

THE NARRATOR'S VOICE IN SCIENCE DOCUMENTARIES: QUALITATIVE AND QUANTITATIVE ANALYSIS OF SUBTITLING STRATEGIES FROM ENGLISH INTO ITALIAN

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Abstract

The current study offers a qualitative and quantitative analysis of the Italian subtitling of the narrator's voice in two science documentaries for the general public. Specifically, it outlines the strategies used to translate the narrator's spoken lines, identifies the linguistic elements that were manipulated, and suggests possible explanations for such manipulations.

For each video, the Italian subtitles were first compared with the English audio. This comparison aimed to identify the subtitling strategies adopted in this particular type of video material. The subtitles were classified depending on the type of strategy applied. Furthermore, for each strategy the type of linguistic element involved was observed (e.g. modifier, adverb, downtoner, etc.). This two-layered analysis showed that while some of the instances of text manipulation corresponded with the well-known needs in subtitling of shortening and simplifying on the one hand and clarifying on the other, the remaining instances were a voluntary attempt to increase the level of formality of the text.

Subsequently, in order to verify whether such a shift in the tenor of discourse simply depended on the shift in mode due to subtitling, where speech is rendered in the written form, the Italian subtitles were compared to the corresponding Italian dubbed lines. It was thus observed that the Italian dubbed version featured exactly the same strategies and linguistic devices as the subtitles. This led me to conclude that the observed shift in the tenor of discourse represents the translators' attempts to adapt the text to Italian culture and that achieving greater formality should be considered a driving force in the subtitling of science documentaries from English into Italian, on a par with clarifying, simplifying and shortening.

1. Introduction

This paper investigates current practices in the interlingual subtitling of science documentaries from English into Italian, an area in which little work has been done so far. More specifically, it considers two science documentaries for the general public and outlines the strategies used to translate the narrator's lines, identifies the linguistic elements that were manipulated, and attempts to provide an explanation for such manipulations.

By science documentary I mean here a non-fictional audiovisual (AV) product illustrating a scientific topic or an aspect of the natural world to a wide, non-specialized audience. Science documentaries present topics and discourse functions of popular scientific discourse, mixing narrative, descriptive, persuasive and expository discourse (Espasa 2004). However, they take advantage of the specific technical features of the audiovisual medium. Thus, alongside the main filmic images, documentaries may include interviews, photos, extracts from other films, and other types of audio-video material, carefully collated by means of a narrator (Kaufmann 2008; Matamala 2009a, 2009b). The narrator's voice plays the specific purpose of connecting the various audio-video materials together (Kaufmann 2008; Matamala 2009a, 2009b). Other speakers may also appear in the documentary, such as interviewees, or people filmed in free conversation (Matamala 2009b). The current paper, however, focuses exclusively on the narrator's lines¹.

In an attempt to prepare the ground for the analysis of the selected material, the following sections provide a brief introduction to issues and current practices in the translation of scientific discourse and in audiovisual translation (AVT), with an eye to possible conflicting needs. Section 2 deals with the notion of register and discusses it in the light of the current material. Section 3 offers an overview of the challenges and constraints of interlingual subtitling, with specific reference to documentary films. A few observations will also be made about dubbing, as this paper will briefly compare the Italian subtitles with the corresponding dubbed lines. Section 4 focuses on current practices in the translation of scientific discourse from English into Italian. Section 5 presents the materials and methods of the current analysis. Section 6 illustrates the results, while Section 7 attempts to draw some conclusions.

2. Register

The way language is used in a given discourse context can be called register and described by means of three variables: field, mode, and tenor (Halliday 1978). The field of discourse is what the participants talk about. In the case of documentaries, this corresponds to the object of the documentary. Mode refers to the medium used in the specific act of discourse, e.g. spoken in the original video, written in subtitles, spoken in dubbed lines. As Hatim and Mason (1990: 49) observe, "the basic distinction here is that between speech and writing and the various permutations on such a distinction, e.g. written to be spoken, etc." Mode, however, also includes other variables, such as channel (e.g. the video channel), and "rhetorical concepts such as expository, didactic, persuasive, descriptive and the like" (*ibid.*). Finally, tenor illustrates the relationship between addresser and addressee, which, in the materials under analysis, are the narrator and the expected audience, respectively. Tenor is generally analysed on the formal to informal continuum. On the tenor of documentaries for a wide audience, Matamala (2009a) observed that the traditional, highly formal, off-screen narrator has recently

¹ For an analysis of the subtitling of talking heads and unplanned talk in documentaries, see Cordella (2006, 2007) and York (2006).

been replaced by new types of narrators who prefer semi-formal or informal language, for the benefit of a young audience.

Field, mode and tenor are interdependent. This is reflected, among other things, in the fact that some of the features characterizing spoken language – e.g. pro-forms, various types of ellipsis, non-clausal material and stand-alone elements, elliptic genitives, questions and imperatives, discourse markers, and attention signals² – are also indicators of informal discourse.

3. Subtitling and dubbing

3.1. Subtitling

Interlingual subtitling is the written transposition of the written and, above all, spoken elements of the original video into a different language³. It is not the only or the most common form of AVT for documentaries⁴; however, it can be found, alongside dubbing, in the DVD version of science documentaries by big production companies, such as the ones analysed in this study.

As in all other forms of AVT, the choices of the subtitle translator are constrained by the presence of non-verbal elements, as well as by technical features of the medium, the most important constraints being limitations of time and space: each subtitle must not exceed two lines, with a maximum of 38-40 characters per line. The display time of a subtitle is limited by the images and original dialogues and must be long enough to be easily read and understood by the average viewer. In this respect, the speed at which the spoken text is uttered is an important variable.

Subtitling the spoken elements of a video implies a change in the mode of discourse that is typical of AVT and is often called diamesic shift (Perego 2003)⁵. Diamesic shift obliges the subtitle translator to adapt the original, spoken lines to the conventions of the written language. This includes adding punctuation and capitalization, finding ways to convey in written form meanings which in the spoken lines are intelligible through intonation and other suprasegmentals, and reducing those linguistic elements which are peculiar to spoken language (e.g. hesitations, repetitions, interjections) or not expected in writing (e.g. swear words, grammar mistakes). Diamesic shift may thus result in written subtitles that have a slightly more formal tenor than the corresponding spoken lines. Furthermore, the concomitant needs to adapt spoken language to writing norms and produce clear, quickly readable subtitles frequently lead subtitle translators to simplify (lexically and/or syntactically) the original lines.

Research on feature films and cartoons has shown that subtitle translators apply specific strategies in order to overcome these technical issues. Several classifications of subtitling strategies exist, including the two frequently cited models described below.

² See for example Leech (2000) for English, and Berruto (1985) for Italian.

³ For a detailed description of subtitling see for example Diaz-Cintas and Remael (2007).

⁴ See Remael (2007) and Matamala (2009b).

⁵ *Diamesia* (from which the adjective form *diamesico*, 'diamesic') was introduced in 1983 by the Italian linguist Mioni as one of five major variables in sociolinguistics.

They have been mentioned here because they inspired the current analytical method, illustrated in Section 5.2.

Gottlieb (1992) identifies as many as ten different strategies: 1. Expansion (i.e. adding extra elements, such as an explanation); 2. Paraphrase (adapting the text to the target language and culture); 3. Transfer (translating word by word); 4. Imitation (reporting the original words in the target text); 5. Transcription (reproducing in writing phonetic puns or other non-standard expressions); 6. Dislocation (substituting the original content with an alternative one inspired by the images); 7. Condensation (conveying the message in a more compact way); 8. Decimation (omitting semantically informative elements); 9. Deletion (omitting elements of little importance); and 10. Resignation (omitting or substituting untranslatable elements). This model is very detailed, but not easy to apply – as some researchers have noticed (see for example Perego 2005: 119) – since differences between the various strategies are sometimes very subtle. Indeed, other frequently cited authors have felt the need for simpler classifications⁶. Among them is Lomheim (1995,1999), whose model includes the following six strategies: Effacement (or Omission; omitting elements); Condensation (or Compression; conveying the message in a more compact way); Addition (or Expansion; adding information); Hyperonymy (or Generalisation; substituting a word with a superordinate one); Hyponymy (or Specification; substituting a word with a subordinate one); and Neutralisation (substituting a word with a connotative meaning with a neutral one)⁷.

Regardless of their differences⁸, Gottlieb's and Lomheim's classifications seem to decline three basic macro-strategies: reducing text length (*text reduction*); clarifying meaning (*explicitation*); and reformulating (*reformulation*)⁹. These three macro-strategies are further discussed below.

Text reduction is a peculiar feature of subtitling, primarily connected to the time and space constraints that characterize this type of translation. Detailed insight into the linguistics of reduction in subtitling is provided by Diaz-Cintas and Remael (2007). These authors describe several linguistic devices that are typically used to implement *text reduction*: replacing verbal periphrases with shorter verb forms; preferring simple to compound tenses; generalizing enumerations; using shorter near-synonyms; changing word classes; using shorter forms and contractions; changing negative and interrogative sentences into affirmative ones; using direct questions rather than indirect ones; simplifying indicators of modality; turning direct into indirect speech; changing the subject of a sentence or phrase; changing the theme-rheme order; reducing compound sentences into simpler ones; transforming active sentences into passive ones or vice versa; replacing nouns or noun phrases with pronouns; merging phrases or sentences; and omitting words such as adjectives, adverbs, phatic words, greetings, interjections,

⁶ Kovačić (1994), for example, only distinguishes between two strategies: partial reduction vs. total reduction, while Gambier (2007) proposes three strategies: reduction (*réduction*), syntax simplification (*simplification de la syntaxe*), and expansion (*expansion*).

⁷ Lomheim's two papers present some terminological differences in the exposition of his theory. In the present work, I distinguish the 1995 terms from the 1999 terms by including the latter in parentheses.

⁸ A comparison between Gottlieb's and Lomheim's models is provided by Perego (2005), who tends to underline differences, and by Georgakopoulou (2010), who stresses similarities.

⁹ For an easier reading of the paper, subtitling strategies have been capitalized, while macro-strategies have been italicized throughout the text.

vocatives, formulas of courtesy, hesitations and false starters (*ibid.* 2007: 145-171). Some of these devices create subtitles that are not only shorter, but also simpler. Indeed, *simplification* is a universal feature of translation (Laviosa-Braithwaite 1998), and in subtitling it meets the need of creating a text that is easy and quick to read.

Explicitation is another translation universal (*ibid.*) which in subtitling serves the purpose of reducing the viewer's cognitive load when reading a subtitle. *Explicitation* has been studied in subtitling by Perego (2003). She observed this feature in attested cases of addition and specification, and explained it as connected to one or more of the following factors: cultural gaps between source culture and target culture (*cultural explicitation*); the need to verbalize data conveyed by the visual or auditive channels (*channel-based explicitation*); the need to compensate loss due to source text reduction (*reduction-based explicitation*).

Finally, *reformulation* encompasses a very broad range of types of text manipulation. In some subtitling literature (see for example Diaz-Cintas and Remael 2007: 145-172), *reformulation* is presented in connection with *text reduction*. However, some of the specific types of *reformulation* listed by Lomheim (i.e. Hyperonymy, and Neutralization), are classified as examples of *simplification* in the literature on translation universals.

Thus, all professional subtitling strategies seem to be guided by three major driving forces: *text reduction*, *simplification*, and *explicitation*.

3.2. Dubbing

Dubbing is the transposition and replacement of the original voices in a video with actors' voices in the target language¹⁰. In the case of off-screen voices, like the narrator's voice in science documentaries, the dubbing translators are constrained in their choices by the need to synchronize spoken text and visuals (action synchrony) and to adapt the length of the text (isochrony). Within these technical limitations, a major challenge for the translator is to "create a readable translation which keeps the register of the original" (Matamala 2009a: 97). Given that mode and channel are intrinsically determined by the very essence of dubbing, the word 'register' in Matamala's sentence is to be interpreted with reference to field (translators should not change the content of the text), and tenor (they should respect the textual functions and the formality level of the given discourse). Furthermore, Matamala's statement presupposes the same level of expertise about the subject in the target audience and in the original audience. This is true in most cases, and indeed it regards the two documentaries under analysis.

3.3. AVT and documentaries

Existing literature on the AVT of documentaries is scarce. Most of the existing papers deal with voiced translations (dubbing or voice-over), rather than subtitling (Taylor 1992; Mir I Boria 1999; Franco 2000; Espasa 2004; Mateu 2005 cited in Matamala 2009a; Matamala 2009b). Of the very few papers dealing with subtitling¹¹, only two are relevant to the current work; however, they analyse subtitles produced by students, rather than professionals or scholars.

¹⁰ For a detailed discussion of dubbing and its issues, see Chaume (2012).

¹¹ In addition to the papers reviewed in the following paragraphs, see also Taylor 2002 (for the Italian-English language pair), Martins 2007 (for the subtitling of fixed language into Portuguese), and Jones 2012 (for the English-Swedish language pair).

Massidda (2010) explains and comments on her own subtitling into Italian of a BBC science documentary about physics. She declares that “the need to condense and reduce the source text, typical of this mode of transfer, led to the use of different techniques, including omission, reformulation and substitution. On the other hand, at times, it was also necessary to add extra information in order to explicitate some of the contents and also to conform to the target text register. When translating within the English-Italian language pair and within the field of scientific texts, the target text is better rendered using a more formal tone” (*ibid.*: 190).

Similarly, Mujagic (2013) describes and comments on his own subtitling into Italian of a BBC documentary about quantum physics. He reports deleting adverbs of time (‘now’) and modifiers such as ‘very’ and ‘simply’, and substituting noun-phrases with pronouns, in order to reduce the number of characters in a subtitle. He also mentions cases of condensation (i.e. joining two sentences into a shorter one, without content loss) and various instances of reformulation. Unfortunately, his comment is not very detailed, but from the examples he provides he seems to have also substituted some personal subjects with impersonal ones and generic verbs with more specific ones, in addition to joining coordinate sentences by using *wh* pronouns and making logical connections explicit. Through these semantic and syntactic manipulations, he created a target text that is more formal in tenor compared to the source text, which is full of false starters, contracted forms, and short and simple sentences.

These two papers on the subtitling of science documentaries suggest that increasing the level of formality in the target text was a deliberate aim of the translators, a sort of translation strategy they felt the need to apply. The current paper will investigate the systematic existence of such a deliberate strategy in the professional subtitling of science documentaries.

4. Translating scientific discourse from English into Italian

Scientific discourse is a type of specialized discourse. The aim of the translator dealing with specialized discourse is to produce a target text that has the same contents and communicative effect as the source text (Scarpa 2001: 77).

In a scientific text, the communication of contents is conveyed primarily by means of monoreferential technical and scientific terminology. Terminology is not generally an issue in written translation, as the translator may add explanations within the text or in a note, in case of absence of a corresponding technical term in the target language (Scarpa 2001: 93). Furthermore, it has been reported that in written scientific translation from English into Italian, translators often resort to *explicitation* devices to better convey content. In a parallel corpus of university manuals of biology, Pavesi and Tomasi (2001) observed recurrent cases of *explicitation* achieved by adding linguistic elements that were absent from the original text or by substituting compact phrases or clauses with more explicit ones. Additions included explanations and definitions, modifiers, and logical connectors, while substitutions included replacing adjectives or prepositional phrases with relative clauses, substituting pronouns with noun phrases, and nominalization. Adding explanations to bypass terminological translation difficulties or applying the *explicitation* devices observed by Pavesi and Tomasi almost

inevitably lead to longer phrasings. However, while target text length is not an issue in written texts, it is a very relevant issue in AVT, as we have seen in Section 3.

Communicative effect, on the other hand, is achieved by means of register choices. In particular, comparison between English and Italian written¹² scientific texts has shown that scientific discourse in Italian “often appears to be more formal than English” (Taylor 1990: 125). According to Scarpa (2001: 121-122), such a difference in the level of formality between English and Italian applies in all scientific texts, and in particular in scientific communication between specialists and non-specialists. The reasons for such differences in tenor between English and Italian scientific texts are primarily cultural: compared to English culture, Italian culture shows greater focus on Power Distance. Power Distance is one of the several cultural orientations identified by authors such as Hofstede (1991) and Brake *et al.* (1995). Each cultural orientation represents a cline along which cultures occupy different positions. In the Power Distance cline, Italy is “a relatively high power distance country, while Northern Europe, Britain and the States in particular tend to emphasize low power distance” (Katan 1999: 239). In the Italian culture, focus on Power Distance determines the “need to formalize in language the distance between interlocutors” (*ibid.* 274).

Indeed, manuals of translation from English into Italian suggest that translators of scientific discourse adapt the tenor of the text to the higher level of formality required by Italian culture (e.g. Ulrych 1992; Katan 1999; Hervey *et al.* 2000; Scarpa 2001). To this aim, a range of linguistic devices involving not only lexical, but also syntactic and/or textual manipulation could be applied. In particular, Musacchio (1995) lists the following: using longer rather than shorter sentences; and also preferring coordinating conjunctions to full stops, and subordinating conjunctions to coordinating ones, nominal to verbal style, third person singular to first and second person singular, and exclusive rather than inclusive ‘we’. Many of these linguistic devices are in sharp contrast to the primary needs of subtitling, the latter requiring that the target text be short and simple in order to favour readability.

5. Materials and method

5.1. *Materials*

This study analyses two science documentaries that are commercially available on DVD, and focuses on how the English narrators’ spoken lines were rendered into Italian. There were three reasons why these particular DVDs were chosen among those featuring Italian subtitles and Italian dubbing alongside the original audio track and subtitles in English. First, they both target a wide, lay audience, and can be considered examples of what Gotti (1991) defines as expert-to-layman communication with an informative intent. Second, they were produced by different companies, which makes it more likely that they were translated by different translators. Third, the narrators’ lines differ as regards the speed of speech, a factor that may impact on subtitling strategies.

¹² The source texts under investigation in this study were written-to-be-spoken; the target texts, on the other hand, belong to the written mode. This justifies reference to literature on written scientific discourse. Furthermore, to my knowledge, no comparative linguistic analysis has been published on tenor differences between English and Italian scientific spoken discourse.

One documentary is titled *Earth* (*Earth – La nostra terra*) and was produced by DisneyNature in 2009. It is a family-targeted documentary depicting the life of some well-known animal species (polar bears, elephants, whales and others) through the four seasons. There are no dialogues. The only spoken text is an off-screen narrative monologue, uttered at a slow pace with long pauses between sentences. Over a total length of about 80', the English version of the documentary includes 3,555 words organized into 287 sentences. The other video is a National Geographic documentary about dinosaurs. Titled *Bizarre Dinosaurs* (*L'impero dei dinosauri* in the Italian version), and hereafter referred to as *BD*, this 2010 production targets the general public and was produced for the National Geographic Channel. In this video, an off-screen narrator guides the viewer along a journey of some curious paleontological discoveries that led researchers to a new understanding of the evolution of dinosaurs' habits and body shapes. From time to time, the floor is given to palaeontologists who talk about their discoveries and theories. The current analysis, however, will only consider the narrator's lines. The English version of the documentary includes 5,628 words – of these, the narrator utters 3,630 words organized into 234 sentences. Although these figures are comparable to those of the Disney documentary, this video lasts only about 47 minutes, i.e. almost half the time of *Earth*. Indeed, the narrator's lines in *BD* are spoken at a faster pace and with fewer pauses between sentences. They also tend to feature longer sentences than those found in *Earth*.

As regards the language used by the narrator, both videos display linguistic features that suggest the texts are semi-formal to informal (*Earth* placing itself closer to the semi-formal end, while *BD* lying closer to the informal end). These features include:

- contracted verb forms (e.g. “It's the longest overland migration on Earth”, *Earth*; “it's a good time to be a paleontologist”, *BD*);
- elliptic genitives (e.g. “Not as fearsome as T-Rex's, perhaps, but clearly a ferocious profile”, *BD*; “If any animal on Earth looks more suited to slamming its cranium into another's, it has got to be some of these guys”, *BD*);
- exclamations (e.g. “A really big crocodile!”, *BD*);
- attention signals (e.g. “Oh! Missed a spot”, *Earth*; “Now, that's impressive”, *Earth*);
- direct questions (e.g. “How could a girl resist?”, *Earth*; “And the penguins?”, *Earth*; “So why were the arms still there?”, *BD*; “But was this all really for battle?”, *BD*);
- discourse markers (e.g. “Well, don't feel sorry for them”, *Earth*; “So how did they get from little *Coelophysis* to, say, this?”, *BD*);
- informal words and expressions (e.g. “he won't be much help”, *Earth*; “mom” and “dad”, *Earth*; “No predator [...] is going to take on such a titanic creature”, *BD*).

This is in keeping with the new types of narrators observed by Matamala (2009a) and mentioned in Section 2.

The two texts also show what Taylor (2002) considers as a recognizable set of language features typical of the nature documentary:

- time and place markers (e.g. “It's ten days later and time for mom to [...]”, *Earth*; “Here in the tropics, [...]”, *Earth*; “150 million years before the explosive end to the age of the dinosaurs [...]”, *BD*; “[...] wherever the brutal sun beats down on dinosaur territory these days it's a good time to be a paleontologist”, *BD*);

- minor clauses beginning portions of text (e.g. “April, and life starts returning to the warming north”, *Earth*; “Sex: it’s what it’s all about”, *BD*);
- and the use of semi-scientific and pseudo-poetic lexis (e.g. “cats” instead of ‘lions’, *Earth*; “the sunlight begins to work her glorious magic”, *Earth*; “But evolution had nonetheless stumbled onto a plan for the dinosaurs’ survival: the bird plan”, *BD*).

Time and place markers are necessary to contextualize the images. The presence of minor clauses beginning portions of text – or even of verbless clauses, as found in the current videos (e.g. “And the equally curious head of Centrosaurus.”, *BD*; “A head-butter this small?”, *BD*) – is justified by the presence of images and represents a short and immediate way to comment on them. Finally, the use of semi-scientific and pseudo-poetic lexis, as well as the ample use of playful and creative metaphors or similes – not listed by Taylor, but found in these videos (e.g. “[...] creatures like this little standard issue prototype had the run of the place”, *BD*; “Other than that, not much to phone home about”, *BD*; “what other challenges are in store for our planet’s newest recruits?”, *Earth*; “[...] they’re one of the few animals with a built-in toboggan”, *Earth*) – are attempts to ease access to the scientific matter for the wider audience, and to compensate for the directness of the images with words that tickle the imagination.

Interestingly, many of these features are precisely the elements upon which greater manipulation was exerted by the Italian translators for the two videos.

5.2. Method

For each set of materials, the Italian subtitles were compared to the English audio/subtitles as well as the Italian audio. By pure chance, in the two DVDs the English audio and the English subtitles coincide, which made my work easier. This also makes it irrelevant to wonder whether the subtitle translators translated directly from the audio or from a written version of it¹³.

The subtitles were classified according to the type of strategy applied; for each strategy the linguistic elements involved (e.g. modifier, adverb, etc.) were observed. Both qualitative and quantitative analyses were performed.

As regards strategies, after a careful look at the data and some attempts to apply the existing classifications, I elaborated a new model, inspired by Gottlieb’s and Lomheim’s classifications. As seen in Section 3.1, Gottlieb’s model is rather complex and stresses minor differences that did not seem to be useful in the current analysis. For example, Gottlieb’s categories of Imitation and Transcription never appeared in the data, and in any case they can be considered special cases of Transfer. Furthermore, Gottlieb’s distinction between omitting elements of little importance and omitting semantically informative elements was not considered relevant in the current paper, since I am more interested in identifying which grammatical elements are more easily manipulated than in establishing the level of loss in a subtitle. On the other hand, Lomheim’s model already provides a simplification of some of Gottlieb’s categories but disregards a few other relevant classes of events, such as Transfer and Paraphrase. Furthermore, Lomheim’s distinction between three different types of substitution seemed redundant.

¹³ Subtitle translators may be provided with a pre-production script, a post-production script, subtitles in the original language, or no written text at all (see Georgakopoulou 2010; Kaufmann 2008; Matamala 2009b).

This led me to develop a personal classification that may result simpler to apply and at the same time powerful enough to support detailed linguistic analysis. Indeed, this classification provided a complete description of each and every sentence in the two videos. The current classification distinguishes the following strategies: Addition; Effacement; Substitution; Literal Transfer; and Reformulation. A detailed definition of each category, including similarities and differences with Gottlieb's and Lomheim's models, is provided in Section 6.

6. Results and discussion

This section outlines and exemplifies the strategies observed in the videos, along with the associated linguistic events. In each table, the first column numbers examples in progressive order; the second provides a transcription of the original audio; the third reports the Italian subtitle and its back-translation; the fourth column identifies the type of element involved; and the final column names the video from which the example is taken. For each category, one example from each video is provided. The examples are necessarily limited in number, but they should be sufficient to illustrate the types of linguistic events observed. When more than one strategy is at play in a given example, only the event being discussed in that specific section will be highlighted and commented on.

It must be noted *in passim* that in the *BD* video a greater degree of text manipulation was observed. In fact, the overall number of manipulation events amounts to 219 in *Earth* and 457 in *BD*, despite similar word and sentence counts in the two texts (respectively, 3,555 and 287 in *Earth* vs. 3,630 and 234 in *BD*). Furthermore, in both videos more than one strategy was at times applied in the same clause, with an average number of manipulation events per clause of 1.3 (SD = 0.7 in *Earth*; SD = 0.6 in *BD*).

6.1. Addition

Addition concerns the expansion of a phrase or sentence by adding semantic elements. This strategy appears in Gottlieb's model (Gottlieb 1992), under the name Expansion, as well as in Lomheim's model, under the name Addition (Lomheim 1995) or Expansion (Lomheim 1999), and is described as a means to explicitate and clarify meaning or to make a phrase more idiomatic in the target language. In the current paper I preferred the term 'addition' over 'expansion' because the former gives the idea of a mental process (adding information), while the latter seems to conjure up a physical process (expanding the number of characters). Undeniably, the two concepts are connected. However, as the data showed, physical expansion of a sentence or phrase may also be a consequence of substitution or reformulation.

In this study, Addition was recurrently observed across the two videos, with a total of 27 instances in *Earth* and 84 in *BD*. Addition was associated with a rich set of elements:

- adjectives, noun phrases or prepositional phrases that modify a noun, collected here under the single term 'modifiers' (*Earth*: 7; *BD*: 30);

- (semi-)modal verbs and other grammatical ways to express modality, here called 'modality markers' (*Earth*: 2; *BD*: 9);
- verbal or nominal items that stress, intensify or reinforce a concept expressed by a noun, verb or adjective, collected here under the single tag 'intensifiers' (*Earth*: 9; *BD*: 13);
- verbs not falling into the previous categories (*Earth*: 1; *BD*: 6);
- adverbs and adverbial phrases, here called 'adverbials' (*Earth*: 3; *BD*: 9);
- logical connectors (*Earth*: 5; *BD*: 17).

Examples are provided in Table 1.

None of the instances of Addition observed makes the text more idiomatic in the target language. On the other hand, the instances involving modifiers, adverbials, verbs, and logical connectors – accounting for 59.3% of cases in *Earth*, and 73.8% in *BD* – are neat examples of *explicitation*, at either sentence or discourse level. In contrast to what Perego (2003) observed (Section 3.1), the instances of *explicitation* by Addition found in the current videos are neither cultural nor channel-based, and only a minority of them are reduction-based. In fact, of the 16 examples of *explicitation* by Addition in *Earth*, only four (25%) co-occur with cases of Effacement, while in *BD* there are only 15 out of 62 cases (24.2%). Four other cases (25%) in *Earth* and 21 (33.9%) in *BD* co-occur with instances of Substitution or Reformulation but, as we shall see, these two strategies do not necessarily produce shorter outputs.

More generally, of all the instances of Addition, only six (22.2%) co-occur with cases of Effacement in *Earth*, and only 23 (27.4%) in *BD*; 12 other cases (44.4%) in *Earth* and 28 cases (33.3%) in *BD* co-occur with instances of Substitution or Reformulation. Interestingly, on the other hand, 44.4%-56% of the cases of *explicitation* by Addition are in keeping with what is described in the literature on scientific translation, i.e. they are achieved by adding modifiers and logical connectors (Pavesi and Tomasi 2001).

Finally, the addition of modality markers and intensifiers – which accounts for 40.7% of the instances of Addition in *Earth* and 26.2% in *BD* – though bearing a clarifying component, seems to be driven more by some form of rhetorical preference.

6.2. *Effacement*

The category of Effacement includes all those cases where a part of the text in the original dialogue does not appear in the subtitles, despite its translatability, and whose effacement brings some level of semantic loss in the target text. For this category, the term 'effacement' – inspired by Lomheim's terminology – was preferred over other options, in particular over Gottlieb's distinction between 'deletion' of elements of little importance and 'decimation' of semantically informative elements. Indeed, in the current paper, I am less interested in establishing the level of loss in the subtitles than in identifying which grammatical elements are more easily manipulated than others.

The range of elements effaced in the materials under analysis is the same as in the Addition category – modifiers (*Earth*: 17; *BD*: 50), modality markers (*Earth*: 7; *BD*: 8), intensifiers (*Earth*: 5; *BD*: 9), verbs (*Earth*: 5; *BD*: 13), adverbials (*Earth*: 8; *BD*: 13), and logical connectors (*Earth*: 0; *BD*: 8) – plus a few new entries:

[1]	The spines, up to two-metre-long extensions of the animal's vertebrae, [...].	<i>Le spine, un'estensione di quasi due metri delle sue vertebre dorsali, [...].</i> [The spines, an almost two-metre-long extension of its <u>dorsal</u> vertebrae.]	modifier (adjective)	<i>BD</i>
[2]	[...] that brings life to every corner of the Earth.	<i>[...] che porta la vita in ogni angolo del pianeta Terra.</i> [that brings life to every corner of planet Earth.]	modifier (noun phrase)	<i>Earth</i>
[3]	[...] the spines must have been doing something important, [...].	<i>[...] le spine sul dorso devono svolgere una funzione importante, [...].</i> [the spines <u>on the back</u> must have been playing an important function.]	modifier (prepositional phrase)	<i>BD</i>
[4]	The answers lie deep in the fossilized bones of the dinosaurs, [...].	<i>La risposta sembra trovarsi nei fossili delle ossa dei dinosauri, [...].</i> [The answer <u>seems to</u> lie in the fossilized bones of the dinosaurs,]	modality marker	<i>BD</i>
[5]	[...] and the journey to the ice begins.	<i>[...] e il viaggio verso il ghiaccio può iniziare.</i> [and the journey to the ice <u>can</u> begin.]	modality marker	<i>Earth</i>
[6]	[...] they're revolutionizing what we thought we knew about them.	<i>[...] che sembrano rivoluzionare completamente le conoscenze finora acquisite.</i> [that seem to <u>completely</u> revolutionize our acquired knowledge.]	intensifier	<i>BD</i>
[7]	[...], and the family could starve.	<i>[...] e tutta la famiglia potrebbe morire di fame.</i> [and the <u>whole</u> family could starve.]	intensifier	<i>Earth</i>
[8]	But [...] there's a method to the madness.	<i>Ma [...] c'è un metodo anche nella pazzia.</i> [But there's method <u>even</u> in madness.]	intensifier	<i>BD</i>
[9]	And then there's that equally classic dinosaur brain.	<i>Inoltre, c'è da tener presente la misura del cervello.</i> [And then there's <u>to consider</u> the size of the brain.]	verb	<i>BD</i>
[10]	It keeps her calm and on course during the storm.	<i>Questo la tranquillizza e la aiuta a seguire la rotta nella tempesta.</i> [This keeps her calm and <u>helps her follow</u> the course during the storm.]	verb	<i>Earth</i>
[11]	Some paleontologists think that [...].	<i>Alcuni paleontologi credono oggi che [...].</i> [Some paleontologists think <u>today</u> that [...].]	adverbial	<i>BD</i>
[12]	The tropics are hundreds of miles behind them [...].	<i>I tropici sono ormai lontani migliaia di chilometri [...].</i> [The tropics are <u>by now</u> hundreds of miles away]	adverbial	<i>Earth</i>
[13]	There's no doubt that the skull of this dome-head, Pachycephalosaurus [...].	<i>In ogni caso, non c'è dubbio che il cranio di questi dinosauri [...].</i> [<u>In any case</u> , there's no doubt that the skull of these dinosaurs]	logical connector	<i>BD</i>
[14]	Lions can see easily.	<i>I leoni invece ci vedono bene.</i> [Lions <u>instead</u> can see easily.]	logical connector	<i>Earth</i>

Table 1. Addition

- subjects (*Earth*: 3; *BD*: 1)¹⁴;
- downtoners (*Earth*: 1; *BD*: 3);
- quantifiers (*Earth*: 2; *BD*: 10);
- discourse markers, excluding discourse connectives, as they are counted amongst logical connectors (*Earth*: 3; *BD*: 4).

Earth also included a single case of Effacement that applies to an entire clause (“there are signs that these lush forests...”, rendered as if it were “these lush forests...”). In all, *Earth* shows 51 instances of Effacement, and *BD* shows 119. Examples are offered in Table 2.

Effacement is obviously a powerful *text-reduction* strategy. With the exception of the effacement of discourse markers and subjects, Effacement determined some degree of semantic loss without, however, threatening understanding, as the examples in the table clearly show. At the same time, it produced a target text of increased formality in a range of cases. This is true for discourse markers, downtoners, and also connectors. In fact, the only connectors effaced were sentence-initial ‘and’ (six instances in all) and ‘but’ (two instances), which could be considered a subgroup of discourse markers.

While semantic loss goes against the general need for clarity and precision that is typical of scientific texts, increasing formality in the target text is a specific need in scientific translation from English into Italian (Section 4). Both features are also an accidental, though frequent, consequence of diamesic transfer in subtitling (Section 3.1).

6.3. Substitution

The category of Substitution was inspired by Lomheim’s categories of Hyperonymy, Hyponymy and Neutralization, whereby a word or phrase in the original dialogue is replaced by a hypernym, a hyponym or a non-connotative, neutral expression. This category also includes cases of Dislocation, Resignation, and Condensation as per Gottlieb’s model.

Substitution was very frequently applied in the materials under analysis (*Earth*: 77; *BD*: 135), but the instances observed only marginally fit the description of hyperonymy, hyponymy or neutralization. In fact, the following types of Substitution were observed:

- substitution of generic verbs or nouns (e.g. do; make; have; be; something) with more specific or technical ones, or hyponyms (*Earth*: 16; *BD*: 30);
- substitution of specific verbs or nouns with more generic ones, or hypernyms (*Earth*: 7; *BD*: 8);
- neutralization (*Earth*: 1; *BD*: 1);
- substitution of abstract words/images with more concrete ones (*Earth*: 10; *BD*: 11);
- substitution of deictics or pronouns with noun phrases (*Earth*: 12; *BD*: 7);
- substitution of noun phrases with pronouns or deictics (*Earth*: 1; *BD*: 6);
- substitution of a technical term or description with one that relates to the same scientific object but from a different perspective, here called ‘change of perspective’ (*Earth*: 29; *BD*: 51); this group of items can be further divided into the following

¹⁴ Subjectless sentences are common and grammatically correct in Italian.

[15]	[...] originating from a <u>tropical</u> ocean thousands of miles away.	[...] <i>originata da un oceano, lontano migliaia di chilometri.</i> [originating from an ocean thousands of miles away.]	modifier (adjective)	<i>Earth</i>
[16]	Instead, studies on T-Rex biomechanics show [...]	<i>Alcuni studi di biomeccanica dimostrano invece [...]</i> [Some studies on biomechanics show instead]	modifier (noun phrase)	<i>BD</i>
[17]	[...] demoiselle cranes <u>have to</u> escape the harsh winters in Mongolia [...]	[...] <i>la damigella di Numidia fugge dai rigidissimi inverni della Mongolia [...]</i> [the demoiselle crane escapes the harsh winters in Mongolia]	modality marker	<i>Earth</i>
[18]	Spinosaurus is, <u>as far as we know</u> , the largest meat-eating dinosaur.	<i>Lo spinosauro è il più grande dinosauro carnivoro mai esistito.</i> [Spinosaurus is the largest meat-eating dinosaur that ever existed.]	modality marker	<i>BD</i>
[19]	[...] a lush water world <u>totally</u> reliant on a seasonal flood,[...].	[...] <i>un rigoglioso mondo ricco d'acqua che dipende da una piena stagionale,[...].</i> [a lush water world reliant on a seasonal flood.]	intensifier	<i>Earth</i>
[20]	[...] but the double row is <u>truly</u> baffling.	[...] <i>due file sono sorprendenti.</i> [two rows are baffling.]	intensifier	<i>BD</i>
[21]	And then <u>there is</u> that riddle of riddles: [...]	<i>E poi, l'enigma degli enigmi: [...]</i> [And then, the riddle of riddles]	verb	<i>BD</i>
[22]	[...] krill, shrimp that <u>begin to</u> swarm here [...].	[...] <i>il krill, piccoli crostacei che si affollano qui [...].</i> [krill, small crustaceans that swarm here [...]]	verb	<i>Earth</i>
[23]	It's fresh-powder conditions <u>up here</u> , [...]	<i>La neve è fresca e farinosa</i> [The snow is fresh and powdery]	adverb	<i>Earth</i>
[24]	In the 21st century, dozens of new dinosaurs <u>a year</u> are coming to light.	<i>Il XXI Secolo ha visto venire alla luce dozzine di nuove specie di dinosauri.</i> [The 21st century has seen dozens of new species of dinosaurs coming to light]	adverb	<i>BD</i>
[25]	<u>And</u> one of them, the Jackson's chameleon, [...]	<i>Uno di questi, il camaleonte di Jackson, [...].</i> [One of them, the Jackson's chameleon,]	logical connector	<i>BD</i>
[26]	<u>But</u> with a head that looks like a crocodile's.	<i>Con una testa simile a un cocodrillo.</i> [With a head that looks like a crocodile.]	logical connector	<i>BD</i>
[27]	<u>Mom and her calf</u> can finally eat their fill.	<i>Possono finalmente mangiare a sazietà.</i> [They] can finally eat their fill]	subject	<i>Earth</i>
[28]	Ugly or not, <u>this face</u> is [...].	<i>Per quanto orribile, è tuttavia [...].</i> [Though ugly, [it] is however]	subject	<i>BD</i>
[29]	<u>Just</u> a few miles from the coast, [...].	<i>A qualche chilometro dalla costa [...].</i> [A few miles from the coast,]	downtoner	<i>Earth</i>
[30]	[...] than <u>just</u> a way to move insatiable mouths [...].	[...] <i>di un modo per spostare una bocca insaziabile [...].</i> [than a way to move insatiable mouths]	downtoner	<i>BD</i>
[31]	Reaching <u>almost</u> 70 miles an hour, [...].	<i>Raggiungono i 110 chilometri all'ora e [...].</i> [They reach 110 km an hour and]	quantifier	<i>Earth</i>
[32]	But <u>two</u> new discoveries have [...].	<i>Ma scoperte recenti hanno [...].</i> [But recent discoveries have]	quantifier	<i>BD</i>
[33]	[...], where its outrageous hands came in, <u>well</u> , handy.	[...] <i>dove i suoi artigli incredibilmente lunghi gli tornano utili.</i> [where its incredibly long claws came in handy.]	discourse marker	<i>BD</i>
[34]	<u>Now</u> , that's impressive.	<i>È davvero notevole.</i> [It's really impressive.]	discourse marker	<i>Earth</i>

Table 2. Effacement

- subcategories: more explicit or technical (*Earth*: 9; *BD*: 21); shorter and/or simpler (*Earth*: 10; *BD*: 16); collocational (*Earth*: 1; *BD*: 1); change of feature (*Earth*: 1; *BD*: 2); more formal tenor (*Earth*: 1; *BD*: 9); other (*Earth*: 7; *BD*: 2);
- substitution of a modality marker with one indicating a different degree of epistemic modality, here called 'change of modality' (*Earth*: 0; *BD*: 5);
 - substitution of one subject with a different one (*Earth*: 2; *BD*: 4), considering only cases which did not involve relevant changes in the syntactic structure of the sentence;
 - substitution of a short term with its longer form (*Earth*: 0; *BD*: 1);
 - substitution of longer phrasings (verbal or nominal strings) with shorter ones, here called 'lexical condensation', to some extent following Gottlieb's and Lomheim's terminology (*Earth*: 0; *BD*: 11).

Examples for each of these types of Substitution are provided in Table 3.

The following paragraphs outline the possible reasons for these types of Substitution.

As a preliminary consideration, it must be observed that none of the instances of Substitution encountered in the analysis was in any way made compulsory by Italian lexicon or morphosyntax, and a more literal translation would have been possible in every case. Only in one group was substitution guided by purely linguistic considerations, i.e. the Change of Perspective – Collocation subcategory (two items in all).

All the instances of Substitution of noun phrases with deictics or pronouns, of specific verbs or nouns with more generic ones, of neutralization, and of condensation clearly aimed to shorten and/or simplify the target text. This is also true for some instances of the 'change of perspective' category, marked by the tag 'shorter and/or simpler' and exemplified in the table by lines [47], [48], and [49]. *Simplification* accounts for 24.4% of instances of Substitution in *Earth* and 31.1% in *BD*.

Another reason that accounts for a good number of the observed instances of Substitution is *explicitation*. This function clearly emerges in the substitution of generic verbs or nouns with more specific or technical ones, of abstract words and images with more concrete ones, and of pronouns and deictics with noun phrases. It also seems to be the driving force in the 'more explicit or technical' subcategory of the 'change of perspective' cases, and possibly a co-element in other instances, such as [55] and [56]. *Explicitation* accounts for slightly more than 45% of the cases of Substitution in each text.

As seen in Sections 4 and 3.1, *explicitation* has been attested in the translation of scientific texts in forms which partially overlap with the ones observed in these data, namely, substituting pronouns with noun phrases and compact phrases with more explicit ones (Pavesi and Tomasi 2001). It has also been described as a leading need in subtitling (Perego 2003) in the three forms of *culture-based*, *channel-based* and *reduction-based explicitation*. However, in the current videos, no *culture-based* or *channel-based* cases were observed, and *reduction-based explicitation* – i.e. cases in which *explicitation* coexists with Effacement or other forms of *text reduction* – only accounts for 18-20% of the instances of *explicitation* by Substitution found. The remaining 80-82% of the instances of *explicitation* by Substitution are cases where the

[35]	If they don't <u>make it</u> in time, [...]	<i>Se non lo raggiungeranno in tempo, [...]</i> [If they don't <u>reach him</u> in time]	from generic to specific (verb)	<i>Earth</i>
[36]	the spines must have been doing <u>something</u> important	<i>le spine sul dorso devono svolgere una funzione importante</i> [the spines on the back must play <u>some</u> important function]	from generic to specific (noun)	<i>BD</i>
[37]	The <u>herd</u> stays on the move, [...].	<i>Il gruppo è sempre in movimento</i> [...]. [The <u>group</u> stays on the move]	from specific to generic (noun)	<i>Earth</i>
[38]	Most oviraptors looked like birds and <u>stuck</u> to bird-like sizes, [...]	<i>La maggior parte degli Oviraptor somigliano ad uccelli e hanno le dimensioni degli uccelli, [...].</i> [Most oviraptors look like birds and <u>have</u> bird-like sizes]	from specific to generic (verb)	<i>BD</i>
[39]	[...], spring <u>creeps up</u> from the south, [...].	<i>[...], la primavera avanza da sud</i> [...]. [spring <u>advances</u> from the south,]	neutralization	<i>Earth</i>
[40]	[...] but he's met <u>his match</u> here, [...].	<i>ma ha trovato avversari alla sua altezza</i> [...]. [but he's met <u>some</u> equally formidable opponents, [...].	from abstract to concrete	<i>Earth</i>
[41]	[...] with no need for all of that <u>violence</u> .	<i>[...] senza il bisogno di scontri violenti.</i> [with no need for <u>violent fights</u>]	from abstract to concrete	<i>BD</i>
[42]	But <u>it</u> slips from his weakened grasp.	<i>Ma il tricheco scivola via dalla sua presa troppo debole.</i> [But <u>the</u> walrus slips from his weakened grasp.]	from pronoun to noun phrase	<i>Earth</i>
[43]	But was <u>this</u> all really for battle?	<i>Ma tutto questo apparato è veramente solo per combattere?</i> [But is all <u>this apparatus</u> really only to fight?]	from deictic to noun phrase	<i>BD</i>
[44]	And <u>all trails</u> lead to one place: [...]	<i>E tutte portano allo stesso posto: [...].</i> [And <u>all</u> lead to the same place:]	from noun phrase to pronoun	<i>Earth</i>
[45]	150 million years before <u>the dinosaurs'</u> catastrophic end [...]	<i>150 milioni di anni prima della loro fine catastrofica, [...].</i> [150 million years before <u>their</u> catastrophic end]	from noun phrase to deictic	<i>BD</i>
[46]	Mom and her calf forge ahead through <u>treacherous</u> seas.	<i>La mamma e la sua piccola avanzano attraverso mari tempestosi.</i> [Mom and her calf forge ahead through <u>stormy</u> seas]	change of perspective (more explicit)	<i>Earth</i>
[47]	[...] forcing him to a choice he <u>didn't want to take</u> .	<i>[...] costringendolo a una scelta che voleva evitare.</i> [forcing him to a choice he <u>wanted to avoid</u>].	change of perspective (shorter)	<i>Earth</i>
[48]	Winds and currents <u>pull</u> nutrients <u>from the deep</u> . [...].	<i>I venti e le correnti spingono il nutrimento in superficie, [...].</i> [Winds and currents <u>push</u> nutrients <u>to the surface</u>]	change of perspective (simpler)	<i>Earth</i>
[49]	[...] like cleaning up <u>for his big</u> date tonight.	<i>[...] come fare pulizia prima dell'appuntamento galante di stasera.</i> [like cleaning up <u>before</u> his <u>gallant</u> date tonight]	change of perspective (shorter + collocational)	<i>Earth</i>
[50]	Welcome to the world of the pachycephalosaurs, or " <u>thick-headed</u> lizards."	<i>Benvenuti nel mondo dei Pachicefalosauri, le lucertole dalla testa a cupola.</i> [Welcome to the world of the pachycephalosaurs, or <u>dome-headed</u> lizards.]	change of perspective (feature)	<i>BD</i>
[51]	But a quick survey of the dinosaur families <u>shows</u> [...]	<i>Un rapido esame del mondo dei dinosauri, tuttavia, ci rivela [...].</i> [A quick analysis of the dinosaur world, however, <u>reveals us</u>]	change of perspective (more formal tenor)	<i>BD</i>

[52]	Milk is <u>the breakfast of choice</u> here.	<i>Il latte è la scelta migliore per la colazione.</i> [Milk is <u>the best choice for breakfast</u>]	change of perspective (other)	<i>Earth</i>
[53]	But <u>perhaps</u> the most mysterious bird-like dinosaur of all is this one:	Ma il più misterioso dei dinosauri simili agli uccelli è <u>senza dubbio</u> questo: [But the most mysterious bird-like dinosaur of all is <u>certainly</u> this one:]	change of modality	<i>BD</i>
[54]	[...] one thing <u>is</u> for sure: [...]	[...] una cosa <u>sembra</u> ormai chiara: [...]. [one thing <u>seems</u> clear by now:]	change of modality	<i>BD</i>
[55]	As <u>the air</u> rises, the water cools [...].	<i>Quando [le nuvole] salgono, l'acqua contenuta in esse si raffredda [...].</i> [As <u>the clouds</u> rise, the water contained in them cools]	change of subject	<i>Earth</i>
[56]	So huge and fantastic is this predator that he's managed to steal the show, literally, from T-Rex.	[...] così mastodontico ed eccezionale, da rubare letteralmente la scena al <u>Tyrannosaurus rex</u> . [so huge and fantastic to literally steal the show from <u>Tyrannosaurus rex</u> .]	from short to long name	<i>BD</i>
[57]	It may be 43° in the shade, <u>never mind the fact that</u> there is no shade, [...]	<i>Ci sono 43 gradi all'ombra... anche se non c'è ombra.</i> [It's 43° in the shade, <u>even though</u> there is no shade]	condensation	<i>BD</i>
[58]	And no predator, even <u>one with a brain the size of a walnut</u> , [...]	<i>Nessun predatore, poi, neanche il più ottuso, [...].</i> [And no predator, not even <u>the most obtuse</u> .]	condensation	<i>BD</i>

Table 3. Substitution

target text is not only more explicit or clearer, but also considerably longer than if more literal alternatives had been used.

Interestingly, longer phrases compared to literal translations were also observed in several of the other categories, as can be seen in the following examples (possible literal translations are reported in parenthesis): [35] (*faranno*); [36] (*fare una cosa importante*); [40] (*un suo pari; un degno avversario*); [41] (*violenza*); [50] (*spessa*); [51] (*mostra*); [52] (*la colazione preferita*); [53] (*forse*); [54] (*è*); [55] (*l'aria*). This is in sharp contrast with the dominant need of keeping the target text short and simple in subtitling.

Finally, as exemplified in the table, many of the cases of Substitution encountered result in subtitles that are more formal than their literal translations and, consequently, than the original lines.

6.4. Literal Transfer

The category of Literal Transfer was inspired by Gottlieb's Transfer category whereby content is transferred into the target language in a form that resembles the original. English and Italian differ in features such as word order within noun phrases, phrase order within the sentence, the use of singular vs. plural, and collocations. Therefore, correspondence was assessed at phrase level and clause level, disregarding mismatches due to differences between the two morpho-syntactic systems. Taking the clause as the unit of measurement, direct correspondence between subtitles and original lines was found 135 times in *Earth*, and 97 in *BD*. Table 4 offers a few examples.

[59]	Sand dunes give way to prairies and savannah.	<i>Le dune di sabbia lasciano il posto alle praterie e alla savana.</i>	<i>Earth</i>
[60]	This contender, called the superb bird of paradise, [...]	<i>Il rivale, detto paradisea superba, [...]</i>	<i>Earth</i>
[61]	These conifers have needle-shaped leaves.	<i>Queste conifere hanno foglie aghiformi.</i>	<i>Earth</i>
[62]	If he doesn't find land soon in this vast ocean, he will drown.	<i>Se non trova presto la terraferma in questo vasto oceano, affogherà.</i>	<i>Earth</i>
[63]	The playful calf is now drinking 150 gallons of milk a day, but Mom is starving.	<i>Questa piccola giocherellona ora beve quasi 600 litri di latte al giorno, ma la mamma sta morendo di fame.</i>	<i>Earth</i>
[64]	The time of giants had arrived.	<i>È giunto il tempo dei giganti...</i>	<i>BD</i>
[65]	It has been shown over and over again that when evolution capitalizes on one part of the anatomy, other parts may become useless, redundant, and eventually disappear.	<i>È stato più volte dimostrato che se l'evoluzione si concentra su una certa parte anatomica, altre parti possono diventare inutili, ridondanti e infine scomparire.</i>	<i>BD</i>
[66]	No more genes.	<i>Niente più geni.</i>	<i>BD</i>
[67]	The anatomy of Carnotaurus is baffling, to say the least.	<i>L'anatomia del carnotauro è a dir poco bizzarra.</i>	<i>BD</i>
[68]	And the key to success was often using your head.	<i>E la chiave del successo è spesso nell'usare la testa.</i>	<i>BD</i>

Table 4. Literal Transfer

As the examples above show, when Literal Transfer is applied, noun phrases, which frequently correspond to technical terms (e.g. ‘sand dunes’, ‘the superb bird of paradise’, ‘needle-shaped’, ‘land’), are rendered with noun phrases that include the correct technical Italian term (*dune di sabbia*, *paradisea superba*, *aghiformi*, *terraferma*), opting for the shortest Italian term in the rare cases where synonyms exist (e.g. *paradisea* instead of *uccello del paradiso*; *piccolo* instead of *cucciolo*). The original sequence of noun phrases, verb phrases and prepositional phrases is maintained or little altered ([65]; [67]). Verb tenses and voice are translated literally (active with active; passive with passive) into a suitable corresponding Italian verb tense and voice. In this respect, the use of the narrative simple present in [64] and [68] is not a mistake, but rather a choice of preference that the subtitle translator of *BD* consistently made throughout the video. Minor changes can be seen in the use of determiners: for instance, in [60], deictic ‘this’ in ‘this contender’ (*questo rivale*) is replaced by the article *il* in *il rivale* (‘the contender’) and the article in ‘the superb bird of paradise’ disappears in Italian; in [65], in the noun phrase ‘one part of the anatomy’, the marked determiner ‘one’ is correctly rendered with the modifier *certa* (‘specific’; *una certa parte anatomica*), and the multiword expression ‘part of the anatomy’ (*parte dell’anatomia*) is translated with the correct Italian collocation *parte anatomica* (‘anatomical part’). However, minor changes of this type are only natural in translation from English into Italian and are justified by grammar and/or usage.

6.5. Reformulation

Reformulation is a very productive strategy encompassing various types of syntactic changes that are not justified by Italian grammar rules and which have been selected by the subtitle translator over possible literal translations. To some extent, this class

subsumes cases that Gottlieb or Lomheim might have considered as instances of Condensation, and other cases that would have gone under Gottlieb's Paraphrase.

The syntactic changes observed in the videos (63 in all in *Earth*, and 119 in *BD*) were classified as follows:

- from parataxis to hypotaxis (*Earth*: 9; *BD*: 11);
- from hypotaxis to parataxis (*Earth*: 5; *BD*: 9);
- from non-finite clause to finite clause (*Earth*: 3; *BD*: 3); of these, some involved the production of a relative clause (*Earth*: 2; *BD*: 1);
- from verbless clause to finite clause (*Earth*: 3; *BD*: 7);
- from finite clause to non-finite or verbless clause (*Earth*: 2; *BD*: 5);
- from agent to described subject (*Earth*: 5; *BD*: 9);
- from described to agent subject (*Earth*: 1; *BD*: 6);
- from personal to impersonal subject (*Earth*: 13; *BD*: 13);
- nominalization (*Earth*: 6; *BD*: 23);
- verbalization (*Earth*: 10; *BD*: 15); of these, some involved the substitution of a noun or prepositional phrase with a relative clause (*Earth*: 4; *BD*: 8);
- from question to statement (*Earth*: 0; *BD*: 5);
- theme-rheme inversion (*Earth*: 2; *BD*: 6);
- condensation (two paratactic clauses transformed into a single matrix) (*Earth*: 4; *BD*: 7).

Some examples are provided in Table 5.

Of the Reformulation devices above, three are immediately attributable to diamesic transfer: condensation, as it reduces text length; passing from hypotaxis to parataxis, as a means to simplify text structure and increase readability; and passing from verbless clauses to finite clauses, which is another easy means to increase the readability of subtitles. These account for 19% of the cases of Reformulation in each text.

A few of the other devices observed – namely, changing interrogative sentences into affirmative ones; changing the subject of a sentence; and changing the theme-rheme order – are reported by Diaz-Cintas and Remael (2007) as ways to achieve text reduction in subtitling. However, this was not necessarily the case in these videos, as the examples in Table 5 show. In fact, while in [79], [80] and [81] the Italian subtitles are shorter than other possible alternatives closer to the original, in [82], [83], [89], [90], [91], [92] more than one translation exists that would have been closer to the original and shorter than the current ones. Interestingly, these possible alternatives would all have been less elegant, or more informal, than the current ones.

The remaining cases of Reformulation at least partially meet *reduction* and/or *simplification* needs (e.g. [70], [77], and [78]), but not always (e.g. [74], [75], [76], [77]). *Explicitation* is at play, too. This is the case of all instances where verbless clauses become finite clauses in the subtitles, but also in examples from other categories, such as [74], [75], and [76].

Despite this, several categories – from parataxis to hypotaxis; non-finite to finite clause; described to agent subject; from personal to impersonal; nominalization; verbalization; question to statement; theme-rheme inversion – still remain totally or partially unexplained. Some of these categories even go against the general need for simplification that characterizes subtitling.

[69]	Either the caribou will make a mistake, <u>or</u> after a mile or so the wolf will give up.	<i>Se il caribù non farà errori, dopo un paio di chilometri, il lupo smetterà di inseguirlo. [If the caribou will not make mistakes, after a mile or so, the wolf will give up chasing it.]</i>	from parataxis to hypotaxis	<i>Earth</i>
[70]	For a long time, it was assumed that this dinosaur was a water-dweller, <u>and</u> used its unusual headgear as a snorkel.	<i>Per lungo tempo si è pensato che l'animale fosse un anfibio, <u>che</u> usava la sua insolita cresta come un boccaglio. [For a long time it was assumed that this dinosaur was a water-dweller who used its unusual headgear as a snorkel.]</i>	from parataxis to hypotaxis	<i>BD</i>
[71]	This enormous dinosaur has a toothless beak, <u>which</u> would suggest that it ate plants.	<i>Questo enorme dinosauro ha un becco privo di denti, <u>ed</u> era quindi probabilmente erbivoro. [This enormous dinosaur has a toothless beak, <u>and</u> it was probably herbivorous.]</i>	from hypotaxis to parataxis	<i>BD</i>
[72]	The elephants herd their young together, <u>forming</u> a protective circle.	<i>Gli elefanti radunano i piccoli e <u>formano</u> un cerchio per proteggerli. [The elephants herd their young together <u>and form</u> a circle to protect them.]</i>	from hypotaxis to parataxis	<i>Earth</i>
[73]	Get so huge <u>they could ignore</u> predators?	<i>Essere enormi <u>al fine di ignorare</u> i predatori? [Be huge <u>in order to ignore</u> predators?]</i>	non-finite to finite clause	<i>BD</i>
[74]	They're waiting for the call <u>to</u> attack.	<i>Aspettano il segnale <u>che darà</u> inizio all'attacco. [They're waiting for the call <u>that will begin the</u> attack.]</i>	non-finite to finite clause	<i>Earth</i>
[75]	<u>Like</u> the musk ox, pachycephalosaurs [...]	<i>Come succede con i buoi muschiati, anche i pachicefalosauri [...]. [As happens with musk oxes, also pachycephalosaurs]</i>	verbless to finite clause	<i>BD</i>
[76]	<u>Spring in the Arctic</u> , and already the sun never sets.	<i>È primavera nell'Artico, e il sole smette di tramontare. [It is <u>spring in the Arctic</u>, and the sun stops setting.]</i>	verbless to finite clause	<i>Earth</i>
[77]	The mothers follow the same trails <u>their families have</u> followed for decades.	<i>Le madri seguono le stesse piste percorse dagli elefanti per decenni. [The mothers follow the same trails <u>trodden by elephants</u> for decades.]</i>	finite to non-finite clause	<i>Earth</i>
[78]	[...] and arms so small <u>they would make</u> even T-Rex giggle.	<i>[...] ma zampe così minuscole da far sorridere persino il T-Rex. [but arms so minuscule <u>as to make</u> even T-Rex giggle.]</i>	finite to non-finite clause	<i>BD</i>
[79]	[...] the buffalo <u>reach the end</u> of their long migration, [...]	<i>[...] i bufali sono alla fine della loro lunga migrazione [...]. [the buffalo are at the end of their long migration.]</i>	from agent to described subject	<i>Earth</i>
[80]	[...] walks on its hind legs, <u>eats</u> meat [...]	<i>Cammina sulle zampe posteriori. È carnivoro. [walks on its hind legs, <u>is carnivorous</u>]</i>	from agent to described subject	<i>BD</i>
[81]	[...] and they're <u>hungry</u> .	<i>[...] e hanno fame. [and have hunger]</i>	described to agent subject	<i>Earth</i>
[82]	[...] sex in the Late Cretaceous <u>was</u> a roaring success.	<i>[...] la sessualità nel Cretaceo Superiore, <u>conosce</u> i suoi anni ruggenti. [sexuality in the Late Cretaceous <u>knows</u> its roaring years]</i>	described to agent subject	<i>BD</i>

[83]	While <u>most agree</u> that the sail was for advertising, [...]	<i>Mentre c'è accordo nel considerare la vela un mezzo di avvertimento, [...] [While there is agreement in considering the sail a means of warning/signalling.]</i>	from personal to impersonal	<i>BD</i>
[84]	But this time, <u>the winds are calmer</u> [...]	<i>Ma questa volta c'è meno vento [...] [But this time, there is less wind]</i>	from personal to impersonal	<i>Earth</i>
[85]	Using the CT scans to generate a 3-D virtual instrument, [...]	<i>Grazie ad un'accurata ricostruzione computerizzata, [...] [Thanks to accurate computer-generated modelling]</i>	nominalization	<i>BD</i>
[86]	A father, alone in an icy wilderness. <u>He scavenges for food</u> in the permanent darkness.	<i>Un padre vaga solitario in queste lande gelide e inospitali, alla ricerca di cibo nella costante oscurità. [A father roams alone in these icy and inhospitable lands, in search for food in the permanent darkness.]</i>	nominalization	<i>Earth</i>
[87]	[...] and display, in the end, is all <u>about sex</u> .	<i>[...] e ostentare, alla fine, è qualcosa che riguarda la sessualità. [and display, in the end, is something that relates to sexuality.]</i>	verbalization	<i>BD</i>
[88]	The pride rallies <u>for an attack</u> .	<i>Il branco dei leoni si prepara ad attaccare. [The pride prepares to attack.]</i>	verbalization	<i>Earth</i>
[89]	So how did they get from little Coelophysis to, say, this?	<i>C'è da chiedersi allora come si sia passati dai celofisi a questo. [We should ask ourselves, then, how they got from Coelophysis to this.]</i>	question to statement	<i>BD</i>
[90]	Makes sense, right?	<i>Questo secondo la logica corrente. [This according to current logic.]</i>	question to statement	<i>BD</i>
[91]	It's the calves they're after.	<i>Quello che interessa loro sono i cuccioli. [What interests them is the calves.]</i>	theme-rheme inversion	<i>Earth</i>
[92]	With a head that big and powerful and agile, who needs arms?	<i>A che servono le zampe con una testa simile, così agile e potente? [What are the arms for, with a head like that, so agile and powerful?]</i>	theme-rheme inversion	<i>BD</i>
[93]	He tests the barrier, but it stands firm.	<i>La barriera resiste a un primo attacco di prova. [The barrier resists a first trial attack.]</i>	condensation	<i>Earth</i>
[94]	Evolution, it seems, has a strange way of [...]	<i>L'evoluzione sembra avere una capacità particolare nel [...]. [Evolution seems to have a peculiar ability to]</i>	condensation	<i>BD</i>

Table 5. Reformulation

Interestingly, some of these devices – substitution of parataxis with hypotaxis; nominalization; the use of a relative clause in place of other types of secondary clauses or even prepositional phrases; and substitution of personal structures with impersonal ones – have been reported as typical features of scientific translation from English into Italian (Pavesi and Tomasi 2001). They have also been described as linguistic devices that produce a target text of greater formality (Musacchio 1995).

As a matter of fact, an increased level of formality can be observed in almost all of

the examples in Table 5, as well as in many other instances of Reformulation in the two videos, and I believe that increasing the level of formality in the target text was indeed a major driving or co-driving force in several of the cases of Reformulation found. This hypothesis will be discussed in the following section.

Finally, it must be noted that the Reformulation devices listed above were not used systematically, and cases of generic 'you' and inclusive 'we', for example, are also attested in the Italian subtitles (e.g. 'Without that crucial tilt, everything as we know it would be different', rendered as *Senza quell'angolazione perfetta, tutto quello che conosciamo sarebbe diverso*). These cases could have been avoided by passing from personal to impersonal described subjects and would have even produced shorter outputs.

6.6. Increased formality: diamesic shift or cultural issue?

As noted above, many of the subtitles in which one strategy or another was applied appear more formal than the corresponding original lines. This is particularly true in all cases of Reformulation, but also in several cases of Substitution and Effacement. The data also suggest that increasing the level of formality in the target text could possibly be a major driving or co-driving force leading the translators' choices in many cases.

If, on the one hand, an increased level of formality can frequently be observed in subtitles as a consequence of diamesic shift, on the other hand, this phenomenon is also typical of English-Italian translation of scientific written discourse (Taylor 1990; Musacchio 1995; Katan 1999; Scarpa 2001) – and in scientific communication between specialists and non-specialists in particular (Scarpa 2001) – due to differences in cultural orientations between English and Italian cultures (Katan 1999). It is therefore not an idle question to wonder whether diamesic or rather cultural needs drove the translator to change the tenor of discourse in the current materials.

A look at the Italian dubbed versions of the two documentaries may provide some insight into this matter. Dubbing, in fact, does not involve diamesic shift and, although it calls for grammatical normalization, it tends to preserve tenor (see Section 3.2).

In the Italian audio of the National Geographic documentary, the spoken lines completely coincide with the text in the Italian subtitles.

In the Disney production, a very high degree of correspondence was found between the dubbed lines and the subtitles. Only 7.9% of the lines (33 out of 416) show some variation, and the differences involve the following elements: 1. single words (e.g. *orsetto* vs. *orsachiotto*; *via* vs. *pista*; *paradisea* vs. *uccello del paradiso*), the shorter option being used in the subtitles; 2. adverbs or modifiers which are present in the dubbed lines, but absent in the corresponding subtitles (e.g. *Segnano il limite della vegetazione sul [nostro] pianeta e l'inizio della foresta boreale*; *I cuccioli camminano [speditamente] accanto agli adulti*); 3. absence of conjunctions in sentence initial position in the subtitles (e.g. *[Ma] Si espandono di anno in anno*); 4. word order (e.g. *almeno fino a ora* vs. *fino ad ora, almeno*); 5. different reformulation (e.g. *Ed è poco probabile che entrambi i cuccioli raggiungano il loro primo compleanno* vs. *Ed è poco probabile che entrambi i cuccioli sopravvivano dopo il loro primo anno di vita*). The differences attested rarely involve changes in the tenor of discourse and are almost all explained by the need for text reduction in subtitles.

To conclude, in both documentaries, the Italian dubbed lines show the application of the same translation strategies and linguistic devices used in the subtitles, and the same increased level of formality compared to the English original. Consequently, the

increased level of formality observed in the subtitles cannot be a consequence of rendering speech into writing, and should rather be attributed to the translators' attempts to adapt the text to Italian culture.

7. Conclusion

In order to investigate current practices in interlingual subtitling when translating the narrator's voice in science documentaries for a general audience from English into Italian, this study analysed the official, professionally made Italian subtitles of two documentaries in English belonging to different production companies and differing in terms of the narrator's speed of speech.

The data suggested the need to develop and apply a personal classification of subtitling strategies. The resulting classification is based on the observation of semantic and syntactic features of the target text compared to the source text, and includes five strategies: Addition, Effacement, Substitution, Literal Transfer, and Reformulation. Each strategy is further divided into sub-classes connected to the type of linguistic element involved (e.g. modifier, adverb, finite clause, etc.). This classification provided a complete description of each and every sentence in the two videos and attests that a wide range of non-literal translation strategies and language manipulation devices is used in science documentaries, sometimes in combined forms, i.e. more than one strategy at play in the same clause/subtitle.

This classification also supported a critical identification of the possible reasons that made the manipulations desirable to the translators.

As expected from the literature on subtitling (Section 3.1), obvious driving forces of text manipulation were *text reduction*, *simplification*, and *explicitation*. The first two were at work in Effacement, Substitution, and Reformulation, while the third related to Addition, Substitution, and Reformulation. On their own, however, these three elements only explained a percentage of the instances of text manipulation observed. Furthermore, the instances of *explicitation* found only minimally matched those described in the literature on AVT, while they largely shared clarifying components in keeping with those described in the literature on English-Italian scientific translation.

Two other features emerged constantly and across strategies in the data: greater formality; and the longer length of the existing target text, compared to possible, grammatical and more literal alternative translations. Although no quantitative analysis of these two features was made – since they emerged during the discussion of results, rather than during the identification and coding of subtitling strategies – it is nevertheless possible to state that the two are connected, and that achieving greater formality in the Italian subtitles was a driving force that explains text length, as well as several other cases of text manipulation that would otherwise remain unexplained.

Longer text length not imposed by lexico-grammatical limitations – i.e. subtitles which are considerably longer than possible, grammatical and more literal alternative translations – was observed in instances of *explicitation*, but noticeably also in cases where *explicitation* was not involved. This is unusual in subtitling, but not in scientific translation, where using longer rather than shorter sentences has been observed as a feature connected to greater formality (Musacchio 1995).

An increased level of formality often appears in subtitles, as a consequence of

adapting spoken text to written norms (Section 3.1); at the same time, it is also a rhetorical and cultural habit in the translation of technical and scientific discourse from English into Italian (Section 4). In order to decide which of the above was the case in the current materials, the Italian subtitles were compared to the corresponding dubbed lines. Dubbing, in fact, does not involve diamesic shift and, although it calls for grammatical normalization, it tends to preserve tenor (see Section 3.2). This comparison showed that almost all of the tenor-lifting devices used in the creation of the Italian subtitles are also attested in the Italian dubbed versions of the two documentaries. For this reason they cannot be considered a consequence of diamesic shift.

This leads me to conclude that the observed shifts in the tenor of discourse represent the translators' attempts to adapt the text to Italian culture and that achieving greater formality should be considered a driving force in the subtitling of science documentaries, on a par with *explicitation*, *simplification* and *text reduction*. If we admit this as a (co-) driving force that conditioned the translators' choices, most of the instances of text manipulation that could not be explained by the need to clarify, simplify and/or shortening find their explanation, including the translators' preference for longer phrasings when shorter ones would have been possible and easily identifiable.

It must be stressed, however, that the use of tenor-lifting devices was not systematic. This suggests tension in the translator's mind, or an attempt to find some sort of balance between the contrasting needs of adopting a more formal tenor, as required by Italian culture, and showing that the subtitles are actually spoken lines, though they are rendered in writing.

Finally, the current analyses were performed on two science documentaries with an informative intent and targeting a general audience. It would be interesting to extend this type of analysis to a wider collection of texts, including documentaries focusing on topics other than natural science (e.g. history; the arts), as well as to science documentaries targeting an audience of specialists. Furthermore, quantitative analysis of instances of greater formality and longer length could be useful to provide quantitative data on, and better clarify, the observed tension between specific needs connected to audiovisual material and the rhetorical habits of the target culture.

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