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## *Chasing the Phantom*

*Translating Medical Terminology and Metaphors  
in Popular Science*



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## Abstract

This study investigates methods for translating medical terminology and metaphors in a popular science text on neurology. The source text translated and used as basis for this study is “Knowing Where to Scratch”, the second chapter from the book *Phantoms in the Brain. Human Nature and the Architecture of the Mind* by V.S Ramachandran and Sandra Blakeslee. The translation is based on Vinay & Darbelnet’s strategies direct translation and oblique translation. Terms and metaphors in the source text are analysed both quantitatively and qualitatively. The quantitative analysis of metaphors is based on Lakoff & Johnson’s conceptual metaphors and provides the basis for the qualitative analysis, mainly based on Newmarks’s theories on metaphor translation. The analysis of terms are based on Arntz’s concept of terminological equivalence and it focuses on phantom as a medical term, inconsistent terminology and terminological gaps.

The translation choices were based on these theoretical findings but also supported by corpus searches in Corpus of Global Web-Based English and Språkbanken as well as searches in Läkartidningen’s digital article archive.

The study demonstrates that the translational process is not only affected by the terminological gaps between languages but also lack of consistent terminology within a limited subject area. Furthermore the study supports Reynolds’ statement on metaphors as “important conceptual ‘tools’ in the scientific tool-kit” and also Loftus’ theory on metaphors going from being a way to explain new medical findings to become parts of medical terminology.

## Key Words

Metaphors, terminology, popular science,

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# 1 Introduction

At first glance, terminology and metaphors can make the impression of not having much in common. Terminology is associated with science and hard facts, whereas metaphors are often talked about in terms of poetry and elaborate language. However, Reynolds (2014:176), calls metaphors “important conceptual ‘tools’ in the scientific tool-kit” and Stålhammar (1997:55) writes that the “basis for the scientific metaphor is that something previously unknown should be mediated in an explanatory and convincing way” and that “metaphors in science often originate from typical every-day areas” [my translation]. Furthermore, Stålhammar draws the conclusion that scientific metaphors contribute to the creation of “related terms, based on a systematic similarity” [my translation]. In this manner, metaphors have been a part of scientific language for a very long time. Loftus (2011: 216–217) points out that metaphors initially used to describe new medical or anatomical findings have become established ways to view the body or an illness. The relation between metaphors and science are according to Lancor (2014:1246) “inescapable”.

Terminology on the other hand is a recognized feature in scientific language and using terminology is a way of being exact. However, terminology is not solely used by professionals when communicating with other professionals to pin down exact meanings. Cabré et al (1999:9) link terminology close to the fields of special subjects but emphasizes that terminology cannot be an end in itself and terminological work cannot be about simply providing series of concepts with their corresponding names.

*Phantoms in the Brain* is a popularized science book aiming to explain scientific findings for readers with little or no knowledge about neurology. In order to do so, metaphors as well as terminology are used, as in (1) and (2).

(1) Surgeons even *perform dorsal rhizotomies* to treat phantom limb pain, *cutting the sensory nerves going into the spinal cord*.

För att behandla fantomsmärta utför kirurger till och med *dorsala rizotomier*, det vill säga att *de skär av de känselnerver som går in i ryggraden*.

In (1) the use of the medical term *dorsal rhizotomi* is followed by an explanation of the term, making it easier for the lay reader to understand the processes the surgeons perform. Another way of adjusting the text and the subject to the lay reader is the use of metaphors, as in example (2) where the thalamus is described as a relay station:

<p>(2) Or they will go all the way into the <i>thalamus</i>, a <i>brain relay station</i> that processes signals before they are sent to the cortex [...]</p>	<p>Eller så går de ända in i <i>thalamus</i>, en <i>kopplingsstation i hjärnan</i> som bearbetar signalerna innan de skickas vidare till hjärnbarken [...]</p>
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In ex (1) the medical term is followed by a description what exactly is done when performing a dorsal rhizotomi. In (2) the medical term *thalamus* is followed by an explanation as well, but in form of a metaphor. The source text's mix of terminology and metaphors in order to explain how brain and the neurological system handles the loss of a body part, makes analysing those two areas particularly interesting.

## 2 Aim

The aim of this study is to investigate metaphors used within the field of neurology to explain functions of the brain and the nervous system for the lay reader. Also, terminology used within the field of neurology and especially referring to functions of the brain and the nervous system for the lay reader, are to be investigated. Both investigations are carried out in order to create idiomatic translations.

## 3 Material and Method

### 3.1 The Source Text: "Phantoms in the Brain"

The source text (henceforth ST) for the translation and analysis is the second chapter from the book *Phantoms in the Brain – Human Nature and the Architecture of the Mind* by V.S Ramachandran and Sandra Blakeslee. V.S Ramachandran is a neurologist, originally from India, but trained at the University of Oxford and now in position as Director of the Center for Brain and Cognition at the University of California, San Diego<sup>1</sup>. Sandra Blakeslee is a science writer specialized in brain sciences<sup>2</sup>. Montalt (2013:79) points out that by tradition the translation of medical texts has been viewed in terms of highly specialized texts. Today, medical texts exist in a whole set of different contexts, for an example popularizations of all kinds, and *Phantoms in the Brain – Human Nature and the Architecture of the Mind* is a good example of this. *Phantoms in the Brain* was originally published in 1998 but the ST for this essay is from the 2005 Harper Perennial edition. The target reader for this text is the well-educated lay reader, reading for pleasure and personal interest.

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<sup>1</sup> <http://cbc.ucsd.edu/ramabio.html>

<sup>2</sup> <http://sandrablakeslee.com/>

## 3.2 Method

Vinay & Darbelnet (1995:166) recommend that a “translation should never be started before the entire text has been read and re-read”. The initial act was therefore to re-read the entire book after which a pilot study of the chosen chapter, “Knowing Where to Scratch”, was carried out, to indicate aspects suitable for an analysis. As the medical terminology as well as the use of metaphors were two features that characterized the ST those were chosen for this analysis. Throughout the translation, comments were made either as a result of the translational work being challenging or when the process proved to illustrate strong examples supporting or disproving the translation methods and strategies discussed in the theoretical background.

The initial analytical work was performed according to the method suggested by Arntz (1993); beginning with reading parallel target language (hence forth TL) texts covering the subjects of phantom limbs and the brain. *Handen och hjärnan. Från Lucys tumme till den tankestyrda robothanden*, by Göran Lundborg, *Kognitiv neurovetenskap* by Lars Nyberg and *Hjärnkoll på värk och smärta* by Martin Ingvar and Gunilla Eldh, have been consulted as well as *Läkartidningen*'s digital article archive. Arntz (1993: 8) specifically points out that at this preparatory stage “translations are completely out of the question”, but as Arntz's method is for terminology work strictly and this analysis also covers metaphors the originals and the translations of Oliver Sack's *A Leg To Stand On* as well as Jill Bolte Taylor's *Stroke of Insight* were included. The corpora *Corpus of Global Web-Based English* (henceforth GloWbE) and *Språkbanken* were also accessed. For specific terminological difficulties Svenska Läkaresällskapets Språkkommitté was consulted.

The metaphor analysis is based on Lakoff & Johnson's theory on conceptual metaphors and Newmark's seven main procedures for translating metaphors. Newmark's preferred procedure, reproducing the same image in the TL, provided that the image has comparable frequency and currency in the appropriate register, proved valid. Translating terminology proved to have other difficulties than translating metaphors, mainly consisting of terminological gaps and the use of inconsistent terminology in the SL as well as the TL. In order to elucidate a certain term's use *Språkbanken*, *GloWbe*, as well as *Läkartidningen*'s digital archives were used. In the translation of medical terms Arntz's method of drawing terminological trees for the terms in the languages concerned proved helpful. Terminology proved to be the most difficult challenge in the translation process, primarily due to lack of coherent

terminology in the TL, but also a lack of literature covering the subject of phantom limbs.

## 4 Theoretical Background

### 4.1 Translational Procedure

The present study of metaphors and terminology is partly based on the two general translation strategies identified by Vinay & Darbelnet (1995:31): *Direct translation* and *oblique translation*. Vinay & Darbelnet hold the strategy of direct translation as the goal which the translator should aim for, but when direct translation is not possible oblique translation should be used. Vinay & Darbelnet divide direct translation in three different methods; *borrowing*, *calque* and *literal translation*. As borrowing and literal translation are the methods referred to in the analysis, these are explained below:

According to Vinay & Darbelnet (1995:32) *borrowing* is the simplest of all translation methods and is used by translators to create a stylistic effect. Borrowing often contains culture-specific expressions, such as the Russian *datcha* or *roubles*. An example taken from the present translation is keeping the ST expression *high school* in the TT. *Literal translation* (Vinay & Darbelnet 1995:33–34) or word-for-word translation is the direct transfer of a ST into a grammatically and idiomatically correct TL text. A literal translation is described as a “unique solution which is reversible and complete in itself”. However, literal translation is most likely to occur when translating between languages belonging to the same language family and between two languages that also share many features. The sentence “I forgot my hat” is a literal translation of “Jag glömde min hatt”, whereas “My hat! I forgot it” is not, even though both translations have the same intended meaning.

*Oblique translation* covers four strategies: *transposition*, *modulation*, *equivalence* and *adaption*. In this essay only the strategy of equivalence is referred to. *Equivalence* (Vinay & Darbelnet 1995:38) is the strategy frequently used when translating animal sounds, idioms and clichés. Equivalence is what happens when we produce two texts but use different stylistic and structural methods. One example is the French *Aïe!* (when hurting yourself) translated into the English *Ouch!* Equivalence is also a strategy recommended for translating metaphors.

According to Vinay & Darbelnet (1995:40) these strategies can be applied on three different levels of expression; lexis, syntactic structure and message, and they are

all applied to different degrees. Sometimes more than one of the seven strategies can be used within one sentence and in some cases translations come under so many methods that they can be difficult to distinguish from each other. As the analysis focuses on terminology and metaphor, the methods are analysed mainly from the aspect of lexical and message expressions.

## 4.2 Translating Metaphors

Vinay & Darbelnet (1995:210) define two main outcomes when translating metaphors. The first outcome occurs when metaphors between two languages correspond exactly or almost. This outcome is mostly a result of translating between cultures that have common traditions. The second outcome occurs when the TL does not permit a literal translation, in which case the translator has to look for an equivalent metaphor in the TL. Newmark (1981:50) lists seven strategies for translating metaphors. Vinay & Darbelnet's two main outcomes of metaphor translation correspond with the two first strategies on Newmark's list. The examples in strategy 1-2 are from the present ST.

- 1 Reproducing the same image in the TL, provided that the image has comparable frequency and currency in the appropriate register. Ex: *Coined the phrase* -> *Myntade uttrycket*.
- 2 The translator may replace the image in the SL with a standard TL image, which does not clash with the TL culture, but which, like most stock metaphors, proverbs etc., is presumably coined by one person and diffused through popular speech, writing and later the media. Ex: *Embark on their research* -> *Sjösätta sitt forskningsprojekt*.
- 3 Translation of metaphor by simile, retaining the image. Ex: *With the sinuous glide of a sea snake* -> *glider fram likt en slingrande vattenorm*.
- 4 Translation of metaphor (or simile) by simile plus sense (or occasionally a metaphor plus sense). Ex: *He is a weasel* -> *Han är lömsk som en vessla*.
- 5 Conversion of metaphor to sense. Ex: *The party was a real dog* -> *Festen blev ett fiasko*.
- 6 Deletion. Ex: *She ran for her life* -> *Hon sprang snabbt*.
- 7 Same metaphor combined with sense. This strategy can be used in case a metaphor cannot be directly translated and/or if there is no equivalent metaphor in the TL. An example from Newmark (1981:52) is the translation of "The tongue is a fire" from

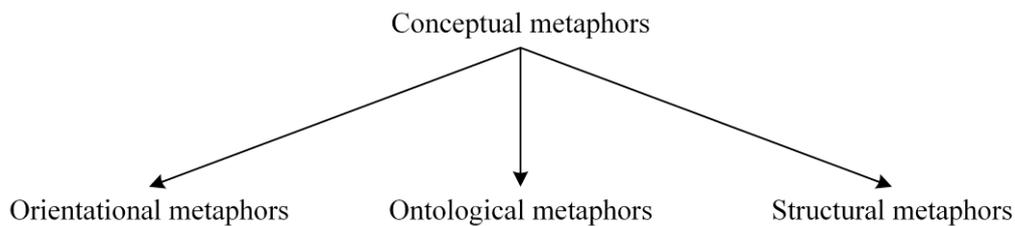
James.3.6 with the suggestion to add “A fire ruin things; what we say can also ruin things”.

Translation strategy 1) reproducing the same image in the TL, provided that the image has comparable frequency and currency in the appropriate register, is more or less a description of Vinay & Darbelnet’s (1995:210) example of metaphors that correspond. Translation strategy 2) replacing the SL image with a standard TL image, corresponds well with Vinay & Darbelnet’s strategy of finding an TL metaphor, should metaphors do not correspond, due to, for an example cultural differences. Newmark’s strategies 1) and 2) are the most frequently used in this study.

#### 4.2.1 The functions of metaphors

According to Scherer et al (2015:37) metaphors are “embedded in how we talk about health and illness”. This statement is supported by expressions such as “I’ve been battling this cold for a week”. Scherer et al (2015:38) suggest that in cases such as these, metaphors serve the function of providing a sense of personal control. When health and illness are discussed in other contexts, such as within popular science, Kendall-Taylor et al (2013:416) claim that metaphors work as “a bridge between expert and public (that is, non-scientist)”. In popular science advanced or difficult scientific findings are described in a way that make them accessible to the lay reader, which make the metaphor function as bridge expedient to its purpose.

Lakoff & Johnson’s classic *Metaphors We Live By* (2003) begins with the authors’ notice that for most people, metaphors are mainly associated with extraordinary language and not ordinary language. Moreover, metaphors are viewed as belonging to language in terms of words instead of thought or action. Lakoff & Johnson (2003:5) oppose these views and with their definition of metaphor as “understanding and experiencing one kind of thing in terms of another” they argue that how we think and act are fundamentally metaphorical. Using one concept to understand another concept is a process referred to by Lakoff & Johnson as a *conceptual metaphor*. Conceptual metaphors are in their turn divided into three categories: *Structural metaphors*, *orientational metaphors* and *ontological metaphors*:



As Lakoff & Johnson’s book was originally published in 1980 their thoughts have influenced language theorists of all kinds for more than 30 years. The year after *Metaphors We Live By* was published Peter Newmark (1981:49) wrote: “As I see it, the main and one serious purpose of metaphor is to describe an entity, event or quality more comprehensively and concisely and in a more complex way than is possible by using literal language.” With time the function of metaphor as a device for structuring thought has been acknowledged. Kendall-Taylor et al (2013:415) describe the metaphor as “a device for thinking and talking with” and define a good metaphor as something that “leads people to think and talk productively about something that they were not previously proficient in thinking or talking about”. Kendall-Taylor et al’s statement is an apposite description of how metaphors are used within popular science. Min-Hsiu (2013:131) points out that metaphors in popularized texts “are important in explaining difficult and abstract scientific concepts to the lay readers” and Loftus (2011: 216–217) describes metaphors as “important tools for generating meaning and are important when medical scientists attempt to formulate new knowledge and in helping health professionals to communicate with patients”. Min-Hsiu’s and Loftus’ descriptions of the function of metaphors are clearly connected to Lakoff & Johnson’s (2003:5) definition of metaphors as the “understanding and experiencing one kind of thing in terms of another”. Kendall-Taylor et al (2013:416) propose that the use of metaphor within science writing “enhance non-scientists’ understanding of science and make them more effective consumers of science media”. In this analysis I will look closer at the recurrent themes of metaphors, used when writing for the non-scientist media consumer.

### *Structural metaphors*

Lakoff & Johnson (2003:14) define structural metaphors as cases where one concept is structured in terms of another and they illustrate their example with the structural metaphor ARGUMENT IS WAR, pointing out that apart from speaking about arguments of in terms of war, we actually think of arguments in terms of war: Arguments can be won or lost, positions are attacked or we win and lose ground.

### *Orientational metaphors*

According to Lakoff & Johnson (2003:14) orientational metaphors organize a whole system of concepts connected to spatial orientation: up-down, front-back, on-off, deep-shallow, central-peripheral. Lakoff & Johnson explain the rise of these metaphors as coming from the way our bodies function in relation to our physical environment. One example is HAPPY IS UP; SAD IS DOWN, which generates metaphorical expressions such as “I’m feeling *up*”, “I’m feeling *down*”, “You’re in *high* spirits”, and “My spirits *sank*”. When used within science Lakoff & Johnson (2003:18) conclude that “[p]surely intellectual concepts, e.g., the concepts in a scientific theory, are often – perhaps always – based on metaphors that have a physical and/or cultural basis.” The examples Lakoff & Johnson give are the “high” in “high energy particles” which is based on MORE IS UP. The “high” in “high level functions” is based on RATIONAL IS UP.

### *Ontological metaphors*

Concepts used within scientific theories can also be metaphors that allow us to understand and talk about our experiences in terms of objects and substances. These metaphors are what Lakoff & Johnson (2003:25) call *ontological metaphors*. Ontological metaphors make it possible for us to quantify and categorize our experiences and be able to reason about them, such as in the examples below:

Referring: My *fear of insects* is driving my wife crazy

Quantifying: It will take *a lot of patience* to finish this book

Identifying Aspects: His *emotional health* has deteriorated recently

Identifying Causes: He did it out of *anger*.

Setting Goals and Motivating Actions: She saw getting married as the *solution to her problems*.

The example used by Lakoff & Johnson is the ontological metaphor THE MIND IS AN ENTITY elaborated as THE MIND IS A MACHINE and THE MIND IS A BRITTLE OBJECT.

THE MIND IS A MACHINE

I’m *a little rusty* today

We’ve been working on this problem all

THE MIND IS A BRITTLE OBJECT

Her ego is very *fragile*

I’m *going to pieces*.

day and now we're *running out of steam*      His mind *snapped*.  
My mind just isn't *operating* today

Many of these expressions are not noticed as metaphors and according to Lakoff & Johnson (2003:27) this comes from their limited range of purposes, such as referring or quantifying mentioned above. Lakoff & Johnson (2003: 29) view ontological metaphors as integral parts of the model of the mind and they are an integrated part of how we think.

### 4.3 Translating Terminology

According to Vinay & Darbelnet (1995:4), texts are usually dominated by a set of terms or key words and they strongly advise to identify these early on in the translation process. The prerequisite for this process is the definition of what constitutes a term. Costa (2013:36) defines terms as “means to represent knowledge”, but the definition to be used in this essay needs to be a bit more exact. Therefore the definition of term held by Terminologikum, [www.tnc.se](http://www.tnc.se), will be used: A term is a “linguistic name for a general concept that belongs to a subject field” [my translation]. To exemplify the definition, the general concept *bow* is used:

- The term *bow* when belonging to the subject field of weaponry: A weapon for shooting arrows
- The term *bow* when belonging to the subject field of watercrafts: The fore-end of a ship or boat
- The term *bow* when belonging to the subject field of calligraphy: A curved stroke forming part of a letter.

The conclusion is that the same general concept can act as one or several terms depending on the context.

According to Arntz (1993:11), definitions of terminologically relevant terms can sometimes be missing in one language or the existent definitions have different structures within their separate languages. This level of equivalence is also discussed by Ingo (2007: 103-105), who emphasizes that when translating a term, the term needs to be on the same level in the hierarchical systems of the SL and the TL. For an example, *grapes* should not be translated into the more general term *fruit* or the more specific term *green grapes*. When comparing terminological structures between languages

different cases of equivalence can appear. Arntz (1993:13–15) defines four such different cases of equivalence: *Complete conceptual equivalence*, *Conceptual overlapping*, *Inclusion*, *No conceptual equivalence* (what Arntz refers to as false amies). *Complete conceptual equivalence* is often to be found within nomenclature, such as the chemical terms di-sodium hydrogen phosphate (SL) and dinatriumfosfat (TL). *Conceptual overlapping* happens when two terms intersect, such as English *informatics* and French *informatique*. *Inclusion* happens when concept A is included in concept B but concept B has some more characteristics. An example is *fantomsmärta* which is included in the concept *fantomsensationer*. However, except *fantomsmärta* *fantomsensationer* also includes *fantomkänsla* which is the feeling of sensations *without* pain. In this case, concept A, *fantomkänsla* has some more characteristics than concept B, *fantomsmärta* which is defined by the sensation of pain. In *no conceptual equivalence* the similarity between the two terms can lead to thinking they are similar even though they are not, for an example ST *academy* and TL *Akademin*.

Vinay & Darbelnet (1995:65) use the expression *lacuna* when they refer to SL words which do not have a match in the TL. They describe *lacuna* as a situation where the concept described does not exist or is not recognized in one of the two languages. The situation may also be that it exists in both languages but is only named independently in one of them. However, when discussing *lacunae* within terminology Cabré et al (1999:116) use the term *terminological gap*, which is the term used henceforth in this essay. Furthermore, Vinay & Darbelnet's equivalence should not be confused with Arntz's terminological equivalence. Both expressions are used in the analysis, however, Vinay & Darbelnet's equivalence can be applied on metaphors and idioms, whereas terminological equivalence referred to by Arntz and Ingo is only used within terminology.

#### **4.3.1 The function of terminology**

Cabré et al (1999:45) define the function of terms as to differentiate special languages from general language, but also to differentiate special languages from each other. According to Costa (2013:36–37) “translators deal with texts/discourses” and describes the translator's work in terms of “changing discourses from one language to another, accurately and naturally transmitting the knowledge that is being conveyed.” Cabré et al (1999:45) point out that terms are used by specialists in order to for them to express themselves, to exchange thoughts between each other and to organize the structure of

their respective disciplines. Lancor (2014:1246) opposes Cabré et al by claiming that “definitions are not uniform across scientific fields. Scientists, generally, do not share a common language, even within a particular discipline.”

Cabré et al (1999:47) state that scientific texts need to be concise in order to reduce distortions in the communicated information. Furthermore, scientific texts also need to be appropriate for the communicative situation and adapted to the reader’s level of knowledge and “introducing more or less redundancy according to need.” This view is supported by Min-Hsiu (2013: 130–131) to a certain extent but Min-Hsiu also emphasizes that the concerns of translating popularized texts are somewhat different and when communicating with lay readers accessibility may be more important than accuracy of science information. Min-Hsiu (2013: 130–131) summarizes that popularization is not a process of simplification, “but a process of recontextualization to meet the existing knowledge of the lay readers”.

The conclusion is that terminology is a key characteristics in scientific texts but the level of the terminology should be adapted to the context, should that be in communication between scientists, between laymen or between scientist and laymen.

## 5 Analysis

The analysis is divided into two parts; metaphors and terminology, and each part includes examples, discussion and an explanation of the chosen translation.

### 5.1 Metaphors

The analysis of metaphors is based on Lakoff & Johnson’s three types of conceptual metaphors; structural, ontological and orientational and begins with a quantitative analysis of metaphor frequency. This is followed by a qualitative analysis of the metaphor translations.

#### 5.1.1 Metaphor Frequency

According to Degerman et al al (2012:564) “[s]cientific papers, as well as textbooks and popular science articles, are packed with metaphors”. To give the analysis a quantitative aspect an investigation of which kind of conceptual metaphor was most frequently used in the ST, was carried out. The metaphors in the ST were counted and divided into Lakoff & Johnson’s three types of metaphors, oriententional, ontological and structural. The results are demonstrated in Table 1:

**Table 1. Type and number of conceptual metaphors**

Type of metaphors	Number of metaphors	% of total
Oriental metaphors	8	7.8
Ontological metaphors	32	31.4
Structural metaphors	62	60.8

Table 1 shows that structural metaphors make up more than half of the metaphors in the ST. As structural metaphors are used to explain one concept in terms of the other, their presence is to be expected. The main topic of the ST is the brain and the neurological system and these complicated functions need to be explained in terms of other, more common, concepts. Ontological metaphors come second, making up for about a third of the total of metaphors. As ontological metaphors are used to explain abstract concepts, such as science, this result supports Lakoff & Johnson's (2003:25) definition of ontological metaphors as a way of identifying our experiences so that they can be referred to, categorized and quantified as if they were material entities. Oriental metaphors come last, with only 7.8 % of the total, which is in line with Lakoff & Johnson's (2003:25) statement: "[O]ne can only do so much with orientation". For metaphors to fully provide a basis for understanding, merely referring to spatial orientation is not enough. Each type of metaphor and how these are represented and translated are discussed in sections 5.1.2 – 5.1.4.

### 5.1.2 Structural metaphors

Two structural metaphors dominate the ST: the map metaphor and the phantom metaphor. Phantom is used terminologically as well, which will be further analysed in sections 5.2.2 and 5.2.3.

#### *The map metaphor*

In the ST the structural metaphor THE BRAIN IS A MAP is used to explain how different parts of the body are represented in the brain, as in (3):

- (3)      *A map* of the entire body surface exists in the brain, with each half of the body mapped onto the opposite side of the brain.      I hjärnan finns en *karta* över hela kroppsytan där varje kroppshalva är kartlagd på hjärnans motsatta sida.

Vinay & Darbelnet (1995:210) claim that when translating metaphors and the metaphors correspond exactly or almost, as in (3) this is mostly a result of translating between cultures that have similar traditions. In the present case the shared cultural

aspect is one of looking at the brain as a map, and Newmark's (1981:51) preferred strategy of translating metaphors is applied through reproduction of the same image of the map in the TL. In (4) the metaphor THE BRAIN IS A MAP metaphor is used again:

- |     |  |  |
|-----|--|--|
| (4) | For the most part, the <i>map</i> is orderly though upside down: The foot is represented at the top and the outstretched arms are at the bottom. | <i>Kartan</i> är på det stora hela systematiskt upplagd men upp och ned: Foten är representerad på hjärnans övre del och de utsträckta armarna är nederst [...]. |
|-----|--|--|

The conclusion is that the structural metaphor THE BRAIN IS A MAP is present in both SL and TL. This makes the metaphor THE BRAIN IS A MAP possible to translate literally, even though metaphors according to Vinay & Darbelnet (1995:38) are often translated through the strategy of equivalence. Map as metaphor is in the process of becoming a term when used in the context of describing the brain's functions, supported by Loftus' (2011: 216–217) theory that metaphors are used to describe new medical or anatomical findings in time can become established ways to look at for example, an illness. The theory of metaphors becoming terminology is also promoted by Newmark (1981:49) as he states that a metaphor in time “may be added to the technical terminology of a semantic field”. An example of map being used as a term is the expression somatosensory map, used in (5):

- |     |   |   |
|-----|---|---|
| (5) | Eleven years after the surgery, they anesthetized the animals, opened their skulls and recorded from the <i>somatosensory map</i> . | Elva år efter ingreppet sövdes aporna ner, deras skallar öppnades och signalerna från den <i>somatosensoriska kartan</i> registrerades. |
|-----|---|---|

The conclusion of the map metaphor becoming a term is also supported by a background text: Oliver Sack's autobiographical work *A Leg to Stand On*. Oliver Sacks is a renowned neurologist as well as a best-selling author on subjects related to neurology. In *A Leg to Stand On* Sacks writes about an accident which led him to lose the awareness of one of his legs. The book was originally published in 1984 and published in Swedish 1996, translated by Lennart Edberg. In Edberg's translation the SL *body map in the cortex* (Sacks 1984:193) is translated into the TL “*kroppsbild i hjärnbarken*” (Sacks: 1996:210). In the SL metaphor *body map* the specific image *map* has been translated into the more general “bild”. Another example is the SL term *cortical map* (Sacks 1984:193) being translated into the TL metaphor “kartbild” i barken “(Sacks 1996:210). The examples from the ST this essay is based on in relation to the examples from Oliver Sacks' book provide a good example of a Newmark's

(1981:49) description of a metaphor used in a special subject field and in time becoming a part of its terminology, contributing to “greater accuracy in the use of language”.

### *The phantom metaphor*

According to the *Oxford English Dictionary*, [www.oed.com](http://www.oed.com), *phantom* can have many meanings, such as ‘ineffectual person or thing’, ‘mental image of an object’, ‘model of the body or an organ for surgical instruction’ and ‘vain show’. *The Oxford English Dictionary* derives the English word *phantom* from French *fantôme* meaning ‘illusion’, ‘delusion’, ‘supernatural apparition’, ‘spectre’, ‘ghost’, ‘something merely imagined’ or ‘a hallucination’. Using *phantom* interpreted as ‘ghost’ as a metaphor, provides according to Lakoff & Johnson (2003:26) the opportunity to “deal rationally with our experiences”. A phantom, in the sense of ghost, is a common phenomenon in the way that everyone has heard about them and one of the main features of a ghost is that it can exist and be experienced without being seen or touched. In (6) *phantom* is used as a metaphor for the reasons behind the experience of phantom phenomenon.

- |     |  |  |
|-----|--|--|
| (6) | They can chase <i>the phantom</i> farther and farther into the brain, but of course they'll never find it. | De kan jaga <i>fantomen</i> djupare och djupare in i hjärnan men de kommer såklart aldrig att hitta den. |
|-----|--|--|

In (6) *the phantom* is translated into target language expression *fantomen* through Vinay Darbelnet’s strategy of literal translation and also in line with Newmark’s preferred strategy of translating metaphors while retaining the image, in this case *phantom*. The structural metaphor could in this case be A LOST LIMB IS A GHOST. The description of a ghost as being experienced without being seen or touched parallels well to the experience of a phantom limb as well as Newmark’s (1981:49) opinion that metaphors are to be used to describe something in a more readily understandable way that would be possible if using literal language. By using the phantom metaphor, the experience of a limb that is not there anymore is given a description, in Newmark’s (1981:49) words, “more comprehensively and concisely” than any literal description would provide.

THE BRAIN IS A MAP and A LOST LIMB IS A GHOST are two structural metaphors that are repeatedly used in the ST. Both these metaphors provide the user with means to comprehend an abstract or difficult subject area. The metaphors have in time been added as components of the terminology belonging to the subject area of neurology, as in *phantom limb* and *somatosensory map*.

### 5.1.3 Ontological metaphors

Lakoff & Johnson (2003:25) define ontological metaphors as metaphors that help us understand and talk about our experiences in terms of objects and substances. From this aspect, ontological metaphors are to be expected in a popularized scientific text on abstract subjects such as scientific theories. In (7) below, the abstract nerve-irritation theory is referred to as a concrete entity physicians can physically cling to:

#### IDEAS ARE ENTITIES

- |  |   |
|--|---|
| (7) Though there are far too many problems with this nerve-irritation theory, because it's a simple and convenient explanation, most physicians still <i>cling to it</i> . | Även om den här nervirritationsteorin medför alldeles för många problemställningar så <i>håller många läkare fortfarande fast vid den</i> , eftersom den är en enkel och bekväm förklaring. |
|--|---|

(7) is an example of what Newmark (1981:49) refers to as a reific process, a process that turns something mental into something physical. The mental experience in ex (7) is the nerve irritation theory and the metaphor *cling to it* turns the mental experience into something physical. The metaphor *still cling to it* is what Vinay & Darbelnet call literally translated to “håller fortfarande fast vid den” retaining the image in the source text and thus using Newmark’s preferred strategy. The process in (8) is somewhat similar.

- |   |  |
|---|--|
| (8) All these clinical experiences <i>lay tucked away in my brain, dormant</i> , until about six years ago, when my interest was rekindled by a scientific paper published in 1991 by Dr. Tim Pons of the National Institutes of Health [...] | Alla dessa fall <i>låg slumrande i min hjärna</i> tills mitt intresse återuppväcktes av en artikel publicerad 1991, av Tim Pons från National Institutes of Health |
|---|--|

In (8) the mental experience that makes up the writer’s clinical experiences are referred to as physical entities, and the metaphor that manifests this procedure is *lay tucked away, dormant*. The ST metaphor has two images: *lay tucked away* and *dormant*. In the TT the metaphorical image of *tucked away* has been deleted, (strategy 6) whereas the metaphor *dormant* has been translated according to Newmark’s preferred strategy of retaining the image. However, the metaphorical image as a whole is retained according to Newmarks’s preferred strategy. The same strategy is used in (9):

- |  |  |
|--|--|
| <p>(9) Maybe even many of us so-called normal people have a bit of <i>cross-wiring</i>, which would explain why we like to have our toes sucked.</p> | <p>Det kanske till och med är så att flera av oss så kallade normala personer är en aning <i>korskopplade</i>, vilket skulle förklara varför vi tycker om när någon suger på våra tår.</p> |
|--|--|

In (9) the psychological experience of liking to have the toes sucked is the mental experience that is turned into a physical entity through the metaphor *cross-wiring*. The literal translation is the TL expression *korskopplade* which is used within the areas of telecommunication and electricity is a way to hook up different types of cables and connections to each other. This reific process enables Newmark's strategy of having the image of cross-wiring to be retained in the TL metaphor. (8) and (9) are also examples of Newmark's (1981:49) reific process where the mental experiences of having an idea in your mind and liking having your toes sucked are turned into something physical, such as cross-wiring and tucked away.

As the brain and mind are the main subjects of the ST it is not surprising that the ontological metaphor THE MIND IS A MACHINE is found in the ST as well. Stålhammar (1997:76) explains that during the 20<sup>th</sup> century, electricity came to be a central part of our lives, and the brain has since then been described as the central control station for the machines that are our bodies. As source culture and target culture share some cultural references, these kinds of metaphors are relatively easy to translate, as they refer to well-known phenomena. The ontological metaphor THE MIND IS A MACHINE is shared by source culture and the target culture, as is IDEAS ARE ENTITIES. As the metaphors between SL and TL correspond exactly or almost, this renders what Vinay & Darbelnet (1995:210) define as the first outcome when translating metaphors. The similarity in (8) and (9) contributes to the literal translation recommended by Vinay & Darbelnet (1995:31) as well as the reproducing of the same image in the TL which is Newmark's (1981:51) preferred strategy for translating metaphors.

#### 5.1.4 Orientational metaphors

Orientational metaphors were the type of conceptual metaphors least used in the ST (see Table 1) and will only therefore undergo a very short analysis. In (10) the description of the pathways as "highly precise" is based on the orientational metaphor MORE IS UP.

- |  |   |
|--|---|
| <p>(10) But the evidence from Tom shows—contrary to what is taught in textbooks—that new, <i>highly precise and functionally effective pathways</i> can emerge in the adult brain as early as four weeks after injury.</p> | <p>Men bevisen hämtade från testerna på Tom visar på att, tvärtemot vad som står i läroböckerna, kan nya, <i>högst precisa och funktionellt effektiva banor</i> utvecklas i den vuxna hjärnan så tidigt som fyra veckor efter att skadan inträffat.</p> |
|--|---|

As the orientational metaphor MORE IS UP is shared by the source culture and the target culture, it was translated according to Newmark's (1981:51) preferred strategy and the image *high* is retained in the target language metaphor.

In the examples provided in this chapter on metaphors all metaphors except one has been possible to translate through Newmark's preferred method of reproducing the SL image in the TL. This is partly a result of the similarities between SL and TL and their respective cultural contexts. Vinay & Darbelnet (1995:38) refer to the strategy of equivalence as being frequently used when translating animal sounds, idioms and clichés. However, the similarities between SL and TL have, as with Newmark's strategy, provided the possibilities of using the preferred literal translation method instead.

## 5.2 Terminology

### 5.2.1 Medical terminology

According to *Medicinskt fackspråk i skrift. Råd och riktlinjer* (2010:5) a medical concept can be translated into several different expressions: 1) The scientific medical term, (ex: TL *appendicit*) 2) general concepts, medical expressions used in the communication between medical staff and the patients and their relations (*blindtarmsinflammation*), (ex: 3) jargon or lingo used by medical staff when communicating with each other (ex: TL shortening: *app* for *appendicit*). The present translation alternates between 1) the scientific medical term, and 2) general concepts, medical expressions used in the communication between medical staff and the patients and their relations, having 2) as first choice. This means that instead of using the term *kortex*, which is the scientific medical term, the term *hjärnbark* is used. The reason for using general concepts, is that these medical expressions are used within the context that is most similar to the context of a scientist communicating (through writing) with a layman.

One exception from *Medicinskt fackspråk i skrift. Råd och riktlinjer*, is made in the translation. This exception regards the target language term *talamus*. According to [Nervsystemet.se](http://nervsystemet.se)<sup>3</sup> the Swedish term for *talamus* is *synhögen* or *synhögarna*. However, searching the term *talamus* in Språkbanken provides 25 hits, whereas *synhögen* provides 0 hits and *synhögarna* 2 hits, both referring to a Governmental Official Report on the care of epileptics, and referring to cat brains, which indicates an obsolete terminology. According to Cabré et al (1999:47)

“a scientific text must be appropriate or suitable to the communicative situation in which it is produced so that, depending on the circumstances of each situation, every text is adapted to the characteristics of the interlocutors and their level of knowledge about the topic, introducing more or less redundancy according to need.”

While the ST belongs to the genre of popular science, the demand for scientific correctness remains, but the readership is more varied than if the ST was a pure scientific text, such as a dissertation or a scientific article. This puts a double demand on the language and the terminology: The terminology still has to be appropriate and exact but should be explained clearly to the readers, without disrupting the text flow or in other ways put too high demands on the reader. Montalt (2011:80) describes medical terminology as “highly dynamic, constantly reflecting discoveries and innovations through neologisms” and “[n]ew terms giving names to new realities [...] are frequent in medical texts and constitute one of the most challenging and time-consuming aspects of medical translation”. When translating a medical text the translator need to be aware of these characteristics and make sure the terminology used in the TL is up to date. A search in Svenska Läkaresällskapetets Language Database for the TL word “fantom” generated only one hit, dated 1995:

”Finns några klassiska termer för fantomkänsla, stumpsmärtor eller fantomsmärtor?”  
The short answer that followed was:”Nej, inte för något av de tre begreppen.”

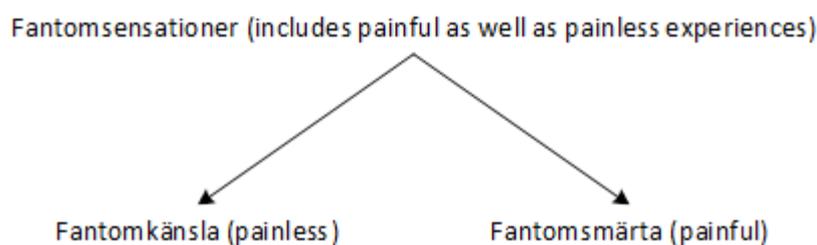
This indicated that the phantom limb phenomenon lacks established terminology. As noted previously, Arntz (1993:11) states that definitions of terminologically relevant terms can sometimes be missing and if they are not missing, they can have different structures within their separate languages. According to Arntz (1993:11), this creates differences in the conceptual equivalence between the languages. This is the case regarding the terminology connected to the phenomenon of phantom sensations.

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<sup>3</sup> [http://nervsystemet.se/nsd/structure\\_294](http://nervsystemet.se/nsd/structure_294)

According to *Vårdhandboken*, the phantom phenomenon contains of three parts: *Fantomsensationer* is the generic term for *fantomsmärta* (the sensation of a body part remains and hurts) and *fantomkänsla* (the sensation of a body part remains but does not hurt). As Arntz (1993:6) recommends drawing up the independent systems of concepts in each language, terminological trees were created in order to making the equivalence, or lack of it, visible:

#### Terminological tree for target language:



According to Arntz (1993:13–15) the relationship between *fantomsensationer*, *fantomkänsla* and *fantomsmärta* are one of inclusion, as both *fantomkänsla* and *fantomsmärta* are included in *fantomsensationer*. According to *Medicinsk Ordbok*, the terms *fantomkänsla* and *fantomsmärta* have the following definitions: "Fantomkänsla fantomsensation, patienten upplever att en bortopererad kroppsdel, t.ex. ben el. bröst, fortfarande finns kvar; skilj från fantomsmärta som är kvarstående smärta/värk på platsen för amputerad kroppsdel." The phantom phenomenon can also be considered a psychological symptom<sup>4</sup>. In *Natur och Kultur's* online psychology dictionary<sup>5</sup> the terms *fantomförmimmelser*, *fantomsensation* and *fantomupplevelse* are collected in the same post and with following explanation: "Eng: phantom (fantom) experience, phantom (fantom) sensation, phantom (fantom) feeling. Förmimmelse, vanligen i form av smärta, från en bortopererad kroppsdel." In *Psykologilexikon*, *fantomsmärta* is given the following explanation:

"Fantomförmimmelser i form av smärta, som kan upplevas komma från en bortopererad kroppsdel, t ex ett ben eller en arm (phantom limb), ett bröst hos en kvinna (breast-phantom). Sådana smärtförmimmelser är sällsynta men kan förekomma i samband med nervskador som leder till kausalgi, en brännande smärta. Uppkomsten av fantomsmärta är i övrigt beroende av hur en person känslomässigt reagerar på en amputation."

<sup>4</sup> <http://www.ne.se.proxy.lnu.se/uppslagsverk/encyklopedi/1%C3%A5ng/amputation>

<sup>5</sup> <http://www.psykologiguident.se/>

Worth noticing in the example from *Psykologlexikon* is the use of *breast-phantom* when referring to English terms. In this context *breast-phantom* becomes a good example of what Arntz (1993:15) refers to as no conceptual inclusion. No conceptual inclusion occurs when two terms are similar although there is no, or only partial, similarity in the concepts they refer to. A corpus search for *breast-phantom* provided one hit, where *breast-phantom* is a breast substitute used by women who have had their breast(s) removed through surgery. This kind of terminological confusion is described by Faber et al (2007:41) who claim that in terminological databases, definitions are “simply inserted in a cut-and-paste fashion from other dictionaries, term bases, or knowledge resources, without taking into consideration both their internal and external coherence”.

The conclusion is that the subject area of the phantom phenomenon lacks a coherent terminology. This leads to the analysis of the translation of the term *phantom*.

### 5.2.2 Phantom as medical term

According to the *Oxford English Dictionary*, [www.oed.com](http://www.oed.com), a phantom limb (or other body part) is a body part that is felt to be present after amputation. Vinay & Darbelnet (1995:27) point out what at first seems obvious: “The translation of a word usually depends upon its context”. However, translating *phantom* as a medical term, proves that context can exist on different levels. Cabré et al (1999:40) point out that even if a term within a subject field should identify only one concept, the reality is that even within a single subject, a term can relate to more than one meaning. This is the case with the term *phantom limb*. Translated into TL *phantom limb* caused confusion regarding which grammatical gender the term *phantom* belongs to. In parallel texts the common/non-neuter *fantomen* as well as neuter *fantomet* were used, both referring to the experiences entity of the lost limb. The example below is from *Vårdhandboken*<sup>6</sup>:

”Sedan tränas “fantomet” genom att göra rörelser med den amputerade foten/benet, exempelvis “trampa symaskin”, “knipa med tårna”.

In *Språkbanken fantomet* provided 2 hits, both referring to an article in *Läkartidningen* where *fantomet* refers to a model used to simulate a body part. Table 2 shows that a search for *fantomet* in *Läkartidningen*’s article archive provided two hits<sup>7</sup>. However, these two hits refers to: 1) a model used to simulate a body part, 2) the non-existent limb which is still perceived by the patient.

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<sup>6</sup> <http://www.vardhandboken.se/Texter/Benamputation-var-d-och-behandling/Fantomsensationer/>

<sup>7</sup> <http://www.lakartidningen.se/Sok-arkiv/?f=q:fantomet>

**Table 2. Phantom and the Swedish gender. Search results from Läkartidningen**

Gender	Total hits	Hits referring to the sensation of amputated limb
<i>Fantomen</i> (the common/non-neuter gender)	9	1
<i>Fantomet</i> (neuter gender)	2	1

*Fantomet* is also used by Ingvar & Eldh (2012:14): “Det finns bra beskrivningar av hur denna lite udda behandling har gjort att patienter kan minska känslan av att *fantomet* har en felaktig ställning som gör ont”. However, in other professional writings *fantomen* is used, as in the article “Ny datasimuleringsteknik mot fantomsmärta” from *Neurologi i Sverige* (Brånemark: 2014:61– 65):”Den virtuella förflyttningen styrs av patientens förflyttning av den intakta extremiteten, utan att intention att förflytta *fantomen* kan påverka detta”. Arntz (1993:8) recommends contact with experts and when consulting Svenska Läkaresällskapetets Språknämnd the conclusion was that neither of the genders are wrong, but the non-neuter *-n* is the more frequently used.

- |  |  |
|--|--|
| (11) For one thing, it doesn't explain why Tom or other patients experience the feeling of being able to move their phantoms voluntarily or why the <i>phantom</i> can change its posture. | Exempelvis förklarar det inte varför Tom och andra patienter upplever att de kan röra sina fantomer eller varför <i>fantomen</i> kan ändra position. |
|--|--|

As Cabré et al (1999:137) list frequency in texts within a certain special field as an indicator of termhood the conclusion was to use *fantomen*, not *fantomet*, as illustrated in (11). However, the confusion regarding a term's grammatical gender is a good example of Arntz's terminological inconsistency and that terminological inconsistency can exist on more levels than lexical.

### 5.2.3 Inconsistent terminology

The confusion regarding grammatical gender of the term *phantom* is one sign of terminological inconsistency. Another sign is the irregular use of terms within the same text. An example from the ST is the irregular use of the terms *phantom limb pain* and *phantom pain* even though they refer to the same phenomenon: the experience of pain from a limb that is not any longer there. In the ST the term *phantom pain* is used four times and the term *phantom limb pain* is used five times. If strictly using Vinay &

Darbelnet's strategy of literal translation, this would generate two different terms in the TT. (12) however, demonstrates what Arntz's (1993:13) refers to as a complete conceptual equivalence. The terms in the two respective languages match in all characteristics and there is what Arntz's (1993:13) calls a conceptual identity.

- (12) We know, for instance, that intractable *phantom pain* may develop weeks or months after the limb is amputated. Till exempel vet vi att svårbehandlad *fantomsmärta* kan uppstå veckor eller månader efter att kroppsdelens amputerats.

In (12) the translation method of literal translation is possible as it produces the TL expression *fantomsmärta*. However, as the terminological expression in (13) changes to *phantom limb pain* the TL term *fantomsmärta* instead becomes a result of Vinay & Darbelnet's (1995: 38) strategy of equivalence:

- (13) But about half the people with phantom limbs also experience the most unpleasant manifestation of the phenomenon—*phantom limb pain*. Samtidigt så upplever ungefär hälften av de som har fantomsensationer den mest obehagliga yttringen av fenomenet: *fantomsmärta*.

Vinay & Darbelnet's strategy of literal translation would translate (12) into the term *fantomsmärta*, while (13) would instead translate into *fantomlemsmärta*, *fantomkroppsdelssmärta* or even *fantomextremitetssmärta*. According to Ingo (2007:226) the signification and the style of the special language should be unambiguous and homogenous. Translating the two alternately used terms in the ST into two different terms in the TT would therefore be to step away from a translator's aim for clarity and homogeneity. Instead both SL terms are translated into one TL term. However, when choosing TL term, the choice stood between the terms *fantomsmärta* and *fantomvärk*.

**Table 3 Number of hits in Språkbanken for *fantomsmärta* vs *fantomvärk***

Term	Number of hits
Fantomsmärtor	177
Fantomsmärta	55
Fantomsmärtorna	10
Fantomsmärtan	6
Fantomvärk	3

*Fantomsmärta* (with its different suffixes) is the less marked expression. This coincides with *fantomsärta* being present in SAOL since 1973<sup>8</sup>. *Fantomvärk*, even though it is used, is not present in SAOL at all. This, together with Cabré et al's (1999:137) notion of termhood the conclusion drawn was to use *fantomsärta*.

Yet another example of inconsistent use of terms in the ST is the use of *auditory nucleus* and *auditory nerve nucleus*, as seen in (14):

- |   |  |
|---|--|
| (14) Axons from the eye movement center in the cortex invade the <i>auditory nucleus</i> so that every time the person's brain sends a command to move the eyes, that command is sent inadvertently to the <i>auditory nerve nucleus</i> and translated into a ringing sound. | Nervcellskott från ögonrörelsecentrat i hjärnbarken tränger in i <i>hörselkärnorna</i> så att varje gång patientens hjärna skickar en uppmaning att röra på ögonen levereras informationen av misstag till <i>hörselkärnorna</i> och översätts till ett ringande ljud. |
|---|--|

In (14) both SL terms were translated into one TL term. The basis for this decision was the non-existent frequency of the SL *auditory nerve nucleus* as well as the TL *hörselnervskärnor*, demonstrated in Table 4:

**Table 4 Frequency of terms *auditory nucleus* / *auditory nerve nucleus***

Term	Hits in GloWbE
<i>Auditory nucleus</i>	1
<i>Auditory nerve nucleus</i>	0

As neither *hörselkärnor* nor *hörselnervskärnor* provided any hits in Språkbanken, the investigation was proceeded in the article archive on *Läkartidningen*'s website. The result is demonstrated in Table 5:

**Table 5 Frequency of *hörselkärnor*/*hörselnervskärnor***

Term	Hits in Läkartidningen
<i>Hörselkärnor</i>	1
<i>Hörselnervskärnor</i>	0

The lack of hits regarding both SL and TL terms indicates that these are highly specialized anatomical terms. Arntz (1993:8) recommends seeing the term in its

<sup>8</sup> <http://g3.spraakdata.gu.se/saob/>

immediate environment, but as the terms provided very few hits in GloWbE, it is not instantly obvious that they represent the same part of the body. However, contrary to Ingo's (2007:107) belief that searching for terms within a dictionary is futile a search in OED, [www.oed.com](http://www.oed.com), for the term *auditory nucleus* provided the information that *auditory nucleus* and *auditory nerve nucleus* refer the same concept: "An anatomically and functionally discrete collection of neurons in the central nervous system. Chiefly with modifying word, or with post modifying Latin adjectives." As *auditory nucleus* and *auditory nerve nucleus* represent the same part of the body they will both be translated into the TL term *hörselkärnor*, and the terminological inconsistency will not be transferred to the TT.

Inconsistent terminology is often referred to as existing between SL and TL, however inconsistent terminology can also exist within a special subject or within one text, as demonstrated in this section. As translators should aim for clarity and homogeneity inconsistent terminology should not be transferred to the TT. However, sometimes the TL provides more than one translation for a SL term. In such cases Cabré et al's definition of termhood as frequency in texts within a special subject proves helpful in the choice of TL term.

#### 5.2.4 Terminological gaps

According to Vinay & Darbelnet (1995:35) "only translators can be aware of the totality of the message, which determines their decisions". This statement proved right, especially when undertaking terminological gaps between SL and TL. Vinay & Darbelnet (1995:61), Cabré et al (1999:50) as well as Arntz (1993:11) agree on that when comparing two languages, terms and the definition of terms often have different structures. The medical terminology encountered in the ST carries proof of that and in the following section provides a further analysis of the SL terms *phantom limb* and *gaze tinnitus*. The translation also provides examples of what Arntz (1993:13) refers to as complete conceptual equivalence, i.e. two terms where all characteristics match and the conceptual identity is complete. This is demonstrated in (15):

- |   |  |
|---|--|
| <p>(15) Once, when the water accidentally trickled down his face, he exclaimed with considerable surprise that he could actually feel the warm water trickling down the length of his <i>phantom arm</i>.</p> | <p>Vid ett tillfälle, när vattnet av misstag sipprade ner för hans ansikte utbrast han, uppenbart överraskad, att han faktiskt kunde känna det varma vattnet sippra ner längs hans <i>fantomarm</i>.</p> |
|---|--|

In (15) the SL term *phantom arm* is translated into *fantomarm*. As both languages use their respective terms where the specific limb that is missed is used, the conceptual identity becomes complete. However, the translation of the ST provided several terminological gaps and first to be analysed is the SL term *phantom limb*.

#### *Phantom limb*

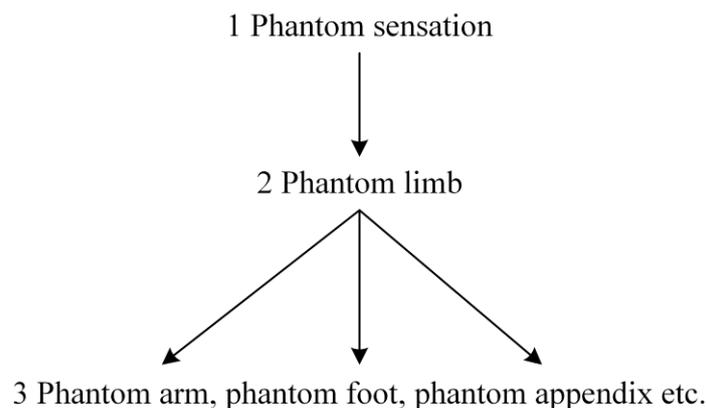
The term *phantom limb* is frequently used throughout the ST as are terms that derive from the term *phantom limb*, as seen in Table 6. Terms that are made up from the term *phantom* + the specified limb, such as the term *phantom arm* are used most frequently. These terms are used 29 times in the ST. A variation of this kind of term is *phantom* + specified limb noun combination, such as *phantom nose and face*.

**Table 6 Number of hits for phantom limb variations in the source text**

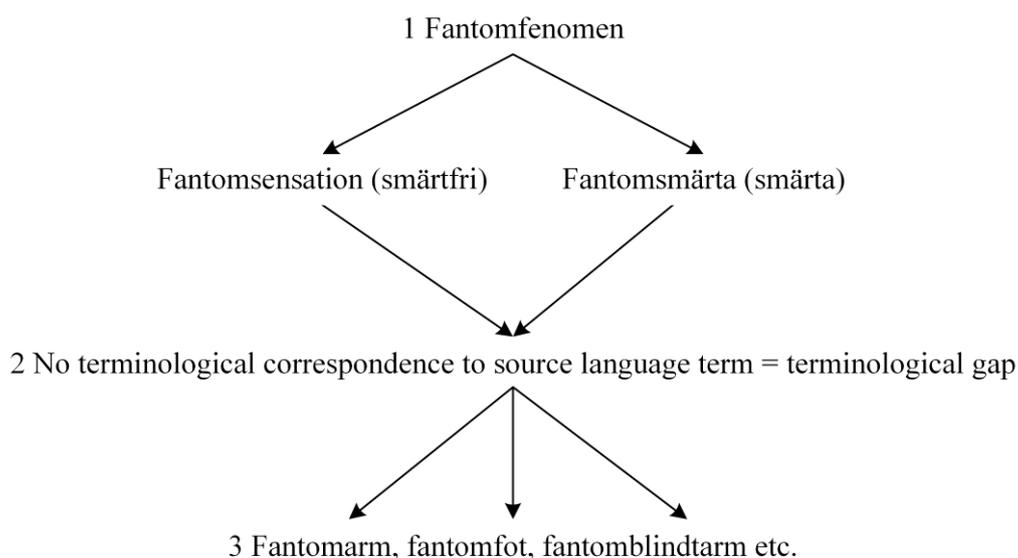
<i>Phantom limb</i> [including plural form <i>phantom limbs</i> ]	13
<i>Phantom</i> + specified limb	29
<i>Phantom</i> + specified limb noun comb	3
<i>Phantom limb pain</i>	5
Total:	50

The ST terms consisting of *phantom* + specified limb or *phantom* + specified limb noun combination, was translated using Vinay & Darbelnet's (1995: 33-34) literal translation. An example of literal translation is (15) where *phantom arm* is translated into *fantomarm*. *Phantom arm* -> *fantomarm* is also an example of Arntz's (1993:13) definition of complete conceptual equivalence as they match in all characteristics: the experience of an arm that is no longer existent. The term *phantom limb*, however, did not always have a corresponding TL term. Instead *phantom limb* provided an example of a terminological gap in the TL. The terminological trees for the respective languages are in this case different from each other:

Terminological tree for source language:



Terminological tree for target language:



According to the strategies Arntz (1993:13–15) suggests for terminological gaps, one way is to invent a new in the target language, either by making up a new one, borrowing the one used in the SL (Vinay & Darbelnet’s borrowing), making a loan translation or creating an equivalent paraphrase (Vinay & Darbelnet’s calque). However, combining the term “fantom” with the TL words for limbs “extremitet” and “lem”, did not prove productive as demonstrated in Table 7:

**Table 7 Språkbanken search results for fantomextremitet/fantomlem**

Term	Number of hits
Fantomextremitet	0
Fantomlem	0

Instead, this terminological gap needs to be addressed differently depending on context. In (16) *phantom limb* is translated through Vinay & Darbelnet's (1995:38) strategy of equivalence into TL *fantomfenomenet*.

- |  |  |
|--|--|
| <p>(16) His impression that his missing arm was still there is a classic example of a <i>phantom limb</i>—an arm or leg that lingers indefinitely in the minds of patients long after it has been lost in an accident or removed by a surgeon.</p> | <p>Intrycket av att hans amputerade arm fortfarande var kvar är ett klassiskt exempel på <i>fantomfenomenet</i>, det vill säga en kroppsdel som lever kvar i patientens medvetande, långt efter att den förlorats i en olycka eller avlägsnats genom ett kirurgiskt ingrepp.</p> |
|--|--|

In (16) the term *phantom limb* and the explanation that follows have no terminological equivalence in the TL. In the ST, *phantom limb* refers to the patient's sensation of a missing arm. Using the specific term *fantomarm* would not correspond to the definition that follows *phantom limb* in the ST. An alternative could have been: "[...] ett klassiskt exempel på fantomarm- eller fantomben, det vill säga ett arm eller ett ben som lever kvar i patientens medvetande [...]". As the phantom limb in the ST refers not to the specific phantom limb, but to an example of a medicinal phenomenon, translating it to a more specific level would go against Ingo's (2007: 105) view that when translated, the TL term should exist on the same hierchal level as the SL term. As the explanation in (16) does not specify the presence or absence of pain, using either expressions on level two in the terminological hierarchy in figure 2, *fantomsensationer* (without pain) or *fantomsmärta* (painful) would convey the incorrect information. The decision is therefore to use *fantomfenomenet*. In (17) *phantom limb* is on the other hand, translated according to the strategy of equivalence into *fantomsensationer*.

- |  |  |
|--|--|
| <p>(17) Such stories are fun to tell, especially around a campfire at night, but they do very little to dispel the real mystery of <i>phantom limbs</i>.</p> | <p>Den här typen av historier är roliga att berätta, speciell kring en lägereld om natten, men de bidrar inte till att lösa det verkliga mysteriet med <i>fantomsensationer</i>.</p> |
|--|--|

The reason for translating *phantom limb* into *fantomsensationer* in (17) is that in this particular example *phantom limb* refers to a case where what was felt in the non-existing arm, was "a peculiar, gnawing sensation" (ST p 23), not pain. In the TL terminological tree the experiencing of a phantom limb without experiencing pain is

known as *fantomsensationer*. In (18), *phantom limb* is once again translated through the strategy of equivalence, but with another result:

- |  |  |
|--|--|
| (18) I lost my left leg below the knee and<br>I've had a <i>phantom limb</i> ever since. | Jag förlorade mitt ben strax under knät<br>och jag har haft ett <i>fantomben</i> ända<br>sedan dess. |
|--|--|

In (18) *phantom limb* is used within the context of referring to a lost leg. In the TL terminological tree this expression is *fantomben*. As in (17) the translation in (18) demands knowledge of context.

In (16) to (18) Vinay & Darbelnet's (1995:38) strategy of equivalence was used. However, the same SL term, *phantom limb* and the same strategy all produced different TL terms. They were also examples of Arntz's (1993:15) *terminological inclusion*. The concepts *fantomfenomen*, *fantomsensation* and *fantomben* were all included in the concept *phantom limb* but *phantom limb* also had additional characteristics when compared to *fantomfenomen*, *fantomsensation* and *fantomben*. However, the translation also provided examples where there was no conceptual equivalence and therefore not even a target language term, as in the case of *gaze tinnitus* below (19).

- |  |  |
|--|--|
| (19) A less titillating example of remapping<br>also involving the ear came from Dr.<br>A. T. Caccace, a neurologist who told<br>me about an extraordinary<br>phenomenon called <i>gaze tinnitus</i> . | Ett mindre kittlande exempel på en<br>förändring av hjärnans kartbild över<br>örat kommer från A.T. Caccace, en<br>neurolog som berättade för mig om ett<br>märkligt fenomen som kallas <i>gaze<br/>tinnitus</i> . |
|--|--|

An equivalence to the SL term *gaze tinnitus* is not found in the TL, instead a borrowed expression to explain the same phenomenon in the TL is "*gaze-evoked tinnitus*". The example is retrieved from an article in *Medikament*, and the article "Somatisk tinnitus – hör vi ljudet av muskelspänningar?" by Johan Hedbrant (2005): "Frågan uppstår nu vilka samband som finns beskrivna mellan tinnitus och perifera sensoriska signaler [22]. Ett tidigt uttryck för sådana överkopplingar var "*gaze-evoked*" tinnitus (gaze = stirra intensivt, spänd blick) som rapporterades som en kuriositet i korrespondensform [23, 24] runt 1982". Vinay & Darbelnet's (1995:33–34) strategy of literal translation applied on the term *gaze tinnitus* would have produced the expression *stirringstinnitus*, which would have indicated the incorrect definition as the symptoms come from moving the eyes, not from staring. Instead Vinay & Darbelnet's strategy of borrowing from the SL proved useful. Another strategy might have been to use term *somatisk tinnitus* but that would have been against Ingo's (2007: 103) translating recommendations to use a term

that exists on the same level in the hierarchal systems of the TL and the SL. *Somatisk tinnitus* includes a whole range of phenomena, connecting tinnitus to muscular tension in different places of the face and head, such as the jaw. This would make the translation into *somatisk tinnus* include phenomena that are not discussed in the ST.

Translating terminology can make the impression of mere mapping between SL and TL concepts. However, translating ST terminology demanded a wide range of strategies, from corpus searches, Arntz's (1993:8) recommendation to read up on parallel texts, grammatical decisions and the drawing of terminological trees. The most interesting find, however, is that the same ST term in combination with the same translational strategy can produce different TL terms.

## 6 Concluding Remarks

This paper argues that metaphors and terminology are two ways of using language to explain scientific findings and phenomena. The aim of this study was to investigate the use of metaphors and terminology within the field of neurology, using a popular science text. The ST was chapter two, "Knowing Where to Scratch", from V.S Ramachandran and Sandra Blakeslee's book *Phantoms in the Brain. Human Nature and the Architecture of the Mind*. The scope of the study was to focus on metaphors and terminology used to explain functions of the brain and the nervous system for the lay reader. Previous research on the subjects of terminology and metaphors was used in order to support translation choices as was the use of *Corpus of Global Web-Based English* and *Språkbanken* as well as searches in *Läkartidningen*'s digital article archive. In line with Arntz's recommendations the translational work took off from a basis of reading parallel texts. Using the theoretical framework of Vinay & Darbelnet (1995), Peter Newmark (1981), Lakoff & Johnson (2003) as well as Cabré et al (1993) and Ingo (2007) as foundation I analysed and discussed my own translation of the ST from English to Swedish. The analysis supported the view of medical metaphors becoming terminology and that the same word can be used both as term and as metaphor even within the same text. The analysis also supported that while terminological gaps between languages are of a certain challenge to translators, so is inconsistent terminology within a single ST as well. Previous research and the use of corpus searches provided a great help in translational decisions regarding words and expressions and which of these were natural in the TL and which were to be discarded as unnatural. The use of metaphors was also analysed through a quantitative analysis of

Lakoff & Johnson's conceptual metaphors in the ST providing the result that structural metaphors were the most widely used.

The areas of terminology and metaphors both came to prove themselves having more aspects than anticipated. However, it would be especially interesting to see the use of metaphors within science and popular science more deeply investigated as well as the phenomena of terminological gaps and terminological inconsistency. Further research within these areas could provide translators within the area of popular science a more solid foundation for their work.

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Läkartidningen [www.lakartidningen.se](http://www.lakartidningen.se)

Nationalencyklepedin <http://www.ne.se>.

Oxford English Dictionary <http://www.oed.com>.

Sandra Blakeslee <http://sandrablakeslee.com/>

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Psykologiguiden [www.psykologiguiden.se](http://www.psykologiguiden.se)

Svenska Läkaresällskapets Språkdatabas <http://www.sls.se/Om-SLS/Organisation/Kommitteer/Sprakdatabasen/>

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Terminologicentrum <http://www.tnc.se/>

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