Medical neologism translation and cognitive estrangement in Star Trek subtitles

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Abstract

In this descriptive, product-oriented study, the translation of medical neologisms in Dutch subtitles of *Star Trek: The Next Generation* was analyzed. A combined quantitative and qualitative approach was used to determine what translation procedures were used to translate these neologisms, and how the translations affected cognitive estrangement, an essential characteristic of the genre of science fiction. Medical neologisms in the ST were categorized into types and the way they produced cognitive estrangement was analyzed. Subsequently, the translation procedures used to translate these neologisms were analyzed, and the TT was compared to the ST in terms of cognitive estrangement. The results showed a strong tendency to retain neologisms and cognitive estrangement in the TT. Furthermore, most neologisms in the TT mirrored the ways in which the corresponding SL neologism type produced cognitive estrangement. The analysis showed that which translation procedures retain cognitive estrangement depends on the SL neologism type, that the expectations and characteristics of medical translation play a role in the production of cognitive estrangement by medical neologisms, and that visuals and audio play an essential role in the production of cognitive estrangement by neologisms in audiovisual translation. By incorporating medical translation and audiovisual translation into an analysis of neologisms and cognitive estrangement, this study provides insight into the relationship between domain, medium and genre and new directions for future research on neologism translation in science fiction.

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1. Introduction

Hololungs, cytoplasmic stimulators and isotropic restraints – aboard Federation starships, there is no shortage of new medical technologies, and the new names that come with them. The *Star Trek* franchise is well known for its 'technobabble': dialogue brimming with neologisms related to technology, science and medicine. These neologisms present a challenge for translators, who must balance the need for novelty with the need for consistency with existing terminology. This balance is particularly important in science fiction, a genre characterized by cognitive estrangement. Cognitive estrangement occurs when new and unfamiliar things are presented to evoke a sense of alienation from the real world, and these unfamiliar things bear a logical or 'cognitive' relationship to real-world science and technology (Suvin, 1979). For medical neologisms, this means that they must be grounded in existing medical terminology to be perceived as believable by the audience and to be not only estranging but cognitively estranging.

This descriptive, product-oriented study analyzes the translation of medical neologisms in Dutch subtitles of *Star Trek: The Next Generation*. It aims to answer the following research questions: 1) What translation procedures are used to translate medical neologisms in the Dutch subtitles of Star Trek? 2) How do the translation procedures used in Dutch subtitles of Star Trek affect cognitive estrangement? To answer these questions, a combination of quantitative and qualitative analysis is used to examine how different types of medical neologisms in the source text (ST) produce cognitive estrangement, what translation procedures are used to translate these neologisms, and how these choices affect cognitive estrangement in the target text (TT).

The relationship of cognitive estrangement to characteristics of medical translation and audiovisual translation, such as the expectation for medical neologisms to be consistent with existing medical terminology, and the presence of multiple semiotic dimensions in audiovisual translation, is incorporated into the analysis. This distinguishes the present study from previous research. There has been a limited amount of previous research on neologism translation and cognitive estrangement in science fiction, which has primarily focused on analyzing translation procedures and their source-orientedness to assess cognitive estrangement. These studies have not significantly analyzed the relationship between domain, medium and genre and its role in the production of cognitive estrangement. Additionally, most previous research on neologism translation in science fiction has studied science fiction literature rather than audiovisual media.

This study examines the influence of the medical domain on the formation of neologisms in the ST and their translations in the TT, the role of images and audio in the production of cognitive estrangement in audiovisual science fiction, and the relationship between different neologism types, translation procedures, visual and auditory information, and cognitive estrangement. In doing so, it provides new insight into medical neologism translation in audiovisual science fiction and the relationship between domain, medium and genre.

Chapter 2 discusses previous research on neologism translation in general and in medical translation, subtitling, and science fiction. Chapter 3 describes the approach to data selection and analysis, including a description of the typologies of neologism types and translation procedures that were used. Chapter 4 presents the results of the analysis. First, neologism types in the ST and their relationship to cognitive estrangement are described. Subsequently, the translation procedures in

the TT are analyzed and the TT is compared to the ST in terms of cognitive estrangement. Finally, chapter 5 discusses the conclusions of the analysis of *Star Trek: The Next Generation* and what these mean for future research on neologism translation in science fiction.

2. Literature review

2.1 Structure of the chapter

This literature review covers neologism translation in general as well as in relation to the domain of medical translation, the medium of subtitling, and the genre of science fiction. Section 2.2 contains a general overview of challenges in the translation of neologisms and introduces major themes in previous research on neologism translation, which are explored in the following sections: domain, which is discussed in section 2.3; medium, which is discussed in section 2.4; and genre, which is discussed in section 2.5. Finally, section 2.6 reflects on the insights from and limitations of previous research and how the present study relates to this.

2.2 Neologisms and translation

2.2.1 Neologisms as a challenge for translators

According to Newmark (1988), neologisms constitute possibly the biggest challenge for non-literary professional translators. They arise not only from the continuous new creations of technology, but from slang, dialect, social sciences, transference from other languages, and more. Neologisms include newly coined lexical units and existing lexical units that acquire new senses (Newmark, 1988, p. 140).

Neologisms present a challenge for translators as there often is no existing, recognized equivalent term in the target language (TL). The translator must decide whether to create a neologism in the TL, or convey the meaning of the source language (SL) neologism without creating a TL neologism. Dasgupta (2004) discusses this dilemma in terms of the 'translation novelty paradox'. This paradox

applies to neologisms and to novelty in translation in general. According to Dasgupta (2004), any translated text must by definition be new to the TL, and yet it is comprised of material that is old: language that already exists in the TL. This creates tension between the need for continuity with existing texts in the TL, and the need to break with tradition in some sense to make room for the new text.

A general understanding of the issue of novelty is required for translators to be able to translate neologisms, and they must be able to navigate this paradox. Translators are pulled in opposite directions by the need to make room for novelty and the need for continuity with what already exists, and the influence of these needs varies depending on the text and context. For example, a science fiction novel may be more conducive to novelty than a historical novel. Therefore, there is no single universal approach to the translation of neologisms. To study how neologisms are translated, typologies of types of neologisms have been proposed, as well as typologies of procedures for the translation of neologisms.

2.2.2 Types of neologisms

Newmark (1988) classifies neologisms into new lexical items (form neologisms) and existing lexical items with new senses (sense neologisms). A 'sense' is one of the denotative meanings of a word, as opposed to connotative meaning (Brown & Miller, 2013). If a word can be used with a positive or a negative connotation, that does not necessarily mean it has multiple senses. However, if it can refer to multiple kinds of entities, such as the word 'table' which can refer to a type of furniture as well as to a way of systematically displaying data, it does have multiple senses. Both individual words and existing collocations can acquire new senses. In addition to old lexical items gaining new senses, neologisms may be new lexical forms altogether. These

form neologisms can be formed in various ways. Newmark (1988) describes new coinages, derived words, abbreviations, collocations, eponyms, phrasal words, transferred words, acronyms and internationalisms.

Newmark (1988) presents a general typology of neologisms. However, because neologisms occupy different positions in different genres, more specific typologies may be necessary to study these genres. In science fiction, neologisms are particularly common and play a significant role in distinguishing the genre from other genres (Westfahl, 1999; Suvin, 1979). According to Stockwell (2000, p.106), science fiction presents "an extreme of fictionality in as stark a realist presentation as it can manage". The fantastical unreality of fiction is presented using the apparently objective and factual language of science. Neologisms are an essential part of this process, as they are used "to signal to the reader that something very clever, advanced, and technological is happening" (Stockwell, 2000, p. 107). Additionally, science fiction may contain specific types of neologisms that do not occur in many genres, as words may be borrowed from fictional alien languages created for the text. For this reason, Stockwell (2000) proposes a specialized typology of neologisms in science fiction, which accounts for specific subtypes that are relevant in science fiction, such as borrowed words from terrestrial languages and borrowed words from alien languages.

2.2.3 Translation procedures

In addition to the classifications of types of neologisms discussed in the previous section, typologies have been proposed of procedures for the translation of neologisms. Translation procedures are defined as the processes used to translate individual sentences and other smaller units of language (such as phrases and words), as opposed to translation methods, which relate to entire texts (Newmark, 1988, p. 81). Previous research on neologism translation has often studied translation procedures using a typology proposed by Newmark (1988) (Aksoy & Soylemez, 2023; Alduhaim & Alkhaldy, 2023; Eslamirasekh et al., 2009; Gray, 2020; Moghadam & Sedighi, 2012). This typology contains eleven (11) translation procedures for the translation of neologisms: transference, TL neologism, TL derived word, naturalization, recognized translation, functional equivalence, descriptive term, literal translation, combined procedures, through-translation and internationalism (Newmark, 1988). This framework accounts for the translation of both neologisms that are new lexical units, and those that are existing lexical units with new senses.

Other typologies have also been suggested. For example, Delabastita (2004) proposes a typology of five (5) procedures: creating a neologism in the TT, copying the SL neologism, using an existing TL neologism, using a non-neologism in the TL, or using different linguistic tools to compensate the neologism. These categories are broader and focus on the neologisms in the TT, while Newmark's (1988) typology provides more detailed insight into how the TL neologisms relate to the SL neologisms by including specific procedures such as through-translation, which means that each individual element of the SL term is translated literally to create a new TL term. Additionally, in a study on the translation of neologisms in science fiction subtitles, Korpi (2021) uses Pedersen's (2011, p. 73-74) typology, which is

tailored to subtitles instead of neologisms. The advantages of Newmark's (1988) typology are its specificity in describing the translation of neologisms and its focus on the relationship between the ST and the TT, which allows for more detailed comparison of the ST and TT. Although there are multiple possible approaches, this typology is most commonly used in previous research on neologism translation.

This previous research on neologism in translation will be discussed in the following sections. Studies tend to focus on two topics: the difficulties and challenges of translating neologisms, and the strategies and procedures used to translate neologisms. A major theme in these studies is that the translation of neologisms is subject to the characteristics of and expectations relating to different text types and the neologisms in them. For example, in a preliminary survey of multiple issues in the translation of science fiction, Wozniak (2014) describes how proper names of alien species, planets, etc. are the least problematic for translation, and are usually kept unaltered or adapted slightly to facilitate pronunciation, while technical neologisms present a significant challenge, because a translator needs to have knowledge of technical terminology in the TL to create convincing translations (Wozniak, 2014).

Regarding the influence of the expectations of text types on the translation of neologisms, three important themes emerge from the literature: domain (or subject matter), medium and genre. Below, each of these is discussed in detail, connecting theoretical insights to previous studies.

2.3 Domain and neologism translation

2.3.1 Overview of domain and neologisms

The translation of neologisms can be influenced by the subject matter of the text and that of the neologisms themselves. In a study of the translation of neologisms from English to Arabic in *Harry Potter* subtitles, Altahri (2013) concluded that the frequency of procedures varied among different categories of neologisms. For example, terms for food and drink items were most often translated using calque, also called through-translation, whereas terms for animals and mythological creatures were more likely to be borrowed and adapted to TL orthography and phonetics.

For the purposes of this study, which will analyze medical neologisms, including terms for medical technologies, it is relevant to discuss the technical, scientific and medical domains. Technical language was mentioned in the discussion of Wozniak's (2014) survey of science fiction translation above: neologisms related to technology were said to create difficulties for translators because familiarity with technical terminology is needed to create convincing translations. In a study of Persian translations of scientific and technical texts, Talebinejad et al. (2012) also touch on the issue of familiarity with terminology. The study found that translators tended to borrow technical terms from the SL, even if Persian neologisms coined by the Academy of Persian Language and Literature (APLL) were available. Additionally, a positive correlation was found between translators' familiarity with APLL terms and their use of these terms in translations, suggesting that a lack of familiarity with APLL terms may be part of the reason why they are used less frequently. However, in some instances, translators opted for borrowings despite

being familiar with an APLL term that would be a suitable translation. In a study of the translation of computer-related neologisms from English into Persian, Moghadam & Sedighi (2012) also found that translators tended to borrow terms from the SL, with transference being the most common translation procedure, used on 34.1% of neologisms. According to Talebinejad et al. (2012), borrowing internationally used terms may be preferred by translators because it facilitates global communication.

In general, facilitating communication of complex information is a major priority in scientific and technical texts. This affects the translation of terminology, which includes neologisms. In a specialized field, such as medicine, terminology is essential for the efficient and precise communication of information, especially between experts in that field (Méndez González, 2019). Newmark recommends that in non-literary texts, translators should avoid creating neologisms, and any neologisms they do create should consist of easily understood Greco-Latin morphemes, at least in English (Newmark, 1988, p. 149). This ensures that any potential neologisms fit into existing terminology and can easily be parsed. Similarly, Cabré (2010) suggests that when proposing a new specialized term, translators must ensure that the term fits with existing terminology, and that it is feasible that the term will be used. To do so, translators require extensive knowledge of lexicology, lexical morphology, pragmatics and sociolinguistics. Finally, regarding medical translation, Buysschaert (2021) remarks that it is uncommon for entirely new terms to be created, and that it is more common for terms to be borrowed from the SL, or for translators to translate each component of the source term separately and then combine those to create a term. The latter is also called loan translation, and it corresponds to the procedure Newmark (1988) calls through-translation. In conclusion, it may be expected that in medical translation, translators will generally

opt to borrow neologisms from the SL into the TL, to create TL neologisms using through-translation, or to use procedures that do not include neologisms in the TT.

The results of a study of the translation of medical neologisms from English into Arabic conducted by Alduhaim & Alkhaldy (2023) support this conclusion. This study analyzed the methods that translators used for new words related to COVID-19. The results showed that the most used methods were description and arabicization. In description, the term is replaced with a description of its meaning rather than an equivalent existing term or TL neologism, as in Newmark's (1988) procedure of descriptive terms. Arabicization means that a term is adopted into Arabic but the morphological and phonological rules of English are replaced by those of Arabic, which means that it generally aligns with Newmark's (1988) procedure of naturalization. In conclusion, the most common translation procedures in this study were to either avoid neology in the TT by describing the meaning instead, or to borrow the English term and adapt it to Arabic morphology and phonology (Alduhaim & Alkhaldy, 2023).

2.3.2 Medical terminology in translation

However, the previous research on the translation of medical neologisms is rather limited and is not sufficient to draw general conclusions about which translation procedures are most frequently used. There is, however, literature on the challenges of translating medical terminology that can help analyze and understand the translation of medical neologisms. As mentioned above, terminology is essential for efficient and precise communication in specialized fields. For translators, understanding and properly translating such specialized terminology is often

challenging, especially when it needs to be adapted to be understood by laypeople (Zethsen & Montalt, 2022).

In general, when approaching medical terminology, the communicative context needs to be considered (Buysschaert, 2021). Communication between health professionals, between specialists in a subfield, and between health professionals and patients or the general public, each carry different expectations. The communicative situation affects the options available for the translation of medical terminology. Among health professionals and specialists, a high density of technical terms is to be expected, and it can be assumed that these terms will generally be understood by all participants. Additionally, among specialists in a subfield, abbreviations tend to be common. These abbreviations are often used within subfields to make communication more efficient, and anyone outside that subfield is unlikely to understand them, but they are familiar to specialists (Buysschaert, 2021).

However, technical terminology can create obstacles in communication between health professionals and patients or other laypeople. Texts need to be patient-friendly and readable and not contain terms that laypeople cannot understand. However, technical terms do not always need to be avoided, as patients tend to remember the names of conditions they are diagnosed with, even if it is a technical term (Buysschaert, 2021).

In addition to the communicative context, the translation of medical terminology involves other challenges. Buysschaert (2021) names confusing variation in terminology as a major obstacle for translators. This confusing variation can involve synonymy, polysemy, homonymy, spelling variation, abbreviations, and confusion between hypernyms and hyponyms. Additionally, outdated variants, false

friends and lexical gaps can further complicate the translation of medical terminology.

With synonymy, variants are not always mutually interchangeable, and usage difference need to be considered (Buysschaert, 2021). In a certain discursive context, an eponymous term, which is a term based on the name of the person who first described a condition or the place where it was first discovered, may be preferred over a descriptive term (e.g. *Graves' disease – diffuse toxic goiter)* whereas the opposite may be true in another discursive context. The same applies for Latin or Greek variants as compared to variants in the vernacular (e.g. *pertussis – whooping cough)* (Buysschaert, 2021). Because synonymy is common in medical terminology, a translator must be familiar with these different variants and their relationships to each other to find the best equivalent for a term.

In general, the terminology of any specialized field constitutes a knowledge structure, where each term, and the concept(s) it represents, is connected to other terms in various ways (Cabré, 2010). Therefore, to understand any individual term, an understanding of this structure is required, and learning the terminology of a particular field implies acquiring knowledge of that field (Cabré, 2010). A translator also requires this type of knowledge for the translation of neologisms, especially when there is no existing fixed equivalent for that neologism in the TL. Understanding the terminological structure of a field helps the translator identify the gaps in that structure, and transfer, derive or create terms that best fill those gaps.

In conclusion, based on previous research, transference, naturalization and through-translation are likely to be common neologism translation procedures in medical translation, alongside procedures that do not produce neologisms in the TT.

Furthermore, the translation of medical terminology, including neologisms, is subject to the requirements of communication among health professionals or between health professionals and patients, and the existing structures of medical terminology.

2.4 Medium and neologism translation

In addition to domain, medium also plays a role in the translation of neologisms. This is demonstrated by a study of Chinese translations of neologisms in *Harry Potter,* in which Lu (2023) studied the application of existing literary translations to movie subtitles. This study analyzed the use of neologism translations from the *Harry Potter* books in subtitles for the *Harry Potter* movies. This study concluded that when existing translations of neologisms from the books are used in movie subtitles, important elements of the original text may be lost or downplayed. The simultaneous presentation of subtitles alongside the source language audio creates different expectations for the translation of neologisms in subtitles as compared to literary translation, where the reader cannot see that a particular neologism was used in the source text (Lu, 2023).

In another study of neologisms in Harry Potter, Altahri (2013) studied the translation of various types of cultural references in Arabic subtitles for the *Harry Potter* movies, including neologisms, which are frequently used in the movies in question. The results showed that for all cultural references, the most common procedure was to 'preserve' the term, i.e. to borrow it but adapt it to fit TL orthography and phonetics. This corresponds to Newmark's (1988) naturalization procedure. Altahri (2013) critiques this approach as precluding the target audience from having the same experience as the source audience, especially in the case of proper names. In the *Harry Potter* series, proper names often carry both denotative

and connotative meanings, which will not be understood by the target audience when the names are 'preserved' in this way (Altahri, 2013). The second most frequent procedure was calque, corresponding to Newmark's (1988) procedure of through-translation, followed by explicitation in third place. The two most frequent procedures in this study, borrowing and calque, are both relatively source-oriented and produce a strong link between the subtitles and the simultaneously presented source language audio, especially in the case of borrowing.

The importance of medium also becomes clear when comparing two studies of the translation in neologisms in science fiction, one of which analyzed literature (Aksoy & Soylemez, 2023), and one of which analyzed subtitles (Korpi, 2021). These studies will be discussed in more detail in section 2.6.3. The relevant insight for this section is that while both studies found that neologisms tended to be retained in translations through source-oriented strategies, Korpi (2021) found a tendency in science fiction subtitles for the neologisms to normalize and move closer to common language, reducing the sense of novelty and alienation produced by the neologisms. Such a tendency was not found by Aksoy & Soylemez (2023) in their study of literary science fiction translations, which concluded that the neologisms were emphasized in the TT and contributed to a sense of alienation from the real world.

This limited research does not allow for precise conclusions to be drawn about translation procedures in subtitling as opposed to other media, but it can be concluded that the translation of neologisms is affected by the medium. In subtitling in particular, an important factor is the presence of multiple semiotic dimensions. Visual elements such as gestures and images as well as music, sound effects and other audio elements, interact with each other and with spoken words to create meaning (Díaz Cintas, 2010). Audiovisual material with subtitles consists of three

main components: the image, the original word (either spoken or written), and the subtitles. The subtitles must interact with the other components in the right way to create the desired meaning and effect, and must also be possible for viewers to read while they are simultaneously watching the images (Díaz Cintas, 2010). This synergy between multiple semiotic dimensions may affect the translation of neologisms because of the need for a strong link between the subtitles, images and audio, and because the images and audio may communicate additional information to the audience about the meaning of neologisms.

Furthermore, there is a widespread belief that subtitles should not draw much attention to themselves, and that it is best if they are not noticed, so that they do not distract from the images on screen (Díaz Cintas, 2010; Altahri, 2013). It is often expected that subtitles should be unobtrusive and should blend in with the source language audio as seamlessly as possible. This expectation that subtitles should not be noticed, may create tension with the novelty of neologisms. However, Díaz Cintas (2010) points out that newer practices, such as use of glosses inside subtitles and notes on top of the screen, are challenging the assumption that subtitles should be as unobtrusive as possible.

Another relevant characteristic of subtitles is the limited space and the need for viewers to understand the subtitles in a single viewing. According to Díaz Cintas (2010), the main strategy that subtitlers use is reduction — the essence of what is said must be communicated, because not every word can be translated and included. Finally, subtitles occupy a vulnerable position due to the simultaneous presentation of the subtitles and the source text. This means that anyone with any knowledge of the SL can compare the two texts and scrutinize the subtitles (Díaz

Cintas, 2010), and it may encourage use of source-oriented procedures like those Altahri (2013) found to be common in *Harry Potter* subtitles, as discussed above.

2.5 Genre and neologism translation

2.5.1 Overview of genre and neologisms

Finally, in addition to domain and medium, genre is a recurring theme in the literature on neologism translation. Neologisms occupy different positions in different genres. In fantastical genres of fiction, including fantasy and science fiction, neologisms play an important role in shaping the genre itself by emphasizing the unreality of the story's setting. These neologisms are also essential to the relationship between the fictional world and the audience, with fans of a particular work marking their in-group identity with their knowledge of its neologisms (Lu, 2023).

In a study of the translation of neologisms in fiction, Eslamirasekh et al. (2009) analyzed Persian translations of two English novels from two different genres. These novels were George Orwell's *1984*, a work of dystopian fiction intended for an adult audience, and J.K. Rowling's *Harry Potter and the Order of the Phoenix,* a children's fantasy novel. The neologisms in the source texts were categorized into Newmark's (1988) types of neologisms, with the results showing that linguistically rule-based neologisms were more common in *1984*, while new coinages and other ‘creative’ neologisms were more common in *Harry Potter*. Subsequently, this study applied Newmark's (1988) taxonomy of translation procedures for neologisms and analyzed whether the novelty of neologisms was preserved in the translations. The most used procedure in both novels was through-translation. However, there were differences between the two novels, and the results showed that translators were more likely to

combine multiple procedures to make the meaning clearer in *Harry Potter* than in *1984* (Eslamirasekh et al., 2009).

The present study will analyze a work of science fiction, a genre in which neologisms occupy a particularly prominent position. Before discussing previous research on the translation of neologisms in science fiction, it is necessary to consider the characteristics of the genre and the role neologisms play in shaping it.

2.5.2 The role of neologisms in science fiction

According to Westfahl (1999), science fiction literature has inspired more devotion, belief in its unique and special nature, and commentary about itself than any other form of literature. Although it is difficult to determine precisely what makes science fiction a unique genre, those who regularly engage with it, whether as authors or as readers, clearly think of it as such. The genre is difficult to define, but there seems to be some shared understanding among science fiction writers and readers of what can be labelled as science fiction. Therefore, instead of proposing a definition of the genre, Westfahl offers the following description of traits shared by works of science fiction: "A work labelled science fiction has these three features —it is a prose narrative with scientific language and non-realistic subject matter —or any two of these three features" (Westfahl, 1999, p. 299).

The third characteristic in Westfahl's (1999) description, that of non-realistic subject matter, or subject matter concerning things that do not exist in the real world at the time of writing, implies that neologisms have a prominent position in the genre. Science fiction could be considered as part of what Dasgupta (2004) calls the 'arcade', in which innovation and experimentation are encouraged and neologisms are common. New words are needed to describe things that do not (yet) exist, and

neologisms can therefore be considered a characteristic feature of science fiction (Westfahl, 1993). The reader must learn these neologisms to understand the strange worlds that are described (Westfahl, 1993).

According to Suvin (1979), what distinguishes science fiction from other genres is not merely this unreality, but the cognitive nature of the connection between the unreal elements and the real world. Suvin presents a spectrum of literature, with the exact recreation of reality on one end, and exclusive interest in a *novum*, an unfamiliar and strange newness, on the other end. When literature is concerned with a *novum*, this confronts the reader with a new, unfamiliar point of view and leads to *estrangement*, a sense that the world of the story is strange and different from the real world (Suvin, 1979). According to Suvin, estrangement is part of the formal framework of the genre of science fiction. However, in science fiction, estrangement manifests in a specific way: it is subject to a cognitive view. Science fiction asks questions about phenomena and sees where they lead and how they can change, rather than presenting static, absolute realities such as those presented in myth (Suvin, 1979). It asks why the unfamiliar things in the story are the way they are.

This distinguishes science fiction from other genres that employ estrangement, such as fantasy. For example, fictional animal species are found both in fantasy and science fiction. However, a work of science fiction is likely to provide some explanation for the species' existence that is (partly) based on real-world science. Stockwell describes science fiction as presenting "an extreme of fictionality in as stark a realist presentation as it can manage" (Stockwell, 2000, p. 106). The fantastical unreality of fiction is presented using the apparently objective and factual language of science. Neologisms are an essential part of this process, as they are

used "to signal to the reader that something very clever, advanced, and technological is happening" (Stockwell, 2000, p. 107).

In addition to these general discussions of the genre of science fiction and the role of neologisms in it, there has been some research on the translation of neologisms in science fiction, which is discussed in the following section.

2.5.3 The translation of neologisms in science fiction

In a study on the translation of neologisms in science fiction, Aksoy & Soylemez (2023) analyzed two novels by Ursula K. Le Guin to determine to what extent translators highlight the fictive neologies in the TTs, and whether they show source-oriented tendencies that promote cognitive estrangement. This product-oriented study examined Turkish translations of two novels, analyzing the translations using Newmark's framework of translation procedures for neologisms. The results showed that the most used procedures were transference, naturalization and through-translation. These procedures fit into a source-oriented approach and served to highlight the neologisms in the text, contributing to the sense of alienation from the real world (Aksoy & Soylemez, 2023).

This conclusion generally aligns with the results from Korpi's (2021) study of the translation of neologies in subtitles of audiovisual science fiction. It centers on the idea of *generic fluency*, where fluency is related to adherence to genre characteristics and the expectations of viewers rather than on textual fluency. The study examined professionally made Finnish subtitles of the TV series *Stargate Atlantis, Star Trek Enterprise, Star Trek Discovery* and *Battlestar Galactica,* and analyzed how neologies are translated and how the translations relate to generic fluency. The study concludes that most translations retain neologies, maintain

cognitive estrangement and meet the expectations of viewers. However, there is a tendency in the translation process for neologies to normalize and move closer to common language. The author concludes that this makes the genre of science fiction less accessible to viewers, as neologies play an important role in creating the cognitive estrangement that is characteristic of science fiction (Korpi, 2021).

Both Korpi (2021) and Aksoy & Soylemez (2023) directly link a source-oriented approach to greater cognitive estrangement. However, these may not always be connected. In a study of the translation of neologisms and wordplay in two works by Alain Damasio, Gray (2020) linked the concept of cognitive estrangement to Venuti's (1995) paradigm of domestication and foreignization. The study aimed to determine whether translators foreignized key elements of the language in these works, disrupting the cultural expectations of the reader, or domesticated them, adapting them to the cultural expectations of the reader to minimize strangeness (Gray, 2020). Additionally, the study examined the relationship between domestication, foreignization and cognitive estrangement.

Neologisms were identified in the texts and their translations were analyzed using Newmark's (1988) typology of neologism translation procedures and Venuti's (1995) concepts of domestication and foreignization. The study concludes that the approaches of domestication and foreignization should not be seen as simple binary opposites, and that in science fiction, a domesticating approach will not necessarily lead to naturalness and fluency, and a foreignizing approach, which is more source-oriented, will not necessarily lead to greater cognitive estrangement (Gray, 2020).

Finally, Wozniak (2014) presents preliminary survey of multiple issues related to the translation of science fiction, including *Star Trek*. Regarding neologisms in *Star*

Trek, the study reaches several conclusions: 1) many different kinds of neologisms are present in *Star Trek;* 2) proper names of alien species, planets, etc. are the least problematic for translation, and are usually kept unaltered, or possibly adapted slightly to facilitate pronunciation; 3) sometimes proper names do pose problems, for example with regards to suffixes that are used to create names of nationalities/races in various languages; 4) besides proper names, there are two main categories of neologisms: those describing objects and other ontological elements shown on screen, and those describing things that are not shown on screen; and 5) in the case of technical neologisms, or what is known among viewers of *Star Trek* as 'technobabble', a translator needs to have some level of knowledge of technical terminology in order to create convincing translations.

2.6 Conclusions from literature

Because of the importance of cognitive estrangement in science fiction and based on previous research by (Korpi, 2021; Aksoy & Soylemez, 2023; Altahri, 2013), it can be expected that transference, naturalization and through-translation will be frequently used in science fiction subtitles, although subtitles may display a stronger tendency to normalize neologisms closer to common language when compared to science fiction literature (Korpi, 2021; Aksoy & Soylemez, 2023). Although transference, naturalization and through-translation are also expected to be common in medical neologism translation, descriptive term and other procedures that do not produce neologisms in the TT are expected to be common in medical translation as well (Buysschaert, 2021; Alduhaim & Alkhaldy, 2023). Additionally, medical neologisms need to fit into existing medical terminology structures to be convincing, which restricts how neologisms can be formed and translated (Cabré, 2010; Wozniak, 2014). This requirement may be at odds with the need for novelty in science fiction.

There has been limited research on the translation of neologisms in science fiction, which has largely focused on translation procedures and their source-orientedness to assess the degree of cognitive estrangement in the TT. However, source-orientedness is not always correlated to cognitive estrangement (Gray, 2020). Additionally, previous research has not analyzed the relationship between the expectations of medical translation, subtitling, and neologism translation in science fiction. The present study aims to analyze how cognitive estrangement is produced by the neologisms in the ST, considering the expectations and characteristics of medical translation and subtitling in the process, and uses this analysis, rather than an assessment of source-orientedness, to analyze cognitive estrangement in the TT.

3. Methods

3.1 Aim of this study

This descriptive, product-oriented study investigates the translation of medical neologisms in Dutch subtitles of *Star Trek*, a franchise known for its 'technobabble': dialogue filled with technical and technological neologisms, including medical ones (Wozniak, 2014). It aims to answer the following research questions:

> RQ1 - What translation procedures are used to translate medical neologisms in the Dutch subtitles of *Star Trek*?
>
> RQ2 - How do the translation procedures used in Dutch subtitles of *Star Trek* affect cognitive estrangement?

To answer these questions, this study uses a combined quantitative and qualitative approach to examine how different types of medical neologisms in the ST produce cognitive estrangement, what translation procedures are used to translate these neologisms, and how the translated neologisms in the TT produce cognitive estrangement. In this chapter, the processes of data selection and analysis are described in more detail.

3.2 Data selection

Star Trek is an extensive franchise consisting of various TV series, movies and videogames. This study focuses on the TV series *Star Trek: The Next Generation* (hereafter referred to as *Star Trek TNG*) (Roddenberry et al., 1987-1994). This series, which aired between 1987 and 1994, began a new era for the franchise on television as well as a new era within the fictional universe of *Star Trek*. With that new era, many new fictional technologies and (extraterrestrial) diseases were

introduced. *Star Trek TNG* mostly uses an episodic format, and most episodes have a main plot and a secondary plot. For this study, episodes featuring either a main or a secondary plot centered on a medical topic were selected. These medical topics include (characters suffering from) diseases, injuries and other medical conditions; medical procedures, treatment and assistance; medical research and discoveries; infectious agents; and characters experiencing anatomical changes. A total of seventeen (17) episodes were analyzed.

The subtitles used in this study are the Dutch subtitles from Netflix. These were chosen because they are readily accessible, and to maintain consistency, because using subtitles from a single platform ensures consistent adherence to a certain set of norms. All subtitles were retrieved between the 14th and 28th of March 2025. Additionally, English transcripts of the episodes were retrieved from the website *Chrissie's Transcripts* between the 14th and 28th of March 2025.

For the identification of medical neologisms, both new lexical units (form neologisms) and existing lexical units with new senses (sense neologisms) were included, following Newmark's definition (Newmark, 1988, p. 140). Neologisms were considered medical neologisms if their senses concerned medical technology, medical procedures, treatment or care, the medical profession, injuries, medical conditions, infectious agents, or anatomy. The English transcripts of the episodes were read and medical neologisms were identified. When it was unclear from the transcript whether an existing term was being used with a new sense, the scene in question was checked for visual or other indications of a new sense. The neologisms were collected along with the episode number and title, the translation of the neologism in the subtitles, the full sentence in which the neologism appeared in the ST, and the translation of the full sentence in the subtitles. Additionally, each

neologism was labelled as either a form neologism or sense neologism. A total of 152 medical neologisms were identified. Table 1 below shows a sample of the data.

Table 1

Sample of collected data

Episode		SL neologism	TL neologism	SL sentence	TL sentence	Form or sense neologism
4x15	First Contact	quadroline	quadroline	Start fifteen octares of quadroline.	Een infuus met quadroline.	Form
4x15	First Contact	del-scan series	del-scan	We'll need a complete del-scan series.	We moeten een volledige del-scan uitvoeren.	Form
4x08	Future Imperfect	visor	vizier	What happened to your visor?	Waar is je vizier?	Sense

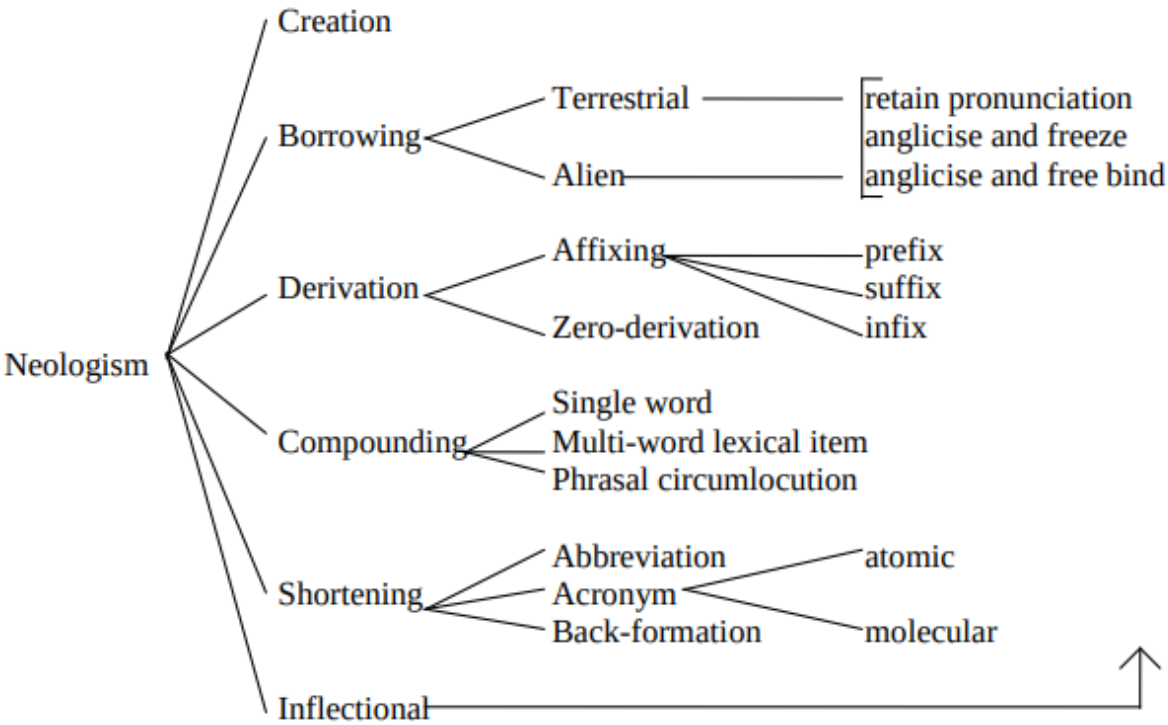
3.3 Analysis

3.3.1 Identification of neologism types and translation procedures

Once the medical neologisms in the ST had been identified, they were categorized according to Stockwell's (2000) typology of neologisms in science fiction. This typology only accounts for form neologisms, so sense neologisms were not categorized into specific types, but labelled only as sense neologisms. Stockwell's (2000) typology is shown below, followed by a description of each type of neologism.

Figure 1

Typology of neologisms in science fiction (Stockwell, 2000, p.114)



1) **Creation**. This is the prototypical neologism, which is (seemingly) created from nothing. These are often proper names, such as 'Klingon' in *Star Trek*. However, although these neologisms are new creations, they are likely to be interpreted by readers through previously existing and known words (Stockwell, 2000).

2) **Borrowing**. This occurs when a word is adopted from another language. In science fiction, words can be borrowed either from terrestrial languages, or from fictional alien languages. Additionally, borrowed words can retain their original pronunciation (e.g. 'schadenfreude'), or they can be naturalized into the receiving language. If they are naturalized, they can be frozen in that form (e.g. 'android'), or they can gain the ability to be freely bound with other morphemes (e.g. 'telepathy' – 'telepath' – 'telepathic') (Stockwell, 2000).

3) **Derivation**. Neologisms can be created through the addition of morphemes to existing words. One method of doing this is affixing: adding prefixes, infixes or suffixes to a word. Another form of derivation is zero-derivation, which means that the class of a word is changed without adding a morpheme (e.g. 'flat line' – 'to flatline') (Stockwell, 2000).

4) **Compounding**. In compounding, two existing words are combined to form a new lexical item. Words may combine into a single word (e.g. 'holodeck', 'wormhole') or multi-word lexical items (e.g. 'black hole', 'virtual reality'). Additionally, new lexical items can be formed by phrasal circumlocution, where a phrase is used to describe a new concept. This phrase becomes a new lexical item, but its origins and its newness remain noticeable (Stockwell, 2000). Examples include 'positronic brain' and 'time paradox'.

5) **Shortening**. Previously existing words can be shortened to create new words. A common method of shortening is abbreviation (e.g. 'biological electronics' - 'bionics'). Acronyms also occur, and these can be either molecular, meaning they are pronounced as if they are words (e.g. 'HAL'), or atomic, meaning every letter is pronounced individually (e.g. 'AI', 'UFO'). Finally, words can be shortened using back-formation, in which a word is divided into false morphemes, which may produce new words by combining with other morphemes. For example, 'hamburger' yields 'burger' through back-formation, which then combines with other morphemes to create 'cheeseburger', 'beefburger', and more (Stockwell, 2000).

6) **Inflectional extensions**. Inflectional morphemes, such as the plural '-s' in English, can be used to create further neologisms out of any existing

neologism (e.g. 'Klingon' – 'Klingons'). These may not necessarily be considered as neologisms proper, but their inclusion is necessary for a complete overview of how science fiction worlds can be extended with new words (Stockwell, 2000).

The SL form neologisms were categorized into these neologism types. Because inflectional extension is not so much a type of neologism as a process that can be applied to all other types of neologism, inflectional extensions in the data were not labelled. Generally, only the main categories were used, because the subcategories would contain very few neologisms per category. However, because of its unique relevance to science fiction, the distinction between terrestrial and alien borrowing neologisms was maintained.

Once the neologisms had been categorized, the SL and TL versions of each neologism, along with the sentences in which they occurred, were compared to determine which of Newmark's (1988) translation procedures for neologisms were used. This typology was chosen because it is frequently used in research on the translation of neologisms, it is specifically tailored to analyze neologism translation, and because its specificity enables detailed comparison between the ST and TT. Newmark defines translation procedures as the processes used to translate individual sentences and other smaller units of language (such as phrases and words), as opposed to translation methods, which relate to entire texts (Newmark, 1988, p. 81). The procedures for the translation of neologisms listed by Newmark (1988) are as follows:

1) **Transference.** This is defined as "the process of transferring an SL word to a TL text" (Newmark, 1988, p. 81). The source neologism is retained in its

source form in the TT.

2) **TL neologism**. In this procedure, a TL neologism is created based on the SL neologism.

3) **TL derived word**. In this procedure, productive affixes are used to produce a new word in the target language.

4) **Naturalization**. This occurs when an SL word is transferred into the TT but is adapted to the normal pronunciation and morphology of the target language.

5) **Recognized translation**. This means that previously existing recognized equivalents are used in the TT, even if they do not seem like the most accurate translation.

6) **Functional equivalence**. According to Newmark (1988), this procedure is commonly applied to cultural words. The procedure neutralizes the SL word by providing a translation that is, insofar as it is possible, culturally neutral.

7) **Descriptive term**. In this procedure, the sense of the SL word is explained through a description in the TT.

8) **Literal translation**. This involves a word-for-word translation of the SL term but still respects the syntactic structures of the TL.

9) **Combined procedures**. This occurs when multiple procedures are applied to a single neologism.

10) **Through-translation.** In this procedure, each individual element of the SL term is translated literally to create a new TL term.

11) **Internationalism.** This means that a loanword that occurs in multiple languages is used.

3.3.2 Analysis of cognitive estrangement

After identifying the types of neologisms and the translation procedures used, a descriptive quantitative analysis of the ST was performed to analyze 1) the total occurrence of each neologism type in the ST; and 2) the occurrence of each unique combination of neologism types in the ST. This data was used as the basis for a descriptive qualitative analysis of the production of cognitive estrangement by the SL neologisms.

Cognitive estrangement is defined by Suvin (1979) as the presentation of the novum, that which is new and unfamiliar, in a way that is both estranging, meaning that it is apparent to the audience that what is presented is different from their familiar reality, and subject to a cognitive view. This cognitive view asks why the unfamiliar things are the way they are and how they relate to what is familiar – the existence of the novum needs to be plausible (Suvin, 1979). In this study, the production of cognitive estrangement by medical neologisms was analyzed based on 1) the extent to which the word itself, the context of the dialogue in the scene, and visual and auditory cues within a scene make the presence of the novum apparent to the viewer (estrangement), and 2) the relationship of the neologism to familiar medical concepts, technologies and terminology (cognitive view).

After the ST analysis, a descriptive quantitative analysis comparing the ST and the TT was performed to analyze the total occurrence of each translation procedure in the TT, and the occurrence of each unique combination of translation procedures in the TT by SL neologism type. This quantitative analysis aimed to answer RQ1: what translation procedures are used to translate medical neologisms in the Dutch subtitles of *Star Trek*?

Finally, the data from the quantitative analysis, alongside the qualitative analysis of the ST, was used as the basis for a descriptive multimodal qualitative analysis comparing the translations of neologisms in the TT to the neologisms in the ST in terms of the production of cognitive estrangement. This qualitative analysis aimed to answer RQ2: to what extent do the translation procedures maintain cognitive estrangement?

In this qualitative analysis, the neologisms themselves, the context in the scene, and visual and auditory information were considered, as well as the characteristics and expectations related to genre, domain and medium described in chapter 2. Neologisms were analyzed using the following guiding questions:

1) If only the words themselves are considered, are the novum and its cognitive relationship to reality more, less, or equally apparent in the TT when compared to the ST?

2) What, if any, additional dialogue or visual or auditory elements are present in the scene that make the presence of the novum or its cognitive relationship to reality apparent regardless of the translation?

3) How does the translation of the neologism reflect the restrictions, expectations and challenges associated with science fiction, medical translation and subtitling?

4) Considering the abovementioned three questions, to what extent does the translation of the neologism in the TT produce cognitive estrangement?

In combination, these different stages of quantitative and qualitative analysis aim to provide insight into the production of cognitive estrangement by medical neologisms

in *Star Trek TNG*, the translation of these neologisms in Dutch subtitles, and how the translation procedures that are used affect cognitive estrangement in the TT.

4. Results

4.1 Overview of the results

This chapter will discuss the results of the quantitative and qualitative analysis of the translation of neologisms in *Star Trek: The Next Generation*. First, section 4.2 presents a quantitative analysis of the frequency of each neologism type in the source text, and a qualitative analysis of how these neologisms produce cognitive estrangement in the ST. Section 4.3 contains a quantitative analysis of the translation procedures used. Subsequently, in section 4.4, mixed quantitative and qualitative analysis is presented of the translation procedures used for form neologisms, followed by a similar analysis of the translation of sense neologisms in section 4.5. In section 4.6, a mixed quantitative and qualitative analysis is presented of instances where neologisms are translated in such a way that there is not necessarily a neologism in the TT. Finally, section 4.7 provides a quantitative summary of the degree of cognitive estrangement in the TT.

4.2 Cognitive estrangement in the ST

4.2.1 Overview of neologism types

A total of 152 neologisms were identified in the ST, of which 78.3% (119 of 152) are form neologisms, and 21.7% (33 of 152) are sense neologisms. After the neologisms in the ST were identified, the form neologisms were categorized according to Stockwell's (2000) taxonomy of neologisms in science fiction, so that any potential connection between the SL neologism types and the translation procedures used could be studied. This analysis was only possible for form neologisms, because Stockwell's taxonomy describes different ways that new lexical units may be formed. The sense neologisms (21.7% of SL neologisms) were not categorized into different

subtypes. This section presents a quantitative analysis of the different neologism types in the ST, and a qualitative analysis of how these neologism types produce cognitive estrangement.

During the analysis, it became apparent that some neologisms fit into more than one type described by Stockwell. For example, a combination of creation and compounding occurs 17 times. One example of such a combination is the term ‘Bendii syndrome’, which refers to a fictional medical condition that affects Vulcans, a fictional alien race in the *Star Trek* universe. This medical condition appears in the episode *Sarek* (season 3, episode 23). The first part of the term, ‘Bendii’, is a creation, a newly formed word that is not based on any existing lexical unit. This neologism is then combined with the existing word ‘syndrome’ through the process of compounding to create the term ‘Bendii syndrome’. Interestingly, the term ‘Bendii syndrome’ occurs 7 times in the episode, but ‘Bendii’ never occurs in isolation. Therefore, it would be inaccurate to separate ‘Bendii syndrome’ into two separate neologisms, classifying ‘Bendii’ as a creation and ‘Bendii syndrome’ as a compound. Instead, Bendii syndrome’ is analyzed as a combination of creation and compounding.

Because of the occurrence of combined types, the SL neologisms were analyzed in two different ways. First, the total occurrence of each type of neologism was counted, regardless of combinations. Subsequently, the occurrence of each specific combination of neologism types was counted. Table 2 below lists the total occurrence of each type of form neologism in descending order of frequency. Here, combinations are counted for all included types. For example, ‘Bendii syndrome’, which is a combination of creation and compounding, is counted in the number of creations as well as the number of compounds.

Table 2

Occurrence of form neologism types

Neologism type	Number	% of form neologisms
Compounding	79	66.4%
Creation	53	44.5%
Derivation	45	37.8%
Borrowing	1	0.8%

Stockwell (2000) lists six main types of neologisms: creation, borrowing, derivation, compounding, shortening, and inflectional. However, only creation, borrowing, derivation and compounding were found in the data. Compounding occurs most frequently (66.4% of new lexical units in the ST), followed by creation (44.5%), derivation (37.8%), and finally borrowing (0.8%), which occurs only once.

Compounding neologisms tend to combine existing medical terms with other medical or non-medical terms to create new concepts. Examples include 'parthenogenetic implant' (season 2, episode 17), 'neural callipers' (season 2, episode 17) and 'plasma plague' (season 2, episode 1). Creation neologisms tend to be either proper names to which derivation and compounding are applied to form the names of diseases, such as 'Altarian encephalitis' (season 4, episode 8), or names of fictional medications. In fact, the only instances of creation neologisms that are purely creations and not also compounded are 22 names of fictional medications, such as 'inoprovaline' (season 5, episode 16) and 'cordrazine' (season 5, episode 16). Finally, derivation neologisms tend to involve affixes with Greek origins, such as 'hypo-' in 'hypospray' (season 7, episode 19) and 'bio-' in 'bioscan' (season 3, episode 25). Additionally, derivation is sometimes applied to proper names in

neologisms such as 'Altarian encephalitis' (season 4, episode 8), as described above.

These patterns found in the different form neologism types display how neologisms in science fiction not only serve to create estrangement, but particularly cognitive estrangement. In each case, the neologisms create a cognitive relationship between the novum and that which is familiar by including elements of existing medical terminology, or through a resemblance to medical terminology in terms of sound. The medical neologisms in *Star Trek TNG* bear a cognitive relationship to existing medical terminology and fit into medical terminological structures as discussed in section 2.3.2. The novum proceeds from reality, rather than seeming to be created *ex nihilo*.

The cognitive aspect of cognitive estrangement is particularly clear in the compounding and derivation neologisms, which combine existing medical terminology in novel ways to create new terms that bear a clear relation to real science and medicine. For example, the compounding neologism 'parthenogenetic implant' (season 2, episode 17) consists of two existing concepts, parthenogenesis and implants, that are combined in a novel way. The viewer will likely know what an implant is and be able to understand that this is a type of implant. Additionally, although some viewers may not be familiar with the term 'parthenogenetic', it is an existing concept, and 'genetic' is a recognizable element that marks its relation to biology. A 'parthenogenetic implant', then, bears a clear relation to real science and medicine, while also being unfamiliar and estranging. Similarly, the derivation neologism 'bioscan' (season 3, episode 25) combines two existing elements to create a new lexical unit. In this case, each element on its own ('bio-' and 'scan') is likely to be familiar to most viewers, enabling them to notice the neologism's relation

to real medicine and infer the neologism's general meaning from the meanings of 'bio-' and 'scan'. Like in 'parthenogenetic implant', existing terminology is used to form a novel combination.

However, while it is clear how compounding and derivation neologisms contribute to cognitive estrangement, creation and borrowing are more complex. After all, a term created out of nothing or borrowed from a foreign language will not necessarily bear a clear relation to existing, familiar terminology. To understand how cognitive estrangement is produced by creation and borrowing neologisms, it is necessary to consider the combinations of neologism types that were found in the data.

4.2.2 Combined neologism types

The combinations of neologism types are listed in table 3 below, which shows the occurrence of each specific combination. For example, ‘Bendii syndrome’ is counted in the category ‘creation + compounding’ and not counted separately as a creation or a compound.

Table 3

Occurrence of combined neologism types

Neologism type combination	Number	% of form neologisms
Compounding	34	28.6%
Creation	22	18.5%
Derivation	18	15.1%
Creation + compounding	17	14.3%
Creation + compounding + derivation	15	12.6%
Derivation + compounding	12	10.1%
Borrowing + compounding	1	0.8%

Regarding creation neologisms, table 3 shows that creation occurs in combination with compounding and derivation 15 times, and in combination with only compounding 17 times. This means that creation and compounding occur together a total of 32 times, whereas creation alone occurs only 22 times. In each of these combined creation + compounding neologisms, a created word is combined with an existing medical term, such as in the previously discussed terms ‘Bendii syndrome’ (season 3, episode 23) and ‘Altarian encephalitis’ (season 4, episode 8). This process of combining a creation neologism with existing terms creates a clear and recognizable relation to existing medical terminology where there otherwise may not have been one and thereby contributes to cognitive estrangement.

Furthermore, the 22 creation neologisms which do not involve compounding, bear a resemblance to existing medical terminology regardless. These 22 neologisms are all names of fictional medications. In total, there are 11 unique creation neologisms, some of which occur multiple times: ‘adrulmine’, ‘borathium’, ‘cordrazine’, ‘felicium’, ‘inoprovaline’, ‘kayolane’, ‘leporazine’, ‘metrazene’,

‘morathial’, ‘quadroline’, and ‘tricordrazine’. Each of these consist of sounds and morphemes that are found in the names of existing medications, such as –azine and –mine. In this case, the connection to existing medical terminology is created through sound rather than through compounding, but it is still present and apparent to the audience and contributes to cognitive estrangement.

Borrowing, unlike derivation, creation and compounding, occurs for only one SL neologism, and notably, it is combined with compounding. This borrowing + compounding neologism is 'VeK'tal response'**.** The word 'VeK'tal' is borrowed from Klingon, a constructed language spoken by the fictional aliens known as Klingons in the *Star Trek* universe, and compounded with 'response' to form 'VeK'tal response'. The neologism ‘VeK’tal response’, then, functions similarly to the previously described creation + compounding neologisms such as ‘Bendii syndrome’: an unfamiliar word that bears no clear relation to familiar language is compounded with an existing term to create a neologism that contributes to cognitive estrangement by being both unfamiliar and recognizably related to existing medical terminology.

In conclusion, the medical form neologisms in *Star Trek TNG* produce cognitive estrangement by presenting the new and unfamiliar in such a way that it bears a relation to existing medical concepts and terminology that the audience can recognize. This is achieved in three ways: by combining existing medical terminology into novel compounds, by combining existing medical terminology with new terms, and by creating new terms that share sound qualities with existing medical terminology. It can be expected that translations that maintain cognitive estrangement will use these same strategies to connect the unfamiliar with the familiar. To what extent the translation procedures used to translate neologisms in *Star Trek TNG* apply these strategies will be discussed in sections 4.4. First, in the

following section, the production of cognitive estrangement by sense neologisms in the ST will be analyzed.

4.2.3 Sense neologisms in the ST

To analyze to what extent cognitive estrangement is maintained in the translation of sense neologisms, it is necessary to understand how cognitive estrangement is produced by sense neologisms in the ST. For form neologisms, it is clear how the novelty of the word produces estrangement, and the previous section discussed how the form neologisms in the ST produce *cognitive* estrangement specifically: by grounding the new lexical units in existing medical terminology. For sense neologism, the situation is reversed: their relation to existing medical terminology, and therefore how they produce the cognitive aspect of cognitive estrangement, is clear. What must be analyzed is how they communicate the presence of a novum to the viewer, to contribute to the *estrangement* aspect of cognitive estrangement. In *Star Trek TNG*, this is achieved through context (such as the preceding dialogue in the scene), images and sounds. Two examples will be discussed below to illustrate this.

Example 1

Sense neologism (season 3, episode 25)

RIKER: Sensors have discovered a small one-man spaceship crashed on the planet. CRUSHER: We're picked up life signs, humanoid, very faint and fading.

The neologism with a new sense in this example is ‘life signs’. This is an existing term that can be used as a synonym for ‘vital signs’ (LIFE SIGNS definition and meaning, n.d.). The term ‘vital signs’ is defined in the Oxford English Dictionary as “a clinical measurement that indicates the state of a patient's essential body functions, *spec.* pulse rate, respiration rate, blood pressure, or temperature” (*Vital sign, n. meanings, etymology and more*, n.d.). However, in this scene in *Star Trek TNG*, ‘life signs’ is being used to mean something else.

The context indicates that a crashed spaceship on the surface of a planet is being scanned from a distance – in fact, the scan is being performed from another spaceship that is orbiting the planet. The life signs in question, then, are something that can be detected by sensors from a great distance. Furthermore, it can be deduced from these life signs that they belong to a humanoid organism. The context indicates to the viewer that the term ‘life signs’ is not referring to its conventional medical meaning, but to an unfamiliar and estranging concept.

Example 2

Sense neologism (season 5, episode 16)

CRUSHER: All neural connections below the first cervical vertebrae have been separated. RUSSELL: Microtome. I'm severing the brain stem now.

A microtome is an existing tool that is used to slice material into very thin sections that can be used as samples in microscopy (Microtome | instrument | Britannica, n.d.)**.** However, this tool is not what the word ‘microtome’ is referring to in this excerpt from *Star Trek TNG*. This is indicated by the direct context: “I’m severing the brain stem now.” The microtome in question is performing a different function from the one performed by microtomes as they exist in the real world. Furthermore, the instrument shown in the scene is clearly new and unfamiliar. It does not look like a real-world microtome, and the way it is used and the sound effect that accompanies its use suggest that it is severing the patient's brain stem using some sort of energy beam or laser instead of a physical blade.

Figure 2

Microtome in season 5, episode 16

In conclusion, where sense neologisms occur in the ST, context as well as visual and auditory information serve to communicate that the existing lexical unit is being used with a new sense. When analyzing cognitive estrangement in the translations of these neologisms, therefore, the context of the neologism as well as the scene's images and sounds must be considered.

This section discussed the production of cognitive estrangement by neologisms in the ST. It was shown that form neologisms in the ST produce cognitive estrangement by combining existing medical terminology into novel compounds, by combining existing medical terminology with new terms, and by creating new terms that share sound qualities with existing medical terminology. Sense neologisms in the ST produce cognitive estrangement by relying on context, images and sounds to communicate to the audience that an existing term is used with a new sense. The remainder of this chapter will analyze the translations of neologisms and the production of cognitive estrangement in the TT in comparison to the ST.

4.3 Overview of translation procedures

This section provides a general overview and analysis of the translation procedures used to translate medical neologisms in *Star Trek TNG*. Table 4 below lists the total occurrence of each translation procedure. Some neologisms were translated with a combination of multiple procedures. Table 4 lists the total number of times each translation procedure was applied, regardless of combinations, for both form and sense neologisms. The total number is listed, as well as the percentage of neologisms in the ST to which the procedure was applied. In addition to the translation procedures defined by Newmark (1988), a new procedure, omission, is

listed, because there were a few SL neologisms that were omitted in the TT. Note that in each column, both a total number (left) and a percentage (right) are shown.

Table 4

Occurrence of individual translation procedures

Procedure	Form neologisms		Sense neologisms		All neologisms	
Through-translation	80	67.2%	5	15.2%	85	55.9%
Transference	43	36.1%	3	9.1%	46	30.3%
Recognized transl.	3	2.5%	18	54.5%	21	13.8%
Naturalization	15	12.6%			15	9.9%
TL neologism	8	6.7%	4	12.1%	12	7.9%
Descriptive term	2	1.7%	4	12.1%	6	4.0%
Omission	3	2.5%	2	6.1%	5	3.3%
Functional equivalence	1	0.8%	1	3.0%	2	1.3%

Overall, the most frequent translation procedure is through-translation (55.9% of SL neologisms), followed by transference (30.3%). The difference between the frequency of these two procedures and the other procedures is rather large: the third most frequent procedure, recognized translation, occurs with 13.8% of SL neologisms. The remaining procedures each occur in less than 10% of neologisms: naturalization in 9.9%, TL neologism in 7.9%, descriptive term in 4.0%, omission in 3.3% and functional equivalence in 1.3%.

The three most frequent procedures (through-translation, transference and recognized translation) all retain the neologisms in the TT. The fourth and fifth most frequent procedures, naturalization and TL neologism, also retain the neologisms in the TT. The less frequent procedures descriptive term (4.0%) and functional

equivalence (1.3%) do not necessarily produce neologisms in the TT, and 3.3% of neologisms are omitted completely. Overall, the frequent use of procedures that retain neologisms in the TT suggests a high degree of novelty and therefore estrangement in the TT.

Chapter 2 concluded that, based on previous research on neologisms in medical translation, the most common translation procedures for medical neologisms were likely to be transference, naturalization, through-translation, and procedures that do not produce neologisms in the TT. Through-translation and transference are the most frequent procedures used for medical neologisms in Dutch subtitles of *Star Trek TNG*, which aligns with this expectation, as well as the expectations for science fiction subtitles. However, procedures that do not produce neologisms in the TT (descriptive term, omission and functional equivalence) are relatively rare in the data, despite being otherwise common in medical neologism translation. The translations of medical neologisms in the data tend towards a higher degree of novelty than normally expected in medical translation, which may be explained by the importance of neologisms in science fiction, a genre characterized by novelty and estrangement.

One phenomenon not accounted for by Newmark's (1988) typology of translation procedures, is that some SL neologisms are maintained in reduced form in the TT. This occurs with 5.9% (9 out of 152) of SL neologisms. In these instances, either only part of the SL neologism is transferred or through-translated, or a recognized translation is used for part of the SL neologism. Two examples are given below.

Example 3

Reduced translation (season 3, episode 25)

ST: Sit down, I'll get the osteotractor frame. TT: Ga zitten, dan haal ik de osteotractor.

Example 4

Reduced translation (season 6, episode 5)

ST: But I need to run a resonance tissue scan to search for any signs of additional infection. TT: Maar ik moet een weefselscan doen om te zien of er meer geïnfecteerd is.

In example 3, transference is applied to the SL neologism, but only to part of it: '*osteotractor'*. The word 'frame', which is part of the compound 'osteotractor frame' in the ST, is not translated into the TT. A similar reduction occurs with through-translation in example 4, where the TL neologism '*weefselscan'* is a through-translation of 'tissue scan'. However, the element 'resonance' which is present in the ST, is not included in the TT. The neologism is generalized from a specific type of tissue scan to simply a tissue scan. Although these translations omit parts of the SL neologisms, they nevertheless produce neologisms in the TT. For the purposes of this study, reduced translations are not analyzed as a separate category, but as instances of the translation procedures used in them. However, individual examples in which the reduction affects cognitive estrangement will be discussed in the analysis.

As shown in table 4, the occurrence of the translation procedures differs between form neologisms and sense neologisms. For form neologisms, through-translation (67.2%) and transference (36.1%) are the most frequent, while for sense neologisms, recognized translation (54.5%) is the most frequent. The following sections will discuss the translations of form neologisms and sense neologisms in more detail to analyze what this difference means and to what extent cognitive estrangement is maintained through the various translation procedures.

4.4 Translation of form neologisms

4.4.1 Form neologisms reproduced in the TT

In section 4.2, the various ways in which the SL neologisms produce cognitive estrangement were discussed: compounding neologisms, derivation neologisms and combined compounding + derivation neologisms produce cognitive estrangement by forming novel combinations using existing terminology; creation neologisms do so through shared sounds and morphemes with existing medical terminology; and combined creation + compounding (+ derivation) neologisms and the single borrowing + compounding neologism do so by combining new words with existing terminology. These mechanisms are generally, though not always, reproduced in the TT. This section will analyze each combination of neologism types and translation procedures and how they relate to cognitive estrangement. First, the translation procedures will be discussed which reproduce the way the SL neologisms produce cognitive estrangement. Table 5 below lists the occurrence of each combination of translation procedures for each combination of neologism types.

Table 5

Translation procedure combinations by neologism type combination

	Compounding		Derivation		Creation	
Descriptive term	2	5.9%				
Recognized translation	3	8.8%				
Through-translation	18	52.9%	17	94.4%		
TL neologism	7	20.6%	1	5.6%		
Transference	1	2.9%			22	100%
Omission	2	5.9%				
Through-tr. + naturalization	1	2.9%				
	Comp. + deriv.		**Crea. + comp.**		**Crea. + comp. + deriv.**	
Through-translation	10	83.3%				
Omission					1	6.7%
Through-tr. + funct. eq.	1	8.3%				
Through-tr. + naturalization			1	5.9%	12	80.0%
Through-tr. + transference	1	8.3%	15	88.2%	2	13.3%
Through-tr. + nat. + transf.			1	5.9%		
	Borrowing + compounding					
Through-tr. + transference	1	100%				

For compounding neologisms, derivation neologisms and combined compounding + derivation neologisms, through-translation is by far the most frequently used procedure, accounting for 52.9% of compounding neologisms, 94.4% of derivation

neologisms and 83.3% of combined compounding + derivation neologisms. Combined procedures including through-translation are used for an additional 2.9% of compounding neologisms and 16.6% of compounding + derivation neologisms. The use of through-translation for these neologisms produces cognitive estrangement in the TT through the same mechanism as in the ST: forming novel combinations using existing terminology. This can be seen in the examples below.

Example 5

Compounding (season 2, episode 17)

ST: Deactivating neural callipers.
TT: Neurale passer uitschakelen.

Example 6

Derivation (season 4, episode 18)

ST: I gave him a complete bioscan.
TT: Ik deed een complete bioscan.

Example 7

Compounding + derivation (season 5, episode 16)

ST: It's called genetronic replication.
TT: Namelijk genetronische replicatie.

For the compounding neologism 'neural callipers' in example 5, the derivation neologism 'bioscan' in example 6 and the compounding + derivation neologism

'genetronic replication' in example 7, each separate element is translated using existing TL terms. These elements together form novel compounds in the TL. Note that for 'bioscan', the form in the TL is the same as in the SL. However, it was still analyzed as through-translation rather than transference, because the TL term consists of existing elements in the TL. The term 'bioscan' is read as a fluent TL term, not a term that has been transferred from another language.

Unlike compounding and derivation neologisms, the creation neologisms in the ST produce cognitive estrangement through shared sounds and morphemes with existing terminology. The 22 creation neologisms in the ST are all names of fictional medications that resemble names of existing medications in terms of sound. Each of these creation neologisms is translated using the procedure transference, meaning the neologism is retained in the TT in the same form as in the ST. Many names of medications are the same or similar in English and Dutch, so the neologisms also resemble the names of existing medications in the Dutch. Therefore, transference of the neologisms into the TT produces the same cognitively estranging effect in the TT as in the ST.

Finally, the combined neologism types including creation or borrowing must be discussed: creation + compounding; creation + compounding + derivation; and borrowing + compounding. In the ST, these neologisms produce cognitive estrangement by combining existing terms with new words that are either borrowed or created, as described in section 4.2.3. The same effect is reproduced in the TT through a combination of through-translation and transference and/or naturalization for all but one of these 32 neologisms. Three examples are provided below.

Example 8

Creation + compounding (season 3, episode 23)

ST: The effects of Bendii Syndrome are irreversible. TT: De gevolgen van Bendii-syndroom zijn onomkeerbaar.

Example 9

Borrowing + compounding (season 5, episode 16)

ST: VeK'tal response is falling rapidly. TT: VeK'tal-respons daalt snel.

Example 10

Creation + compounding + derivation (season 2, episode 7)

ST: The First Officer had a mild case of Thelusian flu. TT: Hun eerste officier had last van Thelusiaanse griep.

The remaining combined neologism involving creation is omitted in the TT. Overall, the translations of 85.7% of form neologisms produce cognitive estrangement in the same way as the SL neologism, with through-translation being used for compounding neologisms, transference for creation neologisms, and combined procedures involving through-translation, naturalization and/or transference for combined neologism types which include creation or borrowing.

4.4.2 Other translation procedures for form neologisms

This section discusses the remaining translation procedures used for form neologisms, with the exception of descriptive term, functional equivalence and omission. These three procedures do not necessarily produce any neologism in the TT, which suggests that cognitive estrangement is likely to be either absent in the TT, or significantly reduced compared to the ST. These translations require more precise attention to determine whether, and if yes, how, they produce cognitive estrangement. Therefore, they will be discussed separately in section 4.6.

The previous section concluded that for 85.7% of form neologisms, translation procedures are used that produce cognitive estrangement in the TT in ways that clearly mirror the SL neologisms. However, in some cases, other translation procedures are used, as shown in table 6 below.

Table 6

Translation procedures for compounding and derivation neologisms

	Compounding		Derivation		Comp. + deriv.	
Descriptive term	2	5.9%				
Recognized translation	3	8.8%				
Through-translation	18	52.9%	9	94.4%	10	83.3%
TL neologism	7	20.6%	1	5.6%		
Transference	1	2.9%				
Omission	2	5.9%				
Through-tr. + nat.	1	2.9%				
Through-tr. + funct. eq.					1	8.3%
Through-tr. + transf.					1	8.3%

For compounding neologisms, the second most frequent procedure is TL neologism (20.6%), which also occurs once (5.6%) for derivation neologisms. In 7 out of 8 cases (87.5%), this produces the same effect as through-translation, with existing terms forming novel combinations. For example, the compounding neologism 'plasma plague' (season 2, episode 1) is translated as '*plasmavirus'* - this is a TL neologism rather than a through-translation because 'virus' is not a clear translation of 'plague', but the result is still a novel combination of existing terms.

There is, however, one exception: the compounding neologism 'tissue mitigator' (season 2, episode 17) is translated as '*weefselverwijdering'* (lit. 'tissue removal'). Unlike the SL neologism 'tissue mitigator', '*weefselverwijdering'* is not a new lexical item. It is a neologism because it is being used with a new sense, but its novelty is less clear than that of the SL neologism, which is a new lexical item. Therefore, it may be less estranging, especially because the context does not immediately make it clear that the term is being used with a new sense, as shown in example 11 below.

Example 11

TL sense neologism for SL form neologism (season 2, episode 17)

ST: I anticipate no complications, as the patient has had positive primary results and exhibits extraordinary physical condition. We'll all be home in time for dinner. Tissue mitigator. TT: Ik verwacht geen complicaties omdat de patiënt goede resultaten behaald heeft en in uitzonderlijke fysieke conditie verkeert. We zijn allemaal op tijd thuis voor het eten. Weefselverwijdering.

The phrase ‘tissue mitigator’ in the ST and ‘*weefselverwijdering’* in the TT are not connected to the preceding sentence. They are separate utterances, and the linguistic context does not indicate much about their meaning. Section 4.2.3 described how not only linguistic context but also images and sounds can make it clear to the audience that a word is being used with a new sense. In this scene, however, the ambiguity remains even when images and sounds are considered. The character who is speaking is handed a surgical instrument that looks unfamiliar, but its function is not clear from its appearance, and there is no clear visual or auditory indication that it couldn’t be used for ‘*weefselverwijdering’* (‘tissue removal’ or ‘excision’).

Figure 3

Tissue mitigator in season 2, episode 17

Aside from through-translation and TL neologism, the following procedures are used for compounding neologisms: descriptive term, omission, recognized translation, and transference. As previously mentioned, descriptive term and omission will be discussed in section 4.6. This means that recognized translation and transference are discussed here.

The data contains three instances of recognized translation for compounding neologisms. In a recognized translation, an existing term is used with a new sense in the TT. Therefore, cognitive estrangement in recognized translation can be understood similarly to cognitive estrangement in sense neologisms in general. Section 4.2.3 discussed how context, images and sounds can make it clear to the audience that a term is being used with a new sense. Therefore, to analyze cognitive estrangement in recognized translations, one must analyze the context, images and sounds in the scene.

In two of the three instances of recognized translation for compounding neologisms in the data, the context makes it clear that the term is being used with a new sense. One of these is shown below.

Example 12

Recognized translation for form neologism (season 2, episode 7)

ST [PICARD:] I can't expose the Enterprise until I know where this disease came from and how it is transmitted. [PULASKI:] I realize that, Captain. Naturally, we'll establish a force field containment. **TT** [PICARD:] Ik stel de Enterprise niet bloot aan iets tot ik weet waar het vandaan komt en hoe de overdracht werkt. [PULASKI:] We gebruiken natuurlijk een krachtveld.

In this example, the preceding sentence shows that the purpose of the 'force field containment' or '*krachtveld'* is to prevent exposure to an infectious agent. Using a '*krachtveld'* ('force field') to contain infectious agents is not possible in reality. Therefore, the audience can infer that '*krachtveld'* is referring to a novel technology in the fictional world. While this use of recognized translation may be less estranging than the use of a new lexical item, the TT does produce cognitive estrangement. In the example below, by contrast, the new sense of the term is not as clear in the TT.

Example 13

Recognized translation for form neologism (season 3, episode 25)

ST: Your neurofibre waves are functioning almost normally again. That puts you about six weeks ahead of my original schedule. TT: Je zenuwvezels functioneren alweer bijna helemaal normaal. Daarmee loop je bijna zes weken voor op m'n schema.

In this example, the Dutch word for neurofibres, '*zenuwvezels'*, is used to translate the SL neologism 'neurofibre waves'. Neither the context nor the images or sounds in the scene provide additional information to indicate that the word is referring to something other than the neurofibres that exist in reality. Because it is not made clear to the audience that the word '*zenuwvezels'* is being used with a new sense, cognitive estrangement is reduced in the TT compared to the ST.

In the single instance of transference for a compounding neologism, reduction also occurs, though with a different effect. The SL neologism 'osteotractor frame' is transferred in part, as shown below.

Example 14

Partial transference (season 3, episode 25)

ST: You dislocated your shoulder. Sit down, I'll get the osteotractor frame.
TT: Je schouder is uit de kom geraakt. Ga zitten, dan haal ik de osteotractor.

In this case, unlike in example 13, the TT is equally estranging to the ST, because there is a new lexical unit in the TT. Furthermore, while the omission of 'frame' makes the TL neologism less specific, the context largely compensates for this. The preceding sentence explains that the reason why the '*osteotractor*' is needed is that a character has a dislocated shoulder. This allows the audience to form a clear picture of what an '*osteotractor*' is used for. Despite the reduction of the neologism in the TT, then, there is no indication that cognitive estrangement is significantly reduced in the TT compared to the ST.

In conclusion, among the translations of form neologisms that retain neologisms in the TT, the majority produce cognitive estrangement in ways that mirror the ST. The exceptions are 3 instances of a form neologism in the ST being translated with a sense neologism in the TT. As discussed in section 4.2.3, sense neologisms rely on information in the context, images and sounds in the scene to communicate to the audience that the familiar term is referring to something unfamiliar. When the ST contains a form neologism, the context, images and sounds do not necessarily provide such information. Therefore, the novelty of the sense neologism in the TT may not be apparent to the audience, leading to a reduction in cognitive estrangement, even though the TT contains a neologism.

4.5 Translation of sense neologisms

Table 7 below shows the translation procedures that are used to translate SL sense neologisms. Descriptive term, functional equivalence and omission, which generally do not produce neologisms in the TT, will be discussed in section 4.6. The remaining procedures will be discussed in the present section.

Table 7

Translation procedures for sense neologisms

Procedure	Occurrence	
Recognized translation	17	51.5%
Through-translation	5	15.2%
Transference	3	9.1%
Descriptive term	3	9.1%
Omission	2	6.1%
Functional equivalence	1	3.0%
TL neologism	1	3.0%
Recognized translation + descriptive term	1	3.0%

Section 4.2.3 discussed how sense neologisms produce cognitive estrangement. Sense neologisms are grounded in existing medical terminology because they consist of existing terms, which contributes to the *cognitive* element of cognitive estrangement. However, in order for estrangement to be produced, the viewer must realize that the existing term is being used with a new sense, referring to a novum. In *Star Trek TNG*, the context, images and sounds in the scene make these new senses clear.

Therefore, it is no surprise that recognized translation is the most frequent translation procedure for sense neologisms, occurring 17 times (51.5%) by itself and

once (3.0%) in combination with descriptive term. This maintains the cognitive relationship to reality through the use of existing terminology, and generally, the same context, images and sounds can be expected to communicate to the viewer that the term has a new sense in the TT just as in the ST. Some context may be missing if the dialogue is greatly reduced in the subtitles, but this does not occur in the data analyzed in this study. The use of recognized translation consistently produces cognitive estrangement in the TT in a way that parallels the cognitive estrangement in the ST. Some examples are provided below.

Example 15

Recognized translation for sense neologism (season 5, episode 16)

TT: Microtome. I'm severing the brain stem now.
ST: Microtoom. Ik snij nu de hersenstam door.

In example 15, the direct context is replicated in the TT, indicating that the instrument called a 'microtome' or '*microtoom*' is being used to sever someone's brain stem, which is not the function of a real-world microtome. Additionally, the images in the scene indicate that this instrument is new and unfamiliar, as it does not look like a real-world microtome, and it appears to use some sort of energy beam or laser rather than a physical blade to sever the patient's brain stem.

Figure 4

Microtome in season 5, episode 16

Example 16

Recognized translation for sense neologism (season 7, episode 19)

ST: Life signs appear to be Klingon.
TT: De levenstekenen lijken Klingon te zijn.

In example 16, the direct context in both the ST and TT indicates that these ‘life signs’ or ‘*levenstekenen*’ indicate what species someone belongs to (in this case, Klingon). This makes it clear that the term refers to information gathered using some sort of scanning technology that does not exist in reality. In conclusion, these recognized translations produce cognitive estrangement in the TT in a similar way to the sense neologisms in the ST, because the context, images and sounds communicate to the viewer that the existing words are being used with new senses.

The second most frequent translation procedure for sense neologisms is through-translation (15.2%), which produces new lexical items in the TT. An example is given below.

Example 17

Through-translation for sense neologism (season 4, episode 15)

TT: Your cranial lobes, for instance, they seem to be surgical implants. ST: Uw schedelkwabben lijken implantaten te zijn.

In this example, the SL neologism ‘cranial lobes’ is through-translated to ‘*schedelkwabben*’, with ‘*schedel*’ meaning skull or cranium, and ‘*kwabben*’ meaning lobes. The word refers to forehead protrusions that are characteristic of an alien species that appears in this episode. The images in the scene make it clear that this is the referent of the neologism, because the speaker moves his hand to touch another character’s forehead while speaking.

Figure 5

Cranial lobes in season 4, episode 15

In the ST, this example fits with the general pattern observed in sense neologisms: visual information communicates that an existing term is being used with a new sense. However, in the TT, because of the use of through-translation, the neologism in question is an entirely new term. This new term produces cognitive estrangement in the same way as through-translations of compound neologisms, which were discussed in section 4.4.1: the neologism is made up of familiar anatomical terms which ground it in existing medical language, and these are combined in a novel way to produce estrangement. Here, the TT diverges from the ST by using a form neologism instead of a sense neologism, but cognitive estrangement is not reduced by this shift. Because the new lexical item consists of familiar medical terms, the cognitive aspect of cognitive estrangement is maintained, and estrangement may even be amplified by the increased unfamiliarity of a form neologism.

It is worth noting that even though the images in the scene are not necessary to indicate that a neologism is being used in the TT, they still add to the cognitive estrangement by showing what the neologism '*schedelkwabben*' is referring to. The word itself is estranging due to its unfamiliarity, and the visual information amplifies this effect by showing the strange and unfamiliar thing it is referring to, in this case an alien facial feature. Therefore, additional information in the scene can play a role in the production of cognitive estrangement through form neologisms as well as sense neologisms. In example 17, the visual information that is necessary in the ST to communicate the presence of a sense neologism, amplifies the novelty of the form neologism in the TT.

The other uses of through-translation for sense neologisms in the data produce similar results as in example 17. The same is true for the single sense

neologism (3.0%) that was translated using the TL neologism procedure, which is shown below.

Example 18

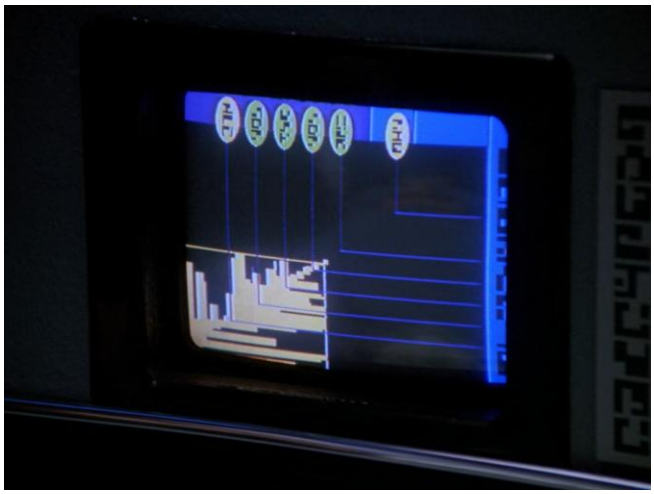
TL neologism for sense neologism (season 4, episode 15)

ST: Move him onto the diagnostic pad.
TT: Leg hem op de diagnosetafel.

The TL neologism '*diagnosetafel*' ('diagnosis table') diverges more from the ST than the through-translation '*schedelkwabben*' in example 17, but it produces a similar effect, where familiar terms are combined in a novel way to produce cognitive estrangement, aided by the images in the scene. The 'diagnostic pad' or '*diagnosetafel*' the character is placed on has monitors like the one shown below, which have unfamiliar symbols, possibly meant to be words in an alien language and script, and from which other characters can deduce information about the patient's health. This communicates to the audience that this is a device that does not exist in reality.

Figure 6

Diagnostic pad in season 4, episode 15



Similarly to through-translation and TL neologism, transference, which was used for 3 sense neologisms (9.1%), produces new lexical items in the TT. However, instead of creating a new lexical item using existing TL words, this procedure transfers the SL neologism into the TT in its original form. All three cases of transference for sense neologisms occur in the same episode and involve the same neologism: ‘VISOR’. One example is given below.

Example 19

Transference of sense neologism (season 6, episode 5)

ST: This is the second time today that my VISOR's just cut out like that.
TT: Dat is de tweede keer vandaag dat m'n VISOR uitvalt.

Figure 7

VISOR in season 6, episode 5

The SL neologism ‘VISOR’ refers to a device worn by a character named Geordi La Forge, shown above, to help him see. ‘VISOR’ is unique among the medical neologisms in *Star Trek TNG* because when spoken, it sounds like it is a sense neologism in which the existing English word ‘visor’ is used with a new sense, but when written, it appears to be a new lexical unit. In written material related to Star Trek TNG, the neologism is spelled ‘VISOR’, explained as an acronym for Visual Instrument and Sensory Organ Replacement (VISOR, n.d.). However, for the purposes of this analysis, it is categorized as a sense neologism because in all its appearances in the data, the audience only hears the word and does not see its written form in the ST.

The fact that the word is rendered as ‘VISOR’ in the TT, implies that the subtitler was aware of its written form in English and possibly of the fact that it is an acronym. The choice to transfer it into the TT in this form hinders the cognitive aspect of cognitive estrangement because for the TL audience, the connection between the neologism and the real world is less clear than for the SL audience.

However, visual information in the scene largely compensates for this. The information provided to the SL audience by the usual meaning of the word ‘visor’ is also communicated visually: the device covers La Forge’s eyes.

Additionally, although cognitive estrangement, an essential characteristic of science fiction, may be somewhat reduced in the TT compared to the ST, this translation choice can still be seen as one that is tailored to the genre of science fiction. As discussed in section 2.5, fans of particular works of fantastical genres of fiction use knowledge of that work’s neologisms to mark their in-group identity (Lu, 2023). Geordi La Forge and his VISOR are a near-constant presence in *Star Trek TNG*, and the VISOR has become an iconic piece of technology from the series. Therefore, for the TT audience, access to its English name means access to a marker for in-group identity as a *Star Trek* fan. This is particularly relevant for a work of science fiction, a genre that tends to inspire high levels of devotion among its audience (Westfahl, 1999). Therefore, although cognitive estrangement is an essential characteristic of science fiction and its presence in the TT serves to give the TL audience access to the genre, a reduction in cognitive estrangement does not necessarily make the genre less accessible to the viewer.

Overall, 81.8% of SL sense neologisms were translated using procedures that retain the neologisms in the TT. The majority of these, 72.7% of sense neologisms, were translated in ways that maintain the cognitive estrangement of the ST in the TT. For the 9.1% of sense neologisms translated using transference, there may be a reduction in cognitive estrangement, but the choice to use transference does give the TL audience access to the SL neologism as a marker of in-group identity. However, this does indicate that even when neologisms are retained in the TT, there can be a reduction of cognitive estrangement. A similar conclusion was drawn

regarding the translation of SL form neologisms with TL sense neologisms in section 4.4.2. Furthermore, the analysis in this section has shown how the subtitles do not function in isolation but rather in conjunction with other dialogue, images and sounds in the scene, and these must be analyzed together in order to assess cognitive estrangement. In the following section, these conclusions will be applied in the analysis of translation procedures that do not necessarily produce neologisms in the TT.

4.6 Translation procedures not producing neologisms

4.6.1 Overview of procedures not producing neologisms

In this section, the translation procedures descriptive term, functional equivalence and omission will be analyzed. These have been separated from the other procedures because they do not necessarily produce neologisms in the TT. They may incidentally result in neology in the TT, but this is not inherent to the procedures themselves, unlike procedures such as through-translation and TL neologism, which were discussed above. This means that when descriptive term, functional equivalence or omission is used, cognitive estrangement is likely to be reduced in the TT. To assess the effect of these translations on cognitive estrangement, closer analysis is required that considers context, images and sounds. Table 8 below shows how many SL neologisms were translated using the procedures in question.

Table 8

Occurrence of procedures that do not produce neologisms

Procedure	Form neologisms		Sense neologisms		All SL neologisms	
Descriptive term	2	1.7%	3	9.1%	5	3.3%
Omission	3	2.5%	2	6.1%	5	3.3%
Functional equivalence			1	3.0%	1	0.7%

Descriptive term and omission each occur 5 times (3.3%), while functional equivalence only occurs once (0.7%). Additionally, these three procedures occur more frequently for sense neologisms than for new lexical units. Each procedure will be analyzed below.

4.6.2 Descriptive term

Two SL form neologisms were translated using descriptive terms, and the two instances produce different effects regarding cognitive estrangement.

Example 20

Descriptive term for form neologism (season 5, episode 16)

ST: The cortical spinal tract has continued to deteriorate over the last seventy-two hours despite CPK enzymatic therapy. TT: De piramidebaan is in de afgelopen 72 uur blijven aftakelen... ondanks de therapie met CPK-enzymen.

Example 21

Descriptive term for form neologism (season 5, episode 16)

ST: The first step would be to fit your legs with motor assist units like this one.
TT: De eerste stap is het uitrusten van je benen met dit soort apparaten.

In example 20, the TT has a similar cognitively estranging effect as the ST, as all the same elements are present (therapy, CPK-enzymes) and in both cases, existing terms are used to create something new. However, in the TT, the descriptive term '*therapie met CPK-enzymen*' ('therapy with CPK enzymes') is used instead of a compound noun like 'CPK enzymatic therapy' in the ST. The compound noun in the ST gives the impression that CPK enzymatic therapy is an established procedure that exists in the Star Trek universe, and therefore a specific novel concept for the viewer. The descriptive term in the TT does not create the same impression of a specific novel procedure. Additionally, there is no visual or auditory information or context in this scene that pertains to this neologism. Although it is unclear whether this shift affects cognitive estrangement, it could be said to reduce the audience's access to the fictional world of Star Trek.

In example 21, there is more evidence for a reduction in cognitive estrangement because of the translation choice. In translating 'motor assist units' to '*dit soort apparaten*' ('this kind of device'), the cognitive element of cognitive estrangement is diminished, because the relationship of the novum to existing concepts and technologies is less clear. The TT is still estranging, because an unfamiliar looking medical device is shown, but there is a weaker cognitive relationship between reality and the fictional world.

Figure 8

Motor assist unit in season 5, episode 16

However, it cannot be said that the cognitive element is entirely lost. The dialogue in example 21 follows an explanation of treatment using implants that pick up electrical impulses from the patient's brain and stimulate his muscles, in order to bypass damage to his spinal cord and help him regain control of his legs. The 'motor assist units' are named as the first step in this process. Therefore, while the neologism itself is less cognitively estranging in the TT, the context explains the cognitive relationship between real medicine and the novum to the audience.

In addition to these two examples, descriptive term is used 3 times (9.1%) for SL sense neologisms. In all 3 cases, this involves the SL neologism 'life signs' being translated as '*tekenen van leven*' ('signs of life'). Two examples are provided below.

Example 22

Descriptive term for sense neologism (season 3, episode 25)

ST: We've picked up life signs, humanoid, very faint and fading. TT: Er zijn tekenen van leven. Menselijk en heel zwak.

Example 23

Descriptive term for sense neologism (season 3, episode 25)

ST: His neck is broken. No life signs. TT: Z'n nek is gebroken. Geen tekenen van leven.

Figure 9

Scanning for life signs in season 3, episode 25

In example 22, the effect is similar to when the recognized translation '*levenstekenen*' is used, as discussed in section 4.5: the context indicates that the 'life signs' in the ST or '*tekenen van leven*' in the TT provide information about what

species or group of species an organism is part of, which suggests that some sort of fictional scanning technology is being used. In example 23, the context does not provide as much information about the meaning of '*tekenen van leven*', but the fictional scanning technology is shown on screen and emits beeping sounds that draw attention to its presence. This communicates to the audience that something unfamiliar is happening that involves '*tekenen van leven*'.

Because either the context or the images and sounds communicate that '*tekenen van leven*' is being used with a new sense, these translations have a similar cognitively estranging effect as the SL neologism 'life signs' and the recognized translation 'levenstekenen'. However, like with the translation of 'CPK enzymatic therapy' in example 20, the descriptive term in the TT does not create the impression of a specific established phenomenon or concept in the same way that the compound neologism in the ST does.

4.6.3 Omission

Omission occurs a total of 5 times (3.3%). The 2 uses (6.1% of sense neologisms) of omission for sense neologisms, like the uses of descriptive term for sense neologisms, involve the SL neologism 'life signs'. The ST sentence 'I'm losing life signs' is translated as '*Hij zakt weg*' ('He is fading') (season 2, episode 1) and '*Hij zakt langzaam weg*' ('He is slowly fading') (season 2, episode 22). Like in example 23, the scanning technology is shown on screen.

Figure 10

Scanning for life signs in season 2, episode 1

However, while in the ST this visual information communicates what ‘life signs’ refers to, the omission of the neologism in the TT here removes this link between the visuals and the dialogue. In the ST, the viewer can see unfamiliar technology on screen, recognize that ‘life signs’ are being scanned with this technology, and therefore understand that the familiar term ‘life signs’ is referring to something unfamiliar. This connection between the familiar and the unfamiliar produces cognitive estrangement. However, in the TT, the audience can only see unfamiliar technology on screen. The unfamiliar does not have a clear cognitive relationship to the familiar, which means that cognitive estrangement is reduced in the TT.

In the 3 uses (2.5% of new lexical units) of omission to translate new lexical units in the ST, this reduction in cognitive estrangement is more pronounced. In these cases, there is no visual or auditory information that relates to the SL neologism. Therefore, the omission of the neologism means there is no indication of novelty in the TT, and the cognitive estrangement produced by the neologism in the

ST is not maintained in the TT. These omissions may be related to the limited space available in subtitles. For example, the ST phrase ‘during an outbreak of plasma plague’ is translated as ‘*tijdens een uitbraak’* (‘during an outbreak’) in season 2, episode 1. The omission is likely not related to any difficulty with the neologism ‘plasma plague’ itself, because elsewhere in the episode it is retained in the TT and translated as ‘*plasmavirus’* (‘plasma virus’). In this case, it is likely to have been omitted to save space for other parts of the longer sentence. Nevertheless, this omission does negatively affect cognitive estrangement in the TT.

4.6.4 Functional equivalence

Finally, the procedure functional equivalence is used once (0.7%), as shown below.

Example 24

Functional equivalence (season 1, episode 3)

ST: I'll make up more hypos for the others. TT: Ik maak injecties voor de rest.

Figure 11

Hypo in season 1, episode 3

The SL neologism ‘hypos’ is short for ‘hyposprays’, a recurring term in *Star Trek TNG* that refers to a device which can inject substances without penetrating the recipient’s skin. The functional equivalent ‘*injecties*’ (‘injections’) in the TT is less specific and does not communicate by itself that a novel technology is being referred to. The images in the scene do provide some indication, because the device is used on top of a character’s clothing, which is not normally done with injections that use needles. However, it is uncertain whether most viewers will notice this. The generalization from ‘hypos’ to the functional equivalent ‘*injecties*’ reduces the estranging effect by drawing less attention to the novelty of the device and thus reduces cognitive estrangement.

In conclusion, although descriptive term, omission and functional equivalence lead to reduced cognitive estrangement in the TT compared to the ST, the context, images and sounds in the scene partly compensate for this in the uses of descriptive term. For the single case of functional equivalence in the data, the context, images and sounds do not significantly compensate for the reduced cognitive estrangement.

When a neologism is omitted altogether in the TT, this type of compensation is not possible because there is no neologism to connect the context, images and sounds to, which means that compared to the other procedures, omission leads to the greatest reduction in cognitive estrangement.

4.7 Quantitative summary of results

Overall, the translations of medical neologisms in Dutch subtitles of *Star Trek TNG* tend to retain the neologisms in the TT and retain cognitive estrangement. Additionally, the neologisms in the TT tend to produce cognitive estrangement in ways that mirror the different types of SL neologisms. This is the case for 93.3% (111 out of 119) of SL form neologisms. For 4.2% (5 out of 119) of SL form neologisms, which were translated using TL sense neologisms or descriptive terms, cognitive estrangement is reduced in the TT compared to the ST, but this reduction is partly compensated for by context, images and sounds in the scene. The remaining 2.5% (3 out of 119) of SL form neologisms are omitted in the TT, leading to a reduction in cognitive estrangement that is not compensated for by context, images or sounds.

Of the 33 SL sense neologisms, 72.7% (24 out of 33) were translated in ways that retain the cognitive estrangement of the ST in the TT. This includes the 54.5% (18 out of 33) of SL sense neologisms that were translated with recognized translation, which reproduces the way SL sense neologisms produce cognitive estrangement. Additionally, it includes the 18.2% (6 out of 33) of SL sense neologisms that were translated using through-translation or TL neologism and produced form neologisms in the TT, possibly increasing cognitive estrangement in the TT. For 18.2% (6 out of 33) SL sense neologisms, which were translated using either transference or descriptive term, cognitive estrangement is reduced in the TT,

but this reduction is partly compensated for by context, images and sounds in the scene. In the case of transference, the reduction occurs because the cognitive link between the novum and reality is weakened, while in the case of descriptive term, the TT is less novel and estranging than the ST. Finally, 9.1% (3 out of 33) of SL sense neologisms were either omitted in the TT or translated using functional equivalence, leading to a reduction in cognitive estrangement that is not compensated for by context, images or sounds in the scene. Table 9 below summarizes these results.

Table 9

Overview of cognitive estrangement in TT

Cognitive estrangement	**SL form neologisms**	**SL sense neologisms**	**All SL neologisms**
Retained, mirrors ST	111 93.3%	18 54.5%	129 84.9%
Retained		6 18.2%	6 4.0%
Reduced with compensation	5 4.2%	6 18.2%	11 7.2%
Reduced without compensation	3 2.5%	3 9.1%	6 4.0%

5. Conclusion

In this descriptive, product-oriented study, the translation of medical neologisms in Dutch subtitles of *Star Trek: The Next Generation* was analyzed. The aim of the study was to determine what translation procedures were used to translate these neologisms, and how the translations affected cognitive estrangement, an essential characteristic of the genre of science fiction. A combined quantitative and qualitative approach was used to answer these questions. Medical neologisms in the ST were identified and classified as form neologisms (new lexical units) or sense neologisms (existing lexical units with new senses). Form neologisms were further categorized into subtypes. Each type of neologism was analyzed to determine how it produces cognitive estrangement. Subsequently, the translation procedures used to translate the medical neologisms were identified, and each combination of translation procedure and SL neologism type was analyzed to assess cognitive estrangement in the TT.

The analysis of the neologisms in the ST found that different types of SL neologisms produce cognitive estrangement by creating a cognitive link between the novum and reality in different ways. Among the form neologisms, compounding and derivation neologisms combine existing medical terminology into novel compounds. Creation neologisms create new terms that share sound qualities and morphemes with existing medical terminology. Neologisms involving combinations of creation or borrowing and compounding or derivation combine existing medical terminology with new terms. In conclusion, the medical neologisms in the ST all bear a strong relationship to existing medical terminology. This grounds them in reality and enables a cognitive view of the novum. For form neologisms, the word form itself is novel, while sense neologisms rely on context, images and audio in the scenes to indicate

their new senses and create a sense of novelty. This novelty combined with the strong relationship to existing medical terminology leads to cognitive estrangement.

Overall, there is a strong tendency for the TT to retain neologisms and cognitive estrangement. For a total of 88.9% of SL neologisms, there is no significant reduction of cognitive estrangement in the TT compared to the ST. Like the SL neologisms, these TL neologisms create a strong link between the novum and existing medical terminology, technology and concepts. Furthermore, 84.9% of SL neologisms were translated using procedures that specifically reproduce the way the corresponding SL neologism type in the ST produces cognitive estrangement. For example, SL compounding neologisms, which produce cognitive estrangement by forming novel combinations of existing SL terms, tend to be translated using through-translation, which produces novel combinations of existing TL terms. Therefore, in addition to a tendency for the TT to retain cognitive estrangement, there is a strong tendency for the TL neologisms to produce cognitive estrangement through the same mechanisms as the corresponding SL neologism.

For 7.2% (11 out of 152) of SL neologisms, there is some reduction of cognitive estrangement in the TT, but this is partly compensated for by context, images or sounds in the scene. These neologisms include those translated using descriptive term, as well as SL form neologisms that were translated with sense neologisms in the TT, and SL sense neologisms that were translated using transference. Finally, for 4.0% (6 out of 152) of SL neologisms, there is a reduction of cognitive estrangement in the TT compared to the ST that is not compensated for by context, images or sounds in the scene. These include SL neologisms that were omitted entirely in the TT, and a single SL neologism that was translated using the procedure functional equivalence.

The translation procedures found in the data include through-translation, transference, recognized translation, naturalization, TL neologism, descriptive term, omission and functional equivalence. The most frequent translation procedures overall are through-translation (55.9%), transference (30.3%) and recognized translation (13.8%). For SL form neologisms, the most frequent procedures are through-translation (67.2%), transference (36.1%) and naturalization (12.6%). For SL sense neologisms, the most frequent procedures are recognized translation (54.5%), TL neologism (12.1%) and descriptive term (12.1%).

The high frequency of through-translation and transference aligns with what was expected for medical translation and for science fiction subtitles. However, procedures that do not produce neologisms in the TT are less frequent than expected for medical translation. The TT tends towards a greater degree of novelty than otherwise expected in medical translation, which may be explained by the importance of novelty and estrangement in science fiction. Furthermore, despite the greater degree of novelty, both the SL neologisms and the TL neologisms tend to bear strong relationships to existing medical terminology.

From this study, several conclusions emerge that are relevant for future research on (medical) neologisms and cognitive estrangement in science fiction subtitles. First, different types of medical neologisms can produce cognitive estrangement in different ways. Form neologisms produce estrangement through the novelty of the word form, and different subtypes have their own mechanisms to ground the neologism in existing medical terminology and establish a cognitive link between reality and the novum. Sense neologisms, on the other hand, establish this cognitive link by using existing terms, and rely on other information from context, images and sounds to indicate the word’s new sense and produce estrangement.

This means, for example, that if an SL form neologism is translated with a TL sense neologism, the additional information from context, images and sounds needed to produce cognitive estrangement may not be present. Therefore, which procedures are likely to maintain cognitive estrangement in the TT, depends on the type of SL neologism that is being translated. Furthermore, this demonstrates the importance of multiple semiotic dimensions in the production of cognitive estrangement in audiovisual translation, which could be explored further in future research.

Second, although cognitive estrangement and source-orientedness have been linked in previous research, they are not always correlated. In *Star Trek TNG*, the relatively target-oriented procedure TL neologism tended to retain the ST's cognitive estrangement in the TT. Furthermore, when the source-oriented procedure transference was used to translate sense neologisms, this led to a reduction in cognitive estrangement. To provide a more complete picture of translation procedures and cognitive estrangement, future research could analyze individual translation procedures, while considering how different neologism types contribute to cognitive estrangement, rather than determining the degree of source-orientedness to assess cognitive estrangement.

Finally, although cognitive estrangement is an essential characteristic of science fiction, in some cases, other expectations of the genre may conflict with it. For example, recurring SL neologisms may gain an iconic status and become markers for in-group identity among fans. Transferring these neologisms into the TT in their SL form may reduce cognitive estrangement in the TT, but it does provide the TL audience with access to this marker for in-group identity. While this applies to fantastical fiction in general, such markers may be especially important in science

fiction, a genre that tends to evoke great amounts of devotion among its fans. The data from this study is not sufficient to determine whether transference of recurring SL neologisms is a common phenomenon in science fiction, and future research could explore it further.

Neologisms are one of the greatest challenges for translators (Newmark, 1988). Medical neologisms in particular require knowledge of medicine and medical terminology on the part of the translator, because they must fit with existing medical terminology to be convincing. This is especially important in science fiction because of the importance of cognitive estrangement, which involves both a high degree of novelty, and a clear cognitive relationship between the unfamiliar and the familiar. By incorporating expectations and characteristics of medical translation and audiovisual translation into an analysis of neologisms and cognitive estrangement, this study has provided new insight into the relationship between domain, medium and genre, and thereby new directions for future research on neologism translation in science fiction.

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Appendix A: Data

Ep.	SL	TL	Type	Subtype	Procedure(s)
1x03	life signs	levenstekens	Sense	Sense	Recognized translation
1x03	hypos	injecties	Sense	Sense	Functional equivalence
2x01	plasma plague	-	Form	Compounding	Omission
2x01	plasma plague	plasmavirus	Form	Compounding	TL neologism
2x01	plasma plague	plasmavirus	Form	Compounding	TL neologism
2x01	plasma plague	plasmavirus	Form	Compounding	TL neologism
2x01	life signs	-	Sense	Sense	Omission
2x07	Thelusian flu	Thelusiaanse griep	Form	Creation + compounding + derivation	Naturalization + through-translation
2x07	Thelusian flu	Thelusiaanse griep	Form	Creation + compounding + derivation	Naturalization + through-translation
2x07	Thelusian flu	Thelusiaanse griep	Form	Creation + compounding + derivation	Naturalization + through-translation
2x07	Thelusian flu	Thelusiaanse griep	Form	Creation + compounding + derivation	Naturalization + through-translation
2x07	Thelusian flu	Thelusiaanse griep	Form	Creation + compounding + derivation	Naturalization + through-translation
2x07	Thelusian flu	Thelusiaanse griep	Form	Creation + compounding + derivation	Naturalization + through-translation
2x07	force field containment	krachtveld	Form	Compounding	Recognized translation (reduced)

2x07	life signs	levenstekenen	Sense	Sense	Recognized translation
2x17	metabolation occlusions	metabole sluitingen	Form	Derivation + compounding	Functional equivalence + through-translation
2x17	heterocyclic declination	heterocyclische afbraak	Form	Compounding	Through-translation
2x17	neural callipers	neurale passer	Form	Compounding	Through-translation
2x17	neural callipers	neurale passer	Form	Compounding	Through-translation
2x17	parthenogenetic implant	parthenogenetisch implantaat	Form	Compounding	Through-translation
2x17	thoracic polychromatics	thoracale polychromatiek	Form	Compounding	Through-translation
2x17	biomolecular physiologist	biomoleculaire fysioloog	Form	Derivation + compounding	Through-translation
2x17	tissue mitigator	weefselverwijdering	Form	Compounding	TL neologism
2x17	metabolation	metabulatie	Form	Derivation	TL neologism
2x17	sterile field	steriel veld	Sense	Sense	Recognized translation
2x17	heterocyclics	heterocyclus	Sense	Sense	Through-translation
2x22	felicium	felicium	Form	Creation	Transference
2x22	tricordrazine	tricordrazine	Form	Creation	Transference
2x22	tricordrazine	tricordrazine	Form	Creation	Transference
2x22	tricordrazine	tricordrazine	Form	Creation	Transference
2x22	life signs	-	Sense	Sense	Omission
3x23	Bendii Syndrome	Bendii-syndroom	Form	Creation + compounding	Transference + through-translation
3x23	Bendii Syndrome	Bendii-syndroom	Form	Creation + compounding	Transference + through-translation
3x23	Bendii Syndrome	Bendii-syndroom	Form	Creation + compounding	Transference + through-translation
3x23	Bendii Syndrome	Bendii-syndroom	Form	Creation + compounding	Transference + through-translation

3x23	Bendii Syndrome	Bendii-syndroom	Form	Creation + compounding	Transference + through-translation
3x23	Bendii Syndrome	Bendii-syndroom	Form	Creation + compounding	Transference + through-translation
3x23	Bendii Syndrome	Bendii-syndroom	Form	Creation + compounding	Transference + through-translation
3x25	protodynoplaser	protodynoplazer	Form	Creation + compounding + derivation	Through-translation + naturalization
3x25	motor-assist bands	motorische hulpbanden	Form	Compounding	Through-translation
3x25	bioscan	bioscan	Form	Derivation	Through-translation
3x25	bioscan	bioscan	Form	Derivation	Through-translation
3x25	neurolink	neurolink	Form	Derivation	Through-translation
3x25	neurofibre waves	zenuwvezels	Form	Compounding	Recognized translation (reduced)
3x25	inoprovaline	inaprovaline	Form	Creation	Transference
3x25	emergency bio-support unit	biosupporteenheid	Form	Compounding	Through-translation (reduced)
3x25	osteotractor frame	osteotractor	Form	Compounding	Transference (reduced)
3x25	life signs	tekenen van leven	Sense	Sense	Descriptive term
3x25	life signs	tekenen van leven	Sense	Sense	Descriptive term
3x25	neurofeedback	neurale feedback	Sense	Sense	Recognized translation
4x08	Altarian encephalitis	Altariaanse encefalitis	Form	Creation + compounding + derivation	Naturalization + through-translation
4x08	compression attenuator	compressieverzwakker	Form	Compounding	Through-translation
4x08	neural scanners	neuroscanners	Form	Compounding	TL neologism
4x08	neural scanners	neuroscanners	Form	Compounding	TL neologism
4x08	neural scanners	neuroscanners	Form	Compounding	TL neologism

4x08	VISOR	vizier	Sense	Sense	Recognized translation
4x08	VISOR	vizier	Sense	Sense	Recognized translation
4x08	VISOR	vizier	Sense	Sense	Recognized translation
4x15	vital buffers	-	Form	Compounding	Omission
4x15	phaser wound	faserwond	Form	Compounding	Naturalization + through-translation
4x15	adrulmine	adrulmine	Form	Creation	Transference
4x15	quadroline	quadroline	Form	Creation	Transference
4x15	del-scan series	del-scan	Form	Creation + compounding	Transference + through-translation (reduced)
4x15	diagnostic pad	diagnosetafel	Sense	Sense	TL neologism
4x15	cranial lobes	schedelkwabben	Sense	Sense	Through-translation
4x18	bioscan	bioscan	Form	Derivation	Through-translation
4x18	bioscan	bioscan	Form	Derivation	Through-translation
4x18	bioscan	bioscan	Form	Derivation	Through-translation
4x18	bioscans	bioscans	Form	Derivation	Through-translation
4x18	kayolane	kayolane	Form	Creation	Transference
4x18	T-cell stimulator	T-cel-stimulator	Sense	Sense	Recognized translation
4x18	T-cell stimulator	T-cel-stimulator	Sense	Sense	Recognized translation
4x18	T-cell stimulator	T-cel-stimulator	Sense	Sense	Recognized translation
4x23	metrazene	metrazene	Form	Creation	Transference
4x23	metrazene	metrazene	Form	Creation	Transference
4x23	hypospray	hypospray	Form	Derivation	Through-translation
4x23	hypospray	hypospray	Form	Derivation	Through-translation
4x23	metabolic booster	booster	Sense	Sense	Recognized translation (reduced)

5x16	detronal scanner	detronale scanner	Form	Creation + compounding	Naturalization + through-translation
5x16	CPK enzymatic therapy	therapie met CPK-enzymen	Form	Compounding	Descriptive term
5x16	motor assist units	dit soort apparaten	Form	Compounding	Descriptive term
5x16	cybernetic regeneration	cybernetische regeneratie	Form	Compounding	Through-translation
5x16	holosimulations	holosimulaties	Form	Compounding	Through-translation
5x16	neural metaphasic shock	neurale metafase shock	Form	Compounding	Through-translation
5x16	neural transducers	neurale transductors	Form	Compounding	Through-translation
5x16	thalamic booster series	reeks thalamusprikkels	Form	Compounding	Through-translation
5x16	genetronics	genetronica	Form	Derivation	Through-translation
5x16	genetronics	genetronica	Form	Derivation	Through-translation
5x16	biomonitors	biomonitors	Form	Derivation	Through-translation
5x16	exoscalpel	exoscalpel	Form	Derivation	Through-translation
5x16	polyadrenaline	polyadrenaline	Form	Derivation	Through-translation
5x16	genetronic procedure	genetronische procedure	Form	Derivation + compounding	Through-translation
5x16	genetronic procedure	genotronische procedure	Form	Derivation + compounding	Through-translation
5x16	genetronic replication	genetronische replicatie	Form	Derivation + compounding	Through-translation
5x16	genetronic replicator	genetronische replicator	Form	Derivation + compounding	Through-translation
5x16	genetronic replicator	genetronische replicator	Form	Derivation + compounding	Through-translation
5x16	genetronic scans	genetronische scans	Form	Derivation + compounding	Through-translation

5x16	bio-active interfaces	bioactieve interfaces	Form	Derivation + compounding	Through-translation
5x16	borathium	borathium	Form	Creation	Transference
5x16	borathium	borathium	Form	Creation	Transference
5x16	cordrazine	cordrazine	Form	Creation	Transference
5x16	inoprovaline	inaprovaline	Form	Creation	Transference
5x16	inoprovaline	inaprovaline	Form	Creation	Transference
5x16	inoprovaline	inaprovaline	Form	Creation	Transference
5x16	leporazine	leporazine	Form	Creation	Transference
5x16	leporazine	leporazine	Form	Creation	Transference
5x16	leporazine	leporazine	Form	Creation	Transference
5x16	morathial	morathial	Form	Creation	Transference
5x16	morathial	morathial	Form	Creation	Transference
5x16	rybo-synetic therapy	rybo-synetische therapie	Form	Creation + compounding	Transference + naturalization + through-translation
5x16	VeK'tal response	VeK'tal-respons	Form	Borrowing (alien) + compounding	Transference + through-translation
5x16	chloromydride	chloromydride	Form	Creation + compounding	Transference + through-translation
5x16	alkysine treatment	alkysinebehandeling	Form	Creation + compounding	Transference + through-translation
5x16	borathium therapy	borathiumtherapie	Form	Creation + compounding	Transference + through-translation
5x16	drechtal beams	drechtalstralen	Form	Creation + compounding	Transference + through-translation
5x16	morathial series	morathial-reeks	Form	Creation + compounding	Transference + through-translation
5x16	rybo-therapy	rybo-therapie	Form	Creation + compounding	Transference + through-translation
5x16	TCH levels	TCH-niveaus	Form	Creation + compounding	Transference + through-translation

5x16	restraining field	krachtveld (...) om me tegen te houden	Sense	Sense	Recognized translation + descriptive term
5x16	microtome	microtoom	Sense	Sense	Recognized translation
5x16	restraining field	krachtveld	Sense	Sense	Recognized translation (reduced)
5x16	restraining field	krachtveld	Sense	Sense	Recognized translation (reduced)
6x05	plasma infusion unit	plasma-infuus	Form	Compounding	Recognized translation
6x05	resonance tissue scan	weefselscan	Form	Compounding	Through-translation (reduced)
6x05	VISOR	VISOR	Sense	Sense	Transference
6x05	VISOR	VISOR	Sense	Sense	Transference
6x05	VISOR	VISOR	Sense	Sense	Transference
6x05	neural inputs	neurale input	Sense	Sense	Recognized translation
6x22	physiostasis	fysio-stasis	Form	Derivation	Through-translation
6x22	inoprovaline	inoprovaline	Form	Creation	Transference
6x22	tricorder scan	tricorderscan	Form	Derivation + compounding	Transference + through-translation
6x22	cortical stimulators	cortexstimulators	Sense	Sense	Through-translation
6x22	tissue scan	weefselscan	Sense	Sense	Through-translation
7x19	Urodelan flu	-	Form	Creation + compounding+ derivation	Omission
7x19	Symbalene blood burn	Symbaleense bloedbrand	Form	Creation + compounding+ derivation	Naturalization + through-translation

7x19	Terrelian Death Syndrome	Terreliaans Doodssyndroom	Form	Creation + compounding+ derivation	Naturalization + through-translation
7x19	Terrelian Death Syndrome	Terreliaans Doodssyndroom	Form	Creation + compounding+ derivation	Naturalization + through-translation
7x19	Urodelan flu	Urodelaanse griep	Form	Creation + compounding+ derivation	Naturalization + through-translation
7x19	intron virus	intronvirus	Form	Compounding	Through-translation
7x19	microcellular scan	micro-cellulaire scan	Form	Compounding	Through-translation
7x19	ribocyatic flux	ribocyatische verandering	Form	Compounding	Through-translation
7x19	amniotic scan	vruchtwaterscan	Form	Compounding	Through-translation
7x19	bioscan	bio-scan	Form	Derivation	Through-translation
7x19	bioactivant solution	bio-activerende oplossing	Form	Derivation + compounding	Through-translation
7x19	biospectral analysis	bio-spectrale analyse	Form	Derivation + compounding	Through-translation
7x19	hypospray	hypospray	Form	Derivation	Through-translation
7x19	Barclay's Protomorphosis	Barclay's protomorfose	Form	Creation + compounding + derivation	Transference + through-translation
7x19	Barclay's Protomorphosis Syndrome	Barclay's protomorfosesyndroom	Form	Creation + compounding + derivation	Transference + through-translation
7x19	life signs	tekenen van leven	Sense	Sense	Descriptive term
7x19	life signs	levenstekenen	Sense	Sense	Recognized translation
7x19	life signs	levenstekenen	Sense	Sense	Recognized translation
7x19	amniotic scan	vruchtwaterscan	Sense	Sense	Through-translation