called pneumonia” and “Infection in the lungs (pneumonia)”, respectively. In one case, the translator decided to use both terms together, adding *Lungenentzündung* between brackets as an explanation of the less transparent term *Pneumonie*:

En: One patient in Group 5 reported a serious side effect of pneumonia.

De: Ein Patient in der Gruppe 5 meldete die schwerwiegende Nebenwirkung Pneumonie (Lungenentzündung).

Another root which signals the register differences between English, German, and Italian, is *-rrhoe/-rrhö*, with *-* as already mentioned above with respect to the prefix *dia-* – more frequent recourse to the term of Germanic origin (*Durchfall*) rather than of classical matrix (*Diarrhö*).

There are also cases which go against this general trend, i.e., where German presents terms of a higher register. This is shown for instance by the root *-zyt/-cyt*, which has a higher frequency in German than English and even Italian. This increase is due to the terms *Thrombozyt* and *Granulozyt*.

Interestingly, in German *platelet* is translated 3 times as *Thrombozyt*, while *trombocita* never occurs in Italian, as this term is always translated with the less scientific variant *piastrina*. *Thrombozyt* occurs twice as a parenthetical addition following an explanation, i.e., as a second de-terminologization strategy:

En: Abnormal levels of a type of blood cell that helps to clot blood (platelet)

De: Anormale Level einer bestimmten Art von Blutzelle, die bei der Blutgerinnselementstehung hilft (Thrombozyt)

En: Fewer than normal blood cells involved in forming blood clots (platelets)

De: Weniger an der Bildung von Blutgerinnseln beteiligte Blutkörperchen (Thrombozyten) als normal ist

In the third instance (“Niedrigere Anzahl an Thrombozyten im Blut”, to translate “Lower numbers of platelets in the blood”) no explanation is presented; however, the term *Thrombozyt* occurs in the same text, more

specifically in the same table, again as a second de-terminologization strategy. The term *platelet* is translated with the more popular variant *Blutplättchen* in the rest of the subcorpus, thus in 16 cases. This also occurs in another case of de-terminologization, i.e., in:

En: Low level of the pieces of blood cells that help blood to clot – called “platelets”.

De: Niedrige Anzahl der Blutzellen, die die Blutgerinnung unterstützen, sogenannte „Blutplättchen“.

Granulozyt (which is a hypernym and includes *Neutrophile*, *Eosinophile*, *Basophile*, and *Mastozyten*) is used twice with the adjective *neutrophil* as a translation of the English noun *neutrophil*:

En: Decreased levels of neutrophils in the blood

De: Verringertes Niveau der neutrophilen Granulozyten im Blut

En: This participant had a fever with low levels of neutrophils.

De: Dieser Teilnehmer hatte Fieber und eine niedrige Anzahl an neutrophilen Granulozyten.

In the rest of the subcorpus the term *Neutrophil* is preferred (29 occurrences). In Italian only the noun *neutrofilo* is found (31 occurrences).

A second root which goes against the general trend of decrease in German is *erythro-*. This is due to the fact that English tends to use the acronym *ESAs* for the term *erythropoiesis-stimulating agents*, while in German the extended form *Erythropoese-stimulierende Substanzen* (less often *Erythropoese-stimulierende Mittel* or *Erythropoese-stimulierende Agenzien*) is favored. These terms are sometimes accompanied by the acronym *ESA* and by the anglicism *erythropoiesis-stimulating agents* as a parenthetical construction. The acronym *ESA* is used without its extended form in the German subcorpus only when it occurs along with the term *Behandlung*, in *ESA-Behandlung* (12 occurrences), as a translation of *ESA treatment*.

Another root going against the general trend, thus showing an increase in German compared to English and also Italian, is *my(o)-*. This is due to the aforementioned use of *Myom* to translate *fibroid*.

3.3.3 Analysis of verbs signaling explanations, definitions, and other glosses

While analyzing the morphemes of classical matrix in Section 3.3.2, some definitions and explanations have already been reported, as they play a major role in de-terminologizing complex terms (especially those of classical origin). In the present subchapter the aspect of explanations, definitions, as well as glosses with synonyms and hypernyms will be looked at in closer detail.

3.3.3.1 Explanations, definitions, and other glosses in the STs

As mentioned in Section 3.2, in this analysis section we will focus on the verbs *mean*, *call*, *know* (as a past participle), *define*, *describe*, *denominate*, *refer*, *be*, and *consist in/of* in order to detect definitions, explanations, and other glosses with synonyms and hypernyms.

For the verb *mean*, 98 occurrences with these functions were detected in anaphoric explanations, with the technical term preceding its definition. Some instances are:

Autoimmune means the body's immune system (its natural defense system against illness and infection) attacks healthy cells in the body by mistake.

The medicine was given as a subcutaneous injection, which means that it was delivered through an injection just under the skin.

"Stable" in this trial meant that the participants' vision stayed the same and did not get weaker or stronger.

Part 3 of the study was open-label, meaning that both the participants and the study doctors involved in the study knew that all participants were given gantenerumab in this part of the study.

In most cases the verb *mean* is introduced by the pronoun *this* (77 occurrences). Most explanations introduced by this construction refer to trial types. Some instances are the following:

This was a “double-blind” trial. This means none of the participants, doctors, or other trial staff knew what treatment each participant took. This was a “single blind” trial. This means the doctors and other trial staff knew what treatment each participant received, but the participants did not.

This was also a “dose escalation” trial. This means that a group of participants started out taking a low dose of BAY 1217389. The doctors looked at the results for these participants. Then, the researchers decided whether to increase the dose in the next group of participants. Part 2 of this trial was done as a “dose expansion”. This means that a larger group of participants with specific types of advanced cancer received the highest dose found to be safe in Part 1. The doctors looked at the results for the first group of participants in Part 2. Then, the researchers decided whether to give other doses.

The study was “randomized”. This means that it was decided by chance which of the medicines people in the study would be given – like tossing a coin.

Trial phases are also explained through this construction, as in:

This study is a “Phase 3” study. This means that atezolizumab had been tested in a smaller number of people with non-small cell lung cancer before this study.

This study was a “Phase 4” study. This means that the study was done after vemurafenib had been approved for doctors to give to patients.

This study was a “Phase 3b/4” study. This means that the study was done after bevacizumab had been approved for doctors to give to people.

Interestingly, the latter instance is followed by three more explanations with the same construction in the respective layperson summary, i.e.,

This study was “single arm”. This means that everyone in this study was treated with bevacizumab (alone or in combination with other drugs). This study was “open label”. This means that both the people taking part in the study and the study doctors knew what study medicines people were taking.

This study was an “extension study”. This means that people who had previously taken part in a study of bevacizumab kept taking bevacizumab after the previous study (“parent study”) had ended.

This structure, with separated sentences and a series of explanations introduced by the pronoun *this*, almost tends towards Easy Language.

Also statistical terms (which, according to the guidelines, should be avoided in the layperson summaries) are explained with the construction *this means*, as in

The differences in average FEV1 between umeclidinium and vilanterol combination group and the other two treatment groups were statistically significant. This means that the difference was not likely due to chance alone.

In addition, in only one definition the pronoun *this* was replaced by *that*:

This study was a type of study called an extension study. That means people had taken bevacizumab (alone or in combination with other medicines) in an earlier study and benefitted from taking it.

For the verb *call* (which introduces cataphoric indications) we will start with the copula BE + PAST PARTICIPLE, which occurs 151 times⁴⁵ in the subcorpus.⁴⁶

.....
45 The occurrences were 152, but one was labelled as “noise” and excluded:

If the participants decided to join another trial where they were contacted about their medical problems for a long time, they did not need to visit or be called by their trial site.

46 14 instances are preceded by the pronoun *this*.

The construction was often used to explain the concept of “double-blind” as well as the two noun phrases *adverse events* (37 occurrences plus one with the specification “of special interest”) and *adverse reactions* (59 occurrences), in sentences such as

Neither patients nor study doctors knew who was receiving which study medicine. This is called a double-blind study.

This section is a summary of the medical problems the participants had during the trial. These medical problems are called “adverse events”.

This section is a summary of the adverse events that the doctors thought may be related to the treatments. These events are called “adverse reactions”.

253 instances of *called* used as a postnominal attribute were found. In many cases, the participle follows a hypernym and precedes the corresponding hyponym, as in “a condition called ‘hand-foot skin reaction’”, “a protein called ‘clotting factor 8’”, “a man-made hormone called levonorgestrel”, “white blood cells called lymphocytes”, or “the genes called EGFR or ALK”. In other cases, the participle follows a holonym and precedes the corresponding meronym, as in “a part of the eye called the cornea”. In many other sentences, the verb *called* is preceded by a concise definition, as in “a type of lymphoma called follicular lymphoma, or FL”, “a specific type of skin cancer called BRAFV600 mutation-positive melanoma”, and “a type of leukaemia called chronic lymphocytic leukaemia or CLL”.

72 occurrences of the participial construction *also called* were found. While *called* tendentially signals a relation between an explanation and the term in question, *also called* signals mainly a relation between denominations. Some instances are the following:

All the participants in this trial received damoctocog through a needle put into their vein, also called an intravenous infusion.

Condition where part of the bowel pushes through the stomach muscles, also called a hernia.

In both parts, all of the participants received aflibercept through a needle put into their eye, also called an eye injection.

The trial treatment, befovacimab, is given through a needle put under the skin, also called an injection.

In many cases, this construction was found together with drug names, as in

Thank you to the participants who took part in the clinical trial for regorafenib, also called BAY 73-4506 and Stivarga®.

Thank you to the participants who took part in the clinical trial for nifurtimox, also called BAYA2502 and LAMPIT.

The construction *also called* is also frequently used to introduce initialisms, acronyms (10 occurrences altogether), or abbreviations of units of measurement (12 occurrences). Some instances with respect to initialisms and acronyms are the following:

They studied the size of the tumors using a measurement called the Response Evaluation Criteria in Solid Tumors, also called RECIST.

The researchers asked for the help of men and women who needed pictures of their brain taken using magnetic resonance imaging, also called MRI.

To learn about the risk of harm, trial doctors kept track of dose limiting toxicities, also called DLTs.

Some examples involving abbreviations of units of measurement are:

The level of nifurtimox was measured in hours multiplied by micrograms per liter, also called h•µg/L.

The level was measured in hours multiplied by international units per deciliter, also called h•IU/dL.

This writing choice is, however, not optimal, as abbreviations of units of measurement are usually put between brackets.

The participial construction *also called* was also sometimes used to introduce synonyms of terms, which may belong approximately to the same register, like in the former case, or be a more popular variant of the actual technical term, like in the second instance:

A bleeding event, also called “a bleed”, is any time when a participant experienced bleeding. Current treatments for nasal polyps include corticosteroid nasal sprays, also called nasal steroid sprays.
Diuretics, also called water pills, help increase the body’s urine amount.

Another construction that was searched for in the corpus, as it had turned out to be quite frequent in other similar texts (cf. Pedrini 2022b: 198), was “doctors/researchers call this/these + technical term”.⁴⁷ However, no occurrences were detected here.

For the verb *know* (which, like *call*, introduces cataphoric indications), we will start with the construction BE + PAST PARTICIPLE + AS, for which 41 occurrences were detected. Some instances are:

The researchers kept track of all the medical problems the participants had during the trial. These are known as “adverse events”.
When the study first opened, the treatment groups were decided by chance using a computer. This selection process is known as “randomisation”.

Known as is found 8 times in the corpus, as in

The vaccine also contained an ingredient known as an adjuvant.
B cells (a type of white blood cell known as a lymphocyte that helps fight infections)

.....
47 Such constructions are discussed by Niederhauser (1999: 145) among linguistics resources and formulations which serve to draw the readers’ attention to technical terms and highlight their nature of technicisms. He mentions the following instances: “unter Fachleuten [...] heißen”, “in der Fachsprache zu [...] gehören”, “Physiker [or any other scientists] sprechen von [...]”, “Fachleute bezeichnen dies als [...]”, and “Fachleute nennen dies [...]”.

When abnormal B cells build up in the lymph nodes (pea-sized glands found throughout the body) or other body organs, they form a lump known as a lymphoma.

They help the body make defences, known as antibodies, against those bacteria.

“Nasopharyngitis” is a swelling in the passages of the nose and throat – commonly known as a “cold”.

104 occurrences of the participial phrase *also known as* were detected. Some instances of definitions followed by this construction are:

The researchers studied how the tumors were affected after taking the treatment, also known as “tumor responses”.

Group 2 received damoctocog only when needed for the treatment of bleeds, also known as on-demand treatment.

As noted with respect to the participial construction *also called, also known as* was sometimes used to list more understandable synonyms of a technical term, as in “allergic rhinitis, also known as nasal allergies or allergies”, “Intravitreal aflibercept, also known as aflibercept eye injections”, and “Treatments to prevent pregnancy are called contraceptives, also known as birth control”.

Again, as occurs with the participial phrase *also called*, this construction often introduces initialisms, acronyms (24 occurrences altogether), or abbreviations of units of measurement (39 occurrences). Some instances of the introduction of initialisms and acronyms are “macular edema related to central retinal vein occlusion, also known as CRVO”, “a type of imaging scan called multiple-gated acquisition, also known as MUGA”, “heart failure and preserved ejection fraction, also known as HFpEF”, or “‘erythropoiesis-stimulating agents’, also known as ESAs”. Some examples of the use of *also called* before abbreviations of units of measurement (which, as mentioned above, are not very idiomatic) are:

The doses of radium-223 were measured in kiloBecquerels per kilogram of body weight, also known as kBq/kg.

The doses of darbepoetin alfa were measured in micrograms, also known as µg.

The assumed distinction between *called* and *also called* also applies to *known as* and *also known as*, with *known as* tendentially signaling a relation between an explanation and the term in question and *also called* signaling mainly a relation between denominations (such as synonyms, acronyms, abbreviations, and initialisms).

The verb *define* occurs only 6 times in the corpus, and none of these cases provides an actual explanation. In 2 cases, the meaning is ‘to establish/to diagnose’, as in: “Exacerbation was defined by the study doctor”. In the other 4 cases, *define* describes the illness severity according to a certain scale: “Low axSpA symptoms was defined as a score of less than 4”.

The verb *denominate* does not occur at all in the corpus. As for the verb *describe*, it is used mainly in intertextual references and metadiscourse, as occurs in the following sentences:

The chart below describes the different measurements and results.

These side effects are described in section 5.

More information about what happened in the study is described below.

In one instance it introduces an anaphoric definition:

People with the type of NSCLC called “squamous” usually take medicine called chemotherapy that kills cancer cells or stops the cancer cells from growing. The word “squamous” [sic] describes the type of lung cells affected by cancer – squamous cell cancers are usually found in the centre of the lung.

The verb *refer* is sometimes (13 times) used both anaphorically and cataphorically to explain the terminology that will occur in the layperson summary, as in

Damoctocog alpha pegol will be referred to as damoctocog in this document.

People with melanoma and V600 mutations in the BRAF gene are referred to here as having BRAF mutation-positive melanoma.

In this document, radium-223 dichloride will be referred to as radium-223.

In this summary, “side effects” refer to those events that the study doctor thinks may have been caused by the study medicine.

Here, *side effects* actually means ‘adverse reactions’; this explanation occurs 9 times in similar sentences.

In one instance a technical term is provided through the cataphoric construction “researchers/doctors refer to ... as + term”:

The type of chemotherapy given in this study was a combination of four different medicines. These medicines were cyclophosphamide, doxorubicin, vincristine, and prednisone. Researchers and doctors sometimes refer to this combination as “CHOP”.

As might be expected, the verb *be* – linked to anaphoric indications – was extremely frequently used to introduce definitions. For the construction BE + A/AN + NOUN, 106 occurrences involving definitions, explanations, and other glosses were found, such as:

Squamous cells are a type of lung cell that is affected by cancer.

Pleural mesothelioma is a type of a cancer that affects the lining of the lungs.

A “urinary tract infection”, or UTI, is an infection that affects the kidney, bladder or the tubes in which participants pass water from the body.

Hemoglobin is a protein that carries oxygen and can be found in red blood cells.

Nasal polyposis (polyps) is a condition in which the inner lining of the nose develops nasal polyps.

An arteriovenous fistula is an abnormal connection between an artery and a vein.

21 occurrences of the construction BE + THE + NOUN introducing a definition were detected. Some examples are the following:

The researchers also studied “overall survival”, which was the amount of time the participants lived during the trial.

The cornea is the clear outer layer at the front of the eye.

The researchers also studied “time to worsening of symptoms”, which was the amount of time before the participants’ mesothelioma symptoms got worse.

A median is the middle number in a set of numbers.

The two types of ARIA are ARIA-E, which is the build-up of fluid in the brain, and ARIA-H, which is small bleeding in the brain.

The retina is the very back part of the eye.

In addition to these results, 42 occurrences of BE + NOUN (not introduced by an article) were found, as in the following examples:

[...] tumors in the gastrointestinal tract. This is part of the digestive system and includes the stomach and the intestines.

Infusion site extravasation, which is leakage of what is in the IV needle into the tissue around the injection site.

Uterine fibroids are growths that are not cancerous that develop in or around the uterus.

SSEs are also called symptomatic skeletal events. These are symptoms that are related to the bone, including breaks in the bone and pain.

NSAIDs, such as ibuprofen and aspirin, are medicines that can lower pain and inflammation.

Finally, no instances of the verb *consist* were found.

3.3.3.2 Translations of the explanations, definitions, and glosses

It was also deemed of interest to analyze the translations of the English constructions signaling definitions, explanations, and other glosses (detected in Section 3.3.3.1). The main outcome is that they are maintained in almost all cases both in German and Italian.

For the verb *mean*, almost all translations include the verbs *bedeuten* and *significare*. *This means* is translated mainly as *das bedeutet* and *questo significa*; in 7 cases it was rendered as *dies bedeutet* and in 4 as *ciò significa*. Other German translations involve *das heißt* (1 occurrence), *d.h.* (1 occurrence), and two reformulations, which are listed here:

En: Most side effects were mild or moderate (such as headache or dizziness) meaning that they were easy to treat if necessary, and participants recovered.

De: Die meisten Nebenwirkungen waren leicht oder mäßig (z.B. Kopfschmerzen oder Schwindelgefühl), *sodass* sie bei Bedarf leicht zu behandeln waren und sich die Teilnehmenden erholten.

En: Gantenerumab is a type of monoclonal antibody, meaning that it is a kind of medicine that helps the immune system to specifically recognise the harmful amyloid protein that is linked to Alzheimer's disease.

De: Gantenerumab ist eine Art monoklonaler Antikörper. *Das ist* ein Medikament, das dem Immunsystem hilft, das schädliche Amyloid-Protein, das mit Alzheimer in Verbindung gebracht wird, gezielt zu erkennen.

Other Italian translations involve *indicare* (8 occurrences), *ossia* (4 occurrences), *ovvero* (1 occurrence), *per ... s'intende* (1 occurrence), and *nel quale cioè* (1 occurrence).

As for the verb *call*, the construction BE + PAST PARTICIPLE is rendered mainly as *genannt werden* and *essere/venire chiamato*. Other German variants are *bezeichnet werden* (31 occurrences), *man nennt* (7 occurrences), and *man spricht von* (1 occurrence). Italian shows more variation, having variants like *essere detto* (10 occurrences), *essere definito* (5 occurrences), *venire indicato*

come (2 occurrences), *essere* (2 occurrences), *ossia* (1 occurrence), *si chiama* (1 occurrence), *si definisce* (1 occurrence), and *si parla di* (1 occurrence). In 3 cases the construction BE + PAST PARTICIPLE is rendered as a postnominal attribute:

En: The immune system releases many chemicals, one of which is called histamine.

It: Il sistema immunitario rilascia numerose sostanze chimiche, tra cui una chiamata istamina.

En: The antibody in anetumab ravtansine is able to find and attach to a certain protein. This protein is called mesothelin.

It: L'anticorpo contenuto in anetumab ravtansine è in grado di individuare e legarsi a una determinata proteina chiamata mesotelina.

In the latter instance (which occurs twice in the corpus) the two English sentences are rendered as one sentence in the TT, and the repetition of *protein* is left out.

The bare passive form *called* was translated mainly as *namens* and *chiamato*. Other German translations are *sogenannt* (19 occurrences), *als ... bezeichnet* (12 occurrences), relative clauses entailing *als ... bezeichnet werden* (14 occurrences) or *genannt werden* (7 occurrences), *genannt* (7 occurrences), *mit der Bezeichnung* (4 occurrences), *also* (1 occurrence), *bedeutet* (1 occurrence), *mit Namen* (1 occurrence). In 10 cases, the participial construction was replaced by an apposition, as occurs in:

En: Two bacteria, called *Haemophilus influenzae* and *Moraxella catarrhalis* [sic] are commonly found in the lungs of COPD patients and can cause exacerbation.

De: In der Lunge von COPD-Patienten finden sich häufig zwei Bakterien, *Haemophilus influenzae* und *Moraxella catarrhalis*, die Exazerbationen verursachen können.

En: The researchers in this trial also wanted to find out how many participants had any medical problems caused by the IV infusion or medical problems that affect a part of the eye called the cornea.

De: Die Wissenschaftler in dieser klinischen Prüfung wollten auch herausfinden, wie viele Teilnehmer medizinische Probleme hatten, die durch die Infusion verursacht wurden, oder medizinische Probleme, die einen Teil des Auges, die Hornhaut, betreffen.

En: In people with type 2 diabetes, the body does not make enough of a hormone called insulin or does not use insulin well.

De: Bei Menschen mit Typ-2-Diabetes stellt der Körper nicht genug des Hormons Insulin her oder nutzt Insulin nicht gut.

In 6 cases, the participial construction was translated with recourse to constructions entailing *bestimmt*, as in:

En: Venetoclax (ven-et-oh-klaks') is a medicine used as part of the treatment for a type of leukaemia called chronic lymphocytic leukaemia or CLL.

De: Venetoclax⁴⁸ ist ein Medikament, das als Teil der Behandlung einer bestimmten Art von Leukämie, der chronischen lymphatischen Leukämie (CLL), eingesetzt wird.

En: To find this out, the trial staff looked at the levels of a protein in the blood called alanine aminotransferase (ALT).

De: Zu diesem Zweck wurde der Gehalt eines bestimmten Proteins im Blut untersucht: Alanin-Aminotransferase (ALT).

This translation choice is interesting, since it highlights the hyponymic relationship between the two concepts in question.

In one case, the participial construction was replaced by a parenthetical construction:

.....

- 48 In this translation, the intuitive phonetic transcription of the commercial name of the drug is omitted in German. This is quite interesting since such transcriptions may create acceptability issues in texts, as they sound quite childish and patronizing (cf. Maaß 2020: 97). Unlike in German, it is maintained in Italian:

Venetoclax (ven-et-o klaks') è un medicinale utilizzato nell'ambito del trattamento di un tipo di leucemia denominato leucemia linfatica cronica (LLC).

En: 1 patient died of a blood infection called pseudomonal sepsis.

De: 1 Patient starb an einer Blutinfektion (Pseudomonas-Sepsis).

Finally, in 2 cases the participial construction was left out, i.e., in:

En: Condition called “hand-foot skin reaction” that can cause redness, pain, and swelling of the skin on the hands and feet.

De: „Hand-Fuß-Syndrom“, die Rötung, Schmerzen und Hautschwellungen an Händen und Füßen verursachen kann.

En: In 2011, a study called BRIM-3 showed that [...]

De: 2011 wurde in der BRIM-3-Studie gezeigt, dass [...]

Other Italian translations are *denominato* (15 occurrences), *detto* (5 occurrences), *definito* (3 occurrences), *costituito da* (2 occurrences), *ovvero* (2 occurrences), and *cosiddetto* (1 occurrence). In 4 cases, the bare passive construction was omitted, as in:

En: The plaques may be covered with silvery white buildup called scales, and may itch or feel sore.

It: Le placche possono essere ricoperte da un accumulo di “squame” bianco-argentate e provocare prurito o dolore.

This translation is interesting, as inverted commas were added in the TT. *Scales* (like *squame* and *Schuppen*) is a technical term referred to the cutaneous manifestation of psoriasis. Here, a possible interpretation is that the translator deemed the term informal and metaphorical in Italian to non-expert readers. As a matter of fact, inverted commas frequently⁴⁹ accompany technical terms to better signal them and draw readers’ attention to them (cf. Niederhauser 1999: 145), but they are otherwise rarely added *ex novo* in the TTs.

.....

49 See, for instance:

En: These medical problems are called “adverse events”.

De: Diese medizinischen Probleme werden „unerwünschte Ereignisse“ genannt.

It: Questi problemi medici vengono chiamati “eventi avversi”. ►

The participial construction *also called* was translated mainly as *auch genannt* and *noto anche come*. Other German translations are *sogenannt* (4 occurrences), *auch als ... bezeichnet* (3 occurrences), *das auch als ... bezeichnet wird* (1 occurrence), *was als ... bekannt ist* (1 occurrence), and *... abgekürzt* (1 occurrence to introduce an initialism). Furthermore, in 6 cases the technical term or expression (more specifically, in 2 cases acronyms and initialisms, in another case the abbreviation of a unit of measurement) was added as a parenthetical construction, as in

En: Diffuse large B-cell lymphoma, also called DLBCL, is a type of blood cancer.

De: Das diffuse großzellige B-Zell-Lymphom (DLBCL) ist eine Art von Blutkrebs.

In one case, the participial construction was left out in German:

En: Thank you to the participants who took part in the clinical trial for molidustat, also called BAY 85-3934.

De: Wir danken den Teilnehmern, die an der klinischen Prüfung mit BAY85-3934 teilgenommen haben.

Here, the drug name is mentioned in other parts of the German text, but making it clear that it is the same drug (as occurs in English) is a good strategy. Other Italian translations are *detto* (11 occurrences), *ossia* (7 occurrences),

En: This was an “open-label” trial.

De: Bei dieser klinischen Prüfung handelte es sich um eine „offene“ klinische Prüfung.

It: Questo studio è stato di tipo “in aperto”.

En: In people with hemophilia A, the body does not create enough of a protein called “clotting factor 8” in the blood.

It: Nelle persone affette da emofilia A, l'organismo non produce in quantità sufficiente una proteina del sangue chiamata “fattore ottavo della coagulazione”.

De: Bei Menschen mit Hämophilie A produziert der Körper nicht genügend eines im Blut vorkommenden Proteins namens „Blutgerinnungsfaktor 8“.

chiamato anche (4 occurrences), *denominato anche* (2 occurrences), and *altresì definito con l'acronimo* (1 occurrence). In 16 cases (among which 12 were abbreviations of units of measurement) there were just more usual parenthetical constructions, as in

En: The level was measured in nanograms per liter, also called ng/L.

It: Il livello è stato misurato in nanogrammi per litro (ng/L).

As for the verb *know*, the construction BE + PAST PARTICIPLE + AS was rendered mainly as *als ... bezeichnet werden* and *essere noto come*. In addition, 3 cases in German are rendered as *als ... bekannt sein*, while 2 cases in Italian are translated as *essere/venire chiamato*.

The participle *known* used as a bare passive is translated with several strategies in German. It is rendered 3 times as *als ... bezeichnet werden*, twice as *sogenannt*, once as a *Linksattribut* entailing the verb *bezeichnen*, once as an apposition and once as a noun phrase following a colon. In Italian it was translated as *noto come*, and only once as *indicato come*.

The participial construction *also known as* is translated mainly as *auch genannt* and *noto anche come*. Other German translations are *auch bekannt als/unter dem Namen* (18 occurrences), *auch als ... bezeichnet* (8 occurrences), *sogenannt* (2 occurrences), and *kurz* (2 occurrences to introduce initialisms). In 11 instances the technical term or abbreviation/initialism/acronym was added as a parenthetical construction, as in

En: To answer this question, the doctors took pictures of the participants' tumors using either a computed tomography scan, also known as a CT scan, or a magnetic resonance imaging scan, also known as an MRI scan.

De: Um diese Frage zu beantworten, machten die Prüfürzte mithilfe von Computertomografie (CT) oder Magnetresonanztomografie (MRT) Aufnahmen von den Tumoren der Teilnehmer.

In 3 cases, the participial construction was left out in German, as occurs in “BAF312, also known as Siponimod” rendered just as “BAF312”, and in the following sentences:

En: The researchers asked for the help of men and women with renal cell cancer, also known as RCC.

De: Männer und Frauen mit Nierenzellkrebs haben an dieser klinischen Prüfung teilgenommen.

En: Researchers are looking for a better way to treat hepatocellular carcinoma, also known as HCC.

De: Wissenschaftler suchen nach einem besseren Weg zur Behandlung von Leberzellkarzinomen.

Other Italian translations are *vale a dire* (4 occurrences), *detto anche* (2 occurrences), and *ossia* (1 occurrence). An interesting aspect here is that, of the 39 English participial constructions introducing abbreviations of units of measurement, 38 were translated as parenthetical constructions (which is more common than the ST formulation), as in:

En: This was measured in micrometers, also known as μm .

It: Questo è stato misurato in micrometri (μm).

In the other case there is an explicitation (a repetition, considering the following sentences in both languages):

En: The doses of radium-223 were measured in kiloBecquerels per kilogram of body weight, also known as kBq/kg. A kBq is a common measurement of radioactivity.

It: Le dosi di radio-223 sono state calcolate in kiloBecquerel per chilogrammo di peso corporeo, *unità di misura* nota anche come kBq/kg. Un kBq è un'unità di misura standard dell'attività di un radionuclide.

The verb *refer* is translated mainly as *sich auf ... beziehen* and *intendere*, as in:

En: In this summary, “side effects” refer to those events that the study doctor thinks may have been caused by the study medicine.

De: In dieser Zusammenfassung bezieht sich der Begriff „Nebenwirkungen“ auf diejenigen Ereignisse, die nach Meinung des Studienarztes auf das Prüfpräparat zurückzuführen sein könnten.

It: In questa sintesi, con “effetti indesiderati” si intendono gli eventi che il medico dello studio ritiene possano essere stati causati dal farmaco dello studio.

Other German translations are *als... bezeichnet werden* (2 occurrences), *als... bezeichnen* (1 occurrence), and *genannt werden* (1 occurrence), while Italian shows more variation, with translations like *riferirsi* (2 occurrences), *venire indicato* (1 occurrence), *essere denominato* (1 occurrence), *essere definito come* (1 occurrence), and *chiamare* (1 occurrence). The verb *describe* is translated as *bezeichnen* and *descrivere*.

The verb *be* is translated mainly with the equivalents *sein* and *essere*. Other German translations are *bei ... handelt es sich um/dabei handelt es sich um* (6 occurrences), *also* (2 occurrences), *d.h.* (2 occurrences), *gehören zu* (2 occurrences), and *was ... entsprach* (1 occurrence). In one case, the TT segment was made more concise than the corresponding ST segment through an apposition:

En: Fevipiprant was an investigational drug that was being studied for the treatment of nasal polyps.

De: Fevipiprant, ein Studienmedikament, das zur Behandlung von Nasenpolypen untersucht wurde.

In 4 instances, the German TT was reformulated, as in:

En: EMA401 is a drug that researchers had suspected may be able treat neuropathic pain.

De: Mit dem Medikament EMA401 sollen neuropathische Schmerzen behandelt werden.

En: Itraconazole is a medicine already available for doctors to prescribe for fungal infections.

De: Itraconazol steht Ärzten bereits zur Verschreibung gegen Pilzinfektionen zur Verfügung.

Other Italian translations are *far parte di* (31 occurrences), *ossia* (4 occurrences), *consistere in* (3 occurrences), *riguardare* (1 occurrence), *l'acronimo ... definisce* (1 occurrence), and *per ... s'intende* (1 occurrence). Two instances of reformulation in Italian are:

En: One medication that is available for doctors to prescribe is metformin. This is a treatment that helps slow down sugar creation in the body.

It: Uno dei medicinali prescrivibili dai medici è la metformina. Questo trattamento favorisce il rallentamento della produzione di zuccheri nell'organismo.

En: EMA401 is a drug that researchers had suspected may be able treat neuropathic pain.

It: I ricercatori avevano ipotizzato che il farmaco EMA401 potesse trattare il dolore neuropatico.

An interesting aspect is that very idiomatic constructions in the TLs (like *dabei handelt es sich um [...]*) are very rare. This could be due to interference of the SL constructions.

3.4 Discussion

With respect to word frequency, the English subcorpus has the highest number of lemmas indicated in the frequency dictionary (355), while this number decreases in the translated subcorpora (330 lemmas in the German subcorpus and 338 in the Italian subcorpus). Among the 100 most frequent lemmas of each PoS category were also technical terms, which, unsurprisingly, are not recorded in the frequency dictionaries. This occurred with nouns such as

chemotherapy, placebo, hemoglobin, hemophilia, and anemia. Some instances of technical terms found among the 100 most frequent adjectives are *adverse* (as in *adverse events* or *adverse reactions*), *open-label*, *platinum-based*, *double-blind*, *uterine*, *macular*, *cardiovascular*, and *squamous*. Verbs and adverbs, as might be expected, present less instances of such technical terms, like *randomize* and *intramuscularly*.

An acronym, *MRI*, is also found among the most frequent English lemmas. Other abbreviations are among the most frequent German lemmas, i.e., *ca.* and *ggf.*

Overall, the morphemes of classical matrix in the English subcorpus are 2,485. This number decreases in the German subcorpus (2,149 morphemes), while it increases in the Italian subcorpus (3,294 morphemes). While in German a term of Germanic origin is often favored (as in *Durchfall* in lieu of *Diarrhö*), in Italian the register is frequently raised when choosing the translation of a technical term (as in *epistassi* and *rinorrea* as translations of *nosebleed* and *runny nose*, which are rendered as *Nasenbluten* and *laufende Nase* in German). It is also interesting to note that, beside these discrepancies in register due to the different origin of the terms, there are cases where Italian resorts to so-called “collateral technical terms” (*tecnicismi collaterali*). This concept is more known in Italian linguistics and terminology:⁵⁰ it has been introduced by Serianni in 1985 and defined as stereotypical expressions, not necessary for denotative reasons, but preferred in light of their technical connotation (ibid.: 270). Some instances are given by the expressions *affetto da* (377 occurrences), *a carico di* (3 occurrences), and *accusare* (1 occurrence), often used as translations of simpler forms such as *with* (followed by the pathology), *that affect*, and *have*. Some examples in the subcorpus are the following:

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50 It is indeed not easy to find this concept in English literature. Some occurrences of the abovementioned translation *collateral technical terms* (or also *collateral terms*) were found in the English abstracts of an Italian monography and an article about this topic (Puato 2008, 2020).

En: The results from this trial helped researchers learn more about how damoctocog worked and how safe it was in participants with severe hemophilia A.

It: I risultati di questo studio hanno aiutato i ricercatori ad approfondire l'efficacia e la sicurezza di damoctocog su partecipanti affetti da emofilia A grave.

En: It can also cause serious conditions that affect the heart and blood vessels, like heart attacks, heart failure, and strokes.

It: Ciò può causare anche gravi patologie a carico del cuore e dei vasi sanguigni, come attacchi cardiaci, insufficienza cardiaca e ictus.

En: People with allergies can also have an itchy throat or ears, coughing, difficulty breathing, and mucus that drains from the nose into the throat.

It: Le persone affette da allergie possono anche accusare: prurito alla gola o alle orecchie, tosse, difficoltà respiratorie e secrezioni che defluiscono dalle cavità nasali alla gola.

The register discrepancy between English and Italian, therefore, does not concern only technical terms. One instance of remarkable raise in register, which is not compatible with the Plain Language variant, is the use of *coloro* (47 occurrences) in sentences like:

En: Thank you to the participants who took part in the clinical trial for [...] ⁵¹

It: Grazie a coloro che hanno partecipato allo studio clinico su [...]

En: If you have questions about your own treatment: [...]

It: Coloro che hanno domande in merito al trattamento assunto possono: [...]

In the latter sentence, the register mismatch is even more clear. This example is also interesting since there is a shift in the way readers are addressed. In the English ST, they are addressed directly, while in the Italian TT an impersonal construction is favored. The former strategy is the one which should be

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51 This instance, along with the corresponding TT segment, occurs 28 times in the corpus.

preferred in text simplification (cf. Bredel & Maaß 2016a: 506–507; Cutts 2020: 48), as it has the highest action-enabling potential (cf. for instance Maaß 2020: 94). Another instance is the use of *presente* (124 occurrences with this meaning) to translate *this*, as in:

En: This document provides a short summary of this study for a general audience.

It: Il presente documento contiene una breve sintesi dello studio rivolta a un pubblico generico.

Another similar example, where *in this document* is translated as *ai fini di questo documento*, is provided by the following sentence:

En: This is a summary of the results of a clinical trial (called a “study” in this document) – written for: [...]

It: Il presente riassunto dei risultati di una sperimentazione clinica (chiamata, ai fini di questo documento, “studio”) è stato redatto per [...]

Here, other elements contributing to a raised register in Italian are the aforementioned use of the adjective *presente* and the choice of the verb *redigere* to translate *write*. *This* is also often translated as *tale* (66 occurrences), as in:

En: This signal is a protein called BCL-2, which builds up in patients with CLL and is already an approved treatment for these patients.

It: Tale segnale è una proteina chiamata BCL-2, la quale si accumula nei pazienti affetti da LLC.

This sentence also shows another interesting choice of the translator, the use of the construction ARTICLE + *QUALE* (3 occurrences), which has a far higher register than the more neutral variant *che*, usually used to introduce relative clauses. Another example (listed in Section 3.3.3.2) is the translation of *also* as *altresì*:

En: In this trial, these symptoms are called symptomatic skeletal events, also called SSEs.

It: In questo studio i sintomi sono chiamati Eventi Scheletrici, Sintomatici altresì definiti con l'acronimo EES.

Another phenomenon that shows that the register is frequently raised in Italian is the recourse to verbal forms with pronominal enclisis, as occurs with *verificat*si* (299 occurrences) and *trattasi* (1 occurrence). Some instances are:

En: These are symptoms that are related to the bone, including breaks in the bone and pain.

It: Trattasi di sintomi correlati alle ossa, tra cui, in particolare, fratture e la comparsa di dolore.

En: High blood pressure happened in 53.1% of participants. This was 26 out of 49 participants.

It: Pressione sanguigna alta verificatasi nel 53,1% dei partecipanti, ossia in 26 partecipanti su 49.

Other examples related to verbs are the translation of *believe* as *ritenere* (9 occurrences) and *help* as *favorire* (20 occurrences) or *promuovere* (1 occurrence). An instance of the former is:

En: Researchers believe it was due to a non-trial pain medicine that the participant took.

It: I ricercatori ritengono che fosse dovuto ad un antidolorifico esterno allo studio assunto dal partecipante.

Two examples with the verb *help* are:

En: The trial drug, copanlisib, works by stopping certain proteins in the organs and the blood from helping cancer cells grow and spread.

It: Il farmaco dello studio, copanlisib, agisce impedendo a determinate proteine negli organi e nel sangue di favorire la proliferazione e la diffusione di cellule tumorali.

En: A protein called vascular endothelial growth factor helps the growth of new blood vessels.

It: Una proteina chiamata fattore di crescita endoteliale vascolare promuove la crescita di nuovi vasi sanguigni.

In some cases, the register is raised also in German. For instance, *how* was translated as *inwiefern* 73 times. Some examples are:

En: How has this trial helped patients and researchers?⁵²

De: Inwiefern hat diese klinische Prüfung Patienten und Wissenschaftlern geholfen?

En: The researchers studied how the participants' tumors changed or did not change after taking rogaratinib.

De: Die Wissenschaftler analysierten, inwiefern sich die Tumore der Teilnehmer nach der Einnahme von Rogaratinib veränderten bzw. nicht veränderten.

This translation choice, however, is justified by semantic reasons and also sounds more idiomatic in the TT in the instances cited above.

Another example is the adjective *vorliegend*, which is sometimes used to translate *this* and corresponds to the abovementioned *presente* in Italian. Some examples are:

En: This summary is based on that report.

De: Die vorliegende Zusammenfassung basiert auf diesem Bericht.

En: Please remember, this summary only shows the results of one clinical trial.

De: Bitte bedenken Sie, dass die vorliegende Zusammenfassung sich nur auf die Ergebnisse einer einzelnen klinischen Studie bezieht.

This German adjective, however, occurs only 20 times highlighting a strong difference in register with Italian, where the equivalent adjective occurs

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52 This instance, along with the corresponding TT segment, occurs 41 times in the corpus.

124 times. Another instance is given by recourse to the pronoun *dies*, of a higher register than the equivalent *das*, occurring 631 times, as in:

En: This helped make sure the treatments were chosen fairly and comparing the results of the treatments was as accurate as possible.

De: Dies gewährleistete eine unvoreingenommene Auswahl der Behandlungen und ermöglichte den Wissenschaftlern, die Ergebnisse der Behandlungen so genau wie möglich miteinander zu vergleichen.

Italian also has two options in this case: *ciò* and *questo*. *Ciò* has a far higher register and should therefore be avoided according to many authors. It occurs less frequently than the German pronoun *dies* (168 times):

En: This can cause bleeding for a long time from minor wounds, painful bleeding into joints, or internal bleeding.

It: Ciò può causare sanguinamento prolungato in seguito a ferite lievi, sanguinamento doloroso nelle articolazioni o emorragie interne.

Other examples of high-register translation choices in German are discussed in Chapter 7 in the analysis of connectives and, in particular, pronominal adverbs.

Technical terms tend to be explained, as recommended by the guidelines. This is particularly true for terms referring to trial types and concepts related to trial procedures (like placebo, etc.). Interestingly, in general the explanations provided for these concepts are quite similar to those provided as instances in the guidelines on layperson summaries (cf. Sections 1.4 and 3.1.5). This is likely due to the fact that, having been provided some “approved” instances and wordings, writers use them rather than finding other options (which might be less understandable). Pathonyms, adverse events and reactions, as well as symptoms are often accompanied by explanations, too. Explanations are often repeated in the same text, as well. For instance, in a text written by Bayer, the term placebo is explained the first time it is introduced in the trial overview and again a few pages later, in the corresponding subchapter:

A placebo looks like a treatment but does not have any medicine in it. [...]

The participants in this trial took either vericiguat or a placebo as a tablet by mouth. A placebo looks like a treatment but does not have any medicine in it. The researchers used a placebo to learn if the participants' results were due to vericiguat or if the results could have been due to chance.

Some distinctions made by Niederhauser (1999: 140–162) in his analysis of ways to explain technical terms in popularizing texts may be useful to discuss explanations and definitions. The author differentiates between definitions proper, which are quite detailed and encompass one or more sentences, and shorter definitions and clarifications, which are not as direct as definitions but sometimes more effective and therefore generally more frequent. The latter often encompass parenthetical constructions and appositions.

In the present analysis, verbs like *be*, *mean* (particularly with the form [*this*] *means*), *know*, and *call* (in the constructions BE + PAST PARTICIPLE + AS), are generally associated with the category of definitions proper. It should be noted that even these fully-fledged definitions are usually not very detailed: as often occurs in popularizing texts, they are limited to a few aspects that are necessary to correctly identify a concept. Other information which would be necessary in communication between experts is left out so as not to make the text too pedantic and difficult to follow (Niederhauser 1999: 143–144, 147–148). Other constructions analyzed in Section 3.3.3.1, such as postnominal attributes and participial constructions (like *called*, *also called*, *known*, and *also known*), correspond to the category of short definitions and clarifications proposed by Niederhauser (ibid.: 147–150). As has been shown above, they are associated with other denominations (like abbreviations, initialisms, etc.), synonyms, and glosses with hypernyms or holonyms. This type of information is not detailed at all, but it is sometimes enough to contextualize concepts which would otherwise be quite obscure. In addition, they have the advantage of “camouflaging themselves” in the text and being less invasive than actual definitions which take more place and may make the summary sound too didactic.

Another important aspect is the distinction between anaphoric and cataphoric explanations (cf. *inter alia* Kalverkämper 1989: 49–50). Based on the explanations, definitions, and other glosses detected in 3.3.3.1, the most frequent type consists of cataphors (i.e., the technical term is introduced after the explanation, definition, etc.). This corresponds to the order of the second de-terminologization strategy elaborated by Montalt Resurrecció and González Davies (2007: 252).⁵³ Explanations introduced by the verbs *call*, *know*, and in some cases *refer* belong to this category. Those introduced by the verbs *mean*, *describe*, *be*, and in some cases *refer* are anaphors, i.e., the technical term precedes its explanation, which corresponds to the first de-terminologization strategy elaborated by Montalt Resurrecció and González Davies (2007: 252). According to the data presented in 3.3.3.1, there are over twice as many cataphoric explanations as anaphoric explanations. This equals the order recommended by the layperson summaries' guidelines, according to which technical terms should be provided between brackets (thus after the explanation). It also corresponds to the tendency to use cataphoric definitions when introducing new technical terms in communication between experts (Niederhauser 1999: 147). Cataphoric definitions also have an inherently didactic connotation, as they are typical of textbooks (cf. Magris 2009: 92), and they are overall the best choice in comprehensibility-enhanced texts. As a matter of fact, as will be pointed out in the theoretical framework of Chapter 7 (Section 7.1.5), cataphoras are easier to understand than anaphoras, as they follow the reading direction⁵⁴ and therefore attract the readers' attention *before* the text portion in question is presented. This way, they know they should read the following lines carefully. Anaphoras, on the contrary, go against the reading direction, therefore they refer to something that readers have already received. If the portion of text is not in the working or long-term memory, readers need to go back to the text portion that the anaphoras refer to, which disrupts the reading process (Bredel & Maaß 2016a: 510–511).

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53 The only difference is that, for some reason, these scholars only consider technical terms introduced as a parenthetical construction.

54 The importance of a linear sequence to guarantee text comprehension in simplified language variants has been pointed out also, *inter alia*, by Di Meola (2023).

The aforementioned tendency to use cataphoric definitions and other explanations is found also in the TTs. As mentioned in Section 3.3.3.2, the constructions of the STs have likely influenced those of the TTs, and the order of term and explanation (or gloss) is maintained. The only exception detected consists in the use of a *Linksattribut*, where the order is changed due to structural differences:

En: In MS, the coating that protects the nerves, *known as myelin*, is damaged.

De: Bei MS wird *die als Myelin bezeichnete* Hülle, die die Nerven schützt, verletzt.

It was also interesting to note that the verbs and constructions introducing these definitions and glosses are usually translated with the closest semantic equivalent in both Italian and German, thus with the lowest possible effort on the part of the translator. In general, Italian shows more variation than German (apart from cases like *called* used as a postnominal attribute, where German has more options).

On the whole, the German subcorpus has fewer words belonging to the basic vocabulary than the Italian and English subcorpora, but this is also due to the presence of compound words. As far as terminology and register are concerned, German texts tend to be less complex than Italian ones, with more popular variants of terms. German translators are apparently aware of the difficulty inherent in medical terminology of classical matrix and try to avoid it, while Italian translators pay less attention to this aspect. This tendency is partly justified, since it is ascribable to interlinguistic differences: terms of classical matrix are far more understandable to Italian speakers (even non-experts) than to English and German speakers. On the other side, this trend is sometimes due simply to negligence in translating, as some terms and words have a register that is extremely high and not adequate in Plain Language texts.

4 Active and passive voice

After the analysis of the lexico-terminological level, the focus will now shift on the morphosyntactic level. The first aspect which will be considered is voice, which, as will be illustrated in greater detail in Section 4.1, greatly affects comprehensibility.

4.1 Theoretical framework

Voice (or diathesis/*genus verbi*) may be defined as “a mechanism that selects a grammatically prominent syntactic constituent – subject – from the underlying semantic functions (case or thematic roles) of a clause” (Shibatani 1988: 3). In English, German, and Italian, the main voice opposition is between active and passive (ibid.; Teich 2003: 90–96; Halliday & Matthiessen 2004: 182; König & Gast 2009: 123; Pierini 2012: 185). Bisiada (2019: 38) points out that, “[w]hile the contrast does not affect the experiential meaning of the clauses, it changes the mapping of the roles of Actor, Process and Goal ‘onto the interpersonal functions in the modal structure of the clause’ (Halliday and Matthiessen 2004: 182)”.

This subchapter⁵⁵ will first give a brief overview of the passive structures (as well as alternatives to passive constructions) in English, German, as well as Italian, and then describe them from a cross-linguistic perspective. It will then deal with voice in LSPs and the functions of the passive diathesis. Finally, it will illustrate the cognitive implications of voice and the corresponding recommendations in some guidelines for language simplification.

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55 It should be noted that the theoretical framework of this chapter is partially based on theoretical sections (re-elaborated and expanded on) entailed in two papers written by the author of the present book (Pedrini 2022a, 2022b). In particular, the remarks concerning English and Italian in Sections 4.1.1 and 4.1.2 are based on Pedrini (2022a), while Sections 4.1.3 and 4.1.4 are mainly based on Pedrini (2022b).

4.1.1 A brief overview of passives in English, German, and Italian

The present section aims at providing a concise overview of the passive voice in some English, German, and Italian grammars as well as in linguistics articles, in order to point out which aspects are thematized and what is actually considered to be a passive. As a matter of fact, several languages are characterized by the presence of both passives which are canonical and universally regarded as such, and others which are not prototypical and whose status is more controversial. This applies also to English, German, and Italian.

In *The Cambridge Grammar of the English Language*, Huddleston and Pullum (2002: 1427–1447) define voice and the active-passive dichotomy in English, then deal with the syntax of passives. They call the prepositional phrase involving *by* – i.e., the one that expresses the agent – *internalized complement* in order to distinguish it from the semantic role *agent*. They also differentiate between long and short passives depending on whether the internalized complement is expressed or not, and maintain that short passives do not have active equivalents, as these would have to encode information about the subject that is not made explicit by the passive form. They also differentiate between *be*-passives, *get*-passives, and bare passives (such as “The guy *mauled by our neighbour’s dog* is in intensive care” [my italics]) from a syntactic point of view. The following subchapters deal with complements externalized from the passive verb phrase as well as with adjectival passives; they also provide a deeper insight into *get*-passives and the pragmatic factors favoring actives or passives.

A study dealing exclusively with passivity in the English language which focuses in detail on non-canonical forms is the one conducted by Puckica (2009), who states that the passive voice clearly does not limit itself to the construction BE + PAST PARTICIPLE. According to him, passive constructions may be divided into central passive constructions, entailing a passive past participle form, and marginal passive constructions, without a past participle. The first category includes BE or GET + PAST PARTICIPLE, but also other linking or copular verbs with a more uncertain status, such as *become*, *seem*, *remain*, *look*, and *feel* (ibid.: 222–223), as well as constructions with HAVE + OBJECT + PAST PARTICIPLE and postnominal participial attributes. The second category

is made up by what he calls *V-ING passive constructions* and *V-ABLE₁ passive constructions*. These are constructions like “The carpet needs cleaning”⁵⁶ (ibid.: 225) and passive adjectives with the suffix *-able*.

As for the German language, in Duden (2016: 556–570) it is pointed out that the active voice is unmarked, while the passive one is marked. With respect to the latter, its predominant auxiliary consists of *werden*, which may be used to express both personal and impersonal passives. The *werden*-passive or *Vorgangspassiv* is then examined, focusing particularly on its restrictions (verbs expressing possession or change of possession such as *haben* or *besitzen*, verbs meaning ‘to contain’ such as *enthalten*, the verbs *wissen* and *kennen*, verbs with an accusative object and reflexive dative object such as *sich einbilden*, the dative-accusative verbs *schulden* and *danken*, perception verbs in the construction “accusative with infinitive”, as well as many idioms and *Funktionsverbgefüge*, which cannot build passive constructions or can do so only in specific contexts). The grammar then deals with the formation of impersonal passives starting from intransitive verbs, agentivity, and passive alternatives. In particular, these encompass *Funktionsverbgefüge*, several types of reflexive constructions, *SICH LASSEN* + INFINITIVE, *SEIN/BLEIBEN/STEHEN* + *ZU*-INFINITIVE, *GEHÖREN* + PAST PARTICIPLE, *GEHEN* + (*ZU*-)INFINITIVE, *SEIN* + ADJECTIVE with the suffixes *-bar*, *-lich*, *-sam*, and *-fähig*. The following subchapters in the grammar deal with the *bekommen*-passive (or recipient, beneficiary, and dative passive) and *sein*-passive (or *Zustandspassiv*).

Among recent studies dedicated to German non-canonical passives and passive alternatives, those by Lenz (2006) and Puato (2017) stand out particularly for their depth of analysis. In her doctoral thesis, a corpus analysis of texts pertaining to the legal field, Lenz analyzes thoroughly the constructions *LASSEN* + *SICH* + INFINITIVE,⁵⁷ *SEIN* + *ZU* + INFINITIVE, *Funktionsverbgefüge* with a passive component (as in “Anwendung finden”, “zum Einsatz gelangen”, “unter dem Einfluss stehen”), passive attributes (i.e., participial attributes,

56 Puckica is not the only scholar who considers these constructions to express passivity. They are mentioned also by Huddleston and Pullum (2002: 1199–1200), who call them *concealed passives*.

57 Or *lassen*-middle, according to, for instance, König and Gast (2009: 134–136) and Steinbach (1998: 14), among others.

attributes with a gerundive, and passive adjectives),⁵⁸ as well as (although in lesser detail, as she devotes to them only a brief chapter) the constructions REFLEXIVE PRONOUN + VERB⁵⁹, BLEIBEN + PAST PARTICIPLE, and BLEIBEN + ZU + INFINITIVE. Puato, in an exclusively theoretical review, starts from the “dative passive”⁶⁰ and discusses its use and constraints. She then turns to impersonal constructions with the pronoun *man*, reflexive constructions, *Funktionsvergbefüge*, VERB (mostly *sein*, but also *bleiben*, *stehen*, *scheinen*, and *gehen*) + ZU-INFINITIVE,⁶¹ SICH LASSEN + INFINITIVE, GEHÖREN + PAST PARTICIPLE, deverbal adjective derivations, and gerundives.

With regard to the Italian language, in *Grande grammatica italiana di consultazione* Salvi (1991: 85–98) discusses the selection of the passive auxiliary verbs *essere*, *venire*, and *andare*. The author points out that *essere* may give rise to ambiguities between two interpretations, one referred to an action and the other to a state. The former or the latter are chosen based *inter alia* on agent expression, adverbials, and tense choice. *Venire* can occur exclusively with simple tenses and only implies an action interpretation. Furthermore, it is used especially when the auxiliary *essere* cannot be resorted to (“*la mamma è baciata” vs “la mamma viene baciata”) or favors a statal interpretation (“la porta è chiusa” vs “la porta viene chiusa”). Unlike *essere* and *venire*, *andare* cannot be employed with an overt agent. Other auxiliaries mentioned by Salvi are *restare*, *rimanere*, *finire*, *preferire*, and *desiderare*. He also deals with other two passive constructions, which are not structures with a predicative complement like the ones examined so far. One involves the verb *avere* and the other *volere*, as in “Il sergente ebbe la testa tagliata da un ussaro” and “Voglio queste battute suonate più a tempo”, respectively. The subsequent subchapters discuss sentences which are not passivizable, passives with intransitive verbs and impersonal

58 Some instances are “die daraufhin erhobene Klage”, “die zu berücksichtigenden Kriterien”, and adjectives entailing the suffixes *-bar* and *-lich* as well as the pseudosuffixes *-wert*, *-pflichtig*, *-bedürftig*, and *-würdig*.

59 These constructions are also called *plain middles* by König and Gast (2009: 134–136) and *middle constructions* by Steinbach (1998).

60 One instance of this construction is “Sie bekommt zum Geburtstag einen Ring geschenkt” (Puato 2017: 170).

61 Puato also compares the construction ES GIBT ZU + INFINITIVE to these modal infinitives.

passives, as well as passive functions. Another construction which expresses passivity examined thoroughly in Salvi's volume is the passivizing or passive *si* (as in "Si mangiano le mele", *ibid.*: 102). In this construction, the object is promoted to subject and therefore agrees with the verb, as in standard passive constructions. The differences between these two structures are then analyzed in detail (*ibid.*: 107–108). Among others, with the passive *si* the agent phrase cannot be introduced by the preposition *da*, but by *da parte di*; the subject (even if implicit) must be human and plural – and not in the first or second person. Finally, with the passive *si* a preverbal subject is not always acceptable, unlike in passive constructions.

Some recent studies concerning the passive voice with a particular focus on non-canonical constructions are those by Giacalone Ramat (2018) and Grochowska-Reiter (2020). Giacalone Ramat considers not only the canonical auxiliaries *essere*, *venire*, and *andare*, but also *finire*, *rimanere*, and *trovarsi*, which she regards as "passives with aspectual connotations" and as object of an ongoing grammaticalization process. She also mentions the verb *vedersi*, which she considers to be subject to grammaticalization. The overview provided by Grochowska-Reiter is quite similar, although she seems to regard all these verbs as proper auxiliaries. She also agrees with Salvi (1991: 85–98) in viewing *essere* as the only auxiliary without additional connotations and *venire* as an auxiliary with a more dynamic reading (Giacalone Ramat & Sansò 2014: 22, *qtd.* in Grochowska-Reiter 2020: 35). She then moves on to passives with *andare*, whose function is either that of a loss passive or a modal passive. The label *loss passive* is used by Grochowska-Reiter (2020: 36) to refer to passives expressing loss or destruction with recourse to past participles such as *perso*, *disperso*, *smarrito*, *speso*, *sprecato*, *versato*, *distrutto*, *buttato*, *abbattuto*, and *venduto*. Modal passives, on the other hand, have a deontic connotation, as occurs in "I documenti vanno spediti entro oggi" (*ibid.*: 36). After these canonical auxiliaries, Grochowska-Reiter mentions *rimanere*, *restare*, *vedersi*, *trovarsi*, and *finire*, with their additional connotations and the full verbs they usually introduce.

4.1.2 Cross-linguistic and translational perspective

It is interesting to look at voice also from a contrastive, typological, and translational perspective in order to better evaluate the results of the corpus analysis.

Works in the field of translation studies often provide interesting insights into cross-linguistic differences. In her analysis concerning the language of medicine and medical translation, Magris (1992: 71) assumes that the (canonical) passive voice in English is more frequent than in Italian and German, as in this language there are no impersonal constructions which may replace it adequately. She does indeed point out the existence of the pronoun *one*, but adds that it is too informal for specialized discourse. In German, instead, the pronoun *man* is used far more frequently, and the same goes for constructions with the particle *si* in Italian. Bisiada (2019) also conducted a study comparing passives in English and German, more precisely in business articles, and found that translators have a tendency to passivize English active sentences in the German TTs. He also highlights that editors, instead, tend to correct the passivized sentences and turn them into active constructions again.⁶² He also points out some contrasts between passive forms in the two languages, more precisely with respect to participant roles:

While in English any kind of participant role can become the subject (Teich 2003: 96), German allows only participant roles that have the function of direct object in active voice to become the subject in a passive construction. Constructions with the auxiliary verbs *bekommen* and *kriegen* may form exceptions to this rule, but König and Gast (2012: 159) argue that such constructions “belong more to informal, spoken German than to the written language”. (Bisiada 2019: 38–39)

Bisiada (ibid.: 39) also highlights that, thanks to its freer word order through case markings, German also has more theme options and its speakers can therefore

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62 In another article, this scholar had already claimed that “it could be argued that editing is largely a simplifying activity, with editors trying to apply quantitative strategies to make the text more comprehensible” (Bisiada 2017: 269).

resort to other linguistic means than the passive in order to control the theme-rheme structure of a text. The factors discussed by the author so far imply a lower recourse to passive constructions in German than in English; however, there are also aspects encouraging its use, such as “a semantic restriction of Agents acting as subjects to ‘animate and conscious participants’”⁶³ (ibid.: 40).

In their volume pertaining to the field of contrastive linguistics, König and Gast (2009) also provide interesting insights into the cross-linguistic differences between English and German with respect to the passive voice. They point out that, unlike in English, in the German language intransitive verbs are passivizable (ibid.: 123, 124, 131), which leads to the creation of subjectless sentences. On the other hand, unlike German and other languages, English allows the derivation of passive constructions from active sentences with directional complements and locative adjuncts⁶⁴ (ibid.: 128).

As for the interlinguistic differences between English and Italian, Palumbo (1999: 105) notes that in English passives are the main resource to obtain depersonalization. As he points out, this may also be achieved by resorting to the pronoun *one*, which is nevertheless usually avoided since it is quite cumbersome.⁶⁵ Another scholar who delves into this topic is Taylor (2006: 30), who first reports some reflections made by Scarpa (2001: 133). Examining linguistic features pertaining to LSPs, Scarpa points out that cross-linguistic differences start being visible at the morphosyntactic level, and that in the linguistic combination English-Italian some “typical potential clashes” are “the use of singular and plural nouns, prepositions, participles, subordination patterns, nominalisation processes, passive formations, modality, etc.”. Taylor (2006: 31) then discusses the phenomenon of nominalization in English scientific texts, whose structure is exemplified as follows: “Noun Phrase + copulative verb (+ past participle in passive formation involving restricted

63 An instance provided by Bisiada (ibid.: 40) regarding this is “To solve such problems, plants have evolved two strategies which they superimpose upon photosynthesis”, translatable as “Zur Lösung solcher Probleme haben sich bei den Pflanzen zwei Mechanismen herausgebildet, von denen die Photosynthese überlagert wird”.

64 Two instances are “This lake has been gone across many times in winter” and “This bed has been slept in” (König & Gast 2009: 128).

65 See the similar considerations made by Magris (1992: 71) reported above.

number of verbs) + NP [NP = noun phrase]”. He states that nominalizations in other languages may differ syntactically – he mentions “impersonal *si* formations and active verb forms with impersonal subjects” in Italian – and that “this must be constantly borne in mind to avoid such errors as forcing another language into, for example, a passive formation that is grammatically correct but conventionally inappropriate” (ibid.: 32). In the same vein, Garzone (2020: 107) notes that impersonal or passive *si* constructions are useful linguistics resources that may be resorted to while translating English constructions without a direct equivalent in Italian.⁶⁶

In the field of corpus linguistics, Musacchio (2006) compares two corpora of economics and physics texts with the aim to evaluate translation quality. The first corpus was made up of Italian translations (parallel component) and the second corpus of original Italian texts (comparable component). According to the results provided by the comparable texts in the physics corpus, scientists are mentioned much less frequently in Italian than in English, as passive or impersonal constructions are favored. Interestingly, these findings seem to contradict the trends shown by the other linguists mentioned in the present section.

Moving on to the field of purely contrastive linguistics (i.e., not referring to translation studies), some interesting considerations concerning voice are made by Pierini (2012), who points out that English and Italian are characterized by a different repertoire of passive constructions, which also occur at different frequencies (ibid.: 147). Like Palumbo, she notes that canonical passives are often used in English as they are the main resource which signals depersonalization and topicalization. Italian, on the other hand, can also resort to the impersonal construction with *si* and to left dislocation, respectively. The author (ibid.: 186) also discusses the different types of passive constructions available in the two languages. In Italian, only direct objects may be promoted to the subject position, while in English this may occur also with constituents like indirect objects and objects of prepositions. Pierini

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 66 She states that passive forms involving verbs like *show*, *report*, and *find* may be suitably translated by using the impersonal *si* construction followed by a dependent declarative clause or other constructions in Italian.

(ibid.: 186–187) also compares both the functions and the interplays with verb aspect of the auxiliaries of the two languages. According to her, standard passives (meaning the auxiliaries *be* and *essere*) are usually resultative, i.e., the process or action they express results in a state. She then states that *andare* and *venire* have a more dynamic reading and focus on the process; she compares them to *get* in English. She also compares the use of *andare* with a deontic connotation to the periphrastic form BE + TO + BE + PAST PARTICIPLE in the English language.

4.1.3 Frequency of passive voice in LSPs and functions

LSPs (in written texts or oral discourse with characteristics of written text types, such as presentations) are characterized by a higher frequency of passive forms than general language (cf. for instance Kalverkämper 1998: 36; Becker & Hundt 1998: 119; Hoffmann 1998b: 195; Hoffmann 1998c: 254; Baumann 1998: 375–376; Hundt 2015: 381; Drumm 2018: 36–37; Adamzik 2018: 78; Borgwaldt & Sieradz 2018: 67, 70). Halliday (1990: 57–58) defines this phenomenon as “a typical syndrome of grammatical features” in special languages, which concerns also nominalization and information condensation. It should be pointed out that this increased frequency is only relative, since the active voice still remains more frequent than the passive one in absolute terms also in LSPs (cf. *inter alia* Magris 1992: 70; Roelcke 1999: 77). In a corpus analysis focusing on voice and conducted on a wide range of text types, Svartvik (1966: 164–165) highlighted that even in the subcorpus with the highest frequency of passives, i.e., “scientific exposition”, the proportion of passive to active forms was not higher than 1 : 3. Similarly, Sager et al. (1980: 209) compare the passive voice of technical-scientific texts to that of literary prose. The result of the analysis is that the percentage ranges from 26 to 32.6% in the former, whereas it amounts to a strikingly – although not surprisingly – low percentage of 2.2–3% in the latter.

Many explanations have been provided by scholars and linguists for the increased frequency of the passive voice in LSPs. According to Hoffmann (1976: 239), passive forms are one of the easiest ways to present information neutrally: the agent (or “logical subject”) may be mentioned, but is usually not explicit. Borgwaldt and Sieradz (2018: 67) also point out that the

passive voice leads to depersonalization and a neutral fact presentation, where the action itself is highlighted and the agent is considered redundant or unimportant. Neutrality and objectivity are also regarded as passive (as well as nominalization) functions by Drumm (2018: 49) and Venohr (2018: 92–93). Scarpa (2008: 46) also lists anonymization as one of the functions of passives in LSPs, and mentions theme-rheme progression, as well. Lange (2018: 81) states that passives (together with nominalizations and compound words) allow to achieve concision through the omission of certain information, which the reader has to infer.

As stated in 4.1, some studies which focus more extensively on the passive voice rather than on the traits of LSPs in general are those by Lenz (2006) and Puato (2017: 151–182). In her analysis of voice in the legal field, Lenz (2006: 215–216) points out that the main function of passives is agent omission – which, in fact, occurs in 80% of *Vorgangspassiva* (processual passives) in her corpus. This is due to several reasons: for instance, the agent is already mentioned in the context (with a higher frequency of anaphoric agent ellipsis compared to a relatively low number of cataphoric agent ellipsis), or it is of a very general nature, so that its explicitation would not be meaningful. In case the agent does occur, the functions of the passive voice are linguistic economy and its unmarkedness in allowing a natural sounding theme-rheme progression. Puato (2017: 152–154) – discussing passive functions also outside of LSPs, from the point of view of teaching German as a foreign language – first delves into the stylistic aspects of passives. They allow sentences to be structured in a parallel, linear way, which in some cases would not be possible if the active form were to be used twice in a row (e.g., “Die Vorstellung dauerte 90 Minuten; Kritiker haben die Vorstellung begeistert aufgenommen → Die Vorstellung dauerte 90 Minuten und wurde von Kritikern begeistert aufgenommen”, *ibid.*: 152), they make it possible to avoid metonymy (Lütze-Miculinić 2011)⁶⁷ or redundant information if the agent has already been mentioned, and they

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67 According to Lütze-Miculinić (2011: 198–199), metonymy and personification are among the causes of passive use in German. An instance she quotes from Zifonun et al. (1997: 1831) is the following: “*Seitens des Gerichtes wurde er aufgefordert, seinen Wohnort nicht zu verlassen*” (my italics). She also states that this preference is language-specific: in a language like Croatian an active sentence with an equivalent metonymy would be far more acceptable.

allow a certain expression variation. Secondly, she examines deagentivization. Passives – in particular, German impersonal passives, as in “es wird gearbeitet” – highlight the action itself, and the focus is on the patient rather than the agent, which may be omitted. This occurs for several communicative reasons: in case the agent is unknown, irrelevant, or considered to be known by everyone, for generalizations, for the sake of concision, if encyclopedic knowledge is sufficient to infer it, if the action should be carried out by the reader, and to achieve anonymization, thus concealing who is responsible for a certain action, as a face-saving strategy. Finally, she mentions theme-rheme progression.

4.1.4 Cognitive implications of voice

Passive forms are generally considered to be more difficult to understand than active ones. Their higher complexity is shown by their relative late acquisition in children, demonstrated for instance by experiments conducted by Grimm (1975). In a study on sentence processing and language acquisition, Bever (1970) pointed out that English-speaking children often erroneously interpret passive sentences as active transitive clauses if the components also semantically allow an active interpretation. An instance provided by Diessel (2015: 301) to exemplify this concept is “The girl was kissed by the boy”, which could be interpreted as an active sentence, i.e., “The girl kissed the boy”, despite its passive morphology. Diessel also mentions that evidence from psycholinguistic research (cf. Slobin & Bever 1982) shows that “in English word order provides a stronger cue for grammatical relations than morphology so that English-speaking children often ignore the morphological marking of passive sentences and interpret them as active transitive clauses”.

Additionally, adults may find it difficult to correctly interpret passive sentences or reduced relative clauses⁶⁸ when put under time pressure (cf. Ferreira 2003; Townsend & Bever 2001). Another study that focuses on the elaboration of the passive voice has been conducted by Gorin (2005), who showed that

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68 The same type of mistake that occurred with passives in children also occurred with several clause types with the word order NP-V-NP, such as cleft sentences and reduced relative clauses (Diessel 2015: 301–302). According to Bever (1970, qtd. in Diessel 2015: 301–302), children interpret these clauses based on a grammatical “template”, the “canonical sentence schema” of English.

passives and negatives increase processing difficulty. Müller-Feldmeth et al. (2015) also examined the effect of specific text features on reading times through an experiment with eye-tracking, and found that it took longer for participants to read sentences with passive forms (ibid.: 251). Other studies showed more mixed results. Slobin (1966) maintains that passive affirmative sentences are processed faster than active negative ones. Tannenbaum and Williams (1968) found that passives increase the processing time only in sentences that are focused on the agent. In the legal field, Charrow and Charrow (1979) claim that the passive voice does not increase the complexity of a text if it does not occur in subordinate clauses.⁶⁹ Other scholars who do not agree with the hypothesis that passives are more complex are Ballstaedt et al. (1981: 207) and File and Jew (1973: 65–66).

Moving on to the field of foreign language learning, Wanner (2013: 55–56) points out the need for language learners to “dissociate the subject from the agent interpretation”, which, as mentioned above, is easier when the passive is irreversible, i.e., when it is semantically impossible for the subject to be the agent (Pinker et al. 1987, qtd. in Wanner 2013: 55–56). Lenz (2006: 75) highlights that passives are generally not easy to acquire for learners of German as a foreign language. Similarly, the passive voice is usually introduced at a quite advanced stage in Italian grammar syllabi for foreign learners, i.e., at a B2 level and beyond (Grochowska-Reiter 2020: 38–39).

Bredel and Maaß (2016a: 313–314) attribute the complexity of the German passive voice – but this could be applied also to English and Italian – to two main factors, a semantic and a morphological factor. With respect to the former, the event representation in passive sentences is more abstract than in active ones. The agent must be inferred, since it does not appear in the surface structure. In particular, referring to *Leichte Sprache*, Maaß (2015: 78–80) points out that action orientation is one of the main principles for text simplification, and that agents should be explicit in order to clarify who

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 69 Similarly, Bock (2018: 51) maintains that passives are not particularly problematic *per se*, but rather pose issues if they are used together with other linguistic features that are cognitively demanding, such as modals, negation (especially double negatives), nominalization, or very long sentences.

is performing an action.⁷⁰ Interestingly, she does not refer only to canonical passives, but also to passive-related structures, like modal infinitives, as may be inferred from an example she provides.⁷¹ This matter is discussed also in another work (Maaß 2020). There, the author points out that the problem of passives is of textual-pragmatic nature:

The passive voice is used to conceal the protagonists who are carrying out the actions. Thus, the passive voice poses a problem whenever this knowledge is needed to understand what is really going on, who is responsible, who might be addressed for further help etc. In texts where functionality entails an action-enabling potential, the frequent use of the passive voice might hinder this function from unfolding. (ibid.: 245)

However, she also points out that, in some cases, avoiding the passive voice may lead to unnatural constructions that hinder comprehension. An example she provides is a context “where the main intention is to indicate the perspective of the victim (who ‘has been injured’ in a traffic accident)” (ibid.).

With respect to the morphological explanation, Bredel and Maaß (2016a: 313–314) attribute the difficulty inherent in the use of canonical passives to their analytic structure. In German, in particular, the meaning-carrying part of the verb shifts to the end of the sentence. However, this problem is not limited to German (where it particularly manifests due to the *Satzklammer* that passives imply); in English for instance, Cutts (2020: 73) points out that having verbs towards the end of a sentence, as is often the case with passive forms, “forces readers to store large chunks of text in their short-term memory while

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70 Although agents may theoretically be indicated also with the passive voice, according to Duden (2016: 561) they are predominantly omitted (in approximately 90% of cases) in German *Vorgangspassiva*. Brinker (1971: 40) and Schoenthal (1976: 124) conducted some corpus analyses and calculated a percentage of agent omission with passives of 86.32% and 84%, respectively. According to Lenz (2006: 50), agent omission is even more frequent for alternatives to conventional passives. Some estimations concerning the English language were made by Svartvik (1966: 141) and Givón (1979: 58). The percentage of agentless passives calculated by Svartvik amounts to 80%, while the one calculated by Givón to 82%.

71 This example is “Passivkonstruktionen sind zu vermeiden”.

they wait to discover the doer and what the action will be”. Another explanation for the increased difficulty in understanding the passive voice may be the dichotomy “centrality-peripherality” postulated by Maaß (2015: 78), who recommends using more frequent linguistic resources in comprehensibility-enhanced texts. Although she mentions explicitly only less common synonyms and grammatical categories like genitive, subjunctive, and preterite, the same principle may be applied to the passive voice, since it is far less frequent than the active voice.

4.1.5 Voice and guidelines for language simplification

Considering its impact on text comprehensibility, voice is often discussed in text simplification. In the *Oxford Guide to Plain English* Cutts (2020) refers to writing which is full of passives as “passive-infested style” and maintains that the frequency of this voice is due to the habit of teaching students to use formal, obscure formulations at school. At the same time, he points out the advantages of passive constructions, i.e., their ability to omit irrelevant or obvious agents, their role as a hedging or face-saving strategy, as well as their capacity to thematize important information. Regarding *Leichte Sprache*, the *Netzwerk Leichte Sprache* (BMAS 2014: 29) as well as Bredel and Maaß (2016a: 313–317) recommend against using the passive diathesis. As for *Leichte Sprache Plus*, Maaß (2020: 244–245) states that passive forms can be used under certain conditions, i.e., “while keeping the action-enabling potential in mind” (ibid.: 245).

In the guidelines for Italian Plain Language written by Fortis (2003), the passive voice is mentioned twice. Firstly, Fortis points out that Plain Language does not have rules, but recommendations, and that it tendentially uses active constructions but does not hesitate to employ passive forms where necessary (ibid.: 11). Then, a few paragraphs later (ibid.: 12), he underlines again that in Plain Language active forms should be favored over passive ones.

In her manual for *Linguaggio facile da leggere e da capire*, Sciumbata (2022: 51–52) highlights that active constructions should be chosen over passive ones, as the active voice immediately communicates the sentence subject. However, passives are not banned altogether; on the contrary, if the agent is unknown or unimportant, passive constructions can be considered.

The Good Lay Summary Practice recommends using “active rather than passive voice” (GLSP 2021: 12). The same suggestion is found in the Recommendations of the Expert Group on Clinical Trials (2018: 4).

4.2 Methodology

After the theoretical overview, we will now move on to the empirical section. The analysis consisted of two phases. The first was a more automated analysis, where the software Analyze My Writing⁷² and Ratte⁷³ (*Regensburger Analysetool für Texte*) were employed for English and German, respectively. The constructions that were looked after are BE + PAST PARTICIPLE and WERDEN + PAST PARTICIPLE, which were then double-checked manually in order to get rid of false positive and false negative results. For Italian, the results were obtained directly by searching for the various forms of the passive auxiliaries *essere*, *venire*, as well as *andare* (in the third person singular and plural as well as in non-finite forms, i.e., in the options frequent in LSPs), and then getting rid of the noise. The purpose was to calculate the percentage of active and passive sentences (with these canonical passives) in the whole corpus of 180 layperson summaries, so as to calculate the number of passives in the STs and determine whether there was an increase or decrease of these types of passive constructions in translation.

In the second phase, the features signaling passivity not considered in the automated analysis were examined in 30 texts (10 English STs and the corresponding German and Italian TTs). For English, these linguistic features were GET + PAST PARTICIPLE, BECOME, SEEM, REMAIN, LOOK, and FEEL + PAST PARTICIPLE, HAVE + OBJECT + PAST PARTICIPLE, the V-ING passive construction, as well as the pronoun *one* in impersonal constructions. For German, these were *Zustandspassiva*, *bekommen*-passives (or recipient passives, also with their variants entailing the auxiliaries *erhalten* and *kriegen*), *bleiben*-passives,

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72 <https://www.analyzemywriting.com/>

73 <https://www.uni-regensburg.de/sprache-literatur-kultur/germanistik-did/downloads/ratte/index.html>

constructions with *SICH LASSEN* + INFINITIVE, plain middles, modal infinitives (with *sein*, *stehen*, *bleiben*, *scheinen*, and *gehen*), the construction *GEHÖREN* + PAST PARTICIPLE, gerundive constructions, *Funktionsverbgefüge* with a passive connotation, and impersonal sentences with the pronoun *man*. For Italian, the analyzed features were *RESTARE*, *RIMANERE*, *FINIRE*, *PREFERIRE*, *DESIDERARE*, *TROVARSI*, and *VEDERSI* + PAST PARTICIPLE, impersonal/passive (or passivizing) *si*,⁷⁴ *AVERE* or *VOLERE* + OBJECT + PAST PARTICIPLE, *ESSERE* (or *RIMANERE* and *RESTARE*) + *DA* + INFINITIVE.⁷⁵ In addition, other non-language-specific passive alternatives which were considered are adjectives with a passive connotation and participial attributes.

4.3 Analysis

In 4.3.1, the percentages of mean passive sentences against those of active sentences will be shown. The different tendencies in the texts by the various pharmaceutical companies will also be illustrated. Section 4.3.2 will integrate the features not considered in 4.3.1.

4.3.1 Automated analysis

Of the constructions examined in this part of analysis, i.e., *BE* + PAST PARTICIPLE, *WERDEN* + PAST PARTICIPLE, *ESSERE*, *VENIRE*, as well as *ANDARE* + PAST PARTICIPLE, only the latter was not found.

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74 As occurs in many other works, impersonal and passive *si* were examined together. For example, D'Alessandro (2007) and Sansò (2018) regard them as two variants of the same syntactic structure.

75 These constructions were not listed in Section 4.1.1, as they were not analyzed in the section concerning passives of *Grande grammatica italiana di consultazione*. On the contrary, they were included in the chapters concerning subordination (Skytte et al. 1991: 536). The meaning indicated for these constructions in this grammar book is *DOVER ESSERE* + PAST PARTICIPLE for *ESSERE* + *DA* + INFINITIVE and *DOVER ANCORA ESSERE* + PAST PARTICIPLE for *RIMANERE* and *RESTARE* + *DA* + INFINITIVE. Thus, these structures have both a passive and a deontic connotation. Another factor which justifies why these constructions are examined here is that analogous structures are traditionally considered to be passive alternatives in other languages. An instance is provided by modal infinitives in German (see in particular those with the auxiliaries *sein* and *bleiben*).

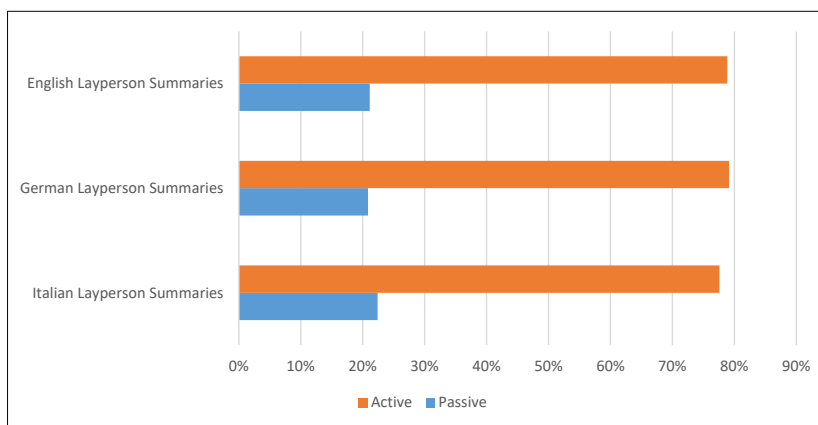


Fig. 20: Average percentage of active and passive sentences in the whole corpus

Fig. 20 shows a prevalence of the active voice in the English layperson summaries, with a percentage of 78.86% of active sentences against a percentage of 21.14% of passive sentences (cf. the considerations made by Magris 1992: 70 and Roelcke 1999: 7, reported in Section 4.1.3). The same proportion is found in the translated subcorpora. Interestingly, though, the percentage of passive sentences shows a slight increase in Italian (22.41%), while it decreases – although even more slightly – in German (20.86%). Overall, 40 out of 60 Italian TTs (66.67%) show an increase in passive constructions; for German, only 19 texts (31.67%) show an increase in passives compared to the corresponding English texts. These results are in line with those of a similar analysis conducted on a smaller selection of layperson summaries in Italian (Pedrini 2022a), where a slight increase in translated passive constructions had already been found. In another study conducted on a corpus of English and German layperson summaries (Pedrini 2022b), on the other hand, an increase in passive constructions was also detected for the translated German texts. This discrepancy is explained by the composition of the corpus: here, more than half of the texts were produced by the pharmaceutical company Bayer.⁷⁶

⁷⁶ The composition of the corpus is illustrated in Chapter 2. In sum, each subcorpus consists of 33 texts by Bayer, 11 by GSK, 8 by Novartis, and 8 by Roche.

In fact, significant differences may be noticed between the translated texts of this company and those of the other pharmaceutical companies with respect to the linguistic features analyzed in the present section. These differences will be shown in the following figures and paragraphs.

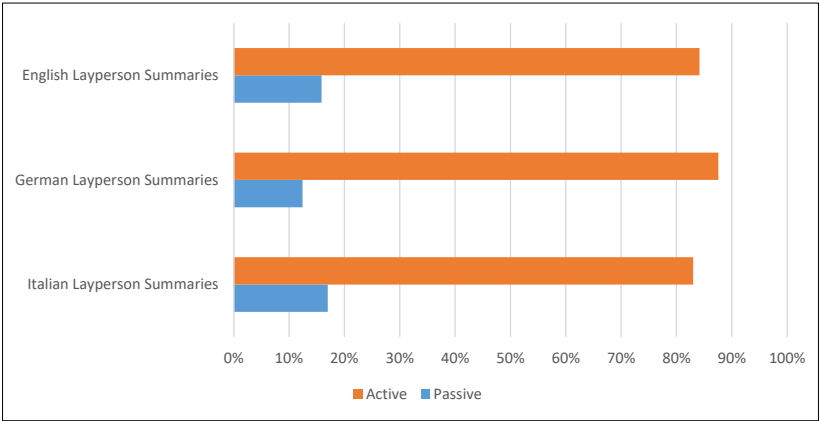


Fig. 21: Average percentage of active and passive sentences in the three subcorpora of the pharmaceutical company Bayer

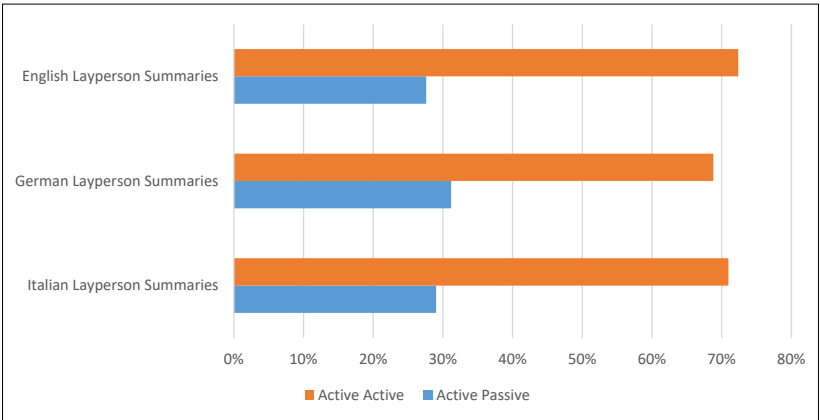


Fig. 22: Average percentage of active and passive sentences in the three subcorpora of all pharmaceutical companies except Bayer

As shown by the comparison between Fig. 21 and Fig. 22, the percentage of passive sentences is notably lower in the texts published by Bayer. In the English texts of this pharmaceutical company, it amounts to 15.85%, while it increases slightly in the Italian TTs, reaching a percentage of 16.99%. The number of passive sentences decreases in German, reaching a remarkably low 12.42%. 24 of 33 Italian TTs (72.73%) show an increase in passives, while 31 German TTs (93.94%) show a decrease in passive constructions.

In the English texts written by all the other companies (Fig. 22), the percentage of passive sentences amounts to 27.61%. This number increases in Italian, reaching 29.03%, and even more in German, reaching 31.18%. 16 of 27 (59.26%) Italian TTs show an increase in passives. For German, 17 of 27 (62.96%) TTs show this increase. These results are therefore in line with those of Pedrini (2022b), where only 2 out of 30 texts belonged to Bayer. Both showed a decrease in passive constructions in the German layperson summaries compared to their English STs. As for the texts produced by the other pharmaceutical companies, 21 of 28 (75%) texts showed an increase in passives in German.

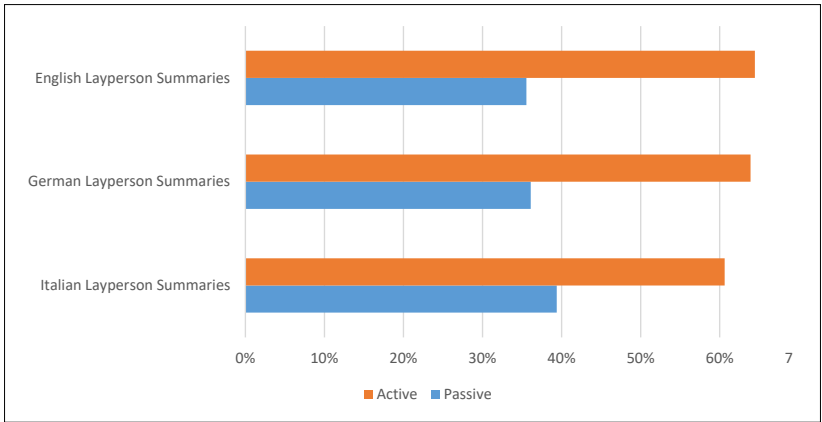


Fig. 23: Average percentage of active and passive sentences in the three subcorpora of the pharmaceutical company GSK

As may be inferred from Fig. 23, the texts produced by GSK have the overall highest percentage of passives. The English STs have an average passive sentence occurrence of 35.55%; this number increases in both translated subcorpora, reaching 36.10% in German and 39.38% in Italian. 8 of 11 (72.73%) Italian and 5 of 11 (45.45%) German TTs show an increase in passives.

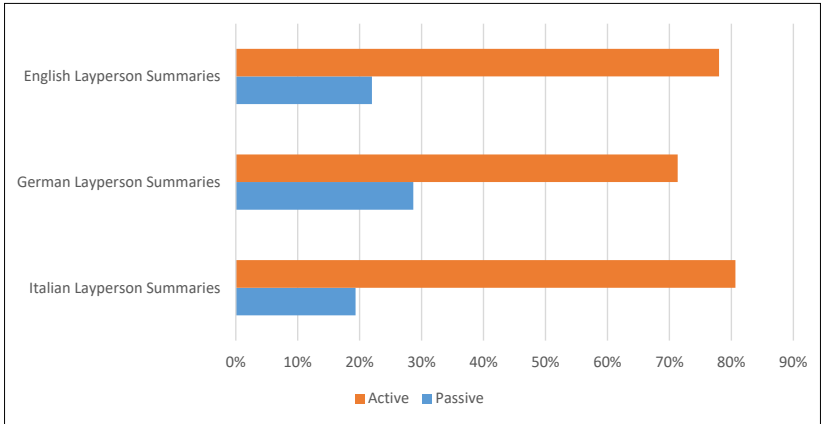


Fig. 24: Average percentage of active and passive sentences in the three subcorpora of the pharmaceutical company Novartis

Fig. 24 shows some interesting findings, as it is the only graph with a decrease in passive forms in the Italian translations. The English layperson summaries of this pharmaceutical company have a percentage of passives of 21.98%, while in Italian a slight decrease has been detected (19.34%). On the other hand, it is also the graph with the highest increase in passive constructions in the German TTs (28.66%). Overall, 6 out of 8 (75%) Italian texts show a decrease in passives, while the same number of texts shows an increase in passives in German.

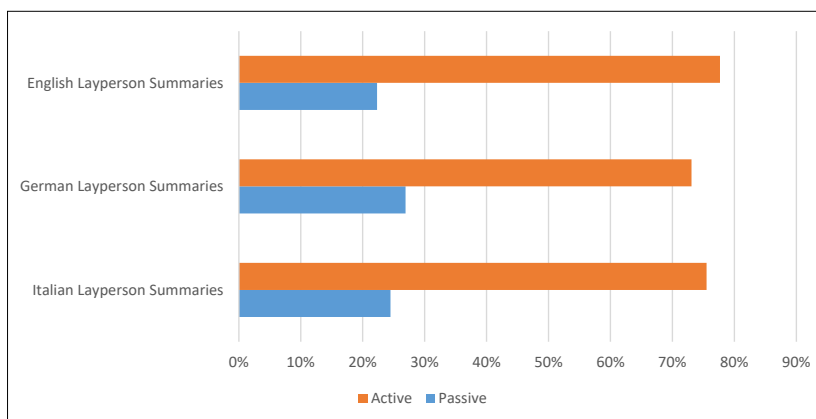


Fig. 25: Average percentage of active and passive sentences in the three subcorpora of the pharmaceutical company Roche

Fig. 25 shows an increase in passives in both translated subcorpora. In the English subcorpus, the average number of passive sentences amounts to 22.32%, while in Italian to 24.49% and in German to 26.92%. For both languages, 6 out of 8 (75%) texts show an increase in passives compared to the corresponding English layperson summaries.

4.3.2 Further types of passives and alternatives to passives

With respect to non-canonical passives in English, no occurrences of *get*-passives were found. This is not particularly surprising, as *get*-passives have diamesic as well as semantic restrictions. Regarding diamesic restrictions, *get*-passives sound quite informal and therefore occur more frequently in spoken discourse than in written texts (cf. for instance Puckica 2009: 222; König & Gast 2009: 125; Wanner 2013: 47). As far as the semantic constraints are concerned, many linguists attribute an adversative reading to this type of passive⁷⁷ (König & Gast 2009: 126). This construction is also thought to imply a partial responsibility of the patient (Givón & Yang 1994: 119–121; König & Gast 2009: 126).

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 77 However, it should be pointed out that there is no consensus in this respect.

One occurrence of passive built with the verb *become* was found:

Histamine travels through the blood and attaches to certain proteins on cells. This causes those cells to swell up and *become inflamed*.

No occurrences were detected for the verbs *seem*, *remain*, *look*, and *feel*.

In German, cases of *Zustandspassiv* or *sein*-passive were quite frequent (58 occurrences), in particular in metadiscourse and intratextual references, as in:

Die Ergebnisse *sind* in der folgenden Abbildung *aufgeführt*.
Für diese Studie *sind* die wichtigsten Einschluss- und Ausschlusskriterien nachstehend *aufgeführt*.

More general instances are:

Derzeit *sind* keine weiteren Studien zu CIS bei Patienten mit Asthma *geplant*.
Wie *war* die Studie *gestaltet*?

According to Bock (2018: 47), *sein*-passives are not thought to cause particular understanding issues; in fact, they can even be built correctly by little children.

No occurrences of *bleiben*-passives were detected. According to König and Gast (2009: 131), this is “a special case of the *Zustandspassiv* which indicates the continuation of a state. It is often used when a change of state is expected or in some way under discussion”. As it is semantically more specific than the *sein*-passive, its absence in the texts is not particularly surprising.

With respect to the recipient passive (or dative, beneficiary, and addressee passive, cf. Puato 2017: 170–171), 2 occurrences with the auxiliary *bekommen* were found in a text – both with the *get*-passive in the corresponding ST sentence:

En: When patients *got* BVS857 through an IV needle put into their vein, patients who *got* higher doses had higher amounts of BVS857 in their blood.

De: Wenn Patienten BVS857 intravenös *verabreicht bekamen*, hatten Patienten, die höhere Dosen bekamen, eine größere Menge BVS857 im Blut.

En: When patients *got* BVS857 through an injection under the skin, the amount of BVS857 in the blood was very different from one patient to another.

De: Wenn Patienten BVS857 mittels einer Injektion unter die Haut *verabreicht bekamen*, war die Menge BVS857 im Blut von Patient zu Patient verschieden.

No occurrences of recipient passives entailing the variants *erhalten* and *kriegen* were found. This, together with the low number of occurrences with the verb *bekommen*, is not particularly surprising considering the restrictions of this construction, which may be used if its corresponding active sentence has both an accusative and a dative object (or a free dative, which may be a *dativus commodi*, a pertinence dative, or a *dativus incommodi*, cf. Puato 2017: 170).⁷⁸ Even more importantly, this passive form also has diamesic, diaphasic, and diatopic restrictions, as it generally considered to be typical of spoken German (Leirbukt 1997). Depending on the verb choice, it is also perceived to be more or less regional and colloquial (Puato 2017: 170–171). The variant with *kriegen* belongs to a particularly low register, while that with *erhalten* is stylistically more elevated (ibid.).

In the Italian subcorpus, there were no occurrences of passives with the verbs *restare*, *rimanere*, *finire*, *preferire*, *desiderare*, *trovarsi*, and *vedersi*. This was not unexpected, since these verbs have several semantic restrictions. According to Giacalone Ramat⁷⁹ (2018: 107–108), *finire* is usually followed by past participles depicting violent deaths (e.g., *assassinato*, *trucidato*, *fucilato*, *avvelenato*, *impiccato*, *distrutto*, and *sepolto*) or verbs like *battuto*, *espulso*,

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78 The instances provided by Puato (2017: 170) to illustrate these types of dative are the following: “er schenkt ihr einen Ring”, “sie schneidet ihm die Haare”, “sie fühlt ihm den Puls”, and “sie ruiniert ihm die Haare”.

79 The considerations for the verbs *finire*, *rimanere*, *restare*, and *trovarsi* are based on corpus analyses investigating the corpora la Repubblica and CORIS, while those for the verb *vedersi* are based on a corpus analysis consulting corpora like CORIS or COLFIS.

intrappolato, and *intercettato*. Thus, this verb usually has an adversative reading (the connotation is positive only in one case, i.e., with the past participle *assolto*). The same may be claimed for the verb *rimanere*, whose frequency of use is quite low; it is usually followed by the past participles *ucciso*, *ferito*, *coinvolto*, *colpito*, *bloccato*, *intrappolato*, *danneggiato*, *invischiato*, and *schacciato* (ibid.: 108–109). *Restare* is similar to *rimanere*, and the past participles associated with it are approximately the same (for instance *paralizzato*, *incollato*, *rinchiuso*, *ucciso*, *ferito*, and *contagiato*; ibid.: 109). The verb *trovarsi* is usually associated with past participles like *assediato*, *coinvolto*, *circondato*, *costretto*, *estromesso*, *impegnato*, *innalzato*, *intrappolato*, *invischiato*, *inserito*, and *immerso* (ibid.: 109–111). *Vedersi* is also quite rare and is usually followed by the past participles *abbandonato*, *calpestato*, *condannato*, *costretto*, *obbligato*, *respinto*, *schacciato*, and *soppiantato*. This passive construction also has an adversative reading. In sum, the absence of all these types of passives in the Italian texts considered in the present analysis is attributable to their semantic restrictions and their adversativity. In addition, as may be deduced from the listed past participles, they are more likely to occur in narrative texts rather than LSPs.

Among other constructions expressing passivity in the English texts, 3 occurrences of the construction HAVE + OBJECT + PAST PARTICIPLE were detected:

At these visits, the participants: [...] *had their health and walking ability checked*.

During the trial, the participants: [...] *had their heart health checked* using an ECG and a heart imaging test.

The participants *had tests done* to make sure they could join the trial.

No occurrences of the V-ING passive constructions were found. This was not unexpected, as such structures are far less frequent than prototypical passives, as pointed out by Puckica (2009: 226), who also notes that there are aspectual differences between these constructions and canonical passives. Whereas V-ING passive constructions tend to highlight the development of the event, i.e., the process, canonical passives focus primarily on the result to be reached. Finally, “only a handful of semantically related verbs can fill the V₁ (matrix verb) slot of the construction” (ibid.: 225). These verbs express necessity or

lack; the most frequent is *need*. *Want* and *require* are also quite frequent, but the former only occurs “in the ‘spoken’ or ‘informal’ use in which it expresses a need rather than a wish, a use which again is not restricted to the V-ING passive construction” (ibid.). Other verbs listed by Puckica are *deserve*, *repay*, and *merit*. Impersonal constructions with the pronoun *one* were absent in the texts, too – which corresponds to the low frequency of use pointed out *inter alia* by Magris (1992) and Palumbo (1999) and reported in Section 4.1.2.

As far as the German texts are concerned, *lassen*-middles were absent. This was quite surprising, as they represent a rather frequent feature in German (Kunze 1996: 648), notably in the language of science (Puato 2017: 173).

Two occurrences of plain middles were detected:

En: After 12 weeks of treatment in Part B, patients who got BVS857 *had no change* in the amount of muscle in the thigh.

De: Bei den Patienten, die im Studienteil B für 12 Wochen BVS857 erhalten hatten, *zeigte sich* keine Veränderung des Volumens der Oberschenkelmuskulatur.

En: More information about the study results *is available* in the scientific results summaries (links to those summaries are provided at the end of this document).

De: Weitere Informationen über die Studienergebnisse *finden sich* in den Zusammenfassungen der wissenschaftlichen Ergebnisse (siehe die Links zu diesen Zusammenfassungen am Ende dieses Dokuments).

The presence of the plain middles is surprising if it is considered that *lassen*-middles are absent in these texts, as “[t]he *lassen*-middle is clearly less constrained than the plain middle in German and can replace the latter in most cases” (König & Gast 2009: 135). As a matter of fact, plain middles, unlike *lassen*-middles, require an adverbial specification; they are also excluded if the predicate is complex and if an active interpretation is possible⁸⁰ (ibid.: 136).

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80 Two instances provided by König and Gast (2009: 136) to illustrate these constraints are: “Diese Vokabeln lernen (*analysieren) sich leicht” vs “Diese Sätze lassen sich leicht analysieren” and “Beamte *bestechen sich leicht” vs “Beamte lassen sich leicht bestechen”.

Four occurrences of modal infinitives with *sein* were found. Three of these four cases entail the verb phrase *auf ... zurückführen* and refer to drug effects (or adverse reactions):

En: The researchers used a placebo to learn if the participants' results *were due to* vericiguat or if the results could have been due to chance.

De: Die Wissenschaftler verwendeten ein Placebo, um herauszufinden, ob die Ergebnisse der Teilnehmer *auf* Vericiguat *zurückzuführen* waren oder ob es sich hierbei um Zufallserscheinungen handelte.

En: In this summary, 'side effects' refer to those events that the study doctor thinks may *have been caused by* Relvar/Breo Ellipta treatment.

De: In dieser Zusammenfassung bezieht sich der Begriff ‚Nebenwirkungen‘ auf diejenigen Ereignisse, die nach Meinung des Studienarztes *auf* die Behandlung mit Relvar/Breo Ellipta *zurückzuführen sein* könnten.

En: In this summary, side effects refer to those events that the study doctor thinks may *have been caused by* the study medicine up to week 52.

De: In dieser Zusammenfassung bezieht sich der Begriff ‚Nebenwirkungen‘ auf diejenigen Ereignisse, die nach Meinung des Studienarztes bis zu Woche 52 *auf* das Prüfpräparat *zurückzuführen sein* könnten.

The last instance found in the texts is slightly different:

En: In these children, the immune system does not eliminate the virus and it keeps making copies of itself. As a result, *there are* high levels of virus particles in the blood.

De: Bei diesen Kindern wird das Virus nicht durch das Immunsystem beseitigt, sondern vermehrt sich weiter. Folglich *ist* im Blut eine erhöhte Menge von Virusbestandteilen *zu finden*.

No occurrences of modal infinitives entailing the auxiliaries *stehen*, *bleiben*, *scheinen*, and *gehen* were detected. The absence of the modal infinitives with the

auxiliary *gehen*, in particular, was not unexpected, as it is marked diaphasically, belonging to a low register (Puato 2017: 172; Vogel 2009).

A modal component, which is inherent in the aforementioned *lassen*-middles, most plain middles, and (as the name suggests) modal infinitives, is inherent also in the construction GEHÖREN + PAST PARTICIPLE and in gerundive constructions. The construction GEHÖREN + PAST PARTICIPLE was absent in the texts. According to Pape-Müller (1980), this construction is colloquial; König and Gast (2009: 131) point out that it is mainly found in prohibitive modal statements. Its absence in the texts is therefore easily understandable.

One instance of gerundive construction was found in a chart: “zu beantwortende Fragestellungen”. The corresponding English segment is “Questions it might answer”; interestingly, the deontic connotation is added in the German text, since it is absent in English, where only a possibility is implied. This feature was not expected to occur in these texts, as it is not easy to elaborate and is frequent in the nominal style of legal texts (Lenz 2006: 232). As a matter of fact, Lenz (ibid.) thoroughly examined it in her analysis of passives and passive alternatives in the legal field.

Fifty occurrences of *Funktionsverbgefüge* with a passive connotation were detected. Among these, some constructions involve the verb *stehen*, as in “in Zusammenhang stehen”, “in Verbindung stehen”, and “zur Verfügung stehen”:

Die Fragestellungen 4 und 5 behandeln Nebenwirkungen, die wahrscheinlich *im Zusammenhang* mit Bevacizumab *stehende* medizinische Probleme sind.⁸¹

Die unerwünschten Ereignisse, die nach Ansicht der Prüfarzte *in Verbindung* mit den Behandlungen in einer klinischen Prüfung *stehen*, werden „Nebenwirkungen“ genannt.

Other verbs are *kommen* (“zum Einsatz kommen”) and *bedürfen*, as in the following instances:

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81 Here, the complexity of the construction is further increased by the presence of a *Linksattribut* with a *Partizip I*.

Bei Krebs *kommen* oft Behandlungen wie die Chemotherapie *zum Einsatz*.

Es bedarf vieler Untersuchungen, um herauszufinden [...].

Five occurrences of the impersonal construction with the pronoun *man* were found:

En: An adverse event *is considered* “serious” when it is life-threatening, causes lasting problems, the participant needs hospital care, or results in death.

De: Als „schwerwiegend“ *bezeichnet man* unerwünschte Ereignisse, wenn sie lebensbedrohlich sind, anhaltende Probleme verursachen, eine Versorgung des Teilnehmers im Krankenhaus erforderlich machen oder zum Tod führen.⁸²

En: Multiple myeloma that is not well treated by approved drugs *is called* either: [...].

De: Ein Multiples Myelom, das mit zugelassenen Medikamenten nicht gut behandelbar ist, *nennt man* entweder [...].

En: Bevacizumab works by starving a tumour of the blood it needs to grow (this *is called* “anti-angiogenic” therapy).

De: Bevacizumab wirkt dadurch, dass der Tumor durch Unterbinden der Blutzufuhr ausgehungert wird (*man nennt* dies „antiangiogene Therapie“).

En: For any treatment to work well, patients must take it as directed by their doctor. This *is called* adherence.

De: Damit eine Behandlung gut wirken kann, müssen die Patienten die Arzneimittel wie von ihrem Arzt angeordnet anwenden. Das *nennt man* Adhärenz.

As may be noticed, all German impersonal constructions were used to translate English canonical passives with *be*.

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82 This instance occurs twice in the subcorpus.

In Italian, several instances of the impersonal/passive (or passivizing) *si* were found (25 occurrences). Some examples are the following:

En: While not required, *when using* these data, we ask that proper credit or attribution of GSK as the source of the data be given.

It: Sebbene non sia obbligatorio, chiediamo di citare opportunamente GSK come fonte di provenienza quando *si utilizzano* questi dati.

En: *There was* also better adherence in the other groups (Groups 2, 3, and 4) when information about inhaler(s) use was shared compared with when information about inhaler use was not shared (Group 5).

It: *Si è osservata* una migliore aderenza al trattamento anche negli altri gruppi (Gruppi 2, 3 e 4) quando le informazioni sull'uso dell'inalatore o degli inalatori sono state condivise rispetto a quando non sono state condivise (Gruppo 5).

En: During a trial, all adverse events *are recorded*, whether or not they *are thought to* be caused by the trial drug.

It: Nel corso di uno studio *si registrano* tutti gli eventi avversi, indipendentemente dal fatto che *si ritengano* causati dal farmaco in studio.

En: So when new drugs *are being studied*, researchers keep track of all medical problems that patients have.

It: Pertanto, quando *si studia* un nuovo farmaco, i ricercatori tengono traccia di tutti i problemi medici riscontrati nei pazienti.

En: This *is called* 'anti-angiogenic' therapy.

It: Tale terapia *si definisce* 'anti-angiogenica'.

Interestingly, the latter instance was also rendered with an impersonal construction (*man*) in German, as shown above.

Finally, there were no occurrences of the constructions AVERE or VOLERE + OBJECT + PAST PARTICIPLE, nor of the construction ESSERE (OR RIMANERE and RESTARE) + DA + INFINITIVE.

Moving on to constructions expressing passivity which are not specific of a single language, in English 28 adjectives with the suffix *-able* occur, such as *available*, *applicable*, *chewable*, and *unacceptable*. This distribution is

not particularly surprising, since of the English suffixes included in passive adjectives, *-able*, *-ible*, and *-uble* (cf. for instance Haspelmath 1994: 163; Puckica 2009: 229–233), *-able* is the only productive one nowadays (ibid.: 230). In German, 25 adjectives with a passive component were found. Most entail the suffixes *-bar* and *-lich* (as in *kaubar*, *verfügbar*, *vergleichbar*, *behandelbar*, *unerklärlich*, *zugänglich*, and *erhältlich*), while one contains the suffix *-abel* (*akzeptabel*). This distribution corresponds to that detected by Lenz (2006: 170), who noted that the most frequent adjectives are those composed by the suffixes *-bar* and *-lich*. Other passive pseudosuffixes listed by Lenz (2006: 169–186) and Puato (2017: 173) are *-wert*, *-würdig*, *-fertig*, *-bereit*, *-bedürftig*, *-pflichtig*, and *-fähig*. However, none of these occur in the texts. 33 adjectives with a passive component (with the suffix *-bile*) were detected in the Italian texts. Some instances are *prescrivibile*, *masticabile*, *inspiegabile*, *variabile*, and *inaccettabile*.

Participial attributes, whose passive connotation is made clear by the denomination *bare passives* given to English postnominal attributes in certain grammars (for instance Huddleston & Pullum 2002: 1429–1430), are generally very frequent in English (Fabricius-Hansen 2010: 5). 152 bare passives were found in the examined texts. Some examples are: “inhalers *used* in this study”, “with the sensor *clipped* on it”, and “the average percentage of doses *taken*”. In particular, several of these instances were found in graph descriptions, as “study medicine *given* directly through a vein” and “Out of 26 people *treated with* [...]”, or in charts, as “adverse events of special interest *reported* during the on-treatment period”, and “dangerously low blood pressure *caused* by a life-threatening response to an infection”.

The German equivalent of these constructions consists in *Linksattribute*, i.e., prenominal attributes (68 occurrences), some of which build quite complex nominal phrases. Some instances are: “die *erfassten* Daten”, “die *vom Herz erzeugten* elektrischen Signale”, “die *am Ende dieser Zusammenfassung aufgeführten* Webseiten”, “die *in dieser Studie verwendeten* Dosierungen und Kombinationen der Studienmedikamente”, “die *höchste als gut verträglich eingestufte* Dosis”, “eine *in die Vene eingeführte* Nadel”, “die *vor Behandlung und 24 Wochen nach der Behandlung ermittelten* Werte”, “die *als HBsAg bezeichneten* Virusbestandteile”, and “in einer *auf ihren Smartphones installierten* App”. The

corresponding English passages are “the data collected [...]”, “electrical signals *produced* by the heart”, “the websites *listed* at the end of this summary results”, “the doses and combinations of trial drugs *used* in this trial”, “the highest doses *that could be safely given to participants*”, “a needle *put* into their vein”, “the scores *from before treatment and after 24 weeks of treatment*”, “virus particles *called* HBsAg”, and “on an app *installed* on their smartphone”. As may be noticed, almost all English ST segments contain bare passives.

For Italian, an even higher number of postnominal attributes expressing passivity was found (220 occurrences). Some instances are “una proteina *chiamata* alanina aminotransferasi o ALT” and “tipo di eventi avversi *riferiti* durante lo studio”. The corresponding ST phrases are “protein [...] *called* alanine aminotransferase or ALT” and “types of adverse events *reported* during this trial”, thus bare passives, as well. The increase in this type of construction is quite remarkable (220 vs 152); in many cases, it was due to additions in the TTs. Some instances are the following: “[...] un farmaco chiamato bevacizumab (‘farmaco dello studio’) *somministrato* a persone affette da cancro)”, “dopo il trattamento di bevacizumab *assunto* nel primo studio”, “i risultati *ottenuti* dallo studio”, “siti Internet *elencati* alla fine del riepilogo”, whose ST passages are “This study was done to find out what effects, good or bad, a medicine called bevacizumab (the ‘study medicine’) has on people with cancer”, “after treatment with bevacizumab in the first study”, “the main results from the study”, and “websites at the end of this summary”. Another (rarer) typology consists of the transformation of prenominal attributes into postnominal attributes, as in “their *assigned* treatment”, rendered as “il trattamento *assegnato*”. There were also several cases of passivization of active English constructions, as in “Primo paziente *arruolato* nello studio di estensione”, “In questa sezione trattiamo tutti i problemi medici *manifestati* dalle persone”, and “I pazienti *trattati* con BVS857 hanno evidenziato un aumento della massa muscolare delle cosce rispetto ai pazienti *trattati* con placebo?”. The corresponding English ST segments are “First patient *entered* extension study”, “Here, we talk about all medical problems that the people *had* during the study”, and “Did patients who *got* BVS857 have more muscle in their thighs than patients who *got* the placebo?”. In particular, recourse to the postnominal attribute *trattato* was fairly frequent.

It has been mentioned that prenominal attributes are typical of the German language (*Linksattribute*). As may be deduced from the instance presented above for the transformation of English prenominal attributes into Italian postnominal attributes, these constructions occur also in English. However, their distribution is far more limited than that of *Linksattribute*, since – unlike English postnominal attributes – they cannot be expanded to reach a high degree of complexity (cf. Fabricius-Hansen 2010: 5). Only 11 occurrences of English prenominal attributes were found in the texts. Some instances are “an *inhaled corticosteroid*”, “*fixed doses*”, “*poorly controlled asthma*”, “number of *expected doses*”, and “*approved drugs*”.

In Italian, only 2 occurrences of prenominal attribute were detected. Both involve *suddetto*, have a text-deictic function⁸³ and are characterized by a high degree of grammaticalization: “[...] arruolare altri pazienti nel *suddetto* gruppo” and “Al termine di *suddetti* studi”. The corresponding ST segments are “[...] enrol more patients in *this group*” and “At the end of *those* studies”. Both Italian prenominal attributes are thus instances of translations where the register has been raised.⁸⁴ The overall low frequency of prenominal attributes in Italian is not surprising; among others, Mortara Garavelli (2001: 166) noted that participles are “heavier” attributes which tend to be postponed rather than introduced in a prenominal position.⁸⁵

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83 One instance of past participles with a text-deictic function that occupy a postnominal position in lieu of their usual prenominal position was also found in the texts: “In aggiunta ai farmaci dello studio *summenzionati*” (with the ST segment “In addition to the trial drugs *above*”). Clearly, it was counted among the postnominal attributes.

84 Ondelli (2014: 32–33) noted that prenominal past participles are one of the distinctive traits of the legal language. In a corpus analysis in the legal field, he compiled a list of such participles which includes the following instances: *detto*, *citato*, *siffatto*, *suddetto*, *menzionato*, *suesposto*, *predetto*, *summenzionato*, *succitato*, *anzidetto*, *richiamato*, *descritto*, and *precitato* (ibid.: 35).

85 This occurred also in the translation of the English prenominal attributes mentioned above: just to mention a few, “*dosi attese*”, “*farmaci autorizzati*”, as well as “*asma scarsamente controllata*”. In the translation of the technical term *inhaled corticosteroid*, the Italian version (“*corticosteroide per via inalatoria*”) contains an adverbial phrase.

4.4 Discussion

As expected, the English layperson summaries show a prevalence of active sentences, with a mean percentage of 78.86% of these structures against a mean percentage of 21.14% of passive sentences. As for the translated subcorpora, the percentage of passive sentences shows a slight increase in the Italian texts, while it decreases slightly in the German ones. However, there are remarkable differences between the percentages of some pharmaceutical companies: the decrease of passive forms in the German subcorpus is attributable to the tendency not to passivize in the translated texts of the pharmaceutical company Bayer (whose texts are those with the lowest percentage of passive sentences in all three languages compared to the other pharmaceutical companies). In fact, if the texts by Bayer are not considered, the German TTs show an increase of passive sentences, too. This aspect is even more remarkable considering that the cases of *Zustandspassiv* were not counted in the first section of analysis. If this had been the case, the discrepancy between the German and English texts would have been even higher, since the semantic difference between statal and processual passives is not marked morphologically in the English language – both are rendered through the auxiliary *be* and therefore counted by the software *Analyze My Writing*.

Overall, the results of the Italian subcorpus and those related to the German texts of the pharmaceutical companies GSK, Novartis, and Roche contradict the Translation Universal of Simplification (see for instance Baker 1993; Mauranen & Kujamäki 2004). Nevertheless, as mentioned in 4.1.2, some studies (like Bisiada 2019) already showed that there is a tendency to passivize active constructions in translation.

Other constructions which are not recommendable in simplified language variants were found in the texts. This applies for instance to impersonal sentences, whose use in Easy Language is discouraged by Sciumbata (2022: 49–50), as they do not clarify whom or what the verb refers to. An even clearer instance is provided by gerundive constructions in German, which should be expressed through less complex structures.

Another aspect to consider is that passivization in translation is often accompanied by deagentivization; this, however, impacts negatively on the

interpersonal function of language, since in the ST explicitly mentioning the agent (such as *doctors, researchers, trial staff*, etc.) helps build trust and increase authoritativeness.

5 Nominalization

The second morphosyntactic feature which will be analyzed is nominalization, which, as will be shown in Section 5.1, has a significant impact on text comprehensibility.

5.1 Theoretical framework

Verbs and nouns are sometimes regarded as part of a continuum, which, as Janda (2015: 619) points out, “overlaps formally [...] in the existence of deverbal nouns (such as *a look*) and noun-to-verb derivation or conversion (such as *to calve*)”. This continuum will be looked at in more detail in the present chapter.

5.1.1 The nominalization phenomenon

Comrie and Thompson (2007: 334) define nominalization as “a process by which something turns into a noun” and point out that in such process “a functional change takes place from one lexical category to another, the noun category”. According to Gaeta (2002: 20, my translation), nominalization is a “transcategorization or transposition from any lexical class to the noun class”. Givón (2016: 272) points out that nominalization is an “at least initially [...] diachronic process via which a finite verbal clause – either a complete clause or a subject-less verb phrase – is converted into a noun phrase”.

Nominalization is also an instantiation of the grammatical metaphor postulated by Halliday (1985), which is of paramount importance in scientific discourse. This phenomenon may be defined as “an alternative lexico-grammatical realization of a semantic choice” (Ravelli 1985: 55) or as the “realization of a meaning in an atypical lexicogrammatical form” (ibid.: 4), where processes are re-construed as nouns instead of verbs.

Comrie and Thompson (2007) divide lexical nominalization into action/state and participant nominalization. In this dichotomy, action/state nominalizations consist in *nomina actionis*, while participant nominalization

includes agent, patient, and instrument (thus *nomina agentis*, *nomina patientis*, as well as *nomina instrumenti*).

5.1.2 Nominalization and deverbalization in LSPs

Languages for Specific Purposes are characterized by the presence of what Halliday (1990: 57–58) calls “a typical syndrome of grammatical features”. Among these, the most important one is arguably nominalization (cf. for instance Garzone 2020: 78 and Cortelazzo 1990). Other scholars who stress this aspect in LSPs are Sager et al. (1980: 219–222), Magris (1992: 67–68), Kalverkämper (1998: 36), Roelcke (1999: 81–83), Scarpa (2008: 41–44), as well as Borgwaldt and Sieradz (2018: 69).

In LSPs, nouns have a higher frequency than verbs. According to Hoffmann (1998d: 424–425), verbs make up only about 10–14% of writing, while nouns and adjectives approximately 50 to 60%.⁸⁶ The reason why nouns and adjectives prevail over other PoS categories is that they are needed to denominate objects and phenomena that are paramount in specialized discourse. Specialized vocabulary also consists mainly of nouns (which can be modified by other nouns or adjectives), although verbs in LSPs are also characterized by a tendency towards terminologization. In another study, Hoffmann (1985: 139) states that verbs are the fourth most frequent PoS category in LSPs, following nouns, adjectives, and even prepositions. In literary prose, their frequency is second only to that of nouns. As for the language of medicine, Sager et al. (1980: 234) provide percentages similar to the ones listed above. According to these scholars, nouns make up around 44% of PoS lemmas in a medical text, while in general language this percentage is 28%. If adjectives are also considered along with nouns (as they are the most frequent components of noun phrases), their percentage reaches the one mentioned by Hoffmann (1998b: 193), i.e., 60%.

The predominance of nouns and adjectives in specialized discourse due to their important role as meaning carriers is stressed also by Buhlmann and Fearn (2000: 19) as well as by Magris (1992: 67–68). Verbs are too vague for the exact definitions needed by scientists, while nouns may be followed by

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86 In another article by this author (Hoffmann 1998b: 193), the percentage of nouns and adjectives is said to be on average 60%.

precise measurements and values. In addition, nouns are more easily modified than verbs and can therefore convey more content. Verbs and adjectives are often nominalized; deverbalization is often a consequence of this phenomenon. Sometimes verbs are eliminated altogether, in other cases they lose meaning and merely serve to connect noun phrases (Möhn & Pelka 1984: 48, qtd. in Magris 1992: 68). Some of these “semantically neutral” verbs are *essere*, *avere*, *dare*, *fornire*, *ottenere*, *produrre*, *comportare*, *implicare*, *aumentare*, *diminuire*, *restringere*, *limitare*, *portare a*, *essere dovuto a*, and *derivare da*. Deverbalization (and consequently nominalization) often consists in the replacement of specific verbs with others that have a more general meaning followed by a noun (so-called support verb constructions), such as *effettuare un’analisi* rather than *analizzare* (ibid.). In the same line, Scarpa (2008: 43) states that verbs in LSPs “lose power” and often have the role of a copula. She then lists some typical verbs used in scientific discourse to indicate processes and relations (such as *causare*, *comportare*, *follow*, *be due to*, *provare*, *indicare*, *suggest*, and *show*), the verbs *essere* and *be*, copulative verbs (such as *costituire*, *equivalere*, *consist of*, and *mean*), and stative verbs (*essere posizionato* and *be limited to*). In some cases, the verb *be* plays a particular role in definitions (so-called “equative be”, cf. Roncaglia et al. 1986: 67) and creates a relation between subject and predicate which corresponds to a mathematical equation. Similarly, Garzone (2020: 82–83) states that nominalization is connected to a reduction of the semantic load carried by verb forms; such “semantically empty verbs” are for instance *be*, *happen*, *take place*, and *represent* in English, and *essere*, *avvenire*, *costituire*, *svolgere*, *rappresentare*, and *realizzare* in Italian. In some cases, there is a shift of logico-semantic relations to the verb form (as occurs for example with *cause*, *follow*, *depend on*, *lead to*, *result in*, *causare*, *derivare*, *risultare*, *determinare*, *dipendere*, *essere subordinato a*, etc.); in other instances, these relations are expressed by a nominal predicate (as occurs with nouns like *result*, *consequence*, *cause*, and *indication*, or *conseguenza*, *causa*, etc.). In a similar vein, Hoffmann (1998b: 195, 1998d: 423) points out that verb phrases are often desemantized, which leads to the creation of support verb constructions, or German *Funktionsverbgefüge* (*Spannungsprüfung ausführen* instead of *Spannung prüfen*, *Minderung erbringen* instead of *mindern*, *Möglichkeit eröffnen* instead of *ermöglichen*, *Anwendung finden* instead of *angewendet*

werden, etc.). According to him, the advantage of these constructions is that nominal elements are more easily modified by attributes than verbs by adverbs, which also plays a role in syntactic compression. He also points out that the last phase of deverbalization is the use of the auxiliary verb *sein* as a copula between noun phrases, as occurs in definitions. The role of *Funktionsverbgefüge* in German specialized discourse is discussed also by Roelcke (1999: 81–82), who stresses the variety of aspects and modalities that such constructions can express (see for instance *konstruieren* vs *eine Konstruktion durchdenken/durchführen/vornehmen/veranlassen*). According to this author, the typological interpretation of these constructions lies in the differentiation between syntheticity and analyticity, since they contribute to the increase of analyticity in LSPs compared to standard language. He also points out that nominalizations in special languages consist mainly of deverbal forms. The same is highlighted by Garzone (2020: 78), who stresses that nominalization usually derives from “de-verbal forms functioning as *nomina actionis*”, and that these forms – unlike for example deadjectival nominalizations – have a major impact on textual organization. Similarly, Wellmann (1975: 210) states that most abstract nouns derive from verbs (in 62.2% of cases, according to his calculation); the second most frequent class consists in deadjectival abstract nouns (28.7%), while participles and other nouns play a less relevant role (5.2% and 3.9%, respectively). Mattiello (2010: 132) also points out that “[t]he head noun of the nominalized noun phrase is normally related morphologically to a verb, either as a derived deverbal noun [...], or as a converted one”, while deadjectival nouns are not as important.

The functions of nominalization in LSPs are often discussed by linguists. Syntactic compression has already been mentioned above (Hoffmann 1998d: 423). More specifically, Hoffmann refers to Kaehlbrandt (1989: 34), who points out that syntactic synonymy is achieved mainly through syntactic condensation, i.e., through constructions that “compress” other structures, which are more explicit. For instance, a certain content can be conveyed by means of a dependent clause or another type of structure. In the latter case, the finite verb is replaced by abbreviating forms like nominalizations, appositions, participial constructions, etc. Linguistic economy is also discussed by Göpferich (1998: 553) as one of the advantages of nominalization. Similarly,

Oksaar (1998: 399–400) states that nominalization enables condensation, objectivity, as well as anonymity. The latter aspect is considered also by Roelcke (1999: 81) as the most important function of nominalization, since it achieves abstraction from the people or objects that are referred to.⁸⁷ In the same line, Piro (2022: 81) highlights that nominalization enables deagentivization (and consequently abstraction and objectivity), common in LSPs. Other functions are referred to by Borgwaldt and Sieradz (2018: 69), who mention precision and explicitation, and further cite Fluck (1996: 56), who in turn states that the use of nominalization (and other constructions) in LSPs is due to functional reasons, as it helps achieve expression economy and a clearer representation of facts and thoughts. The capacity to express precision and represent facts and thoughts clearly is actually what Hoffmann (1998b: 193, mentioned above) refers to as he points out that nouns are more important than verbs in LSPs due to their role in denominating objects and phenomena. All these scholars therefore refer to the denotative function of nouns that is self-evidently one of the main characteristics of LSPs in general. The functions of nominalization are also discussed by Scarpa (2008: 41–42). According to her, this phenomenon is due to both stylistic and functional reasons, since it enables the concise organization of discourse, with conceptual richness and a synthetic and compact syntax. It also meets the need for technicity and describes the complexity of a dynamic and concrete world in an abstract and static way. Another advantage of nominalization is the capacity to thematize new information at the beginning of a sentence and to confer more objectivity from the writer's perspective. This topic is also discussed in detail by Garzone (2020: 78–90), who highlights that nominalization guarantees concision and efficiency, as it

tends to shift hypotactic relations from clause-complex level to noun-group level, also contributing to simplifying the organization of clauses within the sentence. Recourse to complex noun groups makes it possible to pack into a single clause or into a limited number of clauses

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 87 According to him, on the contrary, linguistic economy is rarely achieved through nominalization and *Funktionsverbgefüge*.

a quantity of meaning which otherwise would have required numerous clauses, organized into an intricate hypotactic or paratactic complex. (ibid.: 86–87)

Since nominalization allows for the omission of information (such as the subject of a given action), its wide use in LSPs is often a consequence of “a general tendency of specialized texts to avoid that the assertion of a hypothesis, of a rule, of an evaluative stance should be subordinate to an explicitly expressed epistemic subject” (ibid.: 89). The nominal style thus provides conference of objectivity and universality to the findings that are reported.⁸⁸ This aspect is also linked to de-personalization, which can be regarded as a hedging strategy. Finally, Garzone (ibid.: 79–80) also stresses that the nominal style confers “a typically expert flavour on a text”. In this respect, it is interesting to note that Knobloch (1998: 446) goes as far as to state that by using unspecific technical terms and nominalized forms it is possible to simulate scientificity in any discourse, even when talking about holidays or other trivial topics. Similarly, Göpferich (1998: 553) points out that the higher the level of technicality of a text, the higher the number of features like nominalization. From the opposite perspective, Laudisio (2015: 188) notes that one of the main features of the popularization process, in addition to the avoidance of technical terms, is the avoidance of nominalization and noun phrases. Some instances he provides from an analysis of the language of TV series (of the medical drama *Grey’s Anatomy*) are the replacement of the nominal forms *underdevelopment* and *breath capability* with *to be underdeveloped* and *could breathe*, respectively. Another example is the replacement of the more specialized variant “A primary closure was attempted” with the almost colloquial version “We pushed in as much of the bowel as we could” (ibid.: 188–189). Another advantage of nominalization is that it leads to variation in texts, as it avoids repetitions and pleonasms. This is pointed out, among others, by Spranger (1985: 184), who highlights that redundancy may be prevented through nominalization.

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88 This corresponds to the so-called *ich-Verbot* of special languages posited by Weinrich (1989: 132–134), as pointed out by Göpferich (1998: 553).

5.1.3 Cognitive implications of nominalization

One of the consequences of nominalization is an increase in the lexical and semantic density of texts. As Garzone (2020: 79) puts it, “[t]he choice to use nominalizations has the immediate effect of increasing the density of a text by ‘packing’ information (to use Halliday’s expression) into conceptual units”. More specifically,

one of the effects of recourse to a nominal style is a substantial increase in the lexical and semantic density of texts, i.e. an increase in the relative frequency of lexical elements within the sentence, measured as the number of lexical words in each clause compared to the total number of words. (ibid.: 88)

Also Scarpa (2008: 43–44) points out that one of the main consequences of the nominal style is the high lexical density typical of special languages. In English scientific discourse, it can be as high as 13 lexical items per sentence against 2 lexical items per sentence in general language. The frequency of nominal phrases can therefore be used to determine the level of technicality of a text. Since noun phrases convey most information, one of the negative consequences of lexical density is a high semantic complexity that can impact on a text’s clarity and make it more opaque to readers.

Another – in the case of language simplification negative – consequence of nominalization, already mentioned in 5.1.2, is its abstraction and depersonalization. As Garzone (2020: 88) points out,

[r]ecourse to a nominal style also has a number of discursive consequences. Above all, when nominalization is used, there is no need to indicate the subject of a given action, nor is it necessary to express tense and mood, as it would be if a verb form was used.

Furthermore, the relations between nouns are not always as clear as relations expressed by clauses or other constructions (cf. Magris 1992: 52–53). Therefore readers must make more inferences, as nominalization results in a higher

degree of implicitation. Another interesting aspect is the polysemy of nominal forms, highlighted by Spencer (2004: 1260):

English has no systematic way of distinguishing between nominalizations representing events or processes and those representing results or states. Thus, it is not uncommon to encounter polysemy of the type shown by the word *construction*, which can mean ‘act of constructing’, [sic] (*the construction of the dam took two years*), ‘abstract result’ (*the construction of the dam cost millions*) [sic] ‘concrete result’ (*the construction is eighty meters high*), ‘manner’ (*the construction of the dam is very unusual*) (cf. Bauer 1983: 185–189).

Similarly, Pierini (2012: 112) highlights the polysemy of some Italian nominalizations. She analyzes for instance the noun *rapimento*, which in some cases expresses the “action of X” and in others the “result of action X”. She therefore concludes that “the meaning of the suffix *-mento* is more a matter of the context in which the nouns occur than of any inherent meaning of the suffix”, whereas other suffixes are only resultative (e.g., *-ura*).

Another interesting aspect related to the implications of nominalization is highlighted again by Scarpa (2008: 44), who mentions the connection between grammatical metaphor and ideology individuated by Halliday (1998: 228). From the point of view of the interpersonal metafunction of language, grammatical metaphors aim at creating as much distance as possible between writer (expert) and reader (non-expert). Similarly, Mattiello (2010: 143) states that, while nominalization is a useful linguistic device for specialists since it leads to information condensation and textual cohesion by “facilitating stable reference to technical concepts already mentioned”, it may cause comprehension and accessibility issues for non-specialists. So, “the complexity of nominalization can be viewed as a means to maintain cohesion among the members of the specialist community and, as a consequence, to exclude outsiders” (ibid.: 144).

5.1.4 Cross-linguistic and translational perspective

Hansen-Schirra et al. (2009: 109) point out that German is considered to have a more marked nominal style and in general to be more complex than English with respect to phrase structure. In the same vein, Bisiada (2018: 38) states that nominalizations “are the most frequent part-of-speech shift in translations from English to German”, since the latter language is characterized by a stylistic preference for the nominal style in many genres.⁸⁹ In his corpus analysis, he examines the editing of business articles translated from English to German with respect to nominalization and de-nominalization: interestingly, while translators tend to nominalize, editors often reverse this process. His hypothesis was that “nominalisation is more likely to be reverted if the sentence is considered to be difficult to understand, for instance, due to high nominal density” (ibid.: 40), since readability is one of the factors influencing editor’s decisions. This hypothesis proved to be right, as his data

all indicate[s] a marginally higher information density of the sentences where the nominalisation [sic] was reverted. While that difference is by no means the only explanatory factor of reverbalisation, it is possible that a trained editor’s eye will notice that difference in informational density and thus make simple or more extensive changes to increase the readability of the sentence. (ibid.: 41)

Bisiada tries to explain these trends assuming that

the translators of the articles in this corpus have worked with a strict linguistic focus on individual sentences (which may be increased by the segmentation approach of CAT tools), while the editors may give greater consideration to the text as a whole. The translators may thus be affected to a greater extent by the academic nature of the source texts, which conventionally favours a nominal style in German, while the editors in this case incorporate popularising strategies. (ibid.: 46)

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89 Cf. for instance Göpferich (1995: 420–421) and Fabricius-Hansen (1999: 203), qtd. in Bisiada (2018: 39).

It is also interesting to note that in cases where editors nominalized the TT, extensive changes were visible and adaptations to target language conventions were often found. Also noteworthy is that the two most noticeable construction types in which only the reverb-alization had been changed by the editor are *Funktionsverbgefüge* and *Finalangaben*, which are “constructions expressing purpose using the preposition *zu* and a noun” (ibid.: 43). Some instances of nominalization and de-nominalization operated by the editors are the following triplets: “lack” > “stehen nicht zur Verfügung” > “fehlen” and “coordinate” > “zur Koordination” > “um ... zu steuern”. According to Bisiada, *Funktionsverbgefüge* and *Finalangaben* represent “a likely trigger for a ‘ready-to-use’ reverb-alisation”, meaning that this process may be an automatism for editors.

In a similar vein, Krein-Kühle (2003: 87–160) analyzes syntactic equivalencies in scientific and technical translation between English and German. Among the constructions considered, infinitive clauses are of particular interest for the present examination. Her main finding is that “29% of all the infinitives counted in the corpus are nominalized in translation” (ibid.: 106), with either the *-ung* suffix or through conversion (“substantive infinitives”), or with *Funktionsverbgefüge*. In particular, the most important subcategory of infinitive clauses consists of those expressing purpose, which “account for 44% [...] of all infinitives counted and represent the only infinitive construction in the ST under analysis to occur frequently enough to yield statistically corroborated findings” (ibid.: 91). Here, a further subcategory (“regular infinitive clauses of purpose”) shows even more remarkable results with respect to nominalization, with 56% of English clauses rendered as *zur* or *für* and abstract noun, 9% as other nominal forms, and only 35% as infinitive clauses with *um ... zu*. One instance she provides is “To simulate an integrated two stage process” with the corresponding TT “Zur Simulierung eines integrierten Zweistufenverfahrens”. According to Krein-Kühle, this is because abstract nouns are a very frequent and highly productive feature in German special languages, as they designate continuous activities but also denote the completion, result, or means of the activities. She also points out that

the level of abstraction may change - [sic] the sense remaining unchanged - [sic] when subordinate clauses/reduced clauses are translated into German (Frank 1980: 65). Like the German infinitive construction with *um* - [sic] *zu*, preposition plus abstract noun is a preferred feature of scientific and technical discourse in German, since it contributes to condensation of meaning by eliminating finite subordinate clauses, as infinitive clauses do in English. Moreover, prepositional phrasing meets the register requirement of a higher level of abstraction in the TL. (ibid.: 95)

For the language pair English-Italian, Mattiello (2010: 144) points out that Italian shows a greater tendency towards a nominal style than English. This can also be observed in translated texts, as English TT translated from Italian tend to de-nominalize (ibid.: 134). According to Mattiello (ibid.: 134–135), this is due in part to the success of the Plain Language movement in English-speaking countries, which is leading to gradual changes. Likewise, Garzone (2008: 61) highlights that nominalization or de-nominalization procedures are among the strategies frequently deployed by translators in the legal field, with the latter being particularly frequent in translations from Italian into English. The opposite procedure, i.e., the shift from non-nominal forms to nominal forms, is rarely observable in translations in this language direction.

Garzone (2020: 78–91) delves into this topic in greater detail in a book concerning specialized discourse and its popularization. Firstly, she states that particular attention should be paid to the rendering of nominalization in scientific and technical translation, although she admits that an advantage is given by the fact that this feature (and all the phenomena associated with it as for textual organization) is found across languages. In particular, Garzone mentions English, Italian, French, Spanish, German, and Russian. She also points out that nominalization is not used very differently in English and Italian, although these two languages do not behave in exactly the same way. She highlights that nominalizations are often found in the Italian standard language, too, far more than occurs in English, where they are rarely used

in informal registers (ibid.: 91–92).⁹⁰ On the contrary, the frequency of nominalization is very similar in LSPs; Garzone points out that in many cases nominalized forms can be translated by maintaining the same clause and sentence organization. In other cases, the syntactic structure of the sentence should be changed altogether, i.e., by nominalizing or de-nominalizing the source text. A shift from a non-nominal form in English to a nominal form in Italian is quite frequent since, as mentioned above,

although specialized discourse in English is characterized by a style which is potentially more nominal than other varieties of this language, in many domains in comparable Italian texts the frequency of nominal constructions (noun phrases or nominal verb forms) tends to be even higher. (ibid.: 93)

Garzone also points out that, in other cases, de-nominalization from English into Italian is necessary or possible. Some instances reported by the author are “*there has been no systematic examination of the impact of humanitarian aid on fertility nor a joint consideration of its effects [...]*”, rendered as “*non è stato esaminato sistematicamente l’impatto degli aiuti umanitari sulla fertilità né sono stati studiati congiuntamente i suoi effetti [...]*” and “*because of severe cut-backs in insurance coverage [sic] for mental illness in recent years*”, which can be rendered either with the nominal form “*a causa dei forti tagli praticati negli ultimi anni alla copertura assicurativa sulla malattia mentale*” or de-nominalized as “*poiché negli ultimi anni la copertura assicurativa per malattia mentale è stata fortemente ridotta*” (ibid.: 93–94).

Garzone also notes that the structural similarity between the two languages often concerns other elements, like complex prepositions that accompany the nominal elements (*because of, a causa di*). The same goes for verb forms (mainly existential verbs with a low semantic load) that collocate with

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90 Similarly, Scarpa (2008: 42) states that Italian not only tends to maintain the nominal style found in the English STs in translation (Balboni 2000: 42), but it also extends it to non-specialized texts. This trend is due not only to the habit of conforming to anglophone textual models, but also to a tendential convergence between different text types in Italian (Dardano 1994: 390).

nominalized elements, which sometimes correspond in English and Italian, as in “for reassortment to occur” and “perché avvenga il riassortimento” (ibid.: 94–95). The similarities cease where English favors collocations with the verb *be*, as Italian tends to use more formally complex existential verbs, such as *avvenire*, *costituire*, *rappresentare*, and *consistere*. One instance is the following: “the key experimental issue is *whether the research methods used were in fact able to measure* [...]”, which can be translated as “il problema sperimentale fondamentale è *costituito dalla effettiva capacità dei metodi di ricerca di misurare* [...]”: the rendition of the verb *be* as *costituire* makes it necessary to nominalize the clause introduced by *whether* in Italian (ibid.: 95). Another case where translators should nominalize the ST construction in order to guarantee a natural-sounding TT is given by English non-finite forms, mainly participles (*-ed* or *-ing* forms). This is particularly true for non-finite forms of verbs which mean *increase* or *decrease*. Some instances are the following: “Maternal seafood intake [...] was associated with *an increased risk* [...]” and “*Increasing pressure* [...]”, which can be translated as “Il consumo materno di pesce [...] è stato associato a *un aumento del rischio* [...]” and “*L’aumento della pressione* [...]”, respectively (ibid.: 97). Another case where nominalizations tend to be favored in Italian is given by indirect interrogative clauses with the adverb *how* followed by an adjective or an adverb or a conjunction like *if* or *whether*. One instance is “Another important cellular function that has been investigated [...] is *how fast cells grow or proliferate*”, which can be translated as “Un’altra importante funzione cellulare [...] è *la velocità di crescita o proliferazione delle cellule*” (ibid.: 97–98). Garzone points out that in this translation the introduction of a nominal form (*la velocità*) requires the nominalization of the other elements, too (*crescita* and *proliferazione*). Sometimes *how* is also translated as *modo*, as in “[...] no matter *how the unemployment issue is addressed*”, rendered as “[...] indipendentemente dal *modo in cui il problema della disoccupazione viene affrontato*”. Similarly, indirect questions introduced by *whether* or *if* can be translated with nominal forms, as in “[...] to determine *whether electromagnetic radiation can damage DNA*”, rendered as “al fine di determinare *la possibilità di danneggiamento del DNA da parte delle radiazioni elettromagnetiche*” (ibid.).

5.1.5 Nominalization in guidelines for language simplification

In the guidelines for Plain English, Cutts (2020: 77–84) devotes a whole chapter to the need to avoid nominalization, with the telling title “Using vigorous verbs”. He claims that in writing “too often verbs are smothered, all their vitality trapped beneath heavy noun phrases” (ibid.: 77). Some instances he provides for “smothered verbs” are the following: “Commuters don’t apply for a travel pass: they make an application” or “Staff don’t urgently consider a request: they give it urgent consideration” (ibid.: 78). He then goes on to define nominalization as “a noun that *masks* a verb” (my italics) and as part of “a chain of obscurity” that “converts the simple verb *apply* into *applicable*, *applicability*, and *application* [...] until the life has been squeezed from the writing” (ibid.). Overall, he suggests avoiding the nominal style (which he refers to as “smothered-verb style”) by paying attention to three types of constructions containing nominalizations: those linked to *to be* or *to have*, to active verbs or infinitives, or to passive verbs. In particular, he recommends converting “noun-heavy writing” into bullet-point lists (ibid.: 82).

In their manual for *Leichte Sprache*, Bredel and Maaß (2016a: 498–500) highlight that complex nominal constructions are capable of presenting events concisely, but often omitting the agent. While these constructions can be rendered as clauses in standard language, this cannot be done in *Leichte Sprache*. The right strategy here is to turn the complex nominal structures into a series of juxtaposed sentences (often with the addition of further explanations). This *modus operandi* has an impact on the thematic structure of the text, on information focus and on text length, as more words and sentences are needed to express the content of the nominalized, concise forms. This corresponds to the *Leichte Sprache* tenet of analyticity as opposed to syntheticity (see also ibid.: 520).

In his Plain Language guidelines, Fortis (2003: 12) also recommends against nominalization. He states that verbs should be favored over the corresponding nouns (as in “perché mancano i fondi” rather than “a causa della mancanza di fondi”).

Sciumbata (2022: 51) recommends avoiding nominalization also in *italiano facile da leggere e da capire*. Nominal forms should be avoided because they make texts more abstract and too semantically dense. They also force readers

to “mentally translate” the noun, which represents a state, into a verb, which on the contrary represents an action.

Interestingly, neither the Good Lay Summary Practice (2021) nor the Recommendations of the Expert Group on Clinical Trials 2018) contain any suggestions with respect to the choice between verbs and nouns.

5.2 Methodology

The present analysis focuses on deverbal nominalizations, in light of the more important role they play in LSPs (for instance compared to deadjectival nominalizations), as highlighted in 5.1.2. In particular, only *nomina actionis* were taken into account, as the categories of *nomina agentis*, *nomina patientis*, and *nomina instrumenti* were considered to play a less relevant role in the nominalization or de-nominalization of texts.

The analysis is divided into two parts. The first part entails two sections of analysis (5.3.1 and 5.3.2) conducted by means of Sketch Engine on the whole corpus. The second part of analysis (5.3.3) was conducted by observing the smaller selection of 30 texts (with 10 texts for each language).

In Section 5.3.1 the nouns containing nominalizing suffixes are considered and compared in order to determine how many cases of nominalization occur in the three languages. One limitation is that only nominalizations formed through derivation are taken into account. This is because other categories of word formation are not easy to detect quantitatively. For instance, English nouns formed by conversion⁹¹ are difficult to spot through Sketch Engine,

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91 There is no full consensus on the meaning of the term *conversion*. In this work, the following definition is taken as a starting point: “[c]onversion normally involves changing a word’s syntactic category without any concomitant change of form, as in the creation of the verb *humble* from the adjective *humble* or of the noun *attempt* from the verb *attempt*” (Bauer & Huddleston 2002: 1640). Some linguists regard conversion and zero-affixation (or zero-suffixation, zero-derivation) as a single phenomenon (cf. for instance Crocco Galèas 1991). However, this approach is criticized *inter alia* by Iacobini and Thornton (1992: 29–31) as well as by Bauer and Huddleston (2002: 1641). In particular, Bauer and Huddleston state that this way of looking at the phenomenon is unsatisfactory, as the point of conversion is that “there is no affix at all, not that there is an abstract or covert affix”. In the same line, in this work

as they do not contain a suffix that signals them. German and Italian nouns deriving from conversion are easier to spot (e.g., by looking for the verb desinence *-en* in German among the list of nouns provided by Sketch Engine). However, in order to make the comparison possible, conversion was not taken into account in these two languages, either.

Firstly, a list of nominalizing suffixes which have verbs as bases was compiled by drawing on lists of suffixes indicated in some grammars (Bauer & Huddleston 2002: 1700–1706; Duden 2016: 722–753), a volume about the word formation of nouns (Wellmann 1975), as well as an article containing a contrastive analysis of nominalization in Italian (Južnič 2015) and another one concerning word formation tendencies in contemporary Italian (Iacobini & Thornton 1992). In English, the nominalizing suffixes which have verbs as bases and were searched for are *-age*, *-al*, *-ance/-ence*, *-ation/-ion/-ition/-sion/-tion/-ution* (considered to be variants of a single form by Bauer & Huddleston 2002: 1701), *-ing*, *-ment*, *-th*, *-ure*, and those ending in *-y* (*-y* and *-ery/-ry*). In German, the analyzed suffixes are *-age*, *-e*, *-(er)ei*, *-ement*, *-enz/-anz*, *-(at)ion*, *-nis*, *-(s)t/d(-e)*, *-tum*, *-ung*, and *-(at)ur*. Nouns entailing zero suffixes and ending in *-(s)t/d(-e)* were also added, as they were found while searching for the corresponding suffixes. Other nouns formed through zero suffixation were not considered due to the excessive noise (as occurs for conversion in English). In Italian, the examined suffixes are *-aggio*, *-anza*, *-eggio*, *-enza*, *-io*, *-ita*, *-ore*, *-mento*, *-sione*, *-ura*, *-zione*, as well as zero suffixes (ending with *-a* and *-o*). The results obtained through Sketch Engine (more specifically, with the function “Wordlist”, by selecting the type of lemma “noun” and “ending with”) were then cleaned to get rid of noise.

In Section 5.3.2, some case studies are examined. These include the analysis of the occurrences of some nouns – selected among those with a high frequency – belonging to two different semantic fields. The first regards trial end and involves the nouns *Ende* and *Beendigung* in German as well as *fine* and *termine* in Italian. The second field concerns treatment (and other substances) administered to trial participants and involves the nouns *Einnahme*, *Erhalt*, as

forms like *l'arrestare* (from the verb *arrestare*) will be regarded as instances of conversion, while cases like *l'arrivo* (from the verb *arrivare*) will be labeled as “zero-derivation”.

well as *Verabreichung* in German, and *assunzione* as well as *somministrazione* in Italian. These nouns were examined and compared with the ST segments in order to determine how many of these cases were nominalizations and how many cases were translations of English nominal forms.

Section 5.3.3 reports the trends individuated in the observation of the more limited selection of texts, allowing also for the consideration of the types of nominalization not taken into account in 5.3.1 (e.g., conversion, or phonological modification in English). In particular, a categorization of the most frequent typologies of nominalization will be put forward.

5.3 Analysis

Tables 19, 20, and 21 will show the nouns containing the suffixes listed in Section 5.2. Only the suffixes found in the three subcorpora will be listed. Nominalization and nominal style are a very frequent feature in these texts. One instance of sentence with a remarkable series of noun chains is the following:

En: The difference [...] resulted from the unexpected drop in the amount of thigh muscle in patients who got the placebo and not from a gain in thigh muscle in patients [...].

De: Da der Unterschied [...] aus dem unerwarteten Verlust an Volumen der Oberschenkelmuskulatur bei Patienten resultierte, die das Placebo erhielten, und nicht vom Zuwachs an Volumen der Oberschenkelmuskulatur von Patienten.

It: La differenza [...] è stata determinata dal calo imprevisto della massa muscolare delle cosce nei pazienti trattati con placebo e non da un aumento della massa muscolare delle cosce nei pazienti [...].

5.3.1 Nominalizing suffixes

As mentioned in Section 5.2, this phenomenon was analyzed quantitatively in the corpus by extracting nouns with nominalizing suffixes.

-age	
blockage	19
leakage	2
miscarriage	1
Tot.	22

-al	
trial	3,594
approval	11
survival	3
withdrawal	3
removal	1
Tot.	3,612

-ance/-ence	
defence	3
maintenance	3
disappearance	2
occurrence	2
tolerance	2
appearance	1
reassurance	1
Tot.	14

-ation/-ion/-ition/-sion/-tion/-ution	
reaction	797
infection	95
injection	72
hospitalization	68
combination	66
extension	64

-ation/-ion/-ition/-sion/-tion/-ution	
decision	61
participation	55
inflammation	45
infusion	31
identification	28
exclusion	18
inclusion	18
escalation	16
exacerbation	15
mutation	13
application	11
attribution	11
circulation	11
addition	10
publication	9
randomisation	8
radiation	6
administration	5
contribution	5
ejection	5
occlusion	5
reduction	5
production	4
evaluation	4
hospitalisation	4
dehydration	3
examination	3
expansion	3
progression	3
vaccination	3

-ation/-ion/-ition/-sion/-tion/-ution	
calculation	2
collection	2
complication	2
connection	2
induction	2
irritation	2
operation	2
acquisition	1
action	1
biodistribution	1
conclusion	1
confusion	1
creation	1
cross-vaccination	1
definition	1
discontinuation	1
distribution	1
dose-escalation	1
elevation	1
emission	1
extravasation	1
formulation	1
investigation	1
limitation	1
overreaction	1
presentation	1
prevention	1
randomization	1
recommendation	1
selection	1
Tot.	1,617

-ing	
bleeding	70
listing	32
feeling	14
finding	10
worsening	9
screening	8
vomiting	6
swelling	5
breathing	4
writing	4
beginning	3
stopping	3
monitoring	2
narrowing	2
understanding	2
burning	1
checking	1
cleaning	1
covering	1
functioning	1
living	1
recording	1
sleeping	1
working	1
Tot.	183

-ment	
treatment	1,798
requirement	16
measurement	15
enrolment	9

-ment	
on-treatment	6
improvement	5
assessment	3
impairment	3
movement	2
assignment	1
development	1
replacement	1
statement	1
Tot.	1,861

-th	
death	85
growth	26
birth	4
Tot.	115

-ure	
pressure	30
failure	22
exposure	9
Tot.	61

-y	
summary	818
injury	9
recovery	1
Tot.	828

Tot. EN	8,313
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Table 19: English nouns with nominalizing suffixes

-e	
Frage	276
Einnahme	107
Suche	64
Teilnahme	59
Aufnahme	24
Kontrolle	9
Hilfe	8
Angabe	7
Analyse	5
Diagnose	5
Gabe	4
Gesundheitsfrage	4
Zwischenanalyse	4
Abnahme	3
Medikamenteneinnahme	3
Röntgenaufnahme	3
Umfrage	2
Zunahme	2
Annahme	1
Aussage	1
Gewichtszunahme	1
Magnetresonanztomographie-Aufnahme	1
Stichwortsuche	1
Videoaufnahme	1
Tot.	595

-enz	
Adhärenz	7
Patientenadhärenz	4
Tot.	11

-(at)ion	
Kombination	70
Infektion	64
Reaktion	50
Injektion	49
Operation	29
Infusion	24
Injektionsstelle	14
Augeninjektion	13
Ejektionsfraktion	13
Blutzirkulation	11
Mutation	11
Exazerbation	10
Lungeninfektion	9
Expositionstage	8
Identifikationsnummer	8
Medikamentenkombination	8
COPD-Exazerbation	7
Dosis-Eskalation	6
Extensionsstudie	5
Dosis-Eskalations-Studie	4
Evaluation	4
Hand-Fuß-Hautreaktion	4
Harnwegsinfektion	4
Komplikation	4
Reduktion	4
Arzneimittelkombination	3
Expirationsvolumen	3
HBV-Infektion	3
IV-Infusion	3
Knochenmarkstransplantation	3
Pilzinfektion	3

-(at)ion	
Produktion	3
Placeboinjektion	2
Rekonstitution	2
Risikoreduktion	2
V600-Mutation	2
BRAFV600-Mutation-positiv	2
Immuntoleranzinduktion	2
Abwehrreaktion	1
Antikörperreaktion	1
Atemwegsinfektion	1
Bay-1862864-Injektion	1
Biodistribution	1
Blutinfektion	1
BRAFV600-Mutation-positiv	1
Chemotherapie-Kombination	1
Definition	1
Dosis-Eskalationsstudie	1
Dosis-Eskalations-Studium	1
Eskalation	1
Expositionstag	1
Extension	1
Fixkombination	1
Hautinfektion	1
Hautreaktion	1
Hefeinfektion	1
Hepatitis-B-Virus-Infektion	1
I-Dosis-Eskalations-Studie	1
Immunreaktion	1
Impfstoffinjektion	1
infusionsbedingt	1
Infusionsstelle	1

-(at)ion	
Insulinproduktion	1
Krankheitsprogression	1
Leberinfektion	1
Limitation	1
Mehrfachdosis-Eskalations-Studie	1
Meningokokken-Infektion	1
Nierentransplantation	1
Nutrition	1
Phase-I-Dosierung-Eskalations-Studie	1
Phase-I-Dosis-Eskalationsstudie	1
Phase-I-Eskalations-Studie	1
Positronen-Emissions-Tomographie	1
Progression	1
Publikation	1
Standardkombination	1
Studieninjektion	1
Tumorprogression	1
Überreaktion	1
Vaginalinfektion	1
Zweifach-Fixkombination	1
Tot.	510

-nis	
Ergebnis	1,085
Ereignis	1,007
Studienergebnis	69
Gesamtergebnis	63
Hauptergebnis	43
Erkenntnis	23
Forschungsergebnis	13
Prüfungsergebnis	7

-nis	
Bedürfnis	5
Sicherheitsergebnis	4
Testergebnis	3
Blutungsereignis	2
Empfängnisverhütung	2
Verständnis	2
Augentestergebnis	1
Endergebnis	1
Ergebnisbericht	1
Haupterkennnis	1
Kenntnis	1
Medianergebnis	1
Regorafenib-Ergebnis	1
RNV-Ergebnis	1
Verhältnis	1
Zufallsergebnis	1
Tot.	2,338

-(s)t/d(-e)	
Ansicht	117
Geburt	67
Übersicht	8
Herkunft	3
Fehlgeburt	1
Tat	1
Tot.	197

-tum	
Wachstum	21
Tumorstadium	10
Krebswachstum	3

-tum	
Zellwachstum	3
Gewebewachstum	2
Wachstumsfaktor	2
Tot.	41

-ung	
Prüfung	2,731
Behandlung	1,526
Nebenwirkung	1,104
Zusammenfassung	832
Forschung	211
Dosierung	203
Krebserkrankung	199
Verbindung	190
Wirkung	178
Blutung	129
Anwendung	82
Behandlungsgruppe	71
Behandlungsmethode	71
Untersuchung	71
Behinderung	66
Einweisung	65
Behandlungsmöglichkeit	62
Forschungsprojekt	56
Erkrankung	55
Veränderung	53
Nierenerkrankung	49
Verschlechterung	49
Änderung	48
Beantwortung	46
Erstellung	46

-ung	
Auswirkung	43
Verwendung	39
Entzündung	38
Verfügung	36
Durchführung	32
Entdeckung	32
Monatsblutung	30
Abbildung	29
Verabreichung	29
Entscheidung	27
Rekrutierung	26
Meinung	26
Behandlungsentscheidung	25
Behandlungsphase	23
Verlängerungsstudie	20
Erweiterung	19
Behandlungszyklus	18
Fragestellung	17
Lungenerkrankung	17
Versorgung	17
Verlängerung	16
Studienbehandlung	15
Erkältung	14
Gesundheitsversorgung	14
Krebsbehandlung	14
Bildung	13
Blockierung	13
Forschungsergebnis	13
Schwellung	13
Bewertung	12
ESA-Behandlung	12

-ung	
Nierenschädigung	12
Prüfungstitel	12
Standarddosierung	12
Überprüfung	12
Voraussetzung	12
Bedingung	11
Haftung	11
Lungenentzündung	11
Messung	11
Nennung	11
Verstopfung	11
Zulassung	11
Beurteilung	10
Einwilligungserklärung	10
Leberschädigung	10
Verhütungsmittel	10
Zufallerscheinung	10
Ausbreitung	10
Behandlungsgerät	9
Behandlungswoche	9
Formulierung	9
Lebererkrankung	9
Randomisierung	9
Veröffentlichung	9
Verschreibung	9
Beeinträchtigung	8
Behandlungsende	8
Prophylaxebehandlung	8
Rötung	8
Studienbezeichnung	8
Übersetzung	8

-ung	
Verhinderung	8
Beendigung	7
Prüfungsergebnis	7
Rückbildung	7
Sicherheitsnachbeobachtung	7
Verbesserung	7
Verschlimmerung	7
Altersverteilung	6
Bedarfsbehandlung	6
Behandlungsplan	6
Blutungsrisiko	6
Flüssigkeitsansammlung	6
Forschungsstudie	6
GOV-Kennung	6
Nachbeobachtungsphase	6
Schädigung	6
SLE-Behandlung	6
Standardbehandlung	6
Verringerung	6
1217389-Dosierung	5
Bedeutung	5
Behandlungsbeginn	5
Behandlungstag	5
Berechnung	5
Bevacizumab-Behandlung	5
Bezeichnung	5
Erhöhung	5
Ermittlung	5
Erprobung	5
FVIII-Behandlung	5
Gerinnungsfaktor	5

-ung	
Lösung	5
Nachbeobachtung	5
Abschlussuntersuchung	4
Ansammlung	4
Autoimmunerkrankung	4
Bestimmung	4
Blutgerinnungsfaktor	4
Empfindung	4
Entfernung	4
Impfstoffformulierung	4
Reizung	4
Steigerung	4
Verletzung	4
Voruntersuchungsphase	4
Wucherung	4
Behandlungsabbruch	3
Behandlungszeitraum	3
Bildgebung	3
Dosis-Erweiterung	3
Erhaltungstherapie	3
Eudract-Zusammenfassung	3
Gelenkerkrankung	3
Impfung	3
Kopfverletzung	3
Kreislaufkrankung	3
Mineraleinlagerung	3
Nahrung	3
Nierenfunktionsstörung	3
Standardversorgung	3
Störung	3
Studiendurchführung	3

-ung	
Überwachung	3
Voruntersuchung	3
Augenerkrankung	3
Auswertung	3
Anhäufung	2
Asthmabehandlung	2
Auffassung	2
Auflistung	2
Aufzeichnung	2
Behandlungsdauer	2
Behandlungsform	2
Behandlungsunterbrechung	2
Behandlungszeitraum	2
Berührung	2
Bestrahlung	2
Betrachtung	2
Bewegung	2
Bewertungsskala	2
Blutgerinnung	2
Verengung	2
Zuweisung	2
Blutungseignis	2
Blutvergiftung	2
Dehydrierung	2
Dosisfindungsstudie	2
Einführung	2
Einleitungsphase	2
Empfängnisverhütung	2
Erfahrung	2
Erinnerung	2
Erkältungssymptom	2

-ung	
Erstbehandlung	2
Erweiterungsteil	2
Fettlebererkrankung	2
Freisetzungsrate	2
Funktionsstörung	2
Hautschwellung	2
Heilung	2
Identifizierungsinformation	2
Kennung	2
Krankenhausbehandlung	2
Lähmung	2
Leberentzündung	2
Nachverfolgung	2
Nahrungsmittel	2
Narbenbildung	2
Peritonealdialyse-Behandlung	2
Planung	2
Reduzierung	2
Roche-Niederlassung	2
Schmerzbewertung	2
Sicherheitsnachbeobachtungsphase	2
Strahlung	2
Verdeutlichung	2
Abkürzung	1
Abschwächung	1
Absiedelung	1
Abtötung	1
Allergiebehandlung	1
Amyloid-Bildung	1
Anämiebehandlung	1
Anti-Krebs-Behandlung	1

-ung	
Anweisung	1
Atmung	1
Atmungsorgan	1
Auskleidung	1
Ausscheidung	1
Austrocknung	1
Bauchspeicheldrüsenentzündung	1
Behandlungsdosierung	1
Behandlungsdosis	1
Behandlungs-Gruppe	1
Behandlungslinie	1
Behandlungsoption	1
Behandlungsperiode	1
Behandlungsperiode	1
Behandlungsstrategie	1
Behandlungstyp	1
Behandlungsunterbrechungsphase	1
Behandlungszeitplan	1
Behandlungszeitpunkt	1
Beschreibung	1
Betreuungsperson	1
Bewältigung	1
Fevipirant-Behandlungsgruppe	1
Flüssigkeits-Ansammlung	1
Forschungsassistent	1
Forschungsassistentin	1
Forschungssponsor	1
Fortsetzung	1
Freisetzung	1
Funktionseinschränkung	1
FVIII-Ersatz-Behandlung	1

-ung	
Gelenkentzündung	1
Genehmigung	1
Geruchsbeurteilung	1
Geschlechterverteilung	1
Gewebeschwellung	1
Handlung	1
Hauptbehandlung	1
Hauterkrankung	1
Hautrötung	1
Hautverdickung	1
Hirnblutung	1
Hitzewallung	1
Hormonstörung	1
Intervalldosierung	1
Itraconazol-Behandlung	1
Kortikosteroid-Behandlung	1
Krebsbekämpfung	1
Langzeitwirkung	1
Lippenverletzung	1
Mischung	1
Mittelohrentzündung	1
MS-Behandlung	1
Stimmänderung	1
Stimmungsschwankung	1
Streuung	1
Suizidgefährdung	1
Symptombewertung	1
Symptomverschlechterung	1
Teilung	1
Trübung	1
Tumor-Messung	1

-ung	
Tumorrückbildung	1
Überdosierung	1
Übereinstimmung	1
Umgebung	1
Untersuchungstermin	1
Unterversorgung	1
Vaginalblutung	1
Verdauung	1
Verdauungssystem	1
Verdauungstrakt	1
Vergößerung	1
Verhütungsmethode	1
Verkleinerung	1
Verlängerungsschema	1
Verlangsamung	1
Vermischung	1
Vernarbung	1
Verstärkung	1
Versteifung	1
Versuchsbehandlung	1
Verteidigungsmechanismus	1
Viruserkrankung	1
Vorbeugung	1
Bildgebungsgerät	1
Bildgebungsverfahren	1
Blähung	1
Blasenentzündung	1
Blutansammlung	1
Blutfilterung	1
Blutgerinnselektstehung	1
Blutungshäufigkeit	1

-ung	
Blutungswahrscheinlichkeit	1
Diabetesbehandlung	1
Doppelblind-Behandlung	1
Dosiserhöhung	1
Double-Dummy-Behandlungsstudie	1
Durchblutung	1
Eignung	1
Einblutung	1
Einleitung	1
Einteilung	1
Eiteransammlung	1
EKG-Auswirkung	1
Ellipta-Behandlung	1
Empfehlung	1
Entwicklung	1
Erfassung	1
Erhebung	1
Erholung	1
Erkältungssymptom	1
Ernährungsgewohnheit	1
Erstlinienanwendung	1
Erstlinienbehandlung	1
Erziehungsberechtigte	1
Eudract-Kennung	1
Muskelzuckung	1
Nachbehandlung	1
Nachbehandlungsphase	1
Nachbeobachtungsbesuch	1
Nachuntersuchung	1
Nasennebenhöhlenentzündung	1
NCT-Kennung	1

-ung	
Niederlassung	1
Nierenentzündung	1
Nierenzellkrebs-Behandlung	1
Nifurtimox-Behandlung	1
Parallelgruppen-Dosisfindungsstudie	1
Phase-I-Dosierung-Eskalations-Studie	1
PHN-Behandlung	1
Prüfbehandlung	1
Prüfungsbeginn	1
Prüfungsbehandlung	1
Prüfungsnr	1
Prüfungspersonal	1
Prüfungszweck	1
Regulierung	1
Sauerstoffversorgung	1
Schlafstörung	1
Schließung	1
Schlussfolgerung	1
Schmerzlinderung	1
Spitalbehandlung	1
Sprachstörung	1
Stabilisierung	1
Standardkrebsbehandlung	1
ST-Hebung	1
Voruntersuchung	1
Wertänderung	1
Wertschätzung	1
Wirkungsweise	1
Zahnreinigung	1
Zerlegung	1
Zerstörung	1

-ung	
Zubereitung	1
Zuckerbildung	1
Zuckung	1
Zuordnung	1
Zuteilung	1
Zwei-Wege-Crossover-Verabreichung	1
Tot.	9,766

-Ø (ending with -d/-t[e])	
Ende	213
Abschnitt	117
Bericht	89
Erhalt	48
Unterschied	26
Fortschritt	11
Studienende	9
Arbeit	8
Behandlungsende	8
Verlust	7
Eintritt	6
Gewichtsverlust	5
Antwort	4
Blutverlust	4
Herzstillstand	2
Antikörperantwort	1
Beitritt	1
Betracht	1
Sehverlust	1
Ergebnisbericht	1
Wasserverlust	1
Geschmacksverlust	1

-Ø (ending with -d/-t[e])	
Haarverlust	1
Haupt-Vergleichspunkt	1
Tot.	566

Tot. DE	14,024
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Table 20: German nouns with nominalizing suffixes

-aggio	
dosaggio	41
monitoraggio	15
drenaggio	4
sondaggio	2
pompaggio	1
sovradosaggio	1
Tot.	64

-anza	
mancanza	7
complicanza	3
intolleranza	2
tolleranza	2
Tot.	14

-enza	
conoscenza	63
assistenza	36
precedenza	12
provenienza	8
esigenza	6
sopravvivenza	5

-enza	
incidenza	4
insorgenza	3
permanenza	3
corrispondenza	2
bioequivalenza	1
esistenza	1
sofferenza	1
Tot.	145

-ita	
vita	98
nascita	70
crescita	41
perdita	28
Tot.	237

-ore	
bruciore	3
Tot.	3

-mento	
trattamento	1,909
sanguinamento	125
peggioramento	73
reclutamento	26
cambiamento	18
rivestimento	12
arruolamento	11
funzionamento	10
arrossamento	9
miglioramento	8

-mento	
aggravamento	7
collegamento	4
intorpidimento	4
affaticamento	3
mantenimento	3
ringraziamento	3
movimento	2
rallentamento	2
restringimento	2
svenimento	2
alleviamento	1
annebbiamento	1
assorbimento	1
completamento	1
fallimento	1
giovamento	1
gocciolamento	1
innalzamento	1
inquinamento	1
inserimento	1
irrigidimento	1
ispessimento	1
offuscamento	1
post-trattamento	1
proseguimento	1
raggiungimento	1
rigonfiamento	1
sopraslivellamento	1
spostamento	1
svolgimento	1
Tot.	2,253

-sione	
estensione	65
visione	33
infusione	32
pressione	29
diffusione	19
esclusione	18
inclusione	18
decisione	16
progressione	6
conclusione	5
occlusione	5
scansione	5
espansione	4
lesione	4
sospensione	4
comprensione	3
ammissione	1
compressione	1
confusione	1
contusione	1
emissione	1
sovraespressione	1
suddivisione	1
Tot.	273

-ura	
stesura	8
procedura	4
lettura	3
apertura	1
chiusura	1
Tot.	17

-zione	
reazione	792
sperimentazione	230
somministrazione	140
assunzione	105
infezione	99
iniezione	77
combinazione	57
diminuzione	54
infiammazione	46
partecipazione	43
variazione	35
identificazione	34
preparazione	32
conduzione	26
riduzione	26
misurazione	25
mutazione	24
associazione	21
azione	18
ostruzione	17
valutazione	17
alterazione	15
approvazione	13
formulazione	13
coagulazione	12
circolazione	11
interruzione	11
esposizione	10
pubblicazione	9
randomizzazione	9
limitazione	8
traduzione	8

-zione	
esacerbazione	7
aggregazione	6
produzione	5
respirazione	5
eiezione	5
evoluzione	5
acquisizione	4
irritazione	4
redazione	4
registrazione	4
rimozione	4
applicazione	3
assegnazione	3
cicatrizzazione	3
costrizione	3
disidratazione	3
disposizione	3
formazione	3
perforazione	3
preoccupazione	3
prevenzione	3
proliferazione	3
radiazione	3
sostituzione	3
vaccinazione	3
abbreviazione	2
definizione	2
induzione	2
introduzione	2
manifestazione	2
operazione	2
osservazione	2
percezione	2

-zione	
prescrizione	2
scomposizione	2
ulcerazione	2
affermazione	1
asportazione	1
attenuazione	1
biodistribuzione	1
comunicazione	1
concezione	1
considerazione	1
contrazione	1
cross-vaccinazione	1
defecazione	1
descrizione	1
determinazione	1
distribuzione	1
elaborazione	1
eliminazione	1
esecuzione	1
illustrazione	1
individuazione	1
inibizione	1
lacrimazione	1
miscelazione	1
oscillazione	1
presentazione	1
raccomandazione	1
riacutizzazione	1
secrezione	1
titolazione	1
ubicazione	1
Tot.	2,182

-Ø (ending with -a)	
domanda	364
ricerca	307
visita	46
modifica	35
cura	34
misura	20
conta	2
copia	2
verifica	2
influenza	1
pronuncia	1
Tot.	814

-Ø (ending with -o)	
studio	4,973
riepilogo	590
rischio	111
inizio	95
ricovero	82
aumento	80
danno	74
utilizzo	52
controllo	36
elenco	36
uso	35
confronto	30
accumulo	28
vomito	19
incremento	17
sviluppo	15
prelievo	14
decesso	13

-Ø (ending with -o)	
anticipo	12
arresto	12
contributo	11
supporto	11
blocco	9
accordo	8
conteggio	1
conto	1
incontro	1
ricordo	1
ritardo	1
sbaglio	1
starnuto	1
stravaso	1
taglio	1
respiro	6
ritiro	5
trapianto	4
distacco	3
rilascio	3
trasporto	3
consulto	2
aborto	1
avvio	1
collasso	1
consumo	1
Tot.	6,402

Tot. IT	12,404
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Table 21: Italian nouns with nominalizing suffixes

The nouns with nominalizing suffixes increase in both translated subcorpora compared to English (8,313): in German there are almost twice as many (14,024), and in Italian their frequency is only somewhat lower than in German (12,404).

5.3.2 Case studies

Some case studies will be considered to complete the results reported above. In the analysis these will consist of some frequently occurring nouns in the German and Italian subcorpora, as well as in the comparison with the English subcorpus in the attempt to determine the main translation tendencies. These nouns belong to two semantic fields: the first concerns trial end, thus involves the nouns *Ende* and *Beendigung* in German as well as *fine* and *termine* in Italian. The second semantic field concerns treatment (and other substances) administered to trial participants and involves the nouns *Einnahme*, *Erhalt*, as well as *Verabreichung* in German, and *assunzione* as well as *somministrazione* in Italian.

The noun *Ende* occurs 213 times in the German subcorpus. Of these, 141 are excluded, as they represent mere intratextual references, as in:

En: See *the end of the summary* for the full title of the study.

De: Den vollständigen Studentitel finden Sie am *Ende der Zusammenfassung*.

The noun *Ende* therefore occurs 72 times with a temporal connotation. Of these occurrences, only 14 segments are translations of ST nominal constructions (as in “Am Ende dieser Studien” for the ST segment “At the end of those studies”), while the other cases were nominalized in the TT. Some examples of nominalizations in translation are:

En: The sponsor reviewed the data collected *when the trial ended* and created a report of the results.

De: *Am Ende der klinischen Prüfung* überprüfte der Sponsor die erfassten Daten und erstellte einen Bericht über die Ergebnisse.

En: What's happened *since my trial ended*?⁹²

De: Was ist *seit dem Ende* dieser Studie passiert?

The synonymous noun *Beendigung* only occurs 7 times in the German subcorpus. Interestingly, in none of these cases does a nominal form occur in the corresponding ST segments. Some instances are the following:

En: But, *because the trial ended early* and only included a small number of participants [...].

De: *Aufgrund der vorzeitigen Beendigung der klinischen Prüfung* und einer nur geringen Anzahl von Teilnehmerinnen [...].

En: *The decision to stop* was not related to safety.

De: *Die Entscheidung zur vorzeitigen Beendigung* stand nicht im Zusammenhang mit dem Sicherheitsprofil der Behandlung.

The second example illustrates well that the use of *Funktionsverbgefüge* rarely contributes to text concision.

The corresponding Italian nouns, *fine* and *termine*, occur 158 and 130 times, respectively. Of the 158 occurrences of *fine*, 126 should not be considered, as they are intratextual references and 19 occur in final clauses (where the noun, masculine instead of feminine, is used in the collocation “*al fine di*”, ‘in order to’):

En: The websites listed *at the end of this summary* may have additional information about adverse events that happened during this trial.

It: I siti web indicati *alla fine di questo riepilogo* possono contenere ulteriori informazioni sugli eventi avversi verificatisi durante questo studio.

En: So, researchers are looking for treatments with longer lasting effects *so that patients do not have to receive treatment as often*.

.....
92 In this instance, the replacement of the first-person pronoun *my* with a more impersonal construction is also interesting.

It: Pertanto, i ricercatori cercano trattamenti dagli effetti più duraturi *al fine di ridurre la frequenza di somministrazione del trattamento ai pazienti*.

This way, only 13 occurrences were considered. Of these, 8 were translations of nominal forms, like:

En: After that, the tumors were checked every 8 weeks *until the end of the treatment*.

It: Dopo di che, i tumori sono stati controllati ogni 8 settimane *fino alla fine del trattamento*.

Five cases, instead, were nominalized in the TT segment, as occurs in the following instances:

En: A participant was considered to have stronger vision in this trial if they could read at least 15 more letters on the eye chart *by the time they finished the trial*.

It: In questo studio, la visione di un partecipante veniva considerata più nitida se il partecipante riusciva a leggere almeno 15 lettere in più sulla tavola oculistica *entro la fine dello studio*.

En: What's happened *since my trial ended?*

It: Cosa è successo *dopo la fine della sperimentazione?*

The second Italian noun, *termine*, occurs 130 times: of these occurrences, 3 are intratextual references and 29 represent noise of other nature (like the use of *termine* meaning “technical term” or in the collocation “a lungo termine”). Therefore, only 98 occurrences were considered. Of these, 10 occurrences are translations of English nominal forms, while the other occurrences are nominalizations of the English ST. Some examples of nominalization in translation are:

En: This study was set up so that people could continue to take bevacizumab *after the first study* (also called a “parent study”) *had ended*.

It: Il presente studio è stato condotto affinché le persone potessero continuare ad assumere bevacizumab *in seguito al termine del primo studio* (chiamato anche “studio originario”).

En: The sponsor reviewed the data collected *when the trial ended* and created a report of the results.

It: *Al termine dello studio*, lo sponsor ha esaminato i dati raccolti e ha redatto un rapporto dei risultati.

As for the second semantic field, the German noun *Einnahme* occurs 107 times. Of these, 9 cases were additions in the TTs, as in:

En: The doctors called the participants and asked about their health 30 days *after their last dose*, and then every 3 months after that.

De: Die Prüfarzte riefen die Teilnehmer 30 Tage *nach der Einnahme der letzten Dosierung* sowie alle drei Monate danach an und befragten sie zu ihrem Gesundheitszustand.

En: Because some participants switched *from the placebo to regorafenib*, a total of 190 participants took regorafenib at some point during the trial.

De: Da einige Teilnehmer *von der Einnahme des Placebos zur Einnahme von Regorafenib* wechselten, nahmen zu einem bestimmten Zeitpunkt während der Prüfung insgesamt 190 Teilnehmer Regorafenib ein.

En: Because of this, the researchers determined that *800 mg of rogaratinib* twice a day was safe to take for the rest of the trial.

De: Aus diesem Grund bestimmten die Wissenschaftler, dass *die Einnahme von 800 mg Rogaratinib* zweimal täglich für die restliche klinische Prüfung sicher war.

In the other cases, the nouns were nominalizations of verbs, as occurs in the following examples:

En: There was 1 participant *who took 240 mg of BAY 1217389* who died due to a serious adverse reaction.

De: Ein Teilnehmer starb aufgrund einer schwerwiegenden Nebenwirkung *nach der Einnahme von 240 mg BAY 1217389*.

En: Out of the 133 participants *randomly chosen to take regorafenib*, only 132 participants took the drug.

De: Von 133 Teilnehmern, *denen die Einnahme von Regorafenib nach dem Zufallsprinzip zugewiesen wurde*, nahmen nur 132 Teilnehmer das Arzneimittel ein.

En: Rogaratinib quickly went into the bloodstream *after the participants took it by mouth*.

De: Rogaratinib gelangte *nach der oralen Einnahme* schnell in den Blutkreislauf.⁹³

En: [...] *Had taken at least 2 types of non-steroidal anti-inflammatory drugs (NSAIDs)* that didn't work to treat their axSpA.

De: *Einnahme von mindestens 2 Arten nicht-steroidaler Antirheumatika (NSAR)*, die nicht gegen die axSpA halfen.

As for the noun *Erhalt*, 4 occurrences out of 48 were additions, as in:

En: Did vilaprisan decrease the amount of pain the participants recorded *after treatment*?

De: Reduzierte Vilaprisan die Stärke der Schmerzen der Teilnehmerinnen *nach Erhalt der Behandlung*?

En: How many participants had stronger vision *after treatment*?

De: Wie viele Patienten hatten *nach Erhalt der Behandlung* eine bessere Sehkraft?

All other cases were nominalizations of the ST segment, as in:

.....
93 This instance is quite interesting as it involves not only a nominalization, but also recourse to a Latinate adjective (*oral*) in lieu of a prepositional phrase of Germanic origin (*by mouth*).

En: Their kidneys did not work as they should *before the participants took the trial treatment*.

De: Die Nierenfunktion der Teilnehmer war *vor dem Erhalt der Behandlung* im Rahmen der klinischen Prüfung beeinträchtigt.

En: Unwanted medical events (adverse events) can happen to people *when they receive a medicine*.

De: *Beim Erhalt eines Arzneimittels* können beim Menschen auch unerwünschte medizinische Ereignisse auftreten.

En: *If the participants received treatment for 36 weeks*, they could continue trial treatment in the Part A extension.⁹⁴

De: *Nach Erhalt der Behandlung für 36 Wochen* konnten sie mit der Behandlung im Rahmen der klinischen Prüfung in der Erweiterung von Teil A fortfahren.

As for the noun *Verabreichung*, 5 occurrences out of 30 corresponded to nouns also in the ST:⁹⁵

En: The liquid vaccine formula eliminates the need to reconstitute the dry powder component with the liquid component *before administration* [...]

De: Aufgrund der flüssigen Impfstoffformulierung ist das Zusammenbringen (die sogenannte Rekonstitution) des Trockenpulver-Bestandteils mit dem flüssigen Bestandteil *vor der Verabreichung* nicht mehr erforderlich [...]

It: La formulazione liquida del vaccino elimina la necessità di ricostituire la componente in polvere secca con la componente liquida *prima della somministrazione* [...]

En: Eliminating the need to reconstitute the vaccine before its injection is expected to ease the *vaccine administration*.

.....

94 Here, the conditional subordinate clause is rendered by means of a noun phrase with a temporal connotation.

95 The Italian translations are reported as well, since these ST sentences are the same which will be referred to below while discussing the noun *somministrazione*.

De: Da die Rekonstitution des Impfstoffs vor dessen Injektion nicht mehr erforderlich ist, wird erwartet, dass *die Verabreichung des Impfstoffs* erleichtert wird.

It: Si prevede che l'eliminazione della necessità di ricostituire il vaccino prima della sua iniezione faciliti *la somministrazione dello stesso*.

En: At-home *administration* (ClinicalTrials.gov Identifier; NCT 04592341)

De: *Verabreichung* zu Hause (ClinicalTrials.gov-Kennung; NCT 04592341)

It: *Somministrazione* a domicilio (codice identificativo ClinicalTrials.gov: NCT04592341).

En: Full Trial Title: An open-label, parallel-group, multi-center study to investigate pharmacodynamic effects *after daily administration* of vilaprisan or ulipristalacetate for 8–12 weeks in patients with uterine fibroids for whom surgery (hysterectomy or myomectomy) is planned.

De: Vollständiger Titel der klinischen Prüfung: Eine offene multi-zentrische Parallelgruppen-Studie zur Untersuchung der pharmakodynamischen Wirkungen *nach täglicher Verabreichung* von Vilaprisan oder Ulipristalacetat für 8–12 Wochen bei Patientinnen mit Uterus-Myomen, für die eine Operation (Hysterektomie oder Myomektomie) geplant ist.

It: Titolo completo dello studio: Studio multicentrico, in aperto, a gruppi paralleli per valutare gli effetti farmacodinamici *dopo somministrazione giornaliera* di vilaprisan o ulipristal acetato per 8–12 settimane in pazienti affette da fibromi uterini con intervento chirurgico programmato (isterectomia o miomectomia).

En: Full Trial Title: [...] Followed by (Part 2) a *Two-way Crossover Administration* of Four Different Doses of BAY 1902607 in Patients With Refractory Chronic Cough to Assess Safety, Tolerability and Efficacy for Proof of Concept

De: Vollständiger Titel der klinischen Prüfung: [...] gefolgt von (Teil 2) einer *Zwei-Wege-Crossover-Verabreichung* von vier verschiedenen Dosierungen von BAY 1902607 an Patienten mit refraktärem

chronischem Husten zur Untersuchung der Sicherheit, Verträglichkeit und Wirksamkeit für den Wirksamkeitsnachweis

It: Titolo completo dello studio: [...] seguita da (Parte 2) una *somministrazione in cross-over* a due vie di quattro diverse dosi di BAY 1902607 in pazienti con tosse cronica refrattaria per valutare la sicurezza, la tollerabilità e l'efficacia per la prova di concetto

In 2 cases, the noun *Verabreichung* was added:

En: Researchers wanted to see how well *the addition of umeclidinium* to dual therapy improved patients' lung function compared with dual therapy alone in patients who had poorly controlled asthma.

De: Forscher wollten herausfinden, wie gut *die zusätzliche Verabreichung von Umeclidinium* zur Zweifachtherapie die Lungenfunktion von Patienten mit schlecht kontrolliertem Asthma im Vergleich zur Zweifachtherapie alleine verbesserte.

En: Researchers concluded that *addition of umeclidinium* to dual therapy, when treating patients with poorly controlled asthma, showed a greater improvement in lung function compared with dual therapy alone.

De: Die Forscher kamen zu dem Schluss, dass *die zusätzliche Verabreichung von Umeclidinium* zur Zweifachtherapie bei der Behandlung von Patienten mit schlecht kontrolliertem Asthma eine größere Verbesserung der Lungenfunktion im Vergleich zur Zweifachtherapie alleine erzielte.

In all other cases, *Verabreichung* was a nominalization of the ST segment, as occurs in the following examples:

En: Infection caused by a device used *to give treatments* through a vein happened in 6.1% of the participants.

De: Eine Infektion, die durch ein Gerät *zur Verabreichung von Behandlungen* über eine Vene verursacht wurde, trat bei 6,1 % der Teilnehmer auf.

En: The amount of BAY 1217389 in the participants' blood was higher when given together with paclitaxel compared to *when it was given* alone.

De: Die Menge an BAY 1217389 im Blut der Teilnehmer war höher, wenn BAY 1217389 zusammen mit Paclitaxel verabreicht wurde, im Vergleich zur *Verabreichung* von BAY 1217389 allein.

As for the Italian nouns, *assunzione* occurs 105 times. Of these, 5 were additions:

En: Doing this meant that *the order of the treatments* were [sic] not the same for each participant.

It: In questo modo, *l'ordine di assunzione dei trattamenti* non sarebbe stato lo stesso per ciascun partecipante.

En: Did *LMB763* affect the fats in the participants' bodies?

It: *L'assunzione di LMB763* ha influito sui grassi nell'organismo dei partecipanti?

En: Some participants developed other antibodies against the part of damoctocog that is not the FVIII, but this went away after the participants stopped *treatment*.

It: Alcuni partecipanti hanno sviluppato altri anticorpi contro la parte di damoctocog che non contiene il FVIII, tuttavia questi sono scomparsi dopo che i partecipanti hanno interrotto *l'assunzione del trattamento*.

All other occurrences were nominalizations of verbs in the ST, as in:

En: For Part 1, the doctors kept track of the adverse reactions that the participants had *while they took BAY 1902607 or the placebo*.

It: Per la Parte 1, i medici hanno monitorato le reazioni avverse che i partecipanti hanno avuto *durante l'assunzione di BAY 1902607 o del placebo*.

En: The researchers calculated the average highest level of midazolam in the participants' blood at different times *after they took each treatment*.

It: I ricercatori hanno calcolato il livello medio più alto di midazolam in circolo nel sangue dei partecipanti in momenti diversi *dopo l'assunzione di ciascun trattamento*.

Of the 140 occurrences of *somministrazione*, 5 were translations of nouns in the ST (see the translations reported above in the section about the noun *Verabreichung*). 13 occurrences were additions in the TT, as occurs in the following excerpts:

En: There were 3 groups of participants who received damoctocog *using different schedules* [...]

It: Vi sono stati 3 gruppi di partecipanti che hanno ricevuto damoctocog *secondo schemi di somministrazione diversi* [...]

En: The researchers compared the level of “FVIII inhibitors” in the blood *before and after treatment* during all parts.

It: I ricercatori hanno confrontato il livello degli “inibitori del FVIII” nel sangue *prima e dopo la somministrazione del trattamento* durante tutte le parti dello studio.

En: *This* is called an intravenous infusion, also known as an IV infusion.

It: *Questa via di somministrazione* è chiamata infusione endovenosa, detta anche infusione EV.

En: 68.2% of people's cancer was not detected on scans by the end of treatment (*venetoclax with rituximab plus chemotherapy group*)

It: Il 68,2% dei tumori non è stato rilevato mediante scansioni entro il termine del trattamento (*gruppo con la somministrazione di venetoclax con rituximab e chemioterapia*).

All other occurrences were nominalizations of verbs in the ST, as occurs in the following examples:

En: Researchers think this may help the effects of treatment last longer so that patients *do not have to receive treatment as often*.

It: I ricercatori ritengono che ciò potrebbe contribuire a prolungare la durata degli effetti del trattamento al fine di *ridurre la frequenza di somministrazione del trattamento* ai pazienti.

En: For the third part, called the Extension, the researchers wanted to study *how safe BAY 81-8973 was to receive* over a long period of time.

It: Nella terza parte, chiamata Estensione, i ricercatori hanno voluto studiare *la sicurezza della somministrazione di BAY 81-8973* per un periodo di tempo prolungato.

Overall, in this second semantic field nouns are the preferred option to translate verbs like *take, get, receive, give, and administer*. Only 5 occurrences of the noun *administration* are found in the English subcorpus.

To summarize, these case studies also show an increase of nominalizations in the TTs – with *fine* being the only exception.

5.3.3 Observation of nominalization/verbalization in the selection of texts

The observation of the smaller selection of texts confirms the tendency towards nominalization in translation (also considering the cases of nominalization that were not taken into account in 5.3.1, such as conversion). In fact, only in a very limited number of cases are instances of verbalization visible. Some examples are the following:

En: You should not *make changes* to your care based on the results of this or any single study.

De: Sie sollten Ihre Behandlung nicht aufgrund der Ergebnisse dieser oder einer anderen einzelnen Studie *ändern*.

It: Non deve *cambiare* il Suo trattamento sulla base dei risultati di questo studio o di ogni singolo studio.

En: This is a *summary* [...].

De: In diesem Abschnitt *sind* [...] zusammengefasst.

It: Questa sezione *riassume* [...].

En: The researchers *asked for the help* of men and women with heart failure and preserved ejection fraction [...].

De: Männer und Frauen mit Herzinsuffizienz und erhaltener Ejektionsfraktion *haben* an dieser klinischen Prüfung *teilgenommen*.

It: I ricercatori *si sono rivolti* a uomini e donne affetti da scompenso cardiaco con frazione di eiezione preservata [...].

Some examples where only the German sentences are verbalized are the following:

En: Overall, the researchers found that copanlisib *had no effect on* the participants' heart health.

De: Generell fanden die Wissenschaftler heraus, dass Copanlisib die Herzgesundheit der Teilnehmer *nicht beeinträchtigte*.

It: Nel complesso, i ricercatori hanno rilevato che copanlisib *non ha avuto alcun effetto* sulla salute del cuore dei partecipanti.

En: LMB763 *has not yet been approved for use*.

De: LMB763 *ist noch nicht zugelassen*.

It: Il medicamento LMB763 *non è stato ancora approvato per l'uso*.

En: Use of the data and information contained in this Document is unrestricted.

De: Die in diesem Dokument enthaltenen Daten und Informationen *dürfen uneingeschränkt verwendet werden*.

It: L'uso dei dati e delle informazioni contenuti nel presente documento non è limitato.

The following step was to attempt to detect the main categories of nominalization in translation in the selection of texts. The result is that these consist of nominal constructions as alternatives to subordination (especially temporal and final clauses), nominal constructions as alternatives to adjectives and participles, collocations with deverbal nouns (*Funktionsverbgefüge* in German), as well as reformulations and explicitations or additions including deverbal nouns.

As for alternatives to subordination, some examples of nominalized temporal clauses detected in these texts are the following:

En: *Before the trial started*, the trial doctors did tests to check patients' overall health.

De: *Vor Beginn der Studie* führten die Studienärzte Untersuchungen durch, um den allgemeinen Gesundheitszustand der Patienten zu untersuchen.

It: *Prima dell'inizio della sperimentazione*, i medici della sperimentazione hanno eseguito degli esami per controllare lo stato di salute generale dei pazienti.

En: This is because the lower left chamber of the heart, called the left ventricle, is not able to fill properly *before it pumps*.

De: Das kommt daher, dass die linke untere Kammer des Herzens, auch linke Herzkammer genannt, *vor dem Pumpen* nicht vollständig gefüllt werden kann.

It: Ciò è dovuto al fatto che la camera inferiore sinistra del cuore, chiamata ventricolo sinistro, non riesce a riempirsi adeguatamente *prima del pompaggio*.

Final clauses are nominalized more frequently in German. Some instances (where a verbal form is favored in Italian) are:

En: *A study to assess the safety of belimumab in patients with systemic lupus erythematosus*

De: *Eine Studie zur Bewertung der Sicherheit von Belimumab bei Patienten mit systemischem Lupus erythematosus*

It: *Uno studio per valutare la sicurezza di belimumab in pazienti affetti da lupus eritematoso sistemico*

En: A randomized parallel-group, placebo-controlled, double-blind, multi-center trial *to evaluate the efficacy and safety of the oral sGC stimulator vericiguat to improve physical functioning in activities of daily living in patients with heart failure and preserved ejection fraction (VITALITY-HFpEF)*

De: Eine randomisierte, placebokontrollierte, multizentrische Parallelgruppen-Doppelblindstudie *zur Untersuchung der Wirksamkeit und Sicherheit des oral eingenommenen sGC-Stimulators Vericiguat zur*

Verbesserung der physischen Funktionen bei alltäglichen Aufgaben bei Patienten mit Herzinsuffizienz und erhaltener Ejektionsfraktion

It: Studio multicentrico, randomizzato a gruppi paralleli, controllato con placebo, in doppio cieco *per valutare l'efficacia e la sicurezza dello stimolatore della sGC orale Vericiguat per migliorare la funzionalità fisica nelle attività della vita quotidiana in pazienti affetti da scompenso cardiaco con frazione di eiezione preservata (VITALITY-HFpEF)*

One instance of nominalization involving Italian as well is the following:

En: This trial was designed to learn if the trial drug LMB763 worked *to treat* a severe type of fatty liver disease called NASH, or non-alcoholic steatohepatitis.

De: In dieser Studie sollte herausgefunden werden, ob das Studienmedikament LMB763 *für die Behandlung* einer schweren Form der Fettlebererkrankung wirksam ist, die als NASH bzw. nichtalkoholische Steatohepatitis bezeichnet wird.

It: Lo studio è stato progettato per scoprire se il medicamento LMB763 oggetto dello studio fosse efficace *per il trattamento* di una forma grave di malattia del fegato grasso detta NASH, o steatoepatite non alcolica.

Some instances of nominal constructions which replace adjectives and participles are the following:

En: *Decreased appetite* happened in 42.3% of participants.

It: *Diminuzione dell'appetito* verificatosi nel 42,3% dei partecipanti.

En: Overall, the researchers found that the participants in each group had *an increased ability* to do their daily tasks.

De: Generell verzeichneten die Wissenschaftler *eine Steigerung der Fähigkeit* der Teilnehmer in jeder Gruppe, ihre alltäglichen Aufgaben zu erledigen.

It: Nel complesso, i ricercatori hanno rilevato che i partecipanti in ciascun gruppo hanno mostrato *un aumento della capacità* di svolgere le loro attività quotidiane.

En: Novartis is a global healthcare company based in Switzerland that provides solutions to address *the evolving needs* of patients worldwide.

It: Novartis è una società farmaceutica globale con sede in Svizzera che fornisce soluzioni per rispondere *alle esigenze in evoluzione* dei pazienti di tutto il mondo.

Some instances of collocations with deverbal nouns (more specifically, *Funktionsverbgefüge* in German) are the following:

En: Many volunteers and many clinical trials are needed *to advance* medical science.

De: Es bedarf vieler freiwilliger Teilnehmer und vieler klinischer Studien, um *Fortschritte* in der medizinischen Forschung zu *erzielen*.

En: After Week 52, all patients continued their regular SLE treatment and could *choose* to take belimumab, if approved by their regular doctor.

De: Nach Woche 52 fuhren alle Patienten mit ihrer regulären SLE-Behandlung fort und *hatten* nach Genehmigung durch ihren regulären Arzt *die Wahl*, Belimumab hinzuzufügen.

Some instances of translations involving collocations with deverbal nouns in the Italian subcorpus are the following:

En: How has this study *helped* patients and researchers?

It: Che *aiuto ha fornito* lo studio ai pazienti e ai ricercatori?

En: This study *compared* the safety of belimumab when added to regular SLE treatment with regular SLE treatment alone in patients with SLE.

It: Questo studio *ha messo a confronto* la sicurezza di belimumab quando viene aggiunto al trattamento abituale per il LES rispetto al solo trattamento abituale nei pazienti affetti dal LES.

Two instances of recourse to collocations with deverbal nouns to translate an English phrasal verb with the verb *look* are:

En: Researchers and health authorities *look at* the results of many clinical trials to understand which drugs work and if they are safe.

It: I ricercatori e le autorità sanitarie *prendono in esame* i risultati di diversi studi clinici per capire quali farmaci funzionano e se sono sicuri.

En: Researchers *were looking for* a better way to help patients with SBMA.

De: Forscher *waren auf der Suche nach* einer besseren Möglichkeit, Patienten mit SBMA zu helfen.

Other interesting examples of collocations with deverbal nouns in Italian are

En: During the trial, the participants: gave blood and urine samples [...] *had their heart health checked* using an ECG and a heart imaging test.

It: Durante lo studio, i partecipanti: sono stati sottoposti al prelievo di campioni di sangue e di urine [...] *sono stati sottoposti a un controllo* dello stato di salute del cuore tramite ECG e un test di imaging cardiaco.

En: Over time, patients with SBMA can *lose* muscle. This loss can result in muscle weakness in their legs.

It: Nel tempo, i pazienti affetti da SBMA possono *subire perdita* della massa muscolare. Questa perdita può causare debolezza muscolare nelle gambe.

In the latter instance, a repetition of the noun *perdita* is favored over the alternation of verb and noun (*lose/loss*) in English.

Some instances of reformulations involving a nominalization are the translation of the following ST sentences:

En: Participants in clinical trials *belong to a large community of people* who take part in clinical research around the world.

De: Teilnehmer einer klinischen Prüfung *leisten einen wertvollen Beitrag* für die weltweite klinische Forschung.

En: The following graph shows the treatments *that the researchers planned for the participants to take*.

De: In der folgenden Grafik sind die Behandlungen dargestellt, *die die Teilnehmer gemäß den Anweisungen der Wissenschaftler einnehmen sollten.*

Some instances of explicitations and additions are the following:

En: We hope *this* helps the participants understand the results and their important role in medical research.

De: Wir hoffen, *diese Zusammenfassung* hilft den Teilnehmern dabei, die Ergebnisse und ihre wichtige Rolle in der medizinischen Forschung zu verstehen.

It: Ci auguriamo che *questo riepilogo* aiuti i partecipanti a comprendere meglio i risultati dello studio e il ruolo importante da loro svolto nella ricerca medica.

En: The results from this trial helped researchers learn more *about vericiguat* in participants with HFpEF.

De: Die Ergebnisse dieser klinischen Prüfung halfen den Wissenschaftlern, mehr *über die Anwendung von Vericiguat* bei Teilnehmern mit Herzinsuffizienz und erhaltener Ejektionsfraktion zu erfahren.

Some instances where the addition/explicitation occurs only in German are the following:

En: Before starting the study, patients were asked to replace their previous asthma treatment (*if different*) with Relvar/Breo Ellipta.

De: Bevor die Patienten in die Studie eintraten, wurden sie gebeten, ihre vorherige Asthmabehandlung durch Relvar/Breo Ellipta zu ersetzen (*falls sie eine andere Behandlung angewendet hatten*).

En: Multiple myeloma that is not well treated by approved drugs is called either: [...] Relapsed if it had been well treated at one time, but isn't now.

De: Ein Multiples Myelom, das mit zugelassenen Medikamenten nicht gut behandelbar ist, nennt man entweder: [...] Rezidiert

(wiederkehrend), wenn eine Behandlung früher einmal gut geholfen hat, aber jetzt nicht mehr hilft (*Rückfall*).

En: In addition to the trial drugs above, participants could receive certain *other drugs for their cancer and symptoms*.

De: Zusätzlich zu den oben genannten Studienmedikamenten durften die Teilnehmer bestimmte *andere Medikamente zur Behandlung ihrer Krebserkrankung und Symptome* anwenden.

In the following case, instead, the nominalization takes place only in Italian, and repeats the noun already introduced by the translator in the previous sentence:

En: This causes blood and fluid to collect in the lungs, blood vessels, and tissues of the body. *Fluid in the lungs* can lead to shortness of breath and tiredness, making it harder for people to do their daily tasks.

It: Ciò causa l'accumulo di sangue e di liquidi nei polmoni, nei vasi sanguigni e nei tessuti dell'organismo. *L'accumulo di liquidi* nei polmoni può dar luogo a difficoltà respiratorie e stanchezza, rendendo alle persone più difficile svolgere le loro attività quotidiane.

5.4 Discussion

Overall, it is evident that there is a high number of nominalizations, despite recommendations to favor verbs over nouns in Plain Language. It should be reiterated that only deverbal nominalizations were considered, but the number of noun phrases is even higher if other cases (like deadjectival nominalizations) are taken into account, as in the following instance, translated with a deadjectival noun in both German and Italian:

En: A trial to learn [...] *how safe it* [the drug] was in participants with heart failure and preserved ejection fraction

De: Eine klinische Prüfung, um mehr über *die* [...] *Sicherheit von dem Medikament* bei Teilnehmern mit Herzinsuffizienz und erhaltener Ejektionsfraktion zu erfahren

It: Studio per valutare [...] *la sicurezza del farmaco* su partecipanti affetti da scompenso cardiaco con frazione di eiezione preservata

The tendency towards nominalization is particularly evident in translation, especially in German (see also Sections 6.3.1 and 6.3.2.3 for the intersection between the translation of clauses and the trends identified in the three languages). This goes against the Universal of Simplification in translation, and is attributable partly to interlinguistic differences, and partly to a probable tendency of translators to maintain this feature as an automatism derived from LSP translation. Clearly, this can create comprehensibility issues in this text genre and is not recommended. As for the interlinguistic differences, some instances are provided by the translation of participles (in particular with verbs meaning *increase* or *decrease*) with nominal forms in Italian, since this construction sounds more natural in Italian, as pointed out by Garzone (2020: 97). Another example is the nominalization of indirect interrogative clauses with the adverb *how* followed by an adjective or an adverb, or a conjunction like *if* or *whether* (cf. Garzone 2020: 97–98). In German, the tendency to nominalize English infinitive clauses is stressed by Krein-Kühle (2003: 91) and is evident also in the present analysis.

In highlighting the tendency towards nominalization in translation, in particular while evaluating the results shown by Section 5.3.1, it should be noted that conversion is more frequent in English than in German and Italian (cf. for instance Magris 1992: 30 and Bauer & Huddleston 2002: 1641). However, this tendency has also been confirmed by the other analyses of the present chapter (which also considered conversion), and by the data provided in Sections 6.3.1 and 6.3.2.3.

6 Syntactic tendencies: parataxis or hypotaxis

After analyzing the morphosyntactic features of voice and nominalization, we will shift our focus to syntax *stricto sensu*, i.e., paratactic or hypotactic tendencies in layperson summaries and their role in comprehensibility.

6.1 Theoretical framework

In the present chapter we will firstly provide some notions about parataxis and hypotaxis (Section 6.1.1) and syntax in LSPs (Section 6.1.2), then we will move on to syntax from a cross-linguistic and translational perspective (Section 6.1.3), as well as its cognitive implications (Section 6.1.4) and indications in guidelines for language simplification (Section 6.1.5).

6.1.1 The coordination/subordination dichotomy

According to Frawley (2003: 322), coordinate constructions are those that “may stand alone, by some criteria, and which are either juxtaposed or connected by a conjunction”. Subordinate constructions, on the other hand, may be defined in functional terms as “a particular way to construe the cognitive relation between two events, such that one of them [...] lacks an autonomous profile, and is construed in the perspective of the other event” (Cristofaro 2003: 2). Another definition provided for subordinate clauses by Hartung (1971: 2–3) is the following: “if [...] two sentences are linked together so that one is directly dependent on the other, this type of formation is called subordinative, and their result a compound sentence. The lack of equivalence between the two parts of the sentence leads to the differentiation between main clause and subordinate clause” (my translation). Other definitions in line with those mentioned thus far are Hallidayan, according to which the relationship “between a dependent element and its dominant, the element on which it is dependent” is called

hypotactic (Halliday 2004: 373–374), while that “between two like elements of equal status, one initiating and the other continuing” is called paratactic (ibid.). Another distinction pointed out by Bisiada (2013: 46) is that “[w]hile the hypotactic conjunction, being part of its clause, can move around with the clause and thus occur initially as well as medially, the paratactic conjunction must stand between the clauses and cannot occur initially”.

6.1.2 Syntax in LSPs

In LSPs, subordination helps to confer precision to discourse (Efing & Kiefer 2018: 180). The rate between main clauses and subordinate clauses depends on the discipline and text type (Borgwaldt & Sieradz 2018: 69): hard sciences, like technology and engineering, seem to contain relatively few subordinate clauses (Buhlmann & Fearn 2000: 49), which seem to be more frequent in the humanities (Plag 2011). This has also been shown by Scarpa (2008: 45), who points out that LSPs are often characterized by parataxis (especially in English). Disciplines like economics, however, are characterized by a higher frequency of hypotaxis. The paratactic tendency is linked with the frequency of nominal style, which guarantees condensation and concision (cf. Chapter 5).

It should be noted that there is no absolute consensus in literature regarding the most frequent types of subordinate clauses in LSPs, although some similarities may be found. For instance, Hoffmann (1998b: 195) states that in technical and scientific sublanguages most clauses consist of relative clauses with an attributive function, often used to replace a simple attribute which might be insufficiently precise, and specific adverbial clauses, i.e., conditional, causal, final, and modal clauses, which in turn are more precise than adverbs and adverbials. Roelcke (1999: 80) highlights that the most recurring types of subordination are conditional (with or without conjunction), final, adversative, and relative clauses. According to Borgwaldt and Sieradz (2018: 68), the most frequent types of subordination are relative, conditional (often without a conjunction), causal, and final clauses.

6.1.3 Cross-linguistic and translational perspective

The present section will report the findings of some studies concerning syntax in the three languages of analysis, in a cross-linguistic and translational perspective.

Becher (2011a) analyzed a diachronic corpus of paratactic and hypotactic sentences in original and translated texts and identifies an increase in the use of parataxis, with a corresponding decrease in the use of hypotaxis in written discourse in German. He also states that hypotaxis has seen a decrease in frequency in German non-translated language, in general (ibid.: 198). Similarly, Fischer (2007) conducted an analysis on a bidirectional corpus of children's books in English and German and found that in German translations of English STs hypotactic sentences were often constructed paratactically: for example, temporal clauses introduced by *as* were often replaced by coordinate clauses introduced by the conjunction *und* (ibid.: 397). Bisiada (2013) also conducted a similar study on causal and concessive clauses in the field of management and business writing, analyzing a translation corpus (with English STs and German TTs), a comparable corpus (with German original texts), and a pre-edited corpus (with English STs, their published German translations, and the corresponding non-edited versions). His starting point was that

[t]ranslators who encounter hypotactic structures in English have the option of translating them hypotactically or paratactically. As there is no syntactic difference between them in English (the conjunction does not have a morphosyntactic effect on the verb or the subject-verb-object structure of the clause), translators may not immediately be aware of this option and, based on the English word order, translate the construction as a paratactic verb-second structure. The hypothesis, then, is that the English ST structure determines the choice of conjunction in German, which in turn determines the tactic type of the construction to be paratactic. If this structure then becomes selected by other language users, it would mean that the hypotactic structure may become a minor use pattern in German. (ibid.: 50–51)

His conclusion was that there is indeed a tendency towards what he calls “paratactisation” (ibid.: 151–157), not only in translation but also in original German texts. As he points out, this goes against the popular impression according to which “convoluted sentences with a large amount of subordination are typical for German, whereas English is known to be precise and brief” (ibid.: 157). In his opinion, the tendency to opt for parataxis may therefore be attributable to a “phenomenon of overcompensation in which language users who consider German intrinsically difficult decide in favour of a paratactic construction, aware that the amount of subordination typical for German is perceived to make understanding the text unnecessarily difficult” (ibid.). Yet, in spite of this increase in frequency of coordination, hypotactic constructions aimed at expressing causal and concessive clause relationships were still more frequent than the corresponding paratactic structures (ibid.: 190).

As for English-Italian contrasts, what should be considered while translating is that English favors parataxis while Italian tendentially prefers hypotaxis (Pierini 2012: 257–258). This has also been shown by other linguists. Scarpa (2008: 166), for instance, states that English syntax tends to be simpler and more compact than Italian; Balboni (2000: 29, qtd. in Scarpa 2008: 173) also highlights that the English language expresses concepts using simple and clear sentences, tendentially of paratactic nature, while hypotaxis is more frequent in Italian. In a similar vein, Musacchio (2004: 98) points out the different mean length of sentences in these two languages, which results from the more marked hypotactic tendency in Italian.

6.1.4 Cognitive implications of parataxis and hypotaxis

From a cognitive point of view, subordination and coordination are known to imply a different degree of complexity. As Beaman (1984: 45) points out, “[s]yntactically simple authors use short, single clause sentences and rely more heavily on coordinated structures to provide cohesion and show relationships. Syntactically complex authors, on the other hand, use longer sentences and more subordinate clauses that reveal more complex structural relationships”. She also highlights that “syntactic complexity in language is related to the number, type, and depth of embedding in a text” (ibid.). In the same vein,

Piemontese (1996: 143) states that coordinate clauses are not as complex as subordinate ones from the point of view of text comprehensibility.

With respect to this dichotomy, there is also a difference between oral discourse and written texts. According to many authors, written texts are syntactically more complex than oral discourse, in that they exhibit a greater number of subordinate clauses (O'Donnell 1974), while spoken texts are syntactically simpler, with more coordinate clauses (Kroll 1977; Chafe 1982).⁹⁶ In this respect, Ochs (1979) explains the greater use of coordinate or subordinate constructions in discourse through the concept of “planning time”, which he introduced in the field of child language acquisition. This concept may also be applied, *mutatis mutandis*, to the study of the differences between spoken and written language; as written texts allow more time for planning, they are characterized by an increased complexity⁹⁷ (Beaman 1984: 46). Unplanned discourse, on the other hand, is characterized among others by a reliance on morphosyntactic structures acquired early in life, which include coordinate constructions (ibid.: 50).

Some interesting findings from the field of cognitive linguistics which, yet again, confirm the different degree of complexity of coordinate or subordinate constructions are *inter alia* those by Dąbrowska (1997, qtd. in Dąbrowska 2015: 653–654), who tested comprehension of four types of complex sentences⁹⁸ and of slightly longer, but syntactically simpler sentences as control sentences in English. Another investigated variable consisted of diasthathy, as her experiment was conducted on unskilled workers, undergraduates, postgraduates, and university lecturers. Her results corresponded with her expectations in two ways: firstly, lecturers achieved the highest scores, followed by postgraduates,

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96 The same is also pointed out, in more general terms, by other scholars, such as Dąbrowska (2015: 660), who highlights that “many complex constructions are considerably more frequent in written language than in speech” (cf. also Biber 1986; Roland et al. 2007).

97 It should be highlighted, however, that this view is not espoused by all linguists; Halliday (1979: 47), for instance, maintains that “contrary to what many people think, spoken language is on the whole more complex than written language in its grammar; and informal spontaneous conversation ... is the most grammatically complex of all”.

98 These were complex NP sentences, tough movement sentences, and two types of sentences with parasitic gaps.

then undergraduates, and finally unskilled workers. Secondly, performance on the control sentences was much better than on the complex sentences. A similar study was conducted also by Chipere (2001, qtd. in Dąbrowska 2015: 654), with both a comprehension and a recall task of one of the structures used in the Dąbrowska (1997) study, i.e., complex NP sentences. The participants were two groups of eighteen-year-olds from the same school who obtained different results in their GCSE exams (High Academic Attainment, or HAA group, and Low Academic Attainment, or LAA group). Unsurprisingly, the HAA group achieved better results on both tasks. Through a follow-up study involving the LAA group only and including a training experiment which consisted of either memory training or comprehension training, Chipere was also able to determine that the LAA group's low scores were attributable to a lack of linguistic knowledge rather than to a limited working memory capacity.

Other interesting considerations with respect to the choice between coordination and subordination are those by Becher (2011a: 199), who claims that in the popular science genre German language writers are increasingly often favoring verb-second (paratactic) structures to verb-final (hypotactic) structures in order to enhance comprehensibility. This is due to the fact that, as indicated by some studies, verb-final structures are cognitively more demanding for readers because the most important information is only revealed at the end (Weyerts et al. 2002).⁹⁹ On the other hand, coordination is often perceived as overused and is also associated with low-quality writing (cf. for instance Bisiada 2013: 49 and Mittelberg 1967).

6.1.5 The coordination/subordination dichotomy in language simplification

The choice between coordination and subordination is widely discussed in the field of language simplification.

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99 There is no consensus on this point; for instance, Bisiada (2013: 49) highlights that “the evidence supporting this claim that has been provided so far is not conclusive, and there are some good arguments against it”. He mentions for instance the point of view of Farrar (1999: 6–7), who maintains that, due to the German *Satzklammer* that moves the content verb at the end of a clause, the same issues of verb-final constructions may be encountered with auxiliary verbs.

In *The Oxford Guide to Plain English*, Cutts (2020) focuses on the length of sentences rather than on the type of clauses they should be comprised of. In this respect, his (as usual quite strong) statement is that “[r]eaders recoil when they see a long sentence slithering across the page like a snake” (ibid.: 22). Among the solutions he provides to long sentences are “split and disconnect” and “split and connect”; while the former technique is quite self-explanatory, the latter implies the use of a full stop followed by connectives such as *additionally, also, alternatively, and, as a result, because, but, consequently, despite this, even so, further, furthermore, indeed, in other words, in the next few days, moreover, nevertheless, now, or, otherwise, so, therefore, today, yet, or what’s more* (ibid.: 24). From Cutt’s statement along with his suggested solution it may be stated that an excess of subordination is indirectly not recommended.

Based on the manual for *Leichte Sprache* by Bredel and Maaß (2016a), subordinate clauses should be avoided, and recourse to other structures that verbalize semantic relations is preferable. According to these authors, the complexity of subordination is due to the fact that embedded sentences cannot be evaluated directly, as their meaning is obtained from the sentence that they refer to. As a consequence, the deeper the embedding, the higher the number of intermediate steps that are necessary in the interpretation of the text, which makes it cognitively more demanding (ibid.: 384). The two scholars propose different solutions depending on the type of subordination in question. Firstly, relative clauses are examined (ibid.: 387–390) and divided into cases where the pronoun refers to a noun phrase in the superordinate clause, cases where the pronoun refers to a sentence (*Satzrelativsätze*), and free relative clauses, which occur in lieu of a noun phrase. For the former, it is necessary to differentiate between restrictive and non-restrictive relative clauses in order to apply the right simplification strategy (ibid.: 387–389). As restrictive relative clauses are needed to correctly identify the referent, the information contained in them must be conveyed at the beginning, although relative clauses are often presented after the main clause in the ST. For non-restrictive relative clauses, the information order may be chosen arbitrarily. With respect to *Satzrelativsätze*, which are never restrictive and comment on the information provided in the sentence that they refer to, reformulations with an anadeictical *das* are recommended. This way, the original order of main

clause and relative clause is maintained (ibid.: 389). Finally, Bredel and Maaß (2016a: 389–390) stress the difficulty inherent in the simplification process of free relative clauses, as their general character and indefiniteness make them complex to concretize and require the translator to intervene more in the text structure and make more modifications. The authors then move on to the simplification of adverbial clauses (ibid.: 391–398). In this respect, they state that explicit semantic connections between sentence parts make it easier to process a text than having to infer them,¹⁰⁰ and that therefore acceptable alternatives of this type of subordinate clauses in *Leichte Sprache* should be closely considered. The two authors give a detailed overview of these possible reformulations, but a concise summary is also provided at the end of the chapter concerning subordination (ibid.: 401, my translation):

Semantic relation	Details	Linguistic resource (<i>d-Ausdruck</i>) ¹⁰¹
Causality	Chronological order	cause – <i>deshalb</i> – effect
	Informational-structural order	effect – <i>nämlich</i> – cause
Temporality		event 1 → <i>dann</i> → event 2
Conditionality		condition? → <i>dann</i> → consequence
Adversativity		event 1 – <i>aber/trotzdem</i> – event 2
Concessivity		counterargument – <i>trotzdem</i> – event
Finality		intended aim – <i>deshalb</i> – event

Table 22: *d-Ausdrücke* by Bredel and Maaß (2016a: 401)

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100 The instance they provide to exemplify this statement is “Herbert kommt nicht ins Büro, weil er krank ist”, which is easier and quicker to process than “Herbert kommt nicht *ins* Büro. Er ist krank” (Bredel & Maaß 2016a: 391).

101 Bredel and Maaß (2016a: 389–390) use the term *d-Ausdruck* (translatable as *d-expression*) to refer to these reformulation alternatives due to the presence of the consonant *d* in many of them: *d-eshalb*, *d-ann*, *trotzd-em*.

After the adverbial clauses, Bredel and Maaß (2016a: 398–401) approach complement clauses. Regarding subject complement clauses, they highlight that these may be introduced by either specific verbs or adjectives, and that they may be frequently translated as verbal constructions in *Leichte Sprache* texts.¹⁰² As for verbs introducing object complement clauses, they state that a distinction must be made between factive, non-factive, and implicative verbs. They also state that of the three, implicative verbs are the most problematic for the translation process. Discussing coordination, Bredel and Maaß (2016a: 402–415) differentiate between syndesis and asyndesis, and indicate that syndetic constructions are preferred to asyndetic ones, as the former make the connection explicit, while the latter leave it implicit and only inferable on the basis of the uniformity of the conjuncts, their adjacency and the presence of a comma (ibid.: 403). Yet, they also point out that this may be applied only to the coordinating conjunction *und*, which is the less specific and marked of all conjunctions (ibid.: 404–405).

In the guidelines for Italian Plain Language developed by Fortis (2003: 12), it is recommended to avoid using subordinate clauses, and rather to resort to coordinate clauses. Furthermore, he also suggests avoiding embedded sentences.

Similarly, in her manual for *Linguaggio facile da leggere e da capire*, Sciumbata (2022) states that independent and coordinate clauses should be favored over subordinate ones, and that the main sentence should be written before the subordinate clause if the presence of the latter is strictly necessary (ibid.: 39–40). She also points out that the advantage of coordination consists of the fact that both clauses are hierarchically equivalent, thus there is no need to establish which one is more important.

The Good Lay Summary Practice does not address the matter directly; it only suggests using “short words, sentences, and paragraphs” (GLSP 2021: 12). While it may be deduced that a consequence of the presence of “short sentences” would be the lower number of subordinate and coordinate clauses, this is not clearly stated. This issue is directly addressed only in the recommendations for

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102 An example that they provide is the following “Beinahe jedem ist bekannt, dass [...]”, which could be rendered as “Fast alle Menschen wissen das: [...]” (Bredel & Maaß 2016a: 398).

pediatric lay summaries: for the age range 9–11 years it is recommended not to use subordinate clauses (ibid.: 74).¹⁰³ In the Recommendations of the Expert Group on Clinical Trials, the issue was tackled more directly: they not only state that “[s]entences should be kept short and succinct” (2018: 6), but also suggest “[a]void[ing] long and complex sentences that include many clauses as these are difficult to understand” (2018: 4).

6.2 Methodology

The present analysis contains two sections, a more qualitative and a quantitative one. For the first section, the smaller selection of 30 texts (10 English STs and the corresponding German and Italian TTs) was considered. The aim was to analyze the clause types, determine which were more frequent, and specifically which trends could be observed in translation. In this respect, particular attention was paid to interpreting the syntactic changes which can explain the detected translation phenomena.

For the quantitative section, the analysis was carried out on the corpus by using Sketch Engine. First, a list with the main subordinators and coordinators of English, German, and Italian was compiled based on some grammar books of the three languages. The volumes considered are *La Grande Grammatica Italiana di Consultazione* (Renzi 1991) for Italian, Duden (2016) and *Textgrammatik der deutschen Sprache* (Weinrich 2005) for German, and *The Cambridge Grammar of the English Language* (Huddleston & Pullum 2002) for English. In addition, for the latter language a meticulous literature review (Liu 2014) concerning subordination in several grammar books was used. The grammar books analyzed in this review are those by Biber et al. (2000), Carter and McCarthy (2006), Downing and Locke (2002), Huddleston and Pullum (2005), Parrott (2000), as well as Quirk et al. (1985).

It should be noted that the borders between conjunctions and adverbs in grammars are not always very clear. For instance, in the categorization of

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103 For the age range “≤ 8 years” it is recommended to use only simple and short words, not even sentences.

coordination proposed by Renzi (1991: 227–269) the label “conjunctions” does not refer to the corresponding parts of speech, but rather to a specific function. As a matter of fact, the grammarian defines conjunctions as “the coordinate constructions whereby what is said about one of the coordinate elements is valid also for the other elements” (Renzi 1991: 232, my translation). Thus, he also includes in this category lexical elements of adverbial nature, such as *quindi*, *perciò*, and *dunque* (Renzi 1991: 231–232, 242–243). The same goes for the category “adversative coordinators”, with elements like *però*, *tuttavia*, and *invece*. Similarly, in *The Cambridge Grammar of the English Language* (Huddleston & Pullum 2002) some lexical items (like *yet* and *so*) are examined both in the chapters concerning conjunctions and in those concerning adverbs. In the present chapter, cases which were not evidently adverbs were counted (cf. Renzi 1991: 243).

These subordinators and coordinators were then looked for in the whole corpus by means of Sketch Engine. A further step consisted of getting rid of the noise, which in most cases required counting the occurrences of the subordinators and coordinators individually. Some instances of the problems that can arise in a Sketch Engine search are given by the following subordinators, which are less straightforward than it would initially seem: *before*, *während*, and *damit*. For *before* and *während*, it is necessary to distinguish between their uses as a subordinating conjunction and as a preposition. As for *damit*, a distinction must be made between its occurrences as a subordinating conjunction introducing a final clause and as a prepositional adverb.

Some limits were set for the analysis. Firstly, independent clauses and asyndetic constructions were not considered. With respect to subordination, complement clauses and relative clauses were not examined, and among argument clauses only those introduced by subordinating conjunctions were analyzed. As a consequence, participial and gerundive clauses, or conditional clauses where conditionality is signaled by the position of the verb at the beginning, were not studied. Yet, these aspects were not neglected altogether, as they were considered in the qualitative analysis.

6.3 Analysis

6.3.1 Qualitative analysis

The first finding of the qualitative analysis consisted of the higher frequency both of subordination and independent clauses compared to coordination. The latter is attributable to a tendency to have juxtaposed independent clauses rather than coordinate clauses, as in the following example:

Who took part in this trial? The researchers asked for the help of men and women with either year-round or seasonal allergies. The participants in this trial were 18 to 65 years old. The trial included 442 participants in the United States. Why was this research needed?

In other cases, however, far more developed sentences were detected, as in:

Due to the lack of effect of peginterferon alfa-2a plus an antiviral in this study in children, and the lack of effect of peginterferon alfa-2a plus entecavir in two other studies in people with the same condition (one in children and one in adults), no further studies of this combination are planned.

As for the trends detected in translation, the number of independent clauses always increased in the German texts, while for Italian it increased in 5 texts and remained unchanged in 1. Correspondingly, the number of subordinate clauses always decreased in the German TTs, whereas for Italian it decreased in 7 texts (in 2 of the 3 texts which exhibited an increase in subordinate clauses, the difference between the STs and TTs was only slight). In both German and Italian the number of coordinate clauses usually decreased; more specifically, it decreased in 7 texts and remained unchanged in 1 for both languages.

The syntactic changes explaining the decrease of subordination in translation were then investigated. The conclusion was that this phenomenon was mainly due to nominalization, reformulations, ellipsis, omission, and segmentation of complex clauses. Based on this qualitative part of analysis, the clauses which were more frequently subject to nominalization were

temporal clauses. Some instances are the following: “before it pumps”, rendered as “vor dem Pumpen” and “prima del pompaggio”, “when it ended [the trial]”, translated as “nach deren Abschluss [der Studie]” and “al termine dello studio”, or “when they receive a medicine”, nominalized in German as “beim Erhalt eines Arzneimittels” but not in Italian (“quando sono trattate con un farmaco”). In some cases, the nominalization process also implied slight differences in meaning: “after doctors did a liver biopsy” was translated as “mittels Leberbiopsie”, thus replacing its temporal connotation through a modal one. This was the case also in the translation of “when cancer cells quickly die”, rendered as “durch den raschen Zerfall von Krebszellen”. In Italian, a temporal connotation was kept, but the meaning was slightly altered, as well: “a seguito della morte rapida delle cellule tumorali”.

Final clauses were also frequently nominalized, especially in German. Some instances are “to improve” or “to evaluate”, translated in German as “zur Verbesserung” and “zur Beurteilung”, respectively, or “to learn”, nominalized in both languages (as “zur Untersuchung” and “di verifica”).

There were also many other cases of recourse to nominal constructions as alternatives to subordination, more specifically to conditional, relative, modal, comparative, causal, and exceptive clauses, as well as to subject and object complement clauses. Some examples of conditional clauses that were nominalized are “if you have any questions about these results”, which was translated as “per dubbi o domande sui risultati” in Italian, or the very similar clause “If you have questions about your own treatment”, rendered as “Bei Fragen zu Ihrer eigenen Behandlung” in German. Other instances in the latter language are “if they [...]”, translated as “unter folgender Voraussetzung” and “if approved”, which was translated as “nach Genehmigung”. In this example, the meaning of the ST clause is also altered, since conditionality is lost and a merely temporal interpretation is introduced. With respect to relative clauses, instances of nominalization were found only in the German texts: “the number of times their sleep is disturbed”, which was translated as “die Anzahl von Schlafunterbrechungen”, and “that affected B cells”, which was rendered as “mit einer Auswirkung auf B Zellen”. As for causal, comparative, and exceptive clauses, cases of nominalization occurred only in the Italian translations: “because the trial ended early”, rendered as “a causa dell’interruzione

anticipata dello studio”, “as directed by their doctor”, translated as “secondo le prescrizioni del medico”, and “unless instructed so by your doctor” as “salvo diverse istruzioni dal medico”. An example of nominalized modal clause is the translation of “by blocking a protein” as “durch Blockieren eines Proteins”. Two instances of nominalized subject as well as object complement clauses are “how safe it is to take [...]”, translated as “wie sicher die Verabreichung [...] ist” in German, and “make sure the results are looked at fairly”, nominalized in both TTs as “dies gewährleistete eine unvoreingenommene Auswahl der Behandlungen” and “assicura un esame obiettivo dei risultati”.

Some examples of reformulation in the TTs are the following:

En: Patients from Part A could participate in Part B after a “washout period” *that lasted at least 2 months*.

De: Die Patienten aus Teil A konnten nach einer „Auswaschphase“ *von mindestens 2 Monaten* an Teil B teilnehmen.

En: Thank you to the people *who took part in the study*. The people *who took part* have helped clinical researchers [...].

De: Danke den *Teilnehmern der Studie*. *Diese Menschen* haben dazu beigetragen, dass die Forschung [...].

Alongside the previous instance in the German layperson summary is another analogous example with the relative clause in “people *who took part in the study*” omitted and rendered as “*die Studienteilnehmer*”. A few pages later, another two relative clauses are rendered through a participial attribute: “29 of the 59 people *who took part* were boys” and “30 of the 59 people *who took part* were girls”, translated as “29 der 59 *teilnehmenden* Patienten waren [sic]” and “30 der 59 *teilnehmenden* Patienten waren [sic]”. However, it may be claimed that, while avoiding subordination, these constructions are not likely to decrease text complexity. Their presence may arguably be attributed rather to space reasons: they are used in a sort of illustration (see Fig. 26 and 27), where a relative clause in German would have been far longer than in the English ST, whereas these participial attributes guarantee a higher degree of concision and compactness (cf. *inter alia* Borgwaldt & Sieradz [2018: 68] for

the role of participle I and II in German LSPs and their capacity to replace cumbersome relative clauses).

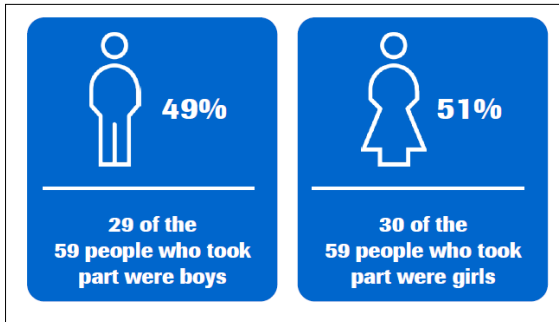


Fig. 26: Instance of relative clause in an illustration (Roche)

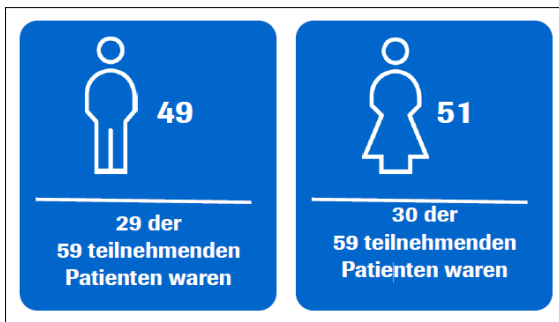


Fig. 27: Instance of *Linksattribut* in an illustration (Roche)

In another English layperson summary, the following excerpt was found:

En: Because this is a summary, a complete listing of adverse events and other clinical trial data are not included.

De: Es handelt sich um eine Zusammenfassung; eine vollständige Liste aller unerwünschten Ereignisse und andere Daten der klinischen Prüfung sind daher nicht enthalten.

In this instance, the causal subordinator *because* was rendered as an adverb, *daher*, and consequently with a different syntactic distribution. Another interesting example is the rendition of the temporal clause as a prepositional adverb in the following excerpt (see Chapter 7 for the use of pronominal adverbs in the German TTs):

En: *When this happens*, parts of the virus are released into the blood.

De: *Dabei* werden Bestandteile des Virus ins Blut freigesetzt.

As for Italian, an instance of reformulation is the following:

En: Itraconazole is a treatment *that is already available for doctors to prescribe* to people with fungal infections.

It: L'itraconazolo è un trattamento *già prescrivibile* dai medici alle persone con infezioni micotiche.

An instance of ellipsis is as follows:

En: CISCRP is not involved in recruiting participants for clinical trials, *nor is it involved* in conducting clinical trials.

It: CISCRP non è coinvolta nel reclutamento di partecipanti a sperimentazioni cliniche, *né* nella conduzione di sperimentazioni cliniche.

As for omission, some instances are the following:

En: If they [...] had their own smartphone, which was *suitable to run the app*

De: Wenn [...] sie ihr eigenes Smartphone besaßen, das *für die App geeignet* war

En: The drug *works by stopping* the narrowing and closing of the upper airways during sleep.

De: Das Medikament *verhindert* die Verengung und Schließung der oberen Atemwege im Schlaf.

En: Novartis is a global healthcare company based in Switzerland that provides solutions *to address the evolving needs of patients* worldwide.

De: Novartis ist ein global operierendes Unternehmen im Gesundheitswesen mit Sitz in der Schweiz, das Lösungen *für die sich wandelnden Bedürfnisse von Patienten* weltweit anbietet.

With respect to the segmentation of complex sentences, an instance is the following, where the German TT is broken down into two sentences (see Chapter 7):

En: Use of the data and information contained in this Document is unrestricted, *provided that it may not be used* in applications by others for regulatory approval of a product.

De: Die in diesem Dokument enthaltenen Daten und Informationen dürfen uneingeschränkt verwendet werden. *Ausgenommen hiervon ist eine Verwendung* durch andere Personen in Anwendungen zur behördlichen Zulassung von Produkten.

Another phenomenon that sometimes occurred was an increase in asyndetic constructions in the TTs compared to the corresponding STs. Some instances are the following, where the conjunction *and* in English is omitted in the German version:

En: Some [people who took part in this study] were treated with bevacizumab only, and others were treated with bevacizumab combined with other cancer treatments.

De: Einige [Patienten, die an dieser Studie teilnahmen] wurden nur mit Bevacizumab behandelt, andere mit Bevacizumab in Kombination mit anderen Krebsmedikamenten.¹⁰⁴

En: Most participants identified themselves as Caucasian (White) and some did not report their race.

.....

¹⁰⁴ This instance is borderline, as it is also characterized by ellipsis of the verb in the TT.

De: Die ethnische Herkunft wurde von den meisten Teilnehmern als kaukasisch (hellhäutig) angegeben, andere machten dazu keine Angaben.

Cases of addition of subordination in translation were also found, albeit not frequently. Some instances are the following:

En: collection of pus in the tissue *around the rectum*

It: raccolta di pus nel tessuto *che circonda il retto*

En: The virus lives inside liver cells *and* makes copies of itself.

De: [...] lebt das Virus in den Leberzellen, *wo* es sich vermehrt.

En: Bayer sponsored this trial *and* has its headquarters at Leverkusen, Germany.

De: Diese klinische Prüfung wurde von der Firma Bayer durchgeführt, *die* ihren Hauptsitz in Leverkusen hat.

The example with the Italian translation is characterized by the addition of a relative clause, while both German instances by the replacement of a coordinate clause through a subordinate one.

6.3.2 Quantitative analysis

6.3.2.1 Frequency of subordinators

The subordinators that were searched for in the quantitative analysis are reported in Tables 23, 24, and 25 (for the English, German, and Italian subcorpus, respectively).

Subordinator type	Subordinators and occurrences	Tot.
Temporal subordinators	After (259); as (3); as long as (4); as soon as (0); before (292); every time (that) (0); no sooner (0); now that (0); once (7); since (2); soon after (0); till (0); until (54); when (402); whenever (0); while (44); whilst (0)	1,067
Conditional subordinators	As long as (0); assuming (that) (0); granted (that) (0); granting (that) (0); if (181); in case (0); in the event that (0); on condition (that) (0); provided (that) (11); providing (that) (0); so long as (0); suppose (that) (0); supposing (that) (0)	192
Causal subordinators	As (4); because (141); considering (0); given (that) (0); in that (0); lest (0); seeing as (0); seeing (that) (0); since (5)	150
Consecutive subordinators	So that (12), too... to (6)	18
Final subordinators	In order for (0); in order that (0); in order to (2); lest (0); to (664)	666
Adversative subordinators	Whereas (0); while (14)	14
Concessive subordinators	Albeit (0); although (2); despite (0); even if (34); even though (1); in spite of the fact that (0); though (0)	37
Explicative subordinators	Inasmuch as (0); insofar as (0); insomuch as (0)	0
Exceptive subordinators	Except that (0); excepting (that) (0); save that (0); unless (8)	8
Aconditional subordinators	However (0); wherever (0); whether ... or not (3); whoever (0 0)	3
Comparative subordinators	As (37); as if (0); as though (0); like (0)	37
Proportional subordinators	The ... the ... (7)	7
Exclusive subordinators	Without (9)	9

Table 23: Subordinators in the English subcorpus

Subordinator type	Subordinators and occurrences	Tot.
Temporal subordinators	Als (9); als gerade (0); bevor (256); bis (55); bis dass (0); da (0); ehe (0); erst (0); erst als (0); gerade als (0); indem (0); kaum (0); nachdem (156); seit (0); seitdem (0); sobald (5); solange (0); solange (1); sooft (0); während (22); währenddessen (0); wie wenn (0); wenn (256)	760
Conditional subordinators	Falls (15); insofern (0); sofern (0); wenn (146)	161
Causal subordinators	Da (58); weil (12); weshalb (0); um so ... als (0); um so mehr als (0 0); um so weniger als (0); zumal (da) (0)	70
Consecutive subordinators	Derartig(...) ... dass (0); dermaßen ... dass (0); so-dass, so ... dass (25); solch(...) dass (0); zu... als dass (1); zu... um zu (2)	28
Final subordinators	Damit (11); zu dem Zweck, dass (0); um zu (538)	549
Adversative subordinators	Anstatt dass/zu (0); bloß dass (0); indes (0); nur dass (0); statt dass/zu (0); während (3); währenddessen (0)	3
Concessive subordinators	Auch wenn (33); dafür dass (0); obgleich (0); obschon (0); obwohl (13); obzwar (0); selbst wenn (0); trotzdem (0); ungeachtet (0); wenn auch (0); wenngleich (0); wenn schon (0); wiewohl (0); wo... doch (0); zugegeben, dass (0); zugestanden, dass (0)	46
Explicative subordinators	Insofern (als) (0)	0
Exceptive subordinators	Außer dass (0); außer wenn (0); außer (um) zu (0); insofern (0); insoweit (0); nur dass (0); sofern (8); soviel (0); soweit (0)	8
Aconditional subordinators	Was immer... (0)	0
Comparative subordinators	Ähnlich wie (0); als (4); als ob (1); als wenn (14); ebenso wie (0); genau (so) wie (0); gleichermaßen wie (0); wie dass (0); wie wenn (0); zu (...) als dass (3)	22
Proportional subordinators	In dem Maße, wie (0); je...desto (8); so (wie) (9); umso...desto (2); umso... je (0)	19

Subordinator type	Subordinators and occurrences	Tot.
Exclusive subordinators	Ohne dass (2); ohne zu (5)	7
Modal subordinators	Dadurch ... dass (2); indem (27)	29

Table 24: Subordinators in the German subcorpus

Subordinator type	Subordinators and occurrences	Tot.
Temporal subordinators	Allorché (0); appena (0); come (0); da che (0); dacché (0); da quando (0); dopo (94); dopo che (91); finché (46); fino a che (0); fino a quando (10); fin quando (0); fin tanto che (0); mentre (6); prima che (119); prima di (130); quando (206); una volta (12)	714
Conditional subordinators	A condizione che (3); a condizione di (0); ammesso che (0); a patto che (0); a patto di (0); laddove (0); nel caso che (0); nell'eventualità che (0); nell'ipotesi che (0); ove (0); purché (8); pur di (0); qualora (2); se (158); supposto che (0)	171
Causal subordinators	Considerato che (0); dacché (0); dal momento che (1); dato che (0); giacché (0); in quanto (38); in quanto che (0); per (3); per il fatto che (0); perché (31); poiché (27); se (0); siccome (0); visto che (0)	100
Consecutive subordinators	A (tal) punto che (0); abbastanza da perché/per/da (0); così... che (1); cosicché (0); così ... da (7); di modo che (0); in maniera (tale) che (0); in modo (tale) che (6); sicché (0); tale che (0); talmente ... da/per/perché (0); tanto ... da (0); tanto... che (0); tanto più che (0); troppo ... da/per/perché (6)	20
Final subordinators	Acciocché (0); acciò che (0); affinché (8); al fine di (16); nell'intento di (0); onde (0); per (706); perché (0)	730
Concessive subordinators	Anche se (38); ancorché (0); benché (1); malgrado (che) (0); nonostante (che) (2); per quanto (0); pure (0); pure se (0); quantunque (0); se anche (0); sebbene (9); se pure (0); seppur(e) (0)	50

Subordinator type	Subordinators and occurrences	Tot.
Exceptive subordinators	A meno che (0), a parte (0), eccetto (che 0), fuorché 0, salvo (che 0), tranne (che 0)	0
Aconditional subordinators	Che... o no (0); checché (0); chiunque (0); comunque (0); dovunque (0); ovunque (0); per quanto (0); quale che (0); qualunque (0); sia che ... o no (0)	0
Comparative subordinators	Come (21); ... quanto (0); tanto... quanto (2)	23
Proportional subordinators	Più/meno... più/meno ... (5); quanto più... tanto più (2), etc.	7
Exclusive subordinators	Senza (12); senza che (1)	13

Table 25: Subordinators in the Italian subcorpus

Clause type	English corpus	German corpus	Italian corpus
Temporal clauses	1,067	760	714
Conditional clauses	192	161	171
Causal clauses	150	70	100
Consecutive clauses	18	28	20
Final clauses	705	549	730
Adversative clauses	14	3	0
Concessive clauses	37	46	50
Explicative clauses	0	0	0
Exceptive clauses	8	8	0
Aconditional clauses	3	0	0
Comparative clauses	37	22	23
Proportional clauses	7	19	7

Clause type	English corpus	German corpus	Italian corpus
Exclusive clauses	9	9	13
Modal clauses	0	29	0
Tot.	2,247	1,704	1,828

Table 26: Comparison of subordinators

Table 26 compares the number of subordinate clauses occurring in the three subcorpora. As shown both in Tables 23 and 26, the most frequent types in the English subcorpus are temporal and final clauses, followed by conditional, causal, concessive, and comparative clauses. Some instances of consecutive, adversative, exclusive, exceptive, and proportional clauses were also found. As the total number of occurrences in the three subcorpora reported in Table 26 shows, there was a decrease in subordination in both translated subcorpora, a tendency that was more marked in German. Only in a few cases did the number of subordinate clauses belonging to a particular type increase in translation. An instance of this featured concessive clauses, but this discrepancy was due mainly to the choice of a different type, as English adversative clauses were often translated with German and Italian concessive ones. See the following translations:

En: While not required, when using these data, we ask that proper credit or attribution of GSK as the source of the data be given.

De: Obwohl zur Nutzung dieser Daten nicht vorgeschrieben, wird um Nennung von GSK als Quelle der genannten Daten gebeten.

It: Sebbene non sia obbligatorio, chiediamo di citare opportunamente GSK come fonte di provenienza quando si utilizzano questi dati.

However, such increase in subordinate clauses in the translated texts was never particularly significant, unlike the decrease of several types of clauses, notably temporal and causal ones.

6.3.2.2 Frequency of coordinators

With respect to parataxis, the coordinators that were detected are reported in Tables 27, 28, and 29. It must be highlighted that the classification of coordinators proposed in the three main grammar books (Huddleston & Pullum 2002; Duden 2016; Renzi 1991) was kept for the sake of fidelity and precision. By so doing, however, the categorizations in the tables are not homogenous.

	Coordinators and occurrences	Tot.
Main coordinators	And	900
	Or	258
	Neither... nor	1
	Nor	26
	But	146
	Not only... but	0
Comparative constructions (bearing resemblance to coordinators)	As well as (0), much less (0), not so much... but (0), rather than (0), still less (0)	0
Expressions of addition/inclusion etc. (bearing resemblance to coordinators)	Along with (0), in addition to (0), including (0), instead of (1), let alone (0), not to say (0), plus (0)	1
Connective adverbs (bearing resemblance to coordinators)	So (68), yet (0)	68
Tot.		1,400

Table 27: Coordinators in the English subcorpus

	Coordinators and occurrences	Tot.
Additive coordinators	Geschweige denn (0); nicht allein... sondern auch (0); nicht bloß... sondern auch (0); nicht nur... sondern auch (0); sowie (7); sowohl... als auch (0); und (627); weder... noch (0)	634
Alternative coordinators	Beziehungsweise (0); bzw. (9); entweder... oder (6); oder (177); respektive (0); resp. (0)	192
Causal coordinators	Denn (2)	2
Explicative coordinators	Das heißt (7); d.h. (0)	7
Restrictive coordinators	Außer (0); es sei denn (0)	0
Adversative coordinators	Aber (27); allein (0); allerdings (51); bloß (0); jedoch (67); nur (0); sondern (0); vielmehr (0); zwar... aber/allerdings/doch (8)	153
Tot.		988

Table 28: Coordinators in the German subcorpus

	Coordinators and occurrences	Tot.
Conjunctions	Dove (0); dunque (0); e (596); laddove (0); mentre (26); mentrech�� (0); n�� (2); quando (0); quindi (36); perci�� (0); se (0)	660
Correlatives	Sia... che (0); sia... sia (0); tanto... che (0); tanto... come (0); tanto... quanto (0)	0
Disjunctions	Cio�� (0); o (237); oppure (10); ossia (3); ovvero (1); ovverosia (0); vale a dire (0)	251
Adversative coordinators	Anzi (0); bens�� (0); eppure (0); invece (2); ma (46); per�� (1); piuttosto (0); se no (0); senn�� (0); tuttavia (59)	108
Tot.		1,019

Table 29: Coordinators in the Italian subcorpus

As may be observed by looking at the total number of coordinators, the coordinate clauses also decreased significantly in translation. Interestingly, the results of the translated subcorpora are quite similar (988 coordinators

in German and 1,019 in Italian, compared to the much higher number of coordinators in the STs, whose occurrences amounted to 1,400).

6.3.2.3 Case study

The present section is dedicated to a case study analyzing a specific subordinator, *when*, and more specifically in the segments where it occurred in English non-final clauses. The aim was to observe how this subordinating conjunction was translated in the TTs. This is because this hypotactic conjunction illustrates very clearly the general trends detected in the quantitative section of analysis. Furthermore, there are a relatively small number of instances (52 of 402 occurrences of *when*), so it was possible to report them all without having to summarize them. However, practically identical occurrences (where only a few words changed in the sentences) were not repeated several times. Instead, it was chosen to add the column titled “No.” to indicate the number of almost identical occurrences of these instances.

EN	N.	DE	IT
Group 2 received damoctocog only <i>when needed</i> for the treatment of bleeds, also known as on-demand treatment.	2	Gruppe 2 erhielt Damoctocog nur <i>bei Bedarf</i> zur Behandlung von Blutungen, auch Bedarfsbehandlung genannt.	Il Gruppo 2 ha ricevuto damoctocog solo <i>quando necessario</i> per il trattamento di episodi di sanguinamento, vale a dire un trattamento su richiesta.
The participants received damoctocog either regularly or <i>when needed</i> .	1	Die Teilnehmer erhielten Damoctocog entweder regelmäßig oder <i>nach Bedarf</i> .	I partecipanti hanno ricevuto damoctocog regolarmente o <i>quando necessario</i> .
Participants were also provided with rescue medicine, which could be taken <i>when needed</i> to manage episodes of increased asthma.	1	Die Teilnehmer erhielten zusätzlich ein Bedarfsmedikament, das sie, <i>falls erforderlich</i> , bei Episoden einer Verschlechterung des Asthmas zur Linderung ihrer Symptome anwenden konnten.	Sono stati messi a disposizione dei partecipanti anche farmaci di soccorso, che potevano essere assunti <i>al bisogno necessario</i> ¹⁰⁵ per gestire episodi gravi di asma.

.....

105 The low degree of idiomaticity of this translation is signaled; *al bisogno* is a more usual – and less redundant – expression.

EN	N.	DE	IT
Trial Purpose: A trial to learn what happened to nifurtimox in the body <i>when taken</i> with and without food and how safe it was in participants with chronic Chagas' disease	1	Ziele der Studie: Eine klinische Prüfung, um mehr über die Sicherheit und mehr darüber zu erfahren, was mit Nifurtimox <i>bei der Einnahme</i> sowohl mit als auch ohne Mahlzeit im Körper von Teilnehmern mit chronischer Chagas-Krankheit geschieht	Scopo dello studio: Studio per valutare il modo in cui nifurtimox ha agito nell'organismo <i>quando assunto</i> a stomaco pieno e a digiuno e la sua sicurezza su partecipanti affetti da malattia di Chagas cronica
The researchers in this trial wanted to learn what happened to nifurtimox in the body <i>when taken</i> with and without food	2	Die Wissenschaftler in dieser klinischen Prüfung wollten herausfinden, was mit Nifurtimox im Körper geschieht, <i>wenn es</i> sowohl mit als auch ohne eine Mahlzeit <i>eingenommen wurde</i>	In questo studio, i ricercatori volevano valutare in che modo nifurtimox avrebbe agito nell'organismo <i>quando assunto</i> a stomaco pieno e a digiuno
In this trial, the researchers wanted to learn more about the safety of befovacimab in participants with hemophilia A or B <i>when taken</i> at different doses.	1	In dieser klinischen Prüfung wollten die Wissenschaftler mehr über die Sicherheit von verschiedenen Dosierungen von Befovacimab bei Teilnehmern mit Hämophilie A oder B erfahren.	In questo studio, i ricercatori volevano valutare la sicurezza di befovacimab su partecipanti affetti da emofilia A o B <i>quando assunto</i> a dosi diverse.
Overall, the researchers found that the average highest level of copanlisib in the blood was about the same on Day 1 <i>when compared</i> to Day 15.	1	Insgesamt stellten die Wissenschaftler fest, dass der durchschnittliche Höchstwert von Copanlisib im Blut an Tag 1 <i>im Vergleich zu</i> Tag 15 etwa gleich hoch war.	Nel complesso, i ricercatori hanno rilevato che il livello medio più alto di copanlisib nel sangue è stato pressoché lo stesso nel giorno 1 <i>rispetto al</i> giorno 15.
Trial Purpose: A trial to learn how copanlisib worked <i>when used</i> together with itraconazole or rifampin [...]	1	Ziele der Studie: Eine klinische Prüfung zur Wirkung von Copanlisib <i>in Kombination mit</i> Itraconazol oder Rifampin [...]	Scopo dello studio: Studio per valutare l'efficacia, gli effetti sulla salute del cuore e la sicurezza di copanlisib <i>quando usato</i> insieme a itraconazolo o rifampicina su partecipanti affetti da tumori solidi in stadio avanzato e linfoma non-Hodgkin

EN	N.	DE	IT
<i>When used</i> in addition to regular type 2 diabetes treatment, results show that albiglutide reduced the risk of having a major cardiovascular problem in patients with type 2 diabetes compared with placebo over the study period.	1	Die Ergebnisse zeigen, dass Albiglutid <i>bei Anwendung</i> zusätzlich zu einer regulären Behandlung des Diabetes mellitus Typ 2 das Risiko für das Auftreten eines wichtigen Herz-Kreislaufproblems bei Patienten mit Diabetes mellitus Typ 2 im Vergleich zu Placebo während der Studiendauer senkte.	I risultati mostrano che, rispetto al placebo, albiglutide, <i>quando utilizzato</i> in aggiunta al trattamento abituale per il diabete di tipo 2, ha ridotto nel periodo dello studio il rischio di sviluppare un problema cardiovascolare importante nei pazienti affetti da diabete di tipo 2.
Overall, the amount of BAY 1217389 in the blood was higher <i>when given</i> together with paclitaxel compared to when it was given alone.	6	Generell war die Menge an BAY 1217389 im Blut höher, <i>wenn BAY 1217389</i> zusammen mit Paclitaxel verabreicht wurde, als bei der alleinigen Verabreichung von BAY 1217389.	Complessivamente, la quantità di BAY 1217389 nel sangue era più alta <i>quando somministrato</i> insieme a paclitaxel rispetto a quando somministrato da solo.
In Part 3, what are the side effects of gantenerumab <i>when given</i> to participants with early Alzheimer's disease every month up to 4.5 years?	3	Welches sind die Nebenwirkungen von Gantenerumab in Teil 3, <i>wenn das Medikament</i> den Studienteilnehmenden, die an Alzheimer im Frühstadium leiden, während bis zu 4,5 Jahren (bis Woche 236) einmal pro Monat verabreicht wird?	Nella Parte 3, quali sono gli effetti indesiderati di gantenerumab <i>somministrato</i> ogni mese per un massimo di 4,5 anni (Settimana 236) a partecipanti con malattia di Alzheimer in fase iniziale?
Trial Purpose: A trial to learn what happened to anetumab ravtansine in the body <i>when given</i> with itraconazole, and how safe it was in participants with advanced cancer.	1	Ziele der Studie: Eine klinische Prüfung, um mehr darüber zu erfahren, was mit Anetumab Ravtansine <i>bei gleichzeitiger Verabreichung mit Itraconazol</i> im Körper geschieht, und wie sicher die Anwendung bei Teilnehmern mit fortgeschrittener Krebserkrankung war.	Scopo dello studio: Studio per valutare il modo in cui anetumab ravtansine ha agito nell'organismo <i>quando somministrato</i> insieme a itraconazolo e la sua sicurezza su partecipanti affetti da cancro in stadio avanzato.

EN	N.	DE	IT
In this trial, researchers compared the results of all participants after 16 weeks of treatment with either fevipirant or placebo, <i>when given</i> along with nasal steroid spray.	1	In dieser Studie wurden die Ergebnisse aller Teilnehmer nach einer 16 Wochen langen Behandlung entweder mit Fevipirant oder mit Placebo, <i>bei gleichzeitiger Anwendung</i> zusammen mit einem steroidhaltigen Nasenspray, miteinander verglichen.	In questo studio, i ricercatori hanno messo a confronto i risultati di tutti i partecipanti dopo 16 settimane di trattamento con intolleranza o placebo, <i>quando somministrati</i> insieme allo spray nasale.
This study, AVALTE, looked at the safety of bevacizumab in people with cancer <i>when given</i> alone or <i>when given</i> with other cancer treatments.	1	In dieser Studie, AVALTE, wurde die Sicherheit von Bevacizumab bei Krebspatienten untersucht, und zwar sowohl <i>bei alleiniger Verabreichung</i> als auch <i>zusammen mit anderen Krebstherapien</i> .	Questo studio, AVALTE, ha esaminato la sicurezza di bevacizumab in persone affette da cancro <i>quando somministrato da solo</i> o <i>insieme ad altri trattamenti antitumorali</i> .
[...] Had cancer that did not get worse after treatment with bevacizumab (as the only treatment or <i>when given</i> with another anti-cancer treatment) in their first study.	1	[...] Sie litten an Krebs, der sich nach der Behandlung mit Bevacizumab (als <i>alleinige Behandlung</i> oder <i>zusammen mit</i> einer anderen Anti-Krebs-Behandlung) in ihrer ersten Studie nicht verschlechterte.	[...] Erano affette da cancro che non era peggiorato dopo il trattamento con bevacizumab (somministrato da solo o <i>con un altro trattamento antitumorale</i>) assunto nel loro primo studio.
A phase II randomized, double-blind, placebo-controlled trial of radium-223 dichloride versus placebo <i>when administered</i> to metastatic HER2 negative hormone receptor positive breast cancer subjects with bone metastases treated with hormonal treatment background therapy	1	Eine randomisierte, doppelblinde, placebokontrollierte klinische Prüfung in Phase-II von Radium-223-dichlorid gegenüber einem Placebo <i>im Fall der Verabreichung</i> an Personen mit Brustkrebs, der metastasierend, HER2-negativ und hormonrezeptorpositiv ist und bei denen Knochenmetastasen mit hormoneller Hintergrundtherapie behandelt werden	Uno studio di fase II randomizzato in doppio cieco, controllato con placebo per valutare l'efficacia di radio-223 dicloruro verso placebo <i>in soggetti con</i> tumore metastatico della mammella a recettore ormonale positivo e HER2 negativo con metastasi ossee trattate con terapia di routine a trattamento ormonale

EN	N.	DE	IT
A phase IIIB, non-randomized, open-label, multi-country, multi-centric cross-vaccination study to evaluate the safety of GSK Biologicals' Herpes ZOSTER subunit (HZ/su) vaccine <i>when administered intramuscularly</i> on a two-dose schedule to subjects who previously received placebo in ZOSTER-006 and ZOSTER-022 studies.	1	Eine offene, nicht randomisierte, multinationale, multizentrische Überkreuz-Impfstudie der Phase IIIB zur Beurteilung der Sicherheit des Untereinheitenimpfstoffs gegen Herpes ZOSTER (HZ/su) von GSK Biologicals <i>nach intramuskulärer Gabe</i> in zwei Dosen bei Patienten, die zuvor in den Studien ZOSTER-006 und ZOSTER-022 Placebo erhalten hatten.	Studio clinico di fase IIIB, multi-paese, multicentrico, di cross-vaccinazione, non randomizzato, in aperto, volto a valutare la sicurezza del vaccino contro l'Herpes zoster (HZ/su) di GSK Biologicals, <i>quando somministrato per via intramuscolare</i> secondo una schedula a 2 dosi in soggetti precedentemente trattati con placebo negli studi ZOSTER-006 e ZOSTER-022.
A Phase IIB, randomised, observer-blind, placebo-controlled, multi-centre study to evaluate the efficacy, safety, reactogenicity and immunogenicity of the GSK Biologicals' investigational vaccine GSK3277511A <i>when administered intramuscularly</i> according to a 0, 2 month schedule in COPD patients aged 40 to 80 years with a previous history of acute exacerbation (AECOPD).	1	Eine randomisierte, Beobachter-verblindete, placebokontrollierte, multizentrische Studie der Phase IIB zur Auswertung der Wirksamkeit, Sicherheit, Reaktogenität und Immunogenität des Prüfimpfstoffs GSK3277511A von GSK Biologicals <i>bei intramuskulärer Verabreichung</i> nach einem 0- und 2-monatigen Schema bei COPD-Patienten zwischen 40 und 80 Jahren mit akuter Exazerbation in der Anamnese (UECOPD).	Studio di fase IIB, randomizzato, con osservatore in cieco, controllato verso placebo, multicentrico per valutare efficacia, sicurezza, reattogenicità e immunogenicità del vaccino sperimentale GSK3277511A di GSK Biologicals <i>quando somministrato per via intramuscolare</i> , secondo una schedula a 0, 2 mesi nei pazienti con BPCO d'età compresa tra 40 e 80 anni con una storia precedente di esacerbazione acuta (EABPCO).
The main focus of this study was to compare the safety of belimumab <i>when added</i> to regular SLE treatment with regular SLE treatment alone.	2	Diese Studie vergleicht die Sicherheit von Belimumab <i>in Kombination</i> mit der regulären SLE-Behandlung mit der Sicherheit der regulären SLE-Behandlung, allein bei Patienten mit SLE.	Questo studio ha messo a confronto la sicurezza di belimumab <i>quando viene aggiunto</i> al trattamento abituale per il LES rispetto al solo trattamento abituale nei pazienti affetti dal LES.

EN	N.	DE	IT
Short Title: A study to compare albiglutide with placebo on major cardiovascular problems <i>when added</i> to diabetes treatment	1	Kurztitel: Studie zum Vergleich der Wirkung von Albiglutid auf wichtige Herz-/Kreislaufprobleme, <i>wenn es zusätzlich zu einer Diabetesbehandlung angewendet wird</i> , mit Placebo	Titolo sintetico: Studio per confrontare albiglutide con placebo per problemi cardiovascolari importanti, <i>quando aggiunto</i> al trattamento per il diabete
Full Scientific Title: A long term, randomised, double-blind, placebo-controlled study to determine the effect of albiglutide, <i>when added</i> to standard blood glucose lowering therapies, on major cardiovascular events in patients with Type 2 diabetes mellitus.	1	Vollständiger wissenschaftlicher Titel: Randomisierte, doppelblinde, placebokontrollierte Langzeitstudie zur Bestimmung der Wirkung von Albiglutid <i>als zusätzliche Gabe</i> zu blutzuckersenkenden Standardtherapien auf wichtige kardiovaskuläre Ereignisse bei Patienten mit Typ 2 Diabetes.	Titolo scientifico completo: Studio a lungo termine, randomizzato, in doppio cieco, controllato con placebo per determinare l'effetto di albiglutide, <i>quando aggiunto</i> a terapie ipoglicemicizzanti standard, sugli eventi cardiovascolari importanti in pazienti affetti da diabete mellito di tipo 2.
Short Title: A study to compare six different doses of nemiralisib with placebo <i>when added</i> to regular medicine(s) in patients with moderate to severe worsening of chronic obstructive pulmonary disease	1	Kurztitel: Studie zum Vergleich von sechs verschiedenen Nemiralisib-Dosen mit Placebo <i>in Kombination</i> mit regulären Medikamenten bei Patienten mit mäßiger bis schwerer Verschlimmerung der chronisch-obstruktiven Lungenerkrankung	Titolo sintetico: Studio per confrontare sei dosi diverse di nemiralisib con il placebo, <i>in aggiunta</i> al farmaco o ai farmaci abituali in pazienti con peggioramento da moderato a grave della broncopneumopatia cronica ostruttiva.
In this study, six different doses of nemiralisib were compared with placebo (no active medicine), <i>when added</i> to patients' regular COPD medicine(s) (standard of care)	1	In dieser Studie wollten die Forscher feststellen, wie sechs verschiedene Dosen von Nemiralisib bei der Linderung der COPD-Symptome im Vergleich zu Placebo (ohne Wirkstoff) wirken, <i>wenn sie</i> zum/zu den regulären COPD-Arzneimittel/n (Standardversorgung) des Patienten <i>hinzugefügt werden</i>	In questo studio, sei dosi diverse di nemiralisib sono state confrontate con il placebo (nessun farmaco attivo), <i>in aggiunta</i> al farmaco o ai farmaci abituali del paziente per la BPCO (trattamento standard)

EN	N.	DE	IT
FEV1 measures the amount of air that a patient can breathe out in the first second <i>when asked</i> to blow as hard as possible into a tube connected to a machine (spirometer).	3	Mit FEV1 wird gemessen, wie viel Luft der Patient innerhalb der ersten Sekunde ausatmen kann, <i>wenn er gebeten wird</i> , so stark wie möglich in ein Röhrchen zu blasen, das mit einem Messgerät (Spirometer) verbunden ist.	Il FEV1 misura la quantità di aria che un paziente riesce a espellere nel primo secondo <i>in cui gli viene chiesto</i> di soffiare il più forte possibile in un tubo collegato a un'apparecchiatura (spirometro).
The researchers found that the participants could safely take 64 milligrams of BAY 1217389 twice a day <i>when taking</i> it with a weekly dose of paclitaxel.	1	Die Wissenschaftler fanden heraus, dass die Teilnehmer 64 Milligramm BAY 1217389 zweimal täglich bedenkenlos einnehmen konnten, <i>wenn sie</i> diese zusammen mit einer wöchentlichen Dosierung Paclitaxel <i>einnahmen</i> .	I ricercatori hanno rilevato che i partecipanti potevano assumere in sicurezza 64 milligrammi di BAY 1217389 due volte al giorno <i>se assunto</i> in combinazione con una dose settimanale di paclitaxel.
They also wanted to find out how safe the medicine was – by checking how many people had side effects and seeing how serious they were, <i>when taking</i> each of the medicines during this study	1	Sie wollten auch herausfinden, wie sicher das Medikament ist – indem sie überprüften, wie viele Personen <i>unter jeder der Behandlungen</i> während dieser Studie Nebenwirkungen hatten und wie schwerwiegend diese waren	Volevano anche scoprire il grado di sicurezza del farmaco, controllando quante persone manifestassero effetti collaterali e misurandone la gravità, <i>con l'assunzione di ciascuno dei farmaci</i> durante questo studio
They also wanted to find out how safe this combination of medicines was, by checking how many people had side effects <i>when taking</i> peginterferon alfa-2a plus an antiviral medicine [...]	1	Die Forscher wollten ebenfalls herausfinden, wie sicher die Kombination dieser Medikamente war, indem sie überprüften, bei wie vielen Teilnehmern der Studie Nebenwirkungen auftraten, <i>wenn sie</i> Peginterferon alfa-2a und ein antivirales Medikament <i>einnahmen</i> [...]	Volevano anche scoprire quanto fosse sicura questa associazione di medicinali, valutando quante persone manifestavano effetti collaterali <i>durante l'assunzione</i> di peginterferone alfa-2a più un medicinale antivirale [...]

EN	N.	DE	IT
Low blood pressure <i>when standing up from sitting or lying down</i>	1	Niedriger Blutdruck <i>beim Aufstehen oder Hinlegen</i> ¹⁰⁶	Pressione sanguigna bassa <i>all'atto di alzarsi in piedi da posizione seduta o sdraiata</i>
Other commonly reported symptoms of endometriosis are lower back and stomach pain, heavy and painful periods, pain <i>when going to the toilet</i> , nausea, diarrhea, and blood in the urine during a period.	1	Andere häufig genannte Symptome von Endometriosis sind Schmerzen im unteren Rückenbereich sowie Magenschmerzen, starke und schmerzhaftes Monatsblutungen, Schmerzen <i>beim Stuhlgang</i> , Übelkeit, Durchfall sowie Blut im Urin während der Monatsblutung.	Altri sintomi comunemente riferiti di endometriosis sono dolori lombari e allo stomaco, mestruazioni abbondanti e dolorose, dolore <i>alla defecazione</i> , nausea, diarrea e presenza di sangue nelle urine durante il ciclo mestruale.
While not required, <i>when using</i> these data, we ask that proper credit or attribution of GSK as the source of the data be given.	9	Obwohl <i>zur Nutzung</i> dieser Daten nicht vorgeschrieben, wird um Nennung von GSK als Quelle der genannten Daten gebeten.	Sebbene non sia obbligatorio, chiediamo di citare opportunamente GSK come fonte di provenienza <i>quando si utilizzano</i> questi dati.
Researchers concluded that addition of umeclidinium to dual therapy, <i>when treating</i> patients with poorly controlled asthma, showed a greater improvement in lung function compared with dual therapy alone.	1	Die Forscher kamen zu dem Schluss, dass die zusätzliche Verabreichung von Umeclidinium zur Zweifachtherapie <i>bei der Behandlung</i> von Patienten mit schlecht kontrolliertem Asthma eine größere Verbesserung der Lungenfunktion im Vergleich zur Zweifachtherapie alleine erzielte.	I ricercatori hanno concluso che l'aggiunta di umeclidinio alla duplice terapia, <i>per il trattamento</i> di pazienti con asma scarsamente controllata, ha mostrato un miglioramento maggiore della funzione polmonare rispetto alla sola duplice terapia.

Table 30: Occurrences of *when* and translations

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106 In this instance, a translation mistake may be observed; the correct translation is the Italian one.

Overall, Table 30 study shows that there was a decrease in subordination in both languages, but this tendency was more prevalent in German, with 19 subordinate clauses and 33 nominalizations as well as similar constructions (with phraseological expressions, such as *bei/nach Bedarf*), while in Italian the number of subordinate clauses amounted to 41 and that of nominalizations and similar constructions (with phraseological expressions, such as *al bisogno/alla defecazione/in soggetti*) only to 11.

6.4 Discussion

Overall, the results of the qualitative and quantitative analysis correspond, indicating that subordination was more frequent than coordination in both the STs and the TTs. Another finding which corresponded in both parts was the decrease in subordinators and coordinators in the translated texts compared to the respective STs. These findings were to some extent surprising, as it was expected that more coordinate clauses than subordinate ones would occur. While analyzing data, limits concerning the quantitative analysis should be considered: only subordinate clauses introduced by subordinators were counted, and asyndetic constructions were not taken into account. However, both subordinate clauses without a subordinator and asyndetic constructions were considered in the analysis of the smaller selection of texts, which showed the same results.

It was also expected, based on the Universal of Simplification, that subordination would not increase in translation, and this hypothesis was confirmed. However, the decrease in hypotaxis was accompanied by a tendency to use more nominal constructions (see Chapter 5) rather than by a more desirable increase in coordination. The findings of the present study contradict the results obtained in other analyses, where a tendency towards paratactization has been shown (cf. Bisiada 2013: 151–157).

As mentioned in Section 6.1.2, there is no absolute consensus in literature as to which subordinate types are frequent, although some similarities may be found. For instance, Hoffmann (1998b: 195) lists relative clauses and specific adverbial clauses, i.e., conditional, causal, final, and modal clauses, Roelcke

(1999: 80) discusses conditional, final, adversative, as well as relative clauses, and Borgwaldt and Sieradz (2018: 68) mention relative, conditional (often without a conjunction), causal, and final clauses. In the analyzed corpus, the most frequent type of adverbial clauses consisted of temporal clauses, which are usually not mentioned by these scholars; the other discussed types were all frequent, apart from adversative and modal clauses, which occurred seldomly. Concessive and comparative clauses, not considered by Hoffmann (1998b), Roelcke (1999) or Borgwaldt and Sieradz (2018), also occurred particularly frequently.

The analyzed layperson summaries did not demonstrate a high variation of subordinators and coordinators. In general, the same conjunctions were used to express the same semantic relations, with few divergencies compared to the wide repertoire of the three languages. This finding corresponds with the recommendations of language simplification, according to which the same linguistic resources should be used to designate the same referents. In this respect, see for instance the chapter “Gleiche Wörter für gleiche Dinge” of the Duden guidebook for *Leichte Sprache* (Bredel & Maaß 2016b: 91–94). Some instances of this low degree of synonymy are provided by the subordinating conjunctions used to express conditionality and concessivity, which will now be examined in more detail. As shown in Table 23, in English only the subordinators *if* and *provided that* were resorted to, with 181 and 11 occurrences, respectively. In the German texts, the same proportion is kept, with only two subordinators used to express this semantic relation: *wenn* and *falls*, with 146 and 15 occurrences, respectively (see Table 24). The Italian texts showed a higher degree of synonymy, with recourse to the subordinators *se*, *purché*, *a condizione che* and *qualora*, with 158, 8, 3 and 2 occurrences, respectively (see Table 25). It should be noted that the subordinator *provided that* occurred only in the texts by GSK, and in a very specific context, i.e., an excerpt of legal nature. In German it was always translated through the segmentation of the complex sentence (see the instance reported in 6.3.1). In the Italian TTs, it was translated as either *purché* or *a condizione che* (subordinators occurring only in the texts written by GSK):

En: Use of the data and information contained in this Document is unrestricted, provided that it may not be used in applications by others for regulatory approval of a product.

It: L'uso dei dati e delle informazioni contenuti nel presente documento non è limitato, purché non vengano impiegati in applicazioni di altri per l'approvazione regolatoria di un prodotto.

It: L'uso dei dati e delle informazioni contenuti in questo documento non prevede limitazioni, a condizione che dati e informazioni non vengano utilizzati da altri per presentare domande di registrazione/approvazione di un prodotto agli enti preposti.

It should be mentioned that in an older, more limited version of the present analysis (Pedrini 2022c), conducted on a smaller corpus of texts (30 for each language) for a conference paper, all layperson summaries were written by the pharmaceutical company Bayer. There, the degree of diversity of the conditional subordinators was even lower, with only *if*, *wenn* and *se* as well as *qualora* occurring in the three subcorpora. Furthermore, the only 2 occurrences of *qualora* in the whole corpus were found in these texts:

En: The participants who took the placebo could switch to regorafenib if their cancer got worse.

It: I partecipanti che assumevano placebo potevano passare al regorafenib qualora il loro tumore fosse peggiorato.

En: The researchers had planned to end the trial early if specific serious medical problems happened.

It: I ricercatori e lo sponsor avevano pianificato di concludere lo studio anticipatamente qualora si fossero verificati problemi medici gravi specifici.

With respect to concessivity, in the English STs only three subordinators occurred: *even if*, *although*, and *even though*, with 34, 2, and 1 occurrence, respectively (see Table 23). In the German texts, the corresponding subordinating conjunctions were *auch wenn* and *obwohl*, with 33 and 13 occurrences, respectively (see Table 24). As occurred with conditionality,

concessive clauses in Italian also showed a higher degree of synonymy than in the other two languages (cf. Table 25), with the presence of the subordinating conjunctions *anche se* (38 occurrences), *sebbene* (9 occurrences), *nonostante* (2 occurrences), and *benché* (1 occurrence). Interestingly, in English the only 2 instances of *although* occurred in a single text written by Roche. In German, *obwohl* occurred only in texts written by GSK (12 instances) or Novartis (1 instance). Of these 12 instances in the texts by GSK, 11 were the translations of the adversative subordinator *while*, mentioned in 4.1, whereas another one was the translation of the subordinator *even though* in the following sentence:

En: The number of COPD exacerbations was similar in both study groups, even though the vaccine brought about a strong immune response.

De: Die Anzahl der COPD-Exazerbationen war in beiden Studien-
gruppen ähnlich, obwohl durch den Impfstoff eine starke Immunantwort
erzielt wurde.

An interesting aspect of the occurrence in the text by Novartis is the different formulation of the semantic relation in translation, where the TT is likely more direct:

En: When the pain caused by shingles doesn't go away after the rash clears up, it is called PHN.

De: Wenn die Schmerzen anhalten, obwohl der Hautausschlag zurück-
geht, spricht man von PHN.

Here, the English temporal connotation is replaced by a concessive one in German: the fact that the pain was expected to go away in case the rash cleared up is more clearly stated. For Italian, *sebbene* only occurred in the texts written by GSK. In 8 cases it was used to translate the adversative subordinator *while*, mentioned in 6.3.1 and above, whereas in the last case it was used to render the subordinator *even though*:

En: The number of COPD exacerbations was similar in both study groups, even though the vaccine brought about a strong immune response.

It: Il numero di esacerbazioni di BPCO si è rivelato simile in entrambi i gruppi di studio, sebbene il vaccino abbia determinato una forte risposta immunitaria.

Interestingly, the distribution of *sebbene* corresponds exactly to that of the German subordinator *obwohl* in these translations.

Nonostante and *benché* occurred in a single text by the pharmaceutical company Roche, as translations of the English subordinating conjunction *although*. Incidentally, in German this subordinator was rendered twice with recourse to the paratactic construction *zwar... aber*:

En: Although this treatment is effective and cures around 60% of patients, 40% of patients do not respond to treatment, or relapse.

De: Diese Behandlung ist zwar wirksam und führt bei etwa 60% der Patienten zur Heilung, aber 40% der Patienten sprechen nicht darauf an oder erleiden einen Rückfall.

En: Although the treatments are effective at killing the cancerous B cells, a large reduction in B cells can also make patients more prone to infections, which in some cases can be serious.

De: Die Behandlungen töten zwar die bösartigen B-Zellen wirksam ab, aber wenn die Zahl der B-Zellen stark reduziert ist, werden die Patienten auch anfälliger für Infektionen, die in einigen Fällen schwerwiegend sein können.

Another interesting feature which should be highlighted is the consistency in the translation of certain subordinators. *Even if* (34 occurrences) was always translated as *auch wenn* in German, with the exception of a single instance, which was reformulated compared to the ST:

En: Trial doctors keep track of all adverse events that happen in trials, even if they do not think the adverse events might be related to the trial treatments.

De: Während einer Studie werden alle unerwünschten Ereignisse dokumentiert und nachverfolgt, unabhängig davon, ob diese möglicherweise durch das untersuchte Medikament hervorgerufen wurden oder nicht.

In Italian, *even if* was always translated as *anche se*; this subordinator exhibits a higher number of occurrences (38) than the corresponding English subordinator (e.g., “*Anche se non si tratta di un requisito obbligatorio*” was resorted to as a translation of “While not required”). This trend¹⁰⁷ seems particularly interesting, as a similar compound conjunction – whose single components are analogous – was used in all languages, thus likely indicating the minimum required effort for the translator. For the translation of the other concessive subordinators, a (slightly) higher degree of variation with no “default choice” was found. It should be noted that the tendency to select default equivalents for the translation of linking devices is neither a new, nor surprising phenomenon: for instance, Musacchio (2006: 181–182), who compared two corpora (one comprising of Italian translations and one of original Italian texts in the fields of economics and physics) in the attempt to evaluate translation quality, had already noted that translators tend to choose the closest equivalent to the ST. Some of her findings include the frequent translation of *but* as *ma* and *however* as *tuttavia*, even in contexts where other alternatives would be preferable. Some of the alternative options she mentions are *invece* and *però*, which in most cases require – or for which it is advisable to introduce – a structure change in the sentence. Thus, she highlights that translators are likely to resort to “the most economical choice, i.e., the one requiring minimum changes” (ibid.: 182). A previous study by Musacchio

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107 It should be noted that this tendency was even more prevalent in the analysis conducted in Pedrini (2022c), similar to the same trend concerning conditionality, which was more evident in texts by this pharmaceutical company. There, concessivity was always expressed with recourse to the subordinating conjunction *even if* in English (30 occurrences), which, in turn, was translated each time as *auch wenn* and *anche se* in German and Italian.

(2005) saw the analysis of a corpus of business and economics newspapers' articles made up of three subcorpora: English articles, their translations into Italian, as well as articles written originally in Italian. Here, Musacchio already pointed out that simple conjunctions which connect phrases loosely, such as *ma* and *tuttavia*, are more frequent in translations than in original texts. On the other hand, conjunctions with a higher semantic weight, such as *invece* and *dunque*, were found to be more frequent in texts originally written in Italian (2005: 80). The results of the present analysis (see Table 29) confirm this trend: *tuttavia* occurred 59 times, *ma* 46 times, while *invece* was detected only twice and *però* once. There were no occurrences for *dunque* (0).

Also interesting are the dimensions of language variation. From a diamesic point of view, the conjunctions that were found are clearly (and unsurprisingly) those of written texts, not typical of spoken discourse. For example, no occurrences of *che* to express causality in Italian were detected (Treccani n.d.a). From a diachronic point of view, no outdated conjunctions occurred, an example of which being *obzwar* to express concessivity in German (which is also diaphasically connotated).¹⁰⁸ From a diaphasic point of view, these texts' registers were not extremely high. For example, there were no occurrences of conjunctions such as *laddove*, *ove*, *quantunque*, *allorché*, *obschon*, or *albeit*. However, there were indeed some features belonging to a non-neutral register, such as the dative *cui* in lieu of *a cui* in Italian, as in "I partecipanti cui era stato assegnato [...]" (cf. Cinque 1988: 457), or the aforementioned conjunction *qualora* (followed by the subjunctive mood) to express conditionality.

Clearly, the number and types of subordinate clauses differed from those of Easy Language, where many reformulations would occur. However, some instantiations of the reformulations of adverbial clauses recommended for Easy Language (cf. *inter alia* Bredel & Maaß 2016a: 391–398) were also sometimes found in this corpus, for instance in the translation of the subordinate clause introduced by *because* with the adverb *daher* (see Section 6.3.1; adverbs will be examined in detail in Chapter 7). In other cases, adherence to other recommendations for language simplification, such as

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108 Duden labels this subordinator as "gehoben veraltend".

those for German *Satzrelativsätze*, would have fostered comprehensibility, especially in particularly complex sentences. See for instance:

Während dieses Zeitraums erhielten die Patienten keine Studienmedikamente, *was dabei half*, jegliche Auswirkungen der vorherigen Behandlungen zu beseitigen.

This could have been rendered with an anadeictical *das* (ibid.: 389):

Während dieses Zeitraums erhielten die Patienten keine Studienmedikamente. *Das* half dabei, [...].

7 Textuality

After discussing the lexico-terminological and morphosyntactic levels of analysis, we will move on to the textual level. In particular, the focus will be on how information is presented and on cohesive devices detected in the layperson summaries.

7.1 Theoretical framework

Text, which is the focus of the present chapter, is the highest, most complex level of analysis, encompassing the levels of sentence, word, and phoneme (Duden 2016: 1073). Correctly understanding and writing a text requires good linguistic competences, since different conditions must be respected. Not only are there grammatical rules that must be obeyed, there are also rules concerning the specific type of text and the choice of elements that are suitable for that register and situation (ibid.).

7.1.1 Textuality: a brief excursus on coherence and cohesion

A text is a complex linguistic sign which is written and read coherently by the communication participants. During this process, writers and readers follow language rules of the grammar and culture-bound praxis of language use (Duden 2016: 1076). The etymology of this term also allows us to better understand it: in Latin, *textus* means ‘fabric’, ‘net’. Like a fabric, a text is perceived as a whole unit rather than a sum of separated items (ibid.).

According to a similar definition, texts and speeches are sequences of sentences, whose content aligns with a common communicative intent. The conceptual relations that allow information from different sentences to create a single, uniform complex message are called *coherence* (Prandi & De Santis 2019: 235).

The concept of coherence is tightly intertwined with that of cohesion, so much so that these two terms are sometimes regarded as synonyms

(cf. for instance Halliday & Hasan 1976; Brinker 2010). It is, however, more appropriate to differentiate between them. Coherence may be defined as “a cognitive phenomenon” whose “recognition is rather subjective as it involves text- and reader-based features and refers to the logical flow of interrelated topics (or experiential domains) in a text, thus establishing a mental textual world” (Menzel et al. 2017: 1). Cohesion, instead, is “an explicit indicator of relations between topics in a text” and “refers to the text-internal relationship of linguistic elements that are overtly linked via lexical and grammatical devices across sentence boundaries” (ibid.: 1–2). In other words, coherence and cohesion are interdependent. Coherence results from cohesion,¹⁰⁹ since the mental representation of a text is created mainly based on information found on the text surface. However, such information is not enough to create a coherent mental representation, since previous knowledge in the long-term memory is necessary to complete it (Frank 2019: 15). Moreover, cohesion is not sufficient to achieve coherence if the text is superficially cohesive but does not mean anything (cf. *inter alia* Prandi & De Santis 2019: 236).

7.1.2 Cohesive devices

A seminal work in this respect is *Cohesion in English* by Halliday and Hasan (1976). The authors differentiate between five types of cohesive ties:¹¹⁰ reference, substitution, ellipsis, conjunction, and lexical cohesion.¹¹¹ In their taxonomy, *reference* includes personal pronouns, demonstratives, and comparatives. Some examples are: “Three blind mice [...] See how *they* run”, “Doctor Foster went to Gloucester [...] and never went *there* again”, and “There were two wrens upon a tree. *Another* came, and there were three”, respectively (ibid.: 31). With

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109 This is not always the case, as made clear by Menzel et al. (2017: 2): “coherence may or may not be signaled by linguistic markers on the text surface, while cohesion and information structure are explicit linguistic strategies which enhance the recognition of conceptual continuity and the logical flow of topics in texts”.

110 The authors call a *tie* “a single instance of cohesion” or “one occurrence of a pair of cohesively related items” (ibid.: 3–4).

111 Halliday and Hasan (1976: 6–7) differentiate between grammatical and lexical cohesion. Reference, substitution, and ellipsis are instances of grammatical cohesion, while conjunction is a borderline category, subsumable both under lexical and grammatical cohesion.

substitution, Halliday and Hasan (ibid.: 88–139) indicate the phenomenon that occurs due to the use of items such as the pro-verb *do* and the pronoun *one*. Two instances are “You think Joan already knows? I think everybody *does*” and “My axe is too blunt. I must get a sharper *one*” (ibid.: 89). The difference between reference and substitution is that reference is a semantic relation, while substitution a grammatical one. As a consequence,

substitution is subject to a very strong grammatical condition: the substitute must be of the same grammatical class as the item for which it substitutes. This restriction does not apply to reference. Since the relationship is on the semantic level, the reference item is in no way constrained to match the grammatical class of the item it refers to. What must match are the semantic properties. But these need not necessarily have been encoded in the text; they may be retrievable from the situation. (ibid.: 32)

Ellipsis (ibid.: 142–222) means that a linguistic element is omitted, as in “Joan brought some carnations, and Catherine [Ø] some sweet peas”. *Conjunction* (ibid.: 226–271) does not indicate where to retrieve information, like the other cohesive devices in this taxonomy, but is a “specification of the way in which what is to follow is systematically connected to what has gone before” (ibid.: 227). It should be noted that “[s]ince conjunction joins whole sentences or series of sentences, the extent of the presupposition is typically larger and more indeterminate than for other ties” (Bernhardt 1980: 48). According to Halliday and Hasan (1976: 238–261), there are four types¹¹² of conjunctive relations: additive, adversative, causal, and temporal. These can be signaled by a variety of structural devices, such as conjunctions, prepositions, adverbs, verbs, or mere juxtaposition. As for *lexical cohesion*, Halliday and Hasan (ibid.: 274–288) “establish a cline of lexical relations, extending from reiteration of a word to the use of synonyms, superordinates, general terms, and collocational items, or words which tend regularly to co-occur” (Bernhardt 1980: 49).

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112 The authors also list other instances of conjunctions which do not belong to these categories, such as *anyway* and *well* (1976: 267–270).

Another seminal work in the field is *Introduction to Text Linguistics*¹¹³ by de Beaugrande and Dressler (1981). The authors, who list cohesion and coherence among the seven standards of textuality,¹¹⁴ state that the linguistic devices that can make a text cohesive are the following: recurrence (i.e., “the straightforward repetition of elements or patterns”), partial recurrence (“the shifting of already used elements to different classes”), parallelism (“repeating a structure but filling it with new elements”), paraphrase (“repeating content but conveying it with different expressions”), the use of pro-forms (“replacing content-carrying elements with short place-holders of no independent content”), ellipsis (“repeating a structure and its content but omitting some of the surface expressions”), morphological agreement (tense and aspect), and junction (ibid.: 49).

In an aforementioned grammar book of the Italian language (Prandi & De Santis 2019: 253–256), antecedents in an anaphoric chain are said to be referred to through *ripetizione* (‘repetition’) and *sostituzione*¹¹⁵ (‘substitution’). In repetition, the antecedent is referred to through the very same word that introduced it, as in “L’ho incontrato ieri. Non lo vedevo da un anno” or “Mio figlio ha *un gatto*. *Il gatto* ha due mesi” (ibid.: 253). In substitution, an antecedent is referred to by means of a different word: more specifically, the options foreseen by Prandi and De Santis (ibid.: 254–256) are the use of pronouns (“Mi hanno regalato un gatto. [...] L’ho subito preso in braccio”), ellipsis (“Mi hanno regalato un gatto. Ø Tremava di paura”), and noun substitution. Noun substitution consists of the use of synonyms, hypernyms, and functionally equivalent expressions of the referent (i.e., noun phrases that have different meanings but can designate the same referent in a text, like “la capitale d’Italia” and “la città eterna”, ibid.: 255). This description of cohesive devices is simpler and more practical than that put forward by Halliday and Hasan (1976); overall, Prandi and De Santis’ *sostituzione* approximately includes Halliday and Hasan’s

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113 *Einführung in die Textlinguistik* (original title).

114 The others being intentionality, acceptability, informativity, situationality, and intertextuality (de Beaugrande & Dressler 1981).

115 Here, the Italian nouns are introduced at the beginning of the explanation to signal that there is a difference with the term *substitution* as used by Halliday and Hasan (1976).

reference, substitution, ellipsis, and lexical cohesion. Connectives – belonging to Halliday and Hasan’s conjunction category – are briefly mentioned in the chapters concerning coherence and cohesion (Prandi & De Santis 2019: 236) and then better thematized in other chapters, including those about conceptual relations between processes (ibid.: 283–328) and connecting words (ibid.: 416, where anaphoric adverbs are thematized along with conjunctions and prepositions). In addition, it should be noted that one of the chapters about cohesion also looks at verb tense.

Cohesion is also dealt with in the Duden grammar (2016: 1079–1133): here, however, the cohesive devices analyzed in the homonymous chapter are all of a grammatical (and, in one case, graphematic) nature, i.e., interpunction, connectives, articles and pronouns, as well as verb tense, mood and voice.

These instances from linguistics and grammar books may suffice to highlight that cohesion can be realized by means of different linguistic resources and that it is categorized very differently by linguists.

7.1.2.1 Connectives

The focus of the present subchapter will be on one of the cohesive devices mentioned in 7.1.2, i.e., connectives, as these are the devices that better highlight logical relations between text parts (Curzi 2013: 40).

There are different terms, definitions, and categorizations of this concept. Firstly, as mentioned in 7.1.2, Halliday and Hasan refer to this cohesive tie as *conjunction*, while the concrete representations of these ties are referred to as *conjunctive adjuncts*.

De Beaugrande and Dressler (1981), who use the term *junction* (‘Konnexion’ in the original work), describe it as a device to signal relations between events and situations through *connectives* (‘Konnektoren’). These relations are classifiable as conjunction, disjunction, contrajunction, and subordination.

In an Italian linguistics manual (Simone 1994), *connettivi* are all elements that connect different portions of text (both within a clause and in different clauses). According to this categorization, connectives include almost all conjunctions, many adverbs, but also some prepositional phrases and clauses (ibid.: 424).

The definition of *connettivi* given by the Treccani dictionary (Ferrari 2010, my translation) is “any of the invariable forms [...] which indicate relations that ‘logically’ structure the meaning of a sentence and text”. Syntactically, these can be subordinating conjunctions or subordinating conjunctive phrases, coordinating conjunctions, as well as adverbs or prepositional phrases with adverbial function.

De Santis and Prandi (2020: 91) define *connettivi* as linguistic resources specialized in enhancing consequentiality. They clearly differentiate connectives from coordinating conjunctions. In another volume (Prandi & De Santis 2019: 182), they refer to them as *ponti anaforici* (‘anaphoric bridges’) due to their function in texts.

These are only some among many examples of the various definitions that can be found in dictionaries, grammars, and linguistics manuals. They suffice to point out that there is no clear consensus as to what should be considered under the term *connective*. In the Methodology section (7.2) we will specify what will be regarded as a connective in the present analysis.

7.1.3 Cognitive implications of textual features

Many studies in the field of cognitive linguistics have thematized coherence and cohesion. According to Karmiloff and Karmiloff-Smith (2002), it is quite difficult to connect sentences by means of linguistic mechanisms that allow for reference to something that has been said previously. Learning such mechanisms is one of the most complex steps in the process of language acquisition and starts at six or seven years of age.

Although producing a cohesive text is a complex skill, a cohesive text is easier to process. In an experiment conducted on subjects of different age groups (a group of university students and two groups of primary school students belonging to different classes), Fayol and Mouchon (1997) showed that the presence of connectives in a sentence increases reading speed. Specifically, in their experiment reading speed increased in the segments after connectives. The authors assume that this occurs because connectives provide information about sentence construction, suggesting that the elements that follow a connective belong to the same structure as the elements that precede

it. Overall, connectives make relations between text parts and events explicit, so that readers do not have to infer them.

“Explicit” is a recurrent word in linguistics studies that discuss cohesion. It occurs, *inter alia*, in the definition provided by Menzel et al. (2017: 1–2) reported in 7.1.1. Halliday and Hasan (1976: 299) refer to cohesion as an explicit codification of relations between text segments. In his book concerning phonic relations, Frank (2019: 16–18) names one chapter “cohesion as explicit textual phenomenon”. In particular, connectives are regarded as explicit structural features of a text which usually operate as single words or word groups at the syntactic level. Other cohesive resources, like tense and mood system, are considered as less explicit (ibid.: 17).

7.1.4 Cross-linguistic and translational perspective

In a volume concerning cohesion and coherence in translation and multilingual settings, Menzel et al. (2017: 2) highlight that, during the translation process,

the conceptual relations in the mental textual world have to be transferred into the target text by using strategies of cohesion and information structure that conform to target-language conventions. Empirical knowledge about language contrasts in the use of these explicit means and about adequate/preferred translation strategies is one essential key to systematize the logical flow of topics in human and machine translation. (ibid.)

Some studies devoted to cohesion and coherence from a contrastive perspective, especially by means of corpus linguistics methods, have highlighted some differences between languages and registers. In particular, Kunz et al. (2017) suggest using more explicit devices, like demonstrative pronouns in lieu of personal pronouns (*dies/das* instead of *es*), when translating from English into German. Kunz et al. (ibid.) go on to show that language contrasts are even more significant when comparing different registers in the same language and therefore recommend that translators use cohesive devices more extensively, for instance, when they translate popular science texts from English into German.

The opposite translation strategies, instead, are favored when translating from German to English (ibid.).

The Universal of Explicitation has also been studied in relation to connectives, both in human and automatic translation (see Becher 2011b; Meyer & Webber 2013; Li et al. 2014). Becher (2011b) examined conjunctive adverbials in business texts translated between English and German, and found more explicitation (addition of connectives) in the direction from English into German. This may be due to two phenomena. Firstly, German has “a richer inventory of linguistic triggers” for these relations (Lapshinova-Koltunski 2017: 111). Secondly, sentence-splitting is a frequent translation strategy, especially in the linguistic combination English-German (Bisiada 2014), which results in the need for more connectives (Lapshinova-Koltunski 2017: 111).

As for English-Italian contrasts with respect to cohesion and coherence, Pierini (2012: 241–252) points out that English shows a preference for repetition, while Italian favors variation with paraphrases or synonyms of the antecedent. Another difference consists in ellipsis and inflectional markers. In Italian, the ellipsis of the subject is often possible and can serve as a cohesive device, since verbs and other parts of speech are inflected and provide information (like person and number) about the subject itself. Connectives are also used differently. In many cases, the English language signals relations such as justification, consequence, and contrast by means of the sequence of segments rather than through connectives. Italian, on the other hand, makes such relations more explicit by using connectives. Some instances (ibid.: 252) are the following:

En: The child had begun to cry. Ø He went to her and bent over, giving her a handkerchief.

It: La bambina aveva cominciato a piangere. Così andò da lei e chinandosi le diede un fazzoletto.

En: The results were exactly as predicted, and very strong; Ø in the honest interview there were more felt than fake smiles and no smiles that leaked either disgust or contempt; Ø in the deceptive interview the leakage smiles appeared and also there were more false than felt smiles.

It: I risultati sono stati esattamente quelli previsti, e molto netti: *infatti* nell'intervista onesta c'erano più sorrisi autentici e non ce n'era nessuno che tradisse disprezzo o disgusto; *mentre* nell'altra intervista comparivano sorrisi che lasciavano trapelare le emozioni, e inoltre i sorrisi falsi erano più numerosi.

Another interesting aspect of cohesion in translation is that translated texts generally tend to maintain the categories, functions, and positions of the ST anaphoras. In addition, translators generally use more nominal coreference than pronominal coreference in light of the tendency towards explicitation (Zinsmeister et al. 2012, qtd. in Lapshinova-Koltunski 2017: 110).

7.1.5 Textuality in guidelines for language simplification

In the *Oxford Guide for Plain English* (2020), several chapters are devoted to textuality. Firstly, the guide highlights the need to follow a reader-centered structure in the way information is provided (ibid.: 9–21). Readers should be able to “quickly extract what they want”, so “big news” should be put early in the text. There are several possible ways to provide information, such as in a chronological order or with questions and answers.

Writers should divide information into clear paragraphs (ibid.: 21–32), which ought to correspond to units of thought. These can refer to previously discussed topics or new ones: in the latter case, writers should start with a sentence introducing the topic. Instead of writing long sentences, authors should prefer shorter sentences whose relations are made explicit by connectives such as: *additionally, also, alternatively, and, as a result, because, but, consequently, despite this, even so, further, furthermore, indeed, in other words, in the next few days, moreover, nevertheless, now, or, otherwise, so, therefore, today, yet, and what's more* (ibid.: 24).

Using vertical lists helps “present complex information into manageable chunks” (ibid.: 84–92). This way of presenting information takes more space, but it is easier to understand. Writers should pay attention to some aspects in order to avoid making lists difficult to grasp. For instance, the items should be kept in parallel. As a matter of fact, if “statements with different grammatical structure are mixed haphazardly, the reader has to stop and backtrack” (ibid.:

87). Some instances are listed items with infinitives, actives, passives, or no verbs at all. It is also important to avoid continuing a paragraph that was begun before the list *after* the list, if possible, since readers' working memory will be overloaded by the list itself.

The importance of correct punctuation is also highlighted, along with the importance of reducing cross-references as much as possible (ibid.: 97–118, 160–162).

In the manual for *Leichte Sprache* (Bredel & Maaß 2016a: 485–487), text coherence is discussed. Anaphora by means of noun phrases and pronominal anaphora¹¹⁶ should be avoided, as encyclopedic knowledge and syntactic awareness are needed for their resolution. Identical occurrence is the only type of anaphoric chain realization that does not pose issues (ibid.: 370). As occurs on other linguistic levels, explicitness should be favored over implicitness. Connectives are superfluous only if readers have sufficient previous knowledge – though this is not expected of the target group of *Leichte Sprache*, where the type of relation between text parts should be signaled in order to make coherence visible (ibid.: 487). In addition, as has been shown in Chapter 6 (Table 22), adverbial connectives (*d-Ausdrücke*) should be used instead of subordinate clauses to guarantee that sentences remain short and relations explicit.

Other textual aspects which are discussed in the manual (ibid.: 506–512) are how to address readers and provide metacommunicative comments. Authors should refer concretely to readers, from person to person, so as to make the reading process less abstract and more similar to oral communication, which is one of the features of *Leichte Sprache*. If readers can or should perform an action, this should be stated explicitly. Formality is a category that exists also in *Leichte Sprache*, and not all readers should be addressed with the informal pronoun *du*. At the same time, indirect, impersonal formulations, as well as hedging strategies should be avoided.

As for metacommunicative comments, correct text reception depends greatly on whether its function is clear to readers. While trained readers often

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116 So far there is a lack of empirical studies concerning the use of pronouns in cases where anaphora resolution is not complicated, since the pronouns have an unambiguous referent (ibid.: 373).

recognize the function of a text at first sight by understanding which text type it belongs to, target readers of *Leichte Sprache* will have less experience with intertextuality, and the text function should therefore be made explicit.

Another important category of metacommunicative comments consists in the use of text (or discourse) deictic references,¹¹⁷ which help readers understand the logical relations in the text and its structure. They are also a useful resource to make complex concepts and relations between concepts more comprehensible, which is why they are frequently found in *Leichte Sprache* (particularly in paraphrases and explanations). The chosen type of text (or discourse) deictic references has an impact on comprehensibility. References can be anadeictic or catadeictic, as well as distal or proximal. Catadeictic references are easier to process, as they follow the reading direction. Readers are warned in advance about the reference that is going to be presented, so they pay more attention. Anadeictic references, instead, are understood with more difficulty. They go against the reading direction, so they refer to something that readers have already received. This type of information has to be available in the working or long-term memory; otherwise, the reader has to go back to the text portion that the anadeixis refers to (ibid.: 510–511). Proximal references, which pertain to near text segments, are easier to understand than distal references, which allude to distant text segments. It is more likely that readers will understand a reference if they only need to move their eyes over a page than if they need to scroll or turn pages (ibid.). Catadeictic references are more frequent in *Leichte Sprache* than in standard language, where anadeictic references are more common (Maaß 2010, qtd. in Bredel & Maaß 2016a: 510).¹¹⁸ If the catadeictic expressions are indented, it is easier to understand where the reference ends. Text deixis and the use of a colon attract the readers' attention so that they know they should read the following lines carefully. Although there are no empirical studies which examine the reception of distal and proximal text deixis in *Leichte Sprache*, it can be assumed that proximal text deictic references should be favored over distal ones with a remarkable distance in the reference chain. In particular, if the text segment referred to is

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117 These aspects clearly also contribute to cohesion and coherence.

118 In standard language, proximal references are also more frequent.

very far away, the reference should be semantically meaningful. For example, references like “Adresse siehe unten” are not suitable, they should be specific like “Die Adresse finden Sie ganz unten auf dieser Seite” (ibid.: 511).

Another aspect discussed among metacommunicative comments is the presentation of some sort of thematic frame of reference. This occurs more frequently in *Leichte Sprache* than in standard language, and it evidences the text’s explication strategies (Bredel & Maaß 2016a: 511–512). The addition of a summary or foreword at the beginning of a text is a common means of presenting a thematic frame of reference (Bredel & Maaß 2016b: 158–159).

In his Italian guidelines for Plain Language, Fortis (2003: 13–14) makes some considerations about text structuration. Information should not be presented randomly, but based on a precise criterion, which can be of logical, chronological or of another nature. More important information should precede secondary information and details. Consequences should be listed before causes (the so-called “inverted pyramid” structure). Texts are fragmented into short paragraphs, which correspond to conceptual units (i.e., they contain information about the same topic). Headings, subheadings, captions, highlighted keywords, and other elements surrounding the text orient readers. Bulleted and numbered lists are widely used, as they allow for information to be divided up and presented in a clear way. Connectives (mainly conjunctions and certain adverbs) should be used adequately because they guarantee text cohesion, make relations (for instance cause-effect, contrast, etc.) explicit, and in some way “guide” readers through the text. Examples should be quite frequent, as they allow readers to understand potentially unclear concepts. Paraphrases are also important and reformulate an idea that has already been expressed in simpler terms or present it from a different angle. Summaries help readers focus on the main concepts if there are too many details that may distract them.

In her manual for *italiano facile da leggere e da capire*, Sciumbata (2022) describes how information should be provided. Unlike difficult words or sentences, a badly organized text is not immediately evident, but it may have an even greater impact on comprehension. Cases of excessive and insufficient information are both problematic, and the same goes for illogical information hierarchy, which makes it more difficult to understand how different passages are connected with each other. It is therefore necessary to plan texts carefully

before starting writing. Information should be selected based on what readers already know and on what they might find interesting, as well as on the text's purpose. It will sometimes be necessary to conduct research to be able to explain certain concepts better, while in other cases, information should be reduced (ibid.: 32–33). The most important concepts should be listed at the beginning. Depending on what is being described, information can be provided in a chronological order, by explaining the cause and then the effect,¹¹⁹ or by describing a concept in a general way and then providing details. Similar topics should be dealt with together and should be introduced by headings and subheadings, which help to make a text clearer and enable readers to find what they are looking for more easily. They should not be too generic (as in *avviso* or *attenzione*), but should instead describe the topic and summarize it. Questions are a good solution, since they are clear and informal (ibid.: 33–36).

Cohesion is paramount, as it enables readers to understand logical relations. Connectives should be used in an appropriate and explicit way, so that readers do not need to make inferences (ibid.: 54–55).

Readers should be addressed in a direct way, not by means of impersonal constructions, and with the informal pronoun *tu* (ibid.: 49). Examples are essential to clarifying concepts; explanations should be inserted in the text, not in footnotes (ibid.: 68). Glossaries are also a good method to provide explanations (ibid.: 75). Numbers can be difficult to understand, since they are abstract concepts. It is therefore better to use less precise but clearer expressions like *alcuni*, *molte*, *la maggior parte*, *pochi*, etc.

Finally, the GLSP (2021) does not focus particularly on textual aspects. It only recommends to “use headings and descriptive sub-headings” (ibid.: 13–14), which should be reader-friendly, as stated in the Recommendations of the Expert Group on Clinical Trials (2018: 11–25). Some instances are “When was this study done?” and “What was the main objective of this study?”

The Recommendations (ibid.: 5) also suggest to present the “big picture” before details (with an inverted pyramid writing style) and to indicate links to additional information as well as resources for online summaries and

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119 So, the opposite of Fortis' inverted pyramid (2003: 13).

background information, which “need to be minimal since hyperlinks can become out of date over time” (ibid.).

7.2 Methodology

The present analysis aims at examining aspects like text hierarchy and structuration of the layperson summaries (including references), meta-communicative comments and allocutive forms, as well as text cohesion.

The first part of the analysis is based on the smaller sample of 30 texts (with 10 SL texts and 10 corresponding TL texts in German and Italian). This is because it was necessary to evaluate visual features which would have been very difficult to examine in the whole corpus. In addition, the standardization of these texts makes the evaluations based on a sample quite generalizable.

As for metacommunicative comments and allocutive forms, the same smaller sample of texts was initially taken into account. In a second step, some particularly interesting aspects were also analyzed quantitatively in the whole corpus by means of Sketch Engine.

The analysis of cohesive devices (Section 7.3.3) has been conducted quantitatively by extracting the main inter-sentence connectives from the three subcorpora by means of Sketch Engine. An analogous corpus analysis in the field of politics conducted by Magris (2021) was taken as a starting point. In the present analysis, connectives *stricto sensu* have been considered, but coordinating and subordinating conjunctions, which, as shown in Section 7.1.2.1, are sometimes included among connectives, were not counted, as they were the subject of a separate analysis (cf. Chapter 6). On the whole, the structures that are more frequently regarded as connectives are adverbs and adverbials. However, since “the grammatical categorisations [of connectives] are not stable enough” (Tamburini et al. 2002), Table 31, 32, and 33 list the forms that have been considered in the present analysis, extracted from grammars and linguistics articles.

Table 31 reports the English connectives, listed in *The Cambridge Grammar of the English Language* (Huddleston & Pullum 2002: 775–779), where they are called *connective adjuncts*. Table 32 reports connective or conjunctive

adverbs listed in the Duden grammar (2016: 585, 596–598). In addition, prepositional (or pronominal) adverbs, which are typical of German and also serve as cohesive devices, have been considered. These are not reported here in the methodology, since they are quite intuitive and – unlike connectives, whose definition varies – uncontroversial (the full list is found in Duden 2016: 592). They are formed by adding *da(r)-*, *hier-* or *wo(r)-* before a preposition. The latter category, which consists of relative and interrogative adverbs, has not been taken into account in the analysis, as the actual connective adverbs are those with *da(r)-* and *hier-* (which is the high-register variant). As in the analysis conducted by Magris (2021), pronominal adverbs required by syntax (i.e., introducing complement clauses) were not taken into account. This can be seen in the following two instances:

Das liegt *daran*, dass dies nicht die Hauptfrage war, die die Wissenschaftler beantworten wollten.

Es trägt weiterhin *dazu* bei, dass FVIII länger im Blut verweilt als andere FVIII-Behandlungen.

Table 33 shows the connectives analyzed in the Italian subcorpus. In this case, the list has been compiled based on several grammars and scientific articles, since none of the most frequently used grammars for Italian seems to report a complete list of connectives. The list is based mainly on the section about connective adverbs of the *Grande Grammatica Italiana di Consultazione* (Lonzi 1991: 411–412) and has been subsequently integrated with connectives reported in Bazzanella (1995: 248–249), Prandi and De Santis (2019: 236, 283–328, 416), De Santis and Prandi (2020: 90–111, 182–183), and Ellero (1986).

It should be noted that the category distinctions and denominations in Tables 31, 32, and 33 are slightly different, since the classifications proposed by the respective grammars have been maintained. In particular, Huddleston and Pullum (2002: 777–779) divide connectives into two main groups: pure and impure connectives. According to them, pure connectives “have no other function than that of connecting their clause to their surrounding text (or context)” (ibid.: 777), while impure connectives mix this function to other, more semantically relevant, functions (i.e., concession, condition, and consequentiality).

The table presented by Duden (2016: 597) has been integrated by adding textual adverbs, which are thematized separately in this grammar, in order to guarantee a correspondence with the English category “ordering” found in Huddleston and Pullum (2002: 778).

As for Italian, Lonzi (1991) does not indicate clear-cut categories like those listed by Huddleston and Pullum (2002) and Duden (2016). As a consequence, connectives have been divided into categories based on the English and German classifications. One exception is the category of “modal connectives”, which are explicitly mentioned by Lonzi (1991: 412) and therefore introduced in the Italian classification (similar connectives are found in English, in the category “Addition and Comparison”).

Pure connectives	
Category	Connectives
Ordering	Finally, first, first of all, firstly, for a start, for another (thing), for one thing, in conclusion, in sum, in the first place, in the second place, last, last of all, lastly, next, on the one hand, on the other hand, second, second of all, secondly, then, third
Addition and comparison	Again, also, alternatively, at the same time, besides, better, by contrast, by the same token, conversely, either, equally, further(more), however, in addition, in comparison, instead, in the same way, likewise, moreover, on the contrary, rather, similarly, too, what is more important
Elaboration and exemplification	For example, for instance, in other words, more precisely, that is (to say)
Markers of informational status	By the way, incidentally, parenthetically
Impure connectives	
Concession	Nevertheless, nonetheless, still, though, yet
Condition	Anyway, in that case, otherwise, then
Reason/result	Accordingly, as a result, consequently, hence, in consequence, so, therefore, thus

Table 31: English connectives

Category	Connectives
Textual adverbs	Erstens, einerseits... andererseits, ferner, schließlich, weiterhin, zweitens
Copulative connectives	Auch, außerdem, daneben, darüber hinaus, dazu, desgleichen, des Weiteren, ebenfalls, ebenso, ferner, weiter, zudem, zusätzlich
Causal connectives	Also, daher, damit, demnach, demzufolge, deshalb, deswegen, folglich, infolgedessen, mithin, nämlich, somit
Adversative connectives	Allerdings, dagegen, demgegenüber, dennoch, doch, einerseits ... andererseits, hingegen, indes/indessen, jedoch, nur, stattdessen, vielmehr
Concessive connectives	Dessen ungeachtet, immerhin, gleichwohl, nichtsdestotrotz, sowieso, trotzdem
Temporal connectives	Anschließend, danach, dann, davor, indessen, währenddem, währenddessen
Conditional and consecutive connectives	Andernfalls, ansonsten, dann, gegebenenfalls, notfalls, so, sonst
Restrictive and explicative connectives	Freilich, insofern, so weit

Table 32: German connectives – conjunctive adverbs

Category	Connectives
Textual adverbs	Anzitutto, anzi tutto, da una parte... dall'altra, in conclusione, in definitiva, innanzitutto, innanzi tutto, in primo luogo, in secondo luogo, in sintesi, in terzo luogo, per concludere, per prima cosa, prima di tutto
Copulative connectives	Altresì, anche, in aggiunta, inoltre, in più, neanche, nemmeno, oltre a ciò, oltretutto, peraltro, per di più, per giunta, pure
Adversative connectives	Eppure, invece, però, tuttavia

Category	Connectives
Concessive connectives	Ciò malgrado, cionondimeno, ciononostante, ciò nonostante, malgrado ciò, nondimeno, nonostante ciò
Temporal connectives	Dopo, dopodiché, dopo di che, infine, in seguito, intanto, poi, prima, quindi, successivamente
Consecutive connectives	Allora, conseguentemente, così, di conseguenza, dunque, insomma, perciò, per questo, pertanto, quindi
Conditional connectives	Altrimenti, sennò
Modal connectives	A ogni modo, al contrario, analogamente, comunque, in maniera analoga, in ogni caso, in ogni modo, inversamente, lo stesso, parallelamente, parimenti
Elaboration and exemplification	Ad esempio, anzi, cioè, in altre parole, in effetti, infatti, in realtà, insomma, meglio, per esempio, per meglio dire, più precisamente, piuttosto
Markers of informational status	Appunto, a proposito, tra l'altro

Table 33: Italian connectives

7.3 Analysis

As mentioned in the Methodology section (7.2), the empirical analysis examines three main aspects: content, text hierarchy, and references (7.3.1), metacommunicative comments and allocutive forms (7.3.2), as well as cohesive devices (7.3.3), where the focus will be on connectives.

7.3.1 Content, text hierarchy, and references

The layperson summaries are very standardized with respect to their presentation and content. They are well structured, with clear information hierarchies. In some cases, the initial pages also present a summary of the text: this occurs in all texts by Bayer (“Overview of this trial”) as well as in one by Novartis (“This trial at a glance”, with page references next to each paragraph) and one by Roche (“Key information about this study”). In addition, all texts by

Roche entail the section “Contents of the summary” which shows all headings in a numbered list, as shown in Fig. 28.

Contents of the summary	
1.	General information about this study
2.	Who took part in this study?
3.	What happened during the study?
4.	What were the results of the study?
5.	What were the side effects?
6.	How has this study helped research?
7.	Are there plans for other studies?
8.	Where can I find more information?

Fig. 28: Example of contents lists

Headings and subheadings divide paragraphs into clear units of thought. They are also quite standardized and frequently consist of questions, as shown by the headings in Fig. 28. Some examples are: “What were the results of the trial?”, followed by an introductory part and then by the subheadings “Average total level of copanlisib in the blood”, “Average highest level of copanlisib in the blood”, and “Did copanlisib affect the participants’ heart health?”. As often occurs with questions in headings or subheadings, the first sentence of the following paragraph is an answer: “No, copanlisib did not affect the participants’ heart health”. Another instance is the following subheading: “Did the participants feel a cooling sensation after taking a chewable tablet form of BAY76-2211?” with the answer “Yes. The researchers found that the participants did feel a cooling sensation after taking a chewable tablet form of BAY76-2211”. Similar headings and subheadings are far clearer than the typical (usually elliptical) juxtaposition of noun phrases found in LSPs.

As required by Annex V of Regulation 536/2014, layperson summaries include references to trial summaries for experts, in case readers want to learn more about the trial. Links to the trial summary or to the general platform (with the identifying trial number to be inserted and sometimes with step-to-step instructions to be followed) are provided at the end of layperson summaries – more rarely at the beginning. In the initial pages, readers are clearly¹²⁰ told that they might find links to further information at the end of the text, as in the following example:

This section shows only the main results from the study. You can find information about all other results on the websites at the end of this summary (see section 7).¹²¹

Some instances of these references to the trial summaries can be seen in Fig. 29 and 30:


Where can I learn more about this trial?

You can find more information about this trial on the websites listed below.

- ▶ clinicaltrials.bayer.com/study/?id=19334
- ▶ clinicaltrials.gov/ct2/show/study/NCT03547583
- ▶ clinicaltrialsregister.eu/ctr-search/search?query=2018-000298-65

Full Trial Title: A randomized parallel-group, placebo-controlled, double-blind, multi-center trial to evaluate the efficacy and safety of the oral sGC stimulator vericiguat to improve physical functioning in activities of daily living in patients with heart failure and preserved ejection fraction (VITALITY-HFpEF)

Protocol number: 19334

ClinicalTrials.gov identification number: NCT03547583

Fig. 29: Reference to trial summaries for experts in a text by Bayer

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120 See the importance of giving precise indications, especially with distal references, highlighted by Bredel and Maaß (2016a: 511).

121 Other intratextual references are quite rare, since there is rather a tendency towards redundancy.

Where can I learn more about this trial?

More information about the results and the full list of adverse events that happened in this trial can be found in the scientific summary of the results available on the Novartis Clinical Trial Results website (www.novctrd.com). Once on the site, click “Clinical trial results” at the bottom of the page. After agreeing to enter the Novartis website, type **CBVS857X2202** into the keyword search box and click “Search”. If you have questions about the results, please speak with the trial doctor or staff at your trial site.

This trial was registered on the following websites:

- Clinical Trials.gov (<https://clinicaltrials.gov/>) - National Clinical Trial # NCT02024932
- <https://www.clinicaltrialsregister.eu/ctr-search> - EU Clinical Trial # 2013-002608-15

Fig. 30: Reference to trial summaries for experts (including instructions) in a text by Roche

7.3.2 Metacommunicative comments and allocutive forms

As for metacommunicative comments, the text function and target are indicated clearly in layperson summaries. For instance, texts by GSK point out at the very beginning that “This document provides a short summary of this study for a general audience”. In layperson summaries produced by Bayer, the following statement was found: “The purpose of this summary is to share information about Bayer’s clinical research with participants and the public”. Roche is sometimes even more specific. One of the texts states:

This is a summary of the results of a clinical study written for:

- people who took part in the study
- family members and guardians of children who took part in the study and
- members of the public.

Interestingly, the denomination “layperson summary” (or other similar names, cf. Section 1.3.2) is not always used in the texts themselves, but rather in the pharmaceutical company platform/database and in the text metadata.¹²² Of the

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122 Metadata in texts by Bayer contain the indication “PLS” (Plain Language Summary), in texts by GSK “Plain Language Summary”, in texts by Roche “LPS” (layperson summary), and in texts by Novartis “Patient Summary”.

10 examined texts, only those by Roche entail the denomination “layperson summary” as a title (“Clinical Trial Results – Layperson Summary”) or at the end of the page, with the date indication and a summary code.

Indications of target readers are usually accompanied by other important clarifications (as foreseen in trial guidelines), like the fact that trial results may differ from other studies and, even more importantly, that readers should not change their treatment arbitrarily only based on what they have read. For instance, texts written by Bayer state as follows:

Please talk to your doctor before making any treatment decisions, and about any healthcare questions you may have. Because this is a summary, a complete listing of adverse events and other clinical trial data are not included. The results from several trials are needed to better understand which treatments work best and are safest.

Layperson summaries produced by GSK specify that:

Your doctor can help you understand more about this study and the results. Speak to your doctor about the treatment options available in your country. You should not make changes to your care based on the results of this or any single study. Keep taking your current treatment unless instructed by your doctor.

We would like to thank the patients who contributed to this study. The results of this study will help answer scientific questions about treating patients with SLE.

This excerpt allows us to introduce another important aspect, i.e., the fact that trial participants are thanked for their help, since it is paramount to make sure that they understand their role in clinical research and feel appreciated for it. Texts produced by Bayer even refer to participants as a “community of people”, which may have a highly emotional effect. In German, this expression is replaced by the *Funktionsverbgefüge* “einen wertvollen Beitrag leisten”.

En: Participants in clinical trials belong to a large community of people who take part in clinical research around the world. They help researchers answer important health questions and find medical treatments for patients.

De: Teilnehmer einer klinischen Prüfung leisten einen wertvollen Beitrag für die weltweite klinische Forschung. Sie helfen Wissenschaftlern bei der Beantwortung wichtiger Fragen zur Gesundheit und bei der Entdeckung neuer medizinischer Behandlungen für Patienten.

It: I partecipanti agli studi clinici appartengono a una vasta comunità di persone che partecipano a ricerche cliniche in tutto il mondo. Essi aiutano i ricercatori a trovare risposte a importanti domande sulla salute e a scoprire trattamenti medici per i pazienti.

The same formulation¹²³ is found in some texts by Novartis, with the difference that the meaning is not changed in German (*große Gemeinschaft von Patienten*):

En: Thank you

As a clinical trial patient, you belong to a large community of patients around the world. You helped researchers answer important health questions and test new medical treatments.

De: Vielen Dank

Als Teilnehmer an einem klinischen Forschungsprojekt gehören Sie zu einer großen Gemeinschaft von Patienten weltweit. Sie halfen Forschern bei der Beantwortung wichtiger Fragen zur Gesundheit und bei der Prüfung neuer medizinischer Behandlungen.

It: Grazie

In qualità di paziente di una sperimentazione clinica, Lei appartiene a una vasta comunità di pazienti di tutto il mondo. Lei ha aiutato i ricercatori a trovare risposte a importanti domande sulla salute e a sperimentare nuovi trattamenti medici.

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¹²³ Overall, this formulation occurs 45 times in the whole corpus. In texts by Bayer it is always translated as “einen wertvollen Beitrag leisten”, except once (“große Gemeinschaft von Menschen”). In texts by Novartis it is always translated as “große Gemeinschaft von Patienten”.

In these excerpts readers and participants are addressed directly. The GSK and Bayer instances above show that these pharmaceutical companies differentiate between readers and trial participants: trial participants, unlike readers, are not addressed directly. Texts by Roche sometimes address them directly and sometimes do not. One of the texts reads as follows: “Thank you for taking part in this global clinical trial (called a ‘study’ in this document). Your generous participation is helping researchers to answer important health questions”. Another one is less direct: “Thank you to the people who took part in this study”. The same goes for layperson summaries produced by Novartis, as shown by the following example:

Thank you to the participants who took part in the clinical trial for the drug LMB763, also called nidufexor. All of the participants helped the researchers learn more about how LMB763 works and how safe it is to take.

Novartis sponsored this trial and believes it is important to share what was learned from the results of this trial with the participants and the public. An independent organization prepared this summary of the trial results.

We hope this helps the participants understand their important role in medical research.

A box with an icon depicting a question mark then refers directly to participants: “If you participated in the trial and have questions about the results, please speak with the trial doctors or staff at your trial site”. The instances above also show another important aspect, i.e., the translation of allocutive forms in German and Italian. Polite forms are mostly used, but in some cases impersonal constructions are found (see the Italian translation):

En: Please talk to your doctor before making any treatment decisions, and about any healthcare questions you may have.

De: Bitte konsultieren Sie Ihren Arzt, bevor Sie Behandlungsentscheidungen treffen und wenn Sie Fragen zu Ihrer Gesundheit haben.

It: Si prega di consultare il proprio medico curante prima di prendere decisioni relative a qualsiasi trattamento e per qualsiasi domanda relativa all'assistenza sanitaria.

This is probably due to interlinguistic differences between English and Italian: impersonal constructions are frequently used to translate more colloquial and direct formulations (cf. Pierini 2012: 259). However, it is not an adequate strategy in simplified language variants, where impersonal constructions should be avoided, if possible.

7.3.3 Text cohesion

Tables 34, 35, 36, and 37 show the connectives that have been extracted from Sketch Engine.

Pure connectives		
Category	Connectives	Total
Ordering	Finally (0), first (4), first of all (0), firstly (0), for a start (0), for another (thing), for one thing (0), in conclusion (0), in sum (0), in the first place (0), in the second place (0), last (0), last of all (0), lastly (0), next (0), on the one hand (0), on the other hand (0), second (0), second of all (0), secondly (0), then (65), third (0)	69
Addition and comparison	Again (6), also (451), alternatively (0), at the same time (2), besides (0), better (0), by contrast (0), by the same token (0), conversely (0), either (0), equally (0), further(more) (0), however (13), in addition (0), in comparison (1), instead (2), in the same way (0), likewise (0), moreover (0), on the contrary (0), rather (0), similarly (0), too (0), what is more important (0)	475
Elaboration and exemplification	For example (7), for instance (0), in other words (2), more precisely (0), that is (to say) (0)	9
Markers of informational status	By the way (0), incidentally (0), parenthetically (0)	0
Tot.		553

Impure connectives		
Category	Connectives	Total
Concession	Nevertheless (0), nonetheless (0), still (0), though (0), yet (0)	0
Condition	Anyway (0), in that case (0), otherwise (0), then (1)	1
Reason/result	Accordingly (0), as a result (1), consequently (0), hence (0), in consequence (0), so (66). therefore (5), thus (1)	73
Tot.		74
Total of both pure and impure connectives		627

Table 34: English connectives in the corpus

Category	Connectives	Total
Textual adverbs	Erstens (0), einerseits... andererseits (0), ferner (0), schließlich (0), weiterhin (33), zweitens (0)	33
Copulative connectives	Auch (421), außerdem (27), daneben (0), darüber hinaus (3), dazu (1), desgleichen (0), des Weiteren (10), ebenfalls (12), ebenso (2), ferner (0), weiter (0), zudem (88), zusätzlich (10)	574
Causal connectives	Also (20), daher (61), damit (2), demnach (0), demzufolge (0), deshalb (12), deswegen (0), folglich (1), infolgedessen (0), mithin (0), nämlich (1), somit (17)	112
Adversative connectives	Allerdings (82), dagegen (0), demgegenüber (0), dennoch (1), doch (1), einerseits... andererseits (0), hingegen (0), indes/indessen (0), jedoch (70), nur (0), stattdessen (2), vielmehr (0)	156
Concessive connectives	Dessen ungeachtet (1), immerhin (0), gleichwohl (0), nichtsdestotrotz (0), sowieso (0), trotzdem (1)	2
Temporal connectives	Anschließend (7), danach (25), dann (36), davor (0), indessen (0), währenddem (0), währenddessen (0)	68

Category	Connectives	Total
Conditional and consecutive connectives	Andernfalls (0), ansonsten (0), dann (0), gegebenenfalls (10), notfalls (0), so (1), sonst (0)	11
Restrictive and explicative connectives	Freilich (0), insofern (0), so weit (0)	0
Total		956

Table 35: German connectives – conjunctive adverbs in the corpus

Prepositional adverbs with <i>da(r)</i> -	Prepositional adverbs with <i>hier</i> -	Total
daran (5)	hieran (0)	5
darauf (4)	hierauf (0)	4
daraus (0)	hieraus (0)	0
dabei (6)	hierbei (59)	65
dadurch (7)	hierdurch (2)	9
dafür (5)	hierfür (13)	18
dagegen (0)	hiergegen (0)	0
dahinter (0)	hierhinter (0)	0
darin (1) / darein (0)	hierin (0) / hierein (0)	1
damit (10)	hiermit (0)	10
danach (25)	hiernach (1)	26
darüber (4)	hierüber (0)	4
darum (0)	hierum (0)	0
darunter (2)	hierunter (1)	3
davon (11)	hiervon (11)	22
davor (0)	hiervor (0)	0
dazu (11)	hierzu (0)	11
dazwischen (0)	hierzwischen (0)	0
Tot.: 91	Tot.: 87	Tot.: 178

Table 36: German connectives – prepositional/pronominal adverbs in the corpus

Category	Connectives	Total
Textual adverbs	Anzitutto (0), anzi tutto (0), da una parte... dall'altra (0), in conclusione (0), in definitiva (0), innanzitutto (0), innanzi tutto (0), in primo luogo (0), in secondo luogo (0), in sintesi (0), in terzo luogo (0), per concludere (0), per prima cosa (0), prima di tutto (0)	0
Copulative connectives	Altresì (1), anche (312), in aggiunta (0), inoltre (98), in più (0), neanche (1), nemmeno (0), oltre a ciò (0), oltretutto (0), peraltro (0), per di più (0), per giunta (0), pure (0)	412
Adversative connectives	Eppure (0), invece (3), però (1), tuttavia (94)	98
Concessive connectives	Ciò malgrado (0), cionondimeno (0), ciononostante (0), ciò nonostante (0), malgrado ciò (1), nondimeno (0), nonostante ciò (0)	1
Temporal connectives	Dopo (0), dopodiché (0), dopo di che (1), infine (3), in seguito (1), intanto (0), poi (4), prima (5), quindi (47), successivamente (26)	87
Consecutive connectives	Allora (0), conseguentemente (0), così (5), di conseguenza (7), dunque (0), insomma (0), perciò (0), per questo (0), pertanto (54), quindi (9)	75
Conditional connectives	Altrimenti (0), sennò (0)	0
Modal connectives	A ogni modo (0), al contrario (7), analogamente (0), comunque (4), in maniera analoga (0), in ogni caso (0), in ogni modo (0), inversamente (0), lo stesso (0), parallelamente (0), parimenti (0)	12
Elaboration and exemplification	Ad esempio (7), anzi (0), cioè (4), in altre parole (2), in effetti (0), infatti (1), in realtà (0), insomma (0), meglio (0), per esempio (3), per meglio dire (0), più precisamente (0), piuttosto (0)	17
Markers of informational status	Appunto (0), a proposito (0), tra l'altro (0)	0
Total		702

Table 37: Italian connectives in the corpus

A comparison of Tables 34, 35, and 37 (which are more directly comparable, since German prepositional adverbs are specific to this language) shows an increase in connectives in the translated subcorpora with respect to the SL subcorpus (with 627 connectives). The increase is more evident in German, where 956 connectives were extracted, while there is no remarkable increase in Italian, where 702 connectives were found.

The German categories with the highest increase are copulative, adversative, causal, temporal, and textual adverbs. It should be noted that copulative and adversative connectives are examined together in the “addition and comparison” category by Huddleston and Pullum (2002). The German class of “copulative connectives” alone has a higher number of adverbs (574) than the whole English category (475). If adversative connectives (156) are counted as well, then the difference is even more significant (475 connectives in the English subcorpus vs 730 in the German subcorpus). Causal connectives, in Duden’s categorization, correspond to the “reason/result” category by Huddleston and Pullum (2002). Here, the increase in the German subcorpus is not as remarkable as that of the “addition and comparison” category, but still evident, with 112 connectives against 73. Finally, it should be mentioned that temporal and textual connectives partly overlap. The German temporal and textual adverbs therefore correspond to Huddleston and Pullum’s “ordering” category. The increase almost equals that of causal connectives, with 101 occurrences in the German subcorpus against 69 in the English subcorpus.

The Italian and German subcorpora, when compared to the English subcorpus, reveal increases across similar categories. Firstly, it should be noted that, in this case, the “addition and comparison” category by Huddleston and Pullum (2002) corresponds to three Italian categories: copulative, adversative, and modal connectives. This is because Lonzi (1991) separates modal connectives (such as *analogamente*, *allo stesso modo*, *parimenti*) from copulative ones. All together, these three categories show 522 occurrences, while, as stated above, in English there are only 475 connectives of this type. As was the case for German, this classification also reveals the occasional blurring of boundaries between textual and temporal connectives, which have therefore

been considered together here. 87 textual and temporal¹²⁴ connectives have been detected in the Italian subcorpus, with only 69 corresponding connectives in the English subcorpus. Finally, the “elaboration and exemplification” category also shows an increase in the Italian subcorpus, with 17 connectives against 9 connectives in the English subcorpus.

As for the German pronominal adverbs (Table 36), what immediately stands out is the high frequency of occurrence of the more formal variants with *hier-*, which, on the whole, are almost as frequent as their counterparts with *da(r)-* (87 vs 91). In one case (*davon/hiervon*), the number of forms with *hier-* equals the variant with *da(r)-*. In 2 cases, the variant with *hier-* is even more frequent than the one with *da(r)-*: *hierfür* occurs 13 times, while *dafür* has 5 occurrences; *hierbei* occurs 59 times, thus being almost 10 times more frequent than its less formal counterpart *dabei* (6 occurrences).

7.4 Discussion

In general, information in layperson summaries is provided in an adequate way, with clear hierarchies thanks to headings and subheadings that explain (mainly in form of questions) what will be thematized in the corresponding paragraphs. This is the aspect for which layperson summaries’ guidelines are followed more closely. However, not all summaries have an initial overview of the text itself, which is useful and should always be included. Text function is always clearly indicated along with target readers, who are usually addressed directly. However, the denomination “layperson summary” (or other synonyms), which is a very important indication that should always be inserted, is not always found in the texts.

As for cohesion, data provided in 7.3.3 shows an increase in connectives in the translated subcorpora. This finding is likely due both to the aforementioned tendency to be more explicit in translation and to the higher tendency of German and Italian to use connectives compared to English (Becher 2011b; Lapshinova-Koltunski 2017: 111; Pierini 2012: 252). However, it should be

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 124 These were actually no instances of textual connectives.

taken into account that the list of analyzed connectives does not make a claim to completeness. In addition, in some cases the connectives correspond to other constructions in the STs. For instance, in the category of adversative connectives, which shows an increase in both translated subcorpora, many German occurrences correspond to English coordinating conjunctions: in 79 cases, *but* is translated as *allerdings*:

En: There are treatments for RCC, but none of these helps cure the cancer.

De: Zwar gibt es Behandlungen für Nierenzellkrebs, allerdings hilft davon keine, die Krebserkrankung zu heilen.

En: There are treatments for hemophilia A, but some of these need to be given often in order to reduce a patient's bleeding.

De: Es gibt bereits Behandlungen für Hämophilie A, allerdings müssen einige davon mehrmals verabreicht werden, um die Blutungen des Patienten zu reduzieren.

While analyzing these results, it is important to consider that other cohesive devices, like repetition, substitution, and ellipsis, were not taken into account due to the difficulty of examining them quantitatively in the corpus. What can be said is that anaphoras by means of third-person pronouns are not always avoided, as suggested in Easy Language:

En: A trial to learn how regorafenib worked and how safe *it* was in participants with renal cell cancer.

De: Eine klinische Prüfung, um mehr über die Wirkung und die Sicherheit von Regorafenib bei Teilnehmern mit Nierenzellkrebs zu erfahren.

It: Studio per valutare l'efficacia e la sicurezza di regorafenib su partecipanti affetti da carcinoma a cellule renali.

En: Bayer reviewed the results of the trial when *it* ended.

De: Nach Abschluss *der klinischen Prüfung* überprüfte Bayer die Ergebnisse *der klinischen Prüfung*.

It: Al termine dello studio, Bayer ha esaminato *i risultati*.

En: Before a treatment is available to all patients, researchers study *it* in trials to better understand *its* safety and how well *it* works.

De: Bevor eine Behandlung allen Patienten zugänglich gemacht wird, führen Wissenschaftler klinische Prüfungen durch, um die Sicherheit und die Wirkung *der Behandlung* besser zu verstehen.

It: Prima di rendere un trattamento disponibile a tutti i pazienti, i ricercatori *lo* sottopongono a studi clinici per comprendere meglio la *sua* sicurezza ed efficacia.

These examples were chosen because of the presence of pronominal anaphora in the STs. Interestingly, in some cases such anaphoras are not found in the TTs, due to recourse to a different structure, like a nominal style (“die Wirkung und die Sicherheit von Regorafenib”/“l’efficacia e la sicurezza di regorafenib”), repetition (“Nach Abschluss der klinischen Prüfung [...] die Ergebnisse der klinischen Prüfung”), or ellipsis (“i risultati dello studio”).

As for pronominal adverbs, a comparison with results of a translated subcorpus (EU TRAD) reported in Magris (2021) may be useful. Even if the size of the two corpora is taken into account (EU TRAD has 22,231 tokens, the German subcorpus of layperson summaries 144,917 tokens), the frequency of adverbs in the layperson summary subcorpus is slightly higher (24 vs 178). The frequency of adverbs with *hier*- is also far higher in the layperson summary subcorpus (4 vs 87). The only subcorpus analyzed by Magris with a similar rate of this type of adverbs (57) is the one with Bundestag’s parliamentary questions. This result is particularly interesting, as high-register adverbs are generally more adequate in political texts like those examined by Magris than in simplified texts. It should also be noted that these pronominal adverbs have a deictic or anaphoric function here; no cases of inter-sentence cataphoric use (recommended by Bredel & Maaß 2016a: 510–511 instead of anaphoras) were detected.¹²⁵

Pronominal adverbs appear to have different functions in the translated texts. In some cases, they seem to have been chosen simply because they are more idiomatic than more literal translations of ST pronouns:

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125 Here, interference of the ST anaphora (or, overall, constructions) may have played a role (see Zinsmeister et al. 2012, mentioned in Section 7.1.4).

En: Then, the doctors measured the levels of markers for certain proteins in the tissue samples. These are specific proteins that can be affected in women with uterine fibroids.

De: *Danach* ermittelten die Prüfarzte das Markergehalt für bestimmte Proteine in den Gewebeproben. *Dabei* handelt es sich um bestimmte Proteine [sic] die bei Frauen mit Uterus-Myomen beeinflusst werden können.

En: This study was “open label”. This means that both the people taking part in the study and the study doctors knew what study medicines people were taking.

De: Es handelte sich um eine offene Studie, eine sogenannte „Open-Label-Studie“. *Dabei* wussten die Studienteilnehmer ebenso wie die Prüfarzte, welche Studienmedikamente die Teilnehmer einnahmen.

En: Paclitaxel works by stopping cancer cells from dividing into new cells. This blocks the growth of the tumour.

De: Paclitaxel wirkt, indem es verhindert, dass sich Krebszellen weiter in zwei neue Zellen teilen. *Hierdurch* wird das Wachstum des Tumors blockiert.

In other cases, these adverbs are added because the ST is segmented in the TT and a cohesive device is needed (cf. *inter alia* Bisiada 2014; Lapshinova-Koltunski 2017: 111):

En: They also wanted to find out how safe the medicines were – by checking how many people had side effects in each treatment group and seeing how serious they were (see section 5 “What were the side effects?”).

De: Die Forscher wollten außerdem herausfinden, wie sicher die Medikamente sind. *Hierfür* überprüften sie, wie viele Personen in jeder Behandlungsgruppe Nebenwirkungen hatten und wie schwer diese waren (siehe Abschnitt 5 „Welche Nebenwirkungen traten auf?“).

En: By targeting the overactive BRAF enzyme, vemurafenib can shrink tumours and helps people with melanoma live longer.

De: Vemurafenib richtet sich gegen das überaktive BRAF-Enzym und kann bewirken, dass Tumoren schrumpfen. *Dadurch* können Melanom-Patienten länger leben.

In other cases, pronominal adverbs are added *ex novo* to make relations more explicit and thus the text clearer, as in:

En: Doctors use MRI to take pictures of the inside of the body. They can use substances that act like “dye” to help make these pictures more clear.

De: Ärzte verwenden MRT, um Aufnahmen vom Inneren des Körpers zu machen. Sie können *hierfür* Substanzen verwenden, die als „Färbemittel“ fungieren, um diese Aufnahme deutlicher zu machen.

In some instances, the pronominal adverbs replace subordinate clauses. Here, it is questionable whether the TT is clearer than the ST (although it is certainly more concise):

En: In people living with chronic hepatitis B, the virus lives inside liver cells and makes copies of itself. When this happens, parts of the virus are released into the blood.

De: Wenn jemand eine chronische Hepatitis B hat, lebt das Virus in den Leberzellen, wo es sich vermehrt. *Dabei* werden Bestandteile des Virus ins Blut freigesetzt.

On the whole, whether pronominal adverbs foster or hinder comprehensibility depends on the individual case. In general, it can be said that they are helpful if they are added in the TT to make relations more explicit, or if they are an idiomatic formulation. On the contrary, if they replace clearer explanations (like the temporal reference in the latter instance), readers will need to make inferences and will arguably have more difficulty interpreting the text.

8 Layout and multicodality

Lexico-terminological, morphosyntactic, and textual features are not the only aspects that affect comprehensibility. The way information is presented on the page also impacts greatly on readers' ability to perceive and understand a text. For this reason, a whole chapter has been devoted to this aspect.

8.1 Theoretical framework

The present chapter focuses on the texts' layout and typographical features, as well as on multicodality. A definition of the latter is provided *inter alia* by Janich and Birkner (2015: 197), who describe it as a type of communication with more than a code of signs (like texts and images), in opposition to multimodal communication, which involves more than one mode of perception (such as visual and auditory modes). Layout and multicodality, often neglected while writing and analyzing texts, are actually not of subordinate importance, as "a reader responds to a document first in terms of how it looks on the page, regardless of what it says" (Child 2016: 399).

The present theoretical introduction will focus on the cognitive implications of those aspects that are more relevant to comprehensibility (8.1.1) and then on the guidelines for language simplification (8.1.2). This is because, although all texts (also standard language and LSP texts) have a typographical structure that is relevant to understandability, this level of analysis has some specific rules in language simplification (Bredel & Maaß 2016a: 502).

8.1.1 Cognitive implications

An optimal visual presentation of texts increases comprehension as well as reading speed (Auberlen 1989, qtd. in Bredel & Maaß 2016a: 266). In perceptual psychology it is well known that information can be received, processed, and memorized particularly well if it is presented in a multimodal or multicodal way (ibid.: 271). Pictures can help activate previous knowledge and exemplify

what is discussed in a text. They are particularly helpful for users with a limited reading ability (Levie & Lentz 1982, qtd. in Bredel & Maaß 2016a: 185). In these cases, pictures can be used to compensate for the poor understanding of the content expressed verbally. However, according to the Cognitive Load Theory (Sweller et al. 1998, qtd. in Bredel & Maaß 2016a: 272) not all types of multicodality are equally suited to making the reading process easier. An excessive amount of information can lead to a cognitive overload, since the working memory only has a limited elaboration capacity. There are two types of cognitive load: intrinsic and extrinsic. The intrinsic cognitive load is the result of absent or insufficient previous knowledge, whereas the extrinsic cognitive load is influenced by the complexity or variety of the material to be processed. In order to guarantee comprehension, neither the intrinsic nor the extrinsic cognitive load should be too high. These two concepts are correlated. The less previous knowledge a reader had on a certain topic, the more likely they are to struggle with a cognitive overload. Overall, this leads to a contradiction. On the one hand, pictures are particularly useful for readers with a limited reading ability and limited previous knowledge of a certain topic. On the other hand, it is exactly because of this limited previous knowledge that providing information in several codes may lead to a cognitive overload.

There are two key principles behind the optimization of comprehension through pictures: the coherence principle and the spatial contiguity principle (Sweller 2005, qtd. in Bredel & Maaß 2016a: 272). Pictures should be coherent with the text and be positioned close to the part of text that they refer to, so that they may be found easily. The spatial contiguity principle allows for the avoidance (or decrease in) what is known as the split-attention effect. If text and picture are positioned far away from each other, the readers' attention is split between them, which increases the load on the working memory and reduces cognitive ability in the comprehension process. If text and picture are positioned close together (integrated format), they can be processed simultaneously (and more easily) by readers (Bredel & Maaß 2016a: 282). Other solutions (Schlag 2011; Mazarakis 2009) that may help tackle the split-attention effect are the use of color coding (using the same color in the picture and in the part of text that refers to it), labelling (emphasizing the part of the text that refers to the picture, e.g., through underlining), and graphical connections (like adding an arrow

that joins text and picture). However, Kalyuga et al. (2003) have demonstrated that the more previous knowledge a person possesses, the less effective these aiding strategies are (expertise reversal effect). This is due to the fact that, in such contexts, readers with a lot of previous knowledge are less motivated to actively deal with text content and tend to overestimate their knowledge and understanding, which in turn leads to worse comprehension.

In addition to pictures, typographical features, like the difference between serif characters and sans serif characters, also have an impact on comprehensibility. Serifs are letters' "decorative" elements (marks or lines). They offer readers an optical aid, as they help their gaze travel across a line. However, since all letter elements of sans serif characters play a role in the identification of a letter, they help the reader to recognize individual letters more than serif characters. Sans serif characters are therefore frequently used to help children learn how to read. In addition, evidence shows that sans serif fonts are easier to read than serif fonts on screens (Bredel & Maaß 2016b: 176).

The higher the reading competence, the easier it is to differentiate between functionally necessary elements and additional elements; the supporting function of serifs then comes into play (Bredel & Maaß 2016a: 226).

8.1.2 Guidelines for language simplification

In the *Oxford Guide to Plain English* (Cutts 2020), a whole chapter is devoted to text layout (ibid.: 281–292). The importance of a good layout is highlighted, as "poor layout can negate some of the benefits of plain English" (ibid.: 282).

The key variables for high legibility are type size, column width, and space between lines (or leading). For many typefaces, size 9 should be sufficient, but this depends also on the other variables. For instance, different typefaces seem bigger than others in the same size due to their design. The optimum column width is regarded to be 50–70 letters (and spaces), or 8 to 12 words, per line. Leading guarantees that readers do not make mistakes when locating the beginning of lines. The right leading depends also on the type size.

Some suggestions are also made with respect to typefaces. Serif fonts are recommended for printed body texts, sans serif fonts for headings and websites, since they seem to be easier to read on screens. Weights like bold, and italics are also discussed. Cutts warns against using them excessively,

since too much emphasis means no emphasis at all. In addition, italics are not noticeably different in some typefaces, especially on webpages. Underlining is not recommended, either. Writing everything (also titles) in capital letters is disruptive to reading and may look aggressive.

White spaces on a page are also important. There should be generous margins and reasonable space between columns. Spaces between paragraphs, if inserted in lieu of indentation of the first line, should not separate them excessively. Contrast between foreground (text) and background is paramount. Colored backgrounds may be problematic, especially for people with color blindness.

Tracking (“adding or taking out space between letters”, *ibid.*: 290) should be sensitive and respect the typeface’s characteristics. If there is an excessive amount of space between letters, readers may look at them individually instead of regarding them as part of a word. Similarly, writers should “scale” (compress or expand) the type while keeping text legibility in mind. Text justification has many advantages, but it tends to produce uneven letter-spacing. With unjustified type, texts look more “relaxed” and “informal” (*ibid.*: 290).

Headings should be hierarchized consistently. So, if different sizes or weights are used to signal chapter headings, subheadings, and paragraph headings, this should always be done in the same way, otherwise readers may misinterpret the hierarchy of information.

Finally, the presence of images is also discussed. According to Cutts (*ibid.*: 283), “[t]he ratio of images to text is likely to play a big part in whether people will pick up a document and read it”.

In their manual on German *Leichte Sprache*, Bredel and Maaß (2016a: 221–296) first discuss its sign system. Like Cutts, they also highlight the distinction between serif and sans serif characters. Sans serif fonts are recommended in text simplification, although empirical studies are needed to demonstrate whether some specific fonts are better than others (*ibid.*: 226–227).

The authors then discuss style settings to express emphasis, like bold, italics, and underlined (*ibid.*: 228–229). Italics is not recommended in *Leichte Sprache*, since it modifies the letters’ shape. Bold is used especially to signal expressions that are important to guarantee comprehension (like negations, cf. *ibid.*: 468–469). Underlining information is also a possible strategy, frequently

accompanied by pictures or other explanations outside the running text. Other similar typographical features are discussed in Bredel and Maaß (2016b: 176), such as using capital letters and different colors as well as increasing letter-spacing. The latter should be avoided, as increased spaces between letters may be interpreted as spaces between words and lead to misunderstandings. Different colors should be used with restraint, as they often decrease contrast and are therefore difficult to read. Capital letters are also not recommended in *Leichte Sprache*.

Another aspect highlighted by Bredel and Maaß (2016a: 231–232) is that Roman numerals should be avoided. They also focus on when numbers should be indicated as digits and when as letters (ibid.: 232–240). The comprehensibility of fractions can be enhanced by adding graphs.

Units of measurement, typically abbreviated in standard language, should be indicated in their extended form in *Leichte Sprache*. In addition, some specific recommendations are listed in the manual, such as resorting to additional explanations which provide a term of comparison for uncommon units of measurement or adding maps to accompany units of length (ibid.: 242–249).

The use of special characters is also discussed (ibid.: 250–252). The special character & can be replaced by the conjunction *und* (except in proper nouns) and the symbol € by the word *Euro* (or it can be kept with an explanation). However, in other cases replacements are impossible, as occurs with the at sign @ in e-mail addresses. Here, the sign must be kept but can be accompanied by an explanation.

Punctuation marks (ibid.: 253–264) are divided into syntactic marks (full stops, colons, commas, and semicolons), communicative marks (exclamation marks, question marks, inverted commas, and brackets), as well as omission marks (hyphens, suspension points, dashes, and apostrophes). Full stops and colons can be used. Colons are particularly useful in breaking down complex sentences, which are not recommended in *Leichte Sprache*. Notably, they are suitable for introducing direct speech and conveying conditionality. On the other hand, commas and semicolons should be avoided. Exclamation marks and question marks are allowed, but inverted commas are recommended only in their conventional use, i.e., for introducing direct speech or mentioning

concepts and sections (like: *der Bereich „Freizeit, Urlaub, Sport“*, ibid.: 259), while they should not be used for figurative language. Brackets can be used to introduce comments and explanations, but not structural (like *sieb[en] tens*) and information alternatives or additional information (like *[wenige] Menschen*). As for the omission marks, apostrophes, suspension points, and dashes should be avoided. Hyphens should not be used to divide words when starting a new line nor should they be used to introduce coordinated words with a common component (like *an- und abschalten*). However, they are allowed in the composition of specific words (like *¾-Takt* or *Ex-Freundin*). They should not be used in compound words, where interpuncts are favored (**Haus-Tür* vs *Haus-tür*).

Compared to standard language texts, *Leichte Sprache* texts have a typographical basic format (ibid.: 264–270) which characterizes them as such (thus increasing intertextuality) and enhances their perceptibility (ibid.: 502). What “gets lost” at a syntactic level should be compensated for at a textual level, though this is no easy task. Lines are used to structure texts from a grammatical point of view, i.e., to signal when a sentence is over (since each line should only contain one sentence).¹²⁶ Paragraphs and headings¹²⁷ structure texts from the point of view of content: paragraphs optically show which parts of a text refer to a certain topic, and headings make the thematic progression of a text clear. Due to the limited linguistic and encyclopedic knowledge of target readers, *Leichte Sprache* texts often need further explanations and additions. However, such insertions may interrupt thematic progression and reduce text coherence. In addition, strategies used in standard language texts, like footnotes, are not a feasible option here. Some potential solutions¹²⁸ are to be found in the insertion of parenthetical constructions, glossaries (for the explanation of technical terms), links, mouse over boxes or infoboxes, as well as in the indentation of the explanation. Other strategies to organize information are lists and the use

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126 If a sentence is longer than a line, words should not be segmented over more lines. Phrases should also be kept on one line and not be separated (Bredel & Maaß 2016b: 177). Line spacing (or leading) is also important and should be sufficiently big, so as to increase perceptibility (ibid.: 157).

127 But also marginal notes and subheadings (cf. Bredel & Maaß 2016a: 503).

128 All of which have some disadvantages and should be used carefully.

of frames to highlight certain information (Bredel & Maaß 2016b: 177–178, 2016a: 504–505).

Multicodality is a topic analyzed in detail in the manual (Bredel & Maaß 2016a: 271–296). Figures are a useful tool in *Leichte Sprache*, but they should be chosen carefully, that is, they should fit in well with the text: in other words, they should be convergent. The highest degree of convergence is redundancy between text and figure. According to the Cognitive Load Theory, redundancy should be avoided, as it results in an excessive cognitive load with no added value. However, redundant figures can indeed be helpful if they are used to illustrate expressions that may be unclear to readers. This occurs more often in *Leichte Sprache* than it does in standard language. To foster comprehension, figures should be sufficiently specific, contain the same information as the text, and be a central rather than peripheral member of a conceptual category.¹²⁹ Figures that are mere decorations or that are unclear and difficult to interpret are considered to be divergent, as they only confuse readers. The types of items that figures can represent are objects, people, actions and processes, concepts, and argumentation (ibid.: 276–280). The position of figures on a page is also important, so as to decrease the split-attention effect (cf. 8.1.3). Figures should be close to the text, in an integrated format. Strategies involving additional optical information like color coding, labeling, and graphical connections are recommended.

Another important aspect discussed in the manual is the type of relation that a figure has with the main text (ibid.: 280–281). Five categories are listed: duplication, expansion, exemplification, explication, and condensation. In duplication, information is merely repeated. In expansion, figures (like, for instance, timelines) contain more information than the text. In exemplification, an instance of the phenomenon described is provided. In explication, the figure (such as a diagram) is needed to explain the text content. In condensation, several types of information are visualized in a sort of summary (like tables and schematic drawings).

The types of figures are also discussed (ibid.: 283–289), based on the categorization by Ballstaedt (2012: 19): images, visualizations (charts

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129 See the prototype theory in cognitive linguistics (for instance Taylor 2008).

and diagrams), maps, and pictograms (icons, symbols, as well as hybrid pictograms). Images are highly iconic and frequently used in *Leichte Sprache*. They also show that the text is written in this simplified language variant, increasing intertextuality. In some cases, figures used in standard language require additional explanations in *Leichte Sprache* due to their high level of iconicity (ibid.: 294–295).

In a subchapter concerning perceptibility (Bredel & Maaß 2016a: 515–516), the recommended font size is (at least) 14, so as to make texts more accessible to people with visual impairments.

Finally, text type conventions (both linguistic and graphic) should be followed as much as possible, if they do not contradict *Leichte Sprache* rules: this is important to guarantee acceptability (Bredel & Maaß 2016b: 160). If the standard language ST is also presented along with the *Leichte Sprache* text, the structure of the former should be followed (ibid.: 168–169), so that readers may read both versions together (and if they want, use the *Leichte Sprache* text only if they find some standard language paragraphs too difficult).

In his guidelines for Italian Plain Language, Fortis (2003: 13–14) considers the impact of graphical rendition on documents' legibility in order to be reader-friendly. Characters should be sufficiently big, in at least font size 12. According to Fortis (ibid.), serif fonts should be favored over sans serif fonts, as they guide readers' gaze over pages. Paragraphs should be separated by white spaces. Tables and graphs are a visual aid which fosters comprehension. Authors should not overuse graphical options to add emphasis, like capital letters, italics, or bold. Using different colors (with restraint) may make some information stand out. Consistency in graphical choices throughout the text is also important.

Sciumbata (2022) also describes how to optimize text layout. Texts in *linguaggio facile* are written with sentences spread over multiple lines, with one piece of information per line. This way, phrases are not separated and are easier to read. Parenthetical constructions should be avoided (ibid.: 40–43). Punctuation is essential: full stops are the best option to signal where a sentence ends, while less frequent punctuation marks like semicolons are not recommended. Suspension points should be used sparingly, and special characters should be avoided. Commas can be used (ibid.: 41). Lists make texts

longer but are quite easy to read; they should be inserted at the end of sentences and not be excessively frequent (ibid.: 42). Roman numerals should also be avoided (ibid.: 76–77). Graphs and tables should be inserted only if strictly necessary, since interpreting them may not be easy (ibid.). This suggestion partly diverges from other guidelines, where the difficulty of interpretation is not (or is rarely) highlighted.

Pictures also play an important role in *linguaggio facile da leggere*, since they do not have a merely decorative function but are needed to explain texts (ibid.: 78). Documents which contain pictures seem more interesting and may look less intimidating to people with intellectual disabilities. Pictures, photographs, and symbols should be clear, therefore:

- 1) Figures with few (but visible) elements should be chosen.
- 2) Childish pictures should be avoided if the target readers are adults – in these cases, photographs or simple drawings should be favored.
- 3) The same type of pictures should be used in the whole document so as to avoid confusion (for instance, only photographs or only drawings should be inserted).
- 4) The same picture should always be chosen to accompany the same concept.
- 5) There should not be an excessive amount of pictures, since this could lead to an overload for readers.

In some cases, it can be useful to insert explanatory captions for pictures. However, these are an additional element and may be hard to understand for people with severe reading difficulties. Therefore, such captions should only be inserted if they are necessary to explain the pictures' content.

Bold weight is very practical for highlighting key concepts. It should not be overused, however, otherwise it will not be effective. In order to understand whether it has been used correctly, it suffices to read all bold words; if they convey the message, the bold emphasis is working well. Italics and underlining are not easy to decipher, so they should be avoided. In addition, underlined text on websites may erroneously be interpreted as a link. Writing the whole text (or whole sentences) in capital letters is not advisable, since that way

there is no variation in the height of the letters and visual reference points are missing. Small letters, instead, enhance legibility, since they have different heights, which helps readers decipher words (ibid.: 78–79).

Dark typefaces on a light background are the best choice. If the background is dark, letters should be light enough to guarantee a sufficient contrast and make reading easier. Colored writing should be used sparingly, not only because it can be harder to photocopy and print, but also because readers may have color blindness. For the same reasons, writing should not appear over photographs or geometrical patterns (ibid.: 79–80).

Typefaces should be clear, with a big size (e.g., 14), and used consistently. The use of sans serif characters is recommended. Shading and decorations should be avoided. There should be enough white space between words and lines; leadings should be at least 1.5. Paragraphs should also be separated by white spaces, so as to make it easier for readers to recognize “chunks” of information and take notes, if necessary. Text should be left-aligned rather than justified, as justification may create unnecessary spaces between words. In addition, left alignment makes it easier for readers to understand where lines end and start again. Indentations at the beginning of paragraphs are not recommended. Division of texts into columns is also not advised. If this is strictly necessary, there should be enough space and a vertical line (or a similar element) between them. Pages should be numbered (especially if documents need to be printed), so that readers know whether they have all the pages and how long the document is (ibid.: 80–83).

The importance of design and layout is also highlighted in the GLSP (2021):

From a readability perspective, layout and design are as important as the wording in a LS by allowing people to use the document and navigate their way around it. The appearance and attractiveness of the document itself can make a difference to the reader. If the LS does not look easily accessible and relevant for the reader at a first glance, it may not be read at all. (ibid.: 41)

Some points to consider (ibid.: 43) are:

- 1) Using adequate white space between lines, headings, and paragraphs (which should correspond to topics).
- 2) Using black text on white background, to guarantee contrast and legibility.
- 3) Limiting use of unnecessary imagery, like logos (which may be considered promotional) and icons (which should represent what they accompany and be used consistently).
- 4) Using visuals, like simple graphs.
- 5) Using left-aligned text.
- 6) Avoid using long lines of text, which are difficult for some readers (using columns produces shorter lines).
- 7) Placing columns and space breaks carefully.
- 8) Using colors to make documents more attractive, but without exaggerating and by choosing them carefully (since some colors are problematic to people with color blindness).
- 9) Using bold text (without exaggerating) and avoiding italics, underlining, fancy fonts, and all caps.
- 10) Using bullet formatting to divide text into separate points.

Callout boxes are helpful and should be placed close to the relevant text part (ibid.: 42). The use of graphics is described in detail (ibid.: 44–45): they should be inserted to support and facilitate the processing of numbers, but they should nonetheless be used carefully. Bar graphs are useful to illustrate comparisons across groups and pie charts to illustrate numerical proportions. Infographics or pictorial representations are also considered to be useful. Some specific recommendations include: making graphics simple, with one simple message per image (avoiding several relationships, or complex trial design diagrams and flowcharts), using black and white print (or also colors, but not brand colors), using clear label captions and axes, and placing captions inside bar or pie slices rather than using colors and keys.

Health numeracy (see definition from the GLSP 2021: 37 in Section 1.4.2) is also taken into account and described thoroughly (ibid.: 37). Beside the abovementioned visuals for the interpretation of numbers, other recommendations include the use of whole numbers, the careful use of

percentages, and the use of numerals rather than words for numbers. Care should also be taken that calculations are not left to readers.

Layperson summaries for pediatric patients may differ in terms of presentation and style, for instance they could include more illustrations or graphics (ibid.: 13).

Some considerations concerning accessibility for people with visual impairments are also made. Electronic copies (especially PDF files) are the most accessible format. In addition, charts and graphs are very effective but not always legible with screen readers, therefore a brief summary of their content should be provided. The same goes for pictures (ibid.: 47).

In the Recommendations of the Expert Group on Clinical Trials (2018: 7), similar points are highlighted in a less detailed way and will therefore not be listed here. One exception is the characters' size, indicated here but not in the GLSP. According to the Recommendations, text should have a font of at least 12.

8.2 Methodology

The present analysis is based on the smaller sample of 30 texts (with 10 SL texts and 10 corresponding TL texts in German and Italian, respectively). This is because it was necessary to evaluate visual features which would have been very difficult to examine in the whole corpus. In addition, the standardization of these texts makes the evaluations based on a sample quite generalizable.

The following aspects were considered: typographical features (like typeface, font size, color, white spaces, bold and other weights, etc.), figures and graphics, as well as health numeracy. Since these features do not undergo major changes in translation in these texts,¹³⁰ only instances from the SL texts are reported.

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130 With the exception of some minor changes, e.g., in cases where an expression written in bold in the SL text is not emphasized in the TL text, which is more likely to be a mistake than a conscious decision.

8.3 Analysis

The layout of texts written by the same pharmaceutical company is quite standardized. In general, the layperson summaries present similar features.

As mentioned in the chapter concerning textuality (Section 8.3.1), all texts by Roche include the section “Contents of the summary”, where headings are reported in a numbered list. While this is a good method to make content clear, in some cases these lists are divided over more pages (see for instance Fig. 31), which makes them harder to follow.

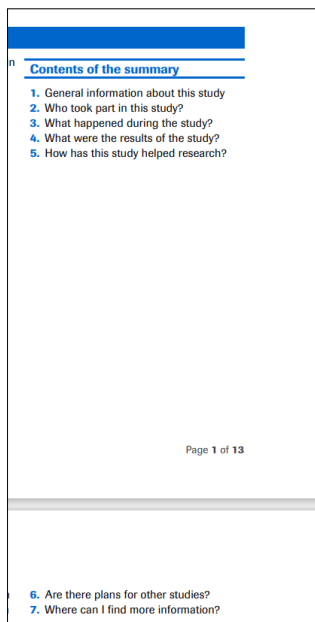


Fig. 31: Example of a content list over more pages

Colors and other typographical features usually highlight headings and subheadings clearly, allowing readers to follow the information hierarchy quite well. In texts by Bayer, for instance, headings are light blue (while the main text's type color is black) and with a bigger font. Subheadings, unlike headings, are written in bold and their font is slightly smaller than that of headings –

but still bigger than the running text. Headings in texts by Roche are not only numbered, they also have white type and a blue background. Subheadings have a blue type and white background. In the texts by GSK, subheadings are underlined to differentiate them from headings, written in bold.

Lists appear in all texts, sometimes with a very high frequency. In some cases, there are even lists within other lists, as shown in Fig. 32 and Fig. 33 (Roche):

Key information about this study

- This study was done to find out what effects, good or bad, a medicine called bevacizumab (the 'study medicine') has on people with cancer.
- People who participated in this study had these types of cancer:
 - Breast cancer
 - Ovarian cancer
 - Peritoneal carcinoma (a cancer that develops in the tissue that lines the abdomen)
 - Renal cell carcinoma (also known as kidney cancer)
 - Colorectal cancer (also known as bowel cancer)
 - Lung cancer
 - Glioblastoma multiforme (a type of brain cancer)
- The researchers wanted to look at how safe treatment with bevacizumab was over a long ('extended') period of time.
- This study included 95 people in 21 countries.
- The main finding was that 17 out of the 95 people (18%) had at least one serious medical problem (a life-threatening problem or one that required hospitalisation) that may or may not have been related to bevacizumab.
- Four people died during the study.
- A total of 21 people out of the 95 in the study (22%) had severe side effects (also known as severe 'adverse reactions') thought to be related to bevacizumab.

Fig. 32: List within lists (1)

People could take part in this study if they:

- Had cancer that did not get worse after treatment with bevacizumab (as the only treatment or when given with another anti-cancer treatment) in their first study.
 - People in this study had the following types of cancer:
 - 11 people had breast cancer
 - 41 people had ovarian cancer or peritoneal cancer (a cancer in the tissue that lines the abdomen)
 - 7 people had colorectal cancer (also known as bowel cancer)
 - 6 people had renal cell carcinoma (also known as kidney cancer)
 - 16 people had non-small cell lung cancer
 - 14 people had glioblastoma multiforme (a type of brain cancer)

People could not take part in the study if they:

- Had cancer that got worse after treatment with bevacizumab in the first study.
- Had a medical problem in the first study that may have been related to bevacizumab, and researchers recommended that they stop taking bevacizumab.

Fig. 33: List within lists (2)

Lists are usually introduced by bullets, but in some cases numbered lists are used. Lists where bullets and numbers are missing and replaced by icons were also found (Fig. 34, Novartis).

Trial drugs

The drugs given in this trial were:



CJM112, given as an intravenous (IV) infusion, which is through a needle in a vein. It had been previously tested in certain types of diseases that involve the immune system, such as psoriasis and asthma. It is designed to help the immune system by blocking a protein called IL-17 that may lead to disease.



PDR001, given as an IV infusion. It had been previously tested in many types of cancer, such as colorectal and blood cancers. It is designed to help the immune system fight cancer by blocking a protein called PD-1 that helps tumors grow.



LCL161, taken as a tablet by mouth. It had been previously tested in certain types of cancer, such as breast and ovarian cancer. It is designed to help kill cancer cells.

Fig. 34: Lists with icons

As for text layout, all layperson summaries are generally left-aligned (as can be seen in Fig. 32). Only some individual paragraphs are presented differently. For instance, paragraphs where patients are thanked and descriptions of the pharmaceutical companies or of the Center for Information and Study on Clinical Research Participation (CISCRP) are often centered. In texts by GSK, a brief legal disclaimer at the end of the first page is justified. In some cases, content in tables or charts is centered or right-aligned.

Columns are very uncommon and were found only in text overviews and sometimes in charts. Pages generally have sufficient white space. Subchapters are rarely divided over more than one page; usually, a large part of the page is left intentionally blank so as to start the new subchapter on the following page. Leading between lines is sufficient, but not particularly wide, especially in some info boxes with single spacing. Paragraphs are not indented; indentation is employed only in some lists, especially when there are lists within other lists, so as to show the information hierarchy more clearly (see Fig. 34). All fonts are sans serif, such as Calibri, Open Sans, Arial, Imago Book, and Imago Medium. In many cases, the font used for headings differs from that of the main text. Font sizes also vary to establish a hierarchy of information. The font size of the running text is generally around 11–13, but in some cases it is smaller (e.g., 10). Some paragraphs, like descriptions of pharmaceutical companies, are even smaller (8 or 9).

The type is mainly black on a white background, although some details (e.g., tables, charts, info boxes) are different. In these cases, the contrast is not always optimal.

Emphasis is used differently and with a different frequency across texts. In layperson summaries by Bayer, bold weight is only used in some headings, subheadings and at the beginning of some sentences (in expressions like “**thank you**” or “**important**”, which also have blue type rather than black type), and in charts. Other pharmaceutical companies use bold weight more often. For instance, in a summary by GSK, bold is used not only in headings, but also to highlight the technical term “side effects” in the running text: “In this summary, **side effects** refer to those events that the study doctor thinks may have been caused by the study medicine [...]”. Roche uses bold weight even more frequently, sometimes also in whole sentences that should stand out, like “**This means that you should not make decisions based on this one summary – always speak to your doctor before making any decisions about your treatment**”, “**The questions that researchers looked at were: [...]**” (as a sort of subheading), and “**The safety results of this study were similar to other studies of bevacizumab. All of the medical problems in people who took bevacizumab in this study have been seen in other studies of bevacizumab**”. Bold weight is also used to emphasize technical terms or key words in the running text (“The most common medical problem was **protein in the urine** – a sign of possible damage to the kidneys”) or in a list of technical terms for study types (between inverted commas), as shown in Fig. 35.

What kind of study was this?

This study was a '**Phase 3b/4**' study. This means that the study was done after bevacizumab had been approved for doctors to give to people.

This study was '**single arm**'. This means that everyone in this study was treated with bevacizumab (alone or in combination with other drugs).

This study was '**open label**'. This means that both the people taking part in the study and the study doctors knew what study medicines people were taking.

This study was an '**extension study**'. This means that people who had previously taken part in a study of bevacizumab kept taking bevacizumab after the previous study ('parent study') had ended.

Fig. 35: Bold weight in the running text

Novartis also frequently uses bold weight. One notable feature of its texts is that bold is found not only in headings and subheadings (with headings having blue font and subheadings black font) and keywords in the running text, but also at the beginning of sentences to emphasize certain types of information, like temporal indications (Fig. 36):

What happened during the trial?

Before the trial started, the trial doctors did tests to check patients' overall health. Trial doctors also checked patients' SBMA symptoms and measured patients' thigh muscles using a medical imaging test called magnetic resonance imaging, or MRI.

2

Clinical Trial Results

During Part A of the trial, **treatment lasted 9 weeks**. Patients were randomly put into 2 groups. Patients received trial treatment every other week for 9 weeks. The first dose was through a needle put into their vein, called an infusion. The rest of the doses were given through an injection under the skin.

- In Group 1, patients got different doses of BVS857 every other week.

Fig. 36: Bold weight for temporal indications

The text then continues in a similar way, with “Part B” presented with the same typographical features. This is interesting, as bold weight is used to better highlight division of paragraphs and the chronological order of events. Other uses of bold in layperson summaries by Novartis include the use of this weight for technical terms and acronyms/initialisms, as occurs in the definitions:

An **adverse event** is any unwanted sign or symptom that participants have during a trial. An adverse event is considered ‘**serious**’ when it is life-threatening, causes lasting problems, the participant needs hospital care, or results in death.

Another interesting feature is the use of bold weight to highlight a popular term or paraphrase as opposed to a technical term (in lists but also in charts and tables), as shown in Fig. 37, Fig. 38, and Fig. 39:

2 participants (5%) had a serious adverse event. These were:	3 participants (7%) had a serious adverse event. These were:
• A non-cancerous tumor in the small intestine (benign small intestinal neoplasm) • A condition where the liver cannot clear waste properly (cholestatic jaundice)	• Cough • Gallstones (cholelithiasis) • Middle ear infection (otitis media)

Fig. 37: Bold weight to highlight term paraphrases/popular terms in lists

Itchiness	54%		30%
Pruritus	20 of 37		13 of 37
Headache	8%		16%
	3 of 37		7 of 37
Protein leak into urine	19%		18%
Urine protein/creatinine ratio increased	7 of 37		8 of 37
Feeling sick to the stomach	19%		11%
Nausea	7 of 37		5 of 37
Diarrhea	11%		9%
	4 of 37		4 of 37
Protein leak into urine	5%		9%
Urine albumin/creatinine ratio increased	2 of 37		4 of 37

Fig. 38: Bold weight to highlight term paraphrases/popular terms in charts/tables (1)

Kidneys suddenly stopped working Acute kidney injury	0% (0)
Harmful blood levels of certain chemicals released when cancer cells quickly die Tumor lysis syndrome	0% (0)
General health got worse Condition aggravated	17% (1)
Inflammation in the lungs Pneumonitis	0% (0)
Infection in the nose, throat, airways, or lungs Respiratory tract infection	17% (1)
Kidneys stopped working Renal failure	0% (0)
Kidneys stopped working well Renal impairment	0% (0)
Life-threatening infection Sepsis	17% (1)
RRMM got worse Disease progression	17% (1)
Tumor pain	0% (0)
Infection in the nose, throat, or airways Upper respiratory tract infection	17% (1)

Fig. 39: Bold weight to highlight term paraphrases/popular terms in charts/tables (2)

This typographical strategy is quite effective, as information for laypeople stands out clearly. Other typographical features to emphasize words, like all caps and tracking, were not used in any text. Italicized letters only occurred in two texts, one by Roche and one by Novartis, in the heading “Thank you!” which precedes a paragraph highlighting the importance of clinical trial participation and the role it has in research. Underlining was generally used only for links; in texts by GSK, it was also found in subheadings.

Figures definitely play an important role in layperson summaries. In some cases, they can be considered a signal of the text type, thus increasing intertextuality. For instance, texts by Bayer always have a picture in the first page, depicting a doctor who is giving some medicines to another person, likely a patient (Fig. 40).

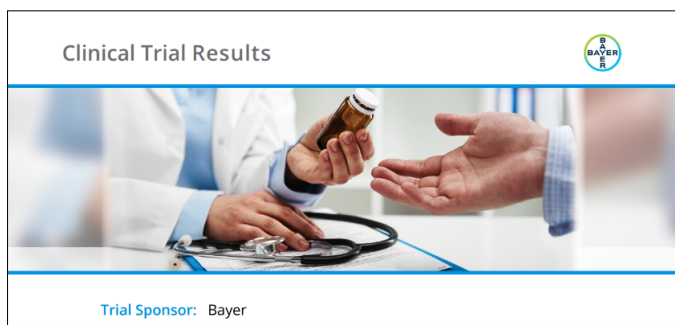


Fig. 40: Picture signaling the text type in layperson summaries by Bayer

Interestingly, the doctor is likely to be identified as a woman, since she is wearing nail polish. A similar illustration which could serve to signal the text type is found in one of the layperson summaries by Novartis (Fig. 41). This illustration also shows some doctors and patients of different ages and from a range of backgrounds, thus with an eye for diversity.

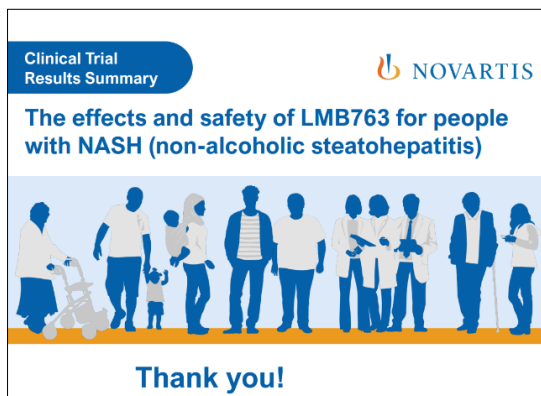


Fig. 41: Picture signaling the text type in layperson summaries by Novartis

These pictures do not correspond to a specific portion of text and do not serve to exemplify a concept; for this reason, they cannot be considered as instances of convergent pictures *stricto sensu*. They may nevertheless be said to make the relation between writers (researchers) and readers (patients) clear, so they are not confusing like divergent pictures.

The pharmaceutical companies' logos also often appear in the summaries, as shown in Fig. 40 and Fig. 41. Other instances of pictures are the representation of a healthy liver and a damaged one in a summary concerning non-alcoholic steatohepatitis (Fig. 42, Novartis).

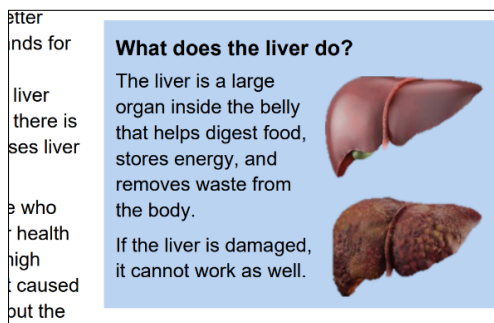


Fig. 42: Illustration of a healthy and damaged liver as a visual aid

This example is definitely convergent, with a clear relation between text and pictures, which function as a visual aid to the text. It is presented in an integrated format close to the text, with the healthy liver close to the general description of this organ and the unhealthy one close to the description of damaged livers. This way, the split-attention effect is arguably avoided. No other additional graphical aids (like arrows guiding the readers' attention towards the illustration) are inserted. The whole explanation is presented in an info box highlighted through colors.

Other instances of figures are maps which show where trial participants came from (Roche). In some cases, participants' origin is shown through bar charts (GSK) or tables (Bayer).

Icons are very frequent in layperson summaries. One simple instance is provided by Fig. 43, presented at the beginning of a layperson summary by Novartis.

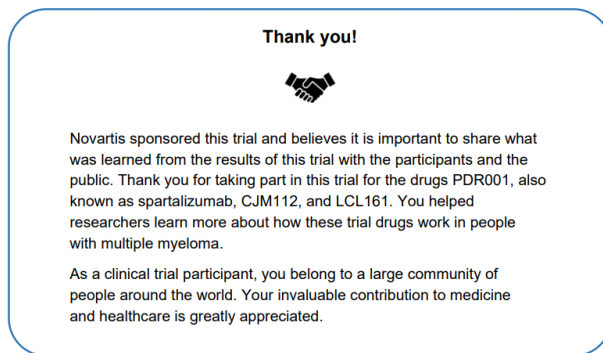


Fig. 43: Instance of icon use

In some cases, icons are quite generic, and their only function is arguably that of dividing the text into paragraphs or serving as decoration. For instance, in Fig. 44 (Bayer) a magnifying glass is inserted next to a paragraph titled "Why was the research needed?"; a microscope next to one titled "What treatments did the participants take?"; and some documents next to one titled "What were the results of this trial?". This last image is arguably the one that fits best with

its corresponding title, although it is still quite generic. Convergence between text and pictures is therefore not fully achieved.

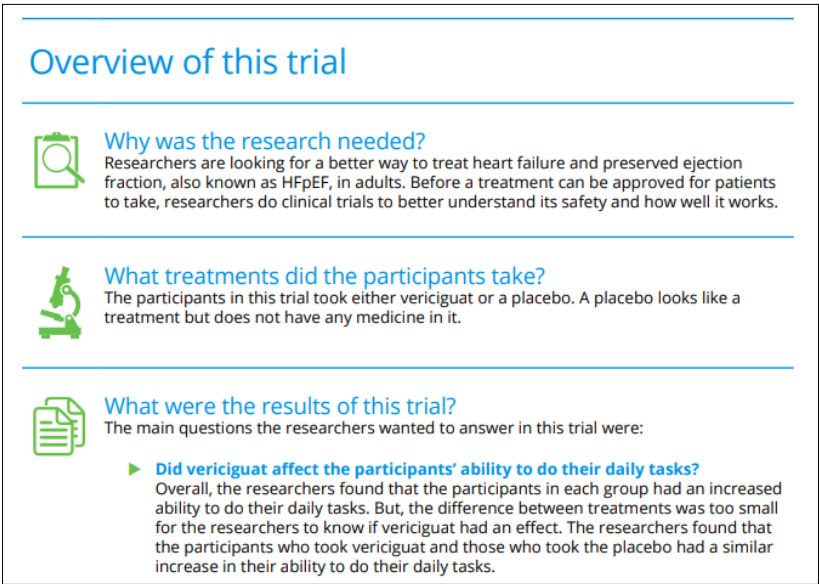


Fig. 44: Instances of generic icons

Icons are typically used to represent the mode of administration, as shown above in Fig. 34 (and below in Fig. 45 and Fig. 46, by Bayer and GSK, respectively), or patients and doctors (Fig. 47, Bayer). Icons representing patients and doctors are frequent where it is necessary to explain who is carrying out a specific action. These icons (especially those in Fig. 46, notably the ones about randomization with division into treatment groups) are far more specific and convergent than the ones presented in Fig. 44.

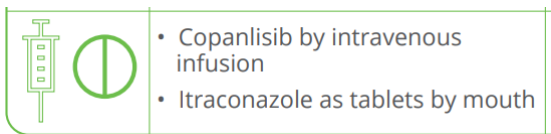


Fig. 45: Instances of specific icons (1)

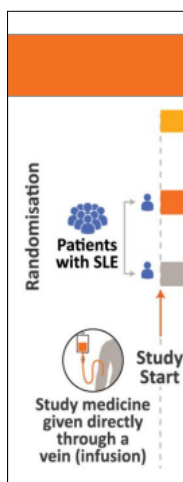


Fig. 46: Instances of specific icons (2)

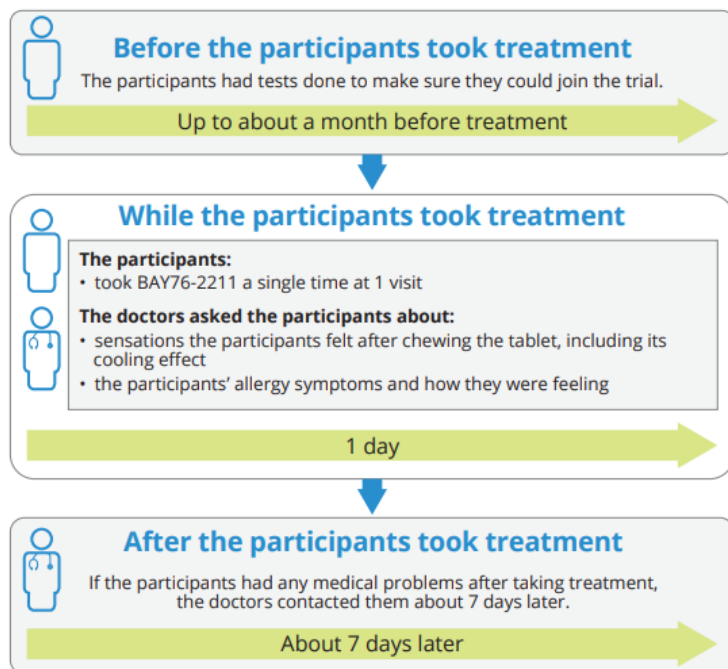


Fig. 47: Instances of specific icons (3)

In many cases, timelines show how the trial took place, which treatments were administered and when. Timelines are sometimes used also to illustrate the different phases of clinical trials and indicate more clearly which type of trial was conducted. This type of figure corresponds to the category of expansion described by Bredel and Maaß (2016a: 280–281) and mentioned in Section 8.1.2.

Graphics and tables are even more frequent than pictures and icons. In particular, bar charts are extremely frequent. They mainly illustrate trial results, like adverse events and reactions, or number of doses taken (Fig. 48, GSK), trial participants, etc.

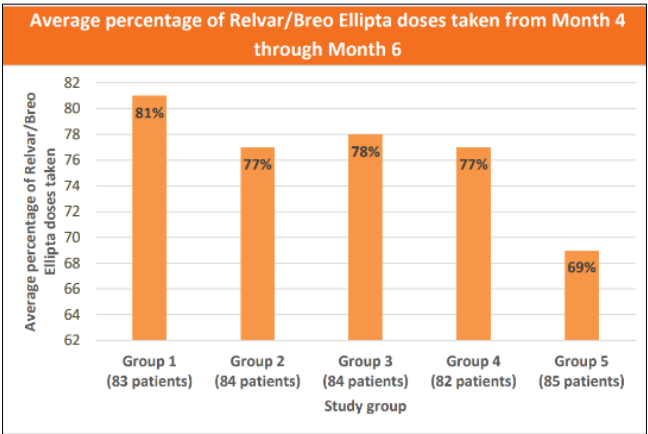


Fig. 48: Example of bar chart

Charts are definitely more effective than tables reporting data, as proportions are immediately clear. Another important aspect concerning health numeracy, evident both in most tables and most charts, is that absolute numbers are usually reported together with the corresponding percentages. For instance, if the number of people who had an adverse event is reported, the corresponding percentage is also indicated. By so doing, readers do not need to calculate the percentage themselves. An example from the texts is the following: “Overall, 4003 patients received at least one dose of the study medicine. The study included 302 (8%) men and 3701 (92%) women”.

Roman numerals are never used. Numbers are usually indicated with numerals, although some texts (like texts by GSK) seem to alternate arbitrarily between numerals and letters, as shown by the following instances:

This study is taking place in two phases. During the first 52 weeks (Year 1), patients were placed in one of two treatment groups by chance (randomisation), as shown in the figure below. [...] The study doctors continued to monitor the safety of the patients for 4 years (follow up phase).

Patients with poorly controlled asthma were put into one of the five groups by chance (randomisation).

8.4 Discussion

On the whole, the layperson summaries' layout and typographical choices are generally quite effective, although there are differences between pharmaceutical companies. Texts written by Roche and especially Novartis have an interesting layout, with different colors and other typographical choices that highlight important information. Other layperson summaries are visually less attractive, and with some typographical choices that are not recommended (e.g., the use of italics in subheadings in texts by GSK). Pictures and graphics help readers understand the content better, especially with respect to numbers (health numeracy). In addition, the use of pictures and graphics serves to increase intertextuality, therefore initial illustrations that signal the text type should always be inserted.

On this level of analysis, the layperson summaries diverge considerably from Easy Language recommendations. The layout is far more similar to that of standard language texts; punctuation is used in a standard way and negations are not emphasized in bold.

Paragraphs and lines also resemble standard language conventions, although some sentences are almost as segmented as Easy Language texts:

Other questions that clinical researchers wanted to answer included:
Does treatment result in the disappearance of virus particles called HBeAg from the bloodstream?
Does treatment result in the production of antibodies against HBsAg?
Does treatment result in the production of antibodies against HBeAg?
Does treatment decrease the amount of virus particles called HBV DNA in the bloodstream?
Does treatment result in the production of antibodies against HBeAg and decrease the amount of HBV DNA in the bloodstream?

The similarity results not only from the sentences' segmentation, with each sentence occupying a single line, but also from the presence of a list of questions introduced by a colon (so as to avoid subordination). Still, except for such instances, the layperson summaries' layout tends more towards standard language and arguably has a higher degree of acceptability than Easy Language texts (cf. Maaß 2020).

9 Gender-inclusive language

After discussing the more “standard” levels of analysis (vocabulary, terminology, morphosyntax, textuality, and layout), we will now shift our focus to an aspect of communication that has been gaining increasing importance: gender-inclusive language. The choice of resorting to gender-fair language not only impacts comprehensibility, but also, potentially, acceptability. Readers may be irritated if social conventions of their language and culture are not respected, i.e., if language is not respectful and women are not mentioned explicitly. However, they may also dislike certain very innovative or controversial strategies, like the use of a *schwa* in Italian.

9.1 Theoretical framework

Over the last decades, more and more attention has been paid to using respectful, inclusive language. The aim is to contrast discrimination on the grounds of gender, but also illness, disability, age, or any characteristic which, for cultural reasons, may make a specific category more vulnerable. The present chapter will focus on gender-inclusive language, as this permeates all discourse and is not restricted to a specific topic or target.

9.1.1 The concept of gender-inclusive language

The movement of gender-inclusive language has emerged to directly oppose linguistic sexism, theorized in the '60s/'70s by feminists and later adopted in some sociolinguistic studies. Linguistic sexism refers to the discrimination, caused by language use, in the way women are represented compared to men (Cavagnoli & Dragotto 2021: 6).

The gender-inclusive (or gender-neutral/gender-fair) language movement¹³¹ is mainly based on the assumption that language has an impact on the way

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131 These considerations may be applied to all fields of inclusive language.

people think and conceive reality, i.e., on the Sapir-Whorf hypothesis¹³² (cf. for instance Elsen 2020: 63–65; Diewald & Steinhauer 2022: 51; Diewald & Nübling 2022: 3). Different words with certain connotations evoke different associations: for example, on the lexical level play on words, euphemisms, synonymy, polysemy and related terms with a different connotation or denotation may lead to a change of perspective (Elsen 2020: 67–68). One instance is the following: “Das Krebsgeschwür des Feminismus verbreitet sich immer weiter” (“The cancer of feminism spreads more and more”, *ibid.*). Here, the cancer metaphor has a negative association which is projected onto the much more neutral¹³³ term *Feminismus*. Other examples are the terms *rape victim* and *rape survivor*. Elsen reports the results of some experiments conducted by Hockett et al. (2014) with English-speaking subjects. In these experiments, the subjects had to list five characteristics of *rape victims* and *rape survivors*. The result was that the term *rape victims* was mostly associated with adjectives like *afraid*, *attractive*, *female*, but also *distrusting* and *young*, while *rape survivors* was associated with adjectives like *afraid* but also *strong*. Victims are more often seen as an object, while survivors are perceived to be more active and capable; furthermore, a varying degree of responsibility and blame is associated with the two terms, with the term *victim* carrying the most. On the morphosyntactic level, passive forms are particularly suitable to conceal agents, and some mass media resort to agentless passive constructions to describe sexual abuse. Tolerance towards a crime is higher with passive forms and deagentivization (Elsen 2020: 68). It is therefore clear that certain linguistic choices impact the way we see the world and act.

Another driving force behind advocacy for gender-inclusive language is that our culture, and consequently language, is mainly androcentric. This is shown by several asymmetries on the morphosyntactic or lexical level. Firstly, many languages resort to the so-called “generic masculine” to refer to both male and female referents. However, it has been proven that readers mainly interpret these referents as men rather than women. Elsen (2020: 86–91) delves into this topic in detail, listing a series of experiments that have been conducted

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132 Cf. Koerner (1992) for a detailed bibliography concerning this theory.

133 Elsen (2020: 67–68) states that it is neutral, but it could be argued that it is a connotated term.

to examine this aspect, especially in the German-speaking area (Moulton et al. 1978 for English; Klein 1988; Scheele & Gauler 1993; Irmen & Köhncke 1996; Braun et al. 1998; Heise 2000; Stahlberg et al. 2001; Stahlberg & Sczesny 2001; Braun et al. 2002; Rothmund & Scheele 2004; Gabriel & Mellenberger 2004; Irmen & Roßberg 2004; Kusterle 2011 for German). The most important results can be summarized as follows: the generic masculine is perceived as referring to men even in neutral contexts, i.e., those which describe jobs not typically associated with men. Another interesting aspect related to the generic masculine is that it takes longer for test subjects to interpret it as having a feminine referent. Also neutral forms (e.g., *wissenschaftlich Tätige*)¹³⁴ do not seem to be effective, as they are mainly associated with male referents, even in contexts describing jobs which are typically associated with women. Tendentially, male subjects opt more often for a male interpretation. While neutral forms do not lead to the desired result, splitting (i.e., mentioning both male and female forms) increases the number of female interpretations of referents. The German *Binnen-I* variant has the opposite effect of the generic masculine, i.e., it mainly evokes associations with female referents. Finally, it has been found that footnotes indicating that the generic masculine is used for the sake of simplicity but also refers to women only result in increasing the associations with male referents.

Other – even more clear – instances of sexist language can be seen in the semantic asymmetries produced by doublets like *uomo libero/disponibile* vs *donna libera/donna disponibile*, *massaggiatore* vs *massaggiatrice*, *peripatetico* vs *peripatetica*, where the feminine variants belong to the semantic field of prostitution (Cavagnoli & Dragotto 2021: 6–7). Lakoff (1973: 57) noted some of these asymmetries in the English language, too, like *master* and *mistress*, where the latter means *lover* and cannot be used independently, but always with reference to another subject (*a mistress/his mistress). Another instance he provides is *he is a professional/she is a professional*, where the feminine variant again refers to the semantic field of prostitution. Similar examples of semantic asymmetries in the German language are listed by Elsen (2020: 76–77), who mentions doublets like *Gouverneur/Gouvernante*, *Sekretär/Sekretärin*,

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¹³⁴ These gender-inclusive options will be illustrated in greater detail in Section 9.1.2.

Hausherr/Hausfrau, Junggeselle/Jungfrau, where the feminine variant clearly has a more negative connotation.

9.1.2 Gender-inclusive English, German, and Italian

This subchapter will deal with gender-inclusive language in English, German, and Italian, also from a cross-linguistic and translational perspective.

Languages are known to behave differently with respect to gender. Gygax et al. (2019) classify languages into five main language groups useful “for researchers interested in the effect of grammatical gender on the mental representations of women and men” (ibid.: 1). These categories are grammatical gender languages, languages with a combination of grammatical gender and natural gender, natural gender languages, genderless languages with few traces of grammatical gender, and genderless languages. German and Italian are subsumable under the category of grammatical gender languages, where personal (i.e., human) and inanimate nouns are classified for gender (ibid.: 3). English, on the other hand, belongs to the group of natural gender languages, which do not classify inanimate nouns – as well as most personal nouns, like *teacher*, *child*, or *politician* – according to different genders (ibid.: 4). These discrepancies clearly lead to different approaches (and different requirements) in gender-inclusive language, and a varying degree of necessity for making gender explicit when translating from natural gender languages like English into grammatical gender languages like German and Italian.

It should also be noted that different countries show a different degree of acceptance (and use) of gender-fair language. Ondelli (2020: 9) points out that Italian speakers seem to use less gender-inclusive language than, for instance, English, Spanish or German speakers, in spite of the innumerable – also top-down – initiatives, like Sabatini’s *Raccomandazioni per un uso non sessista della lingua italiana* (1986), or the more and more frequent studies conducted in this field by academics. Similarly, Rocco (2022: 249) states that gender-fair language is more deeply rooted in German than in Italian. While it might be maintained that the difference between the degrees of gender-inclusive language use in English and Italian is also due to morphological reasons, due

to the different language systems,¹³⁵ this cannot possibly be applied to German and Italian, which are both grammatical gender languages. Moreover, there are cases where gender-neutral language is less complex in Italian than in German: possessive adjectives and relative pronouns are doubled in German if the strategy of splitting is chosen – but not in Italian (Rega 2019: 54). One of the examples that Rega provides is the following:

Der Antragsteller oder die Antragstellerin, *der* oder *die seinen* oder *ihren* Antrag bei der zuständigen Bearbeiterin oder dem zuständigen Bearbeiter vorgelegt hat [...]

In Italian, however, past participles must agree with the subject's gender. It may therefore be claimed that German and Italian have similar difficulties – though in different constructions – and that the differences between the degree of gender-inclusive language use among their speakers could instead be attributed to cultural reasons.

It has been shown that different languages face different problems when it comes to gender neutrality. Different strategies are therefore necessary to tackle them – although some of the issues are similar and have similar solutions in many languages. Some interesting suggestions on how to make English more gender-inclusive are included in the updated edition of the multilingual guidelines on gender-neutral language of the European Parliament (European Parliament 2018: 10–13). The first suggestion is to avoid “the generic use of ‘man’ and its derivatives”. Some alternatives are listed: *humanity* (for *mankind*), *staff* (for *manpower*), a *French person* (for *Frenchman*)/*the French* or *French people* (for *Frenchmen*), *synthetic* or *artificial* (for *manmade*), *advisory panel* (for *committee of wise men*), *political leaders* (for *statesmen*). As for the generic use of *he*, *his*, etc., reformulations are recommended. Some examples are the use of plural forms (as in “Officials shall carry out their duties”), of imperative forms, omission of the pronoun (as in “An official’s salary is dependent on ~~his~~

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 135 Ondelli (2020: 10) admits that it is sometimes difficult to constantly deploy gender-inclusive strategies in a language which is (extremely) morphologically rich, like Italian, while in English it is far easier.

length of service”), and passive constructions (as in “The relevant documents should be sent to ...”). If these strategies do not work, recourse to the doublet *he or she* is suggested. However, it is recommended to do so sparingly and without repeating it more than once in the same sentence. In particular, according to the guidelines, it is better to avoid combined forms such as *he/she*, *him/her*, *s/he*, as well as to avoid alternating masculine and feminine forms. The generic use of *they* and its derivatives for a singular subject (as in “Someone may not know their tax number”) is also addressed. While this construction is considered to be acceptable, the guidelines stress that it may lead to issues in its reflexive/emphatic form, as in “Someone may unintentionally cause harm to themselves”. Here, *themselves* “is a possible neologism, but does not appear to be established as yet, although this may evolve”. Overall, the guidelines allow its use, if no better alternative is found. A list of gender-fair *nomina agentis* is included in an appendix.

The *Handbuch geschlechtergerechte Sprache* by Duden (Diewald & Steinhauer 2022: 119–141)¹³⁶ lists the following gender-inclusive strategies: splitting with explicit mention of both female and male referents (as in *Schülerinnen und Schüler*), splitting with a slash and a hyphen (as in *Schüler/-innen*), brackets (as in *Schüler[innen]*), *Binnen-I* (as in *SchülerInnen*), neographies (*Schüler*innen*, *Schüler:innen*, *Schüler_innen*, *Schüler-innen*), participles or adjectives used as nouns in the plural form (as in *Studierende* and *Verwitwete*), abstract nouns in lieu of more specific referents (as in *Staatsoberhaupt* or *Presse*), neutral words referring to people (as in *Mensch*, *Person*, and *Mitglied*), abbreviations (as in *OB*, *Hiwi*, or *Prof*), direct addressing (as in *Ihre Unterschrift*), reformulations with adjectives (as in *ärztlicher Rat*), reformulations with passive constructions, *wir*, *man*¹³⁷ (as in “Es sollte beachtet werden”/“Wir sollten beachten”/“Man sollte beachten”), and reformulations with relative clauses (“Alle, die...”). In addition, a brief subchapter suggests how to write gender-fair job advertisements (especially useful for job titles of English

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136 In its second edition (with the first edition published in 2020), which can be regarded as an indicator of the success of this topic – as controversial as it may be! – in the German-speaking area.

137 This variant is often criticized for its similarity to the noun *Mann* (Diewald & Steinhauer 2022: 139).

origin with no feminine denomination): with a parenthetical construction and the indication “m/w/d” (*männlich/weiblich/divers*), “m/w/i” (*männlich/weiblich/inter*), or “m/w/x” (where *x* stands for all possible alternatives). Another option is the parenthetical construction with the initialism *gn*, which stands for *geschlechtsneutral*.

Some options for gender-inclusive language in Italian are listed by Giusti (2022). This linguist first mentions splitting, which, however, can lead to quite complex (and in some cases even agrammatical) constructions. Other strategies resort to neutral forms, like collective nouns (*il corpo docente* in lieu of *i docenti e le docenti*), or semantically epicene nouns (such as *persona*, *individuo*, and *essere umano*). Another option is the use of passive sentences with agent omission (such as “La domanda deve essere presentata entro [...]” rather than “I cittadini e le cittadine possono presentare domanda entro [...]”). Another strategy is the use of symbols that replace gender desinences, like asterisks (as in *Car* collegh**), at signs (*Car@ collegh@*), or underscores (*Car_ collegh_*). Finally, another strategy that is being – heatedly – discussed is the use of the schwa symbol ([ə] for the singular form and [ɜ] for the plural form).

9.1.3 Gender-inclusive language in LSPs

Overall, it can be stated that gender-inclusive language has not been researched widely in relation to LSPs. Some considerations can be found in the *Handbuch geschlechtergerechte Sprache* (Diewald & Steinhauer 2022: 210–213), where a whole subchapter is dedicated to gender-fair language in special languages and science. If these texts talk about people, they do not refer to single individuals, but to classes of subjects, usually with specific functions (speakers, patients, buyers, etc.). Therefore, the tendency to use the generic masculine is quite remarkable, even to this day (ibid.: 210). This linguistic choice is often not accompanied by any commentaries, as it is not perceived to be an issue. Some potential solutions are the use of a footnote illustrating that the masculine form also refers to women, or an arbitrary alternation between masculine and feminine referents in a text. The authors highlight criticisms of both strategies, i.e., the fact that a footnote does not make it easy for women to understand whether they are included in certain text portions and that alternating between generic masculine and feminine can cause confusion (ibid.: 211–213).

Another subchapter of the volume (ibid.: 213–223) is dedicated to legal texts. For these texts, following the rules of gender-inclusive language is particularly important, as referents must be mentioned as explicitly and clearly as possible.

9.1.4 Gender-inclusive language and comprehensibility

One of the numerous arguments opposing gender-inclusive language is that it renders texts and discourse more difficult to follow. While further criticisms (such as those which claim that gender-fair language is “ugly” and does not “sound nice”) are not scientifically grounded, the argument of reduced comprehensibility is understandable. Strategies such as splitting make a text longer and in some cases more difficult to read, especially if the noun phrases themselves are already quite long (cf. *inter alia* Maaß 2015: 49; Rega 2019: 54; Rocco 2022: 249; Giusti 2022: 10–11). However, there is no consensus about this topic. Some studies have shown that alternative, gender-fair forms do not impact negatively on the reading process and on text reception. One of the first studies in this field was conducted by MacKay (1980) with English speakers. The experiment consisted of replacing the generic masculine with neologisms. The main outcome was that the neologisms affected text legibility, but not comprehensibility. Other empirical studies concerning informative or legal texts were conducted by Rothmund and Christmann (2002), Braun et al. (2007), Blake and Klimmt (2010), Steiger-Loerbroks and von Stockhausen (2014). Elsen (2020: 90) summarizes their results by stating that, overall, male subjects perceived the text version with the generic masculine as more comprehensible, although they could process the alternative text equally as well. This means that the difficulty inherent in alternative, gender-fair forms is only subjective.

9.1.5 Gender-inclusive language and language simplification

The studies mentioned in Section 9.1.4 concern standard language and LSPs, not language simplification. The intersection between gender-fair language and language simplification is underresearched, to say the least, and not all guidelines in this field examine it.

As for Plain Language, Cutts' guidelines recommend "[using] inclusive language when it's accurate and feasible" (2020: 193). The starting point for this suggestion is that, although hostile language does not negatively impact clarity *per se*, enforcing a barrier between authors and readers may reduce the impact of a message. The use of neutral terms, which do not consider men to be the norm or superior, is recommended: *businessmen*, *firemen*, *headmaster*, and *sculptress*¹³⁸ should be replaced by terms like *business people* (or *executives*), *firefighters*, *headteacher*, and *sculptor*. A list of such words is also provided (ibid.: 198–199). When both men and women are intended, plural forms, the form *he or she*, or using titles are suitable strategies to avoid using only the masculine form.

With respect to German, Bedjis (2021) focuses in great detail on this topic. As this linguist rightly points out, gender-neutral language and language simplification share some basic purposes: to make texts (and society) more inclusive through communication. However, *prima facie* these two movements are difficult to combine, as Easy Language (and Plain Language) aims at reducing linguistic complexity, while gender-fair language often implies a higher degree of complexity. Also Halbritter (2020) points out that *Leichte Sprache* and gender-inclusive language mainly exclude each other, while more gender-fair options are acceptable in *Einfache Sprache*. In this respect, Maaß (2015: 49) points out that for *Leichte Sprache* comprehensibility is more important than other criteria (like gender neutrality) when certain features risk making a text hard to understand. The same is stated in Bredel and Maaß (2016b: 89–91), who stress that gender-fair language should be used in *Leichte Sprache*, if possible, but that it is not the main purpose of this language variant. Splitting with explicit mentioning of both masculine and feminine nouns is not deemed to be suitable, as it can lead to the formation of complex phrases. Splitting with brackets, the *Binnen-I*, or similar constructions are not recommended, either, as they presuppose knowledge about specific

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 138 *Sculptress* belongs to the category of nouns that, while being grammatically feminine, convey the idea that "maleness is the norm or superior or positive and that femaleness is nonstandard, subordinate, or negative" (Cutts 2020: 195). Other similar nouns are *poetess* and *purseress*. Even some actresses prefer to refer to themselves as "actors".

conventions that may be unknown to target readers. Some strategies that are allowed are the use of splitting at the beginning of a text to refer to readers, as in “Liebe Leserin, lieber Leser” (with the masculine and feminine form in two different lines), and the introduction of a disclaimer at the beginning of the text which explains that only masculine nouns are used but that they also refer to women.

Bedijs (2021: 153–164) examines in detail the strategies to express gender neutrality in German, in the attempt to determine which ones work best for *Leichte Sprache*. According to her, using the generic masculine is not a suitable option in this text variant, as target readers may have more difficulties in interpreting it than readers of standard language. Moreover, since the *Leichte Sprache* variant is often read along with the standard language variant by target readers, it is not advisable for the simplified version to present structural differences (such as the absence of gender-fair language, if this is included in the standard language version, *ibid.*: 153).

The first strategy discussed by the author is splitting, which is also regarded by Maaß (2015: 49) as the most suitable variant in language simplification, with the masculine form before the feminine form to minimize reader confusion. However, Bedijs also points out some of its disadvantages, such as its length and its degree of inclusion (masculine referents are always mentioned before their feminine equivalent and non-binary individuals are not considered). The second strategy consists of the use of neutral forms. Bedijs states that these can be used if they are part of the fundamental vocabulary or if they are central concepts in the text and therefore explained. One criticism by the author is that participles (which often make up neutral forms) have to be sufficiently lexicalized in order to be correctly understood by target readers, and are overall not suggested. The third strategy consists of the recourse to reformulations with relative clauses. However, this strategy is not recommended even in standard language, as it excessively emphasizes the referent. In addition, subordination should be avoided in Easy Language. According to Bedijs, a reformulation through independent clauses is also possible, although it could end up being too long and therefore not suitable for important (and recurrent) concepts. The fourth strategy consists of the use of variants like the *Binnen-I*, asterisk, gender gap, interpunct, etc. However, special characters are not recommended

in *Leichte Sprache*. Additionally, the interpunct has another function in this simplified language variant, therefore it should not be used with another meaning. The use of a disclaimer to explain that the generic masculine also includes other genders or to introduce the use of the asterisk as a gender-fair strategy is also discussed. Despite its disadvantages, it is regarded as a potentially effective strategy in *Leichte Sprache*. Overall, empirical studies are necessary to test these strategies and their effects in simplified language variants.

As for Italian, Fortis (2003) and Sciumbata (2022) do not examine gender-fair language in language simplification.

Also in the Good Lay Summary Practice, inclusive language is not mentioned explicitly. The only recommendation which may refer to it *sensu lato* is to “be respectful in your language and apply cultural sensitivity” (GLSP 2021: 12). The Recommendations of the Expert Group on Clinical Trials (2018) do not mention this issue, either.

9.2 Methodology

The aim of the analysis was to determine whether any gender-fair language strategies were employed in the three subcorpora. The analysis was conducted mainly by means of Sketch Engine. Firstly, the most typical English *nomina agentis* of these texts were listed and their translations in the whole corpus were then studied to determine whether only masculine or also feminine nouns occurred. This was done through the “Parallel concordance” function of Sketch Engine.

Some gender-neutral language strategies involving orthographic variants were also searched for in the whole corpus by means of Sketch Engine (gender gap, at sign, schwa, interpunct, colon). Some of these, however, could not be searched for using this software. The *Binnen-I*, for instance, could not be searched for, since this software is not case-sensitive and therefore does not detect any differences between lemmas like *Leserinnen* (plural form of the feminine noun *Leserin*) or *LeserInnen* (gender-fair variant meaning *Leser und Leserinnen*). Asterisks also pose issues, as they are wildcard characters in

searches, i.e., they can be used to look for an unspecified number of characters. As a consequence, they cannot be searched for as normal punctuation marks. For these cases, the search was carried out on the more limited selection of 30 texts (with 10 texts for each language).

In addition, an analysis was conducted on English pronouns through the “Parallel concordance” function of Sketch Engine in order to determine whether the generic masculine is used in the STs.

Finally, the denominations of the documents in the three languages will be briefly discussed.

9.3 Analysis

The *nomina agentis* typical of this text type are *doctors, researchers, (trial) staff, team, nurses, participants, patients, group, adults, children, babies, adolescents, caregivers, people, and public*. The corresponding translations in German are *Ärzte/Prüfarzte, Forscher/Wissenschaftler/Forschende, Prüfteam/Personal, Studienteam, Studienassistenten/Forschungsassistenten, Teilnehmer/Teilnehmende, Patienten, Gruppe, Erwachsene, Kinder, Jugendliche, Bezugspersonen, Menschen, and Öffentlichkeit*.

Ärztin occurs only 6 times in the German subcorpus, as opposed to the 184 occurrences of the masculine variant. All 6 occurrences are instances of splitting, as in the following sentence:

En: If you participated in this trial and have questions about the results, please speak with a doctor or staff at a trial site.

De: Wenn Sie an dieser klinischen Prüfung teilgenommen und Fragen zu den Ergebnissen haben, sprechen Sie bitte mit einem Arzt/einer Ärztin oder dem Prüfteam an Ihrem Prüfzentrum.

In 2 instances the feminine noun precedes the masculine equivalent:

En: Please talk to your doctor before making any treatment decisions, and about any healthcare questions you may have.

De: Bitte konsultieren Sie Ihre Ärztin oder Ihren Arzt, bevor Sie Behandlungsentscheidungen treffen und wenn Sie Fragen zu Ihrer Gesundheit haben.

En: Speak to the doctor in charge of your treatment.

De: Sprechen Sie mit der Ärztin oder dem Arzt, die/der Sie behandelt.

Prüfärztin occurs more frequently, i.e., 29 times (although against a far higher number of occurrences, 414, for the masculine form *Prüfarzt*). In these instances of splitting, the masculine form always precedes the feminine one, as occurs in the following sentence:

En: If you have questions about the results, please speak with the doctor, research nurse, or other team member at your trial site.

De: Falls Sie Fragen zu den Ergebnissen haben, sprechen Sie bitte mit dem Prüfarzt/der Prüfärztin, dem Forschungsassistenten/der Forschungsassistentin oder einem anderen Mitglied des Studienteams.

This example also includes another case of splitting, with the noun *Forschungsassistentin*. This is the only occurrence in the subcorpus of both this noun and its masculine equivalent. Also the noun *Studienassistent* occurs only twice in the subcorpus, with no feminine form. It was deemed interesting to examine which pharmaceutical companies resorted to these gender-fair language strategies. The outcome is that 34 of 35 occurrences of *Ärztin/Prüfärztin* were found in texts by Bayer. The other occurrence was found in a layperson summary by Novartis.

The noun *Forscherin* was never found, whereas the masculine form *Forscher* occurs 136 times. The same goes for the noun *Wissenschaftlerin*, which does not occur, while there are 866 occurrences of the masculine form *Wissenschaftler*. The plural form of the participial noun *Forschende*, which belongs to the strategies to achieve gender-neutral language, occurs only 3 times in the whole German subcorpus:

En: What did researchers want to find out?

De: Was wollten die Forschenden herausfinden?

En: The main questions that researchers wanted to answer were [...]

De: Dies waren die wichtigsten Fragen, welche die Forschenden beantworten wollten.

En: These results have helped researchers learn more about Alzheimer's disease and gantenerumab.

De: Dank den Ergebnissen wissen die Forschenden nun besser über Alzheimer und Gantenerumab Bescheid.

These occurrences were all found in a single layperson summary by Roche. Interestingly, here every occurrence of *researcher* is translated with this participial noun in the plural form, in order to avoid the use of *Forscher* in the generic masculine.

The feminine form *Teilnehmerin* occurs 161 times, while the masculine equivalent *Teilnehmer* was found 3,548 times. However, *Teilnehmerin* occurs only once as a gender-inclusive strategy (splitting) in a text by GSK, whose ST segment also shows the use of gender-fair language:

En: The men and women volunteers in the study got 2 injections of the shingles vaccine, 2 months apart (Figure 1).

De: Die freiwilligen Teilnehmer und Teilnehmerinnen der Studie erhielten zwei Injektionen des Impfstoffes gegen Gürtelrose im zwei-monatigen Abstand (Abbildung 1).

In the rest of the layperson summary, however, gender-inclusive language strategies are not employed, as shown by the next sentence of the text:

En: The study doctors collected information about the possible vaccine side effects from all study volunteers.

De: Die Studienärzte sammelten von allen Studienteilnehmern Informationen über mögliche Nebenwirkungen des Impfstoffes.

In the other 160 cases, *Teilnehmerin* is used in clinical trial summaries referring to pathologies that affect only women, such as uterine fibroids and

endometriosis, or examining the effects of contraceptives used by women, like coils. Some instances are the following:

En: Because there was only a small number of participants in the trial, the researchers could not collect enough information to find out if vilaprisan affected the levels of markers for certain proteins in the uterus.

De: Aufgrund der geringen Anzahl von Teilnehmerinnen in der klinischen Prüfung war es den Wissenschaftlern nicht möglich [sic] genug Informationen zu sammeln [sic] um herauszufinden [sic] ob Vilaprisan den Marker Gehalt bestimmter Proteine im Uterus beeinflusste.

En: To answer this question, the doctors did a procedure to take tissue samples from each participant's uterus.

De: Um diese Frage zu beantworten, führten die Prüfarzte eine Prozedur durch um Gewebeproben vom Uterus jeder Teilnehmerin zu entnehmen.

These examples show that the use of the feminine noun is due to the context. In addition, the other *nomina agentis* mentioned in the text are in the masculine form (*Wissenschaftler, Prüfarzte*). Interestingly, in some cases the layperson summaries reporting results exclusively on female participants erroneously shift back to the masculine form in the same page, as occurs in the layperson summary of a trial about uterine fibroids:

En: Thank you to the participants who took part in the clinical trial for vilaprisan, also called BAY 1002670. All the participants helped the researchers learn more about vilaprisan to help people with uterine fibroids.

Bayer sponsored this trial and thinks it is important to share the results with the participants and the public. Bayer reviewed the results of the trial when it ended. An independent non-profit organisation called CISCRP helped prepare this summary of the trial results.

We hope this helps the participants understand the results of the trial and their important role in medical research. If you participated in the

trial and have questions about the results, please speak with a doctor or staff at a trial site.

Important: The purpose of this summary is to share information about Bayer's clinical research with participants and the public.

De: Wir danken *den Teilnehmerinnen*, die an der klinischen Prüfung mit Vilaprisan, auch BAY 1002670 genannt teilgenommen haben. *Alle Teilnehmerinnen* haben den Wissenschaftlern dabei geholfen mehr über die Vilaprisan zu erfahren um Frauen¹³⁹ mit Uterus-Myomen zu helfen.

Die Firma Bayer führte diese klinische Prüfung durch und findet es wichtig die Ergebnisse den *Teilnehmern* und der Öffentlichkeit zugänglich zu machen. Eine unabhängige gemeinnützige Organisation namens CISCPR hat bei der Erstellung dieser Zusammenfassung der Studienergebnisse geholfen.

Wir hoffen diese Zusammenfassung hilft *den Teilnehmern* dabei die Ergebnisse der klinischen Prüfung und ihre wichtige Rolle in der medizinischen Forschung zu verstehen. Wenn Sie an der klinischen Prüfung teilgenommen und Fragen zu den Ergebnissen haben, sprechen Sie bitte mit einem Prüfarzt/einer Prüfarztin oder dem Prüfteam in einem Prüfzentrum.

Wichtig: Mit dieser Zusammenfassung soll Bayers klinisches Forschungsprojekt *Teilnehmern* sowie der Öffentlichkeit zugänglich gemacht werden.

The following instances are found in another text about a hormonal intrauterine contraceptive:

En: How many participants had serious adverse events? 0.6% of the participants had serious adverse events. This was 1 out of 167 participants.

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139 Here, the ST has been improved: "people with uterine fibroids" is translated as "Frauen mit Uterus-Myomen", which is clearly a more suitable formulation.

De: Bei wie vielen *Teilnehmern* traten schwerwiegende unerwünschte Ereignisse auf? Bei 0,6 % der *Teilnehmerinnen* traten schwerwiegende unerwünschte Ereignisse auf. Dies entspricht 1 von 167 *Teilnehmern*.

En: The participants: • gave blood and urine samples • had a tissue sample taken from their womb • had an x-ray taken of their bones to check the levels of minerals • recorded their endometriosis symptoms and levels of pain in their electronic diaries [...]

De: *Die Teilnehmer:* • gaben Blutproben ab • ließen Gewebeproben von ihrer *Gebärmutter* entnehmen • ließen ihre *Vagina* untersuchen • dokumentierten ihre *Monatsblutungen* in einem elektronischen Tagebuch [...]

In the second instance, the contradiction is particularly evident. These mistakes might be attributable to the translation process with CAT tools; if the text is segmented (and some segments are saved in the translation memory), translators may not have noticed the discrepancy between the masculine noun *Teilnehmer* and the following parts mentioning *Gebärmutter*, *Vagina*, and *Monatsblutungen*. The same goes for the other instances, where segmentation of different sentences and paragraphs through CAT tools – if these are used – is extremely likely. In addition, initial sentences where participants are thanked are very standardized in the layperson summaries, so it is possible that they are already saved in the translation memory and the translator did not even need to translate them. However, these discrepancies should have been noticed afterwards, when revising the whole translation, and consequently corrected.

The noun *Teilnehmende* occurs 40 times in the whole subcorpus. All occurrences were found in a single text, the same that was mentioned above with respect to the noun *Forschende*. One instance is

En: Open-label study = a study where both study doctors and participants know the treatment which the participant is receiving.

De: Offene Studie = Studie, bei der sowohl die Studienärzte als auch die Teilnehmenden wissen, welche Behandlung der/die Teilnehmende erhält.

This example is interesting for several reasons: firstly, it presents an instance of splitting in the singular form, with both the masculine and feminine article. Secondly, it also shows that gender-inclusive language was not used coherently, as *die Studienärzte* is used in the masculine form. *Teilnehmer* is never used in this text.

The noun *Patientin* occurs only 4 times in the whole subcorpus, while the masculine form *Patient* is found 810 times. Only one of these 4 occurrences is an instance of gender-fair language, with the splitting strategy – and the feminine noun preceding the masculine form:

En: This analysis [...] also showed that gantenerumab was unlikely to be effective (unlikely to help people with early Alzheimer's disease).

De: Die Analyse zeigte jedoch auch, dass es unwahrscheinlich ist, dass Gantenerumab nützt (dass es also Patientinnen und Patienten mit Alzheimer im Frühstadium eher nicht hilft).

This text, written by Roche, is the same that presents the nouns *Forschende* and *Teilnehmende*. As shown with respect to the noun *Teilnehmerin*, the other occurrences of *Patientin* were found in texts where the participants are only women.

The other *nomina agentis* are neutral formulations (*Prüfteam*, *Personal*, *Studienteam*, *Gruppe*, *Erwachsene*, *Kinder*, *Jugendliche*, *Bezugspersonen*, *Menschen*, and *Öffentlichkeit*), but it is unlikely that they are used expressly as strategies to achieve gender-inclusive language – which would be plausible if these nouns were used along with other strategies, like splitting or neographies. One instance is the following sentence, where all other *nomina agentis* (*Teilnehmer* and *Prüfärzte*) are in the masculine form:

En: This means that the participants, doctors, or other trial staff learned what the participants were taking.

De: Dies bedeutet, dass sowohl den Teilnehmern als auch den Prüfärzten oder dem Prüfteam bekannt war, welche Behandlung die Teilnehmer einnahmen.

In addition, the noun *Gruppe* (as in *Placebo-Gruppe*, etc.) simply belongs to the terminology of clinical trials. One instance is the following:

En: Group 2 received damoctocog only when needed for the treatment of bleeds, also known as on-demand treatment. Group 3 received damoctocog before, during, and up to 3 weeks after major surgery. The participants in Group 3 received damoctocog to prevent bleeding.
De: Gruppe 2 erhielt Damoctocog nur bei Bedarf zur Behandlung von Blutungen, auch Bedarfsbehandlung genannt. Gruppe 3 erhielt Damoctocog vor, während und bis zu 3 Wochen nach einer größeren Operation. Die Teilnehmer in Gruppe 3 erhielten Damoctocog, um Blutungen zu verhindern.

The Italian translations of the ST *nomina agentis* are *medici (curanti)*, *ricercatori*, *personale dello studio/staff dello studio*, *équipe/team dello studio*, *infermieri*, *partecipanti*, *pazienti*, *gruppo*, (*soggetti*) *adulti*, *bambini*, *neonati*, *adolescenti*, *familiari assistenti*, *persone*, and *pubblico*.

As expected, no occurrences of the very uncommon feminine form *medica* were found. The nouns *ricercatrice*, *infermiera*, *adulta*, *bambina*, *neonata* were not found, either. *Partecipante*, *paziente*, *adolescente*, and *familiare assistente* are neutral nouns; their gender is expressed by other parts of speech that make up the noun phrase (like pronouns or adjectives). *Partecipante* occurs 3,695 times, and *paziente* 667 times. Due to the high frequency, it was decided to look only at some specific concordances, which are enough to give an idea about the distribution of masculine and feminine nouns in the subcorpus. Overall, *la/e partecipante/i* occurs 107 times, while *il/i partecipante/i* was found 1,036 times. *Partecipante* was found as a feminine noun only in texts describing trials restricted to women, as in the following sentence:

En: All the participants in this trial had surgery planned to remove fibroids from their uterus or to remove their uterus completely.
It: Tutte le partecipanti a questo studio avevano un intervento chirurgico programmato per rimuovere i fibromi dall'utero o per rimuovere completamente l'utero.

Similarly, *il/i paziente/i* occurs 249 times in the Italian subcorpus, while *la/le paziente/i* is found only once, in the following sentence, contained in a text reporting the results of a trial about breast cancer:

En: Patients with tumors in their bones can have symptoms like [...]

It: Le pazienti con neoplasie ossee possono manifestare i seguenti sintomi [...]

Adolescenti only occurs 8 times, always in the masculine form, and *familiari* 16 times, also in the masculine form.

As claimed with respect to German neutral formulations, the nouns *personale dello studio/staff dello studio*, *équipe/team dello studio*, *gruppo*, *persone*, and *pubblico* are not considered to be instances of use of gender-fair language, as they do not accompany other corresponding strategies.

No strategies of gender-inclusive language with so-called neographies (cf. Diewald & Steinhauer 2022: 129–130), like asterisks, colons, gender gaps, interpuncts, at signs, or schwas were found in the three subcorpora. The same goes for splitting with a slash and a hyphen, brackets, or the *Binnen-I*.

Finally, it was attempted to determine whether English uses the generic masculine or other strategies by observing its pronouns. Interestingly, no occurrences of *he*, *she*, or *his* were found. *Her* was found only once:

“Intrauterine” means that the contraceptive is in the form of a device that is inserted into the woman’s womb by her doctor.

This means that the third person singular is not used to refer to generic referents, neither in the masculine form nor with splitting. The plural form is favored, as shown by the following instances:

This means each participant knew what they were receiving and how often they received treatment.

“Mild” meant that the adverse event caused mild or temporary discomfort that did not keep the participant from their daily activities.

Interestingly, in the following instance the plural form was misunderstood by the German translator, who seems to have interpreted it as an actual plural:

En: This means each participant and their caregiver knew what the participant was receiving and the doctors and trial staff also knew.

De: Das bedeutet, dass jedem Teilnehmer und *ihren* Bezugspersonen sowie den Prüfarzten und dem Prüfteam bekannt war, welche Behandlung der Teilnehmer erhielt.

Another aspect relevant to the topic of gender-inclusive language concerns the denominations of the summaries. In English, the names are gender-inclusive: *layperson summary* in lieu of *layman summary*. It should be noted that this is not a choice of individual translators or writers but is rather due to Regulation 536/2014. The other possible denominations (Section 1.3.2) are neutral, as well: *lay summary*, *plain language summary*, *lay language summary*, *simple summary*, and *trial results summary*.

In German, the original denomination (when present) was translated as *Zusammenfassung für Laien*, i.e., a masculine noun. However, it should be mentioned that the feminine equivalent *Laiin* is not used frequently.

In Italian, some titles were translated as *sintesi divulgativa* or *riepilogo divulgativo*, with no explicit reference to readers. In other cases, when readers were mentioned, gender-inclusive strategies were not implemented: *riepilogo/sintesi per non addetti ai lavori* or *riepilogo/sintesi per i non esperti*.

9.4 Discussion

Overall, as has been shown in Section 9.1.2, English usually does not differentiate between masculine and feminine nouns, and the same applies to the *nomina agentis* usually occurring in the layperson summaries. It was found that the plural pronoun *they* is used to refer to a singular referent; this strategy is now well-rooted and not surprising.

In the translated texts, only a few cases of gender-neutral language strategies were detected – and only in German. The strategies that occur in these texts

are splitting (sometimes with the feminine noun preceding the masculine one) and the use of participial nouns like *Forschende* and *Teilnehmende* in lieu of *Forscher* and *Teilnehmer*. However, these features are quite rare, are not used coherently and only occur in the texts written by some pharmaceutical companies. Splitting of the noun *Arzt/Prüfarzt* mainly occurs in the texts by Bayer (and only once in a text by Novartis), while splitting of the nouns *Teilnehmer* and *Patient* was found in a text by GSK and in a text by Roche, respectively. The occurrences of the nouns *Forschende* and *Teilnehmende* were also found in the same text by Roche. This is certainly not a coincidence but might rather be a choice made by the translator, who evidently dedicated great attention to gender-fair language – although not every noun in this text is gender-inclusive.

The Italian subcorpus does not show any occurrences of gender-fair language. This outcome confirms the observations reported in Section 9.1.2, according to which gender-inclusive language is less rooted in Italian than in other languages. It should also be considered that one of the most widespread *nomina agentis* of the layperson summaries is *medico*,¹⁴⁰ whose feminine equivalent *medica* is currently quite controversial (despite its existence and etymological correctness). It is therefore easy to understand why it was avoided in these texts.

Overall, it can be hypothesized that the gender-fair strategies implemented in the texts were a choice made by single translators. This is supported by the fact that the Good Lay Summary Practice (GLSP 2021) and the Recommendations of the Expert Group on Clinical Trials (2018) do not give any suggestions with respect to this linguistic feature.

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140 Its German equivalent, *Arzt*, is frequently subject to splitting, as shown in Section 9.3.

10 Explicitness

The present chapter will deal with explicitness and explicitation, a phenomenon which should not be underestimated in linguistic simplification. While many linguistic features¹⁴¹ contribute to a tendency towards implicitness or explicitness, as briefly shown in Section 10.1.1, this chapter will focus on two aspects: explicitation in providing explanations of terms (but also synonyms, hypernyms, etc.) in the translated subcorpora, and implicit or explicit subordinate clause use. Explicit clauses are those with a finite mood, an explicitly mentioned subject and a marked tense, while implicit clauses have a non-finite mood (cf. for instance Treccani n.d.b).

10.1 Theoretical framework

The present theoretical framework will focus on explicitation as a universal in translation. It will also focus on the importance of explicitness in facilitating communication, especially in simplified language variants.

10.1.1 Explicitation in linguistics and translation

More and more attention has been devoted to explicitation in several fields of linguistics. In pragmatics, the relationship between explicit and implicit statements is nowadays topical (Albrecht 2013: 200). In translation, explicitation is regarded as a universal, i.e., a linguistic feature that tends to occur in translated texts more than in original texts and is thought to be independent of specific language combinations (Baker 1993: 243). For instance, it has been shown that in the TTs there are shifts in the types of cohesion markers and in expansions due to the insertion of additional words by translators, resulting in a higher level of explicitness compared to the STs. These phenomena are

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141 In some cases, this is discussed in the corresponding chapters, like in Chapter 7 with respect to connectives.

likely to be due to the process of interpretation of the ST rather than being language-pair specific features (Blum-Kulka 1986). For these reasons, Blum-Kulka (ibid.: 19, 21) posited the “explicitation hypothesis”, according to which “the level of explicitness observed in translated texts and in the written work of second language learners may be a universal strategy inherent in any process of language mediation” (Laviosa-Braithwaite 2001: 289). Other instances of explicitation in translation are the following: the use of interjections to accentuate a certain interpretation or to better express the progression of the characters’ thoughts, the addition of modifiers, qualifiers, and conjunctions, the expansion of condensed passages, the insertion of explanations, more accurate descriptions or extra information, the more precise rendering of implicit or vague data, the explicit mention of toponyms, the repetition of previously mentioned details as well as the disambiguation of pronouns (Vanderauwera 1985). Baker (1992) also points to the insertion of additional background information in the TT in order to fill in a cultural gap, which could be interpreted as the “notwendiger Differenzierungsgrad” (‘necessary degree of differentiation’) posited by Hönig and Kußmaul (1982: 58). The explicitation universal has also been studied in interpreting; in simultaneous interpreting, repetition or recourse to synonyms have been found in lieu of substitution and ellipsis (Shlesinger 1989: 171–172, 1995: 201).

While explicitation seems indeed to be a universal in translation, it should also be noted that languages have different tendencies towards implicitness or explicitness. Therefore, an *appropriate* degree of differentiation (Bosco & Magris 2020: 15) could be added to the aforementioned necessary degree of differentiation, in order to accommodate the different collocation of the source and target cultures on the continuum of explicitness (based on Hofstede’s cultural studies of 1991). For instance, German culture tends towards explicitness more than Italian. As a consequence, translators should pay attention to the degree of differentiation and resort to explicitation, compensation, or omission strategies (ibid.).

10.1.2 Explicitness, comprehensibility, and language simplification

The correlation between explicitness and readability has been underlined, among others, by Toury (1995: 227). The Complexity Principle (Rohdenburg 1996: 151) also links explicitness to comprehensibility. According to this theory, in cognitively complex contexts, the more explicit options are preferred over the implicit when faced with a choice of grammatical options with varying degrees of explicitness.

The correlation between explicitness and readability is also thematized in the language simplification field. Bredel and Maaß (2016a) widely discuss this topic in their manual. As they point out, the principles to be followed in *Leichte Sprache* are reduction and addition (ibid.: 489–512). Reduction refers to features that should be avoided, such as complex grammatical constructions and terminology. Addition aims at compensating for what is left out through reduction, as well as at helping readers by inserting explanations for concepts and terms that may not be clear. Implicit information should be made explicit: Bredel and Maaß even mention the “principle of maximum explicitness” (ibid.: 517–518) among the key principles of *Leichte Sprache*, along with proximity and continuity. Yet, explicitation should not be excessive, as texts are never thoroughly explicit and would become unacceptable if their explicitation level is too high: they would be too long and sound patronizing, which would increase the stigmatization risk.

All these considerations are also applicable to Plain Language, although clearly the level of necessary explicitness is lower.

10.2 Methodology

This chapter will focus on some aspects related to explicitation by expanding on two chapters, i.e., the one concerning the lexical and terminological level (Chapter 3) and the one dealing with hypotaxis and parataxis (Chapter 6).

As for the complementary analysis of Chapter 3, the purpose was to detect potential additions and explicitations in the translated subcorpora with respect to explanations, definitions, synonyms, hypernyms, and more general

clarifications. The analysis was conducted by searching for those verbs and other parts of speech signaling the categories detected in Section 3.3.3.2 by means of the “Parallel Concordance” function in Sketch Engine. Additions and explicitations by means of parenthetical constructions were also extracted.

As for the second aspect, explicit and implicit subordinate clauses have been analyzed, starting from the clauses that have been examined quantitatively in Chapter 6 and extracted from the corpus by means of Sketch Engine. As already stated, only argument clauses introduced by subordinating conjunctions have been analyzed, whereas participial and gerundive clauses have not been examined. In order to avoid bias, subordinators followed by an infinitive have also been excluded from the analysis, because they are rather bound to grammatical, contextual and semantic reasons, and are not really indicative of a tendency towards implicitness or explicitness. For instance, the selection of a subordinator between *damit* and *um...zu* or *perché*, *affinché* and *per* depends on the subject in the main clause and in the subordinate clause. Thus, the clauses that were considered are those with a subordinator followed by past participles and *-ing* forms.

10.3 Analysis

10.3.1 Explication and additions in the translation of terms

In the German subcorpus, 88 additions and explicitations were detected. Of these, only 10 are introduced by the various verbs and other constructions examined, all other cases are mere parenthetical additions.

Of the former group, 3 instances involve the adverb *also* (with the first instance also including *kurz*):

En: Carboplatin affects the genetic material in cells – the DNA.

De: Carboplatin wirkt sich auf das genetische Material (*also die Erbinformation* oder kurz DNA) in den Zellen aus.

En: They studied the size of the tumors using a measurement called the Response Evaluation Criteria in Solid Tumors, also called RECIST.

De: Sie untersuchten die Größe der Tumore mithilfe einer Messgröße namens *Response Evaluation Criteria in Solid Tumors (RECIST)*, also Kriterien für die Bewertung des Ansprechens der Behandlung bei soliden Tumoren.

En: They studied the size of the tumors using a measurement called the Response Evaluation Criteria in Solid Tumors, also called RECIST.

De: Sie untersuchten die Größe der Tumore mithilfe eines sogenannten *Response Evaluation Criteria in Solid Tumors (RECIST)*, also Kriterien für die Bewertung des Ansprechens der Behandlung bei soliden Tumoren.

The latter instance also contains the adjective *sogenannt*. Two other occurrences of this formulation were found in the subcorpus:

En: The liquid vaccine formula eliminates the need to reconstitute the dry powder component with the liquid component before administration, thus preventing possible errors in mixing and administering the vaccine.

De: Aufgrund der flüssigen Impfstoffformulierung ist das *Zusammenbringen* (die sogenannte Rekonstitution) des Trockenpulver-Bestandteils mit dem flüssigen Bestandteil vor der Verabreichung nicht mehr erforderlich, wodurch mögliche Fehler bei der Vermischung und Verabreichung des Impfstoffs vermieden werden.

En: This study was ‘open label’.

De: Es handelte sich um eine offene Studie, eine sogenannte „Open-Label-Studie“.

Two instances of explicitations of English terms with the German equivalent are introduced by the abbreviation *d. h.*:

En: The purpose of this study was to see if patients who added albiglutide to their regular type 2 diabetes treatment were more or less likely to have a major cardiovascular problem [major adverse cardiovascular event (MACE)] compared with patients who did not add albiglutide to their regular type 2 diabetes medicine.

De: Zweck dieser Studie war es festzustellen, ob bei Patienten, die Albiglutid zusätzlich zu ihrer regulären Behandlung des Diabetes mellitus Typ 2 erhielten, im Vergleich zu Patienten, die nur ihre reguläre Behandlung des Diabetes mellitus Typ 2 ohne Albiglutid erhielten, eine höhere oder niedrigere Wahrscheinlichkeit besteht, dass sie wichtige Herz-/Kreislaufprobleme (*so genannte „MACE“, von engl. major adverse cardiovascular events, d. h. wichtige unerwünschte Ereignisse im Herz-/Kreislaufsystem*) bekommen.

En: The main comparison between the treatment groups was the time to first occurrence of a major cardiovascular problem (major adverse cardiovascular event [MACE]).

De: Der Hauptvergleich zwischen den Behandlungsgruppen bezog sich auf die Zeit bis zum ersten Auftreten eines wichtigen Herz-/Kreislaufproblems (*eines so genannten „MACE“, von engl. major adverse cardiovascular event, d. h. wichtiges unerwünschtes Ereignis im Herz-/Kreislaufsystem*).

Three instances are introduced by the verbs *nennen*, *bezeichnen*, and *sein*, respectively:

En: This study investigated the medicine gantenerumab for the treatment of a disease of the brain that affects memory and other brain functions – called ‘Alzheimer’s disease’.

De: Die Studie untersuchte das Medikament Gantenerumab für die Behandlung einer Erkrankung des Gehirns, die das Gedächtnis und andere Gehirnfunktionen beeinträchtigt, die sogenannte Alzheimer-Krankheit (*nachfolgend „Alzheimer“ genannt*).

En: During the run-in period, participants were given a nasal steroid spray for their nasal polyps symptoms to take alongside the trial drugs, fevipiprant or placebo.

De: Während der *Einleitungsphase* (*auch als Run-in-Phase bezeichnet*) erhielten die Teilnehmer ein steroidhaltiges Nasenspray für ihre Nasenpolypen, das sie zusammen mit den Studienmedikamenten (Fevipiprant oder Placebo) anwenden sollten.

En: Exacerbation was defined by the study doctor.

De: Eine Exazerbation ist eine plötzlich auftretende Verschlechterung der COPD und wurde vom Studienarzt definiert.

Among parenthetical additions, the most frequent ones are those introducing terms (27 occurrences). In most cases, the added terms are of Germanic origin, used to explain the Latinate ones. This occurs several times in lists with adverse events and reactions, like “Flüssigkeitsmangel (Dehydrierung)”, “Sepsis (Blutvergiftung)”, and “Durchfall (Diarrhö)” to translate “dehydration”, “sepsis”, and “diarrhoea”, respectively. Other instances in different contexts are the following:

En: AxSpA is a type of arthritis that causes inflammation (swelling, pain, and stiffness) in the joints, mainly in the spine.

De: AxSpA ist eine Form der *Arthritis (Gelenkentzündung)*, bei der es zu Entzündungen (Schwellungen, Schmerzen und Steifigkeit) in den Gelenken kommt, vor allem in der Wirbelsäule.

En: It had been previously tested in certain types of diseases that involve the immune system, such as psoriasis and asthma.

De: Das Medikament wurde bereits bei bestimmten Erkrankungen des Immunsystems, zum Beispiel *Psoriasis (Schuppenflechte)* und Asthma, untersucht.

En: There are different types of melanoma, but more than half of melanoma cases are linked to mutations in the BRAF gene.

De: Es gibt verschiedene Arten von Melanomen, aber über die Hälfte der Melanom Fälle hängt mit *Mutationen (Veränderungen)* im BRAF-Gen zusammen.

En: One patient in Group 5 reported a serious side effect of pneumonia.

De: Ein Patient in der Gruppe 5 meldete die schwerwiegende Nebenwirkung *Pneumonie (Lungenentzündung)*.

En: Blood and sputum samples were taken to assess the body’s defence response to the vaccine.

De: Es wurden Blut- und *Sputumproben (Auswurf)* zur Beurteilung der körpereigenen Abwehrreaktion auf den Impfstoff entnommen.

En: AIN457 binds to and lowers the activity of a protein in the body called interleukin 17a (IL-17a).

De: AIN457 bindet sich an ein *Protein (Eiweißstoff)* im Körper, das als Interleukin-17A (IL-17A) bezeichnet wird, und senkt dadurch die Aktivität dieses Proteins.

En: [...] Refractory if it was never well treated [...]

De: [...] *Refraktär (unempfindlich)*, wenn bisher keine Behandlung gut geholfen hat [...]

En: Relapsed if it had been well treated at one time, but isn't now

De: *Rezidiert (wiederkehrend)*, wenn eine Behandlung früher einmal gut geholfen hat, aber jetzt nicht mehr hilft (*Rückfall*).

In these instances, the term between brackets is the one of Germanic origin. In other cases, the term in the parenthetical construction is of classical matrix (which, however, is less frequent):

En: The people in the study had non-small cell lung cancer that had not been treated with chemotherapy for their metastatic disease before.

De: Die Personen in der Studie hatten ein nicht-kleinzelliges Lungenkarzinom, das zuvor nicht mit einer Chemotherapie gegen ihre *gestreute (metastasierte)* Erkrankung behandelt worden war.

En: 'Nasopharyngitis' is a swelling in the passages of the nose and throat – commonly known as a 'cold'.

De: Eine *Entzündung des Nasen-Rachen-Raums (Nasopharyngitis)* ist eine Schwellung der Nasen- und Rachenschleimhäute, die gemeinhin als Erkältung bezeichnet wird.

The addition of a term of classical origin is not as frequent as the addition of the Germanic term:

En: The participants in this trial took BAY 1217389 as a capsule or a liquid by mouth.

De: Die Teilnehmer in dieser klinischen Prüfung nahmen BAY 1217389 in Kapselform *zum Schlucken (oral)* oder als Flüssigkeit ein.

The presence of two terms was sometimes due to the occurrence of both an anglicism and the German variant of the term:

En: Part 3 of the study was an ‘open-label extension’ study.

De: Teil 3 war eine *offene* („open-label“) *Verlängerungsstudie*.

Other examples of additions to make a term clearer are:

En: Current treatments for nasal polyps include corticosteroid nasal sprays, also called nasal steroid sprays, or surgery.

De: Zu den derzeit verfügbaren Behandlungen für Nasenpolypen zählen Kortikosteroid-Nasensprays, auch als *steroidhaltige Nasensprays* („Kortison“) bezeichnet, sowie operative Eingriffe.

En: If participants had worsening symptoms of SPMS, they were given doses of corticosteroid medicine, as needed, to help treat the symptoms.

De: Kam es im Verlauf der Studie zu einer Verstärkung der SPMS-Symptome, konnte den Studienteilnehmern ggf. ein *kortisonhaltiges Medikament (Kortikosteroid)* gegeben werden, um die Symptome zusätzlich zu behandeln.

In 25 cases, the additions were needed to translate English expressions or acronyms and initialisms, as occurs in the following instances:

En: Researchers are looking for a better way to treat renal cell cancer, also known as RCC.

De: Wissenschaftler sind auf der Suche nach einer besseren Behandlungsmöglichkeit für *Nierenzellkrebs* (kurz „RCC“, *renal cell cancer*).

En: The participants had not received dialysis or “erythropoiesis-stimulating agents”, also known as ESAs.

De: Die Teilnehmer hatten weder eine Dialyse noch „*Erythropoese-stimulierende Substanzen*“ (*erythropoiesis-stimulating agents*, *ESA*) erhalten.

En: A study to find the most suitable dose of venetoclax to use with rituximab or Obinutuzumab plus chemotherapy, and to evaluate these

combinations in patients with a type of blood cancer called ‘diffuse large B-cell lymphoma’ or DLBCL (the CAVALLI study)

De: Eine Studie zur Ermittlung der am besten geeigneten Dosis von Venetoclax zur Verwendung mit Rituximab oder Obinutuzumab plus Chemotherapie und zur Bewertung dieser Kombinationen bei Patienten mit einer bestimmten Art von Blutkrebs, dem *diffusen großzelligen B-Zell-Lymphom* (= DLBCL von engl. *diffuse large B-cell lymphoma*) (CAVALLI-Studie)

En: OLE stands for open-label extension.

De: OLE bedeutet *offene Verlängerungsstudie* („open-label extension“).

En: One test was called the Psoriasis Area and Severity Index, or PASI.

De: Ein Test wurde als der *Psoriasis Flächen- und Schwere-Index oder PASI* (von engl. „Psoriasis Area and Severity Index“) bezeichnet.

En: The other test was called the Investigator Global Assessment, or IGA.

De: Der andere Test wurde als die *Globale Beurteilung der Untersucher oder IGA* („Investor Global Assessment“) bezeichnet.

In some cases, the addition serves to translate indications in English on where to find further information about the trial:

En: Once on the site, click “Clinical trial results” at the bottom of the page.

De: Klicken Sie auf der Website dann auf „*Clinical trial results*“ (*Ergebnisse klinischer Studien*) am Ende der Seite.

En: After agreeing to enter the Novartis website, type CBAF312A2304 into the keyword search box and click “Search”.

De: Nachdem Sie zugestimmt haben, die Novartis-Website aufzurufen, geben Sie in das Schlüsselwort-Suchfeld „CBAF312A2304“ ein und klicken Sie auf „*Search*“ (*Suchen*).

Additions are also introduced to provide the extended form of initialisms which are not further explained in the ST. All 12 instances detected involve the initialisms *CT* and *MRT*.

En: To answer this question, the doctors took pictures of the participants' tumors using either a CT or MRI scan.

De: Um diese Frage zu beantworten, machten die Wissenschaftler Aufnahmen der Tumore der Teilnehmer, entweder mithilfe einer *Computertomografie (CT)* oder einer *Magnetresonanztomografie (MRT)*.

En: The doctors did a CT or MRI scan of the participants' tumors once every 2 cycles for the first 6 months, and then once every 3 cycles after that.

De: Die Prüfarzte führten alle zwei Zyklen in den ersten sechs Monaten eine *Computertomografie (CT)* oder eine *Magnetresonanztomografie (MRT)* zur Untersuchung der Tumore der Teilnehmer durch; danach alle drei Zyklen.

In one instance, the addition consists of an acronym:

En: Squamous cell cancers are usually found in the centre of the lung, but non-squamous cell cancers usually start around the edges of the lungs.

De: *Plattenepithelkarzinome (PEK)* wachsen normalerweise im Zentrum der Lunge. Nicht-PEK breiten sich in der Regel von den Lungenrändern her aus.

In 10 cases the additions were explanations,¹⁴² as occurs in the following examples:

En: The difference between the FEV1 values at baseline and after 12 weeks of treatment is called the Week 12 change from baseline in FEV1.

De: Der Unterschied zwischen den FEV1-Werten zu *Beginn der Studie (Baseline-FEV1)* und nach 12 Wochen Behandlung wird als Veränderung des FEV1 nach 12 Wochen gegenüber Baseline bezeichnet.

.....

¹⁴² It should be stressed that the borders between term and explanation are sometimes fuzzy.

En: Meningitis is caused by infectious agents, and meningococcus types A, C, W, and Y are among the most common bacterial causes of this disease.

De: Meningitis wird von *infektiösen Agenzien (krankmachenden Faktoren)* verursacht; die Meningokokken-Gruppen A, C, W und Y zählen zu den häufigsten bakteriellen Ursachen für diese Erkrankung.

En: This narrowing can cause coughing, wheezing, chest tightness, and shortness of breath.

De: Diese Verengung kann zu Husten, *pfeifenden Geräuschen beim Atmen (Giemen)*, Brustenge und Kurzatmigkeit führen.

En: Novartis, the sponsor of this clinical trial, would like to thank you for taking part in this trial for the drug BAF312, also known as siponimod.

De: Novartis, der *Sponsor (Auftraggeber der Studie)*, möchte Ihnen für Ihre Teilnahme an dieser klinischen Studie zu dem Medikament BAF312, auch als Siponimod bekannt, danken.

En: In the any PD-L1 and medium-high PD-L1 groups, results with atezolizumab were not significantly different than results with platinum-based chemotherapy (meaning that the differences investigators saw could be due to chance) [...].

De: In der Gruppe mit jeglichem PD-L1-Wert sowie der Gruppe mit mäßigem-hohem PD-L1-Wert unterschieden sich die Ergebnisse der Behandlung mit Atezolizumab *nicht erheblich (signifikant)* von denen der Behandlung mit einer platinbasierten Chemotherapie (das bedeutet, dass die von den Prüfern festgestellten Unterschiede Zufall sein könnten).

Finally, in 3 cases the parenthetical constructions are explications of other kind, with no further categorization, of the ST segment:

En: There are several ongoing and planned studies of the new shingles vaccine in different groups of adults.

De: Es gibt mehrere laufende und geplante Studien zu dem neuen Gürtelrose-Impfstoff *in Erwachsenen mit verschiedenen (Vor)Erkrankungen*.

En: Before starting the study, patients were asked to replace their previous asthma treatment (if different) with Relvar/BreoEllipta.

De: Bevor die Patienten in die Studie eintraten, wurden sie gebeten, ihre vorherige Asthmabehandlung durch Relvar/Breo Ellipta zu ersetzen (*falls sie eine andere Behandlung angewendet hatten*).

En: For every 3 participants who took part in the trial, 2 received BAF312 and 1 received placebo.

De: 66 % *oder* 2/3 aller Studienteilnehmer erhielten BAF312, 33 % *oder* 1/3 erhielten Placebo (*Verhältnis 2 : 1*).

The last instance is particularly interesting, since, as stated in the GLSP (2021: 12, 37), “calculations should not be left to your reader”.

In the Italian subcorpus, 23 additions or explicitations were found. Of these, only one is introduced by the examined verbs and constructions, i.e., *detto*:

En: One measure of lung function is forced expiratory volume in one second (FEV1).

It: Una misura della funzione polmonare è il volume espiratorio forzato in un secondo (*detto FEV1, dall'inglese Forced Expiratory Volume in one second*).

All other instances of additions and explicitations detected were other types of parenthetical constructions. Most of them (19) consist of explanations of English expressions or acronyms and initialisms, as shown by the following instances:

En: Umeclidinium is an inhaled long-acting muscarinic antagonist (LAMA).

It: L'umeclidinio è un *antagonista muscarinico per via inalatoria a lunga durata d'azione* (o LAMA, *dall'inglese Long Acting Muscarinic Antagonist*).

En: Vilanterol and salmeterol are inhaled long-acting beta agonists (LABA).

It: Il vilanterolo e il salmeterolo sono *beta agonisti per via inalatoria a lunga durata d'azione* (o LABA, dall'inglese Long Acting Beta Agonist).

En: One type of neuropathic pain is called postherpetic neuralgia (PHN).

It: Un tipo di dolore neuropatico si chiama *nevralgia posterpetica* (PHN, *postherpetic neuralgia*).

In 2 instances, terms were added (in the first instance, *sapore metallico* is added before the parenthetical construction):

En: having a copper taste in the mouth

It: *sapore metallico* (*rame*) in bocca

En: Did LMB763 affect the participants' signs of liver fibrosis?

It: LMB763 ha influito sui sintomi di *fibrosi del fegato* (*fibrosi epatica*) dei partecipanti?

In one instance, the parenthetical construction includes the acronym of the pathology, which in Italian is preceded by the extended term.

En: The researchers in this trial wanted to learn if regorafenib works in a large number of participants with GIST.

It: In questo studio, i ricercatori volevano indagare l'efficacia di regorafenib su un piccolo numero di partecipanti affetti da *tumori stromali gastrointestinali* (GIST).

Overall, explicitations and additions are clearly more frequent in the German subcorpus than in the Italian one (88 vs 23).

10.3.2 Explicit and implicit subordinate clauses

Tables 38, 39, and 40 show subordinators for which at least one case of implicit use was detected in the three languages.

Types of subordinators	Subordinators	Explicit use occurrences	Implicit use occurrences	Tot.
Temporal subordinators	After	164	95	259
	Before	170	122	292
	When	350	52	402
	While	30	14	44
Conditional subordinators	If	179	2	181
Adversative subordinators	While	0	14	14
Exceptive subordinators	Unless	0	8	8
Comparative subordinators	As	15	22	37
Exclusive subordinators	Without	0	9	9
Tot.		908	338	1,246

Table 38: Subordinators with implicit use occurrences in the English subcorpus

Types of subordinators	Subordinators	Explicit use occurrences	Implicit use occurrences	Tot.
Concessive subordinators	Obwohl	2	11	13
Comparative subordinators	(So) wie	1	8	9
Tot.		3	19	22

Table 39: Subordinators with implicit use occurrences in the German subcorpus

Types of subordinators	Subordinators	Explicit use occurrences	Implicit use occurrences	Tot.
Temporal subordinators	Una volta	5	7	12
	Quando	187	19	206
Conditional subordinators	Se	156	2	158
Comparative subordinators	Come	6	15	21
Tot.		354	43	397

Table 40: Subordinators with implicit use occurrences in the Italian subcorpus

Two sentences that show the contrast between explicit and implicit use of subordinate clauses in the English subcorpus are:

Expl.: For Part 1, the doctors kept track of the adverse events that the participants had *while they took BAY 1902607 or the placebo*.

Impl.: The participants visited their trial site between 3 and 6 times *while taking treatment*.

Some instances in the Italian subcorpus are:

Expl.: *Quando ai pazienti veniva somministrato BVS857 tramite un'iniezione sottocutanea*, la quantità di BVS857 nel sangue era molto diversa da un paziente all'altro.

Impl.: Complessivamente, la quantità di BAY 1217389 nel sangue era più alta *quando somministrato insieme a paclitaxel* rispetto a *quando somministrato da solo*.

In German, as shown in Table 39, only two subordinators introduce implicit clauses, *obwohl* and *(so) wie*. Some instances of use in context are:

Expl.: Wenn die Schmerzen anhalten, *obwohl der Hautausschlag zurückgeht*, spricht man von PHN.

Expl.: Die Anzahl der COPD-Exazerbationen war in beiden Studien-
gruppen ähnlich, *obwohl durch den Impfstoff eine starke Immunantwort*
erzielt wurde.

Impl.: *Obwohl zur Nutzung dieser Daten nicht vorgeschrieben,* wird um
Nennung von GSK als Quelle der genannten Daten gebeten.

Tables 38, 39, and 40 show significantly different results. The English subcorpus has a far higher number of implicit clauses (338) of the analyzed types than the Italian (43) and, even more so, the German subcorpus (19).

For subordinators where both an explicit and implicit option are possible, the explicit one is favored in most cases (English: 908 explicit use vs 338 implicit use, Italian: 354 explicit use vs 43 implicit use). The only exception is given by the German results, where the number of implicit use (19) is higher than that of explicit use (3) for both subordinators. Results for these specific subordinators are also similar in the other subcorpora. With comparative clauses, the frequency of implicit use of the detected subordinators is higher than that of explicit use in both English and Italian. As has already been mentioned in Section 6.4, English adversative clauses with the subordinator *while* are often translated with subordinators belonging to the category of concessive clauses in the target subcorpora. Here, the frequency of implicit use of the detected subordinator for adversative clauses is higher than that of explicit use.

As occurs in German, the types of Italian subordinators indicated in Table 39 are found in the source subcorpus, which signals a clear correspondence between STs and TTs. While analyzing these results, it should be kept in mind that Tables 38, 39, and 40 do not show infinitives. However, even counting the subordinators of these types which can be followed by an infinitive, the clear tendency towards explicitness in Italian would still be confirmed. These subordinators are temporal (*prima che/prima di*: 119 vs 130, *dopo che/dopo*: 91 vs 94), conditional (*a condizione che/di*: 3 vs 0), and exclusive (*senza che/senza*: 1 vs 12). Altogether, these instances of explicit use are 214 and those of implicit use 236. If the occurrences indicated in Table 40 are also considered, the instances of explicit use detected in the subcorpus are 568 and those of implicit use 279.

Another interesting aspect to consider is that many of the implicit forms, such as *wie erwartet* and *wie geplant*, can also be regarded as collocations. Otherwise, a more explicit form would have probably been used in their place.

10.4 Discussion

A tendency towards explicitation has been detected both in the STs and in translation, although with some differences between the analyzed languages. As for the integration of Chapter 3, explicitations and additions are clearly more frequent in German than in Italian (88 vs 23). As shown, they mainly involve terms (mostly of Germanic origin),¹⁴³ extended terms for acronyms, and explanations of anglicisms. To correctly interpret this data, it should also be considered that, as pointed out in Section 3.3.3.2, omissions of concepts introduced in the STs were practically inexistent; just a few acronyms or abbreviations were left out in the TTs.

As for the analysis of subordination, explicit clauses were favored in the STs and, even more so, in the translated subcorpora. This might be due to the influence of the target languages, less prone to implicitness (German even less so than Italian), on the one hand, and to the tendency to make content explicit in translation on the other. Many of the implicit forms can also be regarded as collocations (*wie erwartet* and *wie geplant*), which justifies their presence in the texts.

In conclusion, a tendency towards explicitation, which confirms both the Universals of Translation and the tendencies inherent in Italian and German, is visible in both analysis sections. This is in line with other parts of the present book, such as the analysis of connectives, which showed an increase of these constructions in Italian and especially in German.

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143 These findings correspond to the results of Chapter 3, where terms of classical matrix have been shown to be avoided and replaced more often by terms of Germanic origin in the German subcorpus than in the English one.

11 Readability indices and other data

The present chapter reports data concerning readability (particularly readability indices) obtained through software analysis.

11.1 Theoretical framework

Readability assessment aims at quantifying how difficult a text is for readers (Tonelli et al. 2012: 40). Readability indices rely on the presupposition that difficult language features are also an indicator of content difficulty. These indices are calculated based on statistical procedures and consider features of a text that make it easier or more difficult for a specific group of readers to understand content meaning. Stylistic and semantic criteria as well as structural aspects and layout are usually not taken into account (Bamberger 2006: 285), and for this reason, readability indices are quite controversial, since they do not represent a perfect instrument with which to evaluate a text's difficulty (cf. *inter alia* Fortis 2003: 15). One typical criticism is that standard readability indices provide the same score for a “normal” sentence and a sentence whose word order has been changed so that it does not mean anything anymore (e.g., “Readability indices are not always reliable” and “Indices are readability not reliable always”, which both have a SMOG score¹⁴⁴ of 11.21). However, readability indices are frequently used to assess texts aimed at a wide audience, especially in health care (see *inter alia* Heim et al. 2016; Lyatoshinsky et al. 2019; Dyda 2020; Paul et al. 2021).

11.1.1 Readability indices

There are several readability indices for various languages. In some cases, the same index was adapted from English into other languages by considering their unique features. In this subchapter we will focus on readability indices

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144 Calculated with the tool Analyze My Writing.

calculated by three analysis tools, i.e., Analyze My Writing, Ratte, and DyLan TextTools (for English, German, and Italian, respectively). These indices mainly take into account similar parameters (typically word and sentence length), but using different formulas and providing scores which have to be interpreted differently.

Analyze My Writing calculates the Gunning Fog Index, the Flesch-Kincaid Index, the SMOG Index, the Coleman-Liau Index, and the Automated Index. The Gunning Fog Index (FOG Index) considers sentence length as well as the number of complex words (with over three syllables). It is a highly used index, especially with respect to information materials concerning health and medicine (Robinson & McMenemy 2020). The Flesch-Kincaid Index considers sentence length and word length. The SMOG (Simple Measure of Gobbledygook) Index considers the number of polysyllabic words (words with three or more syllables) and the number of sentences in a text. Finally, the Coleman-Liau Index and the Automated Readability Index (ARI) take into account average word length (calculated based on the number of letters per word, unlike many other indices which consider syllables) and sentence length. The final score of all these indices corresponds to the US grade level necessary to understand the text.

Ratte calculates the gSmog index, the LIX, the Flesch-Index, the WSTF, and the RIX. gSmog (German Simple Measure of Gobbledygook) is an adaptation of the Smog index carried out by Bamberger (cf. Bamberger & Vanecek 1984). It considers the number of multisyllabic words (from three syllables onwards) in relation to the number of sentences in the text. The result corresponds approximately to the reading age – expressed in grade levels – for which the text is suitable (ibid.: 58–59). The LIX (Lesbarkeitsindex) is calculated based on the mean sentence length and the percentage of long words (with over six letters). It provides a result which ranges from 15 to 80 (Bamberger 2006: 286). Table 41 explains how to interpret these values:

Score	Evaluation
15+	Very easy
30+	Easy
40+	Average
50+	Difficult
60+	Very difficult

Table 41: Evaluation of LIX scores

The Flesch-Index is based on the average sentence and word length (von der Brück & Leveling 2007: 4). Its score ranges from 0 to 100. Here, however, results should be interpreted differently from the LIX scores (see Table 42). According to the Flesch-Index, the higher the score, the easier the text.

Score	Evaluation
90–100	Very easy
80–90	Easy
70–80	Fairly easy
60–70	Plain language
50–60	Fairly difficult
30–50	Difficult
0–30	Very difficult

Table 42: Evaluation of Flesch-Index scores

The WSTF (Vierte Wiener Sachtextformel) considers the number of sentences, words, and the words with over three syllables. It provides a result that may range from 4 to 15 and represents the grade level for which the text is suitable (Bamberger 2006: 285). The RIX (Regensburger Index)¹⁴⁵ considers the number of words, sentences, words with over six letters, as well as parameters

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¹⁴⁵ It should be noted that this index was calculated by an older version of the software Ratte and has been omitted in the one currently available online. According to the developers, more empiric research is needed before the index can be made official.

of difficulty like passive, sentence complexity (number of sentences with subordinate clauses), and predicates with nominalization. The result corresponds approximately to the reading age – expressed in grade levels – for which the text is suitable.

DyLan TextTools calculates the Gulpease Index (the standard readability index for Italian; cf. Lucisano & Piemontese 1988) and four other, more specific, indices (READ-IT BASE, READ-IT LESSICALE, READ-IT SINTATTICO, and READ-IT GLOBALE; cf. Dell’Orletta et al. 2011). The Gulpease Index takes into consideration the number of letters per word and the number of words per sentence. The higher the values, the easier the text. Readers who only attended primary school can easily read a text with an index over 80, those who attended middle school would find a text with a score over 60 readable, and those with a high school degree can easily understand a text with a score over 40 (Lucisano & Piemontese 1988).

The other four indices are based on more complex linguistic parameters thanks to automatic linguistic annotation tools (by means of the platform AnIta, developed by the Computational Linguistics Institute “Antonio Zampolli”, ILC-CNR). The software evaluates the text and establishes the percentage of likelihood of presenting difficulties based on similarities to two corpora that were used in its training phase (*La Repubblica* and *Due Parole*, a complex and an easy newspapers’ corpus).

READ-IT BASE (‘BASIS READ-IT’) considers those features that are typically taken into account in traditional text readability measures, i.e., sentence length (mean number of words per sentence) and word length (mean number of letters per word). This model approximately corresponds to the traditional readability measures, in particular to the Gulpease Index (ILC-CNR n.d.: 4–5). READ-IT LESSICALE (‘LEXICAL READ-IT’) takes into account word frequency, lexical density, and lexical richness (ibid.: 6–7). READ-IT SINTATTICO (‘SYNTACTIC READ-IT’) considers parameters like parts of speech, sentence structuration, clause structuration, syntactic tree depth, and dependency relations length (ibid.: 7–9). Finally, READ-IT GLOBALE (‘GLOBAL READ-IT’) is a model which combines the aforementioned indices, i.e., READ-IT BASE, READ-IT LESSICALE, and READ-IT SINTATTICO (ibid.: 4).

11.1.2 Additional data

Other measures that are typically considered to assess readability consist of lexical density and lexical richness. Lexical density is

the proportion of content words (nouns, verbs, adjectives, and often also adverbs) to the total number of words. By investigating this, we receive a notion of information packaging; a text with a high proportion of content words contains more information than a text with a high proportion of function words (prepositions, interjections, pronouns, conjunctions and count words). Various variants of lexical density have been proposed. A popular 'minor variant' is to calculate the noun density, the number of nouns divided by the total number of tokens in the text. Other options are for instance verb or adjective or adverb types per total lexical words. (Johansson 2008: 65)

Higher lexical density implies a higher degree of complexity. Tendentially, written texts have a higher lexical density than oral discourse (ibid.).

Lexical diversity (or lexical richness)¹⁴⁶ measures how many different words are used in a text (ibid.). This parameter is typically measured by means of the TTR (type-token ratio). TTR values can be interpreted as follows: the higher the TTR, the more complex the text. An issue is that the TTR is (tendentially) higher in shorter texts and decreases in longer texts, since words tend to repeat themselves and *hapax legomena* (types occurring only once) decrease. This makes comparisons between texts of different length difficult. Some solutions to this problem are some variants of the TTR, such as the theoretical vocabulary and the Köhler-Galle method. The principle of the theoretical vocabulary is to randomly select a certain number of words (e.g., 100) from a text and calculate the number of types in that sample. This enables the comparison of texts of any length; the only restriction is that shorter texts have a more limited number of

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146 The two terms are listed synonymically here for the sake of simplicity, but it should be noted that some scholars differentiate between them. For instance, Malvern et al. (2004), along the lines of Read (2000), maintain that lexical diversity is a hyponym of lexical richness, which also encompasses lexical sophistication, number of errors, and lexical density.

random words to be selected. The Köhler-Galle method consists of a formula which considers the position of a certain type in a text.

11.1.3 Readability indices in layperson summaries' guidelines

The use of readability indices to verify whether the layperson summaries are comprehensible enough is suggested in both guidelines for layperson summaries' writing (Recommendations of the Expert Group on Clinical Trials 2018 and GLSP 2021). Some instances of indices for different languages (including English, German, and Italian, but also French, Spanish, Dutch, and Swedish) are mentioned. The Recommendations of the Expert Group on Clinical Trials (2018: 29) mention the Flesch-Kincaid Grade Level Test for English. The suggested level to aim at according to this index is 6th grade. With respect to German, the Flesch-Index is suggested, with a score of 80 (and above). The Gulpease Index is mentioned for Italian, but with no indication concerning the ideal score.

11.2 Methodology

This chapter reports the results provided by the three aforementioned analysis tools, i.e., Analyze My Writing, Ratte, and DyLan TextTools. As stated above, the three tools provide different types of results. It was therefore decided to focus only on the indices and measures that are approximately comparable. Overall, the purpose of this analysis was to determine the level of comprehensibility of the layperson summaries, the differences between the three languages and the various pharmaceutical companies, as well as the more problematic aspects.

It should be noted that this type of analysis could also have been conducted before all other empirical sections of the present book rather than as a conclusive chapter. Both are methodologically valid alternatives, which, however, are connected to different approaches and expectations with respect to the readability indices' validity. It could be argued that conducting this type of analysis as a first chapter of the empirical section would enable an overall assessment of the quality and comprehensibility of the texts, which would in turn allow to focus on the individual components influencing them in the

following chapters. In other words, the readability formulas could signal which aspects are problematic, so as to delve into them in detail in the rest of the analyses. The opposite approach, i.e., resorting to readability formulas as a conclusive section, was favored for several reasons. Choosing to conduct the analysis by means of readability indices at the end of the empirical section or at the beginning indicates a different degree of weight being given to readability formulas. If they are used at the beginning they are a starting point upon which the analysis should be based, while if they are used at the end they constitute a mere confirmation (or refutation, if that is the case), obtained with a different method, of what has been detected throughout the rest of the study. Only if they are considered to be fully reliable and accurate can they be taken as a starting point and not just be considered as an additional step in the evaluation of the texts. In this study, readability formulas were thought to confer more objectivity and scientificity to the other empirical results, since, while being problematic, they are a universally known method of evaluating text comprehensibility (unlike some of these analyses, which have been created *ad hoc* on the basis of corpus linguistics methods). Readability formulas were therefore deemed valuable, since they make the results comparable to those of other studies which used them and create a common ground, but they were not considered sufficiently reliable to guide the whole empirical analysis. This could have been the case only for the Italian indices READ-IT, which are far more advanced than the German and English readability formulas calculated by means of Ratte and Analyze My Writing, and provide different evaluations on several linguistic levels (vocabulary and terminology, syntax, and global assessment). Clearly, having to conduct a homogeneous analysis in three languages, this approach could not be followed. Finally, this part of analysis was conducted at the end as basing the whole study on readability formulas' results could have introduced biases in the evaluation of the other results.

The examined texts consist of the smaller selection of layperson summaries, 10 for each language (30 in total). As these tools also consider sentence number and length, tables with lists of nouns and other similar information were left out in order to prevent distortion of results.

As for results' interpretation, Analyze My Writing provides an average grade level based on the various indices it calculates. For the sake of simplicity, we will

focus on this result and not discuss all other indices (which will be reported in a table of Section 11.3 anyway). According to this tool, texts which are meant for a wide adult audience should have a score between 8 and 12. However, its instructions also state that the average adult reader in the USA¹⁴⁷ reads at an 8th grade level.

As for German results, the LIX results deemed to be acceptable are scores under 50. The ideal score (categorized as “easy”) would be results ranging from 30 to 40. As for the Flesch-Index, results between 60 and 70 are categorized as “Plain Language”, with anything under 60 being regarded as difficult. WSTF results should not be over 12 (cf. for instance Fries & Keimig 2019: 4–5). The same maximum value has been established for gSmog and RIX, as they (like the WSTF) also provide results corresponding to the reading age expressed in grade levels for which texts are suitable. In addition to standard indices, Ratte also provides an automatic evaluation of text readability by means of a “traffic light” (‘Ampel’) with three different colors (red, yellow, and green). It should be noted that the ranges for the evaluation tool seem to be quite strict.

As for Italian, the threshold has been set at 60, since this is the middle value of the three main GULPEASE benchmarks. The other indices (READ-IT BASE, READ-IT LESSICALE, READ-IT SINTATTICO, and READ-IT GLOBALE) are percentages that express the likelihood of a text to be complex, so they are very easy to interpret: the closer they are to 100, the harder the text. All other results calculated by DyLan TextTools are also quite easy to interpret, as the software signals the degree of comprehensibility by means of a color label (green, yellow, orange, red, and various nuances of these colors). These labels will also be applied to the English and German results in Sections 11.3.1 and 11.3.2, also keeping in mind that there are discrepancies between these three languages in terms of different average word length, sentence length, etc.

It should be noted that the ideal scores indicated in the Recommendations of the Expert Group on Clinical Trials (2018) for English and German were not considered as thresholds of acceptability because they are quite strict for Plain

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147 This tool has been developed in the USA (in its terms and conditions, the law and jurisdiction section mentions the State of California) and its instructions therefore refer to USA readers, but it can be used to evaluate any English text.

Language. This is particularly evident in German: the threshold mentioned for the Flesch-Index is 80 (and above), but as shown in Table 42 of Section 11.1.1, this corresponds to Easy Language rather than Plain Language. In addition, these suggestions only concern two indices. No indication is given in the recommendations for Italian.

Another aspect to consider is that the lexical density calculated by Ratte does not correspond to the one calculated by Analyze My Writing and DyLan TextTools. While the English and Italian tools calculate the standard lexical density (the proportion of content words to the total number of words), the German software calculates a simplified version of this parameter, which compares the number of nouns and verbs to the total number of tokens. The TTR calculated by Ratte also differs from the one calculated by DyLan TextTools, and Analyze My Writing does not calculate the TTR at all. DyLan TextTools only considers the theoretical vocabulary, i.e., the TTR of the first 100 words; this way, all results are comparable regardless of text length. Ratte, on the other hand, uses the Köhler-Galle method (described in 11.1.2) and the Types/Tokens proportion if texts have less than 100 words (which is clearly not the case in the texts analyzed in the present book).

The TTR and lexical density can also be obtained by means of Sketch Engine (with the standard formulas, not the “unusual” ones like the aforementioned Köhler-Galle method), as stated in Chapter 2 (Table 3). The lexicometric data of the whole corpus will be briefly discussed along with the ones calculated in the present chapter, so as to complete the analysis (Section 11.3.4).

11.3 Analysis

Results for the English, German, and Italian subcorpus are reported in Table 43, 44, and 45, respectively. Tables are divided into sections dedicated to a single pharmaceutical company. In these sections, each line reports the results of one of the texts of the pharmaceutical company in question and the final line with numbers in bold represents the average value for that company. Section 11.3.1 will discuss in detail values indicating the highest levels of complexity, Section 11.3.2 the lowest levels of complexity, and Section 11.3.3 the overall

suitability of these texts for a general audience. Section 3.4 will then discuss lexicometric data of the whole corpus as calculated by Sketch Engine.

Novartis					
Gunning Fog	Flesch-Kincaid	SMOG	Coleman-Liau	Automated	Average grade level
8.93	6.66	9.14	10.33	8.55	8.72
10.59	7.82	10.61	11.30	9.42	9.95
11.24	8.11	11.07	11.50	9.96	10.37
10.25	7.53	10.27	11.04	9.31	9.68
Complex word count		Mean sentence length		Mean word length	Lexical density
136		14.98		4.62	55.34%
264		15.28		4.81	55.66%
226		16.05		4.84	55.15%
208.67		15.44		4.76	55.38%
Bayer					
Gunning Fog	Flesch-Kincaid	SMOG	Coleman-Liau	Automated	Average grade level
11.10	8.47	11.05	12.25	9.94	10.56
11.88	9.27	11.61	12.50	10.08	11.07
11.67	8.84	11.46	12.99	10.54	11.10
11.55	8.86	11.37	12.58	10.19	10.91
Complex word count		Mean sentence length		Mean word length	Lexical density
319		14.47		4.99	51.35%
467		14.34		5.03	52.54%
264		14.56		5.11	53.85%
350		14.46		5.04	52.58%

GSK					
Gunning Fog	Flesch-Kincaid	SMOG	Coleman-Liau	Automated	Average grade level
12.18	9.86	11.81	12.81	11.03	11.54
11.76	9.42	11.49	12.38	10.66	11.14
11.97	9.64	11.65	12.60	10.85	11.34
Complex word count		Mean sentence length		Mean word length	Lexical density
201		16.11		5.02	54.41%
195		15.99		4.96	54.07%
198		16.05		4.99	54.24%
Roche					
Gunning Fog	Flesch-Kincaid	SMOG	Coleman-Liau	Automated	Average grade level
10.44	8.95	10.48	10.90	9.14	9.98
11.89	9.56	11.60	12.69	10.02	11.15
11.17	9.26	11.04	11.80	9.58	10.57
Complex word count		Mean sentence length		Mean word length	Lexical density
296		15.49		4.71	52.4%
301		14.03		5.03	54.78%
298.50		14.76		4.87	53.59%

Table 43: English readability indices' scores

Novartis							
gSmog	LIX	Flesch-Index	WSTF	RIX	1-syllable words	2-syllable words	3-syllable words
9.86	52.07	45.38	10.77	11.70	743	498	581
9.91	52.41	43.15	10.86	14.37	887	632	709
10.91	55.41	38.38	11.83	14.09	725	539	672
10.23	53.30	42.30	11.15	13.39	785	556.33	654

Novartis							
Mean sentence length		Mean word length		Lexical density		TTR	Ampel
15.31		6.22		50.97%		0.32	red
15.25		6.34		51.07%		0.31	red
16.84		6.62		57.21%		0.34	red
15.80		6.39		53.08%		0.32	red
Bayer							
gSmog	LIX	Flesch-Index	WSTF	RIX	1-syllable words	2-syllable words	3-syllable words
10.89	59.02	38.15	12.28	13.96	1131	739	1107
11.17	60.31	35.51	12.55	13.15	912	654	942
10.90	58.69	39.11	12.09	12.51	708	527	677
10.99	59.34	37.59	12.31	13.21	917	640	908.67
Mean sentence length		Mean word length		Lexical density		TTR	Ampel
15.34		6.62		48.96%		0.22	red
15.77		6.66		47.57%		0.25	red
15.96		6.51		49.05%		0.28	red
15.69		6.60		48.53%		0.25	red
GSK							
gSmog	LIX	Flesch-Index	WSTF	RIX	1-syllable words	2-syllable words	3-syllable words
10.54	53.59	36.33	11.8	11.88	543	363	493
10.52	52.85	37.16	11.45	12.18	570	406	470
10.53	53.22	36.75	11.63	12.03	556.5	384.50	481.50
Mean sentence length		Mean word length		Lexical density		TTR	Ampel
15.22		6.54		53.88%		0.37	red
16.23		6.41		53.87%		0.37	red
15.73		6.48		53.88%		0.37	red

Roche							
gSmog	LIX	Flesch-Index	WSTF	RIX	1-syllable words	2-syllable words	3-syllable words
10.36	54.0	36.25	11.31	13.62	926	719	799
9.92	52.13	40.47	10.71	12.60	732	523	549
10.14	53.07	38.36	11.01	13.11	829	621	674
Mean sentence length		Mean word length		Lexical density		TTR	Ampel
15.90		6.48		54.37%		0.27	red
15.84		6.20		52.88%		0.32	red
15.87		6.34		53.63%		0.30	red

Table 44: German readability indices' scores

Novartis				
GULPEASE	READ-IT Base	READ-IT lessicale	READ-IT sintattico	READ-IT globale
53.90	32.90%	0.50%	57.50%	42.80%
56.20	22.30%	8.40%	44.50%	66.20%
53.60	38.70%	0.10%	61.00%	8.70%
54.57	31.30%	3%	54.33%	39.23%
Mean sentence length		Mean word length	Lexical density	TTR
17.80 (green)		5.40 (red)	0.545 (green)	0.60 (yellow)
16.50 (green)		5.30 (red)	0.555 (green)	0.67 (orange)
18.50 (green)		5.30 (red)	0.549 (green)	0.53 (green)
17.60% (green)		5.33% (red)	0.550 (green)	0.60 (yellow)
Bayer				
GULPEASE	READ-IT Base	READ-IT lessicale	READ-IT sintattico	READ-IT globale
51.20	45.80%	6.20%	34.40%	89.10%
51.10	41.20%	0.10%	30.30%	10.20%

Bayer				
52	34.80%	0.30%	34.70%	33.20%
51.43	40.10%	2.17%	34.03%	45.53%
Mean sentence length		Mean word length	Lexical density	TTR
19.10 (green)		5.40 (red)	0.540 (green)	0.64 (yellow)
18.40 (green)		5.50 (red)	0.548 (green)	0.53 (green)
17 (green)		5.60 (red)	0.562 (green)	0.56 (green)
18.17 (green)		5.50 (red)	0.550 (green)	0.58 (appr. green)
GSK				
GULPEASE	READ-IT Base	READ-IT lessicale	READ-IT sintattico	READ-IT globale
51.40	46.80%	15.90%	59.80%	85.30%
50.60	51.50%	3.40%	65.80%	76.90%
51	49.15%	9.65%	62.80%	81.10%
Mean sentence length		Mean word length	Lexical density	TTR
19.50 (green)		5.40 (red)	0.550 (green)	0.66 (orange)
19.90 (green)		5.50 (red)	0.533 (green)	0.60 (greenish)
19.70 (green)		5.45 (red)	0.542 (green)	0.63 (appr. orange)
Roche				
GULPEASE	READ-IT Base	READ-IT lessicale	READ-IT sintattico	READ-IT globale
51.70	29.20%	3.50%	85.00%	94.30%
54.30	16.20%	0.10%	71.60%	22.80%
53	22.70%	1.80%	78.30%	58.55%
Mean sentence length		Mean word length	Lexical density	TTR
17.90 (green)		5.40 (red)	0.538 (green)	0.66 (orange)
15.50 (green)		5.40 (red)	0.557 (green)	0.54 (green)
16.70 (green)		5.40 (red)	0.548 (green)	0.60 (greenish)

Table 45: Italian readability indices' scores

11.3.1 Values indicating the highest levels of complexity

In the English subcorpus, a text by GSK has the highest complexity according to all indices except one, leading to an average grade level of 11.54. This can be regarded as a borderline score, as the range for a wide audience is 8–12 and the average adult reader in the USA can easily read grade 8 level texts. This text also has the highest mean sentence length (16.11, still categorizable as “green”). The only exception concerns the Coleman-Index, whose highest score, 12.99, is found in a text by Bayer, and which is considered too difficult. Another text by Bayer has the highest number of complex words (467) and the highest mean word length (along with a text by Roche, with a length of 5.03, categorizable as “greenish”). A text by Novartis has the highest lexical density (55.66%, still categorizable as “green”).

As for the mean values of each pharmaceutical company, texts by GSK show the results indicating the highest level of complexity. Texts by Bayer have the highest number of complex words and the highest mean word length with respect to mean results.

As for the German language, a text by Bayer is the one with the highest complexity according to the gSmog (11.17, borderline result), the LIX (60.31, belonging to the “very difficult” category), the Flesch-Index (35.51, belonging to the “difficult” category), and the WSTF (12.55, considered to be difficult). It also has the highest mean word length, i.e., 6.66 (categorizable as “red”). It is the only text with more 3-syllable-words than 1-syllable words, 942 and 912, respectively. The only readability index with a different result is the RIX, according to which the most complex text is one by Novartis (14.37, considered to be difficult). As mentioned in Section 11.1.1, this index considers other parameters than word and sentence length, such as passives and subordination, which arguably leads to this difference.¹⁴⁸ Another text by Novartis has the highest mean sentence length (16.84, still categorizable as “green”) and lexical density (57.21%, categorizable as “red”). Two texts by GSK are the ones with the highest TTR (0.37).

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148 This also corresponds to results concerning passive diathesis reported in Chapter 4, where it has been shown that texts by Bayer have the lowest level of passive in German and that Novartis, along with GSK, is the pharmaceutical company with more passive in German.

As for the mean results of each pharmaceutical company, Bayer remains the pharmaceutical company with the highest degree of complexity according to most variables. The only exceptions are, again, the RIX (with the highest average in texts by Novartis) as well as the TTR, the Flesch-Index, and lexical density (with the highest degree of complexity in texts by GSK). The highest mean sentence length is that of texts by Roche.

As far as the traditional index for Italian is concerned, the text with the lowest Gulpease Index is one by GSK (50.6; difficult to understand for many readers, if the ideal score of 60 is considered), which also has the highest READ-IT BASE (51.50%) as well as the highest mean sentence length (19.9, still labeled as “green”). As for more specific indices, the text that has been labeled as more difficult is one by Roche, with a READ-IT GLOBALE of 94.30% and a READ-IT SINTATTICO of 85.00%. A text by Novartis has the highest TTR (0.67, labeled as “orange”), while one by Bayer has the highest mean word length (5.6, labeled as “red”) and lexical density (0.562, still labeled as “green”).

With respect to mean values of pharmaceutical companies, texts by GSK have the highest level of complexity based on many parameters: the Gulpease Index (51), READ-IT BASE (with a 49.15% likelihood of being complex), READ-IT LESSICALE (with a 9.65% likelihood of being complex), READ-IT GLOBALE (with a 81.10% likelihood of being complex), mean sentence length (yet, labeled as “green”), and TTR (labeled as “approximately orange”). Texts by Roche have the highest scores of READ-IT SINTATTICO (with a 78.30% likelihood of being complex) and texts by Bayer the highest mean word length (labeled as “red”) as well as lexical density (the latter along with Novartis, labeled as “green”).

11.3.2 Values indicating the lowest levels of complexity

The English text with the lowest degree of complexity according to all indices is one by Novartis, with an average grade level of 8.72 (practically corresponding to the grade level of the average adult reader in the USA, i.e., 8). This is the text where the indices are more consistent; it also has the lowest complex word count (136) as well as mean word length (4.62, labeled as “green”). The only values that are lower in other texts are mean sentence length (14.03, in a text

by Roche, labeled as “green”) and lexical density (51.35% in a text by Bayer, also labeled as “green”).

Similar results are found for the pharmaceutical companies’ mean values, with texts by Novartis being the easiest ones. The only parameters with lower values are lexical density and mean sentence length in texts by Bayer as well as complex word count in texts by GSK.

The layperson summary with the lowest degree of complexity in English (by Novartis) is also rated as the most comprehensible in its German version (according to all indices but one, the WSTF): gSmog of 9.86 (acceptable result), LIX of 52.07 (still belonging to the “difficult” category), Flesch-Index of 45.38 (still belonging to the “difficult” category), and RIX of 11.77 (borderline result). The lowest WSTF index (10.71, acceptable result) is calculated for a text by Roche; however, the WSTF index of this text by Novartis is very close, i.e., 10.77. The lowest mean sentence length is found in a text by GSK (15.22, categorizable as “green”) and the lowest mean word length in a text by Roche (6.2, still categorizable as “red”). The lowest TTR (0.22) and the lowest lexical density (47.57%, categorizable as “green”) are found in a text by Bayer – which, interestingly, is the same text mentioned above with the highest values for most other variables.

As for mean values of pharmaceutical company, texts by Roche have the lowest degree of difficulty according to most parameters (gSmog, LIX, WSTF, and mean word length). Other two indices, the Flesch-Index and the RIX, have lower values in texts by GSK. Finally, texts by Bayer have the lowest mean sentence length, lexical density, and TTR.

In Italian, results are far less consistent than in English and German. The layperson summary with the lowest degree of complexity according to the Gulpease Index is one by Novartis (56.2, still difficult to understand for many readers, if the ideal score of 60 is considered). Another text by Novartis has the lowest value of READ-IT GLOBALE (8.70%) as well as the lowest score of READ-IT LESSICALE (0.10%), mean word length (5.3, also found in another text by Novartis; labeled as “red”), and TTR (0.53, labeled as “green”). Its score of READ-IT LESSICALE (0.10%) is also found in a text by Bayer, which also

has the lowest READ-IT SINTATTICO (30.30%),¹⁴⁹ and in a text by Roche, which also has the lowest READ-IT BASE (16.20%) and the lowest mean sentence length (15.5, labeled as “green”). The lowest lexical density is found in a text by GSK (0.533, labeled as “green”).

Also with respect to mean values of pharmaceutical companies, texts by Novartis have the lowest level of complexity based on many parameters: the Gulpease Index (54.57), READ-IT GLOBALE (with only a 39.23% likelihood of being complex), mean word length (still labeled as “red”), and lexical density (labeled as “green”). The lowest READ-IT BASE (22.70%), READ-IT LESSICALE (1.80%), as well as mean sentence length values (labeled as “green”) are found in texts by Roche. Texts by Bayer have the lowest READ-IT SINTATTICO (34.03%), lexical density (along with Novartis), and TTR (labeled as “approximately green”).

11.3.3 Overall values and (un)suitability for a general audience

According to Analyze My Writing, all English texts have an average grade level within the acceptable range. However, if the level of the average reader indicated by the tool is considered (8), only one text (written by Novartis, with an average grade level of 8.72) is easily comprehensible. Sentence length and lexical density are also always categorizable as “green”. As far as word length is concerned, almost all values are categorizable as “green” (4 are “greenish”).

As for German, the “Ampel” color (red) immediately signals that all texts are considered difficult by Ratte. All LIX and Flesch-Index scores signal that these texts are difficult to understand (with one by Bayer being even “very difficult” according to the LIX, with a score of 60.31). Similarly, only two texts have a score vaguely suitable for a general audience (although still quite high) according to the RIX. The WSTF and gSmog show more favorable results, with only three texts having a WSTF score higher than 12 (although many of the other texts show borderline results) and all texts having a gSmog lower than 12. Mean word length is always too high (label “red”), while average sentence length is always considered to be acceptable (label “green”). Lexical density is also always considered to be acceptable (label “green”), with only one exception,

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¹⁴⁹ This text by Bayer also has the same TTR (0.53).

i.e., a German text by Novartis (label “red”, value of 57.21%). However, it should be considered that the simplified type of lexical density calculated by Ratte (the proportion of nouns and verbs to the total number of tokens) is tendentially lower than the standard lexical density calculated by Analyze My Writing and DyLan TextTools, which considers more content words.

As for Italian texts, the Gulpease index always has a score lower than the one deemed to be suitable for the layperson summaries. READ-IT GLOBALE signals that the readability of five of these texts is very low, while READ-IT SINTATTICO categorizes six texts as very difficult. Only one READ-IT BASE is higher than 50% – thus indicating that the text is likely to be more similar to difficult texts than to easy ones. READ-IT LESSICALE is very low in all texts. Mean word length is always too high (labeled as “red”), while average sentence length and lexical density are always considered to be acceptable (labeled as “green”). TTR values show more differences, with half of the texts labeled as “orange” or “yellow”.

11.3.4 Lexicometric data of the whole corpus

Table 46 shows the lexicometric data of the three subcorpora calculated by means of Sketch Engine – as reported in Chapter 2 (Table 3).

	English subcorpus	German subcorpus	Italian subcorpus
TTR	3.45	5.10	3.98
Lexical density	0.612	0.574	0.614

Table 46: TTR and lexical density of the whole corpus (Sketch Engine)

The TTRs of the whole corpus cannot be compared to the TTRs calculated for the single texts by means of Ratte and DyLan TextTools because of the different method of calculation and text size. However, lexical density is nevertheless a comparable measure.¹⁵⁰ The average lexical densities of the 10 texts calculated

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150 As has already been pointed out, the lexical density calculated by Ratte is slightly different, resulting in a lower value. Yet, this score remains vaguely comparable, unlike TTRs calculated on corpora of different sizes.

by Analyze My Writing, Ratte, and DyLan TextTools are 0.540, 0.522, and 0.548, respectively. Both in this selection of texts and in the whole corpus, the German texts have a lower lexical density than the English ones, while this value is higher in Italian. Italian texts therefore seem to be more packed, implying a higher cognitive load on the reader.

TTRs calculated by means of Sketch Engine show the opposite tendency, with a quite significant increase in German and only a slight increase in Italian. German texts therefore have a more varied vocabulary than English and Italian, resulting in decreased comprehensibility.

11.4 Discussion

In the present section we will try to point out the general tendencies that can be detected based on the results presented so far. In some cases, indices and other parameters calculated for a single text show very consistent results (see for instance the text by Novartis with the lowest values in English), while in others they vary more. This is clearly due to the fact that different indices measure different linguistic features and, even when they analyze the same features, they follow different formulas. For instance, as has been pointed out, German texts written by Novartis have the highest RIX score – which is likely due to features like high passive use. German texts by Bayer, on the other hand, have a high score for indices which consider more standard parameters like word length. Interestingly, while many results vary in an interlinguistic perspective, texts by Bayer are those with the longest, most complex words in all three subcorpora.

The pharmaceutical companies with the most complicated texts according to the readability tools are GSK for English, Bayer for German, and GSK as well as Roche for Italian. The texts with the highest degree of comprehensibility are those by Novartis for English and Italian, while for German the texts rated as the most understandable are those by Roche. Interestingly, as pointed out in 11.3.2, the single text with the lowest degree of complexity is the same in English and German (Novartis).

Based on the various indices and parameters considered, the layperson summaries can be regarded as generally too complex for a wide audience. In

particular, the results for the Italian subcorpus show that most issues are found on a syntactic level, while the lexical level is far less problematic. However, in this respect a limit pointed out in Section 11.2 should be considered: mere lists of adverse events in tables *et similia* were not analyzed in this chapter, as they would have been unsuitable for the analysis tools, which need full sentences with correct punctuation. An experiment has been conducted with a sample of such lists, and the result was indeed an extremely high score for the lexical level (lower word frequency and higher lexical density)¹⁵¹ as well as a very low score for the syntactic level.

While analyzing the results of the indices, it should also be noted that the thresholds of acceptability that have been established in the present book (for instance, the range between 8 and 12 for the English grade level and the maximum level of 50 for the German LIX index; see Section 11.2) are not particularly strict. As indicated in 11.1.3, the Recommendations of the Expert Group on Clinical Trials (2018) actually suggest stricter parameters when readability indices are mentioned. As for English, the suggested level to aim at according to the Flesch-Kincaid Grade Level Test is 6th grade. If this was to be considered, then only one text would be approximately acceptable (with a score of 6.66). With respect to German, the threshold mentioned for the Flesch-Index is 80 (and above). As shown in Table 42 of Section 11.1.1, this corresponds to Easy Language rather than Plain Language, which clearly demonstrates that layperson summaries should be written in an even more comprehensible way according to the guidelines in the field. Anyway, even if the less strict benchmark established in this book is considered, all texts fail to achieve an acceptable score. Overall, results clearly show that more effort is needed to make the layperson summaries easily accessible for the target audience.

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151 In many other cases, lists of terms would have arguably led to a higher mean word length, too.

12 Conclusions

In the present chapter we will aim at summarizing the findings of the corpus study in order to answer the research questions presented in 2.1, i.e.:

- 1) Where are the layperson summaries situated in the continuum of language simplification? Can they be regarded as an instantiation of Plain Language? (Section 12.1)
- 2) What are the main features of the layperson summaries in the STs and TTs? (Section 12.2)
- 3) Do layperson summaries' features follow the guidelines' indications (Recommendations of the Expert Group on Clinical Trials [2018] and the Good Lay Summary Practice [2021])? (Section 12.3)
- 4) Can the existing guidelines be improved based on the analysis results? If yes, how? (Section 12.4)

Having answered these questions, our focus will be on some future research desiderata which were highlighted by the present study (Section 12.5).

12.1 Collocation in the continuum of language simplification

In the continuum of language simplification, the layperson summaries clearly tend towards standard language rather than towards Easy Language. This is signaled by different linguistic features occurring on several levels of analysis. The most evident is probably layout and design (see Chapter 8), where Easy Language would show the typical segmentation of sentences over more lines. The layperson summaries have been shown to present a more standard text structure. In some cases, text structure *almost* tends towards the Easy Language segmentation, as occurs in a series of sentences listed in Section 3.3.3.1, which are reported again here in Fig. 49, which shows how these sentences look on the page:

What kind of study was this?

This study was a '**Phase 3b/4**' study. This means that the study was done after bevacizumab had been approved for doctors to give to people.

This study was '**single arm**'. This means that everyone in this study was treated with bevacizumab (alone or in combination with other drugs).

This study was '**open label**'. This means that both the people taking part in the study and the study doctors knew what study medicines people were taking.

This study was an '**extension study**'. This means that people who had previously taken part in a study of bevacizumab kept taking bevacizumab after the previous study ('parent study') had ended.

Fig. 49: Instance of text structure tending towards Easy Language

If an instance of Easy Language text (Fig. 50) is considered, the difference is immediately clear: Easy Language texts remain far more segmented than the layperson summaries.

Druck auf Deiche immer größer

Durch Niedersachsen fließen viele Flüsse.

Zum Beispiel die Weser.

Oder die Ems.

An vielen von diesen Flüssen sind Deiche.

Deiche sind besondere Bauwerke.

Deiche sind hohe Dämme.

Sie stehen entlang von Flüssen.

Oder an den Küsten.

Deiche schützen die Menschen vor Hochwasser.

Diese Deiche sind jetzt in Gefahr.

Das Wasser drückt nämlich gegen die Deiche.

Fig. 50: Instance of *Leichte Sprache* text (NDR 2024)

Other evident graphical differences are the absence of bold weight to highlight negation as well as of hyphens or interpuncts to separate compound words in German. In addition, layperson summaries' perceptibility is not as enhanced as in Easy Language. These texts do use sans serif fonts as recommended for Easy Language, but the font size is generally far smaller: the running text's font is usually around 11–13, but in some cases it is 10. Single paragraphs, like descriptions of pharmaceutical companies, are even smaller (8 or 9). This is clearly too small for Easy Language, where guidelines suggest a font size of at least 14 (Bredel & Maaß 2016a: 515–516; Sciumbata 2022: 80).

Other aspects that make the layperson summaries tend more towards standard language than Easy Language are of a morphosyntactic nature. These texts show features that should be avoided in the easiest, prototypical simplified language variant: passive forms, nominalizations, subordinate clauses, and generally quite long sentences (see Chapters 4, 5, and 6).

The difference is also evident on the lexico-terminological level (see Chapter 3), where the lexical choices of an at times somewhat high register and the presence of terminology (often, but not always, explained), including acronyms and initialisms as well as other abbreviations, signal a closer collocation to standard language.

The readability indices obtained in Chapter 11 also support the claim that the layperson summaries' language tends towards standard language. In particular, the Flesch-Index interpretation scale for German is quite indicative, as it presents the label "Plain Language", assigned to texts with a score between 60 and 70. According to this scale, "fairly easy" is the label for the score range between 70 and 80, "easy" for the one between 80 and 90, and "very easy" for the one between 90 and 100. The scores of the analyzed texts, with the lowest and the highest values being 35.51 and 45.38, respectively, are far lower not only than those of the categories entailing the label "easy", but also with respect to the score range of "Plain Language". Also, the other readability indices (for all languages) signal that the layperson summaries are far from being suitable for Easy Language readers. In fact, they are also more difficult than would be required to fully belong to the category of Plain Language.

In spite of these scores, the layperson summaries can indeed be regarded as an instantiation of Plain Language, since this category is somewhat wide.

They are clearly comprehensibility-enhanced compared to specialized communication, and generally also to other texts ascribable to expert-lay communication in the medical field, such as package leaflets. However, the current versions of the layperson summaries present features which can be further improved in order to increase comprehensibility (for instance by using terms which are more understandable to laypeople and choosing the right register, not too formal) without impacting on their acceptability. Even with these changes, they would still not fall into the category of Easy Language with the stigmatization risks associated with it (see *inter alia* Maaß 2020: 13). It should be noted that the present reflections are of a theoretical nature; user-oriented research and reception studies, not undertaken for the present book, would be required to establish the level of comprehensibility of the texts in a more direct way.

12.2 Main features of the layperson summaries in the STs and TTs

This section will deal with the main features of the layperson summaries in the three analyzed languages on the lexico-terminological, morphosyntactic, textual, and graphical level.

As for lexis (Chapter 3), all three subcorpora generally contain very common words. The vast majority of the 100 most frequent lemmas of each PoS category were found in the frequency dictionaries. An exception is given by technical terms related to the research process or results of the clinical trials, like *open-label*, *double-blind*, *randomize*, *adverse events*, *adverse reactions*, *chemotherapy*, and *placebo*. Other instances are the denominations of the pathologies under examination, like *anemia* and *hemophilia*, as well as of organs, body parts, and molecules, like *kidney*, *hemoglobin*, and *antibody*. In some cases (like *kidney* and *antibody*), these terms are not reported in the frequency dictionaries but are extremely common also in general language and therefore very likely to be known by readers. Other cases (especially adjectives, like *renal*, *nasal*, and *uterine*) are more problematic – at least in English.

The English subcorpus shows the highest number of lemmas found in the frequency dictionary, followed by Italian and German. The decrease in the German subcorpus is mainly due to the presence of compound words whose *determinans* and *determinatum* are found separately in the frequency dictionary, and does not signal an increased level of difficulty or carelessness on part of the translators *per se*.

On a terminological level, the analysis has shown a decrease in terms of classical, less comprehensible morphemes in the German subcorpus. On the contrary, there was an increase in the Italian subcorpus, which was expected due to being a Romance language with far more words and terms of Greek and Latin origin also in its general vocabulary, let alone in medicine. The discrepancy between the English and German subcorpus, instead, is very interesting, since they are both Germanic languages; the varying rate of morphemes of classical matrix is therefore not due to substantial interlinguistic differences and rather signals an attempt made by translators to use more understandable terms. This is confirmed also by the analysis of explanations, definitions, and other glosses introduced or followed by specific verbs and structures. These clarifications, which are already frequent in the English STs, further increase in the TTs, especially in the German subcorpus (which presents 88 cases of explications and additions, as compared to only 23 in the Italian subcorpus; see Chapter 10). In particular, added explanations or terms are found in parenthetical constructions, which are probably perceived as less invasive. Contrastingly, in the Italian subcorpus, many technical terms are favored even when the ST uses a very popular, almost colloquial term, like in the translation of *nose bleed* as *epistassi* and of *runny nose* as *rinorrea* (in another case, however, the latter term is translated with an equally colloquial expression, *naso che cola*). In the German texts, this register mismatch was not found, since the translations are *Nasenbluten* and *laufende Nase*. These instances show a general tendency to raise the register that is typical of translations into Italian, especially when the source language is English (see *inter alia* Cheshier 1991: 359–360; Pierini 2012: 258–259; Scarpa 2008: 196). This translation strategy may be some sort of automatism, useful and adequate when translating other text types belonging to specialized translation *stricto sensu*, i.e., communication between experts (and frequent also in science popularization, cf. *ibid.* and Pierini 2012:

258–259), but not in Plain Language texts whose target readers are laypeople. The tendency to raise the register is evident not only with respect to technical terms, but also to more common vocabulary (*ai fini di, presente, tale, altresì, redigere, trattasi*, and *ciò*, just to mention a few instances from Chapter 3). The same sometimes applies to the German subcorpus, but to a lesser extent (see for instance translations like *inwiefern, vorliegend*, and the pronominal adverbs belonging to a higher register composed by *hier-* instead of *da(r)-*, illustrated in Chapters 3 and 7).

The first feature belonging to the morphosyntactic level examined in detail is voice (Chapter 4). In the quantitative analysis of canonical passives, the main finding is that, while the German TTs indicate a decrease of passive voice (if passives with the auxiliary *werden* are calculated) compared to the STs, the Italian TTs show an increase. In the English subcorpus, 21.14% of sentences have passive forms, while in the German and Italian subcorpus the rates are 20.86% and 22.41%, respectively. A remarkable difference between pharmaceutical companies has been detected: German translations by Bayer contain definitely less passive voice than texts by other pharmaceutical companies. Other constructions which express passivity and are not recommended in simplified language variants, such as impersonal constructions and *Linksattribute*, have also been found in translated texts.

Another feature that has been considered is deverbal nominalization (Chapter 5). In general, all three subcorpora show more nominalizations than would be desirable in this text type (and their frequency would have been even higher if deadjectival nominalizations had been taken into account). Moreover, the translated subcorpora show an increase compared to the ST corpus. This has been shown by several analysis sections: in the quantitative analysis which examined nominalizing suffixes, in the analysis of case studies belonging to two semantic fields, and in the qualitative analysis of the smaller selection of texts. In particular, the nouns containing nominalizing suffixes extracted in the quantitative analysis were 8,313 in the English subcorpus, 12,404 in Italian, and almost twice as many as in English in the German subcorpus (14,024). This phenomenon may be due partly to interlinguistic differences, and partly to a tendency of translators to nominalize in order to raise the register and adapt it to the style of LSPs, which, however, is counterproductive in these texts.

On the syntactic level (Chapter 6), sentence structure has been evaluated in order to determine whether there is a tendency towards parataxis or hypotaxis, both through a quantitative and a qualitative analysis. It has been shown that subordination is more frequent than coordination in both the STs and TTs. Another finding was the decrease in subordinators and coordinators in the TTs compared to the respective STs. Although this decrease can theoretically have a positive impact on comprehensibility, it was tendentially accompanied by the aforementioned tendency to use more nominal constructions rather than by an increase in coordination or independent clauses.

On the textual level (Chapter 7) it has been shown that information is provided quite adequately in the layperson summaries, with clear hierarchies and headings as well as subheadings, mainly comprised of questions, that introduce the topic of the corresponding paragraphs. Text function is always clearly indicated, as are the target readers, who are addressed directly, especially when they are required to carry out actions, such as talking to doctors, visiting websites to find information, etc. This increases the so-called action-enabling potential (Maaß 2020: 47–48). One exception appears in some Italian translations where an impersonal construction is favored when the ST and the German text refer to readers directly (“si prega di” to translate “please talk to [...]”). This is quite typical of translation from English into Italian (Pierini 2012: 259), however it is not recommended in Plain Language texts. Another aspect analyzed in the corpus concerns connectives. The main finding is that both TT subcorpora, especially the German one, show an increase in these cohesive devices as compared to ST subcorpus.

As for layout and design (Chapter 8), the layperson summaries are generally quite effective and “catchy”. Differences cannot be noticed between languages, since the layout of the STs is always maintained, but rather between pharmaceutical companies. Layperson summaries by Roche and especially Novartis have an interesting layout and use different colors and other typographical features that highlight important information. Layperson summaries by GSK have a simpler layout. Multicodality is also interesting: pictures and graphs may help readers to better understand the content, especially with respect to numbers.

As for gender-inclusive language (Chapter 9), some differences were detected in the three subcorpora. Since English is a natural gender language and therefore classifies neither inanimate nouns nor most personal nouns according to different genders (Gygax et al. 2019: 4), *nomina agentis* in the ST subcorpus did not show any differences between masculine and feminine nouns. An interesting choice is to define the summaries as *layperson summaries* rather than *laymen summaries*, but this is not a choice of individual translators or writers, and rather depends on the denomination established by the Regulation 536/2014 and the other stakeholders. In addition, the plural pronoun *they* is used to refer to a singular referent, but this strategy is now well-rooted and not surprising. In the TTs, only a few cases of gender-fair language strategies were spotted – and only in the German subcorpus. These strategies, which are quite rare and not used coherently in the same text, are splitting (sometimes with the feminine noun preceding the masculine one) and the use of participial nouns like *Forschende* and *Teilnehmende* in lieu of *Forscher* and *Teilnehmer*. It is likely that the gender-inclusive language strategies implemented in the texts were a choice made by single translators.

12.3 Compliance with guidelines' indications

The present section aims at highlighting which suggestions for layperson summaries' writing (Recommendations of the Expert Group on Clinical Trials [2018] and Good Lay Summary Practice [2021]) are followed.

On the lexical level, “complex words” (Recommendations of the Expert Group on Clinical Trials 2018: 4) are not always avoided in favor of “everyday conversational language” (GLSP 2021: 12), as shown by instances of lemmas belonging to a high register in Section 12.2. While, tendentially, the layperson summaries' register is not extremely high, these recommendations should be followed more closely, especially by translators. This also concerns the choice of technical terms among different variants belonging to different registers due to the vertical stratification of the medical language. This aspect is also sometimes neglected by translators, especially Italian ones, while German translators are generally more careful and add more explanations or easier synonyms.

Explanations are indeed thematized in the guidelines: technical terms should be replaced by more popular terms but they can be maintained when they “also aid in finding other medically relevant information and referencing other documents”. In this case, however, it is necessary to “add clear language to define the word followed by the term in parenthesis” (Recommendations of the Expert Group on Clinical Trials 2018: 5). In general, terms are explained – also in the STs – and statistical terms are not left without clarifications or being simply paraphrased. Most explanations, definitions, and glosses consist of cataphoras, which correspond to the order indicated in the guidelines, with the technical term in parenthetical constructions.

On the morphosyntactic level, the suggestion to “use active, rather than passive, voice” (ibid.: 4) is followed only to a certain degree. As shown above, in Section 12.2, and in the corresponding chapter (Chapter 4), different pharmaceutical companies pay attention to this aspect to a different extent: Bayer translators into German are the most compliant. As stated in 5.1.5, no indications concerning the preference for verbs or nouns are given in the guidelines. Suggestions regarding subordination and coordination are also not particularly clear in the Good Lay Summary Practice, although a preference for simpler syntactic constructions is implied (GLSP 2021: 12). The Recommendations of the Expert Group on Clinical Trials (2018: 4) suggest “[a]void[ing] long and complex sentences that include many clauses as these are difficult to understand”. These indications are only partially followed, since there are indeed cases of very long, complex sentences, and subordination is also more frequent than coordination.

As has already been pointed out, textuality is not discussed in detail in the guidelines. The indication to “use headings and descriptive sub-headings” (GLSP 2021: 13–14), which should be reader-friendly (ibid.: 7; Recommendations of the Expert Group on Clinical Trials 2018: 11–26), is followed. General information is also generally provided before details (ibid.: 5), although not all layperson summaries present an outline of the text at the beginning. Links to additional information and resources for expert trial summaries are also indicated, since this is also required by Annex V of the Regulation 536/2014.

The level of analysis where the guidelines' indications are followed more closely is layout and design. Pictures and graphics are inserted to aid readers in understanding content, especially numbers and percentages. Colors and weights are used to emphasize information. Overall, the graphical choices are quite effective.

As far as gender-inclusive language is concerned, the guidelines do not give any indications. They only suggest using empowering (Recommendations of the Expert Group on Clinical Trials 2018: 5), respectful and cultural-sensitive language (GLSP 2021: 12). This could be interpreted, *lato sensu*, as also using gender-inclusive language. If this is the case, the Italian texts do not respect the guidelines at all, while the German texts are slightly more (though not consistently) inclusive.

Shifting the focus on the readability indices, the maximal values suggested by guidelines (Recommendations of the Expert Group on Clinical Trials 2018) are not respected at all. While no maximal value is indicated for the Italian's Gulpease Index, the suggested level to aim at for English texts according to the Flesch-Kincaid Grade Level Test is 6th grade, while for German texts it is 80 and above according to the Flesch-Index. If these values were to be considered, only one English text by Novartis, with a score of 6.66, would be comprehensible enough. As for German, there is no single text in the subcorpus whose score is within the recommended range. However, as has already been pointed out, these benchmarks are too strict; the one for German, in particular, corresponds to Easy Language rather than Plain Language.

Overall, while the content of the layperson summaries is suitable (information required by Annex V is included), their form could definitely be improved in order to respect guidelines and, in general, suggestions for language simplification. To date, the general impression is that adequate writing and translations choices can be attributed to the abilities of single writers and translators, while more systematicity is required. As for the writing and translation process, the schedules indicated in the guidelines are generally respected, as shown by translation finalization dates indicated on the summaries (cf. Chapter 2, Table 2). However, imprecisions and other mistranslations suggest that many other steps to guarantee high quality (such as back translation and revision) are probably missing, at least in some cases.

12.4 Suggestions for layperson summaries' guidelines and practice

Since, as shown by the analyses, the layperson summaries could be further optimized, especially in the translated texts, we will now provide some suggestions with respect to both the guidelines and translation practice.

Firstly, the current guidelines are not very easy to follow. Indications are found in two different documents, and the GLSP (2021), which is the most recent and detailed, often repeats information presented in the Recommendations of the Expert Group on Clinical Trials (2018), while other suggestions are left out. In addition, information is presented in a somewhat disorganized way and concrete suggestions about linguistic features are therefore not easily retrieved. While “professionals directly involved in lay summary projects are encouraged to read the full handbook to benefit from the detailed recommendations” (GLSP 2021: 2), it is questionable whether outsourced translators working for translation agencies¹⁵² actually do so before finalizing a translation. Of course, if they receive many assignments of this kind and become specialized in this type of translation it is likely that they will acquire the necessary tools and knowledge to perform translations to an even higher level. However, it may be hypothesized that translators are unable to read an 85 page long document containing guidelines due to the time constraints of large workload and strict deadlines.¹⁵³ Of course, some translators may already be aware of Plain Language rules and apply them – which is likely the case for some texts analyzed in the present book – but more consistency is necessary.

Another issue concerns the fact that, as mentioned in 1.4.2, suggestions are often given in a random order, mixing different linguistic levels (Recommendations of the Expert Group on Clinical Trials 2018: 4–5; GLSP 2021: 12). Some indications, such as the ones regarding technical terms, are

152 This *modus operandi* is indicated as an option beside inhouse translation in the GLSP. It has also been confirmed by correspondence with some pharmaceutical companies that many layperson summaries' translations are indeed outsourced to translation agencies.

153 Moreover, some tables and annexes with linguistic indications cannot be consulted by means of the Find pane due to their format, so if writers or translators search for specific information through keywords they will not find it.

presented in a redundant way, while others, such as the ones concerning the morphosyntactic level, are lacking. Indications on parataxis or hypotaxis are not very clear in the GLSP, and nominalization or verbalization are never mentioned. Layout and design are discussed in detail, but some aspects relevant to perceptibility – like the use of sans serif or serif fonts – are still not thematized.

Overall, the existing guidelines could be improved by grouping together indications concerning layperson summaries' writing and by titling them, for instance, "Linguistic features". A more organized and, at the same time, complete list (which is a re-elaboration of the existing guidelines, integrated with language simplification recommendations) could be the following:

1) Lexical and terminological recommendations

- Use common words. If a concept can be designated by different words, choose the easiest synonym and not the one with a high register.
- Avoid long, multisyllabic words, which are tendentially more complex, although this is not always the case – sometimes these words are more common than their shorter synonym, so be flexible.
- Verify whether the selected words are actually common by consulting frequency dictionaries or similar resources.
- Use concrete, clear, and explicit formulations rather than abstract, vague, or polysemous words.
- Use technical terms sparingly. They are sometimes useful (when they allow to more easily find other medically relevant information and reference other documents), but they should always be accompanied by an explanation.
- If possible, use cataphoric explanations (i.e., those where the term follows its explanation), which are easier to process than anaphoric ones.
- Keep in mind that too many explanations make your text longer and more difficult to follow.
- In some cases (and especially in some languages), technical terms also have synonyms of a higher register, known mainly to experts;

you should avoid these high-register variants in favor of the more popular variants.

- Avoid anglicisms and latinisms.
- Avoid acronyms, initialisms, and abbreviations or – if they are necessary to make a text shorter – explain them when they are introduced.
- Always use the same word to refer to the same concept, so as not to confuse readers with synonyms or paraphrases.
- Be respectful while resorting to terminology: use people-first language to refer to certain categories (e.g., “people with disabilities” instead of “disabled” or “people with visual impairments” instead of “blind”).

2) Morphosyntactic recommendations

- Favor active voice over passive voice.
- Avoid impersonal constructions and other constructions which hide agents (participial constructions, adjectives, etc.), in order to clearly state who carries out actions, especially if these actions should be carried out by readers.
- Favor verbs over nouns, i.e., avoid nominalizations; in particular, avoid support verb constructions (such as *make a complaint* instead of *complain*), whose register is tendentially high and which make a text less concise and more abstract.
- Avoid long, complex sentences.
- Favor coordination over subordination.
- If a subordinate clause is necessary, insert it after its main clause rather than before it.
- Favor explicit clauses, i.e., with a finite mood, an explicitly mentioned subject and a marked tense, over implicit clauses: for instance, say “Once/after participants have been randomized, they receive a placebo or the study drug” instead of “Once randomized, participants receive a placebo or the study drug”.

3) Textual recommendations

- Insert a clear title that mentions the name “Layperson summary” (or another synonym, like “Lay Summary”).
- Follow an inverted pyramid scheme to provide information, i.e., put the general and most important information first, then add details.
- Try to be concise: do not provide excessive information, focus on what is needed by readers.
- Insert a synthesis of the summary at the beginning, along with an index.
- Use headings and subheadings to explain the content of the paragraphs. They should consist of simple questions rather than nominal phrases.
- Clearly divide paragraphs by topic.
- If you use lists, keep their items in parallel: do not mix infinitives, actives, passives, or no verbs at all, as this may confuse readers.
- Provide references to trial summaries and other additional resources.
- Avoid intratextual references, like “See section”; when possible, repeat the information instead.
- Clearly state the text function and target readers.
- Address readers directly, especially when they are supposed to carry out actions (i.e., talk to doctors).
- Be respectful when addressing readers, i.e., use courtesy forms if they exist in the language you are writing in.
- Use gender-inclusive language if it is appropriate in the language in question, while keeping in mind that it may make the text longer.
- Make your text cohesive, i.e., make the relationship between text parts explicit. Connectives are very useful, since they can highlight relations between events without resorting to subordinate clauses (e.g., write “Researchers wanted to make trial results fairer. For this reason, they put participants into groups by chance” instead of “In order to make trial results fairer, researchers put participants into groups by chance”).

4) Graphical recommendations

- Use left-aligned text rather than justified text.
- Do not use excessively long lines of text, which may be difficult for some readers.
- Use adequate white space between lines, headings, and paragraphs.
- Place columns and space breaks carefully so as not to separate paragraphs.
- Use lists with bullet formatting to divide text into clear separate points.
- Do not use footnotes.
- Use glossaries to explain terms.
- Guarantee contrast between text and its background; the best option is to use black text on white background.
- Use colors to make the documents more attractive, but without exaggerating and by choosing them carefully, since some colors are problematic to people with color blindness.
- Use sans serif fonts like Arial, Verdana, Helvetica, etc.
- Use a font size of at least 12.
- Use bold text (without exaggerating) to add emphasis.
- Avoid italics, underlining, all caps, scaling, tracking, shading, and other decorations that may disrupt reading.
- Hierarchize headings consistently. If you use different sizes or weights (like bold) to signal headings and subheadings, always do it in the same way, otherwise readers may misinterpret the hierarchy of information.
- In general, use figures that have an illustrative function, and not only a decorative one: insert them to explain complex concepts.
- While figures are indeed useful, do not use too many.
- Use the same picture throughout the text to refer to the same concept.
- Select pictures which are easy to associate to a certain concept (in other words, they should be specific and contain the same information of the text).
- Put figures close to the corresponding text, in an integrated format.

- Insert an illustration at the beginning of the text, which should be the same for all layperson summaries (at least by a pharmaceutical company), as this can increase intertextuality, i.e., help readers recognize the text genre.
- Do not select childish pictures, which could lead to stigmatization.
- Do not write text on pictures, which is difficult to read in general and even more so for people with color blindness and other visual impairments.
- Use graphs which may aid readers in interpreting numbers.
- Make graphs as simple as possible, i.e., with one simple message (avoid several relationships, or complex trial design diagrams and flowcharts) and clear captions.
- Use numerals rather than words for numbers.
- Do not use Roman numerals.
- Use whole numbers where possible.
- Use percentages carefully and do not leave calculations to readers.

5) Further recommendations to increase accessibility

- Keep in mind that, while the HTML or XML formats may be used, the PDF format is the most accessible for people with visual impairment.
- Make sure that the security settings of the PDF file allow the screen reader to convert the text to speech or Braille.
- Keep in mind that graphs and charts are not always legible with screen readers, so add a short summary that describes them. Do the same with other figures and pictures.
- Use even larger fonts (like 14) and enhanced contrast than the one recommended above for summaries regarding eye disorders, since people with visual impairment – who are among trial participants and therefore the main target of these texts – benefit from increased perceptibility.

These are general recommendations; more specific indications could be added for language-specific guidelines. For instance, guidelines for German

could include “avoid using *Linksattribute*” among the morphosyntactic recommendations.

The concise, easy-to-consult guidelines proposed above could be sent to translators along with the ST of the layperson summary and some links to Plain Language resources (to consult if they wish to learn more about the concept), in the hope that they will follow language simplification recommendations more closely and by so doing contribute to guaranteeing transparency and comprehensibility.

A further suggestion is to give translators an additional (paid) assignment after the translation itself, i.e., a readability check by means of analysis tools that calculate readability indices. This way, they would know whether the translated text approximately corresponds to the literacy level of target readers. In addition to the traditional readability tools that have been used in the present book and which calculate “normal” indices, other software might be considered, as they could provide translators with useful suggestions and indicate which text parts are problematic, and why. For instance, German translators could use Hurraki,¹⁵⁴ which is limited to *Leichte Sprache* but can still provide interesting insights, and Italian translators could use FLO,¹⁵⁵ which gives suggestions both with respect to Easy Language and to Plain Language.¹⁵⁶ By so doing, a new professional profile would be introduced in the field of layperson summaries, i.e., that of the translator/validator. They would be highly qualified professionals, who would combine “standard” translation skills with language simplification knowledge and competences and could thus guarantee highly comprehensible texts that correspond with the ST *and* comply with language simplification recommendations. They could acquire knowledge concerning

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154 <https://hurraki.de/pruefung/pruefung.htm>

155 <https://www.faciledaleggere.online/#:~:text=Che%20cos%27C3%A8%20FLO%3F,suggerimenti%20e%20spiegazioni%20per%20migliorarli>

156 Both tools can be consulted for free online. After inserting a text, the tools point out which text portions are probably complicated based on some language simplification rules. Some instances of “warnings” are the following: “avoid passive voice”, “avoid subordinate clauses”, “avoid foreign or complicated words”, and “split this sentence”. These tools are clearly not enough to write and translate texts correctly, but they can help avoid mistakes which are easy to spot.

language simplification autonomously, through the provided resources, or receive training through specific programs (as occurs in the Train2Validate¹⁵⁷ project, but with a more specific program). In light of the growing number of produced and translated layperson summaries, these skills could become extremely valuable to the work of translators and therefore additionally prove very profitable. Moreover, these abilities and methods could be applied also to other texts ascribable to the field of expert-lay communication, like package leaflets and informed consents.

12.5 Further research desiderata

As has already been mentioned – and is made clear throughout the analysis sections – this book followed a so-called text-oriented approach, which evaluated text features impacting comprehensibility. The main research desideratum therefore entails an evaluation of the user-oriented perspective of these texts, i.e., the actual reception of the layperson summaries. This approach, which could not be included in the present book, would be the complementary analysis to the ones conducted so far. It concerns the comprehension of these texts, the memorization of the conveyed information, as well as the degree of acceptance of the layperson summaries (in other words, readers' reactions to text content and format). This type of study would consist of a psycholinguistic survey and include a group of target readers – laypeople who are native speakers of the three languages under analysis.

Another research desideratum related to reception concerns the degree of acceptance, use, and validity of the updated guidelines elaborated in the present book. It would be interesting to evaluate to what extent such guidelines would be sent to translators, how these would react, as well as whether the guidelines would have an impact on translated texts' comprehensibility.

Other aspects which could not be examined in the present book concern multimodality and multicodality. While collecting the corpus' texts, the presence of layperson summaries in form of videos was noted on some

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157 <https://plenainclusionmadrid.org/train2validate/project/>

pharmaceutical companies' websites. Also pediatric layperson summaries found on some companies' portals, which are sometimes written as comic stripes, would be an interesting study object.

Finally, the present book tried to provide some theoretical and empirical basis for the interlingual translation of simplified texts, but more should be done to further understand this quickly growing field, for instance by considering other text types and linguistic combinations.

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Appendix

Tables 47, 48, and 49 are an adaptation of the list of the morphemes elaborated by Magris (1992: 31–50).

EN	DE	IT	Meaning
a(n)-	a(n)-	a(n)-	absence
ab-	ab-	ab-	detachment, removal
ana-	ana-	ana-	increase
ana-	ana-	ana-	repetition
ante-	ante-	ante-/anti-	in front of/before
anti-	anti-	anti-	against
bi-	bi-	bi-	two, double
cata-/kata-	cata-/kata-	cata-	lower, inferior
circum-	circum-/Zirkum-	circum-/circo-	around
con-	con-/Kon-	con-	union
contra-	contra-/Kontra-	contr(o)-	contrary
de-	de-	de-	subtraction
di-	di-	di-	two, twice
dia-	dia-	dia-	through
dis-	dis-	dis-	separation
dys-	Dys-	dis-	abnormality
ecto-	ecto-/ekto-	ecto-	outside
endo-	endo-	endo-	inside
ep(i)-	ep(i)-	ep(i)-	above, on top of
eso-	eso-	eso-	within, inside
eu-	eu-	eu-	good
exo-	exo-	eso-	outside
extra-	extra-	extra-	outside of

EN	DE	IT	Meaning
hemi-	hemi-	emi-	half
hyper-	hyper-	iper-	excessively
hypo-	hypo-	ipo-	lacking
in-	in-	in-	inside
in-	in-	in-	without, bereft of
infra-	infra-	infra-	under
inter-	inter-	inter-	between
intra-/intro-	intra-/intro-	intra-/intro-	within, inside
meta-	meta-	meta-	between
meta-	meta-	meta-	after
meta-	meta-	meta-	modification
par(a)-	par(a)-	par(a)-	near
par(a)-	par(a)-	par(a)-	deviation from a norm
peri-	peri-	peri-	around
post-	post-	post-	after/behind
pre-	prä-	pre-	before
pro-	pro-	pro-	before
retro-	retro-	retro-	backwards
semi-	semi-	semi-	half, partially
sub-	sub-	sub-/sotto-	under
super-	super-	super-	excessively
super-	super-	super-	above
supra-	supra-	sovra-/supra-	above
syn-	syn-	sin-	together
trans-	trans-	tra(ns)-	through
ultra-	ultra-	ultra-	beyond, over

Table 47: Prefixes of Greek/Latin matrix

EN	DE	IT	Meaning
-ase	-ase	-asi	enzyme
-ene	-en	-ene	unsaturated hydrocarbon with a double bond
-ia	-ia/-ie	-ia	pathological condition
-iasis	-iasis	-iasi	pathological process
-(o)id	-(o)id	-(o)ide	similar to
-ide	-id	-uro	binary compound of a non-metallic element
-in(e)	-in	-ina	denomination of several substances, such as hormones, enzymes, etc.
-ism	-ismus	-ismo	medical condition
-ite	-it	-ite	small structure
-ite	-it	-ito	salt
-itis	-itis	-ite	inflammatory process
-oma	-om	-oma	tumor
-ose	-ose	-osio	sugar
-osis	-ose	-osi	degenerative process
-yl	-yl	-ile	saturated hydrocarbon radical
-ylene	-ylen	-ilene	unsaturated hydrocarbon radical

Table 48: Suffixes of Greek/Latin matrix

EN	DE	IT	Meaning
aden(o)-	aden(o)-	aden(o)-	gland
-aesthesia	-ästhesie	-estesia	sensitivity
-algia	-algie	-algia	pain
all(o)-	all(o)-	all(o)-	other, different
andr(o)-	andr(o)-	andr(o)-	man
angi(o)-	angi(o)-	angi(o)-	vessel
arthr(o)-	arthr(o)-	artr(o)-	joint
auto-	auto-	auto-	alone, acting on itself
balan(o)-	balan(o)-	balan(o)-	glans

EN	DE	IT	Meaning
bio-	bio-	bio-	life
-blast/-plast	-blast	-blasto	undifferentiated cell
blenno-	blenno-	bleno-	mucus
brachi(o)-	brachi(o)-	brachi(o)-	arm
brachy-	brachy-	brachi-	short
brady-	brady-	bradi-	slow
cardi(o)-	cardi(o)-/ Kardi(o)-	cardi(o)-	heart
caryo-/karyo-	caryo-/karyo-	cario-	nucleus
-c(o)ele	-zele	-cele	hernia
-centesis	-centesis/-zentese	-centesi	evacuative puncture
cervic(o)-	cervic(o)-	cervic(o)-	neck
chol(e)-	chol(e)-	col(e)-	bile
chondr(o)-	chondr(o)-	condr(o)-	cartilage
colp(o)-	colp(o)-/kolp(o)-	colp(o)-	vagina
crypt(o)/krypt(o)-	crypt(o)-/ krypt(o)-	crypt(o)-	hidden
cyan(o)-	zyan(o)-/cyan-	cian(o)-	blue
cyst(o)-	zyst(o)-	cist(o)-	blister
-cyte	-zyt/-cyt	-cito/-cita	cell
derm(ato)-	derm(ato)-	derm(ato)-	skin
desm(o)-	desm(o)-	desm(o)-	ligament
dolicho-	dolicho-	dolico-	long
-ectomy	-ektomie	-ectomia	surgical removal
-(a)emia	-ämie	-emia	blood
encephal(o)-	enzephal(o)-	encefal(o)-	brain
enter(o)-	enter(o)-	enter(o)-	intestine
erythro-	erythro-	eritro-	red
eury-	eury-	euri-	large

EN	DE	IT	Meaning
-fuge	-fugum	-fugo	removing
galact-	galact-/galakt-	galatt-	milk
gastr(o)-	gastr(o)-	gastr(o)-	stomach
-gen	-gen	-geno/-gene	determining agent
-genesis	-genese/-genesis	-genesi	origin
gero(nto)-	gero(nto)-	gero(nto)-	old age
gyn-/gyn(a)e(co)-	gyn-/gynäk(o)-	gin-/gine(co)-	woman
gloss(o)-	gloss(o)-	gloss(o)-	tongue
gon(o)-	gon(o)-	gon(o)-	reproductive
-graphy	-graphie	-grafia	writing
h(a)em(o)/ h(a)emat(o)-	häm-/hämat(o)-	em(o)-/emat(o)-	blood
hepat(o)-	hepat(o)-	epat(o)-	liver
hetero-	hetero-	etero-	other, different
hist-/hist(i)o-	hist-/hist(i)o-	ist-/ist(i)o-	tissue
hom(e)o-	hom(öo)-	om(e)o-	similar
hyster(o)-	hyster(o)-	ister(o)-	uterus
iatro-	iatro-	iatro-	doctor
idio-	idio-	idio-	itself, which produces itself
kine-/kinesi(o)-/ kinet(o)-	kine-/kinesi(o)-/ kinet(o)-	cine-/cinesi(o)-/ cinet(o)-	movement
laparo-	laparo-	laparo-	abdomen
lept(o)-	lept(o)-	lepto-	thin, delicate
leuc(o)-/leuk(o)-	leuc(o)-/leuk(o)-	leuc(o)-	white
lip(o)-	lip(o)-	lip(o)-	fat
lith(o)-	lith(o)-	lit(o)-	stone
logo-	logo-	logo-	word, speech
-lysis	-lyse	-lisi	melting, dis- solution
mast(o)-	mast(o)-	mast(o)-	breast

EN	DE	IT	Meaning
-melia	-melie	-melia	limb
men(o)-	men(o)-	men(o)-	menstruation
mer(o)-	mer(o)-	mer(o)-	partial
metr(o)-	metr(o)-	metr(o)-	uterus
morph(o)-	morph(o)-	morf(o)-	shape
myc(o)-	myk(o)-/myc(o)-	mic(o)-	fungus
myel(o)-	myel(o)-	miel(o)-	marrow
my(o)-	my(o)-	mi(o)-	muscle
myx(o)-	myx(o)-	mix(o)-	mucus
nephr(o)-	nephr(o)-	nefr(o)-	kidney
neur(o)-	neur(o)-	neur(o)-	nerve
nyct(o)-	nykt(o)-	nict(o)-	night
odont(o)-	odont(o)-	odont(o)-	tooth
omphal(o)-	omphal(o)-	onfal(o)-	navel
onco-	onko-	onco-	tumor
oo-/ovi-/ovo-	oo-/ovi-/ovo-	oo-/ovi-/ovo-	egg
oophor(o)-	oophor(o)-	oofor(o)-	ovary
ophtalm(o)-	ophtalm(o)-	oftalm(o)-	eye
orchi(d)(o)-	orchi(d)(o)-	orchi(d)(o)-	testicle
oro-	oro-	oro-	mouth
osteo-	osteo-	osteo-	bone
ot(o)-	ot(o)-	ot(o)-	ear
path(o)-	path(o)-	pat(o)-	illness
-penia	-penia	-penia	insufficiency, lack of
phag(o)-	phag(o)-	fago-	nutrition
phleb(o)-	phleb(o)-	fleb(o)-	vein
-plasy/-plasia	-plasie	-plasia	growth, formation
phren(o)-	phren(o)-	fren(o)-	diaphragm
phren(o)-	phren(o)-	fren(o)-	mind
-plegia	-plegia	-plegia	paralysis

EN	DE	IT	Meaning
-plexy	-plexie	-plessia	stroke, fit
pneum(at)(o)-	pneum(at)(o)-	pneum(at)(o)-	air
pneum(o)-	pneum(o)-	pneum(o)-	lung
-pnoea	-pnoe	-pnea	respiration
-poiesis	-poese	-poiesi	formation, production
procto-	Prokto-	procto-	rectum
prosop(o)-	prosop(o)-	prosop(o)-	face
pseud(o)-	pseud(o)-	pseudo-	fake, false
pyelo-	pyelo-	pielo-	renal pelvis
pyo-	pyo-	pio-	pus
rhin(o)-	rhin(o)-	rin(o)-	nose
rhizo-	rhizo-	rizo-	root
-rrhage/-rrhagia	-rrhagie	-rragia	discharge, flow
-rrh(o)ea	-rrhoe/-rrhö	-rrea	flow
sarc(o)-	sarc(o)-/sark(o)-	sarc(o)-	flesh
schiz(o)-	schiz(o)-	schiz(o)-	split
-scopy	-skopie	-scopia	inspection
sial(o)-	sial(o)-	sial(o)-	saliva
somat(o)-	somat(o)-	somat(o)-	body
sphygm(o)-	sphygm(o)-	sfigm(o)-	wrist
spir(o)-	spir(o)-	spir(o)-	respiration
splen(o)-	splen(o)-	splen(o)-	spleen
spondyl(o)-	spondyl(o)-	spondil(o)-	vertebra
spongi(o)-	spongi(o)-	spongi(o)-	sponge
steat(o)-/stear(o)-	steat(o)-/stear(o)	steat(o)-	fat
steno-	steno-	steno-	narrowing
steth(o)-	steth(o)-	stet(o)-	thorax
stomat(o)-	stomat(o)-	stomat(o)-	mouth
tachy-	tachy-	tachi-	quick
tele(o)-	tele(o)-	tele-/tel(e)o-	far, extremity

EN	DE	IT	Meaning
terato-	terato-	terato-	malformation
-tomy	-tomie	-tomia	surgical incision
top(o)-	top(o)-	top(o)-	place
trich(o)-	trich(o)-	tric(o)-	hair
-trophy	-trophie	-trofia	nutrition, growth
-tropism	-tropismus	-tropismo	affinity for
uran(o)-	uran(o)-	uran(o)-	palate
xanth(o)-	xanth(o)-	xant(o)-	yellow
xer(o)-	xer(o)-	xer(o)-	dry

Table 49: Roots of Greek/Latin matrix

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Giulia Pedrini is a post-doc researcher at the University of Trieste (Department of Legal, Language, Interpreting and Translation Studies), where she has also been teaching German-Italian translation as an adjunct professor at the course Interlinguistic Communication Applied to Legal Professions. She obtained her PhD in Linguistic and Literary Studies ('Studi linguistici e letterari') with a focus on Linguistics, Translation and Interpreting at the University of Udine, in convention with the University of Trieste. Her main research interests are accessibility, Plain Language, translation studies, contrastive linguistics, medical language and terminology.

