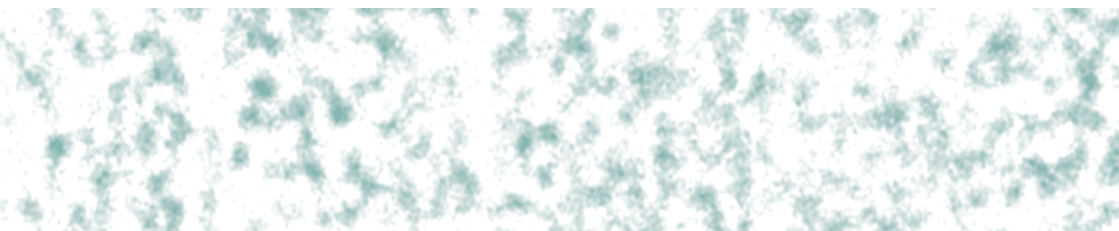


Kölner Konferenz zur **Fachtextübersetzung** (2010)



Herausgegeben von Monika Krein-Kühle,
Ursula Wienen und Ralph Krüger



PETER LANG
EDITION

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Bibliografische Information der Deutschen Nationalbibliothek

Die Deutsche Nationalbibliothek verzeichnet diese Publikation in der Deutschen Nationalbibliografie; detaillierte bibliografische Daten sind im Internet über <http://dnb.d-nb.de> abrufbar.

Umschlaggestaltung:

© Olaf Gloeckler, Atelier Platen, Friedberg

ISBN 978-3-653-02775-4 (E-Book)

DOI 10.3726/978-3-653-02775-4

ISBN 978-3-631-61772-4 (Print)

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Internationaler Verlag der Wissenschaften

Frankfurt am Main 2013

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Vorwort

Aufgrund der Praxisrelevanz der Fachtextübersetzung haben sich in den letzten Jahren aus übersetzungswissenschaftlicher Sicht zahlreiche neue Erkenntnisse auf diesem Feld ergeben, das damit jedoch längst nicht vollständig erforscht ist. Die Kölner Konferenz zur Fachtextübersetzung, die am 21. und 22. Oktober 2010 an der Fachhochschule Köln stattfand, sollte dazu beitragen, einzelne Lücken auf diesem Gebiet zu schließen und neue Forschungsperspektiven im Bereich der Fachtextübersetzung aufzuzeigen. Dies dokumentieren die in diesem Band versammelten Arbeiten, deren Themen wir im Folgenden kurz vorstellen möchten:

Im Bereich der **naturwissenschaftlich-technischen Übersetzung/Übersetzungstechnologie** stellt **Monika Krein-Kühle** das *Cologne Specialized Translation Corpus* vor, das der Verbesserung übersetzungswissenschaftlicher Forschung dienen soll, und weist auf die Relevanz des qualitativen Faktors bei der Korpuserstellung und -analyse hin. **Myriam Salama-Carr** untersucht die besonderen Zwänge und Herausforderungen bei der Übersetzung von Formen des wissenschaftlichen Diskurses, wobei sie insbesondere die Begriffe *power* und *norms* aus ideologischer Sicht beleuchtet. Bei **Uwe Reinke** werden die Möglichkeiten und Grenzen der computergestützten Qualitätssicherung in der Fachtextübersetzung aufgezeigt. **Dino Azzano** veranschaulicht am Beispiel der Arbeit mit Translation-Memory-Systemen und speziellen Dateiformaten die Fallstricke, die bei der Übersetzung von Dokumenten mit Formatierungselementen auftreten können.

Die **Übersetzung an der Schnittstelle zwischen Fachsprache, Gemeinsprache und Literatur** untersucht **Alena Petrova** in ihrem Beitrag zum Begriff der Äquivalenz und zur Rolle des Übersetzers in der literarischen und der Fachtextübersetzung. **Michael Schreiber** zeigt anhand einer Untersuchung zur Übersetzung politischer Reden in den Sprachenpaaren Französisch – Deutsch und Italienisch – Deutsch die Probleme, die – auf dem Kontinuum zwischen Fach- und Gemeinsprache – ein sich ändernder Fachsprachlichkeitsgrad mit sich bringt. Bei **Laura Sergo** werden Formen der Reformulierung in der fachlichen und populärwissenschaftlichen Kommunikation am Sprachenpaar Italienisch – Deutsch kontrastiert; sie analysiert hierzu den italienischen Marker *ovvero*.

Ein weiterer Teil der Beiträge befasst sich mit der **Rechtsübersetzung**: Während **Marianne Aussenac-Kern** die Relevanz des Fachwissens in der Rechtsübersetzung diskutiert und u. a. anhand juristischer Schlussverfahren exemplifiziert, beleuchten **Gerhard Edelmann** und **Aina Torrent** den Äquivalenzbegriff in der Rechtsübersetzung am Sprachenpaar Deutsch-Spanisch und

betrachten rechtsvergleichend wichtige Termini, die den Bereichen des deutschen und spanischen Erbrechts sowie des Strafrechts entstammen. **Marella Magris** und **Federica Scarpa** betrachten die Textsorte *Disclaimer* auf Webseiten im Rahmen einer kontrastiven Analyse und leiten daraus wichtige Ergebnisse für den Übersetzungsunterricht ab.

An der **Schnittstelle zwischen Fachtextübersetzung und Fachkommunikation** angesiedelt ist der Beitrag von **Klaus Schubert**, der das Fachübersetzen innerhalb der fachkommunikativen Arbeitsprozesskette situiert. **Leona Van Vaerenbergh** illustriert anhand der *Textsortennetze* eine weitere für die Translation wie auch für die Fachkommunikation relevante Dimension.

Besondere – und sehr unterschiedliche – **Aspekte der Fachtextübersetzung** greifen die folgenden Beiträge auf: **Wolfgang Pöckl** beleuchtet die wechselseitigen Einflüsse von Eurolinguistik und Fachtextübersetzung und sieht beide Disziplinen vor der Aufgabe, zu einem Abbau von Kommunikationsbarrieren speziell im europäischen Raum beizutragen. Im Beitrag von **Sigmund Kvam** wird die Funktionskonstanz bei Übersetzungen für unterschiedliche Kulturräume problematisiert; er plädiert in diesem Zusammenhang für eine kontrastive Textologie. **Anne Weber** analysiert und vergleicht fachsprachliche Elemente in deutschen und französischen Werbeanzeigen und weist hierbei auf sprachgeschichtliche, rechtliche und kulturelle Unterschiede hin. **Andrea Wurm** zeigt die interessante Entwicklung der deutschen kulinarischen Fachsprache unter französischem Übersetzungseinfluss auf; als Beispiel dient ihr die Vielfalt der Speisenbezeichnungen. Bei **John Stanley** wird die Relevanz des hermeneutischen Ansatzes bei der Übersetzung von Texten aus dem Bereich der Rechnungslegung hervorgehoben. Schließlich befassen sich **Ursula Wienen** und **Vahram Atayan** in einem Beitrag zur Kohäsion im Fachtext mit der Frage, wie mit den spezifischen Funktionen der französischen *c'est que*-Konstruktion in Übersetzungen von Ferdinand de Saussures *Cours de linguistique générale* verfahren wird.

Bei allen Trägerinnen und Trägern möchten wir uns herzlich bedanken für die Forschungsperspektiven, die sie uns im Rahmen dieser Konferenz aufgezeigt haben. Ein ganz besonderer Dank gilt Frau Nina Schmitt (M.A.), ehemalige wissenschaftliche Hilfskraft an der Fachhochschule Köln, die uns mit großer Umsicht bei der Formatierung dieses Bands unterstützte.

Köln, im November 2012

Monika Krein-Kühle, Ursula Wienen und Ralph Krüger

1. Naturwissenschaftlich-technische Übersetzung/ Übersetzungstechnologie

Towards High-Quality Translation Corpora: The Cologne Specialized Translation Corpus (CSTC) – a New Tool Designed to Improve Translation Research

Monika Krein-Kühle (Köln)

1 Introduction

The use of corpora has now found its way into both the theoretical/descriptive and the applied branches of translation studies (e.g. Baker 1995, 1996; Beeby et al. 2009; Laviosa 2002; Olohan 2004; Zanettin et al. 2003). However, there are two crucial problems involved in compiling and analysing corpora for translational research which are rarely addressed. The first problem is that no mention is made of whether the object compiled and examined is, in fact, a translation proper or some other kind of text reproduction (Koller ⁸2011, Koller 1995: 206 ff.; Schreiber 1993), and, the second, that in corpus-based translational research “qualitative judgements are conspicuous by their absence” (Stewart 2000: 213). The latter is also true of corpus selection.

Most descriptive approaches assume that equivalence, as a criterion for a high-quality translation, always exists anyhow or is of “little importance in itself” (Toury 1995: 86), or they simply deny the relevance of the equivalence concept for corpus-based studies (e.g. Baker 1993: 237). Such thinking may have the drawback that findings of a debatable quality can result, since the motivation behind the phenomena investigated is rarely accounted for. In these approaches, the corpora are often either too large to allow in-depth analysis (e.g. Laviosa 1998)¹ or too small (e.g. Englund Dimitrova 2005)² to be representative. The fact is that both the nature of the object being compiled and investigated and its quality will inevitably influence the findings of the analyses. Ignorance of these aspects results in contradictory statements about translational phenomena³ and, hence, may mislead scholars and students alike who work with corpora.

-
- 1 Laviosa (1998: 557) works with the English Comparable Corpus, which at the time of writing her article had an overall size of 2 million words.
 - 2 Englund Dimitrova (2005: 78) works with an extract of a Russian ST of 438 words, which was translated by nine translators (4 professional translators, 2 translation students and 3 language students) into Swedish.
 - 3 For example about the phenomenon of explicitation (Englund Dimitrova 2005: 44; Krein-Kühle 2009: 223, 2011).

2 Theoretical and methodological prerequisites for corpus design

Certainly, all corpus-based translation research will start by defining the purpose or objective of its study. However, in many approaches lacking a sound theoretical/methodological framework with a contextual-situational dimension, the corpus appears to be an end in itself (as in the case of research into the so-called *universals of translation*, Laviosa 2009: 306-310) rather than a means to an end, i.e. a tool that functions as a quantitative extension of a thorough, systematic and theoretically well-founded comparative investigation into translational phenomena, hypotheses, theoretical concepts, etc., and that aims at furnishing more intersubjective, replicable and representative results, which will, in their turn, allow sound generalizations. Our research approach aims at establishing translation regularities or patterns in scientific and technical translation, and, in the process, at testing the theory underlying our research.

2.1 Theoretical prerequisites for corpus design

In order to select and analyse a high-quality specialized translation corpus as a methodological tool in translational research, the following two theoretical requirements must be fulfilled:

a) Firstly, the object of our investigation must in fact be a translation proper or translation *per se* (Koller ⁸2011, Koller 1995; Schreiber 1993) according to the following definition based on Schreiber (1993: 43):

“a translation is defined as the interlingual transposition of a source text into a target text based on the invariance requirement of ST sense/intended sense or ‘das Gemeinte’ [what is meant] [...] and involving an interpretation of the ST against the background of factual knowledge (e.g. domain knowledge, encyclopaedic/world knowledge, etc.) underlying the ST. Since scientific and technical STs may be defective [...], scientific and technical translation may therefore be understood as to include corrections, e.g. to remedy ST factual inaccuracies, or well-motivated minor revisions, omissions or additions (such as a translator’s footnote), but to exclude any revisions, omissions or additions that go beyond the level of sense/intended sense or ‘Gemeinte’ [what is meant].”

(cf. Krein-Kühle 2009: 224, 2011: 393)

Although a clear-cut definition of the subject matter of ‘translation’ is not always feasible owing to the complexity of the concept of translation, in our approach and in a prototypical sense (Halverson 1999), invariance of text function is regarded as the defining criterion for translation.

b) And, secondly, we need to ensure that the translations in the corpus are of a high quality, i.e. that they satisfy the requirement of equivalence – as reassessed by Krein-Kühle (2003, 2011), at all levels, viz. at the syntactic, lexical-semantic, terminological-phraseological, text levels and overall text-in-context level. Equivalence is defined as:

“[...] a qualitative complete-text-in-context-based concept. It refers to the translational relation between a complete source text and a complete target text, both of which are embedded in a specific domain-related context, and implies the preservation of ST sense/intended sense or ‘das Gemeinte’ [what is meant] (the invariant) [...] in the TT using TL linguistic means, **the best possible selection of which** must have been achieved at the syntactic, lexical-semantic, terminological-phraseological, and textual levels. These levels are hierarchically interrelated and subject to pragmatic aspects [...] In this way equality or even improvement (in the case of ST defects) of ‘communicative value’ (Kade 1977: 36) may be deemed to have been achieved.”

(cf. Krein-Kühle 2009: 225, 2011: 394)

A more detailed account of the definitional aspects of translation and equivalence, involving a discussion of the much criticized notion of *tertium comparationis*, which is less subjective than some scholars seem to think, is given in Krein-Kühle (2011: 392-396).

2.2 Methodological prerequisites for corpus design

In order to test our theoretical prerequisite, viz. equivalence as defined here, and to establish translation regularities or patterns, our research builds on two methodological pillars, i.e. a qualitatively and contextually-situationally refined translation corpus and a set of well-defined comparative parameters.

2.2.1 Corpus selection criteria

In order to fulfil the theoretical requirements mentioned earlier, our corpus compilation needs to be based on selection criteria devised for a corpus design that promises relevant and intersubjectively verifiable insights into translational phenomena or regularities. As Olohan (2004: 45) rightly states, the main issues involved in corpus design include “representativeness, size and sampling”. Certainly, corpus design depends on the purpose for which the corpus is intended, but how can we make sure that the data are representative of a particular genre, register and text type and of translation regularities or a particular translation behaviour (cf. Olohan 2004: 47). Moreover, how can we make sure that the corpus is representative of felicitous translation? My point is that a well-defined set

of selection criteria, focussing on qualitative design criteria, will help ensure both the representativeness of genres, registers, text types and the representativeness of translation regularities and translation behaviour to yield intersubjectively verifiable generalizations. Certainly, representativeness is still a fuzzy concept in corpus-based translation studies, but we need to make sure that our corpus is not just a random collection of texts, but a representative section of the target population (cf. Biber 1993: 243, Biber et al. 1998: 246). Representativeness can be brought about by defining a stringent set of general, qualitative and quantitative selection criteria (cf. Krein-Kühle 2003: 64-81, 2011: 395) with a focus on qualitative criteria. Firstly, general selection criteria include corpus attributes, viz., full text, synchronicity, bilinguality, central corpus and reference corpus, and text attributes, viz. text typology, text status, geographical considerations, genre and register considerations. A further text attribute is functional constancy, which as a prerequisite for equivalence is closely related to the question of delimiting translation from other forms of text (re)production (cf. Schreiber 1993) and directly linked to the theoretical prerequisites mentioned in 2.1. Also, there is a relevance criterion that may help demonstrate that the ST-TT pairs selected are representative of a specific genre and domain and of actual translation assignments (Schmitt 1998: 5-13). Secondly, the set of selection criteria also involves qualitative selection criteria based on textual and extra-textual data. Textual data include the availability of parallel texts and additional domain-related reference material. Such documents to be considered alongside the corpus by the researcher can help refute or confirm translation-relevant findings and contribute to their intersubjective verification. The much needed further contextualisation of translation and translational research may be guaranteed by the consideration of extra-textual data which refer to contextual-situational aspects and include, e.g., typicality as reflected in the range of ST authors and translators (Baker 1995), such as translator's competence (cf. Krein-Kühle 2011: 396-397, fn. 5, 6). Further extra-textual criteria are awareness of the origin of the translations, recourse to ST authors, translators and/or experts in the field, exclusion of idiosyncratic translator behaviour, knowledge of the communicative effect of the translations on the receptors, and homogeneity in the selection of texts, genres, registers, domains and translators.

Thirdly, there is a quantitative criterion. Certainly, corpus size may depend on various factors, such as the purpose of the investigation, the applicability of electronic tools or the availability of suitable material in a particular domain/context (cf. also Olohan 2004: 46). We follow Bowker and Pearson (2002) who suggest that more useful information may be retrieved from "a corpus that is small but well designed than from one that is larger but is not customized to

meet your needs” (ibid.: 45-46). This is especially true of high-quality translation corpora due to the various quality-relevant parameters to be taken into account in selecting and analysing ST-TT pairs. A subcorpus size of between 20,000 to 50,000 words may be considered extensive enough to provide a sound basis from which to propose statistically corroborated generalizations.

2.2.2 Comparative parameters

Since even the best-devised corpus may not guarantee compliance with the theoretical requirements mentioned above, i.e. using actual translations and ensuring high quality of the translations in the corpus, each ST-TT pair being considered for inclusion in the corpus on the basis of the above selection criteria is to be checked by the researcher, who – as will be explained – should also be a translator-expert in the field, according to certain comparative parameters. These include a comparison procedure that is both ‘linear’ and ‘selective’ (as distinguished by Reiß 1981: 316-317), a well-defined translation unit, viz. the text-in-context in all its complexity, a reliable *tertium comparationis*, viz. the ‘sense’ or ‘intended sense’ as the basis for the comparison (cf. Krein-Kühle 2011: 396), the directionality of the comparison, and the translational and domain(s)-related competence of the analyst, each of which has been discussed in greater detail elsewhere (Krein-Kühle 2005). As regards the competence of the researcher, Altenberg and Granger (2002: 17) claim that

“[a]ny judgement about cross-linguistic equivalence (or similarity) must be based on the researcher’s ‘translation competence’. This is true at both ends of the analysis: initially, when items are selected for comparison, and finally, when the results of the comparison are evaluated.”

It should be stressed that the researcher’s translation competence should include both linguistic-transfer knowledge and extra-linguistic/domain and contextual-situational knowledge. Only then can the researcher properly replicate translators’ decisions and account for the translation phenomena or any shifts identified.

Specification of a theoretical and methodological framework involves sampling STs and TTs in line with well-defined design criteria, with a focus on qualitative criteria. All criteria have to be made as explicit as possible by the researcher. Such specification will contribute to the much needed intersubjective verification of research results, since such results can be verified or falsified by replication and comparison with other studies on the basis of other, potentially more comprehensive, corpora built according to the same design criteria and analysed within a similar theoretical/methodological framework. Moreover, theories and

hypotheses underlying the research can be tested, confirmed or amended in the process, thus contributing to the advancement of scientific insight in our discipline.

This methodology, which consists of a qualitatively and contextually-situationally refined corpus as a reliable research tool and which involves the establishment of well-described comparative parameters, enables detailed categorization and analysis of translation-relevant features “with due account being taken of all syntactic, semantic, terminological, pragmatic, contextual and situational aspects governing the selection of specific translation solutions and the rejection of others” (Krein-Kühle 2011: 408-409). As will be shown in the following, such an approach yields results of a more robust quality.

3 Description of the Cologne Specialized Translation Corpus (CSTC)

A high-quality specialized translation corpus is being compiled at the Cologne University of Applied Sciences with the aim of establishing corpus-based translation studies there (cf. Krein-Kühle 2007, 2011: 397-399). This corpus is based on certain language pairs, domains, text types and genres. The languages, text types, genres and domains mentioned reflect to a certain extent the profile of our institute’s MA course in Specialized Translation. Fig. 1 shows an overview of the German-English-German section of the corpus which is currently being compiled and analysed. The scientific and technical subcorpus contains as genres: articles in learned journals, research reports, technical reports and the like. The economic subcorpus (in planning) will contain genres such as business reports, market reports, audits, investment guidelines, etc. The legal subcorpus (in planning) will contain genres such as contracts, judgements, legal opinions, etc.

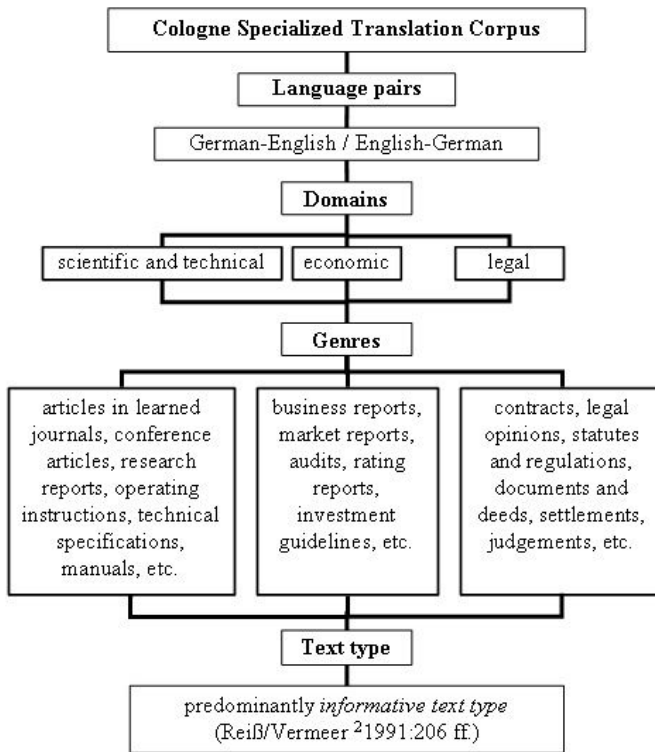


Fig. 1: German-English-German section of the CSTC
(cf. Krein-Kühle 2007)

Fig. 2 gives an overview of the scientific and technical subcorpus, which itself consists of several subcorpora, based in their turn on domain, genre and text type in order to implement a reasonable degree of corpus homogeneity with a view to achieving a meaningful degree of intersubjectivity in the findings of our research. At the moment, research work is being carried out on three subcorpora, i.e.

- the climate change corpus (subcorpus I), which contains technical reports on climate change dealing, in particular, with the possibilities of CO₂ capture and storage;
- the automotive corpus (subcorpus II), which contains articles in learned journals and technical papers on automotive issues; and

- the coal-chemistry corpus (subcorpus III), which contains reports on research into coal chemistry.

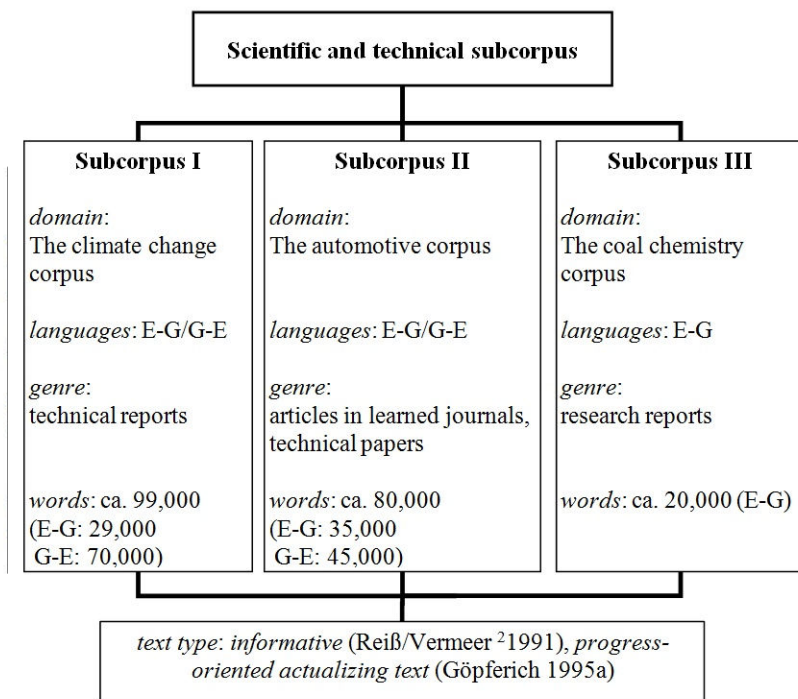


Fig. 2: Overview of the scientific and technical subcorpus
(cf. Krein-Kühle 2007)

Subcorpora I and II (the climate and the automotive subcorpora) contain English into German and German into English translations. Having both translation directions together is the ideal case in corpus compilation and analysis since, under these conditions, the English and German STs may function as prototypical SL and TL texts for their respective translated counterparts. Due to research dominance in a particular domain and in a particular language culture, this requirement is often difficult to fulfil. Subcorpus III (coal) contains English into German translations. All subcorpora are growing entities and further subcorpora will be compiled. All source texts and their translations are of the “informative text type” (Reiß/Vermeer ²1991: 206 ff.) and are what Göpferich calls “progress-oriented actualizing texts” (Göpferich 1995a: 308). These texts impart

knowledge and contribute to the advancement of science and technology (ibid.) in expert-to-expert communication.

4 Application of the Cologne Specialized Translation Corpus in translation research

High-quality specialized translation corpora, which optimally reflect the much sought-after combination of profound domain knowledge and outstanding translational knowledge possessed by the competent professional translator, are an empirical and reliable source for research into translational phenomena, since they deliver hard evidence of felicitous translation.

4.1 Results of corpus-based work

The present research work has been carried out on a section (approx. 30,000 words) of the climate change corpus (subcorpus I) and shows how regularities in translation can be established. What has been investigated as a typical case is the expanded postmodifying past participle in relative clause reduction in the English ST – a typical, common and translation-relevant feature of English scientific and technical discourse – and its translation solutions in the German TT. The category of expanded postmodifying past participle construction (76 occurrences) is understood to refer to an antecedent noun and to contain a complement of greater complexity. This category also includes the reduced version of what Quirk et al. (¹³1995: 1244-1245) call an “adnominal relative clause” (cf. also Göpferich 1995b: 422; Krein-Kühle 1999: 199). As Quirk et al. (¹³1995: 1265) rightly claim, “[...] postmodifying *-ed* and *-ing* participle clauses are both usually restrictive [...]”. This is also true in our case, in which 87% of the clauses in the category investigated can be classified as restrictive and only 13% as non-restrictive. The aspect of restrictiveness vs. non-restrictiveness may, but need not, influence the results of the analysis, since higher ranking aspects, such as register aspects, may govern and modify syntactic aspects of equivalence.

The distribution of translation solutions for this category, which correlates with my own earlier research in this field (Krein-Kühle 1999, 2003)⁴, is as follows:

4 The percentages of translation solutions for this category were as follows (1999: 199-200): Prenominal attribute 44%, 1:0 correspondence 29%, relative clause 6%, word group in prepositional function 5%, Others 16%. For a discussion of these figures see Krein-Kühle (1999, 2003: 115-119).

i) Prenominal attribute**49%**

Example:

Techniques developed for the exploration of oil and gas reservoirs, natural gas storage sites and liquid waste disposal sites are suitable for characterizing geological storage sites for CO₂.

Die für die Exploration von Erdöl- und Erdgaslagerstätten, Erdgasspeichern und Deponien zur Entsorgung flüssiger Abfälle entwickelten Techniken sind auch bei der Charakterisierung geologischer CO₂-Speicherstätten einsetzbar.

Back-translation: The *for the exploration of oil and gas reservoirs, natural gas storage sites and liquid waste disposal sites developed techniques* [...]

The results show a trend towards lengthy premodification or prenominal attribute which accounts for 49% of all translation solutions. This is a frequent feature of German scientific and technical syntax (e.g. Fluck ²1997). However, depending on the semantics of the underlying verb, the past participle may assume a more structural binding function and/or may be considered redundant in the TL, which can lead to a 1:0 correspondence and reliance on prepositions in the TT. This solution accounts for 17% of all translation solutions.

ii) 1:0 correspondence (and relying on prepositions)**17%**

Example:

Most of this CO₂ is obtained from natural CO₂ reservoirs *found in western regions of the US*, with some coming from anthropogenic sources such as natural gas processing.

Der Hauptteil des CO₂ stammt aus natürlichen CO₂-Lagerstätten *im Westen der USA*, ein kleinerer Teil aus anthropogenen Quellen wie z. B. der Erdgasaufbereitung.

Back-translation: Most of this CO₂ is obtained from natural CO₂ reservoirs *in western regions of the US*, [...]

The relative clause solution, accounting for 8% of the cases, may also be a potential equivalent for syntactic, semantic, and pragmatic reasons, as may prepositional word groups, which account for 3%.

iii) Relative clause**8%**

Example:

In addition, there is an increase in the consumption of chemicals such as ammonia and limestone *used by PC plants for nitrogen oxide and sulphur dioxide emissions control*.

Darüber hinaus kommt es zu einer Zunahme des Verbrauchs von Chemikalien wie Ammoniak und Kalkstein, die in kohlenstaubgefeuerten Kraftwerken zur Regulierung der Stickoxid- und Schwefeldioxidemissionen eingesetzt werden.

Back-translation: [...] such as ammonia and limestone, which are used by PC plants for nitrogen oxide and sulphur dioxide emissions control.

iv) Word group in prepositional function

3%

Example:

The projected potential of CO₂ capture *associated with the above emission ranges* has been estimated at an annual 2.6 to 4.9 GtCO₂ by 2020 [...]

Das Potenzial der CO₂-Abscheidung *unter Zugrundelegung der genannten Emissionsmengen* wurde auf 2,6 bis 4,9 Gt CO₂ pro Jahr bis 2020 [...] geschätzt.

Back-translation: The projected potential of CO₂ capture *on the basis of the above emission ranges* [...]

As for the ‘Others’ category (23%), the terminological-phraseological level and/or further pragmatic aspects may come into play and modify syntax. The example under v) shows how terminological aspects, i.e. a high noun-based terminological specificity in the TL, take precedence over mere syntactic aspects.

v) Others

23%

Example:

Reducing the amount of carbon *emitted per unit of primary energy* is called decarbonization.

Die Minderung der CO₂-Emissionen *pro Primärenergieeinheit* wird als Dekarbonisierung bezeichnet.

Back-translation: Reducing the amount of CO₂ emissions *per unit of primary energy* is called decarbonization.

These results can also be viewed as revealing a clear trend toward using ‘equivalent’ sentence-reducing devices in the TL which account for 84% of all translation solutions, whereas complete clauses account for 16%. These may, in fact, become necessary for syntactic, semantic and/or pragmatic reasons to achieve overall text-in-context equivalence. So the overall result suggests compliance with the German register requirement of syntactic compression and condensation of meaning, which is implemented with different, though functionally equivalent, linguistic means in the TT when compared with the English ST

counterparts. The results also underline the decisive influence of register constraints on syntactic aspects of equivalence.⁵ As regards the aspect of clausal non-restrictiveness, which accounts for 13% of the clauses investigated here, prenominal attributes in the TT account for 50%, prepositional word groups for 10% and other solutions for 40%, including mostly finite subordinate clauses. This result points to an increased percentage for the ‘Others’ category as compared to the overall result, but may have to be underpinned on the basis of a more comprehensive corpus.

Our results correlate to some extent with findings from contrastive special languages research (Göpferich 1995a, b), which shows that the ‘adnominal participle construction’ is more frequent in English scientific and technical discourse than the ‘prenominal attribute’ in the respective German discourse type.⁶ However, since there is no translational link between the texts investigated in contrastive special languages research, this type of research fails to point the way to other potentially equivalent translation solutions or account for the conditions under which they are chosen.

It should be stressed that the results of this research do not simply reflect some de-contextualized linguistic features or instances of translational universals, such as “normalization” (Baker 1996: 183), but represent true translational patterns that are useful for the applied areas of TS. The fact that these translational patterns can be submitted to intersubjective verification on the basis of other corpora designed according to similar selection criteria and to a similar theoretical and methodological framework makes them relevant to theoretical and analytical considerations as well.

5 Conclusion

A corpus-based approach to translation, as a truly empirical research method, offers a unique opportunity, which should not be missed, to move away from false assumptions and subjective statements about translation, deductively and inductively developed theories and exemplification for merely illustrative purposes, in order to work with authentic data from real-life translation activities

5 Cf. also Krein-Kühle (2011) for the influence of register constraints on lexical-semantic aspects of equivalence.

6 The adnominal participle construction, as a ‘progressive’ construction, puts less strain on the reader’s receptive capacity than the ‘prenominal attribute’ as a ‘regressive’ construction (cf. Göpferich 1995b: 427). Therefore, the frequency of the latter must be lower in the German TT than that of the adnominal construction in the ST. The terms ‘progressive’ and ‘regressive’ go back to Bally (1950 quoted in Göpferich 1995b: 427).

performed by competent professional translators. However, only high-quality translation corpora will help us get away from merely stating the obvious, such as the presence of de-contextualized linguistic features, interferences from the source language, “translation practices rather than significant translation regularities” (Hewson and Martin 1991: 211), and contradictory statements about translational universals that cannot be properly accounted for. The Cologne Specialized Translation Corpus, which is being carefully designed and tightly controlled, will help us not only to obtain replicable and comparable findings for intersubjective verification that may be useful for the applied branches of TS, but also to expound, test, confirm, dismiss or modify “the very *theory*, in whose terms research is carried out” (Toury 1995: 1) for the sake of advancement in our theoretical understanding of translation and translational phenomena. If we do not want to be left with a mere statistical counting of symptoms without looking at causes, which would simply mean stretching the limits of descriptivity *ad infinitum* and which would also imply entertaining a rather unfounded hope that quantity will sometime translate into quality, then we need to ring in a paradigm shift towards better quality and better contextualisation of both the translation product under analysis and of the theoretical/methodological set-up underlying our research in corpus-based and non-corpus-based translation studies.

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The Translation of Scientific Discourse – Constraints and Challenges

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1 Introduction

Translation researchers have rightly lamented the relative invisibility of the translation event in studies of the dissemination and construction of knowledge, and of scientific knowledge in particular. They have also highlighted the extent to which transparency and neutrality were assumed when translation contributed to the circulation of ideas (see Delisle and Woodsworth 1995; Salama-Carr 2009). But the idea of scientific transmission being a linear, uncontroversial process, unaffected by contingencies of time, place and ideology, is increasingly challenged in the work of historians, philosophers and sociologists of science, a stance which echoes Michel Foucault's argument on how speech and writing shape epistemological frames (Foucault 1969). And whilst it is certainly true that some research on the translation of scientific material does take place¹, it can be argued that mainstream translation studies still generally eschews scientific discourse as an object of study, and that its translation remains marginalized, partly due to a reductive view of the rhetoric of science².

Taking as a point of departure the apparent lack of engagement of translation researchers with scientific discourse, this paper will sketch the status of scientific translation in the field and will consider the challenges and lines of inquiry it can offer to the evolving and increasingly interdisciplinary field of translation studies, by focusing on the issues of *norms* and *power* as central to contemporary discussions in the field.

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- 1 See for instance Olohan and Salama-Carr (eds) (2011), *Science in Translation*, special issue of *The Translator* 17.2, and the (still too few) conferences dedicated to scientific translation, or offering a forum for its discussion.
 - 2 "Problems of 'style' are largely secondary when a technical text is being translated [...] Scientific texts are intended to be read by scientists, and so are scientific translations. Obtrusive 'style' should be notable by its absence" (Finch 1969: 4). This frequently quoted statement on style in scientific and technical translation is a case in point, unless 'obtrusive style' in that statement is to be understood as writing idiosyncracies for which there is less scope in scientific translation.

2 The status of scientific translation

A number of researchers have reviewed the status of scientific translation. Surveys of the literature focused on scientific translation show quite clearly that the majority of publications have aimed to fulfill the roles of guides when it comes to translation practice, and have been rather normative (Olohan 2009; Franco Aixelá 2004). James Holmes had already commented, in 1972, on the paucity of attempts to develop theories for the translation of scientific texts. Exceptions, of course, include the work of Jümpelt (1961) and Maillot (²1981) and it is true that scientific and technical translation is at least recognized as an area of inquiry, albeit an under-researched one. Particularly encouraging in recent years is the inclusion of an entry on scientific and technical translation in the 2nd edition of the Routledge *Encyclopedia of Translation Studies* (see Olohan 2009) but scientific translation is still to acquire its *lettres de noblesse* and to be given its share in anthologies of translation studies.

Beyond the glaring disconnect between the ‘problematism’ of scientific discourse in the history and philosophy of science, and the subordinate position of the translation of this discourse in translation studies writings, further contradictions come to mind. It is often assumed that scientific discourse is neutral and less sensitive in terms of translation when compared with literary or literary-related work, but scientific models are viewed as more rigorous than liberal arts frameworks. As Chalmers states in his introductory textbook to the philosophy of science, *What is this Thing Called Science?* “[t]he naming of some claim or line of reasoning or piece of research “scientific” is done in a way that is intended to imply some kind of merit or special kind of reliability” (Chalmers 2002: ix). This can be unpacked into further contradictions which are of direct relevance to our discipline – scientific discourse, as noted above, is relatively under-researched in translation studies but scientific models are sought after to explain and describe the translation process (see for example the use of Popper’s work in Chesterman 1997). Another contradiction resides in discrepancy between the volume of scientific and scientific-related translation³, and its disciplinary status.

3 A question of terminology arises here. It is increasingly common to refer to STT (scientific and technical translation) as one branch of translation, but Jody Byrne (2006) carefully distinguishes between ‘scientific’ and ‘technical’, arguing that the latter can be described as ‘the ugly duckling of translation’ (ibid.: 1). This paper focuses on scientific translation and draws on the following distinction: “in science the language is concept-centred; in technology it is object-centred” (Newmark 1981: 155). In practice, many texts are based on the interrelation between science and technology in any case.