



Terminological equivalence in technical translation: A problematic concept¹?

St. Jerome and technical translation

Margaret Rogers

University of Surrey

A St. Jerome's Day lecture provides a welcome chance to make one of those satisfyingly unexpected links: between Bible and technical translation. The Bible is not generally thought of as a technical text but some of the problems faced by Bible translators, as well as their problem-solving strategies, are still familiar today. Three examples illustrate the fact that establishing terminological equivalence has long been a challenge. Kelly (1979:126) reports that in the 4th century Jerome employed a rabbi as a linguistic informant when translating the Hebrew Old Testament; according to Bassnett (1991:47), in the 14th century the (second) Wycliffite Bible (1380-1384) translation involved 'counselling "with old grammarians and old divines"' about hard words and complex meanings'; and in the 16th century, Luther consulted foresters, gamekeepers and so on, for their knowledge of specialist terminology (Woodsworth 1998:41).

In the 21st century, such consultations continue alongside the use of documentation, such as source texts and their translations, in order to solve terminological problems. This paper aims to highlight some difficulties in identifying equivalence between terms in parallel texts, one source text and two translations. In the first instance, various equivalence relations in the three texts will be analysed in the context of 'textual equivalence' (Catford 1965; Baker 1992). On the basis of this analysis, there follows a discussion of the implications for the codification of equivalence in bilingual and multilingual termbases in the context of what can be assumed about the expertise of specialist translators.

Preliminaries

The following explanations and remarks are offered in order to clarify the scope of this paper.

Technical text and terms

Key terms are understood as follows:

- 'technical text': a text dealing with technical (e.g. book-binding) or technological (e.g. computer hardware) subject fields or 'domains';
- term: a lexical unit with a specialised meaning relating to a particular domain e.g. *virus* (information technology) versus *virus* (microbiology), *platform* (general language relating to train stations) versus *platform* (software); a term can be multiword e.g. *computerized axial tomography* or an abbreviation e.g. *CAT* or *CT*

¹ The data used in this paper are also used in Rogers (2007).

Equivalence

Over the last decades, one of the most striking developments in the relatively new discipline of Translation Studies has been the problematisation of the notion of equivalence. Various typologies of equivalence have emerged (notably Koller 1979:159-266; see also Koller 1989 for a summary in English) and many notions of equivalence have been criticised from a textual or ideological point of view (see, for instance, Snell-Hornby 1988). One of the key issues to emerge has been the nature of equivalence as a formal relation at system level (*langue*) or as a relation between items in texts (*parole*). The now dominant view in Translation Studies is that intertextual equivalence is the real issue. However, for bilingual terminographers (and even specialist translators storing their *ad hoc* data), the goal is to represent lexical items as equivalents at system level in some kind of terminology collection (or personal 'glossary'), although the lexical data on which this eventual codification is based are 'extracted' from running texts. In this paper some of the problems of moving between text and system will be explored on the basis of a case study of two translations of a set of instructions for use for medical equipment (see below for more details).

In order to explore this topic, I have chosen to return to an early proposal for a distinction between 'formal correspondence' (interlingual) and 'textual equivalence' (intertextual) by Catford, as his emphasis² on *lexical* equivalence does not directly constrain a discussion of *terminological* behaviour:

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).

So understood, the equivalence relation 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).

We return to the notion of probability and how it can be interpreted below.

Lexical chains

In this section, the notion of textual equivalence is expanded in order to develop a framework for analysing terminological equivalence in the chosen texts.

Textual equivalence

A different understanding of 'textual equivalence' has been developed by Baker (1992) to describe cohesive patterns in source and target texts (see, for instance, Rogers 2006 for a re-assessment in relation to Functional Sentence Perspective). Baker asserts what translators recognise intuitively, namely that:

... it is impossible to reproduce networks of lexical cohesion in a target text which are identical to those of the source text. (Baker 1992:206)

The reasons given include the occurrence in source texts of idioms which participate in lexical chains in which literal and metaphorical uses may both occur, the lack of ready lexical

² It would be unfair to claim that Catford is exclusively concerned with word-based equivalence as he also discusses the creation of textual equivalence through syntactic means.

equivalents leading to the use by the translator of superordinates, paraphrases and loan words, and the constraints imposed by the grammatical structure of the target language (Baker 1992:206-7). But there seems to be an implicit assumption – which Baker suggests is not necessarily the case – that specialist texts may present fewer problems:

Significant shifts do occur, *even* in non-literary text. (*emphasis added*) (Baker 1992:206)

In the present paper, these two understandings of ‘textual equivalence’ – lexical and cohesive – will be combined in order to explore further the notion of *intertextual* equivalence: where Terminology Studies normally focuses on interlingual equivalence, the focus here will initially be on intertextual equivalence, before some implications for establishing interlingual equivalence on the basis of intertextual equivalence are considered. The notion that lexical chains vary significantly ‘even in non-literary text’ will be explored as part of this discussion.

Terms and cohesion

Headwords in specialist dictionaries or entry terms in termbases are lemmas: abstract forms which represent a range of inflectionally variable word forms. They perform a formal function in so far as they aid retrieval by human users or computer programs through pattern matching, and serve as labels or headers for structured sets of data and metadata. Definitions which are part of those entries provide semantic information in the form of denotations, applying to the whole class of objects – material or immaterial – covered by the lemma, whereas in text, the semantic relation is one of reference by terms as word forms to ‘what they [stand] for on particular occasions of their utterance’; in other words, reference is an ‘utterance-dependent notion’ (after Lyons 1977:176).

But the referential function is not the only one which terms in texts fulfil. They also help to create ‘texture’ (Halliday & Hasan 1976) or ‘textuality’ (Beaugrande & Dressler 1981) through lexical chains as cohesive devices. For Halliday & Hasan (1976) lexical cohesion is created in a number of ways which they refer to as ‘reiteration’: repetition, synonym, near-synonym, superordinate and general word. Hoey (1991) speaks of ‘repetition’ in the form of simple lexical repetition, complex lexical repetition, simple paraphrase, complex paraphrase and superordinate. A narrow view of a lexical chain would restrict it to chains of words which are linked through inflectionally related *forms*, for instance, of singular and plural forms of a noun. A broader view, which will be adopted here, encompasses ‘cohesive ties sharing the same referent’ which are lexically expressed (Rogers 2007:17). In other words, a lexical chain is understood here to be composed of co-referential expressions which, owing to the nature of term formation in many languages, are not necessarily single orthographic words. Another way of viewing this, from a more conventional terminological or onomasiological perspective, is to consider all designations of a concept within a text as forming a lexical chain.

Catford’s probabilistic notion of textual equivalence and terms

Terms are often assumed to be precise in their reference (extension) and in their sense (intension) when compared to non-specialist words. If this is the case in each of two languages, then 1:1 equivalence should normally follow in technical texts, at least within a particular subject field. In such a view, the translation of terms in technical texts becomes a simple substitution exercise, with appropriate morphological adjustments³ for number or case (for nominal terms), agreement (adjectival terms) and conjugation (verbal terms). But as we

³ Catford does not consider morphological variation when discussing textual equivalence.

have seen from the discussion of lexical cohesion above, ‘even in non-literary text’ patterns of lexical cohesion are unlikely to match between source and target texts. Or could there be exceptions, for example, in texts where consistency and precision are crucial?

A Case Study

The texts

Technical texts often deal with objects which are clearly observable and hence provide good sensory evidence of meanings. Indeed, for certain texts to fulfil their purpose, the clarity of the relation between the text, including verbal and non-verbal signs, and the object of reference is crucial. Safety-critical texts such as instructions for use of medical equipment are a case in point.

The texts chosen for analysis here are taken from the website of a German company (<http://www.weinmann.de/>) which produces a breathing device designed to relieve the symptoms of sleep apnoea. The German original (1071 words) has been translated into English (1263 words) and French (1343 words) and published on the company’s website. In view of the safety-critical nature of this genre and subject field, it seems reasonable to assume that core features of the device will be referred to in a consistent way within the source text and translated in a consistent way in the target texts. The probability of exact ‘textual equivalence’ (or ‘absolute certainty’) in Catford’s sense (1965: 30) therefore seems to be high.

The device

The device consists of a nasal mask, an electronic device to power the system, a tube connecting the nasal mask to the power device, and a valve connecting the tube to the nasal mask which has the dual function of aiding the exhalation of air and suppressing noise. This dual function reflects the medical role of the device to prevent long pauses in the patient’s breathing on the one hand and to reduce noise for those sleeping near the patient on the other hand. Figure 1 (p. 17) is a conceptual representation of the whole device.

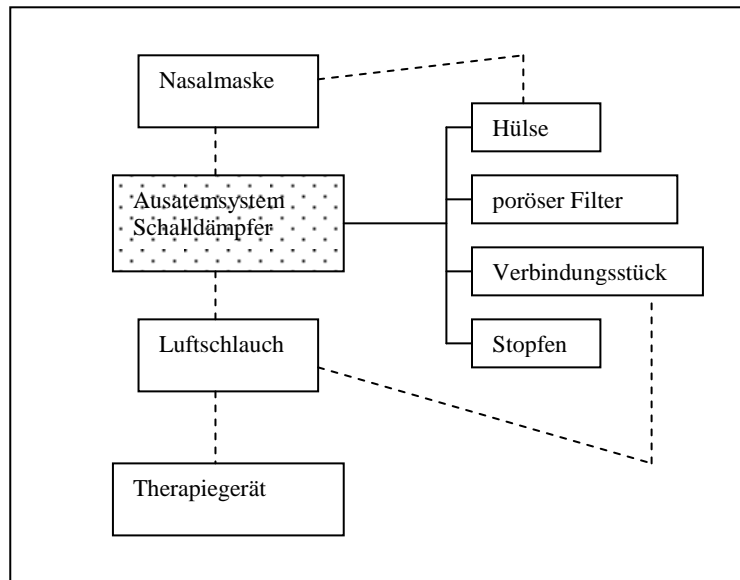


Figure 1: A conceptual representation of the whole device showing part-whole relations (solid lines) and spatial connections (broken lines) (reproduced from Rogers 2007:21)

The item in the device which is the focus of the analysis here is the regulating valve (shaded in Figure 1), which consists of a sleeve, a porous filter, a connecting piece and a plug: this is referred to as *Ausatemsystem Schalldämpfer* in the German, but in English simply as a *noise suppressor* on the company's website. In the instructions for use in the English translation, two terms are used: *muffling system*, and much less frequently *exhalation system*. The distribution of these terms, as well as the French translations, is discussed below.

Lexical chains in source and target texts

In order to establish how stable or variable co-reference is within each text and between texts, Table 1 shows how the valve is referred to in order of mention in each text. The lexical chains in all texts feature:

- simple lexical repetition e.g. *muffling system*, *muffling system*
- shifts between hyponym and hyperonym and between hyperonym and hyponym shifts e.g. *silencieux - dispositif*; *dispositif - silencieux*
- synonymy, understood as (co-)reference to the same item e.g. *Schalldämpfer* – *Ausatemsystem*, even if from different perspectives.

German original	English translation	French translation
Ausatemsystem Schalldämpfer Schalldämpfer Schalldämpfer Schalldämpfer	muffling system muffling system muffling system muffling system	valve d'expiration de type silencieux silencieux dispositif silencieux
Gerät Ausatemssystem Schalldämpfer Schalldämpfer Schalldämpfer	device device muffling system muffling system muffling system	produit valve d'expiration silencieux silencieux silencieux

English
muffling system
device
exhalation system

Table 2b: Designations in the English target text for the valve component

<i>French</i>
valve d'expiration de type silencieux
silencieux
dispositif
produit
valve d'expiration
vanne d'expiration
toutes les pièces
système insonorisant*

*Table 2c: Designations in the French target text for the valve component (*as for 'Schalldämmsystem' in Table 2a)*

Both the original German and the French translation show two forms of compound clipping, a kind of 'double-ended' clipping: *Ausatemsystem Schalldämpfer* → *Schalldämpfer*, and → *Ausatemsystem*, and *valve d'expiration de type silencieux* → *silencieux* and → *valve d'expiration*. Whether this variation is functional, e.g. reflecting the dual function of the device, is questionable (see Rogers 2007: 29). The English does not have an equivalent umbrella term e.g. *exhalation and muffling system*, and uses either *exhalation system* or *muffling system*.

The pattern of the German chain i.e. one occurrence of the full compound (*Ausatemsystem Schalldämpfer*) followed by multiple occurrences of the more frequent clipped term (*Schalldämpfer*), is matched in most cases in the French except for three occasions: on two occasions a general expression is used in the French (*dispositif*; *toutes les pièces*) instead of *silencieux*, on another a pronoun (*il*), the only example of a grammatical tie in the three chains. But *silencieux* is also used to translate *Ausatemsystem* on one occasion, otherwise translated as *valve d'expiration* or *vanne d'expiration*. So while there is a high probability that *Schalldämpfer* is translated as *silencieux*, the relation is not an exclusive and reversible one. Nevertheless, there is a fairly close shadowing here, although one particular part of the chains, as shown in Table 3 (p. 20), exhibits less stability.

German original	English translation	French translation
Schalldämpfer	muffling system	dispositif
Schalldämpfer	muffling system	silencieux
Gerät	device	produit
Ausatemsystem	device	valve d'expiration

Table 3: Extract from the lexical chains showing non-matching patterns

Here, each chain extract follows its own pattern:

- German: clipped compound, clipped compound, general word, synonym (also derived from the full compound)
- English: compound, compound, general word, general word
- French: general word 1, clipped compound, general word 2, synonym (also derived from the full compound)

If the general words and expressions are excluded from each chain, a clearer overall picture is likely to emerge with respect to terminological equivalence, our main concern here. To this end, Tables 4a, 4b and 4c isolate from the lexical chain each of the three core German terms, namely: *Ausatemsystem Schalldämpfer*, and its two clipped variants, *Schalldämpfer* and *Ausatemsystem*. It can be seen, as indicated above, that despite the intratextual terminological variation, there is still nevertheless a high probability of textual equivalence between certain terms, such as *Schalldämpfer* / *muffling system* / *silencieux*, although less so in other cases such as *Ausatemsystem* / *exhalation system* / *valve d'expiration*. As there is only one occurrence of *Ausatemsystem Schalldämpfer*, there is no possibility for intertextual variation (if the German source is taken as the starting point).

German original	English translation	French translation
Ausatemsystem Schalldämpfer	muffling system	valve d'expiration de type silencieux

Table 4a: All occurrences of 'Ausatemsystem Schalldämpfer' and its textual equivalents

German original	English translation	French translation
Schalldämpfer	muffling system	silencieux
Schalldämpfer	muffling system	dispositif
Schalldämpfer	muffling system	silencieux
Schalldämpfer	muffling system	silencieux
Schalldämpfer	muffling system	silencieux
Schalldämpfer	muffling system	silencieux
Schalldämpfer	muffling system	silencieux
Schalldämpfer	muffling system	silencieux
Schalldämpfer	muffling system	silencieux
Schalldämpfer	muffling system	silencieux
Schalldämpfer	muffling system	silencieux

Schalldämpfer	muffling system	silencieux
Schalldämpfer	muffling system	silencieux
Schalldämpfer	muffling system	silencieux
Schalldämpfer	muffling system	il
Schalldämpfer	muffling system	silencieux
Schalldämpfer	muffling system	silencieux
Schalldämpfer	muffling system	silencieux
Schalldämpfer	muffling system	silencieux
Schalldämpfer	muffling system	toutes les pièces
Schalldämpfer	muffling system	silencieux
Schalldämpfer	muffling system	silencieux
Schalldämpfer	muffling system	silencieux
Schalldämpfer	muffling system	silencieux
Schalldämpfer	muffling system	silencieux
Schalldämpfer	muffling system	silencieux
Schalldämpfer	muffling system	silencieux
Schalldämpfer	muffling system	silencieux

Table 4b: All occurrences of 'Schalldämpfer' and its textual equivalents (highlighted cells show variation from the dominant pattern of textual equivalence)

German original	English translation	French translation
Ausatemsystem	device	valve d'expiration
Ausatemsystem	exhalation system	valve d'expiration
Ausatemsystem	exhalation system	valve d'expiration
Ausatemsystem	muffling system	vanne d'expiration
Ausatemsystem	exhalation system	valve d'expiration
Ausatemsystem	muffling system	silencieux

Table 4c: All occurrences of 'Ausatemsystem' and its textual equivalents (highlighted cells as in Table 4b)

In the next section, the implications of these patterns of textual equivalence for codification i.e. 'formal correspondence', are considered.

Textual equivalence and formal correspondence

As noted earlier, while Translation Studies is mainly concerned with intertextual equivalence, Terminology Studies is also concerned with interlingual equivalence in so far as codified terminology collections may be built on the basis of existing documentation.

Tables 5 and 6 show how the limited variation noted in the previous section is realised by specific expressions between German and English and German and French respectively. Column two shows a probability of 1:1 equivalence from the German source to the English and French targets, i.e. taking directionality of translation into account. Column 3 shows how some source-text terms have more than one textual equivalent. Probabilities of equivalence are not, however, necessarily reversible. We return to this below.

As reflected in Tables 4b and 4c above, the German-French equivalences show less stability than the German-English, as both *Schalldämpfer* and *Ausatemsystem* each have three possible equivalents in the French.

German ST	Only English equivalent	Possible English equivalent
Gerät	device	
Ausatemsystem Schalldämpfer	muffling system	
Schalldämpfer	muffling system	
Ausatemsystem		muffling system device exhalation system
Schalldämmsystem	muffling system	

Table 5: Correspondences between co-referential terms in the German source text and the English target text

German ST	Only French equivalent	Possible French equivalent
Gerät	produit	
Ausatemsystem Schalldämpfer	valve d'expiration de type silencieux	
Schalldämpfer		silencieux dispositif toutes les pièces
Ausatemsystem		silencieux valve d'expiration vanne d'expiration
Schalldämmsystem	système insonorisant	

Table 6: Correspondences between co-referential terms in the German source text and the French target text

Taking into account the most frequent textual equivalents for each of the three German terms, the probabilities of Catford's textual equivalence can be calculated as in Table 7.

German source text term	<i>f</i>	Textual equivalent	<i>f</i>	probability
Ausatemsystem Schalldämpfer	1	valve d'expiration de type silencieux	1	1.0
		muffling system	1	1.0
Schalldämpfer	28	silencieux	25	0.89 (25/28)
		muffling system	28	1.0 (28/28)
Ausatemsystem	6	valve d'expiration	4	0.67 (4/6)
		exhalation system	3	0.50 (3/6)

Table 7: Probabilistic patterns of textual equivalence for the most frequently-occurring terms (adapted from Rogers 2007:30)

How could these probabilities be used to shape multilingual entries in a termbase? The most likely formal correspondences are clearly those with the highest probability, i.e. as indicated in Table 7. In fact, the probability of equivalence for *Schalldämpfer* / *silencieux* can be increased to 1.0 as the three cases of non-equivalence are due to the translator's use of generic or grammatical words. The probability for *Ausatemsystem* / *exhalation system* also rises to 0.60 if the generic alternative is omitted from the calculation, but the same does not apply to the probability for *Ausatemsystem* / *valve d'expiration*, as the alternatives are themselves terms (including the apparent synonym *vanne*⁴ *d'expiration*, and *silencieux*, the textual equivalent of *Schalldämpfer*).

Nevertheless, for a monodirectional bilingual entry, the problem is relatively simple to solve, as in Table 8.

German source term	English equivalent	French equivalent
Ausatemsystem Schalldämpfer	muffling system	valve d'expiration de type silencieux
Schalldämpfer	muffling system	silencieux
Ausatemsystem	exhalation system	valve d'expiration

Table 8: Most likely formal equivalents for German-English and German-French monodirectional bilingual entries

A greater codification challenge is presented when decisions have to be made regarding the reversal of the translation direction. In the texts studied there is, of course, only one translation direction. But if these texts form the basis for establishing formal equivalence for terminographical purposes, then there is an implicit assumption of bi-directionality, which may not be justified.

The possibilities of equivalence are reproduced in Tables 9a and 9b for the key terms *muffling system* and *silencieux* with English and French as source languages respectively and German as the target language. We can recall that *Schalldämmsystem* turned out to designate a broader concept; it is included here as the translation choice in English of *muffling system* as its textual equivalent reveals even more strongly what I will call the 'portmanteau' nature of this core term.

English source term	<i>f</i>	German equivalent	<i>f</i>	Probability
muffling system	33	Ausatemsystem Schalldämpfer	1	0.03 (1/33)
		Schalldämpfer	28	0.85 (28/33)
		Ausatemsystem	2	0.06 (2/33)
		Schalldämmsystem	1	0.03 (1/33)
		Ø	1	0.03 (1/33)

Table 9a: Possible formal equivalents for English-German monodirectional bilingual entries

⁴ The term *vanne* is not strictly synonymous with *valve* as it denotes a particular direction of operation, as in a sluice gate, for example.

French source term	<i>f</i>	German equivalent	<i>f</i>	Probability
silencieux	27	Schalldämpfer	25	0.93 (25/27)
		Ausatemsystem	1	0.04 (1/27)
		∅	1	0.04 (1/27)

Table 9b: Possible formal equivalents for French-German monodirectional bilingual entries

According to the data in Tables 9a and 9b, the relatively high probabilities for *muffling system* / *Schalldämpfer* (0.85) and for *silencieux* / *Schalldämpfer* (0.93) suggest that the equivalences established in Table 7 are reversible. Similar calculations for *exhalation system* / *Ausatemsystem* and *valve d'expiration* / *Ausatemsystem* reveal probabilities of 1.0 in both cases (3/3 and 4/4 respectively).

The matter of English-French and French-English equivalents also needs to be explored if a multidirectional, multilingual termbase is being compiled. Retaining the focus on the key terms *muffling system* and *silencieux*, the probability of *silencieux* being the equivalent of *muffling system* is 0.82 (27/33); for the French-English direction, there is a probability of 1.0 (27/27) of *silencieux* being matched by *muffling system*. The lower probability of the English-French direction has to do with the broad use by the English translator of *muffling system*, meaning that there is a wider variety of textual equivalents in the French, including not only generic or grammatical words, but also terms such as the full compound term *valve d'expiration de type silencieux* (for which there is no full term in the English), *vanne d'expiration* (where the English *muffling system* is the rather infelicitous textual equivalent of the German *Ausatemsystem*) and *système insonorisant* (the whole device and its documentation). However, bearing in mind the relatively high probability of 0.82 for *muffling system* → *silencieux*, the equivalences seem to be reversible with some degree of confidence, if not with 'absolute certainty'.

Conclusion

The analysis of the three texts in this paper – one source text and two translations – has demonstrated that lexical chains do indeed differ between source texts and their translations, 'even' in technical texts. Overall, however, some clear patterns of textual equivalence, expressed as high probabilities, have been identified. It has been shown that the variation identified in the lexical chains was due in part to the use by the translators, particularly the French translator, of generic and grammatical words and expressions where the German source had specific terms. Further variations were noted in some terminological choices e.g. for *Ausatemsystem*, the French has *vanne d'expiration* or *silencieux* instead of the much more frequent *valve d'expiration*, and the English has *muffling system* instead of the more transparent *exhalation system*.

Clearly, translators need, as part of the encoding process, to apply their textual knowledge to decisions concerning patterns of lexical cohesion. This is evident in the texts analysed, for instance, in the intermission of generic expressions such as *toutes les pièces* in the lexical chain when the topic of cleaning the valve arises. The motivation for the interchange of terms in a few cases – where apparently more appropriate alternatives exist and are widely used

elsewhere in the text – is much less clear; arguably, such choices may be questionable on grounds of transparency.

Finally, the portmanteau term *muffling system* in the English translation is suggestive of polysemy, for instance, between the whole device and the valve, as well as the whole device plus the accompanying documentation, presenting potential comprehension problems. Any attempt to solve this problem would, however, fall into the area of prescription, which goes beyond the scope of the descriptive theme of this paper.

References

- Baker, Mona (1992) *In Other Words. A coursebook on translation*. London and New York: Routledge.
- Bassnett, Susan (1991) *Translation Studies*. London & New York: Routledge. 2nd edition.
- Beaugrande, Robert de and Dressler, Wolfgang (1981) *Introduction to Text Linguistics*. London and New York: Longman.
- Catford, John C. (1965) *A Linguistic Theory of Translation. An Essay in Applied Linguistics*. London: OUP.
- Halliday, Michael A.K. and Hasan, Ruqaiya (1976) *Cohesion in English*. London & New York: Longman.
- Hoey, Michael (1991) *Patterns of Lexis in Text*. Oxford: Oxford University Press.
- Kelly, Louis (1979) *The True Interpreter. A History of Translation Theory and Practice in the West*. New York: St. Martin's Press.
- Koller, Werner (1979) *Einführung in die Übersetzungswissenschaft*. Heidelberg / Wiesbaden: Quelle & Meyer.
- Koller, Werner (1989) Equivalence in translation theory. In: Chesterman, Andrew (ed.) *Readings in Translation Theory*. [Helsingfors]: Oy Finn Lectura Ab. 99-104 (taken from *Einführung in die Übersetzungswissenschaft*, 186-191; translator's name not given)
- Lyons, John (1977) *Semantics*. Vol. 1. Cambridge: CUP.
- Rogers, Margaret (2006) Structuring information in English: a specialist translation perspective on sentence beginnings. *The Translator*, 12. 29-64.
- Rogers, Margaret (2007) Lexical chains in technical translation: A case study in indeterminacy. In: Antia, B. (ed.) *Indeterminacy in LSP and Terminology: Studies in Honour of Heribert Picht*. Amsterdam / Philadelphia: John Benjamins. 15-35.
- Snell-Hornby, Mary (1988) *Translation Studies: An Integrated Approach*. Amsterdam / Philadelphia: John Benjamins.
- Woodsworth, Judith (1998) Geschichte des Übersetzens. In: Snell-Hornby, Mary/Hönig, Hans/Kussmaul, Paul and Schmitt, Peter A. (eds) *Handbuch Translation*. Tübingen: Stauffenburg. 39-43.

Websites

Weinmann Medical Technology, <http://www.weinmann.de/>, site last visited 16 May 2007.