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Terminological equivalence: Probability and consistency in technical translation

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0 Introduction

The study of terms and terminologies and the study of technical translation and translations enjoy a symbiotic relationship. Terms make an important semantic contribution to lexically dense texts dealing with specialist subject matter, and hence to their translation. On the one hand, data on terms and their equivalents, e.g. in technical dictionaries or termbases, support technical translators in their decision-making. On the other hand, the compilation of codified lexical resources increasingly draws on texts, including translations, as a basic data source. Codified lexical resources and texts (original or translated) are, however, organisms of different kinds. While dictionaries, glossaries, termbases, and so on, are themselves artefacts with a physical embodiment (whether digital or paper), the headwords or entry terms which they use to identify each entry are abstract entities i.e. lexemes. The words or terms in texts are, by contrast, particular forms which perform *inter alia* various textual and referential functions. Translation competence therefore includes knowledge of how to navigate the path between these symbiotic organisms in a bi-directional way: firstly in using codified resources to solve terminological problems when interpreting a given source text and then creating a new text in the form of a translation, and secondly in using texts as a source of data for compiling, for example, personal glossaries or providing feedback to a terminology manager to extend or update existing resources.

However, from the perspective of Terminology Studies – understood here as *Terminologiewissenschaft*, at least as viewed in earlier publications such as Wüster 1974 and Felber 1984 – describing the usage of terms (as in text) was regarded as a preliminary step towards normalising that use in a terminological standard with a view to clarifying professional communication (understood as largely technical communication) in order to avoid the ‘intolerable confusion’ which, it was argued, would arise from ‘free development of terminology’ (Felber 1984:15). This claim rested on at least two assumptions: that there are clear differences in the ways that communication works in general language (LGP) and in special languages (LSPs); and that standardised terms (and in the case of translation, their equivalents) could be slotted consistently into texts in order to create the desired meaning. Subsequent research has challenged these assumptions on both philosophical grounds (e.g.

maintaining that there is a constructed understanding of the world rather than an objective reality) and empirical grounds arising from the analysis of texts (and their translations) (e.g. Rogers 1999).

In this paper, the key notion of equivalence will be discussed from a terminological point of view but one which is rooted in textual analysis.

1 ‘Textual equivalence’

The key notion of equivalence has, in the history of Translation Studies, become increasingly problematised and differentiated according to formal, semantic, pragmatic and textual criteria (see, for instance, Koller 1979:159-266). Even if we confine its scope to lexical equivalence, the problem remains of where the equivalence lies: in the codified resource as part of a lexical system or in the source text-target text relation. The focus in Translation Studies is clearly on text, whereas in Terminology Studies it has been on system. In the onomasiological approach favoured in the largely German/Nordic approach to terminology, equivalence has been defined as a one-to-one mapping of characteristics of a concept (e.g. *square root* in English and *Quadratwurzel* in German in the subject field of Mathematics). But it is also acknowledged that in most cases it is a question of establishing the *degree* of equivalence, as determined by the degree of ‘coincidence’ of the intension of the concept in each system (Felber 1984:152). While varying degrees of equivalence can be reflected in a codified resource by lexicographical symbols, or, more recently (e.g. in concept-based termbases) through a combination of definitions in each language combined with an additional remark to highlight differences, this view of equivalence still focuses on only one aspect: denotational equivalence. What happens when a term is plucked from a dictionary and inserted into a text?

As long ago as the 1960s, Catford distinguished between ‘formal correspondence’ (interlingual) and ‘textual equivalence’ (intertextual) (Catford 1965). While early linguistically-based scholarship in Translation Studies such as that of Catford has been much criticised over the decades, particularly following the many so-called ‘turns’ (pragmatic, cultural, functional, empirical: see, for example, Snell-Hornby 2006), his approach still offers an interesting perspective from a textual point of view if text is understood in terms of its relationship to language system (*parole/langue*) rather than in any other extra-linguistic or cultural dimensions. Catford states:

In a text of any length, some specific SL [source language] items are almost certain to occur several times. At each occurrence there will be a specific TL [target language] textual equivalent (Catford 1965:29-30).

Catford’s notion of equivalence therefore shifts the focus away from degrees of equivalence on a system level to the probability of equivalence based on a distribution throughout a text. Accordingly, the relation between an SL term and a TL term can be expressed as:

a probability, in terms of the probability scale in which 1 means ‘absolute certainty’ and 0 means ‘absolute impossibility’ (Catford 1965:30).

Hence, if term A in the Source Text (ST) is always translated as term A' in the Target Text (TT), this suggests a one-to-one equivalence of A and A' which can be represented unproblematically in a bilingual dictionary, at least, in one language direction, even if it does not explain anything about the nature of the relationship. A probability of less than one indicates variation in the lexical choices made by the translator in the TT for term A, and hence, a lack of consistency if seen from a prescriptive, purely denotative point of view.

2 Consistency and variation in lexical choice

Consistency in the selection of terms is usually promoted as an essential feature of good technical writing, and has been cited as one of the advantages of machine translation over human translation (Vasconcellos 2001:697). In other words, the avoidance of synonymy within a text and, in turn, in its translation, is seen as a communicative virtue. While it is certainly the case that a use of synonyms which is motivated purely by stylistic considerations such as the avoidance of repetition can be outweighed by considerations of clarity in certain textual genres, text-based research has demonstrated that synonymy can be functional (see, for instance, Rogers 1997 for genetic engineering and Temmerman 2000 for the life sciences).

It is well-known, however, that variation in the form of synonymy is widespread in technical writing practice (hence, advice to avoid synonymy for the sake of comprehensibility is common: see, for instance, Göpferich 2002:185). Furthermore, such intratextual variation is overlaid with intertextual variation in translation. Baker asserts, for example, that ‘networks of lexical cohesion’ are impossible to reproduce in translation ‘even in non-literary texts’ (Baker 1992:206;207). There seem, then, to be potential tensions between the demands of lexical consistency and those of patterns of lexical cohesion across languages.

One way of studying this problem in technical texts is to analyse lexical chains as an aspect of textual cohesion. By lexical chain is meant here ‘cohesive ties sharing the same referent’, lexically expressed (see Rogers 2007a:17). An onomasiological approach would view this as a chain of lexical designations (terms) of the same concept.

3 A case study

A genre in which a ST term-TT term relationship could reasonably be expected to have a textual equivalence probability of one would be instructions for use, for, say, a piece of medical equipment, as a need for consistency in term selection and translation is implied by the purpose of the text. Given the safety-critical operative function of such a text, clarity of communication can be expected to be a priority, suggesting that synonymy should be avoided since it may cloud the referential function of the instructions in relation to the equipment and/or to any non-verbal representations of the object or its parts in the text such as diagrams or photographs.

The text which is discussed here (see also Rogers 2007a; 2007b where the data are discussed more fully) is a set of instructions for patients suffering from sleep apnoea on how to use an electrically powered breathing aid. The whole device consists of a mask which is secured over the face, connected by a valve to a tube which is in turn connected to the small electric motor. It is the valve which is the focus of discussion here. The original text is German (1071 words), the translations French (1343 words) and English (1263 words) (<http://www.weinmann.de>).

Analysis of the German ST reveals that four expressions are used to refer (total 36 occurrences) to the valve: *Ausatemsystem Schalldämpfer*, *Gerät*, *Schalldämpfer* and *Ausatemsystem*. The full compound is only used once, near the beginning of the text; the generic *Gerät* also only occurs once. The clipped variant of the full compound, *Schalldämpfer* is the most frequent (28 occurrences), followed by the other component of the compound, *Ausatemsystem* (6 occurrences). The two components of the full compound have the potential to perspectivise the two functions of the device, namely to aid breathing for the patient and thereby to reduce noise (snoring) for those sleeping near-by.

Intratextual variation in the use of expressions for the same part of the device is also found in the French and English translations, but the pattern of variation does not mirror exactly that of the ST. This is immediately apparent from the fact that in the French translation, seven

expressions are found for the valve, and in the English only three. The French expressions are: *valve d'expiration de type silencieux*, *silencieux*, *dispositif*, *produit*, *valve d'expiration*, *vanne d'expiration*, *toutes les pièces*. Again, the full term is used only once (but suggesting explicitly other *types* of breathing aid which do not suppress noise), with the noise-suppressant function of the device dominating the text in the form of the clipped term *silencieux* (27 occurrences). The basic patient-oriented function of the device is less in focus (*valve d'expiration* occurs four times, *vanne d'expiration* only once), as in the German. The generic expressions each occur only once. In addition, there is one grammatical co-referent in the French text: *il*; this is the only non-lexical co-referent in the three lexical chains analysed, probably because of the potential problems of anaphor resolution and the safety-critical nature of the text. The lexical chain of co-referents for the valve in the English TT shows less variation than either the German original or the French translation. There is no superordinate term covering both functional aspects of the valve such as the putative *exhalation and muffling system*. Instead, the term *muffling system* is widely used (32 occurrences) with 3 occurrences of *exhalation system* and two of *device*.

When the patterns of variation are considered across the three texts, there are three instances where the terms do not match between the German and the English, and five which do not match between the German and the French:

German original	English translation	French translation
Schalldämpfer	muffling system	dispositif
Schalldämpfer	muffling system	il
Schalldämpfer	muffling system	toutes les pièces
Ausatemsystem	device	valve d'expiration
Ausatemsystem	muffling system	vanne d'expiration
Ausatemsystem	muffling system	silencieux

Tab. 1: Occurrences of non-matches (shaded cells) of co-referents in the three lexical chains

In all other cases, there was a one-to-one match between *Schalldämpfer* / *muffling system* / *silencieux*, and between *Ausatemsystem* / *valve d'expiration* / *exhalation system*, with the full compound *Ausatemsystem Schalldämpfer* translated by *muffling system* in the English.

In terms of probabilities (see Rogers 2007b:22 for calculations) for the terms occurring in the lexical chains, there are only three cases of a probability of one. In the German-French translation direction, *Ausatemsystem Schalldämpfer* is translated as *valve d'expiration de type silencieux*, but as there is only one occurrence of the full compound in the German original, this is not of any note. In the German-English direction, there are two cases of a probability of one. The first concerns the textual equivalent of the single occurrence of the full compound, the second of the all-pervasive *Schalldämpfer*. Both have *muffling system* as their textual equivalent; hence Catford's 'absolute certainty' (1965:30) is not applicable in the reverse translation direction. Indeed, *muffling system* has three¹ textual equivalents in the German: *Ausatemsystem Schalldämpfer*, *Schalldämpfer* and *Ausatemsystem*.

Nevertheless, there is a relatively high probability for the pair *Schalldämpfer* / *silencieux* (0.89) (as well as the *Schalldämpfer* / *muffling system* probability of one) but lower probabilities for *Ausatemsystem* / *valve d'expiration* (0.67) and *Ausatemsystem* / *exhalation*

¹ In fact, it has four, as there is a broader concept which turns out to subsume the whole of the device plus the documentation: *Schalldämmsystem (système insonorisant)*. For further discussion see Rogers 2007a.

system (0.50). There is therefore greater variation in textual equivalence when the breathing function is in focus in the ST.

The non-reversibility of textual equivalence as demonstrated here has implications for bilingual lexicography and terminography, indicating complex mappings of many-to-one and one-to-many items, with reversible one-to-one mappings being less frequent. In terms of the communicative message, there is a core of stability around the central terms *Schalldämpfer* / *silencieux* / *muffling system*, but certainly not full consistency, ‘even’ in this safety-critical text.

4 Conclusion

The limited data discussed in this paper provide no counter evidence to Baker’s assertion that lexical networks are not exactly transferable in translation, although a core of stability was found in the lexical chains and their translations. Nevertheless, the French translator introduced more variation and the English translator less. The question remains, of course, whether the translations can be regarded as of good quality and fit-for-purpose, but similar questions also arise about the ST. The greater variation in the French also raises questions about possible differences and preferences in particular languages with respect to the patterning of lexical chains.

What is clear is that there is room for further empirical research to explore whether the notion of terminological consistency in the translation of technical texts is a feasible and communicatively relevant goal of technical writing and translation and what the translator’s expertise is in balancing decisions in this context. Finally, there are implications for the operation of computer-assisted translation tools such as translation memory, which reconstructs texts on the basis of segmented units which are not necessarily re-presented in the same order in new texts.

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