

Alicja Zajdel
18312164

Machine vs. Human:
translating metaphor in The Picture of Dorian Gray

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Supervised by Dr James Hadley

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Machine vs. Human: translating metaphor in *The Picture of Dorian Gray*

ALICJA ZAJDEL

This project examines how metaphors in *The Picture of Dorian Gray* are translated by machine translation (MT) and human translators (HTs), by comparing solutions provided by Google Translate with existing published translations into Spanish, Portuguese and Polish. The aim of this study is to evaluate the performance of MT by comparing the choices made by GT with those made by HTs in order to see how and to what extent they differ. Five types of metaphor are considered in the experiment: lexical, multi-word, extended, idiomatic and dead. By applying these categories, the experiment investigates whether the quality of MT output is affected by the length of metaphor and the frequency with which it appears in everyday language.

Moreover, this study also analyses the translation procedures used by both categories of translator, in order to observe patterns of behaviour, including commonalities and differences. As two Romance and one Slavic language are included in the experiment, it also asks whether similar patterns emerge across languages belonging to the same family. The hypothesis is that metaphors using relatively common collocations will be rendered literally by both MT and HTs, but the procedures will diverge in cases of metaphors that use more unusual and/or culture-specific imagery and concepts. The prediction is that HTs will replace these with alternative metaphors more often than MT, which will most likely only be able to translate them literally.

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Abbreviations

CS – Computer Science

GT – Google Translate

HT – human translator

MT – machine translation

NLP – Natural Language Processing

NMT – neural machine translation

PBSMT – statistical phrase-based machine translation

SC – source culture

SL – source language

ST – source text

TC – target culture

TL – target language

TS – Translation Studies

TT – target text

Introduction

Translation is impossible! And I don't just mean it's really, really difficult, but really, it's not actually possible. There's not a single word in any of the languages I translate that can map perfectly onto a word in English. So it's always interpretative, approximate, creative. (Daniel Hahn 2014)

This statement was made by the famous literary translator from Spanish and Portuguese into English, Daniel Hahn, in an interview for the British Council on translating literature. He states that translation is impossible by its very nature, since no two words from different languages will ever be completely equivalent to each other. This argument is not uncommon in the field of Translation Studies (TS) and numerous scholars would agree with Mr Hahn in his claim that translation is an impossible task (see Jakobson 1959, Nida 1964 and Dagut 1976 among others). Yet, despite this assumed impossibility of the task, humans have been translating literary texts from one culture into another for centuries. From early Bible translations to the Latin American Boom of the 1960s, humans have been traversing linguistic and cultural boundaries through the act of translation. Nowadays, however, translators are not facing this challenge alone. Nowadays, thanks to technological advances, the process of translation has become significantly more efficient and less time-consuming. Not only because of resources such as online dictionaries and translation memories, but also due to developments in the field of machine translation (MT).

MT systems have been making rapid progress in the recent years, having advanced from statistical phrase-based MT (PBSMT) to neural MT (NMT) paradigms (Castilho 2017: 109). This has opened new opportunities in the translation industry. NMT has been offering more accurate output than PBSMT and MT systems are now being widely used by professional translators. However, although MT has been a useful tool for technical and commercial texts, its potentials for literary texts remain a subject of debate (Toral and Way 2018 among others). Many argue that the process of translating literature is too subjective and cognitively complex for a computer to ever replace human translators. Nevertheless, despite the scepticism towards these technological advances, artificial intelligence (AI) is becoming increasingly innovative, showing promising results in areas that have always been considered distinctly human. It has produced its own music, poetry and visual art – proving that creativity might

not be an exclusively human ability. Perhaps soon we can expect AI to outperform humans in creative endeavours.

This study aims to put Google Translate (GT) to the test by analysing its translations of metaphors in Oscar Wilde's *The Picture of Dorian Gray*. The experiment will be run across three languages – Spanish, Portuguese and Polish – and the results will be compared with existing published translations. The primary aim of the analysis is to determine whether GT is capable of conveying metaphor and if so, with what frequency as compared to human translators (HTs). A secondary aim is to measure how the solutions provided by GT compare to those offered by HTs. For example, will GT tend to translate more literally, or will it be able to offer idiomatic solutions? Will there be many similarities between MT output and the choices made by HT?

Furthermore, the range of languages included in the experiment – two Romance and one Slavic language – will allow us to see if any patterns of behaviour emerge among languages belonging to the same language family. However, the results may vary across different language pairs not only because of syntactical and lexical differences between the code systems, but also because of the size of the MT corpus available in that language. As MT performs best when there is a large corpus of data it can draw from, it can be expected that translations into Spanish will be of higher accuracy than those into Polish or Portuguese. It should also be noted that this experiment will be using Google Translate, an MT system which is not specifically tailored to literary texts. However, metaphors are a common feature of not just poetic rhetoric, but also everyday language, and examples of metaphors will certainly be found in the texts from the GT corpus.

Methodology

Translating metaphor

Metaphor has traditionally been viewed as an artistic device that features in literary writing, particularly poetry; a device of poetic imagination and rhetorical flourish. However, in their seminal work *Metaphors we live by*, Lakoff and Johnson demonstrate that metaphor is not just 'a matter of extraordinary rather than ordinary languages', as is commonly believed (1980: 3). They argue that metaphor is both a property of language - a linguistic phenomenon - and a property of thought - a cognitive phenomenon (1980: 5). Furthermore, they explain

how collective conceptual metaphors shape the way we think about the world, depending on the culture we happened to grow up in. For example, in the West our conceptual metaphor for *argument* is *war*. This is reflected in the way we use language, as we talk about *winning* an argument, *attacking* a position or *shooting down* arguments (1980: 4). We use this language in a non-poetic way; we simply describe an argument that way because we conceive of it that way. The metaphor is, therefore, conceptual rather than linguistic. This idea continues to be supported in recent scholarship, for example by Shutova, Teufel and Korhonen who claim that:

Metaphor is not limited to similarity-based meaning extensions of individual words, but rather involves reconceptualization of a whole area of experience in terms of another. Thus, metaphor always involves two concepts or conceptual domains: the target (also called the topic or tenor in the linguistics literature) and the source (also called the vehicle). (2013: 304)

The idea of ‘reconceptualization’ becomes problematic in translation, as the metaphor poses a challenge both on a linguistic and conceptual level. This is particularly problematic when translating between languages of cultures that do not share common conceptual metaphors, as the way they describe and understand certain concepts will differ significantly. In Translation Studies, this has been discussed under the concept of equivalence, first examined by Vinay and Darbelnet, who describe equivalence as the same situation being rendered by two texts using ‘completely different stylistic and structural methods’ (1958 repr. 1995: 38). They consider equivalence to be fixed and belonging to a ‘phraseological repertoire of idioms, clichés and proverbs’ (ibid.). Following Vinay and Darbelnet, the concept of equivalence was then considered by Roman Jakobson in his essay *On linguistic aspects of translation*. He argued that ‘on the level of interlingual translation, there is ordinarily no full equivalence between code-units’ (1959/2012: 127). He considered poetry and wordplay to be untranslatable, due to the lack of full equivalence between these text forms (ibid.). The problem of equivalence was then further discussed by Eugene Nida, who rejected the idea that words have fixed meaning, but rather their meaning is acquired through context. He distinguishes three types of meaning: referential, linguistic and emotive meaning (1964: 43). The notion of equivalence was then further theorised by Catford (1965), House (1977) and Baker (1992), making equivalence one of the most problematic terms in the field of Translation Studies.

Translation of metaphor is a similarly contested issue, which has been discussed in Translation Studies primarily with respect to equivalence and translatability (see Dagut 1976 and van den Broeck 1981). The idea of equivalence becomes crucial in the translation of metaphor, since transferring a metaphor from one language to another may be hampered by linguistic and cultural differences. However, as there are different views on the issue of equivalence, so there are on the topic of metaphor translation. In the late twentieth century there have been several papers in Translation Studies that touched on the subject in one way or another (Nida 1964; Reiss 1971; Dagut 1976; van den Broeck 1981; Snell-Hornby 1988; and others). As Burmakova and Marugina point out (2014: 528), some contradictory views on the limits of metaphor translatability have emerged from these studies:

- Metaphors are untranslatable (Nida 1964; Dagut 1976)
- Metaphors are fully translatable (i.e. metaphor translation is no different than translation in general) (Reiss 1981; Mason 1982)
- Metaphors are translatable but pose a considerable degree of inequivalence (van den Broeck 1981; Newmark 1988)

Since the 1990s, research into the concepts of equivalence and translatability has been abandoned in the field, partly due to the so-called “cultural turn” in Translation Studies (see Bassnett and Lefevere 1990). Cultural, rather than linguistic aspects of translation moved into the forefront of the field, with topics such as feminism, postcolonialism and eco-translation becoming widely debated (see Simon 1996; Bassnett and Trivedi 1999; Cronin 2017 among others). However, Translation Studies is an interdisciplinary area of study, and a lot of research into MT overlaps with areas such as Computer Science (CS) or Natural Language Processing (NLP). Therefore, research into MT is often concerned with linguistic analysis of language rather than the cultural aspects of translation. This could explain why literature remains problematic for MT, as it cannot be separated from its cultural aspects.

Metaphor remains under-researched in the fields of MT and NLP, with limited studies on the translatability of metaphor by MT systems. Shutova, Teufel and Korhonen also point out that ‘despite the importance of metaphor for NLP systems dealing with semantic interpretation, its automatic processing has received little attention in contemporary NLP and is far from being a solved problem’ (2013: 303). This study aims to address the gap in current research

from a Translation Studies perspective and the results could potentially be used to inform further CS research to improve the performance of MT system. Another objective of this study is to encourage practising translators, especially those involved in post-editing, to incorporate translation technologies into their practice, whether they translate literary or technical texts. Lastly, the results could provide an indication of how much post-editing is needed when translating literary texts using MT, and thus consider the time and cost efficiency of using this technology in the future.

Materials

This study will analyse the database of 43 metaphors identified in the first five chapters¹ of *The Picture of Dorian Gray*². This text has been chosen as the focus of this study for several reasons. Firstly, it was selected for its descriptive narrative, rich in metaphorical language. Secondly, it has been translated into most major languages, often in multiple versions produced by different translators. This study will analyse translations into Spanish, Portuguese and Polish, comparing two different translations for each language. Details of these translations have been outlined in the table below. Another factor which contributed to the choice of materials was accessibility of the texts. Since *The Picture of Dorian Gray* was published in 1890, it is now available in the public domain. Moreover, the translations into Spanish, Portuguese and Polish are also easily accessible, available either in paperback (Polish), on Kindle (Portuguese) or on Google Books (Spanish).

Language	Code name	Name of the translator(s)	Year of publication	Publishing house
Spanish	SP1	Alfonso and José Sastre	1984	EDAF
Spanish	SP2	Mauro Armijo	2012	Grupo Planeta
Portuguese	PT1	Januário Leite	2019	Mimética
Portuguese	PT2	Maria de Lurdes Sousa Ruivo	2013	FV Éditions
Polish	PL1	Maria Feldmanowa	2015 ³	Vesper
Polish	PL2	Jerzy Łoziński	2015	Zysk i S-ka Wydawnictwo

Figure 1. Publication details of translations of *The Picture of Dorian Gray* used in this study

¹ To limit the scope of the study, only the first five chapters of the novel will be considered, as analysing metaphors from the entire novel is beyond the scale of this project.

² This study will use the 1992 Wordsworth Classics edition of *The Picture of Dorian Gray*, with the 2001 introduction and notes by John M. L. Drew

³ Maria Feldmanowa's translation was first published in 1906

The metaphors identified in the ST will be compared with translations produced by human translators (see Figure 1) and MT output produced by Google Translate. Google Translate has been chosen, as it is the most well-known and widely-used MT system worldwide, currently supporting 103 languages (Turovsky 2016). Its accuracy improved significantly in 2016 when it switched from statistical to neural machine translation (NMT) technology, which is currently applied to most of the languages supported by Google Translate (ibid.). The languages analysed in this study – Spanish, Portuguese and Polish – are all using NMT (Google Translate website). In their 2016 study funded by Google, Wu and others concluded that ‘compared to the previous phrase-based production system, this GNMT system delivers roughly a 60% reduction in translation errors on several popular language pairs’. Numerous other studies have also examined the quality of NMT systems, reporting promising results when comparing NMT to other MT paradigms using automatic metrics (Bojar and others 2016; Wu and others 2016; Castilho and others 2017).

Types of metaphor

In order to analyse the metaphors identified in the ST, several categories will be used to organise the dataset and supply parameters for analysis. First of all, the metaphors will be grouped by type, using the model suggested by Shutova, Teufel and Korhonen (2013: 304). They identify three types of linguistic metaphor:

- lexical metaphor (metaphor at the level of a single word sense)
- multi-word metaphorical expressions
- extended metaphor (metaphor that spans over longer discourse fragments)

This study will apply this typology to its own data set. It will, however, also consider the categories of *dead metaphor* and *idiomatic phrase*, as identified by the Oxford Dictionary of Literary Terms. These will act as a control group for the experiment, as idiomatic expressions and dead metaphors are more likely to appear in non-literary texts, and thus there is a stronger possibility of finding examples of such language in the corpus used by GT. The hypothesis is, therefore, that these two categories will be recognised by MT with higher frequency and translated with higher accuracy, as compared to other metaphor types. Organising data in these categories will allow us to see whether certain types of metaphor are more challenging for MT (or HTs) based on the frequency with which each type of metaphor has been rendered into the target language (TL).

Translation procedures

The next category will focus on translation procedures to understand how these metaphors were translated by MT and HTs and to observe patterns that might emerge in the type of procedures applied by MT and HTs. The concept of translation procedure was first introduced by Vinay and Darbelnet in their 1958 work *Comparative Stylistics of French and English: A methodology for translation*. They identify seven translation procedures (also called methods) that a translator can use to render the ST into the TL: borrowing, calque, literal translation, transposition, modulation, equivalence and adaptation (1958 repr. 1995: 31-39).

While translation procedures are the specific methods applied to individual instances during the translation process, translation strategy is the overall tactic with which a translator approaches the text. This distinction was made by Luc van Doorslaer in his 2007 article, in which he distinguishes between different types of translation strategies, such as free translation, idiomatic translation, functional translation, source/target-oriented translation and foreignising translation, among others (2007: 226). It could be concluded that the translation strategy refers to the overarching vision of the translator and the final effect that the TT should have on the target audience. Translation procedures are used during the process in order to achieve this goal.

As translating metaphorical language is considered to pose a specific problem in translation due to frequent lack of equivalence between languages, specific procedures have been suggested to overcome this translation problem. In 1981 two scholars proposed a set of procedures to translate metaphors. First was Reymond van den Broeck who suggested the following three procedures (1981: 77):

1. Translation 'sensu stricto' (i.e., transfer of both SL tenor and SL vehicle into TL)
2. Substitution (i.e., replacement of SL vehicle by a different TL vehicle with more or less the same tenor)
3. Paraphrase (i.e., rendering a SL metaphor by a non-metaphorical expression in the TL)

These procedures were then expanded by Newmark, who proposed a total of seven procedures to translate metaphor (1981: 88-91):

1. Reproducing the same image in the TL.
2. Replacing the image in the SL with a standard TL image which does not clash with the TL culture.
3. Translating metaphor by simile, retaining the image.

4. Translating metaphor (or simile) by simile plus sense (or occasionally a metaphor plus sense).
5. Converting of metaphor to sense.
6. Deletion, if the metaphor is redundant.
7. Using the same metaphor combined with sense.

Newmark's is the most comprehensive set of translation procedures up to date and this study will analyse the translation procedures using Newmark's typology. They will, however, be renamed for the purposes of inserting these categories into a database. Moreover, the fourth and seventh category will be combined into one procedure named *metaphor to sense*. Another adjustment is the addition of the *simplified metaphor* category, which was not considered by Newmark. This will define translations in which the metaphor was reproduced by the translator, maintaining the same image as the ST, but in a simplified form. Based on this, the classification system used in this study will be as follows:

1. Reproduced metaphor
2. Replaced metaphor
3. Metaphor to simile
4. Metaphor plus sense
5. Simplified metaphor
6. Metaphor to sense
7. Deletion

Additionally, a *N/A* category will be used to identify metaphors that were not translated successfully due to a MT error. For example, this could include ungrammatical phrases, wrong word choice or incoherent translations of multi-word and/or extended metaphors. Therefore, this category will be applied to MT output only.

1. Types of metaphor

This chapter will analyse the frequency with which each type of metaphor was translated by HTs and MT. The database of results consisted of 43 metaphors found in the ST, 17 of which were lexical, 12 multi-word, 7 extended, 4 idiomatic and 3 dead, as illustrated by Figure 2 below.

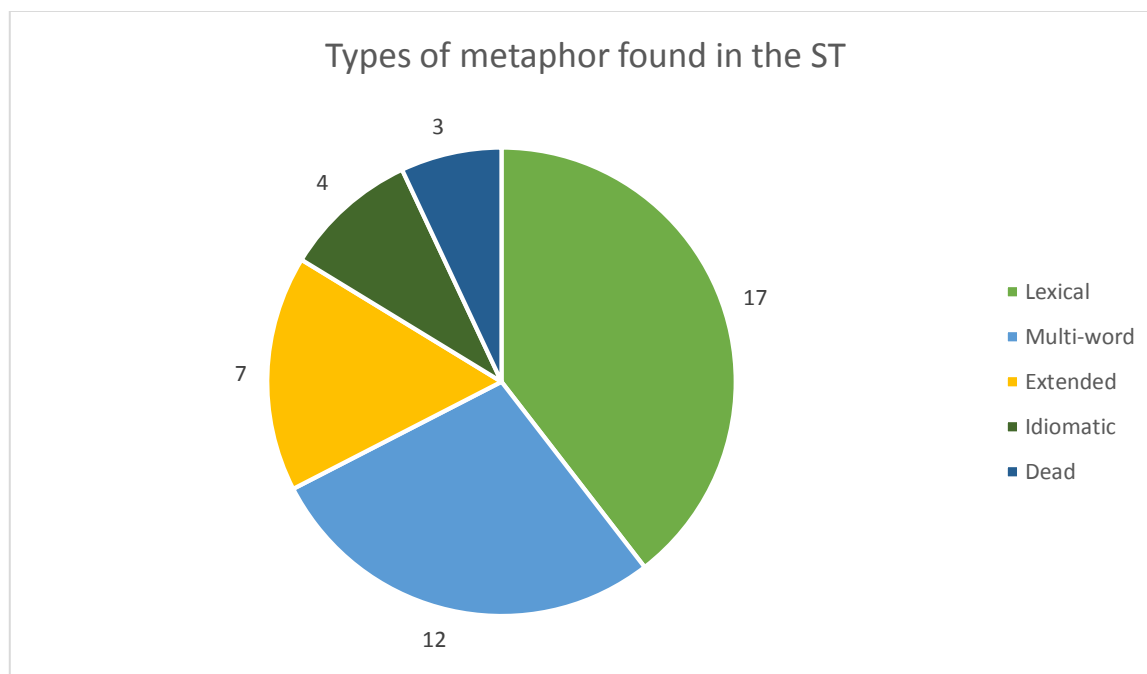


Figure 2. *Types of metaphor found in the ST*

1.1 Lexical metaphors

This section will analyse human and MT translations of metaphors found at the level of a single word, referred to as lexical metaphors (see Introduction). Seventeen lexical metaphors were identified in the first five chapters of *The Picture of Dorian Gray*, out of the total of 43 metaphors. Consequently, lexical metaphors constituted 40% of all metaphors found in the ST, making this the most common metaphor type. Here are some examples from the ST that illustrate what is meant by lexical metaphor:

1. 'the sunlight slipped over the polished leaves' (Chapter 1, page 7)
2. 'stung a little by the lad's silence' (Chapter 2, page 24)
3. 'smiles chasing each other over his lips' (Chapter 3, page 36)

In example 1 the tenor *sunlight* (a natural phenomenon) is being described through the vehicle of *to slip* (verb of motion), thus personifying the sunlight. In example 2 the past

participle *stung* is being used metaphorically to describe the feeling of annoyance or disappointment. Example 3, similarly to example 1, personifies the noun *smiles* (noun of communication) with the verb *to chase* (verb of motion). What all these metaphors have in common is that the metaphor is found at the level of a single word, predominantly verbs. How will MT translate these unusual collocations? Will it be able to convey the metaphorical sense of these phrases? To answer these questions, we will analyse the results of the experiment, as illustrated in the following graph.

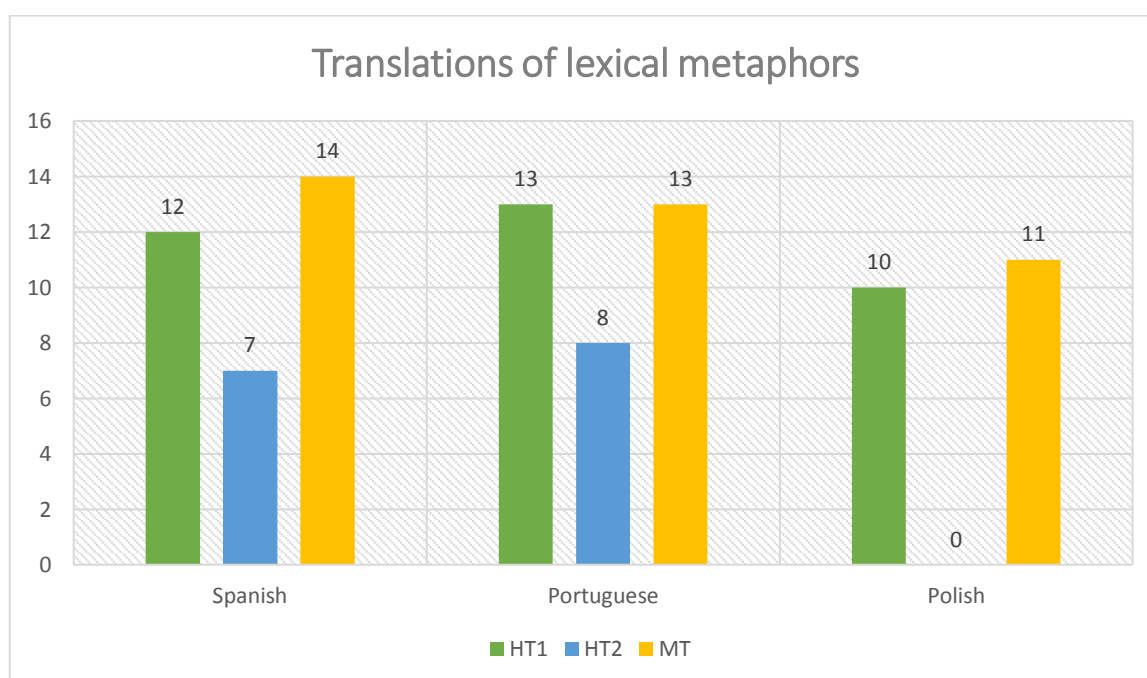


Figure 3. The number of lexical metaphors translated by HTs and MT in each language

This chart shows the number of lexical metaphors that were translated by two human translators (HTs) and machine translation (MT) for each language. Unfortunately, there are no findings for the second Polish translator – Jerzy Łoziński – as his translation abridged and manipulated the structure of the ST to such degree that identifying the corresponding metaphors in the TT was not possible. The results for PL2 have been discarded altogether, which means that only Maria Feldmanowa’s translation (PL1) will be considered in this study.

As can be observed in the bar chart, MT translated 14 out of 17 lexical metaphors into Spanish (82%), 13 into Portuguese (76%) and 11 into Polish (65%). This results in a range of minimum 11 and maximum 14 lexical metaphors. Human translators, on the other hand, display a wider range, with the minimum of 7 in Spanish HT2 and the maximum of 13 in Portuguese HT1. However, the results are higher for HT1 in all languages when compared with HT2, who scored

7 and 8 in Spanish and Portuguese respectively. When MT and HT results are compared, it can be observed that MT translated the same number of lexical metaphors as HT1 in Portuguese and outperformed both Spanish and Polish HTs. In Spanish, MT outperformed HT1 by two metaphors, while doubling the number of metaphors translated by HT2. In Portuguese, MT performed the same as HT1, but translated five more metaphors than HT2. Finally, in Polish MT outperformed the HT by just one metaphor.

These results support the hypothesis that MT would perform best in this category, as it is more likely than human translators to translate literally. This can also be observed in the following graph, which shows the proportion of lexical metaphors that were either *reproduced* or *replaced* by HTs and MT in each language.

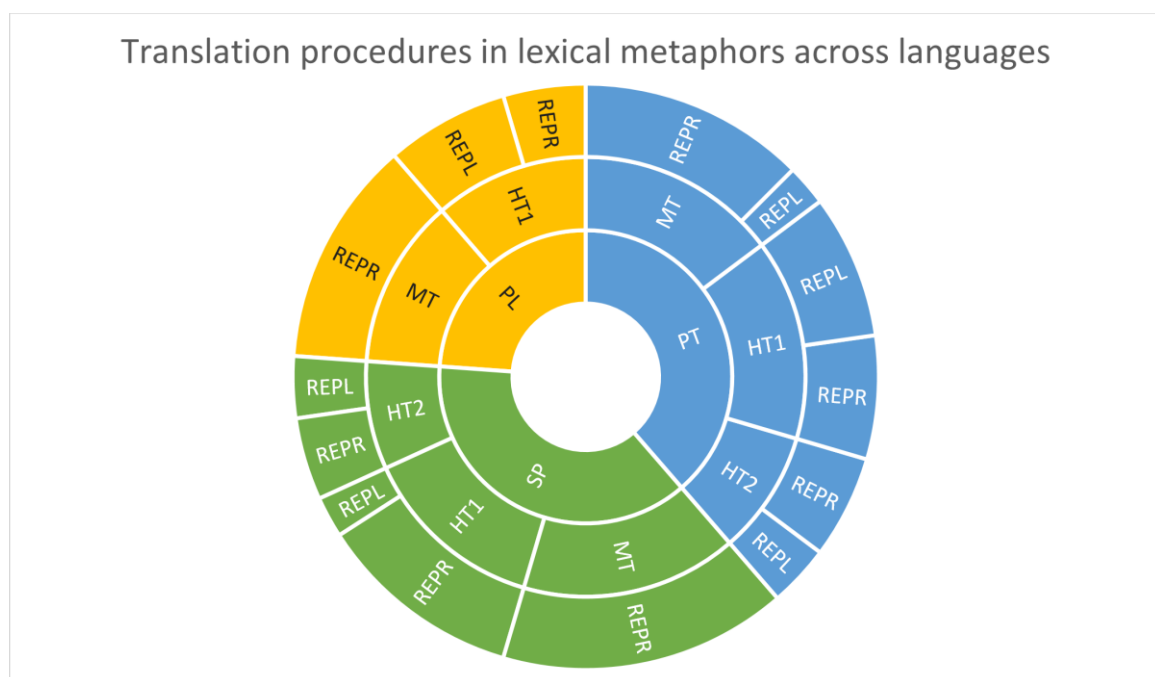


Figure 4. Proportion of lexical metaphors that were reproduced or replaced in each language by both HTs and MT

Figure 4 visualises the proportion of lexical metaphors that were either *reproduced* or *replaced* by both HTs and MT in each language. The blue section shows results for Portuguese, where it can be observed that MT reproduced most metaphors, although there were also some instances of replacement. Human translators, on the other hand, applied the procedures more equally overall, but HT2 reproduced slightly more often than replaced. The green section shows results for Spanish, which display less consistency. MT reproduced all metaphors, while HT1 reproduced most and HT2 replaced and reproduced almost equally,

with slight majority of reproduction. The last section, marked in yellow, shows results for Polish. Here, MT also reproduced all metaphors, but the HT replaced slightly more than reproduced. Polish HT1 and Portuguese HT1 were the only ones who replaced more than reproduced. The trend for MT was to reproduce lexical metaphors, except for two metaphors that were replaced by Portuguese MT. These instances will be discussed in chapter 2, which will explore the potentials of MT for literary texts.

Results for most HTs demonstrate a split between the number of metaphors that they reproduced or replaced. These findings suggest the following two things: a) that HTs tend to translate less literally than MT and b) that although MT translated more literally, this is not a problem for this type of metaphor. In fact, MT has been found to either surpass or replicate the results of HTs in this category. The next section will evaluate MT performance in metaphors that go beyond single-word level.

1.2 Multi-word metaphorical expressions

The next type of metaphor analysed in this study will be multi-word metaphorical expressions, as termed by Shutova, Teufel and Korhonen (2013). They define both multi-word metaphorical expressions and extended metaphors as ‘metaphor that spans over longer discourse fragments’ (2013: 304). For the purpose of this study, the two types will be differentiated in the following way: metaphors that span multiple words within the same sentence will be considered *multi-word metaphorical expressions*. On the other hand, metaphors that go beyond one sentence will be classified as *extended metaphors*. This will allow us to see how MT handles metaphors both at sentence level and across a longer utterance. Examples of multi-word metaphors found in the ST include:

1. ‘Every impulse that we strive to strangle broods in the mind and poisons us.’ (Chapter 2, page 18)
2. ‘Don't squander the gold of your days.’ (Chapter 2, page 21)
3. ‘Reality entered the room in the shape of a servant.’ (Chapter 3, page 36)

Unlike lexical metaphors, metaphors in the above sentences cannot be identified at the level of a single word, but rather span across the entire sentence. In example 1 the verbs *strangle*; *brood*; and *poison* are all being used metaphorically to refer to *impulses*. In example 2 the expression *the gold of your days* refers to the best part of a person's life – presumably youth.

Example 3 compares reality to a servant, suggesting that the characters became aware of reality upon the sight of a servant entering the room. Altogether there were 12 multi-word metaphors in the ST and the number of metaphors translated into each language can be seen in the graph below:

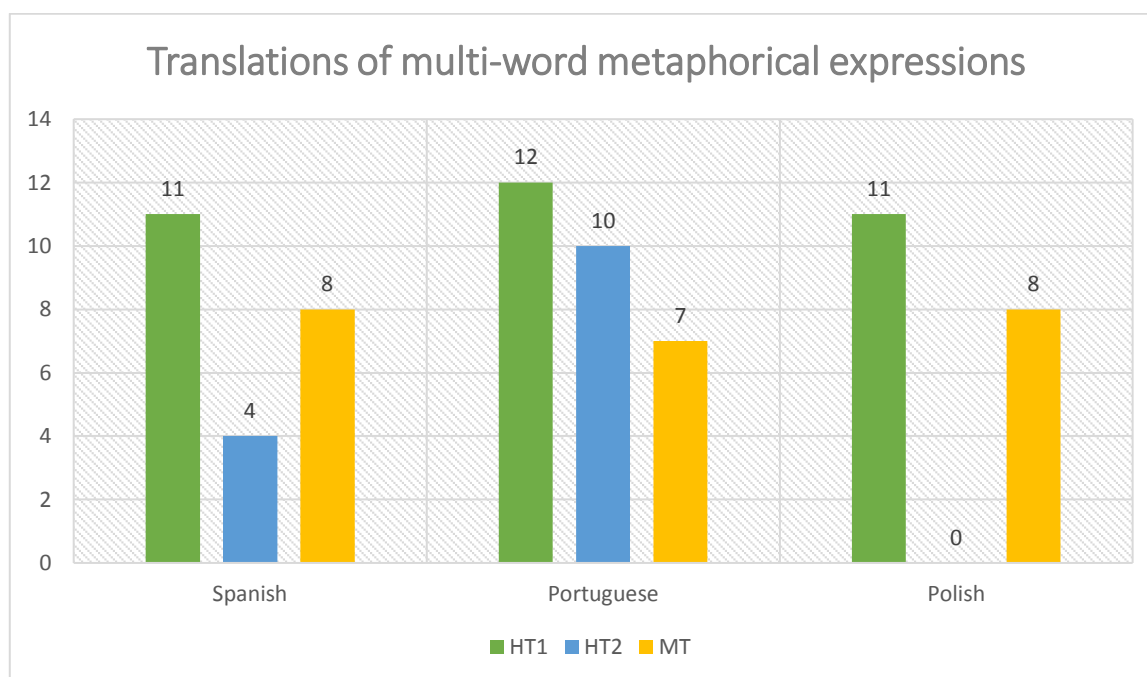


Figure 5. *The number of multi-word metaphors translated by HTs and MT in each language*

Based on the data from this graph, HT1s translated most multi-word metaphors, ranging from 11 out of 12 in Spanish and Polish, to 12 out of 12 in Portuguese. The result for HT2 in Portuguese was slightly lower with 10 out of 12, but the real exception to the trend is Spanish HT2, which translated only 4 out of the 12 multi-word metaphors (33%). MT, on the other hand, produced consistent results across languages, having translated 7 metaphors in Portuguese (58%) and 8 in Spanish and Polish (66%). Overall, MT performed worse in this category, as it translated less metaphors than all HTs, except for Spanish HT2. However, MT had a much smaller range of results as compared to HTs, thus maintaining the trend observed in the previous category. Analysing the procedures employed by these translators will allow us to identify patterns of behaviour and possible translation strategies.

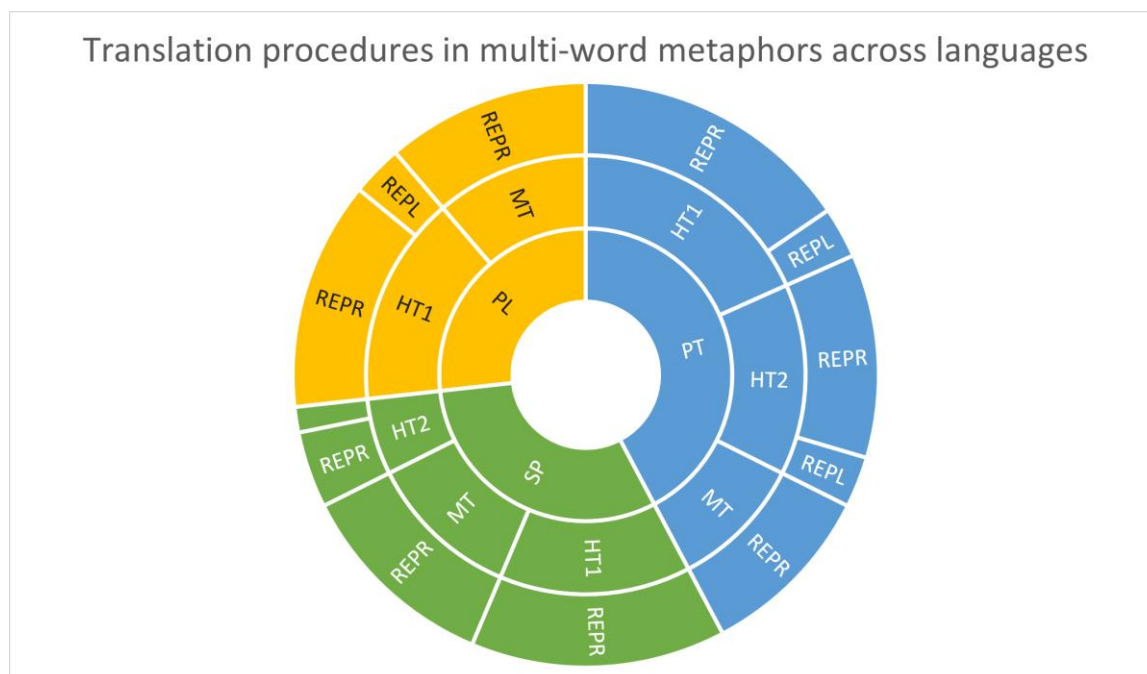


Figure 6. Proportion of multi-word metaphors that were reproduced or replaced in each language by both HTs and MT

This chart illustrates the proportion of multi-word metaphors that were either *reproduced* or *replaced* by both HTs and MT in each language. The blue section shows results for Portuguese. It can be observed that both HTs reproduced most of the multi-word metaphors, while MT reproduced all of them. In the green section, representing Spanish, both HT1 and MT also reproduced 100% of the multi-word metaphors. HT2 reproduced 3 out of 4 metaphors and replaced one. In Polish, HT1 also reproduced most metaphors and MT reproduced all 8 metaphors.

Across the three languages, MT reproduced 100% of the multi-word metaphorical expressions that it translated. Although in the previous category there were two instances of replacement, this did not occur with multi-word metaphors. HTs also tended to reproduce more than replace in this category, having on average reproduced 80% of the metaphors. This suggests that in this category HTs tended to translate more literally than in the case of lexical metaphors. Despite this, MT performance was better in the previous category. This could be due to higher conceptual complexity of longer metaphors, which increases the possibility of grammatical and/or coherence errors on the part of MT. Should this be true, a similar pattern will be observed in extended metaphors.

1.3 Extended metaphors

The next type of metaphor that will be analysed is extended metaphor, i.e. metaphor that extends over more than one sentence. Below are some examples of extended metaphors from the ST:

1. 'The few words that Basil's friend had said to him had touched some secret chord that had never been touched before, but that he felt was now vibrating and throbbing to curious pulses.' (Chapter 2, page 19)
2. 'The common hill-flowers wither, but they blossom again. The laburnum will be as yellow next June as it is now. In a month there will be purple stars on the clematis, and year after year the green night of its leaves will hold its purple stars.' (Chapter 2, page 22)
3. 'He played with the idea and grew wilful; tossed it into the air and transformed it; let it escape and recaptured it; made it iridescent with fancy and winged it with paradox.' (Chapter 3, page 35)

All these metaphors use imagery to refer to more abstract concepts, thus visually representing something which cannot be easily described without the use of metaphor. In example 1 the metaphor of a chord is being used to represent new ideas and feelings that Dorian Gray was experiencing following his conversation with Lord Henry. In example 2 the imagery of flowers withering and blossoming again is used to explain the cyclical nature of time. In the final example, an idea is being described as if it were a physical object, which can be tossed into the air and captured. Altogether there were seven extended metaphors in the ST, which have been translated into Spanish, Portuguese and Polish in the following way:

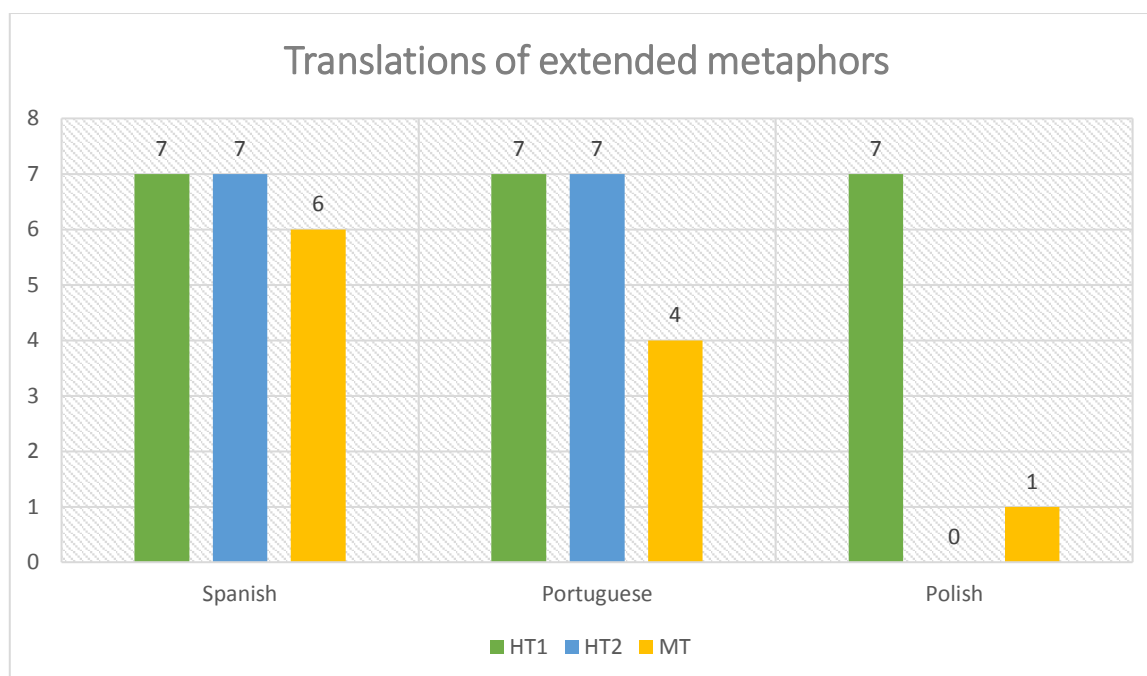


Figure 7. The number of extended metaphors translated by HTs and MT in each language

As can be observed in the graph, HTs translated 7 out of 7 extended metaphors across all languages. These are the highest results for HTs that have been observed so far. While MT results were consistent in the previous categories, this category breaks the pattern and significant variances can be observed between languages. Spanish MT was the most successful, having translated 6 out of 7 metaphors (86%). However, this figure drops down to 4 (57%) in Portuguese and one (14%) in Polish, the lowest performing MT system in this category. HTs, on the other hand, have been most consistent in this category, having translated 100% of metaphors across the board. This suggests that HT performance varies at word-level but remains consistent over longer fragments of text. MT demonstrates the opposite tendency, performing better at word-level, as has been observed in lexical metaphors. However, MT performance varies across languages, which will be further discussed in section 1.6 of this chapter.

1.4 Idiomatic expressions

This section will analyse the translations of idiomatic expressions, as translated both by MT and HTs. Idiomatic expressions are being used as a control group in this study, as it is predicted that examples of idiomatic expressions would have been present in the GT corpus, since their use is not limited to literary texts. Thus, the hypothesis is that GT will be able to recognise idiomatic expressions and will avoid translating them literally.

Four idiomatic expressions were identified in the ST:

1. 'I am all expectation' (Chapter 1, page 8)
2. 'He always said that the country was going to the dogs' (Chapter 3, page 28)
3. 'I want to get something out of you' (Chapter 3, page 28)
4. '(...) had set loose a train of horrible thoughts' (Chapter 5, page 55)

All these expressions are metaphorical as their meaning is not literal and they cannot be translated word-for-word. The translator, thus, must decide whether to replace the idiom with a similar TL expression or explicitate the meaning of the phrase in non-metaphorical language.

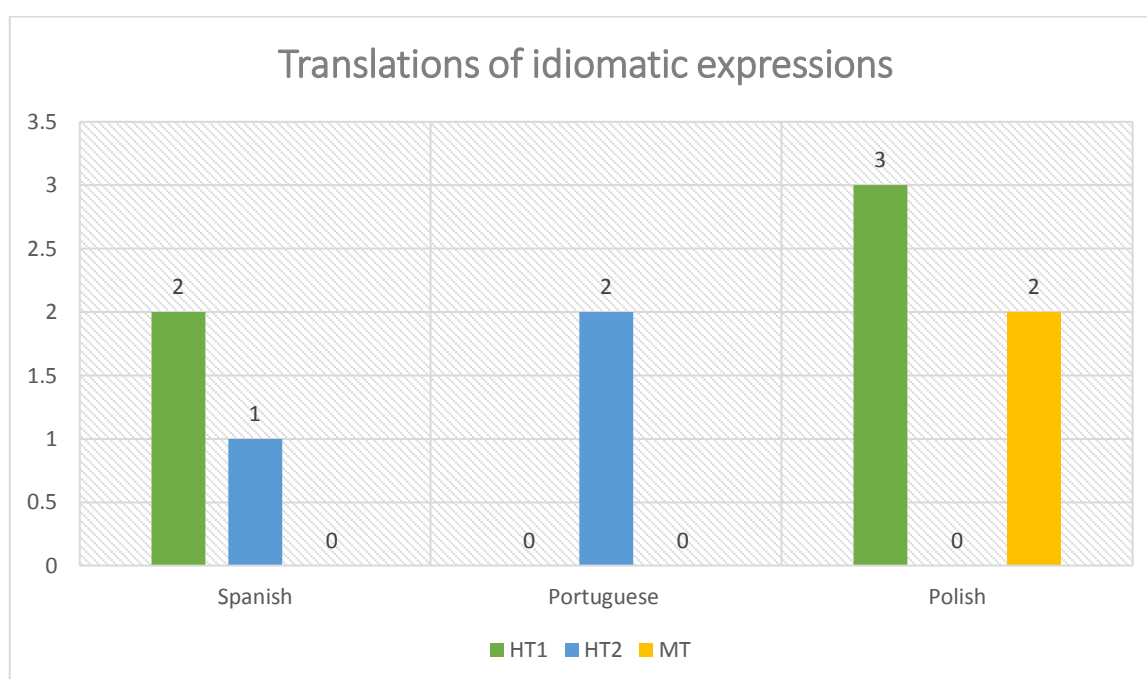


Figure 8. *The number of idiomatic expressions translated by HTs and MT in each language*

This chart illustrates the number of idiomatic expressions that were translated metaphorically by both HTs and MT in each language. In Spanish HT1 translated two out of four idioms (50%) and HT2 translated one (25%). Spanish MT did not translate any of the idiomatic expressions. In Portuguese HT1 did not translate any idioms, while HT2 translated two out of four (50%), similarly to Spanish HT1. Portuguese MT did not translate any idioms, reproducing the results observed in Spanish MT. Polish HT1 achieved the highest result in this category, having translated three out of four idioms (75%). Polish MT translated two idioms (50%), thus situating itself as the best performing MT system in this category. These results contradict the initial hypothesis and demonstrate that idiomatic expressions are not necessarily more

recognisable for MT than other types of metaphor. However, further analysis of translation procedures applied to this category is required to understand the behaviour of both MT and HTs. The table below illustrates the procedures employed by both HTs and MT in this category:

	SP1	SP2	SP MT	PT 1	PT 2	PT MT	PL1	PL MT
Reproduced	1	-	-	-	-	-	-	-
Replaced	1	1	-	-	2	-	3	2
Metaphor to sense	2	3	1	4	2	-	1	-
N/A	-	-	3	-	-	4	-	2

Figure 9. Translation procedures in idiomatic expressions employed by HTs and MT across three languages

What can be observed in this data, is that all HTs either replaced the idiomatic expression (except for one reproduction in SP1) or explicitated the meaning of the idiomatic expression (metaphor to sense). MT was also able to employ these two procedures with one case of *metaphor to sense* in Spanish and two cases of *replacement* in Polish. MT, however, also produced translations that were classed as N/A owing to grammatical and/or coherence errors. Portuguese MT performed the worst with four out of four (100%) of its translations in the N/A category, as compared to three (75%) for Spanish and two (50%) for Polish. Based on this data, we can conclude that even though both Spanish and Portuguese failed to translate idiomatic expressions metaphorically, at least Spanish MT was able to translate one of the expressions as non-metaphor. Portuguese, on the other hand, failed to produce any successful translations. The translations classed as N/A will be further analysed in section 2.3 on common MT errors.

1.5 Dead metaphors

According to Nunberg, all metaphors emerge as novel, but over time they become part of general usage and their rhetorical effect vanishes, resulting in conventionalized metaphors (Nunberg 1987 as cited in Shutova, Teufel and Korhonen 2013: 308). He calls such metaphors “dead” and claims that they are not psychologically distinct from literally used terms (ibid.). In other words, dead metaphors refer to metaphorical uses of words that have become so common that most speakers would no longer consider them metaphorical. Three instances of such metaphor were identified in the ST:

1. ‘not catching the meaning of his words’ (Chapter 2, page 23)
2. ‘a sharp pang of pain struck through him like a knife’ (Chapter 2, page 24)

3. 'the same nervous staccato laugh broke from her thin lips' (Chapter 4, page 39)

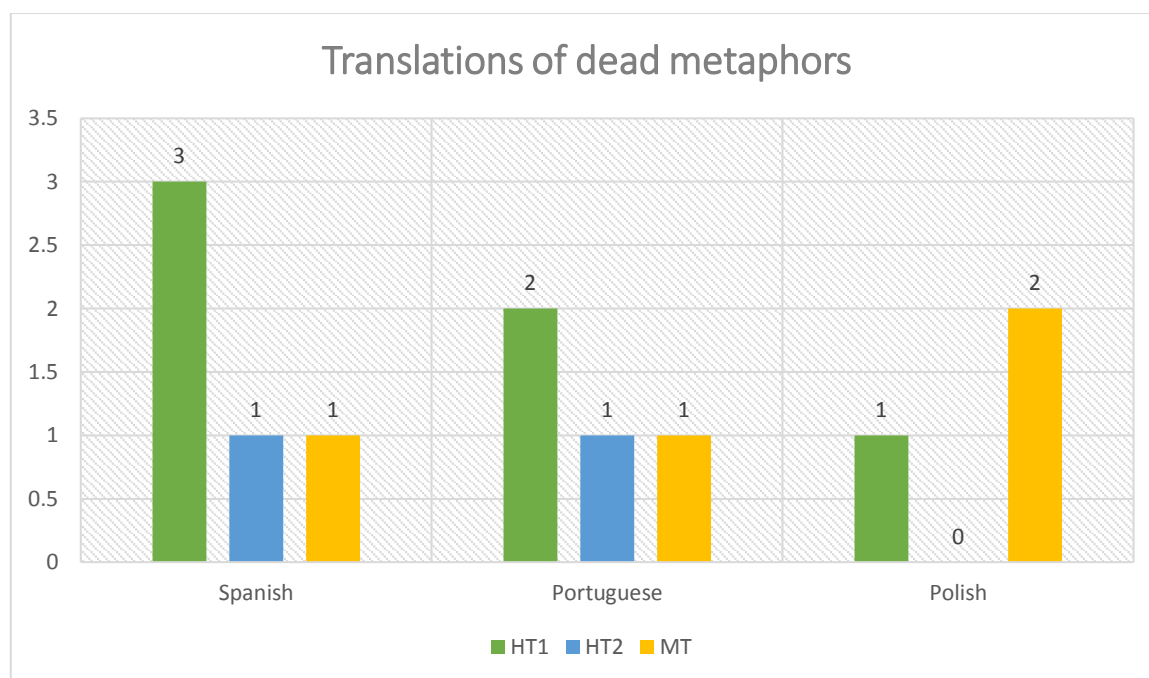


Figure 10. The number of dead metaphors translated by HTs and MT in each language

As can be observed in this graph, HT1 performance varied across languages, ranging from three out of three (100%) in Spanish, two (67%) in Portuguese and one (33%) in Polish. Results for HT2, on the other hand, remained consistent with one translation in both Spanish and Portuguese (33%). MT performed identically to HT2 in Spanish and Portuguese, having translated one dead metaphor, while Polish MT outperformed HT1 and translated two metaphors (67%). It was, therefore, the best performing MT system in this category, replicating the results observed in the previous section. The table below illustrates the procedures used to translate dead metaphors:

	SP1	SP2	SP MT	PT 1	PT 2	PT MT	PL1	PL MT
Reproduced	2	-	1	1	-	1	1	2
Replaced	1	1	-	1	1	-	-	-
Metaphor to sense	-	2	2	1	2	-	2	1
N/A	-	-	-	-	-	2	-	-

Figure 11. Translation procedures in dead metaphor employed by HTs and MT across three languages

These results demonstrate the variety of procedures applied by HTs in each language. For example, Spanish HT1 reproduced two metaphors and replaced one, while HT2 replaced one and explicitated the meaning of two (*metaphor to sense*). Portuguese HT2 applied the exact same procedures, while HT1 displayed more variety, having reproduced one, replaced one

and explicitated one. Polish HT1 reproduced one metaphor and explicitated two. MT did not replace any metaphors, either reproducing (one in Spanish, one in Portuguese and two in Polish) or explicitating (two in Spanish and one in Polish) the metaphors. Portuguese MT was the worst performer, with two out of three metaphors (67%) in the N/A category. Spanish and Polish MT, on the other hand, did not produce any N/A translations. Overall, MT performed comparably to HTs, either reproducing the metaphor or explicitating its meaning (*metaphor to sense*). It did not, however, replace any metaphors, thus diverging from the pattern observed in HTs. This also varies from the previous category, in which Polish MT replaced two metaphors.

1.6 Trends across metaphor types

Having analysed each type of metaphor individually, this section will aim to identify general patterns of behaviour across different types of metaphor. Firstly, performance of HTs across different metaphor types will be analysed.

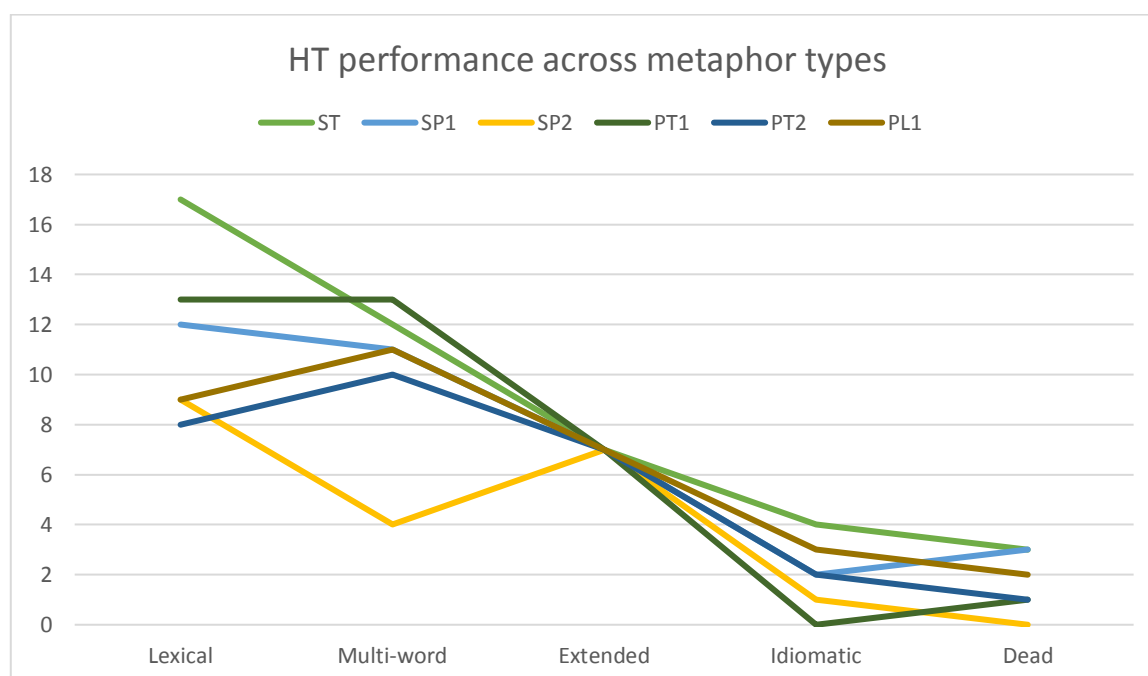


Figure 12. HT performance across metaphor types

Figure 12 represents the number of metaphors that were translated by HTs for each type of metaphor. The number of metaphors in the ST has been included for comparison and marked in dark blue. This data demonstrates that HT performance varies significantly in the categories of lexical and multi-word metaphor. Portuguese HT1 translated the highest number of metaphors in both categories. In multi-word metaphors, the score is higher than that of the

ST, which means that the translator must have translated another type of metaphor as multi-word. The worst performing HT in lexical metaphor was Portuguese HT2, followed by Spanish HT2 and Polish HT1, who translated the same number of metaphors. In multi-word metaphors most HTs remain close to the ST number, except for Spanish HT2, who performed significantly worse in this category, having translated only 4 out of 12 multi-word metaphors. On the other hand, the results are very consistent in the extended metaphor category, where all HTs translated 7 out of 7 metaphors found in the ST. However, the results diverge again in the categories of idiomatic and dead metaphors. Portuguese HT1 and Spanish HT2 are the lowest performers in these categories, having translated none of the metaphors. Polish HT1 displayed the highest performance in these categories, although Spanish HT1 surpassed it in dead metaphors, having translated 100% of the metaphors. However, it must be noted that due to the limited scope of the study for the last two categories, no conclusive results can be drawn.

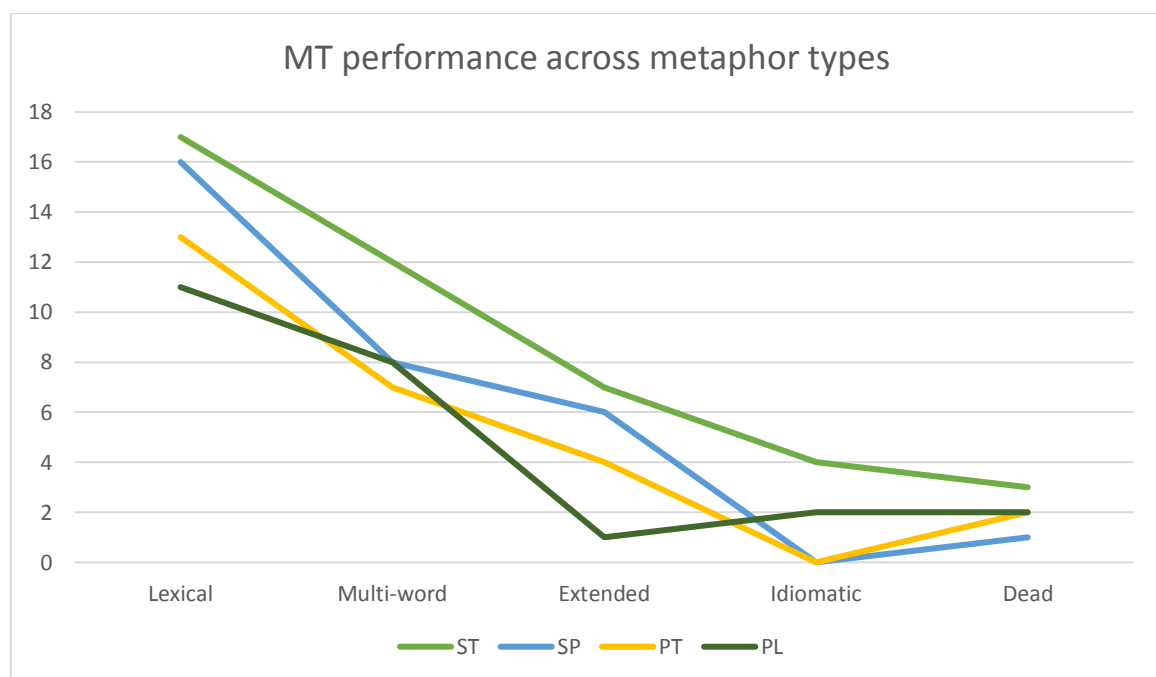


Figure 13. *MT performance across metaphor types*

Comparing MT performance with HTs, MT results display a wider range for lexical metaphors (from 11 to 16, as compared to 8 to 11 for HTs), but the scores are higher across the board. In multi-word metaphors, however, the situation is reversed. MT results are very consistent, but the performance is lower in this category. While MT achieved scores of 7 (Portuguese) and 8 (Spanish and Polish), HTs displayed a range of 4 to 13. Furthermore, while HTs were

most consistent in the extended metaphor category, MT displays a wide range of results. Performance for this category varied by language, with 6 out of 7 metaphors in Spanish, to just one metaphor in Polish. Portuguese situated itself in the middle with four metaphors. Regarding idiomatic and dead metaphors, Polish performed best in both categories, having translated two idiomatic expressions and two dead metaphors. Portuguese also translated two dead metaphors, but failed to translate any idiomatic expressions, similarly to Spanish.

This data suggests that MT performance is lowest in extended metaphors, but these results cannot be conclusive due to the limited scope of the study. To gain a more thorough understanding of these results, the procedures employed in the extended metaphor category will be analysed.

	SP1	SP2	SP MT	PT1	PT2	PT MT	PL1	PL MT
Reproduced	5	5	5	6	4	3	6	-
Replaced	1	2	1	1	2	1	-	1
Metaphor plus sense	1	-	-	-	-	-	1	-
Simplified metaphor	-	-	-	-	1	-	-	-

Figure 14. Translation procedures in extended metaphors employed by HTs and MT across three languages

Four procedures were used in the translation of extended metaphors: *reproduction*, *replacement*, *metaphor plus sense* and *simplification*. In Spanish both HTs reproduced five metaphors. However, HT2 replaced the remaining two metaphors, while HT1 replaced one and supplemented one with additional information. MT followed a similar procedure, having also reproduced five metaphors and replaced one. In Portuguese HT1 reproduced six metaphors and replaced one. HT2 applied a wider range of procedures, reproducing four, replacing two and simplifying one metaphor. Portuguese MT reproduced three out of four metaphors and replaced one. Polish HT1 reproduced six metaphors and supplemented one with additional information. Polish MT translated only one extended metaphor by replacing it with another metaphor.

As it is made evident by this data, MT is limited in its choice of procedures, altering between reproduction and replacement. The other two procedures – *metaphor plus sense* and *simplified metaphor* – have not been applied by MT although they have been used by HTs in every language. These procedures require more complex modifications of the metaphor, either by omitting some details (*simplification*) or inserting additional information to

explicitate the metaphor (*metaphor plus sense*). These results suggest that at this stage MT is not able to make such decisions, as they require the translator to look beyond linguistic features of the text and consider how it will be received by the target reader. The focus on the target audience is an element of translation that, at least for the time being, still requires human input.

The results in this section have shown that GT can recognise metaphor and produce metaphorical translation, although the rate and quality of its output depends on the type of metaphor. MT offered best results in lexical metaphors, that is metaphors at the level of single words, as it outperformed HTs in this category if we consider the number of metaphors that were translated. This result is not surprising, since single-word metaphors are more susceptible to literal translation and, as has been observed, MT reproduced most of the lexical metaphors it translated, thus relying on the method of literal translation. HTs, on the other hand, displayed a wider range of procedures, either translating the metaphors literally (reproducing) or replacing the ST image with another image in the TT. As had been predicted, the results demonstrated an overall drop in MT performance in the multi-word metaphor category, in which the translation rate was 66% for Spanish and Polish and 58% for Portuguese. This is a significant decrease for Spanish and Portuguese, which scored 82% and 76% in lexical metaphors respectively. Polish, however, remained consistent across the two categories, with the rate of 65% in lexical metaphors, only one point lower than the score for multi-word metaphors.

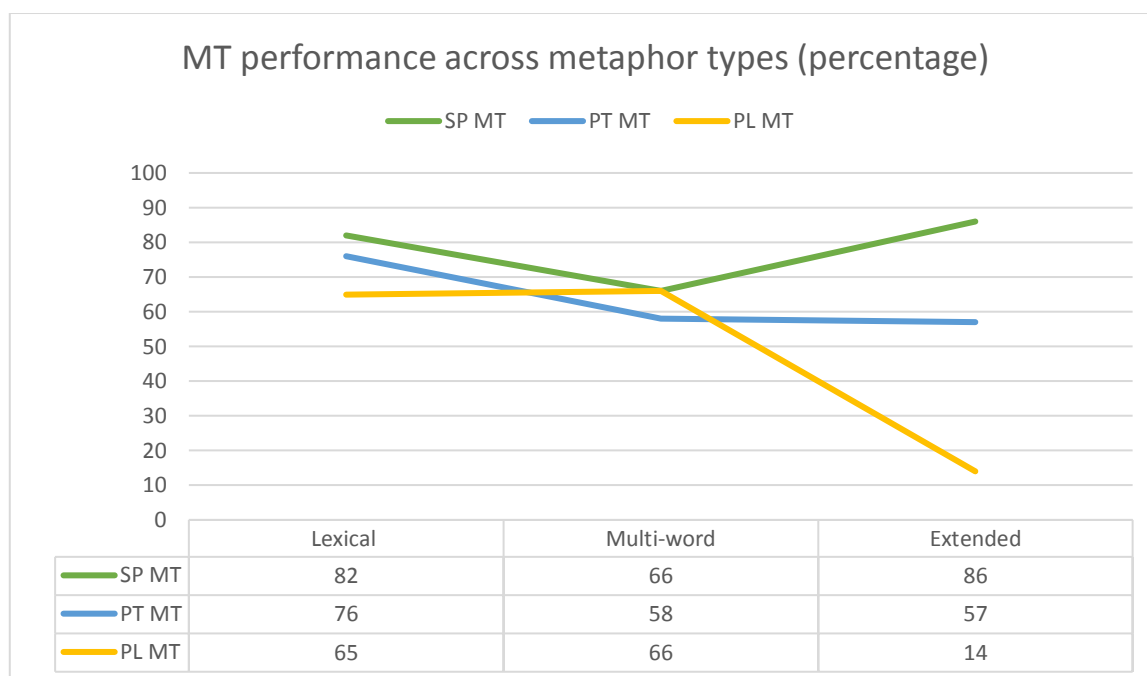


Figure 15. MT performance across metaphor types in percentages

The final category, extended metaphor, revealed a wide range of results that varied across languages. While Spanish continued to perform very well, with the translation rate of 86%, Portuguese dropped down to 57% and Polish scored its lowest result at 14%. These results suggest that the length of metaphor affects the accuracy of MT output, although not all languages are affected in the same way. Results for Portuguese show that MT performance dropped in the categories of multi-word and extended metaphors, as compared to lexical metaphors. However, performance remained consistent across the two categories, suggesting that once the length of metaphor increased from one-word level to sentence level the performance remained unaffected. In Polish, on the other hand, lexical and multi-word metaphors display similar performance, and it is not until the extended metaphor category that a decrease in performance can be observed. Results for Spanish, however, do not follow this pattern, as its performance drops in multi-word metaphors, but peaks in extended metaphors, thus objecting any correlation between the length of metaphor and MT performance.

2. Quality assessment

Translation quality assessment is a topic of debate in the field of TS and the translation industry. As translation is such a complex process, involving cognitive, linguistic, cultural, social and technical aspects, so is the process of assessing the quality of translated texts. This

has become a particularly important issue in relation to machine translation and numerous automatic metrics are being used to assess translation quality, such as BLEU, METEOR, TER and chrF3 (Bojar and others 2016). These metrics have offered promising results for neural MT (NMT), surpassing previous statistical phrase-based MT (PBSMT) systems (see Bahdanau, Cho and Bengio 2015; Bojar and others 2016; Toral and Way 2018 among others). However, some studies have found that ‘although promising results are being reported when comparing NMT with other MT paradigms using automatic metrics, when human evaluation is added to the comparison, the results are not yet so clear-cut’ (Castilho and others 2017: 117). In this study, the quality of MT output will be assessed through analysis of statistical data and examination of specific examples, in which choices made by MT and HTs will be compared. The first section of this chapter will look at the general trends in translation procedures, with the aim to identify patterns of behaviour in both HTs and MT. Following this general overview, section two will focus on examples of MT output that can be considered successful (i.e. accurate and appropriate translations of metaphor were created). Section three, on the other hand, will examine instances of failure on the part of MT by identifying common errors across languages.

2.1 Translation procedures

As has been discussed in the introduction, the term translation procedure refers to a specific method applied to a particular translation problem - for example, borrowing or calque (Vinay and Darbelnet, 1958 repr. 1995) - as opposed to translation strategy, the overarching approach and vision for the TT. While Chapter 1 analysed translation procedures as applied to each type of metaphor, this section will examine the general trends in translation procedures across all metaphor types and languages. The aim of this analysis is to identify patterns of behaviour in the choice of procedure on a wider scale. Which procedures were the most common among HTs and which among MT? How do these compare from one language to another? Do these choices suggest an underlying strategy among HTs?

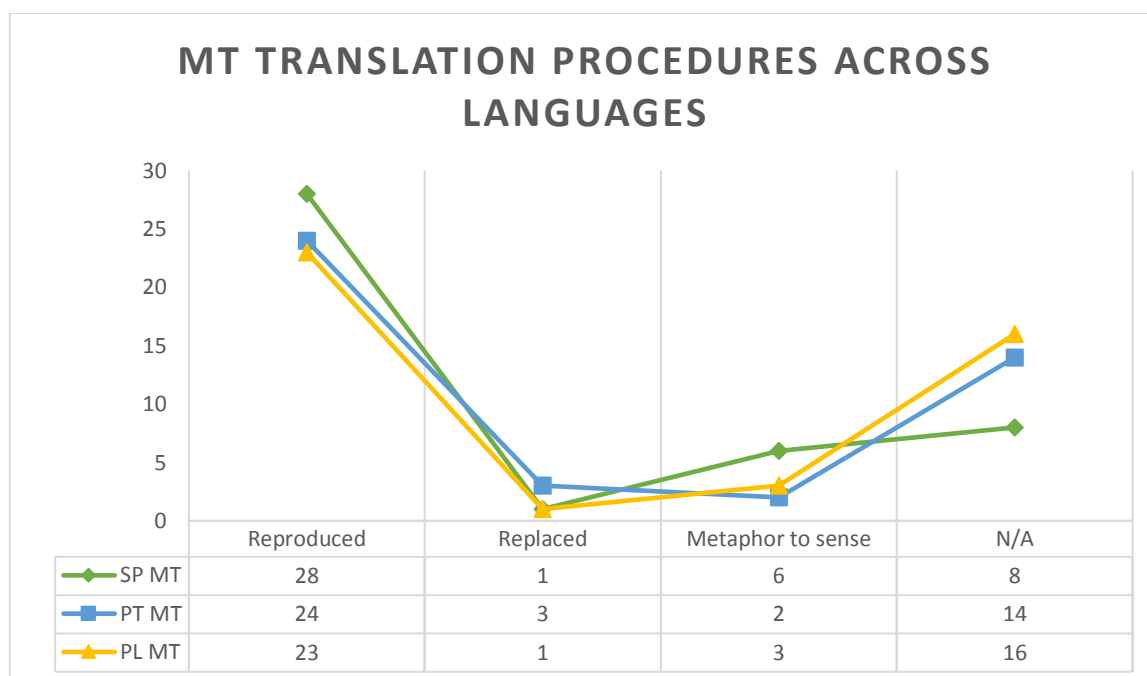


Figure 16. MT translation procedures across Spanish, Portuguese and Polish

This graph illustrates the trends in translation procedures as applied by MT in each language. Spanish has been marked in green, Portuguese in blue and Polish in yellow. Four procedures have been employed by MT: *reproduced metaphor*, *replaced metaphor*, *metaphor to sense* and *N/A*. The procedures *metaphor plus sense*, *metaphor to simile*, *simplified metaphor* and *deletion* are not considered in this graph since they were not used by MT. As can be seen from the data, MT performed consistently across the three languages in the *reproduced* and *replaced* categories. *Reproduced* is the category in which all languages scored the highest, with Spanish reaching the highest rate, having reproduced 28 out of 43 metaphors (65%), as compared to 24 in Portuguese (56%) and 23 in Polish (53%). Although these metaphors were translated literally, the produced outcome functioned as a comprehensible metaphor in the TL.

An example of such metaphor is the following phrase found in Chapter 1, on page 7: ‘the sunlight slipped over the polished leaves’. It was reproduced successfully by MT in all languages, by translating the verb “to slip” literally. The following translations were produced:

- SP HT1:** *la luz del sol resbalaba por las brillantes hojas*
 [the sunlight was slipping over the shiny leaves]
- SP HT2:** *los rayos del sol chocaban sobre las hojas*
 [the rays of sun were crashing against the leaves]

SP MT:	<i>la luz del sol se deslizaba sobre las hojas pulidas</i> [the sunlight slipped over the polished leaves]
PT HT1:	<i>a luz do sol escorregava pelas folhas lustrosas</i> [the sunlight was slipping over the glossy leaves]
PT HT2:	(omitted)
PT MT:	<i>a luz do sol escorregou sobre as folhas polidas</i> [the sunlight slipped over the polished leaves]
PL HT1:	<i>promienie słońca ślizgały się po błyszczących liściach</i> [rays of sun were slipping over the glossy leaves]
PL MT:	<i>słońce prześlizgnęło się po wypolerowanych liściach</i> [the sun slipped over the polished leaves]

Both HTs and MT show little variety in these examples. MT translated all phrases literally and these translations are closer to the ST phrase than some of the solutions provided by HTs. Spanish HT1 replaced the metaphor by choosing a different image (to crash, rather than to slip), while Portuguese HT2 decided to omit the phrase altogether. Although literal translation was not successful in all cases, MT produced a lot of successful metaphors by simply translating the phrase word-for-word, as has been exemplified here.

Returning to Figure 16, the next category - *replaced metaphor* - is where MT results display the smallest range – from one instance in both Spanish and Polish (2%) to three instances in Portuguese (7%). These examples will be further analysed in the next section of this chapter. *Metaphor to sense* was another category in which there was little disparity between languages. Spanish scored slightly higher in this category than Portuguese or Polish. The MT system applied this procedure to six metaphors in Spanish (14%), two in Portuguese (5%) and three in Polish (7%). Overall, the *replaced metaphor* and *metaphor to sense* categories were the least employed by MT. These results are not unexpected, since both procedures require in-depth understanding of the metaphor and its conscious manipulation, either by changing the metaphor with one more suitable to the TC, or explicating its meaning in non-

metaphorical language. Although sparse, the instances of these procedures in MT offer promising results, which will be further analysed in the next section of this chapter.

The data in the final category - *N/A* - suggests that MT was most accurate in Spanish, as only 8 (19%) of all metaphors were translated incorrectly, as compared to 14 (33%) in Portuguese and 16 (37%) in Polish. These results disprove the initial hypothesis that similar patterns might emerge across languages belonging to the same language family. Despite linguistic similarities between Spanish and Portuguese, MT output in Portuguese was less accurate than in Spanish. Furthermore, it had a similar rate of accuracy to Polish, although the languages share few common lexical or syntactic features. This suggests that accuracy is affected by other factors, possibly the size of the corpus that the MT system had been built with or the types of texts that constitute the corpus. Section 2.3 in this chapter will examine the types of errors made by GT and examples of phrases classified as *N/A*.

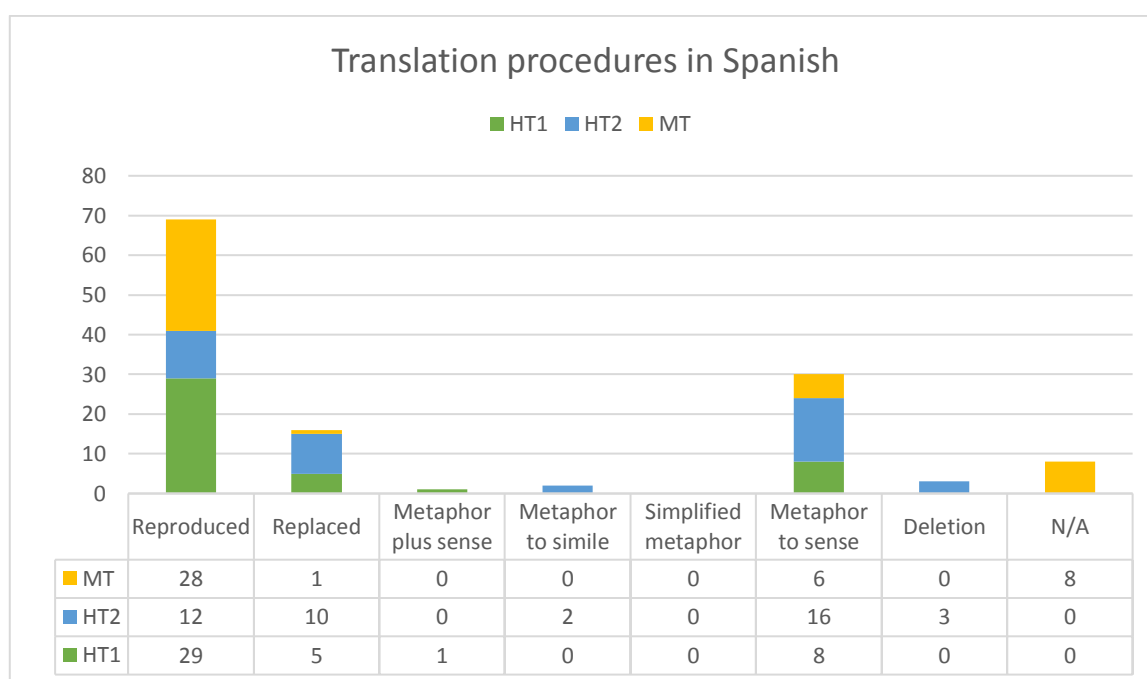


Figure 17. *HT and MT translation procedures in Spanish*

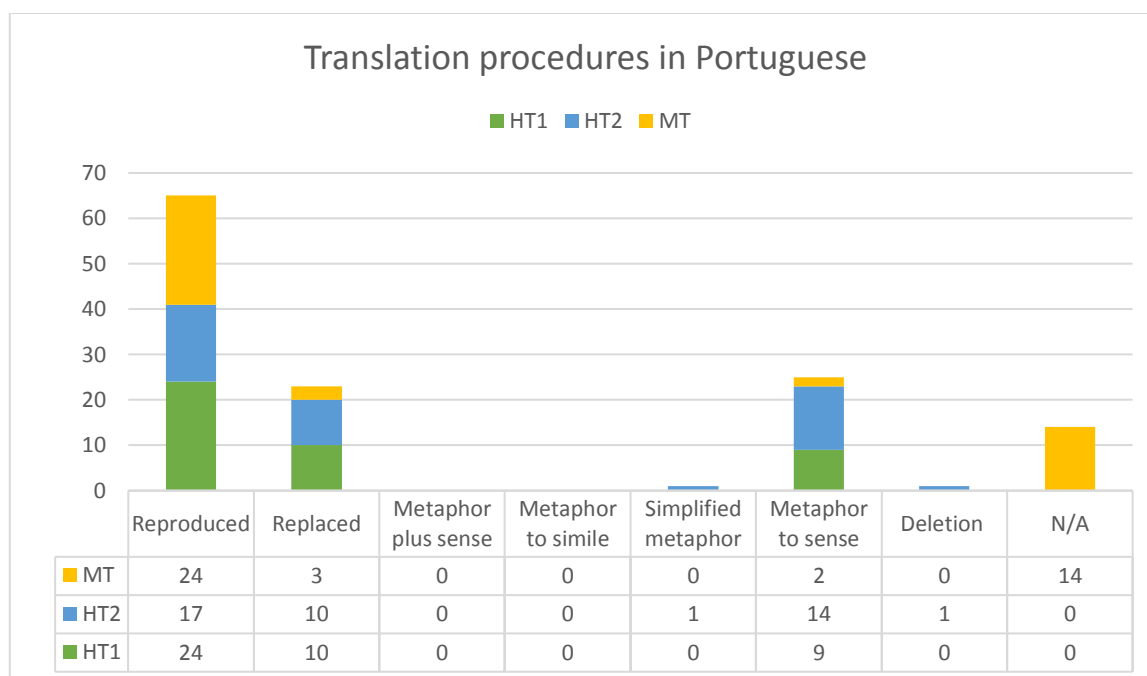


Figure 18. *HT and MT translation procedures in Portuguese*

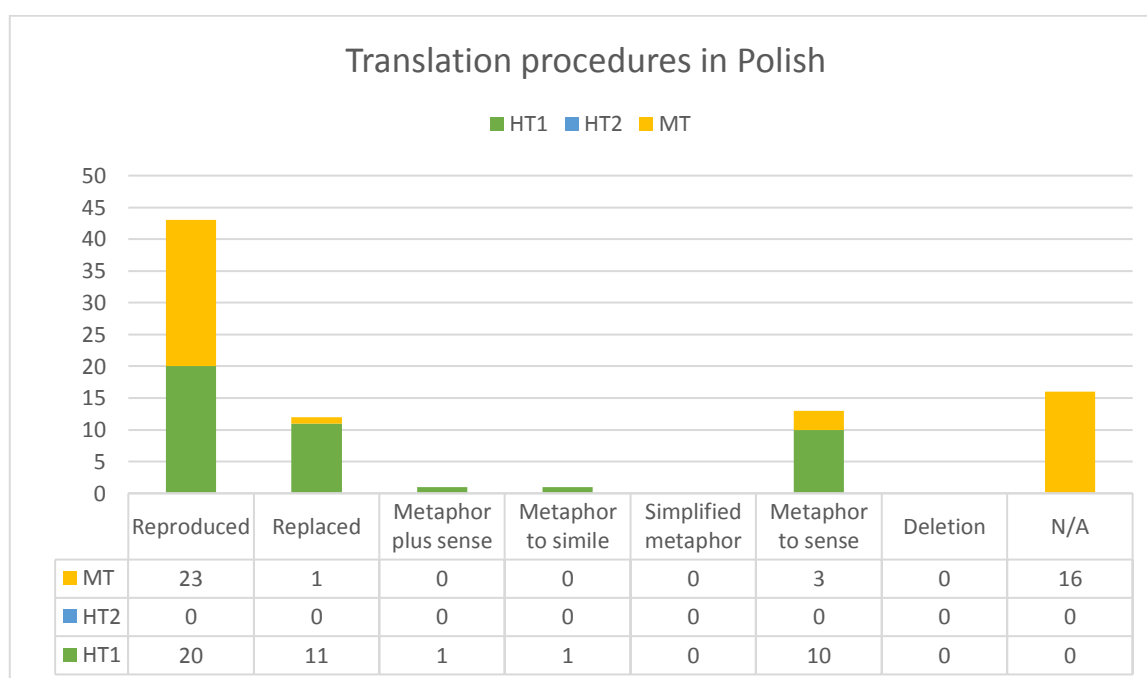


Figure 19. *HT and MT translation procedures in Polish*

Figures 17 to 19 illustrate the translation procedures used by both HTs and MT in each language. The first graph (Figure 17) shows the results for Spanish. It can be observed that Spanish MT reproduced almost as many metaphors as HT1 and more than double the number of metaphors reproduced by HT2. Nevertheless, HT2 replaced a higher number of metaphors, suggesting that the translator could have been working with a different strategy. This trend can be observed across all languages. Figure 18 shows that Portuguese MT reproduced the

same number of metaphors as HT1, but more than a third more than HT2. Unfortunately, the lack of data for Polish makes it impossible to see if a similar pattern would emerge in this language. As shown in Figure 19, Polish MT reproduced more metaphors than HT1 (23 as compared to 20), but data for HT2 were not available. Overall, these results show that MT was able to reproduce a comparable number of metaphors, at times surpassing these numbers by considerable margin.

Comparing MT output with decisions made by human translators, the main differences can be observed in the *replaced* and *N/A* categories. Only one out of 43 metaphors (2%) was replaced by MT in Spanish and Polish (see Figures 17 and 19), while in Portuguese three metaphors were replaced, representing 7% of all metaphors (see Figure 18). The *N/A* category demonstrates the margin of error made by each MT system. As made evident by the data in Figures 17 to 19, Polish had the highest margin of error with 16 out of 43 metaphors in the *N/A* category (37%), followed by Portuguese with 14 (33%) and then Spanish with 8 (19%). As has already been observed before, these results demonstrate that accuracy does not appear to be recreated in languages from the same language family. These results also show that while HTs are more likely to apply more manipulative procedures, for example by supplying additional information, simplifying or omitting a passage altogether, there are no instances of such decision making processes in MT. Procedures *metaphor plus sense*, *metaphor to simile*, *simplified metaphor* and *deletion* require cognitive processes that extend above word and sentence level of the text and require a level of creativity. These procedures might be used by translators purely for aesthetic reasons or as a way of adapting the text to suit the TC and literary tradition of the country. They might, therefore, be translating the text with a different strategy. This could be the potential reason for the disparity between procedures employed by the two HTs in Spanish and Portuguese. While HT1 appears to remain closer to the ST, HT2 appears to take a different approach, replacing rather than reproducing a higher percentage of the metaphors. The fact that multiple translations have been published also suggests that the two versions must vary significantly. An example of this is Jerzy Łoziński's Polish translation of *The Picture of Dorian Gray*, which has been altered to such degree that it cannot be compared to the ST on a sentence-by-sentence level.

2.2 The potentials of MT

Replacement

The next section of this chapter will analyse the instances in which MT replaced a ST metaphor for a different metaphor in the TL. This occurred six times in total: once in Spanish, three times in Portuguese and twice in Polish. Regarding the type of metaphor in which these instances of replacement occurred, three of them were lexical and the remaining three were extended metaphors. The following section will examine each of these instances in detail.

ST	The few words that Basil's friend had said to him had touched some secret chord that had never been touched before, but that he felt was now vibrating and throbbing to curious pulses.
Location	Chapter 2, page 19
Type	Extended metaphor
SP MT	Las pocas palabras que el amigo de Basil le había dicho habían tocado un acorde secreto que nunca antes se había tocado, pero que sentía que ahora estaba vibrando y palpitando pulsos curiosos. [The few words that Basil's friend had said to him had touched/played a secret chord that had never been touched/played before, but that he felt was now vibrating and palpitating strange pulses.]
PT MT	As poucas palavras que o amigo de Basil lhe havia dito tocaram um acorde secreto que nunca havia sido tocado antes, mas que ele sentia agora vibrando e latejando pulsos curiosos. [The few words that Basil's friend had said to him touched/played a secret chord that had never been touched/played before, but that he now felt vibrating and throbbing curious pulses.]

In this example the word “chord” was interpreted differently by MT than HTs. In both Spanish and Portuguese MT conveyed the word as “acorde”, referring to ‘three or more musical tones sounded simultaneously’, rather than chord as synonym for string (Merriam-Webster Online Dictionary 2019), which would have been “cuerda” in Spanish and “corda” in Portuguese. This was the interpretation favoured by HTs, as both Portuguese translators opted for “corda” and the first Spanish translator also rendered the word as “cuerda”. The second Spanish translator used the word “resorte” [spring/elastic], thus also referring to the string rather than the harmony of sounds. However, despite MT’s alternative interpretation of the word, both concepts relate to music and the metaphor still works in the TL, although the image is slightly altered. Another point worth discussing in this example is the verb “tocar”, which means both “to touch” or “to play” in Spanish and Portuguese. Although it is a literal translation of the ST verb, it agrees with the new image of the TT metaphor. It is also

worth noting that Polish MT also conveyed the meaning of “chord” as a group of notes. However, the verb “dotknąć” [touch] does not create an idiomatic collocation with “akord” [chord]. Moreover, there were issues of unnecessary repetition in the Polish MT output, which meant that the metaphor was not classified as a successful translation.

ST	a flush of pleasure stealing into his cheek
Location	Chapter 3, page 32
Type	Lexical metaphor
PT MT	uma onda de prazer invadindo sua bochecha
	[a wave of pleasure invading his cheek]

In this example, the lexical metaphor was found in the phrasal verb “stealing into” as referring to “a flush of pleasure”. The Portuguese MT system rendered this as “invadindo” [invading], maintaining the gerund form of the verb and the imagery of the ST metaphor. Although the ST metaphor was found in the verb, it is the first part of the metaphor (“a flush of pleasure”) which generated unexpected results. MT changed the ST image into “uma onda de prazer” [a wave of pleasure] in the Portuguese translation. Although both words evoke the idea of movement, “a flush of pleasure” is not an unusual collocation in the SL and can be considered a dead metaphor. The TL phrase, on the other hand, “uma onda de prazer” [a wave of pleasure] creates an innovative and metaphorical image. This example demonstrates that MT can create new metaphors in places where they were not present in the ST.

ST	The sunset had smitten into scarlet gold the upper windows of the houses opposite.
Location	Chapter 4, page 49
Type	Lexical metaphor
PT MT	O pôr-do-sol tinha se transformado em ouro escarlate nas janelas superiores das casas em frente.
	[The sunset had transformed itself into scarlet gold on the upper windows of the houses in front.]

In this example MT changed the imagery of the ST phrase by translating the verbal phrase ‘had smitten’ as ‘tinha se transformado em’ [had transformed itself into] thus maintaining the personification but replacing the imagery.

ST	He had merely shot an arrow into the air. Had it hit the mark?
Location	Chapter 2, page 19
Type	Extended metaphor

PL MT	Po prostu wystrzelił strzałę w powietrze. Czy trafił w sedno?
--------------	---

This metaphor appears in Chapter 2 at the end of a lengthy monologue that Lord Henry directs at Dorian. The phrase is used metaphorically to ask whether Lord Henry's speech influenced Dorian in any significant way. Both Polish translators translated the phrase literally, rendering the question as 'czyżby trafiła w cel?' [had it hit the aim/target?]. This can refer to both the physical target at which one would point an arrow, and the overarching objective of Lord Henry's speech. MT, however, rendered the phrase using the idiomatic expression "trafić w sedno", which Linguee most commonly translates as "to get to the heart of the matter". Google Translate also suggests "hit home" and "hit the nail on the head" as possible translations. By using this phrase in its translation, MT removes the image of a physical target and explicates the metaphorical aim of the conversation. Polish verbs are marked for gender in the past tense and the verb form 'trafił' is masculine which makes it agree with Lord Henry rather than the arrow ('strzała' is a feminine noun). This further explicates the meaning of the metaphor, while maintaining the ST imagery of shooting an arrow.

ST	If one hears bad music, it is one's duty to drown it in conversation.
Location	Chapter 4, page 39
Type	Lexical metaphor
PL MT	Jeśli ktoś słyszy złą muzykę, obowiązkiem jest utopić ją w rozmowie.

In the above example, MT translated the verb 'to drown' literally as 'utopić' (to drown something or someone in water), as opposed to changing it to the more idiomatic 'zagłuszać' (to drown out a sound), as has been done by the Polish translator. This has, however, created a novel metaphor in the TL. Although it is not a typical collocation, the phrase is perfectly comprehensible in the TL and creates unusual imagery by combining a verb of change with a noun of communication (WordNet). Whether this metaphor is aesthetically pleasing is of course another question, but putting aside issues of subjective interpretation, it can be concluded that GT invented a new metaphor, thus displaying signs of creativity.

What these examples demonstrate is that in some instances, MT was able to offer creative solutions that differed to those proposed by human translators. This was either done by changing the ST image altogether in the TL, or by maintaining the ST image but using an alternative solution to those suggested by human translators.

Metaphor to sense

While the instances of replacement demonstrated MT's ability to offer creative solutions, the *metaphor to sense* category shows that MT is capable of recognising metaphors and explicating their meaning in non-metaphorical language. There were eleven instances of this translation procedure in the MT output: six in Spanish, two in Portuguese and three in Polish. As can be observed in Figure 20, *metaphor to sense* was a procedure employed more frequently by HTs than by MT. However, the data reveals a discrepancy between the applications of this procedure by HT1s and HT2s. Overall, HT1s explicitated the meaning of metaphors less often than HT2s. As demonstrated in the graph, HT1s display an increasing tendency, ranging from eight in Spanish to ten in Polish. HT2s, on the other hand, explicitated more frequently, with 16 such instances in Spanish and 14 in Portuguese. As for all previous categories, results for Polish HT2 were not considered in this graph.

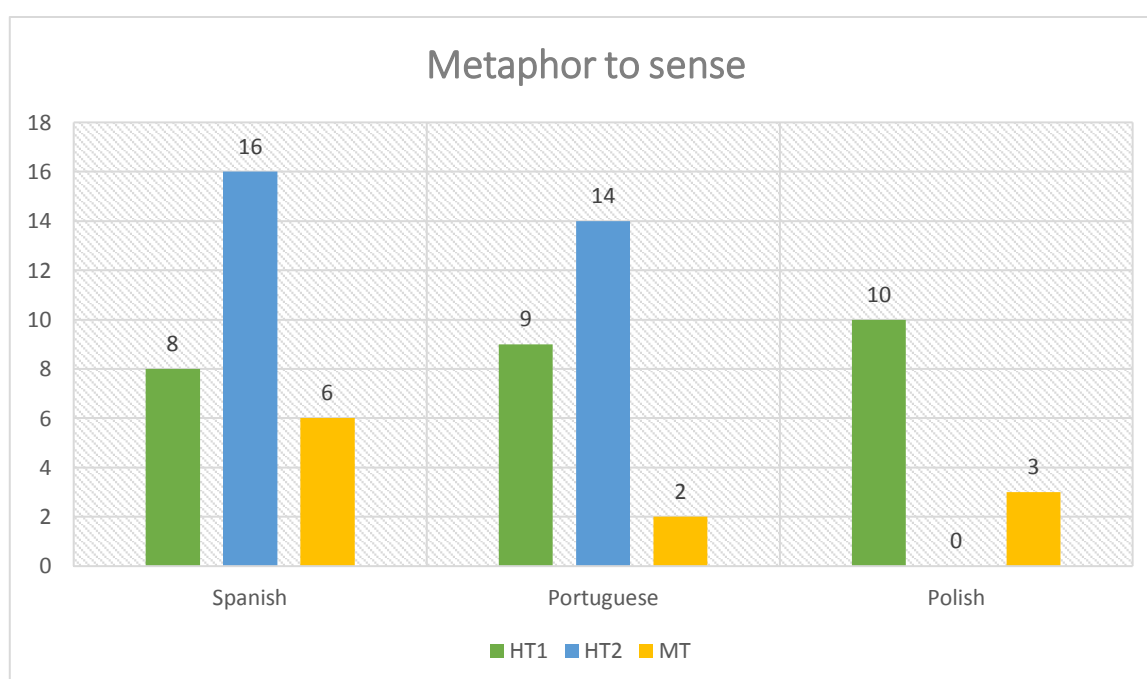


Figure 20. Number of metaphors translated as metaphor to sense by both HTs and MT across all languages

Having examined the statistical data for this category, the following examples will provide more in-depth analysis of specific metaphors and their translations by GT.

ST	a smile of pleasure passed across his face, and seemed about to linger there
Location	Chapter 1, page 5
Type	Lexical metaphor
SP MT	una sonrisa de placer se dibujó en su rostro y pareció quedarse allí

PL MT	na jego twarzy pojawił się uśmiech rozkoszy i wydawało się, że pozostanie tam
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While in the ST the smile is being personified through the verb of motion “to pass”, GT decided to simplify this phrase by translating the verb as “se dibujó” in Spanish and “pojawił się” in Polish, both meaning “appeared”. This differs from the choices made by HTs, both of which translate the phrase metaphorically in Spanish. HT1 reproduces the phrase quite literally, translating the verb as “pasó” [passed], while HT2 alters the metaphor by choosing the alternative “iluminó” [illuminated]. The same pattern repeats itself in Polish. HT1 rendered the phrase literally as “przemknął” [passed quickly], while HT2 substituted the verb with “zagościł” [made itself a guest]. It is also worth noting that in Portuguese GT recreated the metaphor by translating the verb as “atravessou” [passed]. This shows that MT makes different translation decisions for the same sentence across languages and that language families do not appear to follow the same patterns.

ST	not catching the meaning of his words
Location	Chapter 2, page 23
Type	Dead metaphor
PT MT	não percebendo o significado de suas palavras
PL MT	nie rozumie znaczenia jego słów

In this example the verb “to catch” is being used to refer to the abstract noun “meaning” resulting in a metaphorical expression, which has now entered common language and has thus been classified as a dead metaphor. Both Portuguese and Polish MT were able to recognise that the verb “to catch” means “to understand” in this context and decided to translate the verb as that in both languages (“perceber” in Portuguese and “rozumieć” in Polish). HTs applied the same procedure and used the same verbs as those chosen by GT. Spanish MT behaved differently and reproduced the phrase by using the verb “captar” [to catch]. The same decision was made by Spanish HT1, while HT2 explicitated the meaning of the metaphor.

ST	the studio was filled with the rich odour of roses
Location	Chapter 1, page 5
Type	Lexical metaphor
SP MT	el estudio estaba lleno del rico olor de las rosas
PT MT	o estúdio estava cheio do rico aroma de rosas
PL MT	studio wypełnione było bogatym zapachem róż

In this example the passive verb form “was filled with” was replaced by the more idiomatic “was full of” in Spanish and Portuguese. Both languages use the same construction – “estaba lleno” [was full] and “estava cheio” [was full]. In Polish, the phrase is rendered as “wypełnione było” [was filled with] but this construction is not metaphorical in the TL.

ST	(...) had set loose a train of horrible thoughts
Location	Chapter 5, page 55
Type	Idiomatic expression
SP MT	(...) había desatado una serie de pensamientos horribles

This idiomatic expression has been recognised and explicitated by Spanish MT, having been rendered as “a series of horrible thoughts”. The expression train of thoughts, however, does exist in Spanish and it was used by HT1, who translated the metaphor literally. HT2, on the other hand, also explicitated the meaning of the phrase, translating it as ‘(...) y qué originó en su mente horribles pensamientos’ [(...) and which gave rise to horrible thoughts in his mind].

ST	she lives with her mother, a faded tired woman
Location	Chapter 4, page 45
Type	Lexical metaphor
SP MT	vive con su madre, una mujer cansada y descolorida

While in the ST the mother is being described as “faded”, an adjective rarely used to describe the physical appearance of a person, Spanish MT chose “descolorida” [pale], thus reducing the metaphorical aspect of the phrase. HT1 remained more faithful to the ST and used the adjective “desvaído” [faded, washed-out], which is not typically used to refer to people. HT2 omitted the adjective altogether, rendering the phrase as simply ‘una mujer de aspecto cansado’ [a woman of tired appearance]. Portuguese MT translated both adjectives as “cansada” [tired], which resulted in redundant repetition. Polish MT rendered the phrase metaphorically, using the word “wyblakła” [faded], which is also not typically used to refer to people. These examples demonstrate that even though MT approached the phrase differently in each language, all these phrases function in the text, whether the metaphor is maintained or not. The variety of viable options resembles the range of choices made by HTs, all of which are acceptable translations of the phrase.

2.3 The limitations of MT

As has been discussed before, some metaphors were classified as *N/A*, meaning that MT output failed to produce a comprehensible and/or grammatically accurate translation. This category is restricted to MT output, as no ungrammatical or incomprehensible translations occurred in the published translations of the ST. Four main patterns emerged in the types of errors committed by MT, and these have been organised into the following categories: *wrong word choice*, *incoherent phrase*, *incomplete phrase*, *no meaning*. The following section will analyse each of the categories by examining examples of MT output with these types of errors. Then, a general overview of error types will be examined in order to identify patterns of behaviour across languages.

Wrong word choice

These are errors related to lexical choices, for example, choosing a word which does not make sense semantically in the given context. There four instances of such error in Spanish and five in Portuguese and Polish.

ST	He had merely shot an arrow into the air. Had it hit the mark?
Location	Chapter 2, page 19
Type	Extended metaphor
SP MT	*Simplemente había disparado una flecha al aire. ¿Había golpeado la marca?
Gloss translation	[He had simply shot an arrow into the air. Had it punched the mark?]
Error type	Wrong word choice

In this example GT translated the verb ‘to hit’ as ‘golpear’, meaning to physically hit or something, rather than to strike a target. Both HTs rendered the phrase using the Spanish expression ‘dar en el blanco’ meaning to ‘hit the bulls-eye’ (as suggested by wordreference.com), thus maintaining the metaphor. GT’s choice of word was too literal in this case and did not reproduce the metaphorical sense intended in the ST.

ST	stung a little by the lad's silence
Location	Chapter 2, page 24
Type	Lexical metaphor
SP MT	*picado un poco por el silencio del muchacho
Gloss translation	[punctured a little by the boy's silence]
Error type	Wrong word choice

This example also illustrates inappropriate word choice, as GT translated the past participle ‘stung’ as ‘picado’ (punctured or literally stung by an insect), which does not make sense in this phrase. While stung is being used metaphorically in the ST to express the feeling of annoyance or disappointment, the solution suggested by GT does not work in this context. Both HTs explicitated the meaning of the expression by translating it either as ‘dolido’ [hurt] (HT1) or ‘extrañado’ [surprised] (HT2).

Incoherent phrase

These are phrases in which there is a lack of grammatical agreement between the subject and the verb or another part of speech; most commonly found in multi-word or extended metaphors. This type of error occurred once in Spanish, four times in Portuguese and seven times in Polish.

ST	she lives with her mother, a faded tired woman
Location	Chapter 4, page 45
Type	Lexical metaphor
PT MT	*ela mora com a mãe, uma mulher cansada e cansada
Gloss translation	[she lives with her mother, a tired and tired woman]
Error type	Incoherent phrase (Unnecessary word repetition)

ST	the blue cloud-shadows chased themselves across the grass like swallows
Location	Chapter 1, page 14
Type	Lexical metaphor
PT MT	*as nuvens de nuvens azuis se esgueiravam pela grama como andorinhas
Gloss translation	[clouds of blue clouds sneaked across the grass like swallows]
Error type	Incoherent phrase (Unnecessary word repetition)

While grammatically correct, the unnecessary word repetition in these phrases creates an awkward effect and the phrases have not been classified as acceptable translations. Although word repetition could be used as a stylistic choice, this does not occur in the ST and the effect created in the TT is of redundant rather than creative language use.

Incomplete phrase

These are phrases in which one or multiple lexical items are missing while the rest of the sentence remains unchanged. This was the least common type of error, occurring once in Portuguese and twice in Polish. For example:

ST	the words seemed wrung out of him almost against his will
Location	Chapter 1, page 15
Type	Lexical metaphor
PL MT	*słowa wydawały mu się niemal wbrew jego woli
Gloss translation	[words seemed to him almost against his will]
Error type	Incomplete phrase

ST	Every impulse that we strive to strangle broods in the mind and poisons us.
Location	Chapter 2, page 18
Type	Multi-word metaphorical expression
PL MT	*Każdy impuls, który staramy się udusić w myślach i zatrzuwa nas
Gloss translation	[every impulse that we try to strangle and poisons us]
Error type	Incomplete phrase

In both examples the phrases produced by MT are incomplete and do not make sense in their current form.

No meaning

This category was used to classify grammatically accurate phrases but without comprehensible meaning in the TL. This type of error occurred three times in Spanish, four times in Portuguese and twice in Polish.

ST	he always said that the country was going to the dogs
Location	Chapter 3, page 28
Type	Idiomatic expression
SP MT	*siempre dijo que el país iba a los perros
Gloss translation	[he always said that the country was going to the dogs]
Error type	No meaning

ST	a flush of pleasure stealing into his cheek
Location	Chapter 3, page 32
Type	Lexical metaphor
PL MT	*rumieniec przyjemności kradł mu w policzek
Gloss translation	[a flush of pleasure stole him in the cheek]
Error type	No meaning

Having analysed each error type and examples of phrases, the following and final section of this study will look at the frequency with which each of these error types occurred, as visualised by Figure 21:

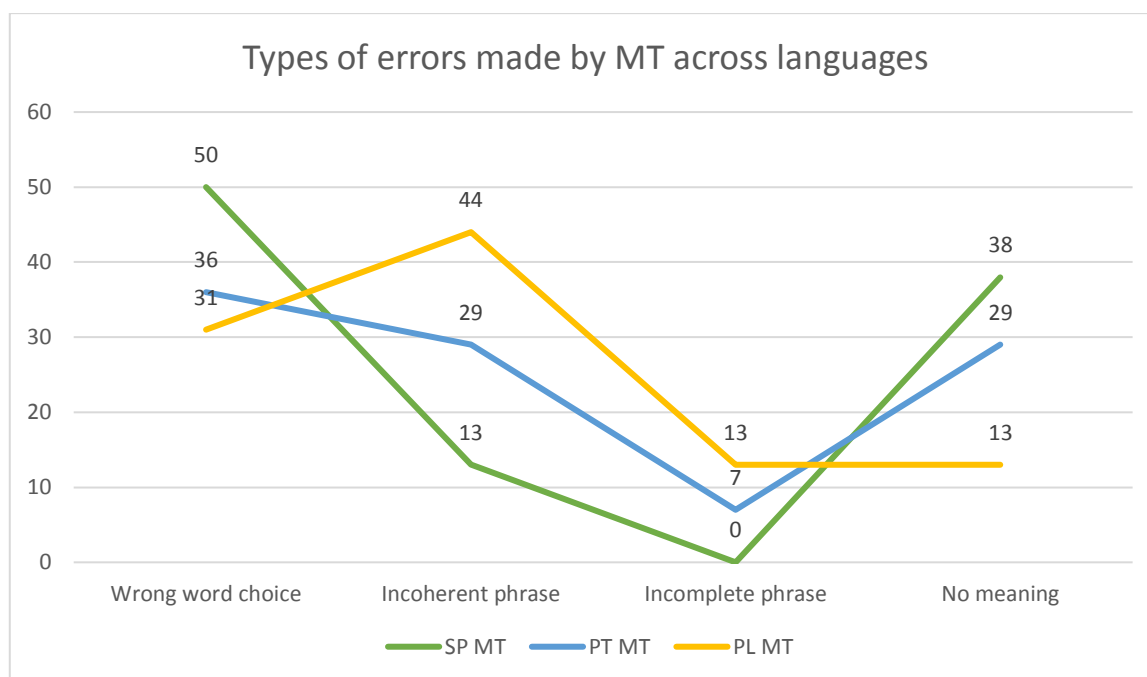


Figure 21. Frequency with which each type of error occurred in MT output across languages

This data demonstrates that Spanish MT had the highest rate of error based on *wrong word choice*, which constituted half of all errors made by MT in this language. It also had the highest rate of *no meaning* errors, but scored lowest in *incoherent* and *incomplete phrase*, with zero instances of errors in the final category. Portuguese scored more than double in the *incoherent phrase* category, while the results for Polish were more than triple those for Spanish. Overall, this was the category which displayed largest divergence between the languages. A similar trend can be observed in the *incomplete phrase* category, in which Spanish scored lowest, followed by Portuguese and then Polish at even distances. However, this pattern of behaviour changes in the *no meaning* and *wrong word choice* categories. Both categories display a reversed trend, in which Spanish scored highest, followed by Portuguese and then Polish with the lowest score. Nevertheless, in *wrong word choice* there is only a 5% difference between Polish and Portuguese, while Spanish outscored them by 19% and 15% respectively. In *no meaning*, on the other hand, Spanish and Portuguese scored significantly higher than Polish.

These results show that, once again, there does not appear to be a clear pattern of behaviour between languages of the same language family when it comes to the types of errors made by MT. Polish had the highest rate of incoherent phrase error type, which could be related to the complex grammatical structure of the language, but further studies are needed to verify this. However, the fact that Portuguese results are often in between Spanish and Polish suggests that the types of error made by MT are not necessarily related to the grammatical system of the language. Overall, wrong word choice and incoherent phrase were the most common error types made by MT, while incomplete phrase displayed the lowest rate of error.

Conclusion

Results

In conclusion, the results of this study have shown that GT is capable of conveying metaphor, although the frequency and accuracy of the output varies across types of metaphor and languages. As has been analysed in chapter 1, MT offered most promising results in the category of lexical metaphors, outperforming most HTs. However, HTs were able to translate longer metaphors with higher frequency than GT, as MT performance decreased in the categories of multi-word and extended metaphors. Nevertheless, no overall conclusions can be drawn from the data, but rather MT performance must be analysed language-by-language. The results from chapter 1 also revealed that the initial hypothesis regarding idiomatic expressions and dead metaphors was incorrect, as MT performance was lowest in those two categories. Results, once again, varied by language and in these categories, Polish performed best, despite demonstrating lower rates of translation in previous categories. Overall, no conclusive patterns of behaviour were observed in MT performance based on metaphor type. Spanish offered most promising results across most metaphor types, usually followed by Portuguese and then Polish, but multiple anomalies in this data make it impossible to identify trends across language families. Further research involving more language pairs and larger datasets is needed to test this hypothesis.

Chapter 2 of this study analysed the translation procedures used by MT and HTs to understand how metaphors were translated by both groups. Results for this section showed that HTs used seven procedures overall, while MT used three, with the addition of the N/A category that classified MT output that failed to produce grammatical or meaningful

translations. MT reproduced 58% of metaphors, making this the most commonly used translation procedure. The other two procedures – replaced metaphor and metaphor to sense – were used significantly less frequently, with rates of 4% and 9% respectively. The remainder of the metaphors was classed as N/A, constituting 29% of all metaphors. These results demonstrate that MT and HTs make different decisions in the translation process, and HTs do not rely on literal translation to the same degree as MT. This can be observed in the lower rate of reproduced metaphors in HT data and higher rates of procedures such as reproduced metaphor or metaphor to sense. Moreover, HTs occasionally applied procedures such as metaphor to simile, simplified metaphor and metaphor plus sense, which MT was not able to do. However, it should be noted that although the instances of replaced metaphor or metaphor to sense were not frequent in MT, they do show promising results. As has been discussed in section 2.2, MT was able to provide different solutions to HTs on some occasions and create novel metaphors in the TL. Results for the metaphor to sense category also demonstrate that MT can explain the meaning of a metaphor in non-metaphorical language, which suggest in-depth understanding of semantics. Considering the scope of this study, these results suggest potential for further progress in MT and its metaphor processing capabilities.

The final section of this study examined the types of error made by MT to understand its limitations and indicate areas of improvement. The results revealed that wrong word choice and incoherent phrase were the most common error types overall. However, this also varied by language, although no clear patterns of behaviour were observed in languages belonging to the same language family. Spanish and Portuguese MT produced more no meaning phrases than Polish, which in turn had the highest rate of incoherent phrases. This could suggest that the complex grammatical structures of Polish affect MT performance, as the lack of subject - verb agreement was more common in this language. However, further research is needed to confirm this hypothesis. Nevertheless, the results of this study do reveal that Polish was the most inaccurate MT system with 16 out of 43 metaphors in the N/A category (37%). Spanish, on the other hand, was the best performer, with only 8 metaphors classed as N/A (19%). Portuguese displayed a similar rate of accuracy to Polish (14 metaphors in the N/A category – 33%), suggesting that languages from the same family do not share the same levels of MT

accuracy. Accuracy of MT output could be affected by other factors, such as the size of the corpus and the types of texts that constitute it.

Ideas for improvement and further research

Having summed up the results of this study, this section will provide a brief overview of the methodology, in order to suggest ideas for improvement and areas of further research. One of the main issues in the methodology of this study was the subjective nature of metaphor identification and classification. The first challenge was to identify metaphors in the ST, which is a process susceptible to human error and open to interpretation. Despite generally accepted definitions of metaphor, its detection can vary from person to person and some metaphors might have been missed due to human error. The five types of metaphor used in this study made it possible to organise and analyse the data, but it must be noted that categorising metaphors in this way also raised issues. While categorising lexical, multi-word and extended metaphors did not prove challenging, the categories of idiomatic expressions and dead metaphors were less obvious to identify. Deciding whether an expression can be considered idiomatic, or if a metaphor has entered common language to the point of becoming a dead metaphor, are both processes that include an element of subjectivity. To overcome these problems, a reception study could be introduced as this would supplement the empirical data with human evaluation. An automatic evaluation metric could also be considered, to assess the quality of these translations without bias or subjectivity. Feedback from both readers and practising translators would be useful to assess the need for post-editing of the MT output.

Furthermore, there are some technical improvements that should be considered, such as increasing the size of the database and using a custom-made MT system, tailored to literary texts. Using a larger volume of data and specifying the type of texts fed into the MT system would most likely increase the accuracy of the results. Further empirical analysis could be carried out should the size of the database increase. Moreover, due to the limited scope of this study, no clear patterns of behaviour were observed across language families. Introducing more language pairs would also improve the quality of results, especially adding another Slavic language for comparison with Polish. Running a similar experiment across multiple language pairs of multiple language families would allow us to draw more conclusive results.

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