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The Language of Psycholinguistics in Popular Science: Translation and Analysis of New Scientist's Cover Story "The Eloquent Ape"

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INTRODUCTION

The aim of this thesis is to provide a translation from English into Italian of the weekly science magazine *New Scientist'*s cover story *The Eloquent Ape* (issue n.3059, published on February 6, 2016). The source text is a special report about the evolution and main features of language, which is observed mainly from a linguistic, psychological and neurobiological point of view; but also with some references to its historical, sociological and cognitive aspects. The article is the result of a collaboration between various authors: Mark Pagel (evolutionary biologist at the University of Reading, UK), Megan Scudellari (science writer in Boston), Hal Hodson (*New* Scientist's technology editor) and Helen Thomson (*New Scientist* consultant). Finally, it includes an interview to David Harrison, linguist at Swarthmore college in Pennsylvania.

The choice of this subject for my final thesis combines my interest for translation (that was one of the main fields of study of my Master's Degree in Modern Languages for International Communication and Cooperation) and for the interdisciplinary field of psycholinguistics, a topic that I frequently encountered during my studies. Furthermore, since I have always been interested in scientific popularisation (mainly because of TV documentaries and magazines), I decided to analyse the features of this genre and the main aspects of its translation.

For what concerns the translation method, first of all it was necessary to create a comparable corpus to use as a reference during the translation process. In brief, a translation corpus is a collection of texts on the same topic and genre as the source text (in this case, popular science articles on the topics of linguistics, psychology and neurobiology) written in English and translated into Italian. More detailed information on the creation and function of translation corpora, as well as on the source text's characteristics and contents, will be given in Chapter 3 of this thesis.

However, before I move on to the final translation, it will be necessary to provide some theoretical background both on special languages and scientific popularisation, also from the point of view of translation. Chapter 1 of this thesis will be focused, first of all, on LSPs (Languages for Special Purposes), presenting their definition and their lexical,

morphosyntactic and textual features. As for their variation, both the horizontal and vertical dimension (that are related, respectively, to the contents and context of a text), but also their diachronic, diatopic and diamesic variation, will be taken into consideration. Finally, starting from the main features of LSPs, I will present some syntactic strategies and textual devices that writers can use to achieve their goals.

The second section of the same chapter will consider, instead, the main features and definitions of scientific popularisation as a genre, including information on its target audience and function, its relationship with the scientific discourse, the various degrees of popularisation, the origins and history of the genre and the main reason for popularising science. After that, I will focus on news reporting, the field that is more relevant for this thesis, presenting its main characteristics and taking into consideration both the Anglophone and Italian context. The main features of news reporting will then be presented, including the use of quotations, the narrative and visual aspects and the linguistic strategies that are employed more frequently by science journalists.

The final section of Chapter 1 will be dedicated to the discipline of psycholinguistics. After an introduction on the discipline and its origins, I will try to outline its collocation considering both the horizontal and vertical dimensions. Finally, the main features of its lexis, specialised terminology and syntax will be presented, considering the various contexts and different degrees of technicality.

Moving on to Chapter 2, it will consider both LSPs and popular science from the point of view of specialised translation, in particular from English into Italian. First of all, there will be a short introduction on translation theory, taking into consideration its main definitions and goals, the concepts of translatability and the different levels of equivalence. Furthermore, I will briefly introduce Translation Studies and the different areas of this discipline, in particular the differences between literary and scientific or technical translation.

The following section will focus on specialised translation. After outlining in greater detail the differences between literary and specialised translation, I will briefly discuss how English became the modern language of science and the consequences that this fact has on translation. As for the research in the field of specialised translation, some information on the use of corpora and assisted translation will be provided. I will then consider the various steps of the translation process, taking into consideration literal

translation, the various types of paraphrase and the main textual, morphosyntactic and lexical strategies that must be used when translating from English into Italian. Furthermore, some considerations on the assessment of translation quality and on the process of revision will be made, including the characteristics that define a good target text and the different types of intervention that can be made by the proof-reader. Finally, a classification of the most common translation mistakes, according to their level of gravity, will be provided.

After that, I will move on to the translation of popular science, starting from the reasons for translation this genre into Italian. Secondly, I will briefly comment on the wide range of translation activities that concern popular science (e.g. documentaries, books or websites), focusing on news articles, their creation and the most problematic aspects of their translation (e.g. the concept of cultural specificity, the translation of metaphors etc.).

Finally, the last section of Chapter 2 will be devoted to the professional figure of the specialised translator. I will focus on those abilities and sub-competences that define good translators, on their modern working environments and on the description of their professional activity. Furthermore, I will consider the different resources and tools that can be used during the translation process, including some reviews of traditional terminological tools, extra linguistic sources, the use of bilingual corpora and termbanks, translation memories and machine translation. Moreover, I will comment on the pros and cons of CAT (Computer Assisted Translation) tools and, finally, both the textual and interpersonal responsibility of translators will be briefly explained.

The final translation of *New Scientist*'s cover story '*The Eloquent Ape'* (see Chapter 3) will be followed by Chapter 4, the last chapter of this thesis, that consists of a commentary on the translation process, its main issues and the strategies employed to get over them. I will explain the translation choices I made also by comparing them to some similar examples that I found on the translation corpus, that I employed as the main reference during the translation of the source text. In particular, the comments will take into consideration the main aspects of textual organisation, morphosyntactic structure, register, the use of modal verbs, the concept of cultural specificity and, finally, the translation of metaphors and figurative language.

CHAPTER 1

SPECIAL LANGUAGES AND POPULAR SCIENCE: THEORY AND FEATURES

1.1 Special Languages: General Features and Variation

The first section of this chapter will focus on LSPs (or 'special languages') and their main characteristics. First of all, the acronym LSP stands for 'Language(s) for Special (or Specific) Purposes (Newmark 1988:286). This is how Cortelazzo (1994:8) defines special languages:

> Per lingua speciale si intende una varietà funzionale di una lingua naturale, dipendente da un settore di conoscenze o da una sfera di attività specialistici, utilizzata, nella sua interezza, da un gruppo di parlanti più ristretto della totalità dei parlanti la lingua di cui quella speciale è una varietà, per soddisfare i bisogni comunicativi (in primo luogo quelli referenziali) di quel settore specialistico.

This means that special languages are, in the first place, varieties of the standard language shared by groups of people belonging to specific and specialised sectors. Therefore, although LSPs are only used by specialists, they are still a part of general language (or LGP). Starting from Cortelazzo's definition, Gualdo and Telve (2011:18-19) observe that, first of all, the adjective *funzionale* (functional) draws the attention on those communicative "needs" that are not met by general language. Secondly, they point out that the expressions "area of knowledge" and "scope of activities" refer to a series of specialised contents that need to be expressed through LSPs. Finally, the third element is the specialised user of LSPs, in this case a community of experts that communicate with each other in a 'referential' (objective) way.

Scarpa (2008:2) makes a distinction between LSPs "in the strict sense", that are highly specialised languages (e.g. the language of physics, medicine, economics or law) with specific lexis, distinctive morphosyntactic and textual features, and special

languages in a broader sense, such as the language of politics, advertising or press. These languages, differently from the previous ones, do not have a distinctive lexis or common traits, but they often borrow terms from special languages. Moreover, LSPs must not be confused with jargons, that are languages used by specific social groups such as young people, gangsters or students.

To observe the main characteristics of LSPs' variation, Gualdo and Telve (2011), as well as Scarpa (2008:4-6) and other authors, consider both the horizontal and vertical dimensions. Moreover, Gualdo and Telve (2011:22) take into account other LSPs' dimensions: diachronic (i.e. their evolution in time), diatopic (which considers the variations between different linguistic areas) and diamesic (that focuses on the different channels employed to disseminate specialised communication) ones.

First of all, the horizontal dimension (that focuses on the contents of communication) marks the distinction between hard sciences (i.e. physical or natural sciences, such as physics, biology, or medicine) and soft sciences (i.e. human or social sciences, such as economy, psychology or history). Furthermore, according to Gualdo and Telve (2011:30-34), the horizontal dimension and the diachronic variation are reciprocally influenced as, in time, the subdivision of the different fields of knowledge can change significantly. The distinction between 'hard' and 'soft' sciences (that will be seen more in detail in the last section of this chapter) is also influenced by the technological development that has characterised complex and scientifically advanced societies in the last two centuries. Actually, from a historical point of view, the hierarchies between different types of knowledge have been re-organised many times, according to the relevance that a discipline had in a given period.

By contrast, the vertical dimension, it is linked to the different registers, genres and text types or, in other words, the context in which the language is used. Sobrero (1993:240), for instance, explains that the choice of register changes according to the communicative situation we are dealing with, varying from a maximum to a minimum level of technicality. Furthermore, based on its level of technicality, Gotti (2011:16-17) and Bianucci (2008:50-55) identify the different clines of specialisation of a text.

The first one is the intraspecialist level or, in other words, texts written by specialists and addressed to other experts in the same field, and therefore characterised by an extremely technical register and the frequent use of specialised terminology, whose

meaning is taken for granted. Slightly below, we find the interspecialist level: in this case, texts are still written by specialists but address experts in different fields. Thus, although the employed language used is still highly technical, some specialised terms or concepts might be explained or simplified.

On a medium level, Bianucci indicates the language of interspecialist popularisation, that consists of specialised texts addressed to a general audience. This language has a lower level of technicality, and specialised concepts are explained through examples taken form everyday life. It is employed, for instance, in popular science magazines such as *Scientific American* or *New Scientist*.

Finally, a lower technicality can be found on the instruction level (for instance in manuals, handbooks and textbooks) and on the "popular" level, that includes the scientific pages of newspapers and magazines, but also TV programmes, websites and blogs. The popularisation level, that is the object of this thesis, will be seen in greater detail in the next section of this chapter.

As previously stated, Gualdo and Telve (2011:47-48) take into consideration other dimensions of LSPs: the diachronic, diatopic and diamesic ones. Starting from the diachronic dimension, the authors believe that, although the study of LSPs is typically synchronic and does not consider them as the result of evolutionary processes, an examination of their diachronic variation would be fundamental to understand how specialised communication works. For instance, both terminology and syntax of modern Italian LSPs are the result of their relationship with Latin, that used to be the language of scientific communication before English.

For what concerns the diatopic dimension, Gualdo and Telve (2011:51-52) explain how spatial variation, that mostly affects lexis (although it is to do with every linguistic level), has always been a problem for scientists and institutions whose aim is having a universal language to express in a univocal and unambiguous way the objects of their research. Their efforts, such as the creation of codes and norms, have been set back because it is difficult to get rid of terms that are deeply-rooted in language.

As for the diamesic variation, Gualdo and Telve (2011:69-76) claim that it is related to all the other dimensions of variation as it is necessary for any form of communication. While oral interaction between two speakers is the simplest one, the written form is considered more complex and formal since the communication of specialised contents

between experts takes place in different times and places. For what concerns transmitted communication, it assumes the features of both the oral and written form. Moreover, the most recent technologies (e.g. telephone, radio, television and computer) allowed more and more people to access a growing body of information.

Moving on to the main characteristics of special languages, according to Cortelazzo (1994:9) the elements that mark the distinction between LSPs and LGP can be found mostly in their specific lexis. However, Sager, Dungworth and McDonald (1980) identified three main criteria that should characterise LSPs: economy, precision and appropriateness. More recently, many authors such as Gotti (2011:20) and Sobrero (1993:243) rely on Hoffman's (1984) more complex list of features, that is:

Exactitude, simplicity and clarity

Objectivity

Abstractness

Generalisation

Density of information

Brevity or laconism

Emotional neutrality

Unambiguousness

Impersonality

Logical consistency

Use of defined technical terms, symbols and features

Gotti (2011:21), however, notices that some of these points might result conflicting or overlapping:

> There are also inconsistencies in Hoffmann's criteria: the need for clarity may conflict with simplicity, the need for unambiguous expression may at times make it impossible to ensure conciseness or abstractness.

Moreover, the author gives a more exhaustive lists of features that characterise special languages. First of all, from a lexical point of view, Gotti (2011:25-47) claims that monoreferentiality is the most widely-investigated feature of specialised language. Monoreferentiality means that each term needs a single referent or, in other words, that only one meaning is allowed for terms used in a given context. This referential precision also avoids the use of indirect reference systems such as euphemisms. Furthermore, the scientific community prefers to avoid the use of alternative terms or synonyms and, therefore, specialised texts tend to produce a high level of lexical repetition.

Secondly, LSPs mostly use a neutral, emotionless tone. The reason is that, differently from general language, the main purpose of specialised discourse is to inform the reader and, as previously stated, it is characterised by referential precision. Moreover, the employed terms have an exclusively denotative function and, as a consequence, the language gains a more neutral and artificial tone that also results in a reduction of the textual surface.

Furthermore, specialised lexis also needs to be transparent and concise. For what concerns transparency, it refers to the possibility to immediately understand the meaning of a term through its surface form. Gotti (2011:30-31) explains that, in order to guarantee transparency in specialised discourse, it is possible to employ conventional affixes, that "have acquired precise values in each discipline as a result of the […] systematisation and standardisation process". As for conciseness (i.e. the need for concepts to be expressed in the shortest possible form), it can be achieved in the following ways: reduction of the textual surface (through omissions of affixes), merging of two lexemes into a single term, internal or terminal reduction of the term, juxtaposition (omission of prepositions and pre-modifiers in nominal groups containing two nouns), use of acronyms and abbreviations.

Moreover, transparency and conciseness can also be achieved through metaphorisation, that is also the way in which special languages "specialise" the meanings of general language. This process assigns to a word belonging to the general language a different meaning in an LSP and, according to Gualdo and Telve (2011:81-

90), it is also called "semantic redetermination". Although some academics are cautious about metaphors, as they violate the concept of emotional neutrality, the authors believe that metaphorisation is essential for scientific progress as it raises hypothesis and thoughts that can change traditional paradigms. Referring to Temmerman's classification (2000:155-159), the authors affirm that metaphors can be divided into three levels: the lexical metaphor (that only involves a couple of words), the conceptual metaphor (a series of words belonging to the same conceptual frame) and the metaphor of domain (that involve more than one category).

Moving on to the morphosyntactic features of LSPs, Gotti (2011:49) points out that:

> The specificity of morphosyntactic phenomena found in specialized languages is not a qualitative but a quantitative one. Certain features may also occur in general language but their higher frequency in specialized discourse makes them typical only of the latter.

Similarly, Gualdo and Telve (2011:118) observed that, although LSPs' syntax does not differ from the syntax of common language, it is characterised by the fact that some traits occur more frequently.

Generally speaking, Sobrero (1993:249) observes that special languages present an extremely high lexical density and are mainly made of long and complex sentences. Moreover, they make use of a series of syntactic strategies to make the text more formal and concise, such as the omission of some phrasal elements (e.g. verbs become weaker and sometimes they are even avoided; the use prepositions and conjunctions is reduced and sometimes they are deleted), nominalisation, the use of passive and depersonalisation.

Among these features, Gotti (2011:58-63) claims that the most common one is nominalisation, meaning that verbs are replaced by nouns to express concepts that refer to actions or processes. Nominal forms are one of the reasons of the high nominal density of this type of texts, and they also lead to a simplification of the syntactic structures within the sentence. Furthermore, nominal style involves a higher level of pre/post-modification and it makes the flow of information easier, creating greater cohesion and emphasizing verbal action.

Another way to make specialised texts more concise from a syntactic point of view is the omission of one of the sentence's constituents, that creates a more compact syntactic structure without compromising the comprehension of the text. Moreover, according to

Gotti (2011:51-55), the structure can be simplified with a series of linguistic strategies to avoid relative clauses. For instance, they can be replaced by an adjective obtained through affixation; subject and auxiliary can be omitted in passive forms; the verb of the relative clause can be turned into a past participle form and placed after the noun it refers to; relative pronouns can be avoided with adverbs and, finally, verbs can be transformed into present participles.

For what concerns the most common verb tenses in specialised texts, Gotti (2011:70-74) observe that present simple is used in the great majority of cases, as it is the required tense for the communicative functions of these texts (e.g. definition, description, observation, illustrating features, qualities, general truths etc.). However, specialised discourse also employs quite frequently some indefinite verb forms that can create more concise sentences, such as the *-ing* form or the infinitive and participial forms. Even passive forms are a rather common feature of specialised texts, as their aim is to depersonalise discourse while putting more emphasis on the actions than on its cause or its agent.

The tendency to depersonalisation can also be found in the fact that the authors usually avoid the use of first-person pronouns, referring to themselves indirectly (e.g. through third-person pronouns) while personalising those inanimate objects (e.g. facts, events and elements) that are more relevant in the texts. However, according to Gotti (2011:74-78), it is also possible to find first-person pronouns in specialised texts if the author wants to emphasise personal statements to make the reader feel more involved.

Finally, moving on to their textual organisation, Gotti (2011) affirms that specialised texts share the same characteristic of all types of texts. Therefore, as for their syntactic features, LSPs' textual features "do not constitute a typological exception but rather a distinction in quantitative terms". However, the author observes that they can recur to a certain argumentative pattern and to the use of devices such as conjunctions and anaphoric references (i.e. a word that refers to, or replaces, another element used earlier in the text) to increase textual cohesion. However, according to Musacchio (1995:71-72), sometimes anaphoric reference is replaced by lexical repetition (i.e. repeating the same word) in order to avoid ambiguity and to obtain a greater level of precision. Furthermore, according to Gualdo and Telve (2011:123-125), it is essential to

keep the thematic progression under control in order to have a coherent and cohesive texts.

However, it is also necessary to keep in mind that LSPs do not always present the same features in every language, and this can be a problem when translating specialised texts from a language to another. This aspect will be taken into consideration in Chapter 2 of this thesis, that will focus on specialised translation and, in particular, on the differences between English and Italian.

1.2 Scientific Popularisation: Main Features of the Genre

Since the object of this thesis is the translation, from English into Italian, of a popular science article about psycholinguistic taken from *New Scientist*, it is now necessary to examine the main features of popularisation from a theoretical point of view. First of all, popular science is commonly defined as an interpretation of science that is intended for a general audience, rather than for scientists or students. More in detail, Calsamiglia and van Dijk (2004:371) define science popularisation as a "large class of discursive-semiotic practices, involving many types of mass media" whose aim is to "communicate lay versions of scientific knowledge, as well as opinions and ideologies of scholars, among the public at large".

As Gotti (2012:145) notes, the concept of popularisation has been widely discussed and, therefore, it has been defined in different ways. For example, it can be referred to the dissemination of specialised knowledge for educational purposes, without providing further insights. However, as Gotti (ibid.) points out, these features are also shared by review articles or abstracts and, therefore, this definition is not completely adequate. Another feature that characterises popular science is the type of audience it addresses, which is made up of non-specialised readers but, again, this does not give a clear distinction between instructive texts and popularised ones. Therefore, the author (ibid.) claims that a sharper distinction with other types of texts would be based on two aspects: the kind of audience and the function of the text.

In the case of popular scientific texts, Manfredi (2014:152) observes that the addresser is a specialist in the field who shares scientific discoveries or specialised issues

with a non-specialist addressee (i.e. "a wide audience of educated, and interested, laypeople"). For what concerns the function of popularised discourse, its aim is, of course, to inform readers. However, differently from "instructive" texts (whose purpose is to "train" non-specialist readers in terms of topic, concepts and specific terminology), popularised texts convey specialised information to non-specialised readers by using general language. According to Olohan (2016:196-197), popular science discourse does not merely serve to inform an otherwise ignorant public but, rather, "readers relate this discourse to their own knowledge, opinions and beliefs". Moreover, popular scientific discourse can interact with other public discourses, such as the economic, political or cultural ones.

Furthermore, Olohan (2016:174) points out how popularisation is often understood as "the simplification, distortion or dumbing down of science" and, for this reason, "professional science and popular science are commonly conceived and analysed as two separate discourses". The author, however, believes that "popular science genres can be regarded as scientific genres in their own right, rather than simplified versions of professional science" (2016:203), adding that it would be more helpful to view them as a continuum and to think in terms of different degrees of popularisation, instead of making stark distinction (2016:174-175). Instead, Olohan (ibid.) argues that, since articles in popular magazines (e.g. *Scientific American*) are addressed to an educated readership that includes professional scientists (that might not be specialists in the field about which they are reading), they have a different degree of popularisation if compared, for instance, to TV documentaries or the explanations of museums' exhibitions, that also need to engage and entertain their audiences rather than just informing them.

For what concerns the origins of popular science, Musacchio (2017:9-10) points out that, as an early example, the function of Lucretius' *De Rerum Natura* was to spread Epicurus' theory of the natural world. Later on, authors like Chaucer used vernacular middle English because it would be easier to understand if compared to Latin. Similarly, Galileo was the first to use Italian instead of Latin to write his letters, speeches or scientific treaties to make them available to a larger part of the population. As for the 'modern' notion of popularisation, according to Gualdo and Telve (2011:182) it began in the 17th century, when press made it possible to share the latest scientific discourses with a larger audience. Finally, from the second half of the 20th century, mass media (e.g.

newspapers, radio, TV, web) increased the public interest towards scientific issues considerably: we are now in a "post-academic" era, in which scientists must take into account public opinion and learn to communicate with this wide audience.

There are many reasons that explain the necessity of popularising science. Garzone (2006:82), for instance, observes that the public needs to understand what kind of research is being conducted to consider any social, ethical or political implication. Moreover, whenever a crisis emerges, "the general public should understand what science and technology can do, and what are the implications of certain forms of interventions". Olohan (2016:173-174) adds that, since a big part of scientific research is publicly funded, scientists need to make their research more accessible not only to the funding bodies, but also to the general public that pays taxes. Therefore, it is necessary for scientific communication not only to focus on findings, but also to make sure that the public understands scientific methods and the importance of evidence in drawing conclusions. These necessities, according to Gualdo and Telve (2011:186), are satisfied by science journalists, a role that is usually performed by researchers willing to dedicate part of their time to scientific popularisation.

Moving on to the various degrees of popularisation, as previously stated, they seem to be related to the employed media or to the context in which specialised knowledge is disseminated and popularised (e.g. magazines, research proposals, TV documentaries, websites, museums exhibitions). According to a survey carried out by the European Commission *Eurobarometer* in 2007, Television is the most trustworthy source according to 68% of European citizens, followed by newspapers (41%), the radio (26%), the Internet (23%), magazines (21%) and other (2%). However, to be coherent with the object of this work, this section will mainly focus on scientific news articles and their characteristics.

As for popular science news reporting, Olohan (2016:203-204) observes that it shares some features with other forms of news reporting and that it can also be characterised by "the specific ways in which the discourse is organised, the arguments constructed and credibility conveyed, and in the ways in which writers engage and interact with their readers". According to Olohan (2016:176-177), the scientific articles we see in the news come from journal articles produced by scientific research organisations and institutions whose aim is to disseminate their research findings beyond

the scientific community. Moreover, for what concerns the mediation between scientists and general public, it is often made by press officers, journalists and translators.

Garzone (2006:84-87) claims that, first of all, news editors must decide which facts, notions or discoveries in the field of science and technology are to be covered in the news according to the impact a given topic has on everyday life. Secondly, to make that topic accessible to the readers, journalists must use a series of specific discursive practices that enable non specialised readers to approach specialised knowledge. For this reasons, the author claims that popular science texts can be compared to translation, as they involve a form of re-writing. Similarly, from a linguistic point of view, Calsamiglia and van Dijk (2004:371) affirm that popularisation involves not only a reformulation, but also a "recontextualisation of scientific knowledge and discourse that is originally produced in specialised contexts to which the lay public has limited access".

For instance, for what concerns headlines and standfirsts, according to Papuzzi (2010:192) their main function is to condense news and information, thus reducing the time for reading. Moreover, they introduce and comment the topic of the article and, in order to do so, the journalist (or the editor) can employ different strategies. On this issue, Olohan (2016:178-189) notices that, while the headlines of journal articles do not mention the findings of the research, those of press releases and news stories are usually focused on the main outcome.

Secondly, Garzone (2006:98-100) observes that a common characteristic of popularisation discourse is the use of quotations or, better, "the use of different linguistic devices that attribute statements to researchers, scholars, scientists, engineers, experts, etc.". The author makes a distinction between direct citation (when there is a fracture between the syntax of the overall text and the discourse of the cited statement); indirect citation (if there is only one discourse) and integrated citation (which has the form of indirect citation but with segments that are signalled as quotations). Moreover, Garzone (ibid.) specifies that the function of quotations in a popular science text is not only an adaptation to a typical journalistic style, but they also emphasize "the authoritativeness of the source tapped in an article". It is also a form of hedging, as it limits the writer's responsibility to a role of reporting something which is stated by someone else.

Furthermore, for what concerns the "visual" aspect of popularisation, Olohan (2016:186) briefly comments on the images chosen by news outlets to attract the readers'

attention to the story. These images, according to the author, also have the function of providing further explanation or exemplification of the text, while acting as framing devices for the story and influencing the way in which readers interpret the text.

As for the typical features of popular science reporting for Anglophone contexts, Hyland (2010:117) states that writers need to negotiate with readers what he calls "proximity of membership" (i.e. the writers' relationship with their community) and "proximity of commitment (i.e. their relationship with the text). According to Hyland, when going from professional to popular science, proximity is negotiated in different ways. For instance, popularisation foregrounds the main claim in the headline, giving more importance to the topic than to the methodology. Secondly, newsworthiness, as well as the readers' interest, become essential and, although specialist terminology tends to be avoided, necessary terms are explained. Moreover, in popularisation, writers use attitude markers, personal pronouns and questions to address the readers directly or to make them feel more engaged. Finally, the author notices that popular science tends to use more similes or explicit links to make the unfamiliar more familiar and cohesive devices such as repetitions to help clarify unfamiliar concepts.

From a narrative point of view, Myers (1994:179) claims that, according to the discourse in which we encounter some scientific facts, our attitudes towards that fact might change. Moreover, the author claims that while the narrative style of much popular science "emphasizes the immediate encounter of the scientist with nature", that of most scientific research reports "emphasizes the concepts and techniques through which the scientist conceives of and delimits nature". Therefore, since popular science texts do not suggest how scientific facts could be questioned or modified, it can be difficult for non-scientists to understand scientific controversy or changes in scientific thinking.

Furthermore, Myers (1994) compared the scientific researches and popular articles focusing on the differences in their organisation, syntax and vocabulary. For instance, on the level of textual organisation, Myers (1994:182-185) observed that while research articles focus more on the construction of an argument, their popularisations tend to tell the whole story in chronological order. Moving on to syntax, the author (1994:185-187) noticed that researches usually employ more complex structures, making a larger use of passive forms and nominalisations. Moreover, popularisation seems to employ quite often the "question and answer" pattern, a traditional technique in pedagogical literature.

Finally, for what concerns vocabulary, Myers (1994:187-188) states that popularisations tend to replace scientific terms with their explanation or with a rough equivalent in the general vocabulary.

Wright (2011:257) explains that for less widely spoken languages (e.g. Dutch, Scandinavian languages etc.) new knowledge first becomes available at the level of popular science, skipping both the language of scientific discovery and the in-depth pedagogical approach of instructional texts. The reason is that these countries mainly use English for university science instruction and even for advanced secondary levels. They do so in order to "prepare students for English-speaking professional environment" but also because "it is often uneconomical to publish state-of-the-art textbooks for a relatively limited readership".

For what concerns the dissemination of popular science in Italy, Gualdo and Telve (2011:188-189) observe that its most successful form are TV documentaries. However, the authors argue that, although Italian television popularises science successfully, it does not give actual "scientific education". They came to this conclusion after observing 2009 PISA's (*Program for International Student Assessment*) survey, according to which young Italian student are below the average for what concerns their knowledge of science, mathematics and literature. However, this is not true of what concerns scientific activities that are conveyed by mass media (e.g. TV, radio, websites, magazines or books): according to the survey, this extra-curricular activities involve a wide range of students, including those who give moderate or low performances. Therefore, the authors conclude that although young people seem to have a high interest for science, this interest does not become proper knowledge.

Furthermore, for what concerns Italian language of popularisation, Cortelazzo (1994:21) states that LSPs tend to lose some of their features and become more similar to general language. Gualdo and Telve (2011:43-44) observe that, as a consequence, the language of popular science opts of a more informal register in order to reach a wider audience. Moreover, according to Garzone (2006:89) popularising texts tend to be more prolix and redundant, with a lower lexical density and their approach is more expositive than argumentative. This last aspect determines a lower frequency of the typical linguistic features associated with argumentation, such as meta-discourse markers. Furthermore,

for what concerns their textual structure, these texts are characterised by a shorter sentence length and a lower complexity.

Another characteristic of popularisation, according to Garzone (2006:91-97) is the tendency to clarify concepts, notions and the meaning of more "specialised" terms. To identify the strategies that are employed to give explanations, the author relies on Calsamiglia and van Dijk's (2004:369-389) model, that includes:

> Denomination (or designation): Introducing new objects, events or terms, for instance with neologisms and metaphors.
>
> Definition: Conceptual delimitation of a term by a brief description of some general and specific properties of the thing the term is referring to.
>
> Reformulation (or paraphrase): A discourse fragment that is easier to understand than the original discourse fragment, and that has more or less the same meaning.
>
> Analogy (or association): A comparison with an area or objects that are certainly known to the layman or easier to understand – as in the case for similes and metaphors.
>
> Generalisation: A proposition that extends the validity of a preposition to all or most members of a set (or, formally, the substitution of an existential quantifier by a universal quantifier).
>
> Exemplification: One or more propositions that are instantiations of a more general proposition (or the substitution of a universal quantifier by more an existential quantifier).

In addition to these explanatory practices, Garzone (2006:97-98) suggests the strategy of explication, that is offering information which enriches the readers' knowledge of the subject matter treated. Moreover, for what concerns the use of figurative language (metaphors in particular) in popularised texts, Manfredi (2014:152) claims that metaphors fulfil both functions of those texts: the first function, as previously stated, is to offer specialised information to non-specialised readers, whereas the second function is to entertain their readers. Garzone (2006:98) concludes that:

> […] popularisation in general, and popularisation in the press in particular, is not characterised by recourse to specific textual structures, but rather by peculiar contextual co-ordinates and linguistic strategies, involving the activation of cognitive devices aimed at giving the general public effortless access to complex scientific and technological knowledge.

Finally, as previously stated, even popularisation's features might differ from a language to another, and it is necessary to keep this aspect in mind when translating popular science texts. These differences, in particular those between English and Italian, will be seen more in detail in the next chapter.

1.3 The Language of Psycholinguistics

Since, as previously stated, the article I chose to translate is mainly about psycholinguistics, the last section of this chapter will provide an insight into this discipline and, in particular, on the language used by experts to talk about it. First of all, psycholinguistics (or psychology of language) is "the study of mental faculties involved in perception, production and acquisition of language"[1]. Moreover, since it concerns different disciplines, in particular psychology, cognitive sciences and linguistics, it is considered an interdisciplinary field.

According to Garnham, Garrod and Sanford (2006:1-9), psychology began to be considered as an independent discipline from 1879, when Wundt founded his laboratory in Leipzig. As for psycholinguistics, although the the authors claim that it is possible to trace its intellectual origins to Ancient Greece (in particular from Plato's theory of "innate" concepts), the history of this discipline is commonly dated from the 1950s, and it actually got started in the mid-to late 1960s.

Nowadays, as previously stated, the study of psycholinguistic can be divided into three main areas: language production, comprehension and development. According to Traxler and Gersnbacher (2006), the study of spoken and written language production

[1] "Psycholinguistics." *Merriam-Webster.com*. Merriam-Webster, n.d. Web. 6 Oct. 2017.

also plays an important role in research and clinical practice concerning speech disorders (e.g. speech delay in children). Furthermore, speech production can be tracked and studied through the use of neuroimaging technologies, that allow, for instance, to understand the relationship between activity in certain brain areas and specific mental functions.

As for language comprehension, it involves first of all the perception of speech (including both the spoken and visual word) from a lexical, semantic, syntactic and prosodic point of view. Moreover, discourse comprehension can be analysed, for instance, both through the use of neuroimaging technologies and eye-movement control in reading and spoken language comprehension. Finally, these researches can be applied to the study of language processing in bilingual speakers, deaf people (that use sign language) and on the study of comprehension disorders and aphasias.

Finally, for what concerns language development, it concerns, first of all, the way in which children learn to talk, read and write and their acquisition of syntax and semantics. However, it also takes into consideration how we can learn a foreign language as adults, or the cognitive and linguistic issues in the study of children with SLI (Specific Language Impairment).

After this necessary introduction on the history and main fields of study of this discipline, it is now necessary to focus on the language used by specialists and laypeople to write and talk about psycholinguistics. In order to do so, both the horizontal and vertical dimension, that were introduced earlier in this chapter, will be taken into consideration.

Starting from the horizontal dimension, that mainly concerns contents, psycholinguistics seems to belong to the so called "soft sciences" (i.e. humanistic or social sciences), that also include psychology and linguistics. According to Scarpa (2008:4), they differ from "hard sciences" (i.e. natural sciences) because they apply the scientific method in different ways. For instance, the objects of social sciences are more complex as human behaviour is changeable and unpredictable, whereas the objects of natural science are more regular. Furthermore, in most of the cases, social sciences cannot verify their hypothesis with laboratory experiments, and the results of the observations are not always absolute and objective.

However, being psycholinguistics an interdisciplinary field, it can also involve the study of natural sciences, such as biology, medicine or neuroscience. For instance,

Garnham, Garrod and Sanford (2006:2-3) state that the original descriptions of Broca's (1861) and Wernicke's (1874) aphasias have been extremely important not only for Medicine, but also in the field of psycholinguistics, as those two areas of the brain are involved in the production and comprehension of language. Therefore, it is possible to conclude that psycholinguistics can be located in an intermediate position between soft and hard sciences. As a consequence, from the point of view of specialised terminology, the language of psycholinguistics can be related to that of medicine. For what concerns Italian medical terminology, Gualdo and Telve (2011:297) affirm that, as for many other languages, the most specific terminology comes from Latin and Greek; whereas the dissemination of collateral specialised terms is due to the influence of English.

On a vertical dimension, considering the different communicative situation or the textual genre, the authors (2011:298-303) identify three main levels of specialisation: on one side there is everyday communication between healthcare professionals and laypeople, that is characterised by a rather low level of technical terms. On the other hand, we have specialised dictionaries in which, of course, there is the highest level of technicality. In between, as a mediation between the two levels, there is the language used in scientific magazines, that is one of the objects of this thesis.

However, if the level of technicality can vary according to the context and genre, Gualdo and Telve (2011:303-305) observed that this does not happen for some syntactic structures that can be found in different types of texts. In particular, for what concerns Italian texts, the authors noticed how they are often influenced by English. For instance, the most common word order in Italian, in which the verb is followed by the subject, is sometimes replaced by the English one, that does the opposite thing. Secondly, this language is characterised by a series of recurrent prepositional phrases, such as *a carico di*, *a livello di*, *in presenza/assenza di* (or *su base*, *in sede*, *di tipo* followed by an adjective). Furthermore, the authors claim that, as for other LSPs, there is a strong tendency to nominalisation and other strategies that make the text more formal and impersonal, such as the use of singular forms (e.g. *il paziente*).

In conclusion, Cassandro (1994:88) claims that the medical language, differently from other scientific LSPs, shows a conservative tendency in lexis while opting for a simpler and modern syntax. This, according to the author, might be explained by the fact that medicine represents the point of interaction between scientific and humanistic

culture. Since, as previously stated, psycholinguistics is an interdisciplinary field that involves different sectors of both science and humanities, it would be possible to extend Cassandro's deduction on the language of medicine to the language of psycholinguistics, that would therefore show similar characteristics from a terminological and syntactic point of view.

CHAPTER 2

SPECIALISED TRANSLATION: FROM ENGLISH INTO ITALIAN

2.1 General Aspects of Translation

The main goal of translation is "rendering the meaning of a text into another language in the way that the author intended the text" (Newmark 1988:5). Therefore, the process involves at least two different languages: Source Language (ST) and Target Language (TL). Generally speaking, while translators need to have a deep knowledge of both languages and their cultures, TL is necessarily their native language.

For what concern the translation process, according to Hatim and Mason (1990:8), the ideal would be "to translate both form and content" of the ST (Source Text) by transferring them into the TT (Target Text), but this is not always possible:

> The form of a source text may be characteristic of SL conventions but so much at variance with TL norms that rendering the form would inevitably obscure the 'message' or 'sense' of the text.

However, when the translator does not have the possibility of conveying both form and content, Nida (1964:164) suggests that "the correspondence of meaning should, in the last resort, have priority over correspondence of style".

Similarly, according to Baker (2009:300), "it is a matter of luck whether the translating language possesses a grammatical structure that allows the ambiguity to be reproduced with the same economy". The concept of translatability is extremely debated, and the main question is "whether translation from one language into another is possible at all, or in what sense or to what degree it is possible".

This leads us to the notion of 'equivalence' that, according to Baker (2009:96), is "a central concept in translation theory, but it is also a controversial one". According to Scarpa (2008:89), translatability means that it is possible to translate each sentence of a text from one language to another; while equivalence between ST and TT means that we

can get the maximum level of semantic, functional and sociocultural correspondence between the two texts.

Actually, we can talk about equivalence on many levels. First of all, Baker (2011) identifies equivalence "at word level", when we consider the degree of equivalence between words belonging to different languages, and "above word level" (i.e. collocations, idioms and fixed expressions): briefly, two words or expressions in two languages can have a degree of equivalence that goes from "full equivalence" to "non-equivalence". After that, the concept is extended further to grammatical equivalence, considering "the diversity of grammatical categories across languages". Moreover, Baker talks about textual equivalence and pragmatic equivalence, linked respectively to the notions of cohesion and coherence. This is how Baker (2011:230-231) sums up the difference between the two concepts:

> Like cohesion, coherence is a network of relations which organize and create a text: cohesion is the network of surface relations which link words and expressions to other words and expressions in a text, and coherence is the network of conceptual relations which underlie the surface text. Both concern the way stretches of language are connected to each other. In the case of cohesion, stretches of language are connected to each other by virtue of lexical and grammatical dependencies. In the case of coherence, they are connected by virtue of conceptual or meaning dependencies as perceived by language users.

All these notions are at the core of the so called 'translation studies', a discipline that also consists of various strategies and theories elaborated by linguists and translator with the aim of easing the translation process. Translation studies, unlike medicine and engineering is a "relatively young discipline in academic terms, though it is increasingly featuring as a subject of study in its own right" (Baker 2011:4). In fact, the interest for this discipline among scholars began to rise only from the second half of the 20th century but, also thanks to the most recent innovations, we can observe a growing need for research in the field of translation.

Of course, there can be many different approaches to the study of translation according to its different fields. In written translation, for instance, the main distinction is the one between literary translation and specialised translation. Scarpa (2008:83) claims that, although they present some relevant differences, these two sub-categories of translation cannot by clearly separated because there is a continuum between them and,

moreover, translators can use the same variety of methods for every type of text. This aspect will be taken into consideration in the following sections, focusing on specialised translation and, in particular, on the differences between English and Italian.

2.2 Scientific and Technical Translation

First of all, it is necessary to explain the differences between scientific and technical (or specialised) translation and literary translation. For what concerns specialised translation, Scarpa (2008:84-85) affirms that scientific and technical texts are "closed" texts, as they can only have one correct interpretation. Therefore, translation is committed to a series of norms whose aim is not to be "faithful" to the ST, but rather to convey information according to the norms of the target language and culture. Moreover, the translator should make use of parallel texts in the TL as a reference during the translation process. As a matter of fact, these "*ad-hoc* and reference corpora can be very useful resources for terminological and phraseological research in preparation for translation" (Olohan 2016:49).

Differently, literary translation consists of "open" texts that can have multiple interpretations and, since each literary text is unique, the translator should not use similar texts as a reference (Scarpa 2008:84). Finally, according to Rega (2001:52-69), it is almost impossible to avoid some losses when translating a literary text from a language to another. However, if those losses can be tolerated in literary translation, when dealing with specialised texts they could compromise the readers' comprehension of the text and, therefore, they must be avoided at all costs.

According to Wright (2011:243), scientific and technical documents (as well as spoken discourse) constitute a "continuum of subject fields and texts classes" and, "although conflating science and technology is inappropriate, it is nonetheless difficult to draw clear boundaries between the concepts". Therefore, it is possible to refer both to the continuum as 'Sci-Tech' and to differentiate its constituents when necessary. Moreover, according to the author, the Sci-Tech spectrum can include a wide range of subdomains, such as medicine, chemistry, bioscience, genetic or automotive engineering, each one with its own set of sub-topics and text classes.

For what concerns scientific translation, it is necessary to point out that, as a matter of fact, English is considered to be the predominant language for scientific communication. According to Musacchio (2017:10), this is due to the fact that the language of the main political-military power also becomes the dominant language of science: as a matter of fact, starting from the 20th century, the USA became the strongest economic and military power and, as a result, English is now the lingua franca of science. Wright (2011:256-257) points out that, nowadays, most scholarly articles are originally published in English and, furthermore, a relative low percentage of these articles is translated into other languages. This is due to the fact that, worldwide, scientists have adopted English as their working language, both in written and spoken communication. This fact, according to the author, mostly affects smaller languages, that usually do not offer a full spectrum of text varieties and, therefore, may lack the highest scientific registers of technical terminology.

Moving on to the research in the field of specialised translation, Gualdo and Telve (2011:66-68) identify two main fields that have been coexisting for a few decades: the translation based on corpora and assisted translation. Although both of them are carried out with the help of computer equipment, they offer different perspectives: while corpora's linguistics is focused on the deduction of grammatical, syntactical and semantic rules (or collocations) from the analysis of oral and written texts, assisted translation is based on the use of bilingual dictionaries, glossaries and termbanks. According to the authors, the combination of these two methods makes the specialised translator's work more precise and reliable than it was in the past, also thanks to the increased potential of information technologies. Both corpora and assisted translation will be seen more in detail in the last section of this chapter.

According to Newmark (1988:11), before starting the translation of a specialised text it is necessary to analyse the ST "from a translator's point of view" in order to "determine its intention and the way it is written for the purpose of selecting a suitable translation method and identifying particular and recurrent problems". Moreover, Scarpa (2008:145) claims that the translator, who is highly responsible towards the text, must consider how the final translation will be used and, therefore, decide what kind of editorial model should be followed according to the target culture and the customer's needs. From a commercial point of view, Wright (2011:252-253) remarks that translation is not just

the act of a single individual (the translator), since it involves many other figures that are: the author (the originator of the text), the requester (the commissioner of the translation), the project manager (PM), the translator service provider (TSP), the editor (or reviser/proof-reader) and, finally, the end user (or consumer), which represents the target audience for the translation.

Moving on to the translation process, according to Scarpa (2008:146-148), the translator can opt for a "literal" translation, (thus keeping the same constituents of the ST while adapting its syntactic structures to the norms of the TL) or for a paraphrase of the text, that means "rewriting" the ST in the TL. While literal translation is mostly used by beginners who are afraid of making mistakes, this strategy can also be useful to write a first draft of the text and, moreover, the more a text is technical, the more its translation needs to be literal.

For what concerns the paraphrase of the text, it is a fundamental method for the redaction of the final version. Furthermore, Scarpa (2008:148-152) claims that paraphrase can be syntactic (transposition), semantic (modulation) or pragmatic (adaptation). First of all, transposition means that the meaning of the ST is expressed in the TT through the use of different syntactic structures (e.g. a verb becomes a noun, a single word becomes a phrase, a paratactic structure becomes hypotactic, modality and verb tenses can change etc.). Secondly, modulation implies a change of perspective that concern, for instance, logical derivation (e.g. the effect is replaced by the cause); antonymic translation (e.g. 'without difficulty' becomes '*facilmente*') or other mechanisms, such as replacing a concrete term with an abstract one. Finally, adaptation is used to solve a pragmatic or cultural problem (e.g. replacing 'baseball match' with '*partita di* calcio', that would sound more familiar to an Italian audience). Moreover, while paraphrasing, the translator can resort to explicitation (that means explaining, through pronouns or connectors, what was left implicit in the ST), expansion, reduction or elimination of some constituents. For instance, in Italian we can find a tendency to expansion.

When translating from English into Italian it is possible to use a series of textual, morphosyntactic and lexical strategies. First of all, from a textual point of view, Musacchio (2007:102) notices that Italian translations tend to keep the same paragraphs of the ST. However, according to Scarpa (2008:154), Italian translations show a tendency to simplification, implying the elimination of redundant information: the reason is that

the specialised registers of English are more addressee-oriented than Italian, and therefore they tend to start from given information to introduce something new. Musacchio (2007:108-109) adds that while English tends to reiterate the same term to make the text clearer, Italian – for stylistic reasons – avoids repetition and opts, instead, for lexical variation. Finally, English is usually more informal, transparent and easier to read if compared to Italian because its thematic structure is more linear and also because English texts are more pedagogic than scientific. Italian, vice versa, has a more complex structure and often uses explicitation and connectors to make the text more formal. (Scarpa 2008:160-165).

From a morphosyntactic point of view, Scarpa (2008:166-182) observes that while English texts are made of simple and short sentences with a paratactic structure, Italian sentences have a more complex, hypotactic structure. Furthermore, Italian often uses a nominal style to avoid using too many subordinates and to make the text more formal. For the same reason, although passive and impersonal forms are used quite frequently both in English and Italian LSPs, Italian texts seem to make a larger use of these forms. Finally, Scarpa (2008:182-183) notices that the two languages do not always express modality in the same way: in the fourth chapter of this thesis, for instance, we will see how the same English modal verb has more than one possible translation in Italian, according to the context in which that verb is used.

For what concerns lexical strategies and the research of terminological and conceptual correspondences, Scarpa (2008:188-195) points out that, while specialised terms can be found in bilingual dictionaries, phraseologies must be extracted from parallel texts, because knowing the right context is fundamental. Moreover, while translating a text into Italian, it is necessary to pay attention to all the "false friends" that come from borrowings and calques of some English terms, mostly in the field of IT. Newman (1988:81-84) considers borrowing and calques as proper translation methods, names respectively "transference" and "through-translation". All these strategies should allow the specialised translator to obtain a simple and functional TT that, if compared to the ST, needs to be more informative and formal (Scarpa 2008:195-196).

Moving on to the assessment of translation quality, Scarpa (2008:205-215) observes that it implies the consideration of professional standards (i.e. norms and techniques that define the characteristics of a product, a process or a service) that control

the translation process. In order to identify these criteria, the author considers the specialised translation both as an independent text and in relation to the ST, while also making a distinction between the theoretical-educational and the professional field: while in the first case the focus is on the translated text, in the second one the emphasis is on the addressee. For what concerns the theoretical-educational point of view, the translation of the ST must be accurate and, as an independent text, it must be usable. As for the professional field, the translated text must be, respectively, adequate and acceptable.

Starting from these criteria, Scarpa identifies three different levels of quality, that correspond to a different rate for the translator. On the highest level, the translation can be published as it has already been revised; on the second level it still needs to be revised and, finally, on the lowest level the translation is considered to be merely "informative".

Focusing on revision, according to Scarpa (2008:215-222) it is the last phase of the translation process, and its aim is to improve the quality of the TT. First of all, proof-readers must check if the specialised terms are correct and if the text fully conveys the information of the ST. Secondly, they need to consider the translated text from a stylistic point of view, in order to verify its linguistic accuracy, internal uniformity and, last but not least, the TT needs to meet the addressee's requests.

To make sure that a translation meets all these characteristics, proof-readers can make different types of intervention on the text, that Scarpa (2008:226) divides into three main categories. First of all, they can be subjective if they are linked to personal habits of the reviser, whose stylistic choices might differ from those made by the translator and, therefore, they are not strictly necessary. Secondly, interventions might be objectively justifiable, if they aim to improve the text by making it clearer and more concise. Finally, it is possible to make specialised interventions, that can concern specialised lexis or terminology or even the whole content of the text.

Finally, for what concerns the classification of mistakes in specialised translation, Scarpa (2008:229-241) takes into consideration a series of factors: first of all, how much a mistake is visible; secondly, the number of occurrences of the same mistake and, finally, the lack of consideration for an eventual correction previously made by the proof-reader. According to these criteria, the author identifies different levels of gravity: the most serious mistakes are those that imply misunderstandings that cannot by noticed by the addressee (they are considered less serious if the addressee can actually spot the

misunderstanding), while linguistic-stylistic mistakes that do not modify the meaning of the text are considered to be more tolerable.

2.3 Translating Popular Science

Nowadays, as previously stated, English is the dominant language of science and, therefore, the same concept applies to popular science, whose function is to make science accessible to laypeople. However, Musacchio (2017:10) observes that, since only an educated minority is proficient in English, science is usually communicated to the general public of each country in their first language. Similarly, Wright (2011:245) notes that the status of English as the dominant language of scientific communication also means that, at the moment, it is more common to translate scientific texts in other language rather than into English.

This is why, as a matter of fact, there is a wide range of translation activities that involve popular science. This section will mainly focus on the translation of scientific news articles, as it is the most relevant genre for this thesis. However, since a comparison might be useful to delineate the characteristics of news articles, even the other genres (or, at least, those that are more relevant for translation) will be presented briefly.

First of all, Myers (2003) points out that, although most research on scientific popularisation was done on texts (e.g. newspaper's articles), it is also necessary to consider the visual elements that are essential for other genres (e.g. lecture demonstrations, TV documentaries or museum exhibits). Olohan (2016:197-198) notes that, among these genres, the most relevant for translation is the scientific documentary film, that is usually broadcasted internationally in languages other than the SL. Documentaries usually rely on voice-over, a technique that allows to keep the original visual and auditory content while the original script is translated and revoiced by dubbing artists or actors. For instance, the dubbed or intralingual versions of many BBC documentaries (originally narrated by David Attenborough) are sold and broadcasted in many countries worldwide.

Other genres that are frequently translated, according to Olohan (2016:198-199) are the research centre websites and popular science books (particularly those written by

well-known scientists). In the first case, some research centres, such as the *Centre National de la Recherche Scientifique*[2] add a bilingual (or multilingual) version to their websites to globally disseminate their most "newsworthy" activities in a way that attracts the readers' attention (e.g. through headlines and visual imagery). For what concerns the popular science books, Olohan (ibid.) explains that they generally aim "to show the author's authority and command of the subject while also engaging the reader and communicating scientific ideas in a non-exclusionist and entertaining way".

Furthermore, Olohan (2016:199-200) mentions those translation activities involving popular science which are "generally not undertaken as professional, paid activities, but rather by translation volunteers, who may or may not be trained translators". Some examples of volunteer translation of scientific popularisation are the TED initiatives[3] and its TED talks, that are largely disseminated online, and the so called "citizen science" such as *Zooniverse*, a web-site that "enables everyone to take part in real cutting edge research in many fields across the sciences, humanities, and more" [4].

Moving on to the news articles, Olohan (2016:188-189) observes that research news are globally disseminated thanks to numerous services, such as *AlphaGalileo*[5] that use translation to do so multilingually. The author also mentions some international news agencies, like *Reuters*, whose aim is the international dissemination and translation of scientific news. These agencies publish science news and other categories of news stories that are often taken up by other media organisations to be translated and adapted into other languages. Moreover, the author (2016:192) also takes into consideration some international editions of popular science magazines or, in other words, "publishing outlets that are dedicated to popular science reporting and that set out to deliver multilingual editions", such as *Scientific American* and *National Geographic*.

For what concerns the reframing of popular science discourse in translation, Olohan (ibid.) focuses on the international editions of *National Geographic*, with the purpose of showing how a science story originally intended for an American audience can be

[2] CNRS (www.cnrs.fr) 11 Oct. 2017

[3] TED (www.ted.com) 11 Oct. 2017

[4] Zooniverse (www.zooniverse.org) 11 Oct. 2017

[5] AlphaGalileo (www.alphagalileo.org) 11 Oct. 2017

localised and reframed for target readers of other languages. In order to do so, it is necessary to take into account cultural specificity, considering the interests and opinions of the target audience in another geographic location and situating the scientific discourse in the context of other public discourses.

First of all, Olohan (2016:192-193) takes into consideration the translation of place names, institutions and other proper nouns. The author claims that there are some research organisations, institutes, universities and multinational companies (e.g. *Harvard*, *NASA* or *Airbus*) which are well known internationally, and therefore they are "reproduced without chance in other languages" or "transcribed but not translated or explained". However, sometimes proper nouns might be translated into the TL, for example the *International Space Station* is usually translated (e.g. in Italian it is often referred to as "*Stazione Spaziale Internazionale*", although the ISS abbreviation, derived from English, is also used because readers might be familiar with it). Moreover, the author claims that "some names may be reproduced in the TT but accompanied by expansion, additional information or explanation". Finally, some institutional information may be condensed or omitted in the translation if it not so relevant for the target audience.

Another aspect of cultural specificity that Olohan (2016:194) takes into consideration is the translation of measurements and currency. As a matter of fact, "when texts are adapted for different readerships, it may be necessary to convert measurements of various kinds, particularly when translating between US, imperial or metric systems". As for the conversion of currency, the author claims that translators do not always do so. In fact, although there is the possibility of using a more familiar system for the target readers, sometimes conversions might lead to a mismatch between ST and TT.

Furthermore, Olohan (2016:197) observes that it is also necessary to consider the different relevance that certain information might have for target readers. For instance, specifying that a research was carried out in Europe by European scientists is useful to bring the issue closer to Europe-based readers.

As previously stated, according to Hyland (2010), another typical strategy in popular science discourse is to use similes and comparison with familiar concepts to explain unfamiliar concepts. However, although sometimes these comparisons work just as well in the translation as in the ST, Olohan (2016:195-196) observes that when dealing with more culture-specific comparisons, it is necessary to use a different strategy. For

instance, the translator might find a similar comparison that would be more familiar to target readers. However, it is also possible to omit any attempt at word play, humour or other attention-attracting techniques by replacing them with a simpler informative sentence.

More in detail, for what concerns the translation of metaphors, Manfredi (2014:159-160) claims that it is necessary to translate them according to their functions, privileging the "creative" ones and even ignoring the merely "decorative" ones. As for the translation of metaphors in popular science, the author compared the English and Italian versions of the *National Geographic* magazine, classifying the translation of metaphors on the basis of their degree of metaphorisation. First of all, the author talks about "de-metaphorisation" when the ST metaphor has been lost or is simply "less congruent" in the TT. Secondly, if it has been recast in the TL, we have an example of "re-metaphorisation" and, finally, we can talk about "metaphorisation" when a metaphor that was absent (or at least "less incongruent") in the ST appears in the TT.

2.4 The Specialised Translator: Resources and Skills

The aim of the last section of this chapter is to introduce the professional figure of the specialised translator, along with the required abilities and the various resources to carry out this job. Starting from the concept of 'competence' in the field of translation, Scarpa (2008:250-255) identifies the ability to generate more than one acceptable TT from the same ST and that of selecting only one of those versions according to the specific purpose (or addressee) of the text. For what concerns other sub-competences, the author claims that they are determined by a cultural component (i.e. linguistic knowledge), a procedural component (i.e. translation ability) and a 'metacognitive' component (i.e. the ability to recognise problems).

The author (ibid.) observes more in detail all those components that, together, identify a good specialised translator. First of all, there is the communicative competence, that means having a good linguistic and cultural knowledge of at least two languages and cultures, especially for what concerns the TL. Secondly, translators need to acquire a method that allows them to mediate between different languages and cultures while

applying different strategies to solve the problems. They also need to be able to revise their own work, and they must know how to adapt their translations according to the norms of different specialised communities. Furthermore, it is essential to have theoretical and methodological competences that allow translators to justify their choices with clients and colleagues. Finally, from a professional point of view, they must know how to carry out terminological researches or how to use technology as a support for their activity.

Nowadays, specialised translators can also work in other fields, such as technical writing and localisation. For what concerns technical writing, Scarpa (2008:291-292) states that translators need to mediate between technical information and the different types of readers and, therefore, it might be useful to cooperate with technical writers. This cooperation, however, might have positive effects for both parts: while technical communicators obtain an internationalisation of their product, translators learn how technical writing is produced.

As for localisation, Scarpa (2008:293-298) defines it as an adaptation of contents to the needs of a specific (local) market. This adaptation can be achieved, for instance, through terminological standardisation; coherence between instructions and functionality of the software; readability of the employed language, that needs to be informative but concise; adaptation to the target socio-cultural context, for what concerns both contents and style.

This is how Olohan (2016:23) describes the professional activity of the specialised translator:

> Scientific and technical translators work in a variety of professional configurations – mostly freelance and for LSPs (Language Service Provider), but also in-house and in institutional contexts.
>
> Scientific and technical translators need to be knowledgeable and skilled in a range of domains; it is also essential to be intellectually curious, to have the capacity to learn and to be adaptable.

Furthermore, Olohan (2016:49) claims that they also "need to be proficient in the use of a variety of technologies used during the translation process, including research or preparatory phases". In more detail, for what concerns the importance of the

terminological research, the author adds that, when dealing with specialised texts, "an understanding of the nature of concepts and terms" enables the translator "to gain an understanding of the concepts and to become familiar with the relevant SL and TL terms".

For what concerns traditional terminological tools, such as bilingual dictionaries and glossaries, Scarpa (2008:309-311) claims that they are often incomplete since, while specialised documents are always innovative, this sources are not always upgraded with the most recent terminology. Moreover, since specialised terminology is rather complex, there might be more than one translation for the same term of the SL and, therefore, translators need to chose according to the context, that is not always included. However, translators can also use extra-linguistic sources, such as encyclopaedias or manuals, but also magazines or pre-existing translations. As a matter of fact, the ability of specialised translators also consists in being flexible, taking into consideration all the different sources at the same time to find the best translation.

An effective way to carry out a terminological research, before starting with the actual translation process, is the construction of bilingual corpora and termbanks. According to Olohan (2016:29-37), the first step is to create a corpus starting from the ST in order to identify its terms and recurrent phrases. After that, the translator can start creating a TL corpus that consists of texts belonging to the same subject domain of the ST in order to identify terms that correspond to those of the ST. However, it is also possible to consult online termbanks, such as IATE[6] (InterActive Terminology for Europe), that allow to search for terms and their equivalent in different languages and in specific fields or contexts, indicating the references and their level of reliability.

Gualdo and Telve (2011:66-67) explain that a translation corpus (i.e. a collection of texts) can be comparable (if it is a selection of texts that belong to the same subject) or parallel (when it compares thematic corpora of different languages). Scarpa (2008:315) argues that, while monolingual corpora (that can be parallel or comparable) are mainly used for translation studies, multilingual (parallel and comparable) corpora are more useful for the professional activity of a specialised translator. Once the corpus – along with the terminological correspondences between SL and TL – is completed, it is necessary to store this data, that can be used in future works on the same domain.

[6] IATE (http://iate.europa.eu) 13 Oct. 2017

According to Olohan (2016:43-47), it is almost impossible to remember all the encountered terminology. Luckily, nowadays translators can use technology to make their job easier. For instance, with a translation memory (TM) it is possible to store translations by aligning the correspondent segments of text between ST and TT: this allows translators to easily retrieve and reuse those segments for future translations. More in general, TM and terminology-management tools belong to the so called Computer-Assisted Translation (CAT) tools, which are widely used for scientific and technical translation and can help with consistency and productivity (Olohan 2016:49).

Olohan (2916:48-49) also mentions machine translation (MT), a software that produces automatic translations without the intervention of the translator. Although, in most cases, raw MT output does not meet professional standards, the most recent advances in statistical machine translation (STM) improved considerably the results of automatic translation, which is increasingly used in scientific and technical translation context.

Furthermore, Scarpa (2008:302) observes that, since the quality of a translation is often a compromise between adequacy, costs and speed of execution, MT allows to reduce time and costs of human translation. Moreover, although it is only employed for 5-10% of the translation process, it is particularly useful for informative "raw" translations. According to the author, automatic translation consists of three main passages. First of all, the ST is analysed through algorithm for sentence analysis (i.e. parsing). Secondly bilingual online dictionaries and rules of grammatical transformation are employed for the linguistic transfer and, finally, the TT is generated.

Scarpa (2008:304) also claims that, between the fully-automatic translation and human translation, there is a wide range of possibilities that integrate human and machine translation. This allows translators to focus on the most creative aspects of translation while the machine does the rest. According to the different relevance of human and machine in these systems, the author identifies Human-Aided Machine Translation (HAMT) and Machine-Aided Human Translation (MAHT).

In conclusion, for what concerns the translators' responsibility, Scarpa (2008:321-329) makes a distinction between textual and interpersonal responsibility. In the first case, their responsibility has to do with the possibility to modify the text to improve it. Translators must be honest and transparent about their choices; whose purpose is to obtain

an equivalent text that is faithful to the ST. As for interpersonal responsibility, the relationship between translator and client must be founded on trust, that implies loyalty and discretion. Finally, as translators can also be considered cultural mediators, one of their main purposes should be to do whatever is possible in order to improve intercultural relationship between people.

CHAPTER 3

TRANSLATION OF NEW SCIENTIST'S COVER STORY "THE ELOQUENT APE"

3.1 Introducing the Source Text

Before moving on to the source text and its characteristics, it is necessary to spend a few words on *New Scientist*, that is the source of the article. *New Scientist* is a weekly popular science magazine founded in 1956 by Tom Margerison, who was a British science journalist, author and broadcaster. The magazine is based in London but, nowadays, it is also published in other countries (e.g. United States and Australia) and, from 1996, it also has a website[7], whose function is to advertise the magazine and, in particular, its digital version.

According to the information that can be found on the website, the main purpose of the magazine is to reach an audience that is made both of scientists and non scientists who want to keep track of scientific and technological progress and, in order to do so, the contents need to be both informative and engaging. Every week, *New Scientist* publishes feature articles, news and commentaries on the latest issues that concern science, technology and environment. Moreover, every weekly issue includes interviews with professionals, reviews, letters from the readers and the advertisement of job and study opportunities in the fields of science, engineering and technology.

The article I chose to translate is the cover story of *New Scientist* n.3059, published on February 6, 2016. First of all, by looking at the cover of the magazine (see appendix A), it is possible to tell that it is the most relevant article of that week's issue. The first thing the reader notices is the image of a tower of blocks, whose pictures represent different types of written communication, from hieroglyphics to programming language. These blocks, combined together, compose the abstract image of a person speaking. The

[7] New Scientist (www.newscientist.com) 19 Oct. 2017

picture, created by Richard Wilkinson, is linked to the word 'language', that is the object of this special report, and to the subheading "Nine big questions about the trait that makes us human".

The whole article, entitled "The eloquent ape", can be found from page 26 to page 33 of the magazine. Before commenting its contents, however, it is necessary to observe its visual aspects (see appendix B). After the headline, there is a short standfirst that introduces the article, explaining that it will answer to the biggest questions about language. The body of the article is divided into ten sections – each one answering to one of these questions – that are written by different authors.

For what concerns the images, as we know, they are often employed in popular science magazines both to attract the readers' attention to the story and, sometimes, to provide further explanation or exemplification of the text. Moreover, they act as framing devices for the story and can influence the way in which readers interpret the text. In this case, however, their function seems to be merely decorative, as they do not provide explanations or exemplification. Most of the pictures that we can find throughout the article represent random people from various part of the world, signs and sentences written in different languages and abstract pictures. Next to some of these images, however, there is a caption that links them to a specific part of the text or that describes the content of that picture.

Moving on to the content of the article (see appendix C for the whole source text), as previously stated, it is the result of a collaboration of different authors. The first three sections (i.e. "Who spoke the first words?", "Why did we evolve language?" and "What were the first words?") are written by Mark Pagel, an evolutionary biologist at the University of Reading, UK. Here the author explains how and when language was born, how it has evolved and why it differentiates us from animals. In order to do so, Pagel compares different studies that observe the evolution of language from different points of view (i.e. the fields of history, biology, sociology and, of course, linguistics), reporting their most relevant findings in a simple and engaging way.

The author of the next three sections (i.e. "Can language rewire your brain?", "Can language influence how you see the world?" and "Does language shape your personality?") is Megan Scudellari, who works as a science writer in Boston. These sections mainly focus on the psychological and neurobiological aspects of language and,

in particular, on the consequences of bilinguism. To prove that our language can influence our personality, our perception of the world and even our brain, the author briefly reports methods and findings of the most relevant studies in this field, often quoting directly the authors of those researches.

The following three sections (i.e. "Will we all one day speak the same language?", "Saving endangered languages" and "How is technology changing language?") are written by Hal Hodson, who works at *New Scientist* as a technology editor. The first and the last of these section speculate about the future of language, focusing in particular on the role of English, on the language of the Internet and on how it has changed the way we communicate. Among the two, the first section is the most "technical", as here the authors incudes the description of some recent studies and the opinions of researchers. In the other section, Hodson interviews David Harrison, a linguist at Swarthmore college in Pennsylvania who studies the so called "endangered" languages. In the interview, they discuss Harrison's field studies, the causes of the extinction of these languages and their future possibilities.

Finally, the last section of the article (i.e. "Could we one day communicate without speaking?") is written by Helen Thomson, a *New Scientist* consultant. The author focuses on recent studies in the field of neurobiology and on the new technologies that would allow paralysed people to communicate only with their brains, reporting the main findings and the researchers' opinions about future developments.

After presenting the main contents of the article, it is necessary to briefly comment on the language and style employed by the authors. First of all, as it is a popular science text, the target audience of the article is made of both specialists and non specialists as it presents a rather low level of technicality. Furthermore, by using online term extractors (e.g. *VocabGrabber*[8]), it is possible to observe that most of the employed terminology belongs to the field of science (88 terms on a total of 1309) whereas the other term are mainly related to people, geography, social studies, arts and literature (each category has about 45 terms). Focusing on scientific terminology, we can observe that most of the terms refer to the human body, especially to areas and components of the brain. Moreover, since most of these terms can be easily understood even by non specialists with a good

[8] VocabGrabber (https://www.visualthesaurus.com/vocabgrabber/) 24 Oct. 2017

level of education, only the most difficult or the less common ones (e.g. 'gene FOXP1' or 'similect') are explained.

In conclusion, for what concerns the register of the article, it seems to be rather informal. For instance, we can notice that contractions (e.g. 'don't,' 'won't') are employed more frequently than their extended forms. Furthermore, in many cases, the authors used phrasal verbs instead of an equivalent verb (e.g. 'come up' instead of 'occur' or 'going on' instead of 'happening'). Finally, they often employed colloquialisms, personal pronouns and other elements (e.g. attitude markers or the question-answer pattern) that are usually avoided in more formal written texts. In popular science, however, they are employed more frequently with the purpose of creating a more engaging text, that needs to be informative but also entertaining to grasp the reader's attention. The function of these strategies, as a matter of fact, is to appeal the readers by addressing them directly and making them feel more involved.

3.2 Translation Corpus

Before starting with the actual translation process, it was necessary to create a bilingual corpus that consists of a series of texts —written both in English and Italian — on the same topic and genre of the ST (in this case, popular science feature articles on the topic of psycholinguistics). Moreover, the texts that form a bilingual corpus are usually both parallel (i.e. independent texts originally written in one of the two languages) and comparable (i.e. the STs and their translations). As previously stated, the use of corpora in translation can be useful to find specialised terms or expressions in the field of the ST and their translation in context, but they can also be used to look at the most common stylistic choices in that genre, that might also vary from a language to another.

First of all, for what concerns the comparable corpus, I selected ten feature articles related to the fields of psychology, neuroscience, linguistics and cognition. These articles were published between 2009 and 2017 and can be found on the online versions of *Scientific American*[9], an American popular science monthly founded in 1845 by Rufus

[9] Scientific American (https://www.scientificamerican.com/) 24 Oct. 2017

M. Porter, and *Scientific American Mind*[10], a bimonthly magazine founded in 2004 that focuses on the fields of psychology and neuroscience. The Italian translations of these article can be found on the Italian magazines *Le Scienze*[11] and *Mente & Cervello*[12], founded respectively in 1968 and 2006 as the Italian editions of *Scientific American* and *Scientific American Mind*. Moreover, for the parallel corpus, I selected ten news articles (that are usually shorter than feature articles) on the same topics taken from *Scientific American*'s website and ten news articles originally written in Italian that I found on *Le Scienze*'s website.

When all the texts are collected, it is necessary to align the segments of the original texts with their translations to create a translation memory. This process can be done automatically with free online tools like *Wordfast Aligner*[13], that only requires to input the raw ST and TT, indicating respectively the SL and TL. The output can be saved as an XLS file (that can be opened with *Microsoft Excel*) or as a TMX file (that works with CAT tools that support TMs, such as *SDL Trados*).

The TM plays an important role in the translation process, as it can be used to search for the possible translations of specialised terms and expressions that belong to the same field of the ST. For instance, translators can easily search for a single term of the ST to look at its occurrences throughout the corpus and, according to the context, they can decide which translation is the most suitable for the TT. As a matter of fact, although most of the times there is only one possible translation for a specialised term, some other expressions might change according to the context and other factors.

Moreover, TM can also be useful to look at the different stylistic choices that were made when translating from a language to another. This allows translators to identify the main characteristics of a genre in terms of register, textual organisation and morphosyntactic structure. Finally, observing how these characteristics change according to the language can help translators in making the best stylistic choices for the TT.

[10] Scientific American Mind (https://www.scientificamerican.com/mind/) 24 Oct. 2017

[11] Le Scienze (http://www.lescienze.it/) 24 Oct. 2017

[12] Mente & Cervello (http://www.lescienze.it/mente-e-cervello/) 24 Oct. 2017

[13] Wordfast Aligner (https://www.wordfast.net/?go=align) 24 Oct. 2017

3.3 Final Translation

IN COPERTINA

La scimmia parlante

Le rane gracidano, gli uccelli cantano e le scimmie farfugliano, ma nessun'altra specie possiede abilità linguistiche ricche e infinitamente adattabili come le nostre, senza le quali non sarebbero esistiti il commercio, le tribù, le religioni e le nazioni, per non parlare di Internet o dell'inchiostro su questa pagina.

A cosa dobbiamo la nostra capacità di condividere le idee e di influenzare gli altri? In che modo ci rende ciò che siamo, e come cambierà? Ecco la nostra guida a nove dei più grandi interrogativi sul linguaggio.

CHI PRONUNCIÒ LE PRIME PAROLE?

Il linguaggio è una potente opera di tecnologia sociale che ci permette di trasmettere i nostri pensieri sotto forma di sbuffi d'aria in codice o tramite dozzine di simboli disegnati che verranno poi decifrati da qualcun altro. Può fornire informazioni riguardanti il passato, il presente e il futuro, può dare forma alle idee, innescare azioni, persuadere, convincere e ingannare.

Al giorno d'oggi si parlano 7102 di questi codici in tutto il mondo. Ogni società umana possiede una lingua e non ce n'è una migliore dell'altra: tutti sono in grado di comunicare ogni aspetto della vita umana. Per chi studia l'evoluzione umana, questa incredibile universalità potrebbe suggerire che la nostra specie abbia usato il linguaggio fin dalla comparsa dell'Homo sapiens in Africa tra i 200.000 e i 160.000 anni fa. Un'origine più recente, in effetti, non spiegherebbe come mai anche i gruppi rimasti in Africa in seguito alla migrazione dell'Homo sapiens nel resto del mondo 60.000 anni fa possiedano l'uso del linguaggio.

Se, dunque, l'Homo sapiens possiede il linguaggio da sempre, è possibile che si sia sviluppato anche in altre specie umane ormai estinte? C'è chi crede che anche l'uomo di Neanderthal l'avesse acquisito, e ciò implicherebbe che entrambi l'abbiamo ereditato dal nostro antenato comune 500.000 o più anni fa. Questa teoria è compatibile con la scoperta che FOXP2, un gene fondamentale per il linguaggio, è identico in due posizioni fondamentali negli esseri umani e nell'uomo di Neanderthal, ma è diverso negli scimpanzé. Tuttavia, un singolo gene non è sufficiente per spiegare il linguaggio, ed una recente prova genetica mostra che il cervello dell'uomo di Neanderthal regolava la sua versione di FOXP2 in modo diverso.

Inoltre, il linguaggio è di natura simbolica: i suoni corrispondono a parole che denotano oggetti reali e azioni. Tuttavia, il ritrovamento di alcuni pezzi di pigmento e di alcune incisioni all'acquaforte molto discusse proverebbe che l'uomo di Neanderthal possa aver sviluppato l'arte o altri comportamenti simbolici. In confronto, gli esseri umani che vivevano al loro fianco in Europa occidentale dipingevano bellissimi murali, costruivano strumenti musicali e disponevano di un'ampia varietà di strumenti e armi.

Le ipotesi che il linguaggio si sia sviluppato ancora prima (ad esempio nell'Homo erectus, una scimmia antropomorfa che camminava in posizione eretta nella Savana africana due milioni di anni fa) sono poco più che mere speculazioni. Sembra più probabile, almeno secondo le prove esistenti, che la nostra abilità nell'attaccare bottone sia unica nel suo genere.

Mark Pagel è un biologo evoluzionista dell'Università di Reading, Regno Unito.

PERCHÉ ABBIAMO SVILUPPATO IL LINGUAGGIO?

Le nostre abilità linguistiche non sono gratuite: gli esseri umani hanno dovuto sviluppare complessi circuiti cerebrali e meccanismi sofisticati per poter parlare, oltre a spendere anni preziosi ad insegnarlo ai loro figli. Perché pagare un tale prezzo?

Molte persone attribuiscono le nostre abilità linguistiche alle grandi dimensioni dei nostri cervelli, alla capacità di compiere gesti manuali molto complessi, ai tratti vocali distintivi e al gene FOXP2, che ci permette di controllare i nostri muscoli facciali con

precisione. Tuttavia, presi singolarmente, questi tratti non spiegano perché abbiamo sviluppato il linguaggio: esistono animali con cervelli più grandi dei nostri, anche i primati gesticolano e, inoltre, alcune specie di uccelli riescono ad imitare il linguaggio umano anche senza la discesa della laringe o la nostra particolare versione di FOXP2.

Piuttosto, si può affermare che la caratteristica che ci separa più chiaramente dagli altri animali sia la sofisticatezza del nostro comportamento sociale simbolico e cooperativo: gli esseri umani, infatti, sono l'unica specie che scambia ripetutamente favori, beni e servizi anche con chi non rientra nella cerchia dei parenti più stretti. Abbiamo un'elaborata divisione del lavoro, ci specializziamo in alcuni compiti e poi scambiamo i nostri prodotti con gli altri. Inoltre, abbiamo imparato ad agire in modo coordinato al di là della nostra unità famigliare (come quando, ad esempio, una nazione va in guerra o quando più persone uniscono le forze per costruire un ponte).

Diamo spesso per scontata la complessità del nostro comportamento sociale, ma tutte queste azioni si basano sull'abilità nel negoziare, trattare, raggiungere accordi e fare in modo che vengano rispettati: ciò richiede la presenza di una connessione che, come un moderno cavo USB, trasporti le informazioni complesse avanti e indietro da un individuo all'altro. Quella connessione è proprio il linguaggio.

Alcuni insetti sociali, come le formiche, le api e le vespe, riescono a collaborare anche senza usare il linguaggio. Tuttavia, di solito questi insetti appartengono a gruppi di famiglie strettamente imparentate tra loro, programmate geneticamente per agire nell'interesse del gruppo, mentre le società umane, invece, devono sorvegliare chiunque cerchi di approfittare degli altri. Tramite l'uso di parole e simboli, possiamo smascherare un imbroglione rovinandogli la reputazione, oppure lodare ampiamente chi se lo merita, migliorando il suo prestigio anche tra persone che non conosce: le parole possono viaggiare più lontano di una singola azione. Per svolgere tutte queste complicate azioni sociali non sarebbero sufficienti i grugniti, i cinguettii, gli odori, i colori e i ruggiti del resto del regno animale, e questo spiega perché solo noi possediamo il linguaggio, elemento fondamentale per l'esistenza di una società complessa come la nostra.

Mark Pagel

QUALI FURONO LE PRIME PAROLE?

È molto probabile che sia esistita una lingua madre originaria, capostipite di tutte le lingue umane, vive e morte. La prova è che tutti i linguaggi umani, a differenza di altre forme di comunicazione animale, mettono insieme le parole per formare delle frasi con dei soggetti, verbi e oggetti ("Ho dato un calcio alla palla"), oltre al fatto che ognuno è in grado di imparare qualsiasi lingua.

L'obiettivo di molti linguisti comparativi è quello di rintracciare i suoni che emergono ripetutamente nelle lingue di tutto il mondo dal momento che, se dovessero esistere ancora oggi delle tracce di una lingua madre, si troverebbero proprio in questi suoni. Merritt Ruhlen dell'Università di Stanford in California, ad esempio, sostiene che suoni come "tok", "tik", "dik" e "tak" vengano usati spesso in lingue diverse con il significato di "dito" (della mano o del piede) o di "numero uno". Questo ed altri studi simili, seppur controversi, affermano che la lista di parole condivise in tutto il mondo, dal momento che suonano quasi allo stesso modo, includa anche le parole inglesi *who*, *what*, *two* e *water* ("chi", "cosa", "due" e "acqua").

Un approccio differente consiste nell'osservare le parole che tendono a cambiare molto lentamente nel corso di lunghi periodi di tempo. Ricorrendo a questi studi statistici, è stato possibile dimostrare che le parole per i numeri dall'1 al 5 sono tra quelle che evolvono più lentamente. In questa lista ci sono anche parole coinvolte nella comunicazione sociale, ad esempio "chi", "cosa", "dove", "perché", "quando", "io", "tu", "lei" e "lui". Questa lista, che include alcune parole presenti anche in quella di Ruhlen, confermerebbe le teorie secondo le quali il linguaggio evolve principalmente a causa del suo ruolo sociale (vedi "Perché abbiamo sviluppato il linguaggio?"). Più ampiamente, possiamo affermare con una certa sicurezza che le prime parole rientravano solamente in poche categorie, ad esempio i nomi semplici che venivano usati da alcuni dei nostri antenati.

I cercopitechi verdi emettono delle grida di allarme distinte per i leopardi, per le aquile marziali e per i pitoni che anche le scimmie più giovani devono imparare. Negli esseri umani, è molto probabile che la prima parola di un bambino sia "mamma", dal momento che i neonati dipendono completamente dalla madre. Inoltre, il suono "m" è presente in quasi tutte le lingue del mondo ed appare naturalmente nella lallazione.

Sembra che alcuni imperativi come “guarda” o “ascolta” siano apparsi molto presto, forse assieme a verbi come “pugnalare” o “scambiare”, che sarebbero stati di aiuto nel coordinare la caccia o gli scambi. In effetti, persino un lessico così semplice consente la creazione di frasi, come “guarda, gnu” o “scambio frecce”. Infine, semplici parole sociali come “tu”, “me”, “io”, “sì” e “no” facevano probabilmente parte del nostro antico vocabolario. Uno studio recente ha simpaticamente osservato che l’esclamazione “uh” è universale, suggerendo che fosse tra le prime parole umane in assoluto. Forse è stata la seconda.

Mark Pagel

STUDIARE UNA LINGUA PUÒ RICONFIGURARE IL CERVELLO?

Nel corso dell’evoluzione della specie, alcune parti del nostro cervello si sono espanse, ottenendo una maggiore potenza di elaborazione del linguaggio: questo è ciò che ci rende programmati per la comunicazione. Quello che forse sorprende di più è il modo in cui il linguaggio riesce a dare forma al cervello nel corso delle nostre vite.

La maggior parte delle prove arriva dagli studi condotti su persone bilingui, le cui scansioni cerebrali mostrano come il passaggio una lingua all’altra inneschi diversi schemi di attività cerebrale rispetto a quando si parla una sola lingua, specialmente nella corteccia prefrontale. Questa parte del cervello, situata nella zona frontale dei nostri crani, è coinvolta nell’organizzazione e nella reazione alle informazioni, compreso l’uso della memoria di lavoro, del ragionamento e della pianificazione. Inoltre, altri studi mostrano che i bilingui sono più veloci nel prendere confidenza con una nuova lingua.

Il poliglotta Arturo Hernandez, direttore del Laboratorio per le basi neurali del bilinguismo all’Università di Houston in Texas, sostiene che queste differenze potrebbero manifestarsi anche nell’architettura dei cervelli bilingui. In altre parole, apprendere un’altra lingua potrebbe cambiare il modo in cui il cervello è configurato. “Nelle persone con un’esperienza linguistica variegata sarebbe sensato poter osservare una sorta di effetto stabile, a lunga durata”, afferma Hernandez.

Il bilinguismo potrebbe anche rendere il cervello più resistente: Ellen Bialystok dell'Università di York a Toronto, Canada, ha scoperto che, in media, ai monolingui viene diagnosticata la demenza 4 anni e mezzo prima rispetto a chi parla più lingue dalla nascita. Inoltre, i bilingui avrebbero più materia bianca rispetto ai monolingui, anche nell'area della corteccia prefrontale. La materia bianca è costituita da fibre nervose che collegano diverse aree del cervello, trasportando le informazioni avanti e indietro da un'area all'altra. Dunque, sembra che migliorare le proprie abilità linguistiche aiuti a costruire cervelli più connessi, anche se Bialystok avverte che questi risultati non sono ancora stati confermati.

L'anno scorso sono giunte ulteriori prove dei benefici di una seconda lingua da uno studio su 608 persone che hanno avuto un infarto. Thomas Bak dell'Università di Edimburgo, Regno Unito, ha osservato come il recupero completo del funzionamento sia avvenuto nel 40% dei bilingui del gruppo, ma solo nel 20% dei monolingui. Bak suppone che la ginnastica mentale coinvolta nel parlare più lingue possa costruire ulteriori connessioni che migliorano il funzionamento del cervello aiutandolo a gestire i danni. "L'idea è che l'esercizio mentale possa "allenare" il cervello, migliorandone la capacità di compensazione", afferma Bak.

Megan Scudellari è una divulgatrice scientifica di Boston.

IL LINGUAGGIO PUÒ INFLUENZARE LA NOSTRA VISIONE DEL MONDO?

Noi italiani viaggiamo avanti e indietro nel tempo con la mente, che può essere "rivolta al passato" oppure "proiettata verso il futuro": questo è un esempio di come un concetto culturale venga codificato nel linguaggio. Ma può il linguaggio, a sua volta, influenzare il nostro modo di pensare?

Maria Sera è madrelingua spagnola dalla nascita, ed è cresciuta credendo che tutti gli scoiattoli fossero femmine. Infatti, la parola spagnola per scoiattolo, *ardilla*, è femminile. Lavorando come linguista presso l'Università del Minnesota, è riuscita a dare sostanza a ciò che pensava da piccola: infatti, gli studi effettuati sul francese e sullo

spagnolo che, come l'italiano, attribuiscono un genere ad ogni cosa, suggeriscono che i parlanti di queste lingue tendano ad associare proprietà maschili o femminili agli oggetti.

L'idea che il linguaggio che parliamo possa influenzare il modo in cui pensiamo risale al 1940, quando il linguista Benjamin Lee Whorf suggerì che se una lingua non possiede le parole per esprimere un concetto, i parlanti non riescono a capirne il significato. La teoria fu relegata tra le scienze di confine fino ai primi anni 2000, quando alcune persone cominciarono ad indagare su un'idea simile ma con più sfumature, ovvero che il linguaggio possa influenzare la percezione. Ad esempio in greco, come in italiano, c'è una distinzione tra azzurro (*ghalazio*) e blu (*ble*) che non esiste in lingue come l'inglese. Uno studio ha dimostrato che, di conseguenza, chi parla greco dalla nascita è tendenzialmente più abile e più veloce nel distinguere le tonalità del blu rispetto a chi parla solo inglese.

Il linguaggio sembra influenzare anche la nostra percezione del tempo e dello spazio: ad esempio, i Guugu Yimithirr australiani non hanno parole che esprimano lo spazio relativo, come "destra" e "sinistra", pur avendo dei termini per "nord", "sud", "est" ed "ovest". Gli studi hanno dimostrato che queste persone tendono ad essere estremamente abili nello stabilire dove si trovano, anche in luoghi che non conoscono. Inoltre, è stato provato che la direzione in cui si scrive il nostro linguaggio può influenzare la nostra percezione del tempo (ad esempio, rispetto a noi, le persone che parlano mandarino tendono a pensare che il tempo scorra dall'alto verso il basso), ma anche il modo in cui percepiamo gli altri (vedi "Il linguaggio determina la personalità?").

Più in generale, il linguaggio ci aiuta a capire il mondo poiché ci permette di categorizzare le cose. Mentre i bambini sono più abili nel raggruppare gli oggetti se hanno già imparato i nomi delle categorie a cui appartengono, questa attività risulta più difficile per chi, in seguito ad un infarto, ha perso alcune abilità linguistiche. "Il linguaggio non influisce solo sulle aree del cervello dedicate ai ragionamenti complessi" afferma Gary Lupyan, dell'Università del Wisconsin-Madison, "ma cambia anche le nostre rappresentazioni percettive di base".

Megan Scudellari

IL LINGUAGGIO DETERMINA LA PERSONALITÀ?

Si dice che Carlo Magno abbia detto che "conoscere una seconda lingua significa possedere una seconda anima", e potrebbe averci visto lungo. Negli anni '60, la sociolinguista Susan Ervin-Tripp dell'Università della Carolina a Berkeley chiese a dei bilingui anglo-giapponesi di descrivere cosa stava succedendo in alcune immagini ambigue. Una persona, ad esempio, ha raccontato due storie diverse nelle due lingue osservando l'immagine di una donna stesa sul divano: se nel racconto in giapponese la protagonista meditava il suicidio in seguito alla perdita del suo fidanzato, nella narrazione in inglese stava semplicemente completando un progetto per un corso di cucito. "In generale, c'era più emozione nelle storie in giapponese" ha scritto Ervin-Tripp nella descrizione dell'esperimento. "Il passaggio da una lingua all'altra porta con sé il bagaglio culturale associato a quel linguaggio".

Nairán Ramírez-Esparza dell'Università del Connecticut ha chiesto a dei bilingui messicani di completare dei questionari sulla personalità sia in inglese che in spagnolo. Le risposte in inglese ponevano l'accento sull'apertura e sull'estroversione, mentre quelle in spagnolo erano più modeste e riservate. "Il linguaggio è molto potente. È evidente che possa cambiare la percezione che abbiamo di noi stessi" afferma Ramírez-Esparza.

Secondo Shai Danziger dell'Università di Ben-Gurion in Israele e Robert Ward dell'Università di Bangor nel Regno Unito, il linguaggio può anche influenzare il modo in cui pensiamo agli altri. È stato chiesto a bilingui arabo-ebrei di collegare nomi arabi ed ebraici a parole che esprimevano tratti positivi o negativi premendo un tasto. I partecipanti hanno involontariamente mostrato un'attitudine più positiva nei confronti degli ebrei quando il test si è svolto in ebraico rispetto a quando si è svolto in arabo. Paula Rubio-Fernandez dell'Università di Oslo, nel frattempo, ha scoperto che i bambini bilingui sono più abili nei test che richiedono di comprendere una situazione assumendo il punto di vista di qualcun altro.

Le prove che dimostrano come le parole a cui pensiamo o che pronunciamo diano forma ai nostri cervelli, alle percezioni e alle personalità sono sempre più numerose. Su cos'altro potranno influire? Forse sui nostri gusti, sulle abitudini o sui valori: siamo aperti ad ogni possibilità.

Megan Scudellari

IN FUTURO PARLEREMO TUTTI LA STESSA LINGUA?

Con più di un miliardo di parlanti nativi, il cinese mandarino è la lingua più diffusa al mondo. L'inglese è al terzo posto dopo lo spagnolo, ma a differenza di quest'ultimo e del mandarino (entrambi parlati in più di 30 paesi) l'inglese si parla in almeno 100 nazioni. In aggiunta ai 335 milioni di persone che lo usano come prima lingua, 550 milioni lo citano come seconda lingua: l'inglese, infatti, domina le relazioni internazionali, il commercio e la scienza.

Tutto ciò suggerisce che l'inglese possa diventare la lingua franca del pianeta, anche se probabilmente non si tratterà della stessa lingua a cui sono abituati i suoi parlanti nativi. Infatti, i milioni di persone in tutto il mondo che parlano inglese come seconda lingua lo stanno usando come base per la creazione di dialetti che incorporano vari elementi delle loro lingue e culture native. Anna Mauranen dell'Università di Helsinki in Finlandia chiama queste varietà "*similect*", termine che associa l'aggettivo inglese "*similar*" (simile) a "*dialect*" (dialetto). Anglo-cinese, anglo-brasiliano, anglo-nigeriano: saranno loro, afferma, a sostituire l'inglese americano o britannico nella costruzione del linguaggio del futuro.

"Pensavamo che ci fossero due futuri possibili", sostiene Jennifer Jerkins dell'Università di Southampton, Regno Unito. "In uno dei due ci saremmo tutti ritrovati a parlare l'inglese americano. Nell'altro, l'inglese si sarebbe separato come il latino, risultando nella creazione di nuove lingue. Penso che nessuno dei due scenari si realizzerà davvero."

Piuttosto, è molto probabile che i *similect* inglesi continueranno ad esistere. Anche in un futuro che vede Cina, India e Nigeria come nuove superpotenze, l'inglese continuerà ad essere la lingua destinata all'ambito internazionale, semplicemente perché viene già usata. Anche se può sembrare strano, ciò metterebbe a rischio i parlanti nativi: "Ci stiamo avvicinando ad una fase in cui tutte le persone istruite del mondo parlano inglese" afferma Jerkins. "Quando non sarà più qualcosa di speciale, i parlanti nativi perderanno il loro vantaggio." Potrebbero persino essere svantaggiati.

I parlanti non nativi prestano molta attenzione alle anomalie linguistiche degli altri. "Se un cileno, un giapponese e un polacco avviano una discussione in inglese, si

capiscono alla perfezione" afferma Jerkins. "Ma se fai parlare uno di loro in inglese con due parlanti nativi, potrebbero nascere dei problemi."

Anna Mauranen immagina un futuro in cui i *similect* inglesi cominceranno a mescolarsi al di là dei confini nazionali e la formazione di nuovi dialetti ruoterà attorno al commercio o alle regioni, affermando che saranno questi obiettivi comuni a guidare l'evoluzione della lingua franca, che la si chiami inglese o meno. Ciò non significa che tutte le altre lingue spariranno: il tedesco resterà la prima scelta all'interno dei confini della Germania e persino l'estone, parlato da appena 1 milione di persone, è al sicuro. "È un linguaggio vero e proprio, usato per qualsiasi cosa [in Estonia]", afferma Mauranen.

Probabilmente, il linguaggio che deriva direttamente dall'inglese Shakespeariano resisterà tra i britannici e gli americani. Ma la lingua inglese, come il calcio, uscirà presto dal loro controllo e verrà trasformata in in qualcosa di nuovo dal resto del mondo.

Hal Hodson è direttore tecnologico presso New Scientist.

SALVAGUARDARE LE LINGUE IN VIA D'ESTINZIONE

David Harrison, che ha dedicato la sua carriera alla registrazione e allo studio delle lingue parlate da pochissime persone, racconta ad Hal Hodson perché queste lingue sono importanti.

Ha viaggiato in tutto il mondo inseguendo le lingue che stanno morendo. Perché?

La varietà linguistica è un'assicurazione contro l'estinzione delle idee e della conoscenza. Le lingue antiche, come quelle degli indigeni australiani o dei Papua della Nuova Guinea, sono un insostituibile registro della vita umana sostenibile. Queste culture hanno un'immensa conoscenza delle piante e dell'ecosistema e diversi modi di pensare: se perdessimo le loro lingue, perderemmo anche i concetti che si sono sviluppati nel corso di millenni.

Cosa spinge una lingua verso l'estinzione?

Non è il numero di parlanti a predire la vitalità di un linguaggio, ma il suo rapporto di trasmissione. Il linguaggio nativo americano più diffuso è il Navajo, con 50.000 parlanti, ma il suo rapporto di trasmissione è appena del 15%.

Questo problema deriva da un atteggiamento, mantenuto sia dai parlanti della lingua dominante che da quelli della lingua minore, che vede queste lingue come arretrate, obsolete e carenti in alcuni aspetti. Ho lavorato in molte comunità dove questo atteggiamento è ben saldo: ciò spinge le persone ad abbandonare le loro lingue per disperazione. L'ultima generazione di persone cresciute in una comunità parlando uno di questi linguaggi prova un forte rimorso per quello che è accaduto. Scenari come questo, in cui si sa che la lingua è destinata a morire, sono molto tristi, per questo sono passato ad altro.

A cosa si sta dedicando ora?

Sto lavorando con lingue minori che hanno ancora dei parlanti di tutte le età, comunità che si stanno opponendo all'egemonia delle lingue principali in modo intelligente. La Papua Nuova Guinea possiede la più grande varietà linguistica al mondo, tante lingue a bassa o media diffusione che non sono a rischio. Le persone possono imparare da 5 a 10 di queste lingue. Ci sono fattori intangibili che le mantengono vive: ad esempio, un atteggiamento di superiorità linguistica, come l'affermare che la propria lingua sia la più bella o la più complicata al mondo, potrebbe essere d'aiuto.

La lingua Yokoim è parlata da circa 1200 persone in tre villaggi. È minacciata perché i bambini vanno a scuola assieme ad altri gruppi etnici e parlano Tok Pisin. Ma tra di loro ci sono alcuni individui carismatici, come Louis Kolisi, che compongono e cantano canzoni originali in Yokoim. Pensandoci, si tratta di una cosa straordinaria: i bambini stanno abbandonando il linguaggio, ma c'è questa persona che lo usa in modo creativo. Oppure consideriamo il Siletz Dee-Ni, un linguaggio nativo americano: è parlato correttamente da una sola persona ed ha una manciata di studenti, ma queste persone stanno inventando attivamente nuove parole per il loro linguaggio. Potrebbero, ad

esempio, inventare una parola che significa "cervello in scatola" da usare al posto di "computer".

Quindi è possibile salvare le lingue?

Penso di sì. I biologi credono che conservando campioni di esseri viventi si possa catalogare e salvare la biodiversità: si può fare qualcosa di simile per le lingue con l'aiuto di Internet. Nel 2009, ho visitato il villaggio di Kundiman, dove si parla Yokohim, e qui abbiamo abbiamo effettuato delle registrazioni e costruito un dizionario vocale. Hanno registrato storie e canzoni che ora si possono trovare su *YouTube*, mentre io li ho registrati mentre parlavano della loro conoscenza delle piante. Quando li ho incontrati per la prima volta, avevano sentito parlare di Internet ma non l'avevano mai usato, mentre ora la loro lingua è presente anche online.

Abbiamo ricevuto richieste per fare la stessa cosa da altre comunità papuane che non utilizzavano Internet: per molti di loro, la prima presenza online è costituita dalla loro lingua, e quando si connettono possono ascoltare le voci dei loro anziani che parlano queste lingue. Provi ad immaginare queste persone come programmatori o tecnici informatici: porterebbero una nuova mentalità ed una maggiore varietà di pensiero in quel settore.

David Harrison è linguista presso lo Swarthmore College in Pennsylvania.

IN CHE MODO LA TECNOLOGIA STA CAMBIANDO IL LINGUAGGIO?

"Una volta la scrittura era molto formale", sostiene Lauren Collister dell'Università di Pittsburgh, Pennsylvania. "C'erano i libri, le lettere d'amore o gli articoli di giornale. Ci si aspettava che la grammatica e l'ortografia fossero precise."

Ma qualcosa sta cambiando: ogni giorno, milioni di persone hanno conversazioni per iscritto in tempo reale, online e sui cellulari e, di conseguenza, la scrittura si sta evolvendo. "Chat room e messaggi istantanei hanno contribuito a rendere più informale

il linguaggio scritto" afferma Collister. Addio "Alla cortese attenzione di", benvenuti txtspk[14] , ¯_(ツ)_/¯e DBEYR[15]. Questa evoluzione sta avvenendo talmente in fretta che stiamo già assistendo al suo trasferimento "offline" nella lingua parlata e nel lessico formale. Nel 2011, ad esempio, l'acronimo "lol" (*laughing out loud*, "sto morendo dal ridere") è stato inserito nell'Oxford English Dictionary.

La vera domanda è: quale nuovo linguaggio ha in serbo per noi la Rete? Spesso il gergo di Internet oltrepassa le barriere linguistiche, quindi il prossimo linguaggio potrebbe avere radici al di fuori della lingua inglese. I forum giapponesi, ad esempio, usano "Orz" con il significato di "inginocchiarsi": la "O" rappresenta la testa, la "r" le braccia e il corpo, la "z" le gambe flesse. In base al contesto, può essere usato per esprimere fallimento e disperazione oppure ammirazione sarcastica. Il gergo cinese ha adattato Orz alla propria lingua, ottenendo 囧rz, che aggiunge un'espressione facciale. Xiangxi Liu dell'Università del Massachusetts, Amherst, prevede un'esplosione di questo linguaggio online, soprattutto nella lingua cinese, che può disegnare migliaia di simboli.

Anche i 'mattoni' che compongono il linguaggio, ovvero lettere e parole, stanno per subire un aggiornamento: Ramesh Jain dell'Università della California, Irvine, ritiene che le immagini giocheranno un ruolo più importante nella comunicazione online del futuro, soprattutto perché oltrepassano le barriere linguistiche. Per averne la prova, è sufficiente osservare come *Facebook*, *Google*, e applicazioni per chattare come *Line* continuino ad aggiungere nuove emoticon e adesivi al loro repertorio.

Ciò ha creato una nuova, inaspettata barriera linguistica: il denaro. Su *Line*, ad esempio bisogna pagare per poter usare gli adesivi: con questa strategia, la compagnia ha guadagnato 75 milioni di dollari nel suo primo anno di vita. Tuttavia, non c'è bisogno di demoralizzarsi: se c'è una cosa che l'esplosione dei "meme" e del gergo di Internet ci ha insegnato, è quanto siamo veloci e creativi nell'inventarci parole nuove che potrebbero essere usate (oppure no) dalla spietata selezione naturale dei social media.

Hal Hodson

[14] "Text speak" (Messaggio testuale

[15] "Don't believe everything you read" (Non credere a tutto ciò che leggi)

IN FUTURO SARÀ POSSIBILE COMUNICARE SENZA PARLARE?

I nostri pensieri ci riempiono la testa ogni secondo, al riparo da orecchie indiscrete. O almeno per ora. Di recente infatti, i ricercatori hanno iniziato ad esplorare nuove tecniche per decifrare i nostri monologhi interiori a distanza. Ma è ancora presto per pensare ad una teoria del complotto: il loro obiettivo è quello di dare voce alle persone che, pur essendo consapevoli di ciò che succede attorno a loro, sono paralizzate o incapaci di comunicare.

Nel 2010, Adrian Owen dell'Università dell'Ontario Occidentale in Canada ha dimostrato che è possibile comunicare con queste persone chiuse in sé stesse tramite domande a cui possono rispondere sì o no. La persona può immaginare di camminare dentro casa per "sì" o di giocare a tennis per "no", ed uno scanner seleziona lo schema distinto di un'attività cerebrale prodotto da ogni scenario. Con un piccolo ritardo, il gruppo è riuscito a decifrare sì/casa e no/tennis.

Ma una conversazione a senso unico non è molto divertente: per questo Philip Kennedy di *Neural Signals* a Duluth, Georgia, ha progettato una protesi cerebrale che registra l'attività delle aree che controllano i movimenti della bocca quando si pronuncia una parola. Sta indagando per scoprire se potrebbe essere impiegata anche per interpretare l'intenzione di parlare di qualcuno, dandogli voce tramite un sintetizzatore audio.

Un'alternativa consisterebbe nel decodificare l'attività cerebrale associata ai concetti, piuttosto che alle parole. João Correia dell'Università di Maastricht nei Paesi Bassi l'ha fatto usando registrazioni EEG non invasive. Riconosce che, in futuro, ciò potrebbe fornire alle persone un vocabolario mentale sufficiente a formare frasi intere, o perlomeno poche parole fondamentali.

Nel frattempo, Brian Pasley e i suoi colleghi dell'Università della California, Berkeley, hanno scoperto che alcuni gruppi di neuroni nelle aree uditive percepiscono determinate frequenze e ritmi: che si senta una parola o che la si pensi soltanto, l'attività rimane la stessa. Pasley ha costruito un algoritmo che analizza quali neuroni sono attivi quando pensiamo di parlare, e converte quell'informazione in un vero e proprio discorso.

Questa tecnologia è ancora un po' rudimentale, e gli elettrodi devono essere piantati direttamente nel cervello, ma il risultato è notevole: ascoltando una delle registrazioni, ho potuto riconoscere la parola "Waldo" prodotta dal discorso immaginato. Potrebbe sembrare forzato, afferma Correia, ma è anche vero che siamo "un passo più vicini a parlare con la mente".

Helen Thomson è consulente di New Scientist.

CHAPTER 4

THE TRANSLATION PROCESS: MAIN ISSUES, STRATEGIES AND COMMENTS

The aim of this chapter is to give a detailed comment on the various steps of the translation process, outlining the approaches and strategies that were employed according to the various problems encountered throughout the procedure. When translating from a language to another, it is necessary to take into account that the SL and the TL might have different lexical, morphosyntactic and textual features. In this chapter I will give further observations and examples —taken both from *New Scientist*'s cover story and from the other articles of the corpus—on the differences between English and Italian, that were outlined in the second chapter of this thesis.

Moreover, the translator must consider the type of text, its genre and the target audience in order to chose the most suitable translation approach. In this case, it was necessary to keep in mind that the text in object was a popular science article addressed an audience of both experts and laypeople. Thus, the TT needs to be informative while engaging the readers, maintaining a medium tone (i.e. neither too formal nor too informal). However, it is necessary to keep in mind that, as observed in the second chapter, Italian tends to prefer a more formal register and more complex sentences if compared to English.

More in detail, the following sections will present, in the first place, some consideration on textual organisation and morphosyntactic structure, comparing ST and TT and presenting a series of strategies that can be used to achieve textual cohesion (e.g. the use of connectors, punctuation, parenthesis, nominalisation etc.). Secondly, I will take into consideration the different registers of the two languages, including a series of strategies that are often employed in Italian texts to achieve a higher level of formality (i.e. depersonalisation, the use of passive construction and first-person plural). After that, the different use of modals and the translation of some specialised terms will be commented and exemplified. Finally, I will consider those aspects that concern cultural

specificity and adaptation, as well as the translation of metaphors and some figurative expressions.

4.1 Textual Organisation and Morphosyntactic Structure

Starting from a textual point of view, one of the first aspect to take into consideration is the structure of both ST and TT. Generally speaking, it has already been observed that, when translating from English into Italian, the TT maintains the same paragraph partition of the source text (Musacchio 2007: 102). By looking at the parallel corpus, I could notice that it confirms this tendency since every Italian texts seems to be translated one paragraph at a time. In general, the paragraph subdivision of the ST is preserved and the structure of translated texts does not seem to be excessively modified of manipulated. Therefore, for what concerns the textual structure of *New Scientist*'s cover story "The Eloquent Ape", in most of the cases I decided to keep the same paragraph subdivision of the ST. It consists of ten section, each one with a title that corresponds to a specific topic. As for the internal structure of each section, it always follows a precise argumentative pattern, and the paragraph sequence illustrates each concept in a logical order. However, in a few occasions, I decided to slightly modify the paragraph subdivision in the TT. See, for instance, the following three examples:

> […] To those of us who study human evolution, this incredible universality suggests that our species has had language right from when Homo sapiens arose in Africa between 200,000 and 160,000 years ago.
>
> A more recent origin could not explain how groups that stayed in Africa after H. sapiens migrated to the rest of the world 60,000 years ago also have language.
>
> […] Per chi studia l'evoluzione umana, questa incredibile universalità potrebbe suggerire che la nostra specie abbia usato il linguaggio fin dalla comparsa dell'Homo sapiens in Africa tra i 200.000 e i 160.000 anni fa. Un'origine più recente, in effetti, non spiegherebbe come mai anche i gruppi rimasti in Africa in seguito alla migrazione dell'Homo sapiens nel resto del mondo 60.000 anni fa possiedano l'uso del linguaggio.

It's a fair guess that there was once an original mother tongue – the ancestor to all living and dead human languages.

The evidence for this is that all human languages, unlike other forms of animal communication, string together words into sentences that have subjects, verbs and objects ("I kicked the ball"), and anyone can learn any language. […]

È molto probabile che sia esistita una lingua madre originaria, capostipite di tutte le lingue umane, vive e morte. La prova è che tutti i linguaggi umani, a differenza di altre forme di comunicazione animale, mettono insieme le parole per formare delle frasi con dei soggetti, verbi e oggetti ("Ho dato un calcio alla palla"), oltre al fatto che ognuno è in grado di imparare qualsiasi lingua. […]

[…] This list fits with the expectation that language evolved because of its social role (see "Why did we evolve language?"). It also has some overlap with Ruhlen's list.

More broadly, we can say with some confidence that the first words probably fitted into just a few categories. The first ones may have been simple names, like those used by some of our primate relatives.

[…] Questa lista, che include alcune parole presenti anche in quella di Ruhlen, confermerebbe le teorie secondo le quali il linguaggio evolve principalmente a causa del suo ruolo sociale (vedi "Perché abbiamo sviluppato il linguaggio?"). Più ampiamente, possiamo affermare con una certa sicurezza che le prime parole rientravano solamente in poche categorie, ad esempio i nomi semplici che venivano usati da alcuni dei nostri antenati.

In these and in a few other similar cases, I decided to slightly modify the original paragraph division because of the presence of one-sentence paragraphs, that I preferred to avoid as those paragraph breaks did not actually imply a change of topic. Therefore, the sentences that were isolated in the ST could easily be assimilated to the previous or following paragraph on the same topic.

Moving on to the internal structure of each paragraph, sometimes it might be necessary to make some changes at the sentence level to obtain a cohesive TT that observes the stylistic norms of the TL. First of all, from a morphosyntactic point of view, we can notice that, if in English it is quite common to find very short, simple sentences

and a mainly paratactic structure, written Italian is characterised by a larger use of hypotactic structures made by longer and more complex sentences. Therefore, when translating from English into Italian, the translator often needs to connect consecutive sentences to make a longer one by modifying punctuation, rephrasing or adding connectors. In this case, for instance, I put some 'extra' information from the first sentence between parenthesis: with this strategy, I could easily connect the two sentences, making the text more cohesive.

> There is also some evidence that the direction in which your first language is written can influence your sense of time, **with speakers of Mandarin more likely to think of time running from top to bottom than English speakers**. And the language you speak may affect how you perceive others.
>
> Inoltre, è stato provato che la direzione in cui si scrive il nostro linguaggio può influenzare la nostra percezione del tempo **(ad esempio, rispetto a noi, le persone che parlano mandarino tendono a pensare che il tempo scorra dall'alto verso il basso),** ma anche il modo in cui percepiamo gli altri.

Differently, in the following example, I simply put the two sentences together with a connector.

> Language is a powerful piece of social technology**.** It conveys your thoughts as coded puffs of air or dozens of drawn symbols, to be decoded by someone else.
>
> Il linguaggio è una potente opera di tecnologia sociale **che** ci permette di trasmettere i nostri pensieri sotto forma di sbuffi d'aria in codice o tramite dozzine di simboli disegnati che verranno decifrati da qualcun altro.

Other examples taken from the parallel corpus can illustrate the different techniques that can be employed on a morphosyntactic level to achieve textual cohesion. While in the first case the translator replaced the first full stop with a colon to put two sentences together, the second one needed to be slightly rephrased:

Our studies contradict this outdated preconception**.** Players who immerse themselves in the fast-paced events of digital fantasy worlds derive significant cognitive benefits.

I nostri studi contraddicono questo preconcetto superato**:** i giocatori che si immergono negli eventi frenetici dei mondi fantasy digitali ricavano vantaggi significativi per la mente.

Forty years ago the broad scientific consensus held that, in addition to language, right-handedness and the specialization of just one side of the brain for processing spatial relations occur in humans alone**.** Other animals, it was thought, have no hemispheric specializations of any kind.

Quarant'anni fa la scienza sosteneva che, oltre al linguaggio, la lateralità manuale e la specializzazione di un solo emisfero per l'elaborazione delle relazioni spaziali fossero esclusive della nostra specie, **una teoria rinforzata dall'idea che** gli altri animali fossero privi di specializzazioni legate agli emisferi.

In a similar way, during the translation process, I rephrased some passages, for instance by modifying the order of a sentence's constituents or merging two separate sentence into one, in order to achieve a higher level of cohesion:

In humans, mama is a strong candidate for a very early noun, given how naturally the sound appears in babbling and how dependent babies are on their mothers. The sound "m" is also present in nearly all the world's languages.

Negli esseri umani, è molto probabile che la prima parola di un bambino sia "mamma", dal momento che i neonati dipendono completamente dalla madre. Inoltre, il suono "m" è presente in quasi tutte le lingue del mondo ed appare naturalmente nella lallazione.

However, in a few cases, I also decided to keep the structures of some short sentences as they were in English if there was a specific stylistic reason to do so. In the following example, for instance, I decided to end the paragraph with the same short sentence because it was the punchline of the joke:

Amusingly, a recent study suggested that huh is universal, prompting headlines that it was among the first human words. **Perhaps it was the second.**

Uno studio recente ha simpaticamente osservato che l'esclamazione "uh" è universale, suggerendo che fosse tra le prime parole umane in assoluto. **Forse è stata la seconda.**

Similarly, in the following case, I added a rather short sentence in the TT in order to maintain the same engaging style of the ST:

Private thoughts fill your head every second of the day, safe from prying ears **– for now.**

I nostri pensieri ci riempiono la testa ogni secondo, al riparo da orecchie indiscrete. **O almeno per ora.**

Although, as previously stated, English texts are mainly made of short, simple and paratactic sentences (whereas Italian uses longer and more complex sentences, often with a hypotactic structure), sometimes it might be necessary to avoid an excessive use of subordinates. In order to do so, Italian often tends to 'nominalise' some sentences by replacing some verbs with nouns. Employing a nominal style can also make the text more formal, as in the following examples taken from the bilingual corpus:

He specializes **in treating** movement disorders and **in recording** from the brain.

È specializzato **nella cura** dei disordini del movimento e **nella registrazione** dell'attività cerebrale.

The right hemisphere is dominant in the control of, among other things, our sense of **how objects interrelate** in space.

Invece l'emisfero destro è dominante, per esempio, nel controllo della percezione delle **relazioni fra oggetti** nello spazio.

Therefore, during the translation process, I often employed this strategy to make the text more formal while avoiding the use of excessively complex structures. The following examples illustrate some of the cases in which the use of nominalisation can improve the translation:

> A more recent origin could not explain how groups that stayed in Africa **after H. sapiens migrated** to the rest of the world 60,000 years ago also have language.
>
> Un'origine più recente non spiegherebbe come mai anche i gruppi rimasti in Africa **in seguito alla migrazione dell'Homo sapiens** nel resto del mondo 60.000 anni fa possiedano l'uso del linguaggio.

> That part of the brain, at the very front of our skulls, is involved in **organising and acting** on information, including **using working memory, reasoning and planning**.
>
> Questa parte del cervello, situata nella zona frontale dei nostri crani, è coinvolta **nell'organizzazione e nella reazione** alle informazioni, compreso **l'uso della memoria di lavoro, del ragionamento e della pianificazione.**

Strategies like nominalisation or other modifications of the morphosyntactic structure of a text are examples of transposition, in which, as observed in the second chapter, the meaning of the ST is expressed in the TT through the use of different syntactic structures: for instance, a verb becomes a noun, a single word becomes a phrase and so on.

Another aspect that the translator needs to keep in mind when going from English into Italian is the use of repetitions. For what concern the use of devices like the anaphoric reference, that are normally used to increase textual cohesion, Gotti (2011:97) points out that they can be found more frequently in general language rather than in specialised languages and that the anaphoric reference is often replaced by lexical repetition to avoid creating ambiguity.

However, if English tends to repeat the same term to expose the text more clearly, Italian, for stylistic reasons, opts for lexical variation to avoid repetitions (Musacchio 2007:108-109). Moreover, Scarpa (2008:154) observed that Italian translations show a

tendency to simplification, implying the elimination of redundant information. As previously reported, the reason is that the specialised registers of English are more addressee-oriented than the Italian ones and, as a consequence, they tend to start from given information to introduce something new. Thus, generally speaking, I tried to avoid them by replacing the iterated term with synonyms or, as in the following example, with generic words that do not change the meaning of the sentence:

> All human societies have **language**, and no **language** is "better" than any other: all can communicate the full range of human experience.
>
> Ogni società umana possiede un **linguaggio** e non ce n'è **uno** migliore dell'altro: tutti sono in grado di comunicare ogni aspetto della vita umana.

In some other cases, however, I wanted to keep the repetition in the translation to give more emphasis to a term. In the following example, to maintain the focus on the word 'language' without having a repetition in the same sentence, I decided to divide it in two separate sentences.

> It's an example of a cultural concept encoded in **language**, but can **language** in turn influence how we think?
>
> […] questo è un esempio di come un concetto culturale venga codificato nel **linguaggio**. Ma può il **linguaggio**, a sua volta, influenzare il nostro modo di pensare?

Finally, another strategy to make the text more concise is to omit some phrasal elements (e.g. verbs, prepositions, conjunctions etc.) or, in a lower number of cases, of a whole sentence. This can be done to create a more compact syntactic structure, as long as the omission does not compromise the comprehension of the text. In the following example, the translator decided to omit the whole final sentence of a paragraph. It was not too relevant for the comprehension of the text, and the aim of its omission was, probably, to avoid a sequence of very short sentences.

No other animal exhibits such variation in lifestyle. **Looked at in this way, a chimpanzee is a cultural nonstarter.**

Chimps and other animals are still interesting and relevant for understanding the origins of the human mind, though.

Nessun altro animale esibisce tanta varietà di stili di vita.

Gli altri animali sono però rilevanti per capire l'origine della mente umana.

As for my translation, however, I generally tried to avoid omissions of constituents and, above all, of whole sentences. Instead, I opted for different strategies such as explicitation, expansion or reduction. For instance, in the following examples, I added one or more words that were not employed in the ST, both to make the text clearer and for stylistic reasons:

Most of the evidence for this comes from studies **of** people who are bilingual.

La maggior parte delle prove arriva dagli studi **condotti su** persone bilingui […]

Other studies show that bilinguals are faster at getting to grips with a new language.

Inoltre, altri studi mostrano che i bilingui sono più veloci nel prendere confidenza con una nuova lingua.

In the first case, translating 'studies of people who are bilingual' literally would lead to an ambiguous sentence in Italian and, therefore, expansion is necessary to clarify the meaning of the sentence. As for the second example, I simply added a connector that was not included in the ST to get a more cohesive text. Moreover, the last example also shows how, in absence of an Italian equivalent for the idiomatic expression "getting to grips", it was translated according to its meaning. This aspect of translation, however, will be

discussed more in detail in the last section of this chapter. Finally, other examples of the uses of these strategies will be commented and exemplified in the next sections.

4.2 Register

As for the difference of register between English and Italian texts, we can notice that while English texts tend to be quite informal, their Italian translations often show a more formal register. For example, while addressing the reader directly by using the second person (you, your) is quite common in English, Italian tends to replace it with more impersonal sentences. See, for instance, these examples taken from the bilingual corpus:

> **You might think**, for example, that animal vocabularies appear small because researchers studying their communications do not really understand what they are talking about.
>
> **Si potrebbe pensare**, per esempio, che i vocabolari animali appaiano ristretti perché i ricercatori che li studiano non capiscono di che cosa stanno parlando.

> Further, language is used by humans in ways no animal can match; **if you understand what language is, you comprehend a little bit more about human nature.**
>
> In più, il linguaggio è usato dagli esseri umani in modi che nessun animale può eguagliare: **se si capisce che cos'è il linguaggio, si capisce un po' meglio la natura umana.**

Another strategy that can be employed to give more formality to the translation can be replacing active constructions with passive ones. In fact, since Italian passive construction can omit the agent, the text becomes more impersonal. Although passive forms can occur quite often also in English texts, especially in scientific productions, by observing the bilingual corpus we can notice that Italian translations seem to make a larger use of passives. See, for instance:

They also set up a formal government program to develop whistling teachers.

Inoltre è stato istituito un programma governativo per formare insegnanti di lingua fischiata.

Therefore, during the translation process, I often replaced active constructions with passive or more impersonal ones in order to make the text more formal. In the following cases, for instance, I decided to omit the subjects, opting for more impersonal constructions.

They asked Arabic-Hebrew bilinguals to match Arab and Jewish names with positive or negative trait words by pressing a key.

È stato chiesto a bilingui arabo-ebrei di collegare nomi arabi ed ebraici a parole che esprimevano tratti positivi o negativi premendo un tasto.

My own team has used such statistical studies to show that words for the numbers 1 to 5 are some of the slowest evolving.

Ricorrendo a questi studi statistici, è stato possibile dimostrare che le parole per i numeri dall'1 al 5 sono tra quelle che evolvono più lentamente.

As previously stated, another way to make the Italian translation more formal is to avoid, whenever possible, the use of the second person to address the reader directly. However, the use of impersonal constructions is not the only solution: sometimes, in fact, 'you' can also be replaced by first-person plural. This choice, that seems to be quite frequent in popular science articles, can avoid addressing the reader directly while being less formal than an impersonal construction. It can also create a bond between author and reader, as in the following example taken from the bilingual corpus:

All that you perceive of the visual world—the shapes, colors and movements of everything around you—is coded into these rivers of spikes with varying time intervals separating them.

Quello che percepiamo del mondo visivo - forme, colori e movimenti degli oggetti - è codificato in questi flussi separati da intervalli di tempo variabili.

During the translation process, my first choice was to replace the second person with an impersonal sentence. However, I opted for first-person plural whenever the author was referring to something that he or she could share with the readers, for examples some characteristics of human brain. See, for instance:

In other words, **learning another language could change how your brain is wired**. "It would make sense, **if you have had this very different linguistic experience**, to see some sort of stable, long-lasting effect", Hernandez says.

In altre parole, **apprendere un'altra lingua potrebbe cambiare il modo in cui il cervello è configurato**. "**Nelle persone con un'esperienza linguistica variegata** sarebbe sensato poter osservare una sorta di effetto stabile, a lunga durata", afferma Hernandez.

In this case, I avoided addressing directly the reader because it would have made the text too informal and opted for impersonal phrases because the author was not referring to something shared by all human beings, but only to people who had 'this very different linguistic experience'. In the following case, on the contrary, I replaced the second person with first-person plural because those characteristics are globally shared:

There is also some evidence **that the direction in which your first language is written can influence your sense of time,** with speakers of Mandarin more likely to think of time running from top to bottom than English speakers. **And the language you speak may affect how you perceive others.**

Inoltre, è stato provato che **la direzione in cui si scrive il nostro linguaggio può influenzare la nostra percezione del tempo** (ad esempio, rispetto a noi, le persone che parlano mandarino tendono a pensare che il tempo scorra dall'alto verso il basso), **ma anche il modo in cui percepiamo gli altri.**

Therefore, the translator needs to choose which, among depersonalisation, passive constructions or the use of first-person plural, is the best strategy according to the context.

4.3 Modal verbs

Another aspect to take into consideration when translating from English into Italian, according to Scarpa (2008:182-183), is the translation of modal verbs. Therefore, I took into consideration the most common modal verbs (can, would, must, should, may, might and will) looking at their translation throughout the Italian corpus to find examples that show how, sometimes, modality is expressed in different ways by the two languages. Starting from 'can', we can observe that its most common translation is the Italian verb *potere*, along with other expressions such as *permettere di* or *essere capace/in grado di*, which have a similar meaning. However, in many cases, Italian translations tend to omit the subject related to this modal verb. See, for instance:

> The organoids **can also let scientists identify** unwanted effects on the developing human brain, thereby preventing drugs that would be harmful during gestation from ever reaching a pregnant woman.
>
> Gli organoidi **permettono anche di identificare** effetti indesiderati sullo sviluppo del cervello, evitando che farmaci potenzialmente nocivi durante la gestazione arrivino alla portata di una donna in gravidanza.

> But using special lab cultures, **researchers can preserve them** in this state permanently and ultimately turn them into almost any desired cell type.
>
> Ma usando speciali colture di laboratorio **è possibile conservarle** in questo stato in modo permanente, e trasformarle in quasi ogni tipo di cellula desiderata.

This, of course, has to do with the Italian tendency to make the text more formal with the use of impersonal constructions. I applied this strategy quite frequently when, during the translation process, I encountered the modal verb 'can'. E.g.:

"The idea is that if you have a lot of mental exercise, **your brain is trained and can compensate better," says Bak.**

"L'idea è che l'esercizio mentale **possa "allenare" il cervello, migliorandone la capacità di compensazione"**, afferma Bak.

As for 'must', it appeared only twice in my source text, and in both cases I translated it with Italian verb *dovere*. However, it could be found more frequently in the parallel corpus, with different translations. In fact, while in the first case it was translated with its Italian equivalent *dovere*, the second one was different, since it expressed a deduction rather than a necessary condition or an obligation:

To assess an incoming stimulus, an organism **must** carry out two kinds of analyses simultaneously.

Per valutare uno stimolo, un organismo **deve** fare due analisi simultanee.

Hence, the role of the right hemisphere in face perception **must have descended from abilities of relatively early vertebrates** to recognize the visual appearance of other individuals of their species.

Quindi, il ruolo di questo emisfero nella percezione dei volti **ha la sua probabile origine evolutiva in un'abilità dei vertebrati primitivi**: riconoscere la comparsa di individui conspecifici.

For what concerns 'would' and 'could' we can notice that, although most of the times they are translated with Italian conditional, they can sometimes be expressed with indicative forms, according to the context:

Even so, I and others **would like to improve them.**

Ma io e altri ricercatori **vorremmo perfezionarli**.

If the mutations affect the development or maintenance of proper human brain architecture or the functioning of cell types that are common only in humans, **then the studies would be doomed to failure.**

Se le mutazioni influiscono sullo sviluppo o sulla conservazione di un'architettura cerebrale prettamente umana, oppure sul funzionamento di tipi cellulari comuni solo all'essere umano, **allora quegli studi sono destinati a fallire.**

In fact, although I mainly translated these modals with conditional forms, in some cases an indicative form appeared to be a more suitable translation, since it expressed an obvious consequence rather than a hypothetical one. In the following case, for instance, while I translated 'could' with a conditional, I opted for an indicative form to translate 'would'.

The idea that the language you speak **could influence** how you think dates back to 1940, when linguist Benjamin Lee Whorf proposed that **people whose languages lack words for a concept would not understand it.**

L'idea che il linguaggio che parliamo **possa influenzare** il modo in cui pensiamo risale al 1940, quando il linguista Benjamin Lee Whorf suggerì che **se una lingua non possiede le parole per esprimere un concetto, i parlanti non riescono a capirne il significato.**

We can observe a similar phenomenon for what concerns 'may' and 'might'. In fact, in the first example the modal 'may' is translated with a conditional as it expresses a hypothesis, whereas in the second case we can find an indicative form, since it is used in a mathematical theory - which has to be true.

According to one of the authors (MacNeilage), the origin of human speech **may be traceable** to the evolution of the syllable—typically an alternation between consonant and vowel.

Secondo uno degli autori (MacNeilage), l'origine dell'uso della parola nell'uomo **potrebbe essere riconducibile** all'evoluzione della sillaba: in genere un'alternanza tra una consonante e una vocale.

The mathematical theory of games often shows that the best course of action for an individual **may depend on** what most other members of its own

La teoria dei giochi dimostra che la migliore linea di condotta di un individuo **dipende da** quello che decide di fare la maggior parte dei membri del gruppo.

Similarly, although most of the times I translated these modals with a conditional, I opted for indicative forms when the author employed them in realistic observations, for instance:

People **might learn** between five and 10 of them.

Le persone **possono imparare** da 5 a 10 di queste lingue.

Even the modal 'should' seems to behave in a similar way. Although it did not appear in my source text, I could notice that it was translated in different ways throughout the parallel corpus. Again, the examples show how it can correspond either into Italian conditional or indicative, according to the context:

But neither can the theory be so simple that **it cannot explain things it should.**

Però non può neppure essere tanto semplice **da non riuscire a chiarire cose che invece dovrebbe spiegare.**

Chomsky contended that as soon as children encountered a few sentences of this type, their brains would set a switch to "on," **indicating that the sentence subject should be dropped.**

Chomsky sosteneva che una volta che un bambino abbia incontrato un certo numero di frasi di questo tipo, il suo cervello imposta su «acceso» un certo interruttore, che a quel punto **indica che il soggetto si può omettere.**

Finally, I focused on the modal 'will'. As we know, although Italian has a future tense, it can also be expressed with the present. However, in written language, the future tense is to be preferred because it makes the text more formal. In fact, looking at the translations of 'will' in the parallel corpus, we can almost always find the future tense, with a few exceptions. For instance, when reporting oral speech, 'will' is translated with a present tense since it is a more informal context. See the following examples:

> Patients must undergo major surgery to implant the **electrodes that will deliver ongoing stimulation**, but they do not suffer memory loss, as can happen in electroconvulsive therapy.
>
> I pazienti devono sottoporsi a chirurgia invasiva per l'impianto degli **elettrodi che emetteranno la stimolazione**, ma non subiscono perdita di memoria, come invece può accadere nella terapia elettroconvulsivante.

> It is possible that animals pack a vast amount of information into a 500-millisecond grunt—perhaps equivalent to **"Please groom my lower back now, and I will groom yours later."**
>
> È possibile che gli animali comprimano grandi quantità di informazione in un grugnito di 500 millisecondi, magari equivalente a **«per piacere, spidocchiami la schiena lì in basso, che poi la spidocchio io a te».**

During the translation process, I always translated 'will' with the future tense, with a few exceptions that will be presented. In the first case, I opted for a conditional tense because the conclusion was only suggested by the author, therefore it is hypothetical:

> An attitude of linguistic superiority – our language is the most beautiful or complicated language in the world – **will help**, for instance.
>
> […] ad esempio, un atteggiamento di superiorità linguistica, come l'affermare che la propria lingua sia la più bella o la più complicata al mondo, **potrebbe essere d'aiuto.**

Differently, in the other cases, I translated it with a gerund to simplify the structure of the sentence.

> We can lavish praise on those worthy of it, **whose reputations will be elevated** even among those they have never met: words can travel further than a single action.
>
> […] oppure possiamo lodare ampiamente chi lo merita, **migliorando il suo prestigio** anche tra persone che non conosce: le parole possono viaggiare più lontano di una singola azione.

In conclusion, it is possible to affirm that even the different translation of modal verbs, as well as nominalisation and other strategies, is an example of transposition, that also concerns the translation of modality and verb tenses.

4.4 Terminology

Moving on to lexical strategies, according to Scarpa (2008:188) it is necessary to search for terminological and conceptual correspondences: while the translation of specialised terms can be easily found in bilingual dictionaries, they are not much useful for what concerns phraseologies, that need to be extracted form a parallel corpus, paying attention to the context.

First of all, after extracting terminology from the source text, I could observe that the majority of specialised terms belonged to the field of science, but also to social studies, geography, arts and literature. The use of a translation corpus has been useful to look for the translation of specialised terms and phrases that belonged, for example, to the fields of psychology, neuroscience and linguistics, although many other terms or expressions belonged to general language rather than more specialised sectors. Moreover, while translating a text into Italian, it is necessary to pay attention to all the "false friends" that come from borrowings and calques of some English terms, mostly in the field of IT.

For what concerns terms and expressions that cannot be translated into Italian, the most common solution is to leave them as they are while giving a brief explanation of

their meaning and etymology. The first example is the term 'similect', that belongs to the field of linguistics. Since it does not seem to have an Italian translation yet, I kept the original term – changing it from plural to singular form – and explained its etymology to the target audience:

> Anna Mauranen of the University of Helsinki in Finland calls these varieties **similects**: Chinese-English, Brazilian-English, Nigerian- English.
>
> Anna Mauranen dell'Università di Helsinki in Finlandia chiama queste varietà **"*similect*", termine che associa l'aggettivo inglese "*similar*" (simile) a "*dialect*" (dialetto).** Anglo-cinese, anglo-brasiliano, anglo-nigeriano […]

Other examples of terms that could not be translated into Italian belonged to the Internet speak (or netspeak). While some of them are known and used even by Italian speakers (e.g. 'lol') some others are not so popular (e.g. DBEYR). However, I decided to give an explanation of all these terms, keeping in mind that some readers might not know the language of the Internet. Here are some examples of how 'netspeak' can be translated:

> Goodbye "To whom this may concern"; hello txtspk , ¯_(ツ)_/¯and DBEYR
>
> Addio "Alla cortese attenzione di", benvenuti txtspk* , ¯_(ツ)_/¯e DBEYR**

> In 2011, "lol" was added to the Oxford English Dictionary.
>
> Nel 2011, l'acronimo "lol" **(*laughing out loud*, "sto morendo dal ridere")** è stato inserito nell'Oxford English Dictionary.

---

* **"Text speak" (Messaggio testuale)**

** **"Don't believe everything you read" (Non credere a tutto ciò che leggi)**

In the first case, I explained the two abbreviations on a footnote to avoid having an excessively long sentence, that was already dense of terms. In fact, an explanation of each term between parenthesis or dashes would have compromised the rhythm of the text. Moreover, I did not include and explanation of the emoticon '¯_(ツ)_/¯' because, as it is a graphic representation of a facial expression and hand gestures, its meaning should be universal and clear to everybody. For what concerns 'lol', I included a brief explanation of its meaning and a non-literal translation between parenthesis. In this case, a footnote was not really necessary because the sentence was simple and rather short. Furthermore, it is an example of explicitation, that means explaining, through pronouns and connectors, what was left implicit in the ST.

4.5 Cultural specificity

Cultural specific terms and expressions were the most difficult to translate. As reported in the second chapter of this thesis, Olohan (2016) claims that some important aspects to take into consideration from the point of view of cultural specificity are the translations of place names, institutions and other proper nouns, but also the conversions of measurements and currencies. However, it is also necessary to consider the different relevance that certain information might have for the readers, considering the interests and opinions of the target audience in another geographic location and situating the scientific discourse in the context of other public discourses. Starting from the names of places and institutions, since the article mainly mentions universities, it was necessary to search for their translations in the corpus. It can be noticed that the names of British or North American universities can be both translated or left as they are, while those of other countries are always translated. See, for instance:

> The group of our colleague Marc Tessier-Lavigne, then at the **Rockefeller University** and now president of **Stanford**, did so as well for its new iDISCO method.
>
> E quello che ha fatto il gruppo del nostro collega Marc Tessier—Lavigne, all'epoca alla **Rockefeller University** e oggi presidente della **Stanford University**, con il suo nuovo metodo iDISCO.

Peter F. MacNeilage is a professor of psychology at **the University of Texas at Austin**.

Peter F. MacNeilage è professore di psicologia **all'Università del Texas ad Austin.**

Onur Güntürkün of **Ruhr University Bochum in Germany** recruited speakers of the Turkish whistled language to test the conventional notion that the brain's left hemisphere is where most language processing occurs.

Onur Guntiirkun, **dell'Università della Ruhr a Bochum, in Germania**, ha arruolato persone che conoscono il turco fischiato per verificare l'idea convenzionale che l'elaborazione del linguaggio avvenga per lo più nell'emisfero sinistro.

During the translation process, however, I opted for a translation into Italian of the university names and related institution with the aim of making the TT more familiar for the target audience. See, for instance:

Quadrilinguist Arturo Hernandez, director of the **Laboratory for the Neural Bases of Bilingualism at the University of Houston in Texas** […]

Il poliglotta Arturo Hernandez, direttore del **Laboratorio per le basi neurali del bilinguismo all'Università di Houston in Texas** […]

As for the conversion of units of measurements or currencies, while the first one was not necessary (because the English texts usually opted for the same units of measurements that are used in Italian), that of currencies can be a problem, as it might lead to a mismatch between ST and TT. In the following example taken from the corpus, for instance, the currency was not converted into euros:

We apply our language and number systems to cases of morality (saving five people is better than saving one), economics (if I am giving **$10** and offer you **$1**, that seems unfair, and you

will reject **the dollar**), and taboo trade-offs (in the U.S., selling our children, even for lots of money, is not kosher).

Noi applichiamo il nostro linguaggio e i nostri sistemi numerici a questioni morali (salvare cinque persone è meglio che salvarne una), economiche [se ricevo **10 dollari** in regalo e te ne offro solo uno ti sembrerà un'ingiustizia e rifiuterai l'offerta) e a transazioni proibite (vendere un figlio, anche in cambio di molti soldi, è una cosa che non si fa).

The ST did not include any unit of measurements and only one reference to a currency. In that case, I chose to not convert from dollars to euros to avoid mismatches, but also because it was not really necessary:

The company made **$75 million** from this scheme in its first year.

[…] con questa strategia, la compagnia ha guadagnato **75 milioni di dollari** nel suo primo anno di vita.

Moving on to other cultural specific expressions, sometimes they could be easily adapted to Italian language and culture, making them more suitable for an Italian audience; but in some other cases I decided to leave them in the original language because of the absence of an Italian equivalent. By looking at the bilingual corpus, we can notice that, whenever possible, sentences that refer to English language and culture are adapted to Italian ones, although this can be done in different ways. In the following case, for instance, the author mentioned some characteristics of Spanish that could also be found in Italian. Although the source text did not mention it, the translator added some references to Italian to involve the reader:

Languages such as Spanish form fully grammatical sentences without the need for separate subjects—for example, Tengo zapatos ("I have shoes"), in which the person who has the shoes, "I," is indicated not by a separate word but by the "o" ending at the end of the verb.

Lingue come lo spagnolo **(e l'italiano)** formano frasi pienamente corrette senza bisogno di un soggetto distinte: Tengo zapatos, («ho scarpe»), per esempio in cui la persona che ha le scarpe, «io», è indicata non da una distinta parola ma dalla «e» alla fine del verbo.

In this other case, since the characteristics described by the author could apply both to English and Italian, the translator decided to limit the discourse to the language of the target audience, without mentioning English:

For example, **English** can embed phrases to the right ("John hopes Mary knows Peter is lying") or embed centrally ("The dog that the cat that the boy saw chased barked").

In italiano, per esempio, si possono inserire nuove frasi a destra («Giovanni spera che Maria sappia che Pietro mente») e in posizione centrale («Il ragazzo vide il gatto che inseguiva il cane, che abbaiò»).

However, in the following example, the translator did not replace English with Italian. The only things that were added are the Italian translation of the example in English and the explanation of why one of the sentences is incorrect.

For example, I could say, "She gave/bequeathed/sent/loaned/sold the library some books" but not "She donated the library some books."

In inglese, per esempio si può dire «She gave/bequeathed/sent/loaned/sold the library some books» **(ella diede/lasciò in eredità/inviò/prestò/vendette alla biblioteca dei libri)** ma non «She donated the library some books» **[corretto è: «She donated some books to the library» (Ella donò dei libri alla biblioteca)].**

Again, in this last example, the translator added an explanation of the English compound 'walkman'. Italian borrowed this term from English, and every Italian knows what a walkman is. However, it might be useful to explain the etymology of the term, that might be unknown for a part of the target audience:

The combinatorial operation, meanwhile, is the mixing of discrete elements to engender new ideas, which can be expressed as novel words **("Walkman")** or musical forms, among other possibilities.

Le operazioni combinatorie, d'altro canto, consistono nel mescolare elementi separati e distinti per dar luogo a nuove idee, che possono essere espresse con nuove parole **(come walkman, composto dalla parola inglese che significa «camminare» combinata con quella che significa «uomo»)** o con nuove forme musicali, o in molti altri modi.

According to the context, I decided which of these strategies would make the translation more suitable for the target audience. For the following extract, for instance, I applied two different strategies:

Merritt Ruhlen at **Stanford University in California,** for example, argues that **sounds like tok, tik, dik, and tak are repeatedly used in different languages to signify a toe, a digit or the number one.** Although studies by Ruhlen and others are contentious, the list of words they say are globally shared because they sound almost the same also **includes who, what, two and water.**

Merritt Ruhlen dell'**Università di Stanford in California**, ad esempio, sostiene che **suoni come "tok", "tik", "dik", e "tak" vengano usati spesso in lingue diverse con il significato di "dito" (della mano o del piede) o di "numero uno".** Questo ed altri studi simili, seppur controversi, affermano che la lista di parole condivise in tutto il mondo, dal momento che suonano quasi allo stesso modo, **includa anche le parole inglesi *who*, *what*, *two* e *water* ("chi", "cosa", "due" e "acqua").**

For the first passage, I kept the original transcription of the sounds but I translated their meaning directly into Italian. In fact, if the sound 'tok' resembles the English word 'toe', the sound 'dik' is more similar to the Italian equivalent *dito*. In this examples, I also highlighted the translation of "Stanford University" to show another example of the translation the name of universities, that were the main type of institutions mentioned in the ST.

In the second part of the example, since the author was referring to sounds, I kept the original words, specifying that they belonged to English language and giving their

Italian translation. Differently, in the following case, I translated the words directly into Italian because the author was focusing on the meaning of the words ad the field in which they are used, rather than on their sound:

> Another approach is to look at words that change very slowly over long periods of time. My own team has used such statistical studies to show that **words for the numbers 1 to 5** are some of the slowest evolving. Also on this list are **words involved in social communication, like who, what, where, why, when, I, you, she, he and it**.
>
> Un approccio differente consiste nell'osservare le parole che tendono a cambiare molto lentamente nel corso di lunghi periodi di tempo. Ricorrendo a questi studi statistici, è stato possibile dimostrare che **le parole per i numeri dall'1 al 5** sono tra quelle che evolvono più lentamente. In questa lista ci sono anche **parole coinvolte nella comunicazione sociale, ad esempio chi, cosa, dove, perché, quando, io, tu, lei e lui.**

The following passage could not be translated literally or simply be adapted to Italian by keeping the same examples. Therefore, it was necessary to find some idiomatic or fixed expressions in Italian concerning future and past:

> Time flows from back to front for **English-speakers:** we **"cast our minds back"** to the 1990s, and **"hope for good times ahead".** It's an example of a cultural concept encoded in language […]
>
> **Noi italiani** viaggiamo avanti e indietro nel tempo con la mente, che può essere **"rivolta al passato"** oppure **"proiettata verso il futuro"**: questo è un esempio di come un concetto culturale venga codificato nel linguaggio.

This solution allowed me to transfer the concept of the source text while making it suitable for the Italian audience. However, since it was only an example of how a cultural concept could be found in language, it would have also been possible to select a different cultural concept that was not related to time with a different set of fixed expressions.

Finally, in some cases, I could manage to include some references to Italian language and culture that were not present in the source text. This is a good strategy to

make the text more suitable for the target audience, making the readers feel more involved while helping them understanding some passages.

> Greek, for instance, has two words for blue — ghalazio for light blue and ble for a darker shade. A study found that Greek speakers could discriminate shades of blue faster and better than native English speakers.
>
> Ad esempio in greco, **come in italiano**, c'è una distinzione tra **azzurro (*ghalazio*) e blu (*ble*)** che non esiste in lingue come l'inglese. Uno studio ha dimostrato che, di conseguenza, chi parla greco dalla nascita è tendenzialmente più abile e più veloce nel distinguere le tonalità del blu rispetto a chi parla solo inglese.

> Maria Sera is a native Spanish-speaker who grew up believing all squirrels were female. The Spanish word for squirrel, ardilla, is feminine. As a linguist at the University of Minnesota, she has found some substance for her childhood belief. Studies of French and Spanish speakers, whose languages attribute genders to objects, suggest they associate those objects with masculine or feminine properties.
>
> Maria Sera è madrelingua spagnola dalla nascita, ed è cresciuta credendo che tutti gli scoiattoli fossero femmine. Infatti, la parola spagnola per scoiattolo, *ardilla*, è femminile. Lavorando come linguista presso l'Università del Minnesota, è riuscita a dare sostanza a ciò che pensava da piccola: infatti, gli studi effettuati sul francese e sullo spagnolo che, **come l'italiano,** attribuiscono un genere ad ogni cosa, suggeriscono che i parlanti di queste lingue tendano ad associare proprietà maschili o femminili agli oggetti.

In both cases, I did not replace directly the languages mentioned in the source text (respectively, Greek and Spanish) with Italian, because the article mentioned some specific experiments and studies made with those languages. Thus, I only mentioned the fact that they shared some characteristics with Italian.

4.6 Metaphors and figurative language

Even the translation of idioms and fixed expressions can be problematic, since, as we can notice from the following examples, most of the times it is difficult to find an equivalent expression in the target language. In the first case, the expression 'to have the lion's share' - which means 'to have the largest portion'[16] – does not have an Italian equivalent. The similar expressions *fare la parte del leone* would not work in this context as it is often used with a slightly negative meaning[17]. Therefore, instead of translating it with another metaphor, I opted for an explanation of its meaning:

> Papua New Guinea **has the lion's share of the world's linguistic diversity** – a lot of small and medium-sized languages that are not at risk.
>
> La Papua Nuova Guinea **possiede la più grande varietà linguistica al mondo**, tante lingue a bassa o media diffusione che non sono a rischio.

For what concerns the second idiomatic expression, saying that someone is "wearing a tin foil hat" or "is a tin foil hat" means that "they have paranoia or a belief in conspiracy theories, especially involving government surveillance or paranormal beings"[18]. Since Italian does not have a similar expression, once again I translated with its meaning:

> Don't jump for your **tin foil hat** just yet.
>
> Ma è ancora presto per pensare ad una **teoria del complotto** […]

[16] https://www.merriam-webster.com/dictionary/lion%27s%20share 2 Nov. 2017

[17] http://dizionari.corriere.it/dizionario-modi-di-dire/L/leone.shtml 2 Nov. 2017

[18] http://www.businessinsider.com/origin-of-the-term-tin-foil-hat-2013-6?IR=T 2 Nov. 2017

A final example is the translation of the idiomatic expression 'to bend someone's ear', that means to talk to someone for a long time[19]. In this case, there is an Italian expression that conveys a similar concept: *attaccare bottone*, which literally translates with 'to attach a button', also means to talk endlessly to someone[20]:

> It seems more likely, from the existing evidence at least, that our ability **to bend each other's ears** is indeed unique.
>
> Sembra più probabile, almeno secondo le prove esistenti, che la nostra abilità **nell'attaccare bottone** sia unica nel suo genere.

In conclusion, it is possible to affirm that all these strategies, that are normally employed to solve pragmatic and cultural problems, are examples of adaptation. The purpose of this translation device is to make the text more familiar for the target audience, not only from a linguistic but also from a cultural point of view.

[19] https://www.merriam-webster.com/dictionary/bend%20someone%27s%20ear 2 Nov. 2017

[20] http://dizionari.corriere.it/dizionario-modi-di-dire/B/bottone.shtml 2 Nov. 2017

CONCLUSIONS

This thesis proposed a translation into Italian of *New Scientist*'s cover story *The Eloquent Ape*, along with a commentary on the main issues, method and strategies employed in the translation process. However, in order to give a more complete study of this subject, it was also necessary to give some theoretical insights on the most relevant topics related to the article and its translation, starting from the main features and variation of special languages (or LSPs), popular science discourse as a genre and, in particular, on the language of psycholinguistics. After that, the second chapter of this thesis focused on translation theory, considering both specialised translation and, more in detail, the translation of popular science news articles.

Starting from LSPs, by comparing the definitions given by various authors (i.e. Cortelazzo, Scarpa, Gualdo and Telve) it was observed that special languages are varieties of the standard language shared by groups of people belonging to specific and specialised sectors and used to satisfy the communicative needs that are not satisfied by general language. Moreover, it is also necessary to make a distinction between LSPs "in the strict sense" (e.g. the language of physics, medicine, economics or law) with specific lexis, distinctive morphosyntactic and textual features; special languages in a broader sense, such as the language of politics, advertising or press (that do not have a distinctive lexis or common traits) and, finally, jargons, that are languages used by specific social groups such as young people, gangsters or students.

Secondly, in order to observe their variation, most of the authors focused both on the horizontal and the vertical dimension. The horizontal dimension, that focuses on the contents of communication, marks the distinction between the language employed by hard sciences (i.e. physical or natural sciences, such as physics, biology, or medicine) and that of soft sciences (i.e. humanistic or social sciences, such as economy, psychology or history). As for the vertical dimension, authors like Sobrero, Gotti and Bianucci claimed that it has to do with the different registers, genres and text types or, in other words, the context in which the language is used.

Moreover, the authors agree in identifying different clines of specialisation, based on the level of technicality of a text. First of all, there is the intraspecialist level,

characterised by an extremely technical register and by the frequent use of specialised terminology, whose meaning is taken for granted. Secondly, we can find the interspecialist level, whose language is still highly technical, but some specialised terms or concepts might be explained or simplified. After that, the authors located specialised texts addressed to a general audience, characterised by lower level of technicality and by the exemplification of specialised concepts through examples taken form everyday life. Finally, the lowest level of technicality can be found on the instruction level (for instance in manuals, handbooks and textbooks) and on the 'popular' level, that includes scientific pages of newspapers and magazines, TV programmes, websites and blogs.

However, authors like Gualdo and Telve also considered other dimensions of variation: the diachronic, diatopic and diamesic ones. While the diachronic variation has to do, for instance, with the influence of Latin and Greek in scientific communication, the diatopic one is often considered an obstacle in the creation of a universal language of science. Finally, the diamesic dimension has to do with the different channel employed in the dissemination of scientific knowledge. For instance, the language employed in written communication is more complex that the oral one, while the language of transmitted communication is something in between the two languages.

Finally, moving on to LSPs main characteristics (as well as the linguistic strategies that can be employed to achieve them), the points of view of various authors (i.e. Cortelazzo, Hoffman, Gotti, Sobrero, Sager, Dungworth, McDonald, Gualdo and Telve) were compared. Starting from LSPs' lexical features, many authors identified monoreferentiality, a neutral and emotionless tone, transparency, conciseness and the use of metaphorisation. Moving on to their morphosyntax, it has been noticed that special languages are often characterised by longer and more complex sentences than those of general language. Moreover, although they do not seem to have peculiar features, they are characterised by a more frequent use of linguistic strategies like nominalisation and depersonalisation (i.e. the use of passive or third-person constructions). As for the verb tenses, LSPs mainly employ the present simple, the *–ing* and participial forms and, as previously stated, passive constructions. As for their textual organisation, they often employ a certain argumentative pattern and devices (e.g. the use of conjunctions, anaphoric references or lexical repetition) in order to achieve textual cohesion.

The special languages of science are also related to popular science discourse, which is another important topic for this thesis. It has been observed that, although popularisation is often understood as a mere simplification of science (and, for this reason, analysed a separate discourse), popular science can be regarded as a proper scientific genre, and that it would be more helpful to view professional science and its popularisation as a continuum, without making a stark distinction.

Furthermore, by comparing the definitions of authors like Gotti, Manfredi, Olohan, Calsamiglia and Van Dijk, it has been observed that, first of all, what marks the distinction between scientific popularisation and other types of text (e.g. review articles, abstracts and instructive texts) is both the kind of audience and the function of a text. As for popular science, its function is to convey specialised info to non specialists by using general language.

Secondly, it has been argued that there are various reasons for popularising science, for instance the need for the general public to be informed on the latest discoveries and their implications on everyday life (ethical reasons) but also for economical reasons, since people with their taxes help funding scientific research. Furthermore, although this section of the thesis was mostly focused on news reporting, it has also been necessary to comment on the various degrees of popularisation, that mainly depend on the media and context of dissemination (e.g. TV, newspapers etc.).

Moving on to science news reporting, according to authors like Olohan, Garzone, Hyland and Myers, it represents a mediation between scientists and the general public carried out by science journalists, that are often researchers willing to dedicate part of their time to popularisation. Science journalists need to take into account factors such as newsworthiness and the readers' interest, as well as the use of discursive practices with the aim of rewriting and 'recontextualising' the scientific discourse.

Looking more in detail at those elements that need to be consider when popularising a scientific text, it has been observed that, for instance, while in scientific research headlines and standfirsts focus on the method, in popularisation they rotate around the main topic of the text. As for quotations, they are often used in popular science text as an adaptation to a typical journalistic style, but also to emphasize the authoritativeness of the source with a form of hedging that limits the writer's responsibility to a role of reporting something which is stated by someone else. Furthermore, form the visual point

of view, news articles often employ pictures with the function of attract the readers' attention while acting as a frame to the article. However, in some cases, they are also used to explain and exemplify some concepts.

Focusing on the linguistic aspects in the Anglophone context, it has been noticed that popular science articles often employ attitude markers or the question/answer pattern to engage the reader, but also similes and repetitions to make sure that the comprehension of the text is easier, while clarifying the most complex scientific notions. From a narrative point of view, authors like Myers pointed out that while research articles mainly focus on concepts, techniques and on the construction of an argument, popular science articles tend to be more interested in the encounter of the scientist with nature, that is presented in a chronological order. Moreover, popularisation often opts for a less complex structure, avoiding some devices that are frequently used in LSPs (e.g. nominalisation).

Finally, moving on to the Italian context, by comparing the opinions of authors like Garzone, Cortelazzo, Gualdo and Telve, it was possible to notice some similarities with English. First of all, it has been observed that the language of popularisation becomes more similar to general language: there is a lower lexical density, the register is more informal, the structure is more prolix and redundant and, finally, texts are more expositive than argumentative. Among the strategies employed with the aim of easing the access to complex scientific and technological knowledge to the general public, the most common ones are denomination (or designation), definition, reformulation (or paraphrase), analogy (or association), generalisation, exemplification and explication. Moreover, popularisation makes a large use of figurative language, whose aim is to explain unfamiliar concepts (e.g. specialised information) while entertaining the readers.

The last section of the first chapter was dedicated to psycholinguistics, an interdisciplinary field founded in the 1950s-60s with the aim of studying the mental faculties involved in the perception, production and acquisition of language. In order to delineate the language employed in this discipline, both the horizontal and vertical dimension were taken into consideration. First of all, it was observed that, as an interdisciplinary field, psycholinguistics can be located in between soft and hard sciences, similarly to the language of medicine. Moreover, as a matter of fact, the most technical and specialised terminology that can be found in psycholinguistic is related to medicine and, in particular, neuroscience (e.g. the areas of the brain implied in the perception,

production and acquisition of language). Therefore, for what concerns the vertical dimension, the analysis focused on the specialised language of medicine. Authors like Cassandro, Gualdo and Telve identified three different levels. On one side, there is the communication between healthcare professionals and laypeople, characterised by a rather low level of technical terms and, on the other hand, there are specialised dictionaries, that present the highest level of technicality. In between, there is the language used in scientific magazines, which was one of the objects of this thesis. Finally, it has been observed that, although Italian medical language is characterised by a conservative terminology (that comes from Greek and Latin), it uses a more modern syntax, often influenced by English. Thus, it was concluded that it is possible to apply these characteristics even to the Italian language of psycholinguistics.

The second chapter of this thesis was dedicated to specialised translation, with an insight on the translation of popular science from English into Italian. After a general introduction on the theory of translation, it was necessary to make a distinction between literary and specialised translation. According to authors like Scarpa, Musacchio, Olohan, Rega, Newmark, Wright, Gualdo and Telve, specialised translation (also referred to as scientific and technical translation) consists of "closed" texts that can have only one correct interpretation, and it is necessary to follow certain norms in order to be as faithful as possible to the source text.

As for the professional figure of the specialised translators, it has been observed that they must have the ability to generate more than one acceptable TT from the same ST, selecting only one of those versions according to the specific purpose (or addressee) of the text. Furthermore, specialised translators also need to have the communicative competence and to acquire the method to mediate between different languages and cultures while applying different strategies to solve the problems. They also need to be able to revise their own work, knowing how to adapt their translations according to the norms of different specialised communities. Finally, they need the theoretical and methodological competences that allow them to justify their choices with clients and colleagues, but they also need to know how to carry out terminological researches or how to use technology as a support for their professional activity.

Before starting with the actual translation process, specialised translators should use a reference corpus to carry out a terminological and phraseological research. It is also

possible to use traditional terminological tools, such as bilingual dictionaries, glossaries and termbanks that, however, are often incomplete, as they are not always upgraded with the most recent terminology. Moreover, translators can also use extra-linguistic sources (e.g. encyclopaedias, manuals, magazines or pre-existing translations): as matter of fact, their ability also consists in being flexible, taking into consideration all the different sources at the same time to find the best translation.

Once the bilingual corpus is constructed and its segments aligned, nowadays translators can use other CAT (Computer Assisted Translation) tools, such as a Translation Memory (TM) that allows them to store the data for future translations on the same field. As for Machine Translation (MT), although the output is often unreliable, it has been observed that, since the quality of a translation is often a compromise between adequacy, costs and speed of execution, the advantage of using MT is that it allows to reduce time and costs of human translation.

Moving of to the actual translation process, authors like Scarpa and Musacchio pointed out that, while literal translation can be useful to get a first draft of the TT, it is then necessary to paraphrase the translated text with a series of strategies (i.e. transposition, modulation, adaptation, explicitation, expansion, reduction or elimination of constituents) to make it more suitable to the norms of the target language. When translation from English into Italian, the authors observed that, from the point of view of textual organisation there is often the tendency to keep the same paragraph subdivision of the ST. However, Italian texts often present a more complex structure but, for stylistic reasons, repetitions (that are quite common in English texts) are generally avoided. Italian also makes a larger use of hypotactic structures, nominal style, passive and impersonal forms if compared to English and, moreover, modal verbs are employed differently in the two languages.

Revision is the final step of the translation process. Its aim is to improve the TT and, in order to do so, the proof-reader can make different types of intervention (i.e. subjective, objectively justifiable and specialised interventions), mostly on the translation of specialised terms, on the style and, finally, it is necessary to check if the translation meets the addressee's requests. Depending on how much a mistake is visible, on its number of occurrences and on the lack of consideration of corrections made by the proof-reader, it has been observed that there are three levels of gravity. The most serious

mistakes are those that create misunderstandings that cannot be noticed by the reader. However, these mistakes are considered to be less serious if the reader can spot the misunderstanding. Finally, linguistic and stylistic mistakes are considered to be less important.

When translating a popular science text, in particular scientific news articles, authors like Olohan observed that the most important concept to take into account is that of cultural specificity, as well as considering the interests, opinions and the relevance that a certain topic might have for a target audience that comes from a different geographic location. First of all, for what concern the translation of proper names, for instance name of places and institutions, it has been observed that, while the most famous and internationally known ones can be simply transcribed without providing an explanation, some others can be translated into the TL or accompanied by an expansion, additional information or an explanation. Secondly, for what concerns measurements and currencies, it is necessary to consider that, although converting them to another system can make the text more familiar for the target audience, sometimes it might lead to a mismatch between ST and TT. Finally, when translating similes and comparison, it has been pointed out that, although sometimes they can be translated without problems, the most cultural specific ones might require different strategies (e.g. they can be replaced with another comparison or even omitted). As for metaphors, it has been observed that they must be translated according to their function in the text.

During the translation process of the popular science article *The Eloquent Ape*, I took into consideration all this aspects, both linguistic and cultural. As a result, I could provide a final translation that meets all the requirements of the genre, topic and context and, finally, I could give a commentary on the whole translation process. After presenting the ST, the parallel corpus and the final translation in the third chapter of this thesis, the fourth and final chapter was dedicated to the commentary, that included all the main theoretical aspects taken into consideration in the first two chapter along with examples taken from the final translation and from the bilingual corpus.

First of all, from the point of view of textual organisation, similarly to the translations of the corpus, I decided to keep the same paragraph partition of the ST in the TT (with the exception of one-sentence paragraphs, that in the TT were assimilated to the previous or following paragraph). As for the morphosyntactic structure, since Italian uses

longer and more complex sentences, I often connected consecutive short sentences by modifying punctuation, rephrasing and adding connectors to achieve textual cohesion, although sometimes short sentences were kept for stylistic reasons. However, it was also necessary to use some strategies (e.g. putting extra information between parenthesis or dashes) to avoid having too many subordinates.

For what concerns the use of strategies like nominalisation and transposition, I often used them to obtain a more concise and formal text. Moreover, since Italian register is usually more formal than the English one (that often addresses the reader directly), I opted for more impersonal sentences, replacing active constructions with passive ones or omitting the subject or the agent. Sometimes, I also chose to use first person plural to create a bound with reader.

As for the use of repetitions and anaphoric references, it has been observed that English tends to repeat the same term to expose the text more clearly while Italian, for stylistic reasons, opts for lexical variation to avoid repetitions. Therefore, I tried to avoid them by replacing the iterated term with synonyms or with generic words that do not change the meaning of the sentence. Sometimes, however, I kept repetitions to give more emphasis to a term.

For what concerns the different use of modal verbs in the two languages, it could be noticed by observing the occurrences of the most common modals in the corpus and their different translations. Similarly, I often translated the same modal verbs in different ways according to the context: for instance, the verb 'must' could be used both to express a duty and a deduction, while modals like 'would', 'could', 'may' and 'might' could be translated, according to the context, both with the Italian conditional and indicative.

From the point of view of terminology, it was observed that the majority of specialised terms belonged to the field of science, and many of them could be found in the bilingual corpus. However, some terms could not be translated into Italian: it is the case on neologisms and expressions belonging to the Internet speak. Here the solution was to keep the original term while adding an explanation of its meaning and etymology.

Moving on to the concept of cultural specificity, the main strategy was to adapt, whenever possible, the reference to English and other language to Italian. The original references, however, were kept as they were if there were no equivalent expressions in Italian or if the context did not allow it. Adaptation can be done in different ways: for

instance, it is possible to replace a reference to English language with examples related to Italian if the ST does not mention a specific study. If it does, it is necessary to leave the original language while adding a translation or an explanation in Italian. As for the translation of idiomatic expressions, it is necessary to find an equivalent or a similar expression that conveys the same meaning. Similarly, to translate figurative language, if there is no equivalent expression in Italian, it is possible to translate it focusing on the meaning and function of the expression.

In conclusion, translating this popular science article has been an interesting and challenging experience. The most difficult aspects of the translation process, however, had not to to with specialised terminology but, rather, with the most cultural specific expressions. As a matter of fact, when dealing with a text about language that is addressed to English speakers, it would not be possible to translate each linguistic example literally if the TT is addressed to an Italian audience and, therefore, it was necessary to make some adaptations. Furthermore, as it is a popular science text, the article presents a simple and rather informal style, and its content can be easily understood both by specialists and non specialists. Thus, although it was necessary to create a slightly more formal register, typical of Italian texts, I tried to keep the style of the TT close to the original text to make sure that it was still readable, easy to understand and engaging for the reader.

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APPENDIX

Appendix A

The eloquent ape

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What's more, language is inherently symbolic – sounds stand for words that stand for real objects and actions. But there is scant evidence that Neanderthals had art or other symbolic behaviour – a few pieces of pigment and some disputed etchings. By comparison, the humans who lived alongside them in Western Europe painted beautiful murals, made musical instruments and had a wide variety of tools and weapons.

Suggestions that language evolved even earlier – for example in *Homo erectus*, an upright ape that walked on the African savannah two million years ago – are little more than idle speculation. It seems more likely, from the existing evidence at least, that our ability to bend each other's ears is indeed unique. **Mark Pagel** is an evolutionary biologist at the University of Reading, UK

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WHY DID WE EVOLVE LANGUAGE?

Our language skills didn't come for free. Humans had to evolve complex brain circuits and sophisticated machinery in order to speak, and spend precious years teaching their children. Why pay that price?

Many people attribute our linguistic skills to our large brains, ability to make complex hand gestures, distinctive vocal tracts and to the gene *FOXP2*, which gives us the fine-tuned control of our facial muscles. But on their own, these traits do not explain why we evolved language. There are animals with larger brains, gesturing is widespread among primates and some bird species can imitate human speech without our descended larynx or our particular version of *FOXP2*.

Instead, the feature that most clearly separates us from other animals is the sophistication of our symbolic and cooperative social behaviour. Humans are the only species that routinely exchanges favours, goods and services with others outside their immediate family. We have an elaborate division of labour, we specialise at tasks and then trade our products with others. And we have learned to act in coordinated ways outside the family unit, such as when a nation goes to war or people combine their efforts to build a bridge.

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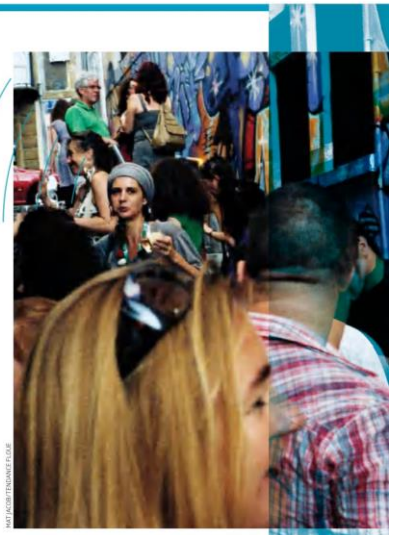

MATJAZ KOVIC/TENDANCE FLOUE

"TOK, TIK, DIK AND TAK MAY ALL DESCEND FROM AN ANCIENT WORD FOR TOE"

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Comparative linguists search for sounds that come up again and again in languages from all over the world. They argue that if any relics of a mother tongue still exist today, they will be in those sounds. Merritt Ruhlen at Stanford University in California, for example, argues that sounds like *tok, tik, dik,* and *tak* are repeatedly used in different languages to signify a toe, a digit or the number one. Although studies by Ruhlen and others are contentious, the list of words they say are globally shared because they sound almost the same also includes *who, what, two* and *water.*

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More broadly, we can say with some confidence that the first words probably fitted into just a few categories. The first ones may have been simple names, like those used by some of our primate relatives. Some sounds could be relics of an ancestral mother tongue

CAN LEARNING A LANGUAGE REWIRE YOUR BRAIN?

As our species evolved parts of our brain expanded, resulting in more computing power for language. It's what makes us hard-wired for communication. What is perhaps more surprising is how language can shape our brains throughout our lives.

Most of the evidence for this comes from studies of people who are bilingual. Brain scan studies show that switching between two languages triggers different patterns of brain activity compared with speaking in one language, particularly in the prefrontal cortex. That part of the brain, at the very front of our skulls, is involved in organising and acting on information, including using working memory, reasoning and planning. Other studies show that bilinguals are faster at getting to grips with a new language.

Quadrilinguist Arturo Hernandez, director of the Laboratory for the Neural Bases of Bilingualism at the University of Houston in Texas, says these differences could reflect differences in the architecture of bilingual brains. In other words, learning another language could change how your brain is wired. "It would make sense, if you have had this very different linguistic experience, to see some sort of stable, long-lasting effect," Hernandez says.

It may also make the brain more resilient. Ellen Bialystok at York University in Toronto, Canada, has found that lifelong bilinguals tend to be diagnosed with dementia on average 4.5 years later than monolinguals, and have more white matter, including in their prefrontal cortex. White matter is made of nerve fibres that connect different brain regions, shuttling information back and forth between them. So boosting language skills appears to build more connected brains – although Bialystok cautions that this still needs to be confirmed.

More evidence for the benefits of second languages came last year from a study of 608 people who had had a stroke. Thomas Bak of the University of Edinburgh, UK, found that of the bilinguals among them, 40 per cent recovered full function, compared with only 20 per cent of monolinguals. Bak speculates that the mental gymnastics involved in speaking several languages could build extra connections that improve function and help cope with damage. "The idea is that if you have a lot of mental exercise, your brain is trained and can compensate better," says Bak. **Megan Scudellari** is a science writer in Boston

JUAN MANUEL CASTRO PRIETO/LUZ VIA CAMERA PRESS

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Imperatives like *look* or *listen* are also likely to have appeared early on, perhaps alongside verbs like *stab* or *trade* that would have helped coordinate hunting or exchanges. Even this simple lexicon allows sentences like "look, wildebeest" or "trade arrows". Finally, simple social words like *you, me* and *I, yes* and *no*, were probably part of our early vocab. Amusingly, a recent study suggested that *huh* is universal, prompting headlines that it was among the first human words. Perhaps it was the second.

Mark Pagel ›

CAN LANGUAGE INFLUENCE HOW YOU SEE THE WORLD?

Time flows from back to front for English-speakers: we "cast our minds back" to the 1990s, and "hope for good times ahead". It's an example of a cultural concept encoded in language, but can language in turn influence how we think?

Maria Sera is a native Spanish-speaker who grew up believing all squirrels were female. The Spanish word for squirrel, *ardilla*, is feminine. As a linguist at the University of Minnesota, she has found some substance for her childhood belief. Studies of French and Spanish speakers, whose languages attribute genders to objects, suggest they associate those objects with masculine or feminine properties.

The idea that the language you speak could influence how you think dates back to 1940, when linguist Benjamin Lee Whorf proposed that people whose languages lack words for a concept would not understand it. It was relegated to fringe science until the early 2000s, when a few people began probing a related but more nuanced idea: that language can influence perception.

Greek, for instance, has two words for blue – *ghalazio* for light blue and *ble* for a darker shade. A study found that Greek speakers could discriminate shades of blue faster and better than native English speakers.

Language even seems to affect our sense of space and time. Some peoples, like the Guugu Yimithirr in Australia, don't have words for relative space, like left and right, but do have terms for north, south, east and west. Studies have shown that they tend to be unusually skilled at keeping track of where they are in unfamiliar places. There is also some evidence that the direction in which your first language is written can influence your sense of time, with speakers of Mandarin more likely to think of time running from top to bottom than English speakers. And the language you speak may affect how you perceive others (see "Does your language shape your personality?", right).

More generally, language helps us understand the world by allowing us to categorise things. Children are better at grouping objects if they have already learned the names of the categories they belong to. Conversely, after a stroke, people who have lost language skills can have trouble grouping objects. "It's not that language just affects some high-level reasoning part of the brain," says Gary Lupyan of the University of Wisconsin-Madison. "It's changing our basic perceptual representations." **Megan Scudellari**

"GREEKS HAVE TWO WORDS FOR BLUE AND ARE FASTER AT TELLING SHADES OF BLUE APART"

What's in a word? It depends who you're talking to

MAL FAIRCHILD/NATIONAL GEOGRAPHIC CREATIVE

DOES YOUR LANGUAGE SHAPE YOUR PERSONALITY?

"To have another language is to possess a second soul," Charlemagne is rumoured to have said. He may have been on to something. In the 1960s, sociolinguist Susan Ervin-Tripp of the University of California at Berkeley asked English-Japanese bilinguals to describe what was going on in ambiguous pictures. One person, for example, told a different tale depending on their storytelling language. A picture of a woman leaning against a couch elicited a story in Japanese about a woman contemplating suicide after the loss of her fiancé. The same person, asked to respond at a separate session in English, said the woman was completing a sewing project for a class. "In general, there was more emotion in the Japanese stories," Ervin-Tripp wrote in a description of the experiment. "The switch in language draws with it the cultural baggage associated with that language."

Nairán Ramírez-Esparza at the University of Connecticut asked bilingual Mexicans to rate their personalities using both English and Spanish questionnaires. English responses emphasised openness and extroversion, while Spanish responses were more humble and reserved. "Language is such a powerful thing. It obviously makes you see yourself differently," Ramírez-Esparza says.

According to Shai Danziger of Ben-Gurion University in Israel and Robert Ward of Bangor University in the UK, it can also influence how you think of others. They asked Arabic-Hebrew bilinguals to match Arab and Jewish names with positive or negative trait words by pressing a key. They say participants showed more involuntary positive attitudes towards Jews when tested in Hebrew than when tested in Arabic. Paula Rubio-Fernandez of the University of Oslo, meanwhile, has found that bilingual children perform better on tests that require them to understand a situation from someone else's perspective.

Evidence is mounting that the words we speak and think shape our brains, perceptions, and personalities. Who knows what else? Perhaps our tastes, habits, or values. The door is wide open.
Megan Scudellari

MARTIN HARVEY/CORBIS/GETTY IMAGES

English will move outside of native speakers' control

WILL WE ALL ONE DAY SPEAK THE SAME LANGUAGE?

With over a billion native speakers, Mandarin Chinese is the language spoken by the greatest number of people. English comes third, after Spanish. But unlike Mandarin and Spanish – both spoken in more than 30 countries – English is found in at least 100. In addition to the 335 million people for whom it is their first language, 550 million cite it as their second. It dominates international relations, business and science.

All this suggests English is on course to be the planet's lingua franca. It just probably won't be the English that native speakers are used to.

Millions of second-language English speakers around the world have created dialects that incorporate elements of their native languages and cultures. Anna Mauranen of the University of Helsinki in Finland calls these varieties similects: Chinese-English, Brazilian-English, Nigerian-English. Taken together they – not American or British English – will chart the language's future path, she says.

"We used to think there were two possible futures," says Jennifer Jenkins at the University of Southampton, UK. "In one we'd all end up speaking American English. In the other, English would separate like Latin did, and we'd end up with [new] languages. I don't think either of those is happening."

Instead, English similects are probably here to stay. Even in a future where China, India and Nigeria are global superpowers, English is likely to be the language of choice for international discourse, simply because it is already installed. Weirdly, this puts native speakers at risk. "We're getting to the stage where all the educated people of the world have English," says Jenkins. "Once it's no longer a special thing, native speakers lose their advantage."

They could even be at a disadvantage. Non-native speakers are all tuned to each-other's linguistic quirks. "If you put a Chilean, a Japanese and a Polish person in a discussion in English, they understand each other perfectly," says Jenkins. "Put one with two native English speakers and there might be problems."

Mauranen envisions a future in which English similects begin to blend over national borders. New dialects are likely to form around trades or regions. She says these common goals will drive the evolution of the lingua franca, regardless of whether we call it English or not.

That is not to say that all other languages will vanish. German will remain the language of choice within German borders. Even Estonian, spoken by just 1 million people, is safe. "It's a fully fledged language, used for everything [in Estonia]," says Mauranen.

Likewise, the language directly descended from Shakespeare's English has staying power with Brits and Americans. But English, like football, will soon move outside their control, pulled into something new by the rest of the planet. **Hal Hodson** is a technology editor at *New Scientist* ›

Appendix C

COVER STORY

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CAN LEARNING A LANGUAGE REWIRE YOUR BRAIN?

As our species evolved parts of our brain expanded, resulting in more computing power for language. It's what makes us hard-wired for communication. What is perhaps more surprising is how language can shape our brains throughout our lives.

Most of the evidence for this comes from studies of people who are bilingual. Brain scan studies show that switching between two languages triggers different patterns of brain activity compared with speaking in one language, particularly in the prefrontal cortex. That part of the brain, at the very front of our skulls, is involved in organising and acting on information, including using working memory, reasoning and planning. Other studies show that bilinguals are faster at getting to grips with a new language.

Quadrilinguist Arturo Hernandez, director of the Laboratory for the Neural Bases of Bilingualism at the University of Houston in Texas, says these differences could reflect differences in the architecture of bilingual brains. In other words, learning another language could change how your brain is wired. “It would make sense, if you have had this very different linguistic experience, to see some sort of stable, long-lasting effect”, Hernandez says.

It may also make the brain more resilient. Ellen Bialystok at York University in Toronto, Canada, has found that lifelong bilinguals tend to be diagnosed with dementia on average 4.5 years later than monolinguals, and have more white matter, including in their prefrontal cortex. White matter is made of nerve fibres that connect different brain regions, shuttling information back and forth between them. So boosting language skills appears to build more connected brains – although Bialystok cautions that this still needs to be confirmed.

More evidence for the benefits of second languages came last year from a study of 608 people who had had a stroke. Thomas Bak of the University of Edinburgh, UK, found that of the bilinguals among them, 40 per cent recovered full function, compared with only 20 per cent of monolinguals. Bak speculates that the mental gymnastics involved in speaking several languages could build extra connections that improve function and help cope with damage.

“The idea is that if you have a lot of mental exercise, your brain is trained and can compensate better,” says Bak.

Megan Scudellari is a science writer in Boston.

CAN LANGUAGE INFLUENCE THE WAY YOU SEE THE WORLD?

Time flows from back to front for English- speakers: we “cast our minds back” to the 1990s, and “hope for good times ahead”.

It’s an example of a cultural concept encoded in language, but can language in turn influence how we think?

Maria Sera is a native Spanish-speaker who grew up believing all squirrels were female. The Spanish word for squirrel, ardilla, is feminine. As a linguist at the University of Minnesota, she has found some substance for her childhood belief. Studies of French and Spanish speakers, whose languages attribute genders to objects, suggest they associate those objects with masculine or feminine properties.

The idea that the language you speak could influence how you think dates back to 1940, when linguist Benjamin Lee Whorf proposed that people whose languages lack words for a concept would not understand it. It was relegated to fringe science until the early 2000s, when a few people began probing a related but more nuanced idea: that language can influence perception. Greek, for instance, has two words for blue — ghalazio for light blue and ble for a darker shade. A study found that Greek speakers could discriminate shades of blue faster and better than native English speakers.

Language even seems to affect our sense of space and time. Some peoples, like the Guugu Yimithirr in Australia, don’t have words for relative space, like left and right, but do have terms for north, south, east and west. Studies have shown that they tend to be unusually skilled at keeping track of where they are in unfamiliar places. There is also some evidence that the direction in which your first language is written can influence your sense of time, with speakers of Mandarin more likely to think of time running from top to bottom than English speakers. And the language you speak may affect how you perceive others (see “Does your language shape your personality?”, right).

More generally, language helps us understand the world by allowing us to categorise things. Children are better at grouping objects if they have already learned the names of the categories they belong to. Conversely, after a stroke, people who have lost language skills can have trouble grouping objects. “It’s not that language just affects some

high-level reasoning part of the brain," says Gary Lupyan of the University of Wisconsin-Madison. "It's changing our basic perceptual representations."

Megan Scudellari

DOES LANGUAGE SHAPE YOUR PERSONALITY?

"To have another language is to possess a second soul," Charlemagne is rumoured to have said. He may have been on to something. In the 1960s, sociolinguist Susan Ervin-Tripp of the University of California at Berkeley asked English- Japanese bilinguals to describe what was going on in ambiguous pictures. One person, for example, told a different tale depending on their storytelling language. A picture of a woman leaning against a couch elicited a story in Japanese about a woman contemplating suicide after the loss of her fiancé. The same person, asked to respond at a separate session in English, said the woman was completing a sewing project for a class. "In general, there was more emotion in the Japanese stories," Ervin-Tripp wrote in a description of the experiment. "The switch in language draws with it the cultural baggage associated with that language."

Nairán Ramírez-Esparza at the University of Connecticut asked bilingual Mexicans to rate their personalities using both English and Spanish questionnaires. English responses emphasised openness and extroversion, while Spanish responses were more humble and reserved. "Language is such a powerful thing. It obviously makes you see yourself differently," Ramírez-Esparza says.

According to Shai Danziger of Ben- Gurion University in Israel and Robert Ward of Bangor University in the UK, it can also influence how you think of others. They asked Arabic-Hebrew bilinguals to match Arab and Jewish names with positive or negative trait words by pressing a key. They say participants showed more involuntary positive attitudes towards Jews when tested in Hebrew than when tested in Arabic. Paula Rubio-Fernandez of the University of Oslo, meanwhile, has found that bilingual children perform better on tests that require them to understand a situation from someone else's perspective.

Evidence is mounting that the words we speak and think shape our brains, perceptions, and personalities. Who knows what else? Perhaps our tastes, habits, or values. The door is wide open.

Megan Scudellari

WILL WE ALL ONE DAY SPEAK THE SAME LANGUAGE?

With over a billion native speakers, Mandarin Chinese is the language spoken by the greatest number of people. English comes third, after Spanish. But unlike Mandarin and Spanish – both spoken in more than 30 countries – English is found in at least 100. In addition to the 335 million people for whom it is their first language, 550 million cite it as their second. It dominates international relations, business and science.

All this suggests English is on course to be the planet's lingua franca. It just probably won't be the English that native speakers are used to.

Millions of second-language English speakers around the world have created dialects that incorporate elements of their native languages and cultures. Anna Mauranen of the University of Helsinki in Finland calls these varieties similects: Chinese-English, Brazilian-English, Nigerian- English. Taken together they – not American or British English – will chart the language's future path, she says.

"We used to think there were two possible futures," says Jennifer Jenkins at the University of Southampton, UK. "In one we'd all end up speaking American English. In the other, English would separate like Latin did, and we'd end up with [new] languages. I don't think either of those is happening."

Instead, English similects are probably here to stay. Even in a future where China, India and Nigeria are global superpowers, English is likely to be the language of choice

for international discourse, simply because it is already installed. Weirdly, this puts native speakers at risk. "We're getting to the stage where all the educated people of the world have English," says Jenkins. "Once it's no longer a special thing, native speakers lose their advantage." They could even be at a disadvantage.

Non-native speakers are all tuned to each-other's linguistic quirks. "If you put a Chilean, a Japanese and a Polish person in a discussion in English, they understand each other perfectly," says Jenkins. "Put one with two native English speakers and there might be problems."

Mauranen envisions a future in which English similects begin to blend over national borders. New dialects are likely to form around trades or regions. She says these common goals will drive the evolution of the lingua franca, regardless of whether we call it English or not.

That is not to say that all other languages will vanish. German will remain the language of choice within German borders. Even Estonian, spoken by just 1 million people, is safe. "It's a fully fledged language, used for everything [in Estonia]," says Mauranen.

Likewise, the language directly descended from Shakespeare's English has staying power with Brits and Americans. But English, like football, will soon move outside their control, pulled into something new by the rest of the planet.

Hal Hodson is a technology editor at New Scientist.

SAVING ENDANGERED LANGUAGES

David Harrison has devoted his career to recording and studying languages that are spoken by just a handful of people. He tells Hal Hodson why they matter.

You've travelled the world chasing dying languages. Why?

Language diversity is an insurance against the extinction of ideas and knowledge. Ancient languages, like those of Indigenous Australians or Papua New Guineans, are an irreplaceable record of sustainable human living. These cultures have immense knowledge about plants and ecosystems, different ways of thinking. When you lose their languages, you're losing concepts that have been refined over millennia.

What pushes a language to extinction?

It is not number of speakers that predicts language vitality, it's the transmission rate. The largest Native American language is Navajo, with 50,000 speakers. But transmission rate is only 15 per cent.

The problem comes from an attitude, held both by dominant and minority language speakers, that small languages are backwards, obsolete, deficient in some way. I have worked in many communities where this attitude has taken hold. People abandon their language in despair. The last generation of people in a community who grow up speaking a language have a great sense of regret that this has happened.

These scenarios where you know the language is going to die are really sad. I've moved into a different area.

What are you focusing on now?

I'm working with small languages that still have speakers of all ages. Communities that are pushing back against the hegemony of big languages in clever ways. Papua New Guinea has the lion's share of the world's linguistic diversity – a lot of small and medium-sized languages that are not at risk. People might learn between five and 10 of them. There are intangible factors that keep these languages alive. An attitude of linguistic superiority – our language is the most beautiful or complicated language in the world – will help, for instance.

The Yokoim language has about 1200 speakers in three villages. It's threatened because children go to school with other ethnic groups and speak Tok Pisin. But it has a few charismatic individuals, like Louis Kolisi, who composes and sings original songs in Yokoim. That's an astonishing thing if you think about it: children are abandoning the language, and here you have this person doing something creative with it.

Or take Siletz Dee-Ni, a Native American language. It has one fluent speaker and a handful of learners. But they're actively inventing new words for their language. They might, for instance, invent a word that means "brain in a box" instead of adopting "computer".

So it is possible to save languages?

I think so. Biologists believe in storing live specimens to record and save biodiversity. You can do something similar for languages with the internet. In 2009, I visited Kundiman village, where they speak Yokoim. We made recordings and built a talking dictionary. They recorded stories and songs that are on YouTube now, and I'm recording them talking about their knowledge of plants. When I first visited, they had only heard about the internet – never used it. Now, their language has a presence online.

We've had requests from other offline Papuan communities to do the same. For several of them, their language is their first online presence. And when they do get the internet, they hear the voices of their elders speaking their languages. Think about those Papuans becoming computer programmers and technologists, and the diversity of thinking they could bring to that work.

David Harrison is a linguist at Swarthmore College in Pennsylvania.

HOW IS TECHNOLOGY CHANGING LANGUAGE?

"Writing used to be very formal," says Lauren Collister of the University of Pittsburgh, Pennsylvania. "It was books, love letters or newspaper articles. Grammar and spelling were expected to be precise."

That is changing. Every day, millions of us have real-time conversations in writing, online and on our mobile phones. As a result, writing is evolving. "Chat rooms, instant messaging, they all contributed to informalisation of written language," says Collister. Goodbye "To whom this may concern"; hello txtspk , ¯_(ツ)_/¯ and DBEYR[21]. This evolution is happening so quickly that we are already seeing it move offline and back into speech and formal lexicons. In 2011, "lol" was added to the Oxford English Dictionary. The question is, what new language is coming down the internet pipeline? Internet-speak often bypasses language barriers, so the next netspeak could have foreign roots. Japanese

[21] Don't believe everything you read

forums use “Orz” to signify kneeling down: the O is the head, r the arms and body, and z is the kneeling legs. Depending on context, it is used to signify failure and despair, or sarcastic admiration. Chinese netspeak has adapted Orz to Chinese script, 囧rz, to convey a facial expression. Xiangxi Liu of the University of Massachusetts, Amherst, foresees an explosion of such online language, especially in Chinese, which can draw on thousands of characters. Even the traditional building blocks of language – letters and words – are being upgraded. Ramesh Jain of the University of California, Irvine, thinks images will play a bigger role in future online communication, precisely because they cross language barriers. You only have to look at how Facebook, Google and chat companies like Line are continually growing their emoticon and sticker libraries to see the evidence for this.

This has created a strange new linguistic barrier: money. Line users pay for stickers. The company made $75 million from this scheme in its first year. Don’t be deflated, though. If there is anything the explosion of internet memes and netspeak shows, it’s how quick and crafty we are at inventing our own new words, which are adopted (or not) by the ruthless natural selection of social media.

Hal Hodson

COULD WE ONE DAY COMMUNICATE WOTHOUT SPEAKING?

Private thoughts fill your head every second of the day, safe from prying ears – for now. Lately, researchers have begun exploring ways to decipher our internal monologues from a distance. Don’t jump for your tin foil hat just yet. The aim is to give a voice to people who are paralysed and unable to communicate, but fully aware of their surroundings.

Adrian Owen at the University of Western Ontario in Canada showed in 2010 that it was possible to communicate with such “locked- in” people through questions with yes or no answers. The person would imagine walking around their home for “yes”, or playing tennis for “no”. A scanner picked up on the distinct brain activity patterns that each scenario produces. With a small delay, the team was able to decode yes/home and no/tennis.

But a one-sided conversation isn't much fun. Philip Kennedy of Neural Signals in Duluth, Georgia, has designed a brain implant that records activity in areas that control the movement of your mouth when you shape a word. He is investigating whether this could be used to interpret a person's intention to speak, and command a speech synthesizer to do the actual talking.

An alternative is to decode brain activity associated with concepts, rather than words. João Correia at Maastricht University in the Netherlands has done this using non-invasive EEG recordings. He reckons this could one day give people enough mental "vocabulary" to form whole sentences, or at the very least a few vital words.

Meanwhile, Brian Pasley and his colleagues at the University of California, Berkeley have found that groups of neurons in the auditory areas are tuned to certain frequencies and rhythms. The activity is the same whether you hear a word or merely think it. Pasley has built an algorithm that analyses which neurons are active when people think about talking and converts that information back into speech.

It's a little rough and ready, and electrodes have to be implanted in the brain, but the outcome is impressive. Listening to one of the recordings, I was able to recognise the word "Waldo", produced from imagined speech. It may be far-fetched, says Correia, but it's also "the closest we've come to speaking with the mind".

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RIASSUNTO IN ITALIANO

L'obiettivo di questa tesi è quello di fornire una proposta di traduzione, dall'inglese all'italiano, di un articolo tratto dal settimanale britannico di divulgazione scientifica *New Scientist*, intitolato '*The Eloquent Ape'*, commentando le principali problematiche e le strategie utilizzate durante il processo traduttivo. Il testo di partenza è un servizio speciale apparso sulla copertina del numero 3059 del settimanale (pubblicato il 6 febbraio 2016). I principali temi trattati sono l'evoluzione, le caratteristiche e il futuro del linguaggio umano, che è osservato soprattutto da un punto di vista linguistico, psicologico e neurobiologico con alcuni riferimenti ai suoi aspetti storici, sociologici e cognitivi.

Trattandosi di un articolo di divulgazione scientifica, è rivolto ad un pubblico composto sia da specialisti che da persone meno esperte e, per questo motivo, è caratterizzato da un lessico non altamente specializzato e da un registro piuttosto informale, che ricorre spesso all'uso di forme contratte, colloquialismi, pronomi personali e altri elementi che sono tendenzialmente evitati nei testi più formali. Nella divulgazione, tuttavia, queste strategie vengono impiegate di frequente con l'obiettivo di creare un testo che sappia catturare l'attenzione del lettore, istruendolo ed intrattenendolo allo stesso tempo.

La scelta di questo argomento per la tesi finale coniuga il mio interesse per la traduzione (uno dei principali ambiti di studio del corso di laurea magistrale in Lingue Moderne per la Comunicazione e la Cooperazione Internazionale) e per l'ambito interdisciplinare della Psicolinguistica, un argomento che ho incontrato di frequente nel corso dei miei studi. Inoltre, poiché ho sempre nutrito un forte interesse per la divulgazione scientifica, ho deciso di analizzare le caratteristiche principali di questo genere e della sua traduzione in italiano.

Per quanto riguarda il metodo di traduzione, innanzitutto è stato necessario creare un corpus comparabile da utilizzare come riferimento durante il processo traduttivo. In breve, un corpus di traduzione è una raccolta di testi sullo stesso argomento e genere del testo di partenza (in questo caso, articoli di divulgazione scientifica sui temi della linguistica, della psicologia e della neurobiologia) scritti in inglese e affiancati dalle relative traduzioni in italiano. Pertanto, ho selezionato dieci articoli tratti dal mensile

americano di divulgazione scientifica *Scientific American* e da *Scientific American Mind*, una rivista bimestrale le cui tematiche sono incentrate prevalentemente sui settori della psicologia e della neuroscienza. Le traduzioni italiane di questo articolo sono state tratte dalle riviste italiane *Le Scienze* e *Mente & Cervello*, che sono rispettivamente le edizioni italiane di *Scientific American* e *Scientific American Mind*.

Per fornire uno studio più completo su questo argomento, è stato necessario includere una serie di approfondimenti teorici sulle principali tematiche correlate all'articolo preso in esame e alla sua traduzione. Il primo capitolo di questa tesi è incentrato sulle caratteristiche principali delle lingue speciali (o LSP), della divulgazione scientifica come genere e del linguaggio della psicolinguistica. Nel secondo capitolo, dedicato alla teoria della traduzione, vengono invece considerate le caratteristiche principali della traduzione specialistica, delle attività traduttive che coinvolgono la divulgazione scientifica e, infine, della professione del traduttore specializzato.

Partendo dalle lingue speciali, dopo aver confrontato le definizioni fornite da diversi autori (Cortelazzo, Scarpa, Gualdo e Telve) è stato osservato che si tratta di varietà linguistiche condivise da gruppi di persone appartenenti a settori specifici e specializzati, che le utilizzano per soddisfare le esigenze comunicative per le quali il linguaggio comune non è sufficiente. Inoltre, è necessario distinguere le LSP "in senso stretto" (ad esempio il linguaggio della fisica, della medicina, dell'economia o del diritto, caratterizzati da un lessico specifico e da caratteristiche testuali e morfosintattiche distinte) dai linguaggi speciali in un senso più ampio, come il linguaggio della politica, della pubblicità o della stampa (che non hanno caratteri distintivi o tratti comuni) e, infine, dai gerghi, ovvero i linguaggi utilizzati da determinati gruppi sociali.

In secondo luogo, per osservare la variazione delle lingue speciali, la maggior parte degli autori ha preso in considerazione sia la dimensione orizzontale che quella verticale. La dimensione orizzontale, che si concentra sul contenuto della comunicazione, corrisponde alla distinzione tra il linguaggio impiegato dalle cosiddette scienze "dure" (scienze fisiche o naturali, come la fisica, la biologia o la medicina) e quello delle scienze "morbide" (le scienze umanistiche o sociali, come l'economia, la psicologia o la storia). Quanto alla dimensione verticale, autori come Sobrero, Gotti e Bianucci ritengono che abbia a che fare con i diversi registri, generi e tipi di testo o, in altre parole, con il contesto in cui si utilizzata il linguaggio.

Inoltre, gli autori concordano nell'identificazione di diversi livelli di specializzazione in base al livello di tecnicità dei testi. Il livello più alto corrisponde alla comunicazione tra specialisti dello stesso settore, caratterizzata da un registro altamente tecnico e dall'uso frequente di terminologia specializzata, il cui significato è dato per scontato. In seguito, troviamo la comunicazione tra esperti di settori diversi nella quale, sebbene il linguaggio sia ancora molto tecnico, alcuni termini o concetti specializzati vengono spiegati o semplificati. Ad un livello inferiore vengono collocati i testi specializzati rivolti ad un pubblico generico, caratterizzati da un basso livello di tecnicità e dalla spiegazione dei termini e dei concetti specializzati tramite esempi tratti dalla vita quotidiana. Infine, il livello più basso corrisponde a quello di istruzione tipico dei manuali e, infine, alla divulgazione, che include ad esempio gli inserti scientifici di giornali e riviste, programmi televisivi, siti e blog.

Tuttavia, autori come Gualdo e Telve hanno preso in considerazione altre dimensioni: la variazione diacronica, diatopica e diamesica. Mentre la variazione diacronica ha a che fare, ad esempio, con l'influenza del latino e del greco nella comunicazione scientifica, quella diatopica viene spesso considerata un ostacolo alla creazione di un linguaggio scientifico universale. Infine, la variazione diamesica riguarda i diversi canali usati per diffondere le conoscenze scientifiche. Ad esempio, il linguaggio impiegato nella comunicazione scritta è più complesso rispetto a quello orale, mentre il linguaggio della comunicazione 'trasmessa' assume le caratteristiche tipiche sia dell'oralità che della scrittura.

Infine, confrontando i punti di vista di vari autori (Cortelazzo, Hoffman, Gotti, Sobrero, Sager, Dungworth, McDonald, Gualdo e Telve) sono state delineate le caratteristiche principali delle LSP e le relative strategie linguistiche. Dal punto di vista lessicale, molti autori indicano la monoreferenzialità, l'uso di un tono neutro, privo di emozione, la trasparenza, la sinteticità e l'uso del linguaggio metaforico. Per quanto riguarda la morfosintassi, è stato notato che le lingue speciali sono spesso caratterizzate da frasi più lunghe e complesse rispetto al linguaggio generale. Inoltre, anche se non sembrano avere caratteristiche particolari, le LSP sono caratterizzate da un uso più frequente di strategie linguistiche come la nominalizzazione e la depersonalizzazione (ottenuta tramite l'uso di costruzioni passive o della terza persona). Per quanto riguarda l'organizzazione testuale, le lingue speciali ricorrono spesso ad una particolare struttura

argomentative a ad altre strategie (ad esempio l'uso di congiunzioni o di ripetizioni lessicali) per ottenere una maggiore coesione testuale.

Le lingue speciali delle scienze sono strettamente legate alla divulgazione scientifica, che è un altro argomento importante per questa tesi. È stato osservato che, sebbene la divulgazione venga spesso intesa come mera semplificazione della scienza, sarebbe più utile visualizzare i due generi come un continuum, senza fare una distinzione netta. Partendo dalle definizioni di autori come Gotti, Manfredi, Olohan, Calsamiglia e Van Dijk è stato osservato che la distinzione tra divulgazione scientifica e altri tipi di testo è determinata da due fattori: la funzione di un testo e il tipo di pubblico a cui è rivolto. Per quanto riguarda la divulgazione, la sua funzione è quella di trasmettere informazioni specializzate ad un pubblico non specializzato usando il linguaggio generale. In secondo luogo, si può affermare che esistano varie ragioni per diffondere la conoscenza scientifica. Innanzitutto, vi sono le motivazioni di natura etica, che implicano la necessità di informare il grande pubblico sulle ultime scoperte e sulle implicazioni che avranno sulla vita quotidiana. Tuttavia, bisogna considerare anche le motivazioni di natura economica, dal momento che i cittadini, pagando le tasse, finanziano anche la ricerca scientifica.

Per quanto riguarda gli articoli di divulgazione scientifica che, secondo autori come Olohan, Garzone, Hyland e Myers, rappresenta la mediazione tra gli scienziati e il grande pubblico, è fondamentale la figura del giornalista scientifico, ruolo che spesso viene ricoperto da ricercatori disposti a dedicare parte del loro tempo alla divulgazione. Nel selezionare le notizie, i giornalisti devono tener conto, innanzitutto, di ciò che può maggiormente interessare i lettori a livello pratico. Inoltre, mentre le ricerche scientifiche mettono in risalto il metodo di ricerca a partire dal titolo, gli articoli di divulgazione si concentrano maggiormente sul tema e sui risultati. Per quanto riguarda le citazioni, che vengono spesso utilizzate nei testi divulgativi per adattarli al tipico stile giornalistico, esse hanno anche la funzione di sottolineare l'autorevolezza della fonte, limitando la responsabilità dello scrittore alla segnalazione di ciò che è stato dichiarato da qualcun altro. Inoltre, da un punto di vista visivo, spesso si ricorre all’uso di immagini all’interno dell’articolo con la funzione di attirare l'attenzione dei lettori. Tuttavia, in alcuni casi, le immagini vengono utilizzate anche per spiegare ed esemplificare alcuni concetti.

Per quanto riguarda il contesto anglofono, è stato notato che gli articoli di divulgazione scientifica ricorrono spesso, ad esempio, al modello domanda/risposta e all'uso dei pronomi personali per coinvolgere il lettore. Vengono spesso impiegate anche similitudini e ripetizioni che, come la spiegazione dei concetti più complessi, hanno la funzione di facilitare la comprensione del testo al lettore. Da un punto di vista narrativo, autori come Myers hanno sottolineato che, mentre gli articoli di ricerca si concentrano principalmente sui concetti, sulle tecniche e sulla costruzione di un'argomentazione, gli articoli divulgativi tendono ad essere più interessati all'incontro dello scienziato con la natura, che viene presentato in ordine cronologico. Inoltre, la divulgazione spesso opta per una struttura meno complessa, evitando alcune strategie utilizzate dalle LSP come la nominalizzazione.

Infine, passando al contesto italiano, dopo aver confrontato le opinioni di autori come Garzone, Cortelazzo, Gualdo e Telve, sono state notate alcune somiglianze con l'inglese. Innanzitutto, è stato osservato che il linguaggio della divulgazione diventa più simile al linguaggio generale: la densità lessicale è inferiore, il registro è più informale, la struttura è più prolissa e ridondante e, infine, i testi sono più espositivi che argomentativi. Tra le varie strategie impiegate con lo scopo di facilitare l'accesso a conoscenze scientifiche e tecnologiche complesse al grande pubblico, le più comuni sono la denominazione (o designazione), la definizione, la riformulazione (o parafrasi), l'analogia (o l'associazione), la generalizzazione, l'esemplificazione e la spiegazione. Inoltre, la divulgazione fa un ampio uso del linguaggio figurativo, il cui scopo è quello di spiegare concetti sconosciuti ai più intrattenendo il lettore.

L'ultima sezione del primo capitolo è dedicata alla psicolinguistica, un ambito interdisciplinare fondato negli anni '50-'60 con scopo di studiare le facoltà mentali coinvolte nella percezione, nella produzione e nell'acquisizione del linguaggio. Al fine di delineare le caratteristiche del linguaggio impiegato in questa disciplina, sono state prese in considerazione sia la dimensione orizzontale che quella verticale. Innanzitutto, è stato osservato che, trattandosi di un campo interdisciplinare, la psicolinguistica può essere posizionata a metà strada tra scienze "morbide" e quelle "dure", analogamente al linguaggio della medicina. Inoltre, la terminologia più tecnica e specializzata che si può trovare in psicolinguistica è proprio quella legata all'ambito medico e, in particolare, alla neuroscienza (ad esempio le aree del cervello implicate nella percezione, nella produzione

e nell'acquisizione del linguaggio). Dunque, per quanto riguarda la dimensione verticale, l'analisi si è concentrata sul linguaggio specializzato della medicina, per la quale autori come Cassandro, Gualdo e Telve hanno identificato tre diversi livelli. Da un lato c'è la comunicazione tra medico e paziente, caratterizzata da un livello piuttosto basso di termini tecnici; dall'altro ci sono i dizionari specializzati, che presentano il massimo livello di tecnicità. Tra i due livelli si colloca il linguaggio utilizzato nelle riviste scientifiche, uno dei principali oggetti di studio di questa tesi. Infine, è stato osservato che, sebbene il linguaggio medico italiano sia caratterizzato da una terminologia piuttosto conservativa, che deriva dal greco e dal latino, la sintassi appare più moderna, poiché spesso influenzata dall'inglese. Si è dunque concluso che queste caratteristiche possano essere applicate anche al linguaggio italiano della psicolinguistica.

Il secondo capitolo di questa tesi è dedicato alla traduzione specializzata, con un approfondimento sulla traduzione degli articoli di divulgazione scientifica dall'inglese all'italiano. Dopo un'introduzione generale alla teoria della traduzione, è stato necessario spiegare la distinzione tra la traduzione letteraria e quella specializzata. Secondo autori come Scarpa, Musacchio, Olohan, Rega, Newmark, Wright, Gualdo e Telve, la traduzione specialistica (o traduzione tecnica e scientifica), a differenza di quella letteraria, ha a che fare con testi "chiusi", che possono avere una sola interpretazione corretta: è dunque necessario seguire determinate norme per ottenere un testo d'arrivo che sia il più fedele possibile al testo di partenza.

Per quanto riguarda la figura professionale del traduttore specializzato, è stato osservato che un buon traduttore deve innanzitutto avere la capacità di generare più di un testo di arrivo accettabile a partire dallo stesso testo di partenza, selezionando infine una sola di quelle versioni in base allo scopo (o al destinatario) della traduzione. Inoltre, il traduttore specializzato deve avere una buona competenza comunicativa, l'abilità di mediare tra lingue e culture diverse e deve saper applicare le strategie necessarie per risolvere i vari problemi. I traduttori devono inoltre essere in grado di rivedere autonomamente il proprio lavoro, adattando le loro traduzioni in base alle norme delle varie comunità specializzate. È inoltre necessario avere le competenze teoriche e metodologiche che consentano di giustificare le scelte di traduzione con clienti e colleghi e, infine, bisogna essere in grado di effettuare ricerche terminologiche utilizzando la tecnologia come supporto all'attività traduttiva.

Prima di iniziare con il processo di traduzione vero e proprio, il traduttore specializzato deve utilizzare un corpus di riferimento per eseguire una ricerca terminologica e fraseologica. È inoltre possibile utilizzare strumenti terminologici tradizionali, come dizionari bilingui, glossari e banche terminologiche, che tuttavia sono spesso incompleti, in quanto non sempre aggiornati con la terminologia più recente. È inoltre possibile utilizzare fonti extra-linguistiche (ad esempio enciclopedie, manuali, riviste o traduzioni preesistenti): infatti, un buon traduttore deve, innanzitutto, saper essere flessibile, tenendo in considerazione tutte le diverse fonti disponibili per trovare la traduzione migliore.

Una volta costruito il corpus bilingue e allineati i segmenti, il traduttore può utilizzare altri strumenti informatici per la traduzione assistita, ad esempio una memoria di traduzione che consente di memorizzare i dati che potranno essere riutilizzati in futuro per altre traduzioni nello stesso ambito. Per quanto riguarda la traduzione automatica, che è spesso un metodo inaffidabile, è stato osservato che, poiché la qualità di una traduzione tende ad essere un compromesso tra adeguatezza, costi e velocità di esecuzione, la traduzione automatica presenta il vantaggio di ridurre i tempi ei costi della traduzione umana.

Per quanto riguarda il processo di traduzione, autori come Scarpa e Musacchio hanno sottolineato che, mentre una traduzione letterale del testo di partenza può essere utile per ottenere una prima bozza del testo di arrivo, è poi necessario parafrasare il testo ricorrendo ad una serie di strategie (cioè trasposizione, modulazione, adattamento, esplicazione, espansione, riduzione o eliminazione dei componenti) per renderlo più adatto alle norme della lingua di arrivo. Quando si traduce dall'inglese all'italiano, gli autori hanno osservato che, dal punto di vista dell'organizzazione testuale, spesso c'è la tendenza a mantenere la stessa suddivisione in paragrafi del testo di partenza. Tuttavia, sebbene i testi italiani presentino spesso una struttura più complessa, per motivi stilistici tendono ad evitare le ripetizioni (che sono abbastanza comuni nei testi in inglese). Inoltre, se confrontato con l'inglese, 'italiano fa anche un uso più ampio delle strutture ipotattiche, dello stile nominale, delle forme passive e impersonali. Infine, anche i verbi modali sono impiegati diversamente nelle due lingue.

La revisione è la fase finale del processo traduttivo. Il suo scopo è quello di migliorare il testo di arrivo e, per farlo, il revisore può fare diversi tipi di intervento,

soprattutto nella traduzione di termini specializzati, nello stile e, infine, verificando che la traduzione soddisfi le richieste del destinatario. A seconda della visibilità dell'errore, del numero di occorrenze e, eventualmente, della mancata considerazione delle correzioni effettuate dal revisore, sono stati identificati tre livelli di gravità dell'errore. Mentre gli errori più gravi sono quelli che creano incomprensioni che non possono essere notate dal lettore, essi sono considerati meno gravi se il destinatario può facilmente individuare il malinteso. Infine, gli errori linguistici e stilistici sono considerati i meno gravi.

Quando si traduce un testo di divulgazione scientifica, autori come Olohan hanno osservato che il concetto più importante da tenere in considerazione è quello della specificità culturale, oltre a considerare gli interessi, le opinioni e la pertinenza che un certo argomento potrebbe avere per un pubblico proveniente da una diversa posizione geografica. Innanzitutto, per quanto riguarda la traduzione di nomi propri, ad esempio nomi di luoghi o istituzioni, è stato osservato che, sebbene i nomi più noti a livello internazionale possano essere semplicemente trascritti senza fornire alcuna spiegazione, altri nomi possono essere tradotti nella lingua di arrivo o accompagnati da ulteriori informazioni o da una spiegazione. In secondo luogo, per quanto riguarda la traduzione delle unità di misura e delle valute, è necessario considerare che, anche se la conversione in un altro sistema può rendere il testo più familiare per i lettori, a volte questa strategia potrebbe portare ad una mancata corrispondenza tra il testo di partenza e quello di arrivo. Infine, quando si traducono le similitudini, è stato sottolineato che, anche se a volte possono essere tradotte senza problemi, quelle ad alta specificità culturale potrebbero richiedere strategie diverse (ad esempio possono essere sostituite da un'altra similitudine o addirittura omesse). Infine, per quanto riguarda le metafore, è stato osservato che devono essere tradotte principalmente in base alla loro funzione all'interno del testo.

Durante il processo di traduzione verso l'italiano dell'articolo di divulgazione scientifica "*The Eloquent Ape*", ho preso in considerazione tutti questi aspetti, sia linguistici che culturali. Di conseguenza, è stato possibile fornire una traduzione finale che soddisfa tutti i requisiti di quel determinato genere, argomento e contesto; includendo un commento sull'intero processo di traduzione. Dopo aver presentato il testo di partenza, il corpus di riferimento e il testo di arrivo all'interno del terzo capitolo di questa tesi, il quarto e ultimo capitolo è stato dedicato al commento finale, prendendo in considerazione

tutti i principali aspetti teorici esposti nei primi due capitoli, accompagnati da esempi presi dalla traduzione finale e dal corpus bilingue.

Innanzitutto, dal punto di vista dell'organizzazione testuale, analogamente alle traduzioni presenti nel corpus, ho deciso di mantenere la stessa ripartizione in paragrafi del testo di partenza in quello di arrivo, ad eccezione dei casi in cui il testo presentava paragrafi composti da una sola frase. Poiché queste separazioni non coincidevano con dei passaggi da un argomento ad un altro, le frasi isolate sono state inserite, a seconda della tematica, alla fine del paragrafo precedente oppure all'inizio del successivo.

Per quanto riguarda la struttura morfosintattica, poiché i testi italiani tendono ad usare frasi più lunghe e complesse, ho deciso di connettere alcune brevi frasi consecutive modificando la punteggiatura, la riformulando le frasi o aggiungendo dei connettori per ottenere una maggiore coesione testuale. In alcuni casi, tuttavia, le frasi brevi sono state mantenute per motivi stilistici. Inoltre, è stato necessario utilizzare alcune strategie (ad esempio, mettendo alcune informazioni aggiuntive tra parentesi) per evitare di avere troppi subordinate nel testo di arrivo.

Per quanto riguarda l'uso di strategie come la nominalizzazione e la trasposizione, esse sono state utilizzate frequentemente per ottenere un testo più conciso e formale. Inoltre, dal momento che il registro italiano è solitamente più formale di quello inglese (che talvolta si rivolge direttamente al lettore), ho optato per frasi più impersonali, sostituendo le costruzioni attive con quelle passive oppure omettendo il soggetto o l'agente. A volte, inoltre, ho scelto di utilizzare la prima persona plurale per creare un legame con il lettore.

Nel caso delle ripetizioni, è stato osservato che l'inglese tende a ripetere lo stesso termine per esporre il testo più chiaramente mentre l'italiano, per motivi stilistici, evita le ripetizioni optando per la variazione lessicale. Pertanto, nel testo di arrivo ho cercato di evitarle sostituendo il termine iterato con sinonimi o con parole generiche che non modificassero il significato della frase. A volte, tuttavia, ho deciso di mantenere le ripetizioni per dare maggiore enfasi a un termine.

Come accennato in precedenza, il diverso uso dei verbi modali nelle due lingue può essere notato osservando le occorrenze dei modali più comuni all'interno del corpus e le loro diverse traduzioni. Allo stesso modo, ho spesso tradotto gli stessi verbi modali in modi diversi a seconda del contesto: ad esempio, il verbo *must* potrebbe essere usato sia

per esprimere un dovere che una deduzione, mentre modali come *would*, *could*, *may* e *might* possono essere tradotti, a seconda del contesto, sia con il condizionale che con l'indicativo.

Dal punto di vista della terminologia, è stato osservato che la maggior parte dei termini specializzati del testo di partenza appartiene all'ambito scientifico e che molti di questi termini si trovavano anche nel corpus bilingue. Tuttavia, alcuni termini non possono essere tradotti in italiano: è il caso, ad esempio, dei neologismi e delle espressioni al linguaggio di Internet. In questi casi, la soluzione più comune è stata quella di mantenere il termine originale aggiungendo una spiegazione del suo significato e della sua etimologia.

Passando al concetto di specificità culturale, la strategia principale è stata quella di adattare, se possibile, i riferimenti all'inglese o ad altre lingue all'italiano. I riferimenti originali, tuttavia, sono stati mantenuti nei casi in cui non esistevano espressioni equivalenti in italiano, oppure se il contesto non consentiva modifiche. L'adattamento può essere svolto in modi diversi: ad esempio, è possibile sostituire un riferimento alla lingua inglese con esempi relativi all'italiano se il testo di partenza non menziona uno studio specifico. In caso contrario, è necessario lasciare il riferimento in lingua originale aggiungendovi una traduzione o una spiegazione in italiano. Quanto alla traduzione di espressioni idiomatiche, è necessario trovare un'espressione equivalente o una simile che trasmetta lo stesso significato. Allo stesso modo, per tradurre il linguaggio figurato, se non esiste un'espressione equivalente in italiano è possibile tradurre concentrandosi sul significato e sulla funzione dell'espressione.

In conclusione, tradurre questo articolo di divulgazione scientifica è stato interessante ma impegnativo. Gli aspetti più difficili del processo di traduzione, tuttavia, non hanno avuto a che fare con la terminologia specializzata, ma piuttosto con le espressioni culturalmente specifiche. Infatti, trattandosi di un articolo sul linguaggio rivolto ad un pubblico anglofono, non sarebbe stato possibile tradurre letteralmente gli esempi linguistici in un testo di arrivo destinato ad un pubblico italiano e, pertanto è stato necessario compiere diversi adattamenti. Inoltre, poiché si tratta di un articolo di divulgazione scientifica, il testo di partenza presenta uno stile semplice e piuttosto informale, e il suo contenuto può essere facilmente compreso sia da specialisti che da non esperti. Pertanto, anche se è stato necessario creare un registro leggermente più formale,

tipico dei testi italiani, ho cercato di mantenere lo stile del testo di arrivo il più vicino possibile a quello di partenza per mantenere una lettura scorrevole e di facile comprensione che coinvolgesse il lettore.