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Translations English – German: investigating the relative
importance of systemic contrasts and of the text-type "translation"

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1. Introduction and overview

In this paper, our focus will be on investigating the relative importance of systemic contrasts and of the text-type "translation" in a characterisation of textual properties of translations English-German. A number of methods will be suggested and critically discussed for empirically testing hypotheses about the extent and direction of resulting differences between source language texts and target language texts in translations, as well as between target language texts in translations and non-translated original texts in the target language. We shall start with a review of some major systemic, i.e. typologically-based contrasts between the two languages, focusing on the implications of these contrasts for the ways in which information is distributed in the clauses of these languages. In contrast to the predominantly structure-based accounts in the existing literature, we shall be focussing on the systems on the basis of

1 I am grateful for discussions relating to questions of this paper to, Silvia Hansen, Juliane House, Christian Matthiessen, Chris Nesbitt and Elke Teich. Robert Spence, in particular, acted as in-depth constructive critic. None of these should be held responsible for any weaknesses in the paper.
which these structures are used to encode and express information. We shall then proceed to an account of textual properties of translated texts, going beyond what has already been said about these in earlier work, by modelling in more detail how the process of understanding and of unpacking of grammatical structures may appear as an independent factor in accounting for these specific properties. Following on from there, we shall address some methodological issues in empirical investigations of translated texts, concentrating at first on the necessity of reducing the very significant initial gaps between our theories, models and initial hypotheses on the one hand, and between the "raw information" contained in electronic corpora of translated and parallel texts on the other. We shall then look at a few instances of translated text, applying to them some tentative techniques developed in the preceding section, the aim being to show whether and to what extent there is hope for a closing of the gap identified before. Finally, we shall take up the question of norms, this time in a discussion of how our theoretically motivated notions of what a translation should be textually may influence "creativity" in translations on the one hand, and our notions of what we consider to be relevant "data" on the other.

2. Systemic typological differences: German-English contrasts

The following overview is based on Steiner and Teich (in press), where we have discussed a range of typological properties of German clauses, using the methodology of Halliday's "Systemic Functional Grammar" (SFL, cf. Halliday 1985/94), but also relying heavily on earlier work on English-German contrasts in Hawkins (1984,1992,1990), Doherty (1991,1993, Hrsg. 1999), König (1996), Lang and Zifonun (eds. 1996), and Erdmann (1990a). A generalised summary of our description in our earlier paper will be given, indicating some implications these properties are likely to have for texts translated into German. We shall not attempt to quantify the effects of the postulated differences. Instead, our focus here will be on properties of translated text resulting from the process of "understanding", rather than from systemic contrasts between the languages participating in the translations under investigation. However, whereas our focus will not be on systemic typological differences here, at least a general account of them is necessary as they are inevitably involved in each textual pair of source-language and target-language texts.

Starting our comparison with the "Interpersonal Function" of grammar on the rank of the clause, and here in particular with a consideration of "Mood" (German "Satzmodus", rather than "Verbmodus"), we notice the low functional load of the syntactic "Subject" as a first contrastive property of German relative to English. Essentially, that load seems to be restricted to the expression of "modal responsibility", through agreement with the head-auxiliary of the verbal group. The realization of Mood in German takes the form of the position of the Finite element of the Verbal Group, in interaction with morphological verb-mood, and does not in itself involve Subject-Operator inversion as in English. One of the implications of this for texts translated from English into German is that the position of the Subject in German is much freer, and interpersonally less meaningful, than in English. Furthermore, not all clause types of German have a Subject, even if most of them do. As far as meanings of Time, Phase, Aspect and Modality are concerned, they are often realized outside the auxiliary complex, i.e. dissociated from modal responsibility, in cases in which we find auxiliaries in corresponding English clauses. Finally, and because of what we have said about the role of the Subject and about "modal responsibility", the "type-specification" in the German clause in general is often the locus for the expression of meanings which in English are expressed in the "instantiation" or "grounding" part (for this global interpretation of the clause, especially its predicative vs. its Subject-Finite complex cf. Langacker 1999:18ff).
Moving over to the "ideational", and particularly the "experiential" function, we note that the basic organisation of the German clause is transitive, whereas the English clause is much more of a mixture, and furthermore less clearly marked morphologically. This means for texts translated from English into German that we must expect German clauses to occur in alternations or diatheses different from their ergative, or ergative-like, English counterparts. We expect explicitly causative constructions, passives, reflexives, active impersonal constructions etc. as German counterparts. Furthermore, the German clause is characterised by a constrained and relatively direct mapping of Participant Roles and Grammatical Functions relative to English, so that for German translations, we can often expect grammatically "less metaphorized" versions than in English (cf. below). This seems valid for the clause, but not so for the verbal group, where English offers the greater differentiation and constraints in some respects. Quite in line with these general tendencies, passivization in German is more constrained systemically than in English, in the sense that many English passives with other than Affected-Subjects will not have a personal passive counterpart in German. The existence of the German "impersonal passive", however, also leads us to expect German passive clauses without a passive English counterpart. Finally, alternations/diatheses in German often require explicit morphological marking where the corresponding English clauses will not show such marking. All in all, the combination of semantic roles and grammatical functions will be different in German clauses from that in their English translational counterparts, and the type of alternation/diathesis will very often be marked morphologically, in contrast to English.

Considering the "textual" function, and here "Theme" in particular, we start with the assumption that Themes other than the Subject will be more frequent in German than in English. Part of the reason for this is that German has a weaker and more cline-like classification of Themes as to "markedness". We find a wider range of non-Subject experiential Themes in the system, relative to English. This is also one of the senses in which German word-order is "freer" (which does not mean "meaningless") than in English. In fact, word order in the German clause is used to express textual meanings to do with thematicity and information distribution, where their English counterparts often use alternations, thematizing and focusing constructions such as various types of "clefting" and/or grammatical metaphor. Finally, several German constructions, notably dependent clauses and also main clauses with complex Verbal Groups, realize their semantic "head" relatively late in terms of linear precedence, which leads us to predict that many German clauses translated from English will have their "head" in relatively non-thematic, but also (close to) "New" or "Focus" position.

To generalise somewhat boldly from what we have said about semantics-to-grammar-mapping in our three functional components above, we first note a fundamentally more constrained mapping in German than in English. That is to say, semantic Participants, Circumstances and Processes will in German translations often be mapped to their morphologically transparent counterparts, whereas we have "incongruent" mappings in English. An English clause like (1) below, for example, may have a translated variant such as (2):

(1) One's best friends usually manage to be credited with the best intentions.
(2) Den besten Freunden gelingt es gewöhnlich, dass man ihnen die besten Absichten unterstellt.

The best friends (DAT) succeeds it (NOM) usually, that one (NOM) them (DAT) the best intentions (ACC) credits.
Partly because of these constraints, German translations will often be non-metaphorical relative to their (more) metaphorical English counterparts, cf. (3) and (4) below (English example from Halliday 1985/94: chapter 10):

(3) The fifth day saw them at the summit.
(4) Am fünften Tag kamen sie am Gipfel an.
"At the fifth day came they at the summit on"

Again partly because of the two tendencies claimed here, German translations will often encode meanings "logically", where English originals favour an experiential encoding, cf. (5) vs. (6):

(5) Long-term use of this medication may lead to a gradual weakening of your immune system.
(6) Wenn Sie die Medikamente über längere Zeit hin benutzen, dann kann dies zu einer allmählichen Schwächung Ihres Immunsystems führen.

As we said above, our remarks here are a generalised summary of earlier and substantially more detailed work (cf. Steiner and Teich in press, as well as the literature referred to there). The concept of "grammatical metaphor", which we have used without much explanation here, will be explained and exemplified somewhat more fully below. But we would like to add an explicit warning at this point, as far as quantifications of the postulated tendencies are concerned: not all the contrastive phenomena between English and German point in one direction, such as "higher grammatical metaphoricity for all constructions in language A over language B", or "greater explicitness for all constructions in language A over language B", and it is an open question to what extent effects may be neutralising each other statistically. Furthermore, of the three major independent variables influencing translations which we shall come back to below, each one may push the translated text in directions opposite to one or both of the other two factors. It will be one of the most challenging aspects of further work to develop an improved understanding of the complicated interaction of independent and dependent variables in the areas concerned.

After our emphasis on contrasts in the language systems involved in the present section, let us now shift our focus to linguistic instances, that is to say, texts. We shall not engage in a consideration of "contrastive register analysis" here, but rather in a discussion of general properties of translated texts, thus moving from the first of our three sources of properties of translated texts in the sense of 3.3. below directly to the third.

3. Textual differences: general properties of translated texts

This section will begin with a brief consideration of some assumptions concerning general properties of translated texts made in the literature. These assumptions, which have been accepted or disputed to varying extents, could until recently never be checked against sufficient quantities of data, which means they were not testable with empirical methods. This lack of testability can now be overcome with the building up and use of electronic corpora plus configurations of test-tools. Baker and her colleagues (cf. Baker 1995, 1996, Laviosa-
Braithwaite ed. 1998) in particular have made assumptions about properties of translated text more specific, assuming normalization, simplification, explicitation and levelling-out to be universal properties of translated texts. Their work appears to constitute a clear case of methodological progress to us, even if we shall be arguing for methodological developments here. We shall make the point that criteria such as number of words per clause, type-token ratios, form vs. function words and a few others have to be complemented, and ultimately be superseded by, more high-level linguistic criteria, if meaningful contact is to be made between high-level assumptions about properties of translated texts arising in various interdisciplinary and in applied contexts on the one hand, and between the raw data in (electronic) corpora on the other. We shall furthermore emphasise that there are at least three sources, and explanations, for properties of translated text: typological factors, register, and properties of the translation process, in particular understanding. The translation process is thus only one of three sources and has to be seen in the context of and in interaction with the other two. This interaction needs to be integrated into methodologies investigating properties of translated texts, and we shall outline a framework for doing so, suggesting a partial model of the traces which this factor leaves in the features of translated texts, thus preparing the ground for empirical investigations of it.

3.1. Some assumptions made in the literature on translation

Assumptions about properties of translated text have been made for some time and with various degrees of refinement. With respect to translations of literary texts in particular, opinions have varied between on the one hand regarding translated texts as inferior relative to "original" texts and on the other seeing in translated texts loci of particular creativity. Venuti (1995, and elsewhere), and numerous others after him, have in recent years emphasised the active and visible role of translators, and thus the language of translated texts as something worth serious effort by the translator and serious attention by the scholar. We shall not review this entire hermeneutical debate here, although it may well be the context in which ultimately empirical findings only make sense (cf. our final section, where we shall return to some of the questions involved). Instead, we shall review some assumptions which stay somewhat more closely to the details of textual realization in lexicogrammar, so as to open the way for empirical studies of properties of translated texts.

One of these views can be called the "layperson's" assumption. With respect to English-German translation, this can be glossed as "in translations from English into German, each text becomes longer by something like 30%" (cf. among many others an article titled "Die Multikulturmaschine", discussing technical translation and localization, in DIE ZEIT of 29th April 1999). Under this view, German translated texts are always longer than their source texts for a variety of reasons, some of them to do with the language, others with the process of translation. This belief appears to be fairly widespread, and may well have some realistic basis in experience, but is on the other hand definitely not tenable for all types of texts. In order to give it a somewhat more serious formulation, one would at least have to say how length is to be measured, whether in terms of characters, morphemes, words, phrases, or simply in terms of layout on the page. In Table 1, for example, we reproduce results of Unix word and character counts on 7 English texts and their published German translations, followed by counts on 4 German original texts and their translations into English (all of them from popularising scientific prose, key words identifying individual texts by topic).

\[ \text{Cf. For example Bermann 1985/2000 for a very differentiated, yet basically "deficit"- view of translated texts, and for a highly interesting list of properties} \]
Table 1: Text-length measurements by words and characters

<table>
<thead>
<tr>
<th>English originals</th>
<th>German translations</th>
<th>German originals</th>
<th>English translations</th>
</tr>
</thead>
<tbody>
<tr>
<td>code1: 1267 words, 5899 characters</td>
<td>code1: 1184 words, 6529 characters</td>
<td>code: 3168 words, 16799 characters</td>
<td>code: 3582 words, 15486 characters</td>
</tr>
<tr>
<td>code2: 396 words, 1760 characters</td>
<td>code2: 321 words, 1862 characters</td>
<td>latex: 959 words, 5970 characters</td>
<td>latex: 943 words, 4789 characters</td>
</tr>
<tr>
<td>electr: 2922 words, 14895 characters</td>
<td>electr: 3023 words, 18645 characters</td>
<td>phyto: 3254 words, 19993 characters</td>
<td>phyto: 2966 words, 15396 characters</td>
</tr>
<tr>
<td>hydro: 3048 words, 14695 characters</td>
<td>hydro: 2829 words, 17968 characters</td>
<td>spiel: 3047 words, 18397 characters</td>
<td>spiel: 3482 words, 16616 characters</td>
</tr>
<tr>
<td>interf: 2745 words, 13584 characters</td>
<td>interf: 2559 words, 16370 characters</td>
<td></td>
<td></td>
</tr>
<tr>
<td>leop: 2979 words, 14882 characters</td>
<td>leop: 2803 words, 17719 characters</td>
<td></td>
<td></td>
</tr>
<tr>
<td>time: 2031 words, 10176 characters</td>
<td>time: 1908 words, 11161 characters</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

These fairly typical results in our current corpus are meant to illustrate a methodological point only: the results of counting linguistically ill-motivated units point in different, and possibly arbitrary, directions as far as our hypotheses are concerned. There are some obvious facts which do not allow us to interpret such data with any degree of methodological rigour, such as the fact that in ASCII files, German "Umlaute" are spelled and counted as two characters, and punctuation marks, which may have partly different frequencies in the two languages, are counted as characters as well. Word count is influenced by the fact that in the German
spelling system, many multi-verb units are written as one graphological word, as are nominal compounds, whereas neither of this holds for English. Finally, figures such as those given in Table 1 cannot be interpreted without significance tests based on sufficiently high numbers of instances.

Quite clearly, hypotheses expressed in terms of low-level criteria are problematic because of their doubtful relationship to higher-level theoretical concepts, such as ”interference, normalisation, creativity, explicitation, levelling-out, simplification, understanding” which are intended to be tested in each particular case. The ”phenomena” being counted may have very little, or nothing, to do with the phenomena about which our theorising is made.

A more refined and influential assumption derives from Levy (1969). He posited two tendencies of translated texts: lexical impoverishment on the one hand, and explicitation on the other. But even in his case, the question of what exactly is the best range of dependent variables was not answered satisfactorily. Another interesting position is that of Toury (1995: 259ff), who posits the dialectically related laws of ”growing standardisation” and of ”interference” for translated texts. In a nutshell, these refer to the fact that those translators who are oriented towards acceptability in the target-culture, tend to (over-)standardise their texts, whereas those that place particular importance on the source-language text, and/or whose linguistic competence is influenced by the source language, will produce translations showing interference from the source text and from the source language.

Quite clearly, these assumptions promise to capture properties of translated texts, or at least they are plausible hypotheses about such properties, but for a long time there were methodological problems testing them empirically which can only now be overcome. For example, it was not always clear, whether all or only some of the postulated properties were meant to hold for each single translated text. Furthermore, the criteria of how to make these assumptions into testable hypotheses were either unclear, or at least to some extent underdeveloped. Finally, counting by hand was never a technique by which one could have hope of getting insights into (preferably maximally representative) sets of data, and without significance tests, results cannot be interpreted with any degree of confidence.

3.2. Empirical investigation: normalization, simplification, explicitation, levelling-out

An important step towards empirical testing of existing ideas and hypotheses about translated and also about registerially parallel texts can be seen in the collection and building up of multilingual corpora (e.g. Biber 1995, Biber et al. 1998, Johansson and Oksefjell. (eds. 1998), House 2000, Armstrong 1997 and others). Baker and other researchers using the UMIST ”Translational Equivalence Corpus (TEC)” suggested four basic properties of translated text: normalization, simplification, explicitation, and levelling-out (cf. Baker 1995, Laviosa-Braithwaite ed. 1998). ”Normalization” refers to the assumed property of translated text to conform to target-language and target-register norms maximally, or even to a greater extent than original target-language texts. ”Simplification” is the assumed property of simplifying the lexicogrammar of translated texts. ”Explicitation” refers to the assumed property of making information more explicit in translations than in comparable target-language texts, and finally ”levelling-out” means that for any set of translations, they are more similar to each other than some same-size set of original target-language texts. In at least one study another property has been posited, namely that of ”sanitization”, meaning the tendency of translated texts to prefer less marked lexicogrammatical means in terms of creativity and affect than original texts (cf. Kenny 2001.). Clearly, this kind of work is an important step towards
operationalising the concepts involved in thinking about properties of translated text. It is to my knowledge the first time that hypotheses relating to such properties have been formulated in such a way as to make them testable in a more specifically empirical sense. Furthermore, most of this work has been focused on comparing texts translated into English from a variety of different languages with comparable texts within the target-language (English), in order to test properties of translated texts irrespective of source languages. Related to this is the aim of this kind of research to find out about "universal", i.e. language-pair-independent properties of translated texts.

Whereas we see the significant progress towards empirical investigations of properties of translated text which has been made through this kind of research, we also see the potential, and even the necessity, of further methodological development to obtain further insights into the phenomena involved. Methodological development seems to be desirable in at least two respects:

In the first place, the linguistic phenomena in terms of which the hypotheses have been formulated are very low-level and in some cases questionable. Counting words with or without lemmatization, words per sentence, percentages of form words vs. function words, type-token ratios for lexical items, number of realized vs. non-realized conjunctions (e.g. "that" in English) and a few other phenomena of this order of concreteness is methodologically too far removed from the level at which one would want to formulate hypotheses about properties of texts. No relevant model of textuality is formulated anywhere near this low level of representation. This is what we are referring to as the "gap" between the data in electronic corpora and the level at which hypotheses are formulated. Related to this gap, there is a further methodological problem, at least for multilingual corpora: some of the phenomena counted are artificial products of writing systems, rather than direct reflections of textual properties. Take the notion of "a word" for example. Compounding is reflected in the writing systems of English and German in such different ways that any statistics based on numbers of words will be inevitably misleading. This is common knowledge – or should be – for the spelling of nominal compounds (e.g. taxi driver vs Taxifahrer), but the same applies to the spelling of phrasal, prepositional and phrasal-prepositional verbs in English vs. the spelling of many of their counterparts in German (e.g. sit down vs. hinsetzen). In the same way, any statistics based on non-lemmatized forms, i.e. without a morphological analysis, are grossly misleading across languages such as English and German, because of their different morphological types and the effects of this on any statistics derived from them. Admittedly, this further methodological problem will not arise in monolingual corpora, as there is only one writing system involved, yet even then it is a source of methodological concern to know that one is partly counting linguistic pseudo-phenomena. It is to the closing of this gap between the level of our hypotheses on the one hand, and between the level of the data in our corpora that the present study wants to make a contribution.

In the second place, monolingual (comparable) corpora allowing comparisons between translated and non-translated texts in one language are valid, and even necessary, empirical bases for investigations of properties of translated texts. But they cannot be the only basis if we want to broaden our investigations in the direction of taking into account the different sources – and in that sense explanations – of those properties. Whatever we find out about textual properties of translations, they will be due to at least the following three sources
the translation process,
the typological-comparative relationship of the languages involved,
and the comparative registers.

Only the first of these can be conceptualised as cutting across particular language pairs, or combinations of languages, to some extent, and even then can it be assumed that this "cutting across" does not mean being independent of the particular combination involved (cf. our remarks about "understanding" in the next section). We would therefore urge towards working with multilingual corpora in addition to and alongside with monolingual corpora of the TEC type.

In summary, as far as methodological issues in empirical studies within our present area are concerned, we argue for a closing of the gap between hypotheses and data on the one hand, and for multilingual corpora, alongside monolingual ones, on the other.

3.3. Three sources of properties of translated texts: typological factors, register, understanding

In this section, we would like to start from three sources of properties of translated text, proceeding to model one of these three sources in more detail, the process of "understanding" in translation. Understanding is, in turn, only one of the processes that are involved in a more general category "properties of the translation process", which, however, we shall not be able to address beyond the factor of "understanding" in this context. We shall then, in chapter 4, come back to some key methodological issues arising in corpus-based work on translation in general, and arising for our own suggested approach here in particular.

It has already been claimed in this chapter that whatever the properties of translated texts may turn out to be, they will be due to at least the three factors mentioned above. In section 2 above, we have attempted an overview of the main systemic typological differences between English and German, and we would expect that for any translation which aims at preserving a relatively great amount of meaning from its source text, where meaning specifically is meant to include the interpersonal and the textual dimensions of grammar, the typological properties of the source language system should be reflected in some of the properties of the translation. "Literal translation" can be seen as a strong case of such a strategy.

A second important source of properties of translated text is "register", or, more precisely, the fact that the preferred registers of source text and target text for a given context may or may not be exactly the same, and the translator(s) may have decided to make changes to the register of their target-text. An example would be the case where, say, the German translation of an English text from the register of popular scientific prose shows properties of backgrounding of interpersonal meanings, which may or may not be the result of a conscious decision by the translators. While we would like to maintain that too large a degree of register change in our current modelling would run counter to the notion of translation, some degree may very well be compatible, and should even be expected, unless we rule such texts out of our corpus deliberately.

The third source of properties of translated text assumed here is "understanding", one of the larger set of factors of the translation process as a whole. We would like to suggest a particular way of modelling important aspects of "understanding" for translation, a way which leads on to a set of further hypotheses about properties of translated text. Essentially, we
suggest that understanding involves relating given units of text, say clauses, to more explicit and more "literal" paraphrases. In contrast to the more conventional notion of "paraphrase", though, we adopt a notion of "multifunctional" paraphrase, to be explained below. It is widely held in linguistic theorising that states and events represented in texts can be encoded in very different phrasal, or grammatical, categories, such as clause complex, clause, phrase/group, word, morpheme, and of nominal, verbal etc., types. In each case, a distinction can be made between "congruent" (transparent, literal, non-metaphorical) variants on the one hand, and "metaphorical" ones on the other. Aspects of this general phenomenon are variously covered by the terms "translation" (Tesnière 1959), "part-of-speech lexical function" (Mel’cuk 1988), "paraphrase" in many semantic theories, the opposition between "explizit und komprimiertem Ausdruck" (v. Polenz 1988: 26ff), or as the notions of "derivation" and "category-changing transformation" in variants of transformational syntax. It is also partly addressed in some of the translation procedures in the comparative stylistics of Vinay and Darbelnet (1958). We shall exploit here Halliday’s (1985/94: chapter 10) and Halliday and Matthiessen’s (1999) notion of "grammatical metaphor" for a modelling of "understanding" in translation (cf. also Halliday and Martin (1993) for a modelling of how grammatical (de-)metaphorization may function in understanding). For the time being, we shall limit ourselves to a consideration of ideational metaphors, leaving interpersonal (and textual?) metaphors out of account. However, an attempt will be made to at least indicate a more complete picture in section 4 below.

We shall first give two examples of what this process of de-metaphorization involves in our modelling of translation. We shall then look at the general direction of grammatical metaphorization, and implications which this may hold for translation.

Let us begin with an adapted and slightly changed example from Halliday and Matthiessen (1999: 231), which they use to illustrate some key properties of "grammatical metaphor", cf. (7) to (9) below:

(7) Lung cancer death rates are clearly associated with increased smoking.
(8) (It is clear that) if more people smoke, then more people die of lung cancer.
(9) (It is clear that) some people smoke more, so they die faster of lung cancer.

In these examples, variants (8) and (9) are grammatically "de-metaphorized", or "more congruent" variants of (7). At the same time, they are two of the possible disambiguated readings of (7). And, furthermore, variants such as (8) and (9) function as valid (partial) answers to questions such as "what is the meaning of (7)". In other words, grammatical de-metaphorization seems to be one way of modelling these aspects of understanding monolingually. Interpersonally and textually, of course, (8) and (9) are much more than paraphrases of (7), but these two dimensions of linguistic meaning will be held in the background at the moment. Note that we have also not listed all possible paraphrases, for example none in which the causal relationship between the two states of affairs would be reversed – which would be implausible, though linguistically possible.

Moving on to consider an example where two languages are involved, we can easily make up a set of interlingual (German) variants of (7), some of which are given in (10) to (16) below.

(10) Lungenkrebssterblichkeitsraten sind klar assoziiert mit verstärktem Rauchen.
(11) (Es ist klar, dass), wenn mehr Menschen rauchen, eine groessere Zahl von ihnen an Lungenkrebs stirbt.

(12) (Es ist klar, dass) einige Menschen mehr rauchen und sie deshalb schneller an Lungenkrebs sterben.

(13) Die Sterblichkeitsrate bei/an Lungenkrebs steht in deutlicher Beziehung zum Anstieg des Rauchens.

(14) Die Sterblichkeitsrate bei/an Lungenkrebs ist klar korreliert mit erhöhtem Tabakkonsum.

(15) Bei verstaerktem Tabakkonsum erhoeht sich nachgewiesenermassen die Sterblichkeitsrate bei/an Lungenkrebs.

(16) Es gibt eine deutliche Beziehung zwischen erhöhtem Tabakkonsum und steigenden Sterblichkeitsraten bei/an Lungenkrebs.

(10) is a literal translation of (7), and (11) to (16) are examples of grammatically de-metaphorized variants in German. These are meant to illustrate our claim that human translation should not be seen as a process of directly transferring features or structure on either semantic or lexicogrammatical levels, but rather as a process involving "understanding" of the source text to a certain depth, and then re-creating the understood meaning as fully as possible in ideational, interpersonal and textual aspects in the target language. Understanding, in turn, is taken to involve relating meaningful (grammatical) units to some of their less metaphorical variants, thus making many types of meaning which are implicit in the original explicit with the help of co-textual and contextual knowledge. At some point in that chain of de-metaphorization, then, re-wording in the target language begins, and although good translators will approximate a full semantic paraphrase (in the sense of Steiner 2001), they will often not go all the way back up the steps of grammatical metaphorization, either for contrastive-typological reasons, or simply because of internal "fatigue". We therefore expect a somewhat reduced amount of grammatical metaphorization to be a feature of translated texts, relative to non-translated source language texts – and also relative to their source texts, but this is difficult to control, as all the typological factors play a major role there.

Let us give another example of how grammatical metaphor works, following again ideas developed by Halliday. If we assume the clauses (17) and (18) below, and additionally a causal relationship between the states or events expressed in them, then we get the variants (19) to (24) as alternative lexicogrammatical variants:

(17) A rising number of people smoke.
(18) The number of people dying from lung cancer is increasing.

(19) A rising number of people smoke. As a consequence, the number of people dying from lung cancer is increasing.

(20) Because a rising number of people smoke, the number of people dying from lung cancer is increasing.
(21) *Because of* an increase in the number of smokers, the number of people dying from lung cancer is increasing.

(22) The increase in smoking *leads to* an increase in death rates from lung cancer.

(23) Increasing lung cancer death rates and the *causally related* increase in smoking …

(24) *The cause of* increasing lung cancer death rates in increased smoking …

What we intend to illustrate here is that any kind of linguistic meaning, in this case the expression of the logical relationship of causation, can be expressed on different lexicogrammatical ranks, and within ranks by different types of unit, ranging from a cohesive device as in (19), which is still outside grammar, through conjunctions, prepositions, verbs, adjectives, up to nouns. Now, very importantly, it is not – or not necessarily – the lexical head alone which expresses the meaning, here that of causation, but rather, it is potentially the complete phrase headed by that lexical category. Secondly, change of the phrasal type in the expression of some unit of information, say from verb(Phrase) to noun(Phrase), usually involves lexicogrammatical changes in other grammatical units within the same clause and sometimes within entire clause complexes.

What we also want to illustrate in our examples (19) to (24) is the fact that, following work by Halliday, Matthiessen and others, metaphorization within a language seems to follow a certain hierarchy, graphically represented in Figure 1: *Direction of metaphorization*.
And again, we would like to suggest that grammatical metaphorization/de-metaphorization as a basic process applies interlingually as much as it does intralingually. Figure 2 below, extending a monolingual English version in Halliday and Matthiessen (1999: 246) illustrates change of grammatical category in translation between English and German. The English variant in each case is taken to be the more metaphorical variant, i.e. the assumed direction of translation would be English into German. Accordingly, the German variant is the more congruent one.
Figure 2: Change in grammatical category in translation

Directions:

Congruent <= metaphorical
Explicit <= implicit

Direction of translation:

German <= English

| 1. adjective <= noun       | instabil/instability       |
| 2.1. lexical verb <= noun  | transformieren/ transformation |
| 2.2. auxiliary <= noun     | können/ the possibility of |
| 2.3. semi-aux <= noun      | wollen/ the desire to       |
| 3.1. preposition <= noun   | mit/ accompaniment         |
| 3.2. prepositional phrase <= Noun | Staub auf dem Boden/ floor dust |
| 4. conjunction <= noun     | wenn/ condition            |
| 5.1. verb <= adjective     | Armut steigt/ rising poverty |
| 5.2. auxiliary <= adjective| sein… -en/ the previous, past… |
| 5.3. semi-aux <= adjective | beginnen/ the initial…     |
| 6.1. preposition <= adjective | mit/ the accompanying… |
| 6.2. prep-phrase <= adjective | auf der Oberfläche/ superficial… |
| 7. conjunction <= adjective | bevor/ previous            |
| 8.1. preposition <= verb   | anstatt/ replace           |
| 8.2. prep-phrase <= verb   | in eine Schachtel/ to box  |
| 9. conjunction <= verb     | nachdem/ follow            |
| 10.1. conjunction <= preposition | weil/ because of |
| 10.2. conjunction <= prep-phrase | weil/ as a result |
| 11. 0 <= noun              | 0/ the fact that…         |
| 12.1. 0<=> verb            | beeinflussen/ have an influence |
| 12.2. 0<=> causative       | X lasst Y arbeiten/ X imposes work on Y |
| 12.3. 0<=> phase-aux       | beginnen zu untersuchen/ to begin an examination |
| 13.1a) NG-Head <= Post-Mod | Die Regierung entscheidet/ a decision by the government |
| 13.1b) NG-Head <= Deictic  | Die Regierung entscheidet/ the government’s decision |
| 13.1c) NG-Head <= Classifier | Die Regierung entscheidet/ governmental decision |
| 13.2 adverb <= adjective   | entscheidet hastig/ a hasty decision |
| prep-phrase <= adjective   | stritten fuer eine lange Zeit/ a lengthy argument |
| adverb <= various          | stritten gestern/ yesterday’s quarrel |

3 The „0“ in 12.2. and 12.3. may be somewhat misleading. What is happening in both cases is that the relatively metaphorical variant (English) expresses some meaning in a main verb, which is not expressed as a main verb in the more congruent one. The more congruent variant is, again, more explicit in expressing that meaning in a separate, more auxiliary-like verbal marker.
After looking at our notion of grammatical metaphor and its relationship to understanding, let us now depict in a very simple diagram our assumption about translation:

**Figure 3: "Incomplete Re-Metaphorization in Target Language"**

Figure 3 symbolises in a very simplified form what our current modelling of the process of grammatical de-metaphorization in translation amounts to: understanding involves, among other processes, the unpacking of grammatical metaphor, at least in many cases, and at least to a certain extent. At some point of "depth of understanding", re-production in the target language sets in, and here the process of re-metaphorization is cut short below the degree to which it might otherwise go. The reasons could be language-specific (i.e. because of typological-contrastive properties of the languages involved), they could be register-specific (i.e. in cases where the target language and context suggest a lower degree of metaphoricity), and/or they could have to do with a lack of effort or ability on the part of the translator – or, indeed, with some as yet unknown factor. In any case, if the phenomenon exists and is correctly predicted by our model, it should be empirically measurable in representative corpora of texts.

This is as far as we propose to pursue the issue of understanding, grammatical metaphor and translation for the moment. We shall return to it, though, in the next section in an attempt at deriving empirically testable research hypotheses from the model just outlined.
We have claimed in this section three properties of translated text, two of which have a reasonably well documented history of being studied for their own sake, namely in typologically-based comparative linguistics on the one hand (cf. Hawkins 1986, 1990, 1992, or Doherty ed. 1999 for German in comparison to English), and contrastive register studies on the other (cf. Biber 1995 and elsewhere, Ghadessy 1993). The third may be less well studied, but there have been earlier attempts at looking at translation and understanding from different backgrounds (cf. Gutt 1991, or several of the contributions in Guenthner and Guenthner eds. 1978). All three of these areas appear to be rich sources for deriving hypotheses about properties of translated text. These hypotheses, however, would certainly be formulated on levels of abstraction which are substantially higher than that of the word, involving more or less rich frameworks of lexicogrammatical analysis. Therefore, most interesting theoretical work so far has not been empirically tested, on the one hand, and most of the work which has been empirical, such as the work referred to in 3.2., has not exploited the richer theories about the three sources of properties postulated here. It appears to us to be potentially highly promising to attempt at least a partial closing of this gap, which is what we shall turn to in the next section.

4. Methodological issues in empirical investigations of translated texts

In this section we shall briefly address a few relevant techniques for reducing the gap between theories, models, hypotheses on the one hand, and between data on the other, mentioning a few corpora, tagging, and particularly techniques for automatic tagging, techniques for identifying syndromes of shallow linguistic features indicating more abstract concepts such as "register", and significance tests (for good state-of-the-art surveys from our perspective cf. Hansen and Teich 2001). We shall then take up one high-level notion relevant for properties of translated text, namely "understanding", as an example where the gap between data and our modelling is initially wide, but where the possibility for empirical research is currently arising. Closing the gap in this example means first of all modelling an important aspect of "understanding" in terms of a theory of language, using the concept of "grammatical metaphor". We shall then attempt to express certain relevant phenomena to be expected in the area of grammatical metaphoricity of translated texts in terms of distributions of certain basic lexical classes, then in terms of certain registerial phenomena, and finally and above all as relationships between shallow phrase structure configurations, illustrating in three in-depth examples how hypotheses formulated in such terms can be tested in electronic corpora.

4.1. Reducing the gap between theories, models, hypotheses and data

In investigations of properties of translated texts between English and German, it is important to be aware, initially, of a range of existing monolingual corpora which can be used to obtain information about original texts of a considerable range of registers (cf. our list of electronic corpora at the end of this paper). These corpora are accessible to different degrees and at different levels of cost. They can be used for establishing comparative figures for non-translated texts of the registers in question, yet are, of course, not tagged.
There is also nowadays a limited range of multilingual corpora (cf. again the list at the end of this paper), with various, sometimes quite limited degrees of accessibility, and there is also a small number of corpora partly or entirely oriented towards translated texts (apart from those cited at the end, these also include parts of the corpora used in the "Sonderforschungsbereich Mehrsprachigkeit" of the University of Hamburg (cf. Bührig et al. eds. 2000)). Again, these are untagged, but can be tagged in principle, provided the adequate tools are available. Some of these corpora can be, and have been, used for comparative register studies (cf. Biber 1995, Teich 2001), some of them for studies of originals and translations (Mauranen 2000, House 2000), and some of them for comparative studies of translated vs. non-translated texts within one language (cf. Laviosa-Braithwaite. ed. 1998).

But “using a corpus” may mean quite different things in different circumstances. In our context, we are interested in testing empirical claims about differences in register, either between registers in different languages, or between originals and their translations, or else between translated texts and parallel original texts within one language. Now, probably the most advanced research tradition in the area of corpus-based empirical register studies is currently that represented by Biber and his colleagues (Biber 1995). Their technique includes the identification of dimensions (complexes) of lexical and partly grammatical features serving as statistically significant discriminators between registers. One example of such a dimension is the distinction between "involved" and "informational production" reflected in Figure 4 below:
Figure 4: Biber’s ”involved vs. informational production” dimension (Biber 1995)

Co-occurring linguistic features on English dimension 1: ‘Involved versus Informational Production.’ (Features in parentheses have lower weights and are not used in the computation of dimension scores)

Dimension 1

‘Involved Production’
Positives features:
- Private verbs: 0.96
- THAT deletion: 0.91
- Contractions: 0.90
- Present tense verbs: 0.86
- Second person pronouns: 0.86
- DO as pro-verb: 0.82
- Analytic negation: 0.78
- Demonstrative pronouns: 0.76
- General emphatics: 0.74
- First-person pronouns: 0.74
- Pronoun IT: 0.71
- BE as main verb: 0.71
- Causative subordination: 0.66
- Discourse particles: 0.66
- Indefinite pronouns: 0.62
- General hedges: 0.58
- Amplifiers: 0.56
- Sentences relatives: 0.55
- WH questions: 0.52
- Possibility modals: 0.50
- Non-phrasal coordination: 0.48
- WH clauses: 0.47
- Final prepositions: 0.43
- (Adverbs): 0.42

‘Informational Production’
Negative features:
- Nouns: -0.80
- Word length: -0.58
- Prepositions: -0.54
- Type-token ratio: -0.54
- Attributive adjectives: -0.47
- (Place adverbials): -0.42
- (Agentless passives): -0.39
- (Past participial postnominal clauses): -0.38
Involvierter gegenüber informationsorientiertem Register: Merkmale

Fürs Deutsche, in Anlehnung an Biber: 1995

Involviertes Register:
Positive Merkmale

Private Verben
Kontraktionen
Präsenzverben
Pronomina in der Vertrautheitsform
Analytische Negation
Demonstrativpronomen
Emphasepartikel
First-person pronouns
Pronomen es
SEIN als Hauptverb
Kausale Subordination
Diskurspartikel
Indefinitpronomen
Abschwächungspartikel
Emphasepartikel
W-Fragen
Modalpartikel
Nicht-phrasale Koordination
W-Sätze
(Adverbien)

Negative Merkmale:
Nomen
Wortlänge
Präpositionen
Type-Token-Verhältnis
Attributive Adjektive
(Ortsadverbien)
(Agenslose Passivsätze)
(Postnominale Partizipialsätze)

Biber’s methodology gives us a relatively safe methodological starting ground for interlingual register studies. This methodology, being by nature empirical, has as one of its essential parts a significance testing of results found (cf. for comprehensive accounts Biber et al. 1998, as

4 This part of Figure 4 is in German, as it is a verbatim excerpt of our coding sheet
well as Manning and Schütze, 1999). Note that with this methodology, we need either no tagging, or at most word class tagging and some very shallow phrase-structure tagging.

As far as work comparing translations and original texts within one language is concerned (cf. Laviosa-Braithwaite ed. 1998) we welcome a focus on translated texts as such, but also see the disadvantage of a weaker methodological foundation as far as automatic identification procedures for registers (including “translation”) are concerned. WordSmith seems to be the most high-level linguistic tool used hitherto in this research tradition ([http://www1.oup.co.uk/elt/catalogue/Multimedia/WordSmithTools3.0/download.html](http://www1.oup.co.uk/elt/catalogue/Multimedia/WordSmithTools3.0/download.html)), cf. for similar functionalities also the “Simple Concordance Programme” ([http://www.textworld.freeserve.co.uk/sep](http://www.textworld.freeserve.co.uk/sep)), or for one operating on an aligned translation corpus ParaConc ([http://www.ruf.rice.edu/~barlow/parac.html](http://www.ruf.rice.edu/~barlow/parac.html)). In spite of the considerable merit of these tools for enabling a number of empirical corpus-based studies, research on lexicogrammatical properties of all sorts of texts would gain significantly by taking on board several of the advances in the Biber tradition, as well as by using the relatively reliable word-class tagging now available for several languages, including English and German (TnT ([Brants 1999; http://www.coli.uni-sb.de/~thorsten/tnt/)]), the Brill-Tagger (([http://www.ifi.unizh.ch/CL/tagger](http://www.ifi.unizh.ch/CL/tagger)), ([http://www.cs.jhu.edu/~brill](http://www.cs.jhu.edu/~brill)) or tools for morphological analysis (e.g. [http://www.iai.uni-sb.de](http://www.iai.uni-sb.de) or [http://www.lingsoft.fi/doc/gertwol/](http://www.lingsoft.fi/doc/gertwol/)).

Essentially, what tagging for word class and possibly some shallow phrase structure analysis allows us to do is to formulate our hypotheses about registerial properties of texts under investigation in terms of lexicogrammatical syndromes which can be identified in the data on the basis of raw wordings plus word-class and shallow phrase structure tagging. Work in this area which, to my knowledge, is at the moment furthest developed is represented in Teich 2001. Some of her results can directly or indirectly be re-interpreted to yield testing of some of our hypotheses about the role of grammatical metaphor, among them relationships between frequencies in word-class distribution (her chapter 5.3.2.), results about comparative register dimensions (her chapter 5.3.3.7.), and certainly her results about grammatical metaphor directly (chapter 5.3.4.7.). It should be emphasized here that Teich’s results only partly confirm the general trend of the hypotheses to be presented in 4.2. below – a result which, if confirmed in further studies, needs to receive full attention in the evaluation of our hypotheses. On the other hand, and as we shall see below, we would modify several of the diagnostic syndromes checked in the data, with possibly different results.

Teich’s results are also important in so far as they point to a possible methodological development which we shall not foreground here, but which will be explored elsewhere: If we consider her quantitative results in those parts of her work where she goes into comparative register computations and into typological comparisons of her sub-corpora, we could then envisage a technique by which we compute these quantitative results into the results of our text comparisons suggested in 4.2., and then explain all the quantitative differences found on those data which diverge from Teich’s figures as the quantitative effects of “understanding”, rather than of register differences or of typological differences between the languages.

A final technique which can be employed to reduce the gap between hypotheses and data in studies of the type envisaged here is that exemplified in Frangart 2001: this technique presupposes a hand-tagging of corpora, where tagging has to be done for “transitivity” of clauses and for types of grammatical metaphor (in the sense of Figure 2 above). It then becomes possible to get results for grammatical metaphoricity of originals, translations, and parallel texts directly, but there are as yet several problems involved in this type of method. It
is, to start with, expensive in terms of human labour involved in tagging, even if that tagging is done with tools for automatic support (cf. TATOE (http://www.darmstadt.gmd.de/~rostek/tatoe.htm), SysRef (http://minerva.ling.mq.edu.au/) or Coder (O'Donnell 1995; http://cirrus.dai.ed.ac.uk:8000/Coder/index.html)... or some comparable tool. Furthermore, it has inherent problems of inter-coder consistency, as far as transitivity classifications are concerned, and as far as decisions about what is congruent and what is metaphorical are concerned. Finally, it is important to differentiate metaphoricity from transcategorization, although that seems to be relatively straightforward. Further studies using this methodology are going on at the moment, and preliminary results provide both confirmations and falsifications of individual hypotheses about grammatical metaphor and translation.

What we want to do in 4.2. below is attempt a formulation of our hypotheses about grammatical metaphor in such a way that they become testable using the most advanced techniques in the traditions just identified.

4.2. Understanding, grammatical metaphor, and data in multilingual electronic corpora

While we have given above an overview of available resources for large-scale empirical testing of hypotheses about translated text, and while we have indicated in some detail how the gap between the information contained in current electronic corpora and many researchers’ high-level hypotheses about translated text can be narrowed, we have not yet specified this for hypotheses deriving from our view of relating grammatical metaphoricity and understanding in translation. We shall attempt to do so in an in-depth discussion of two example sentences from earlier work by Doherty and of one paragraph from a German translation from Goldhagen, with the aim of illustrating the testing methodologies, assessing their value as indicators of grammatical metaphor, and critically discussing their overall suitability for our purposes. We would also like to emphasise very strongly that in these sample analyses, the results as such, being those of an extremely small "corpus", have no meaning, as they may or may not be representative for a larger corpus. Where they do have their significance is in their potential to show what we can, and what we cannot, expect from applying certain methodologies to empirical studies on multilingual electronic corpora.

In our three examples below, we shall in each case
- cite the text to be analysed (examples)
- discuss the application of some WordSmith-type and Biber-type techniques to them
- tag the examples manually with word class labels
- tag the examples manually with a set of labels giving a flat phrase structure analysis
- carry out analyses of corresponding grammatical units, and in that sense "translational" units, in terms of phrase structure and the translational relationships between them
- give something like a full SFL analysis of the examples, including hand-coding them for grammatical metaphor along the typology given in Figure 2.

We shall then, for each of these types of data, consider whether and how they could be used for testing hypotheses of grammatical metaphoricity.
Example 1:

Our first example consist of 4 short texts E1 – E4 where E1 is an English original, E2 its original translation, E3 a word-for-word back-translation into German for clarification, and finally a registerially parallel German original text.

(E1) The suspicion that volcanic eruptions are the primary source of aerosols in the upper atmosphere has been around for many years.
(English Original)

(E2) Seit vielen Jahren vermutet man schon, dass die Aerosole in den höheren Schichten der Atmosphäre vor allem aus Vulkanausbrüchen stammen. (Translation)

(E3) Since many years suspects one already that the aerosols in the higher layers of the atmosphere above all stem from volcanic eruptions (word-for-word back-translation into English)

(E4) Viel zu wenig beachtet wird die Tatsache, daß die Heilwirkung der Digitalis nur beim kranken Menschen deutlich hervortritt. Auf das gesunde Herz hat die Digitalis keine wesentliche Wirkung bzw. in höheren Dosen nur eine toxische. (German Original from our corpus of registerially parallel texts)

(for E1 and E2 cf. Doherty 1991)
WordSmith-type techniques

Table 2: WordSmith Techniques

<table>
<thead>
<tr>
<th></th>
<th>English</th>
<th>German</th>
<th>German original</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form vs. Function words:</td>
<td>8 : 13</td>
<td>8 : 12</td>
<td>17 : 18</td>
</tr>
<tr>
<td>Words per clause:</td>
<td>21 : 1</td>
<td>6 : 1</td>
<td>18 : 1</td>
</tr>
<tr>
<td></td>
<td>13 : 1</td>
<td>14 : 1</td>
<td>11 : 1</td>
</tr>
<tr>
<td>type-token:</td>
<td>17 : 21</td>
<td>18 : 20</td>
<td>30 : 35</td>
</tr>
</tbody>
</table>

The first set of statistics just considered has a fairly indirect relationship to grammatical metaphoricity: a high form/function-word ratio would seem to be an indicator of a higher degree of grammatical metaphoricity, although it does not hold for all types of grammatical metaphor (cf. 3.3. above), and not exactly in the same way for English and German, with English being typologically much more analytic. As far as number of words per clause is concerned, we have already stated that we tend to be suspicious of using statistics on "words" as graphological units, because they would partly be statistics about properties of writing systems, rather than about lexicogrammatical properties. Finally, as far as the type-token relationships are concerned, we do not immediately see a direct relationship between that measure and the degree of grammatical metaphoricity, except that again a higher percentage of function words will, simply because they are by definition closed-class items, lower the type-token ratio, even if this is not the case with our isolated example here. Note that all the three types of statistics so far discussed may be interpreted as measuring a mixture of register-triggered, typologically triggered and "metaphorization-triggered" effects, but if we cross-analyse these figures with others that we obtain on comparative sub-corpora of registerially similar texts, we should be able to factor out the three different types of effects.

5 Let us add one or two methodological remarks on our classification systems underlying the figures in Table 2: First, we have assumed lemmatisation, that is to say various inflected forms of one lexical item (lemma) are only counted as different tokens of one and the same type, for example in the case of the various inflected forms of the German definite article. Second, in cases where the borderline between form and function words (content vs. form words; lexical vs. grammatical words) is difficult to draw, we have tended to decide in favour of a closed-class interpretation. But however decisions are made in this area, the important consideration here is that decisions are made explicitly and consistently, so as not to endanger the validity of statistical comparisons.
Let us briefly consider analyses for register according to Biber-type features: We shall not give the actual figures for our samples sentences here, because they would not make any statistical sense at all with such a small sample. However, considering Biber’s features for involved vs. informational production as such (cf. Figure 4: Biber’s “involved vs. informational production” dimension), it would appear that subsets of these features could serve as indicators for grammatical metaphoricty, in the sense that informational production goes with higher metaphoricty, whereas involved production goes with lower metaphoricty. These links are, however, in some cases weak and need further testing.

Let us now move on to a tagging of our samples above with word classes and the resulting Figures, cf. Table 3:

**Table 3: Global Distribution of word classes in examples (E1), (E2) and (E4)**

<table>
<thead>
<tr>
<th></th>
<th>conj</th>
<th>prep</th>
<th>lex-verb</th>
<th>adverb</th>
<th>adjective</th>
<th>noun</th>
</tr>
</thead>
<tbody>
<tr>
<td>English Original</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>German Original</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>German Translation</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>6</td>
<td>5</td>
<td>8</td>
</tr>
</tbody>
</table>

As far as indicators of grammatical metaphoricity are concerned, it would be tempting to consider proportionalities for the word classes involved in grammatical metaphoricization according to our Figure 1 above. This would be a mistake, though, because Figure 1 relates *semantic categories*, whereas at this point we are counting *lexicogrammatical realizations*. It also expresses the general potential of the overall linguistic system, which cannot be taken as a direct predictor of quantitative effects. Therefore, we need to look to our Figure 2 *Change in grammatical category in translation*, because this Figure relates lexicogrammatical categories to each other, even if we still have to be careful in our interpretations. This Figure 2 has to be treated with caution for another reason as well: Whereas the category change involved in expressing concepts non-congruently is a clear case of grammatical metaphor, general figures on the proportionalities between word classes in sets of texts (rather than between translational/ corresponding units) will be the outcome of several relationships (especially typological ones and relationships of register). Furthermore concepts and events in general are expressed as phrases, rather than as words, so that shifting between degrees of metaphoricty in texts involves relating phrases to each other, rather than individual words.

To sum up: what increasing metaphoricty means for texts in terms of word classes is a shift from generally more event-type and in this general sense more verbal ways of phrasing...
towards more entity-type and relation-type phrasing. In general, nominal-type phrases will increase at the expense of more verbal-type phrases, thus:

\[
\begin{align*}
\text{conj} &: \text{ prep} \\
\text{verb} &: \text{ noun} \\
\text{adverb} &: \text{ adjective} \\
\text{lex-verb-finite} &: (\text{infinitive + participle + gerund})
\end{align*}
\]

will all be larger for more congruent, i.e. grammatically less metaphorical texts.

Also, the combined proportion of \((\text{lex-verb-finite+conjunction+adverb}) : (\text{noun+adjective+gerund})\) should be higher for congruent than for metaphorical texts.

There are two important gaps here at the moment, which are infinitives and participles on the one hand and prepositions on the other. The reason is that their functions appear so heterogeneous at first sight that we need to perform further investigations before we feel secure about including them in either side in our statistics.

Let us now go on to tag the examples manually with a set of labels giving a flat phrase structure analysis, or rather, look at some emerging statistics given in Table 4.

**Table 4: Types of phrases based on a rank-based flat constituency analysis of examples (E1), (E2) and (E4)**

<table>
<thead>
<tr>
<th></th>
<th>Clause Complex</th>
<th>Clause</th>
<th>Phrase</th>
<th>Group</th>
<th>Word</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>English</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Original</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>7</td>
<td>21</td>
</tr>
<tr>
<td><strong>German</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Translation</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td><strong>German</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Original</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>11</td>
<td>35</td>
</tr>
</tbody>
</table>

In the above IC-analysis, only branching groups and phrases are counted, i.e. single words are not counted as phrases with empty projections. Furthermore, we are adopting a “flat” constituency analysis. If our assumption about word-classes, i.e. the behaviour of lexical heads under metaphorization, is correct, i.e.

\[
\begin{align*}
\text{conj} &: \text{ prep} \\
\text{verb} &: \text{ noun} \\
\text{adverb} &: \text{ adjective} \\
\text{verb-finite} &: (\text{infinitive + participle + gerund})
\end{align*}
\]

will all be larger for more congruent texts, then we would hypothesise that the more highly metaphorized variants should have more groups and phrases per clause, and more of these
three types of unit together per clause complex than the congruent ones. Possible measures to be tested are

\[((\text{number of groups} + \text{phrases}) : \text{number of clauses}) : \text{number of clause complexes}\]

The resulting figures for our examples are:

English Original (1) : ((10:2):0) = infinite
German Translation (2): ((8:2):1) = 4
German Original (4): ((14:3):0) = infinite

According to the model of grammatical metaphor, we should not simply count the relationships of ranks to each other, but rather look at the differences between types of phrases and groups, dependent on the class of their lexical heads. This will give us at least one more type of hypothesis:

\[(\text{number of units headed by a nominal head}) : (\text{number of units headed by a verbal head})\]

English Original (1): 9:5
German Translation (2): 7:7
German Original (4): 13:10

We would like to point out that in these statistics, "Units" does include "Words", as is usual in a rank-based analyses. Furthermore, attention should be drawn to the fact that we can formulate parallel hypotheses for all pairs of nominal-type phrases vs. verbal-type phrases standing in an opposition relationship as to grammatical metaphoricity, e.g. number of phrases headed by adjectival vs. adverbial, prepositional vs. conjunctional etc. phrases. For all hypotheses just outlined, the value should be higher for the metaphorical than for the non-metaphorical text.

We shall now move on to analyses of corresponding grammatical units, and in that sense "translational" units, in terms of phrase structure, and the translational relationships between them. In this methodological step, we compare the rank shifts and relationships not for the texts of the corpus globally, but for those phrases between which there obtains a translation relationship (cf. Toury 1995: 77ff for earlier and related notions of "translation relationship" and "textual segments"). In this part of the investigation, we are obviously looking at original source language texts and their translations only, not at pairs of translated (target language) texts and parallel original texts in the target language.

Let us also point out the property of this analysis that we do not necessarily link textual segments grammatical unit by grammatical unit. Instead, we find several cases, even in our short illustrative example here, where units (e.g. NG) are related to combinations of units (e.g. VG(+projection)), units to zero, zero to units, and complexes of units to other complexes. Neither is there a stipulation that the clause is an absolute boundary for translation relationships, although we do not have an example of trans-clausal translational relationships here (but see our third example of the Goldhagen-excerpt below).
It should also be said that in cases (not represented in this example), in which we have textual material in the target-language text which is not the direct translation of any textual material in the source text, e.g. in cases of so-called ”compensation” by the translator, this has to be accounted for as a case of ”0 => …” correspondence. But let us also emphasise that this will not only be found in cases of compensation, but also in all cases where the target language grammatically enforces encoding of meanings where the source language does not - e.g. in cases of translating a zero-article into a non-zero one, but also in many others.

Examples (E1) and (E2) are repeated here for ease of reference:

(E1) The suspicion that volcanic eruptions are the primary source of aerosols in the upper atmosphere has been around for many years. (Original)  
(E2) Seit vielen Jahren vermutet man schon, dass die Aerosole in den höheren Schichten der Atmosphäre vor allem aus Vulkanausbrüchen stammen. (Translation)

\[ \text{Clause} \Rightarrow \text{Clause Complex} \]

The suspicion that volcanic eruptions are the primary source of aerosols in the upper atmosphere  
vermutet man schon, dass die Aerosole in den höheren Schichten der Atmosphäre vor allem aus Vulkanausbrüchen stammen

\[ \text{NG} \Rightarrow \text{VG} (+\text{Projection}) \]

The suspicion  
vermutet man

\[ \text{NG} \Rightarrow \text{NG + V} \]

The  
\[ \text{Art} \Rightarrow 0 \]

Suspicion  
vermutet

\[ \text{N} \Rightarrow \text{V} \]
that volcanic eruptions are the primary source of aerosols in the upper atmosphere =>

dass die Aerosole in den höheren Schichten der Atmosphäre vor allem aus Vulkanausbrüchen stammen

**projected relative clause => projected complement clause**

Volcanic eruptions => Vulkanausbrüchen

NG => N

Observe that, in this particular case, we have a movement towards increasing metaphorization, rather than away from it.

Are => 0

V => 0

the primary source of aerosols in the upper atmosphere =>

die Aerosole in den höheren Schichten der Atmosphäre vor allem aus … stammen

NG => NG + PP+PP+VG

The primary source = >Vor allem aus ... stammen

NG => PP + PP+VG

Of aerosols in the upper atmosphere = > die Aerosole in den höheren Schichten der Atmosphäre

PP + PP => NG(PP(NG))

Upper => Höhere Schichten

ADJ => NG
What we can see in most of our translation relationships here is a clear confirmation of our hypothesis that the translation de-metaphorizes in the sense of translating more nominal-type phrases into more verbal-type phrases, even in this isolated example. However, what we do not yet have available, to our knowledge, is the possibility of high quality aligned corpora which give us a corpus by translational units. So there is considerable human coding involved before any statistics can be obtained. As an aside, it should also be clear that in this part of the investigation, non-translated original texts in the source or target language do not constitute part of the corpus.

4. SFL-Analyse

(E1) The suspicion that volcanic eruptions are the primary source of aerosols in the upper atmosphere has been around for many years. (Original)

(E2) Seit vielen Jahren vermutet man schon, dass die Aerosole in den höheren Schichten der Atmosphäre vor allem aus Vulkanausbrüchen stammen. (German translation)

(E4) Viel zu wenig beachtet wird die Tatsache, daß die Heilwirkung der Digitalis nur beim kranken Menschen deutlich hervortritt. Auf das gesunde Herz hat die Digitalis keine wesentliche Wirkung bzw. in höheren Dosen nur eine toxische

English:

Experiential:


Logical:

Carrier (Head => projected fact)

Interpersonal:

Indicative

Non-modalized

Textual:

Theme: unmarked, on “The suspicion that volcanic eruptions are the primary source of aerosols in the upper atmosphere”

Information: NEW strongly on “primary source” and weakly on “for many years”
German Translation:

Experiential:


Logical:

Head-clause - projection - dependent clause

Interpersonal:

Indicative + indicative

Non-modalized

Textual:

Theme marked, on “Seit vielen Jahren....

Information NEW on “seit vielen Jahren” and on “vor allem aus Vulkanausbrüchen”

What we can see in the full SFL-analysis is, again, how the English version is more metaphorical. However, this full analysis also requires hand-coding, even if automatic support is nowadays available (cf. Frangart 2000).

German original (first clause inclusive of embedded clause only):

Viel zu wenig beachtet wird die Tatsache, daß die Heilwirkung der Digitalis nur beim kranken Menschen deutlich hervortritt. (Auf das gesunde Herz hat die Digitalis keine wesentliche Wirkung bzw. in höheren Dosen nur eine toxische)

Experiential:

Phenomenon (Event,Actor,Location) Process: mental, Circumstance

Logical:

Process (embedded projection)

Interpersonal:

indicative (embedded indicative),

Non-modalized

Appraisal (”viel zu wenig”)

Textual:

Theme strongly marked, on “viel zu wenig beachtet....”

Information NEW on “viel zu wenig beachtet” and on “nur beim kranken Menschen“
Let us finally consider a version of our sample sentences, which has been hand-coded for types of grammatical metaphor, with numbers in brackets referring to types of grammatical metaphor in our Figure 2.

(E1) The suspicion (2.1.) that volcanic eruptions (2.1 + 13.1.) are the primary source (2.1. +13.1) of aerosols in the upper atmosphere has been around for many years. (Original)

(E2) Seit vielen Jahren vermutet man schon, dass die Aerosole in den höheren Schichten der Atmosphäre vor allem aus Vulkanausbrüchen (2.1.) stammen. (Translation)

(E4) Viel zu wenig beachtet wird die Tatsache, daß die Heilwirkung der Digitalis (2.1.+13.1) nur beim kranken Menschen deutlich hervortritt (12.1.). Auf das gesunde Herz hat (12.1.)die Digitalis keine wesentliche Wirkung (2.1.) bzw. in höheren Dosen nur eine toxische (2.1.)

It appears clear that hand-coded data would be the most direct source for statistics on grammatical metaphoricity. However, we need to be aware of the methodological problems of cost and reliability, already mentioned above.

Let us now move on to a parallel discussion of our second example, deliberately choosing one which exemplifies a different type of grammatical metaphor and de-metaphorization, but also one which is typical and frequent in translation (example from Doherty 1993).

Example 2:

(E5) To solve such problems, plants have evolved two strategies which they superimpose upon photosynthesis.

(E6) Zur Losung solcher Probleme haben sich bei den Pflanzen zwei Mechanismen herausgebildet, von denen die Photosynthese ueberlagert wird.

(E7) For-the solution of-such problems have itself with the plants two mechanisms evolved by which the photosynthesis overlaid becomes. (word-for-word back-translation)
Table 5: WordSmith-techniques, examples (5) and (6)

<table>
<thead>
<tr>
<th></th>
<th>English</th>
<th>German</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Form vs. Function words:</strong></td>
<td>8:6</td>
<td>8:10</td>
</tr>
<tr>
<td><strong>Words per clause:</strong></td>
<td>4:1</td>
<td>18:1</td>
</tr>
<tr>
<td></td>
<td>10:1</td>
<td>6:1</td>
</tr>
<tr>
<td></td>
<td>5:1</td>
<td></td>
</tr>
<tr>
<td><strong>type-token:</strong></td>
<td>14:14</td>
<td>17:18</td>
</tr>
</tbody>
</table>

With the proviso, once more, that there appears to be only a very indirect relationship between grammatical metaphoricity and the variables measured here, and that we do not claim any significance other than a methodological one, the translation here appears clearly congruent relative to a much more metaphorical original on the first dimension. Along the second, it would be the opposite, partly due to the fact that we are counting adverbial clauses as (hypo)tactically linked, but not as part-of their head-clauses (following Halliday 1985/94 and elsewhere). Along the third, it would again be the English original which is more metaphorical - but note again that type-token measurements of texts of such short length are not valid, for obvious reasons. The contradictory findings here are of particular significance in view of the fact that the type of metaphoricity in (E5) vs. (E6) is quite different from that in our previous examples.

Moving on to application of Biber-type techniques for a rating along the “informational vs. involved production” register would not yield any “involved” classifications for any of the two variants. For longer texts of the same register, the German version would probably be classified as slightly more metaphorical by the technique.

Table 6 below will give us the global distribution of word classes in examples (E5) and (E6):
Table 6: Global Distribution of word classes in SL and TL corpus

<table>
<thead>
<tr>
<th></th>
<th>conj</th>
<th>prep</th>
<th>lex-verb</th>
<th>adverb</th>
<th>adjective</th>
<th>noun</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>German</td>
<td>0</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
</tbody>
</table>

The German translated version is shown to be more metaphorical along the first two dimensions here. The combined proportion of \((\text{lex-verb+conjunction+adverb}) : (\text{nouns+adjective+gerund})\), in this case 4:4 for English and 2:5 for German, gives the same result.

Table 7: Types of phrases based on a rank-based flat constituency analysis for examples (5) and (6)

<table>
<thead>
<tr>
<th>Clause Complex</th>
<th>Clause</th>
<th>Phrase</th>
<th>Group</th>
<th>Word</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>German</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>7</td>
</tr>
</tbody>
</table>

As in our previous example, our hypothesis is that the more highly metaphorized variants should have more groups and phrases per clause, and more of these three types of unit together per clause complex than the congruent ones.

\(((\text{number of groups + phrases}) : \text{number of clauses}) : \text{number of clause complexes}\)

The resulting figures for our examples are:

English Original (E5): \((4:3):1 = 4/3\)
German Translation (E6): \((10:2):0 = \infty\)
Again, the particular numerical values here do not matter because of the smallness of our sample. The “infinite” in particular is only a product of the fact that we are analysing a single clause, and thus is very unlikely to occur in any larger text.

Our second hypothesis here is:

\[
\frac{\text{number of units headed by a nominal head}}{\text{number of units headed by a verbal head}} \text{ is higher for metaphorical than for non-metaphorical texts.}
\]

English Original (E5): 2:8  
German Translation (E6): 6:8

We can see, very interestingly, that the original is classified as clearly less metaphorical than the translation here, but also that both (E5) and (E6) are identified as much less metaphorical than either of (E1), (E2), and (E4).

Let us move on again to an analysis of corresponding grammatical units, and in that sense "translational" units, in terms of phrase structure, and the translational relationships between them. For ease of reference, the examples will be repeated here:

(E5) To solve such problems, plants have evolved two strategies which they superimpose upon photosynthesis.

(E6) Zur Lösung solcher Probleme haben sich bei den Pflanzen zwei Mechanismen herausgebildet, von denen die Photosynthese überlagert wird.

On the highest level, a clause complex is translated as a clause.

\[
\text{CC} \Rightarrow \text{Clause}
\]

This in itself is a step which normally indicates a move towards increased grammatical metaphorization, and so it is here, in that the logico-semantic relationship of "purpose" is expressed through a preposition Zur, rather than through the more conjunction-like infinitival to. But observe that in the English version, the (intentional) purpose is grammatically ascribed to the first Participant role of evolve, which would result in a highly metaphorical personification if it were taken over into the German version. That is to say, increase in metaphoricity in one respect helps to prevent an increase of the metaphoricity of the whole construction.

To solve such problems \(\Rightarrow\) Zur Lösung solcher Probleme

\[
\text{Cl (non-finite)} \Rightarrow \text{PP}
\]

In this case again, a local increase in metaphorisation leads to a global decrease by weakening the agency feature of the clause complex concerned.
Plants have evolved two strategies which they superimpose upon photosynthesis:

Plants ➞ bei den Pflanzen

NG ➞ PP

have evolved ➞ haben sich … entwickelt

VG ➞ VG

two strategies which they superimpose upon photosynthesis ➞ zwei Mechanismen herausgebildet, von denen die Photosynthese ueberlagert wird.

NG ➞ NG

To solve ➞ Zur Losung

VG ➞ PP

Such problems ➞ solcher Probleme

NG ➞ NG

Which ➞ von denen

NG ➞ PP

They ➞ 0

NG ➞ 0

Superimpose ➞ ueberlagert wird

V ➞ VG
We can see here that, in contrast to the first example above, the metaphoricity of the English version consists less in the rank at which sequences, figures and participants are encoded, but rather in the metaphorical way in which semantic entities, processes etc. are mapped onto grammatical participants, processes etc.

Let us now turn to a full SFL analysis of the English (E5) and the German (E6) sentences and indicate the main results of this type of testing.

(E5) To solve such problems, plants have evolved two strategies which they superimpose upon photosynthesis.

Experiential:


Logical:

Beta (Purpose), Alpha

Interpersonal:

indicative, non-modalized

Textual:

Theme marked, on “To solve such problems....”

Information NEW on “To solve such problems ” and weakly on “strategies ” and on “upon photosynthesis”

German:

(E6) Zur Lösung solcher Probleme haben sich bei den Pflanzen zwei Mechanismen herausgebildet, von denen die Photosynthese überlagert wird.

Experiential:

Purpose - Process:event - Location - Medium(Rankshift: Term - Process:relational –Value)

Logical:
Main clause
Interpersonal:
Indicative
Non-modalized
Textual:
Theme weakly marked, on "zur Lösung solcher Probleme"
Information NEW on “zur Loesung solcher Probleme” and weakly on “Mechanismen” und “überlagert…”

What we can see in the full SFL analysis is that the metaphoricity consists in the incongruent mapping of semantic figures of one type (event plus relation) into grammatical processes of another (action + action). However, this is not a question of rank, but rather one of class of unit on one and the same rank. As above, this full analysis requires hand-coding, even if automatic support is nowadays available.

As a final step in our discussion of the second example, let us consider a hand-coded version of our sample sentences, with numbers in brackets referring to types of grammatical metaphor in Figure 2:

(E5) To solve such problems, plants have evolved two strategies which they superimpose upon photosynthesis (2.1.).

(E6) Zur Lösung (2.1.) solcher Probleme haben sich bei den Pflanzen zwei Mechanismen herausgebildet, von denen die Photosynthese überlagert wird.

The metaphorisation is more difficult to establish here than in our last example, and cannot easily be mapped onto the purely grammatical account in Figure 2. It consists in that

- the purpose clause adds a feature of agency to the clause complex
- the process in the main clause “evolve” is realized as a directed action, with “plants” being treated as animate agents
- strategies is a noun whose (potential) projections add agency to the clause
- “superimpose’ is again realized with features of agency
- the semantic processes “strategies” and “photosynthesis” are treated as grammatical participants of an actional process “superimpose”.

However, the metaphoricity seems not so much to show up in the type and rank of units, in which information is encoded, but rather in the configurations of the semantic units and in the mapping from semantics to grammar. In actual fact, the metaphorisation which we have claimed here is that of the English version seen through the perspective of German. Each clause, as seen from its own language is not very metaphorical - as is shown by most of our quantitative results above.
Let us, as a third and final example for the illustration of our methodology, look at two excerpts (E7) and (E8) which we previously discussed in Steiner 2000, but on a different level of analysis. We shall reproduce them here for the sake of convenience:

(E7) "In addition to accounting for the diverse actions which the cases have specified, an explanation of the perpetration of the Holocaust must account for the specific identities of both the perpetrators and the victims. It must also account for the varied persons, institutions, and settings of the perpetration. It must identify features common to the perpetrators that would explain both why such relatively uniform action and why these particular discrete actions would emerge in varied settings among a large number of heterogeneous individuals. It must explain the smoothness of the overall operation. It must also achieve the following. It needs to integrate the various levels of analysis, namely the remarkable convergence of the overall policy, the frequently uncoordinated local implementation of it, including the character of institutions of killing, and the actions of individuals. This is most striking in the domain of Jewish "work". Typically, until now, macro analysis of Nazism and the Holocaust has been generally disjointed from the meso and micro analyses. An explanation must further account for the genocide in a comparative perspective - which the conventional explanations typically do not even address and for which they are inadequate. Crucially, an explanation must supply the motivational mainspring that is adequate to all these demands. Finally, it must explain the genesis of this motivation.” (Goldhagen 1996a: 391)

German translation:

For these two more extended passages, let us at least illustrate the kind of picture which we can expect from running through our analyses:

**Table 8: WordSmith-Techniques:**

<table>
<thead>
<tr>
<th></th>
<th>English</th>
<th>German</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form vs. Function words:</td>
<td>100 : 116</td>
<td>91 : 101</td>
</tr>
<tr>
<td>Words per clause:</td>
<td>216 : 19</td>
<td>192 : 21</td>
</tr>
<tr>
<td>type-token:</td>
<td>109 : 216</td>
<td>119 : 192</td>
</tr>
</tbody>
</table>

Once more, we absolutely cannot draw any conclusion from such isolated examples, but if these figures were based on data on a much larger scale, and if they were tested for levels of significance, they would lead to conclusions which are interesting both from the point of view of contrastive work, and from the point of view of translation.

**Table 9: Global Distribution of word classes in (E7) and (E8)**

<table>
<thead>
<tr>
<th></th>
<th>conj</th>
<th>prep</th>
<th>lex-verb</th>
<th>adverb</th>
<th>adjective</th>
<th>noun</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>English</strong></td>
<td>6</td>
<td>31</td>
<td>14</td>
<td>14</td>
<td>27</td>
<td>47</td>
</tr>
<tr>
<td><strong>German</strong></td>
<td>12</td>
<td>14</td>
<td>21</td>
<td>16</td>
<td>24</td>
<td>39</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>English</th>
<th>German</th>
</tr>
</thead>
<tbody>
<tr>
<td>conj : prep</td>
<td>6:31</td>
<td>12:14</td>
</tr>
<tr>
<td>verb : noun</td>
<td>14:47</td>
<td>21:39</td>
</tr>
<tr>
<td>adverb : adjective</td>
<td>14:21</td>
<td>16:24</td>
</tr>
<tr>
<td>finite VG : non-finite VG</td>
<td>17:3</td>
<td>20:3</td>
</tr>
</tbody>
</table>

The German translation is clearly more congruent on all counts other than the third here, thus confirming our hypotheses. It needs to be seen for our interpretations, though, that the explanation behind at least the finite VG : non-finite VG dimension may be as much a typological one as one in terms of the translation process.
Furthermore, the combined proportion of (lexverb+conjunction+adverb) : (noun+adjective+gerund), in this case 34:74 for English and 49:63 for German, is higher for the congruent German translation than for the relatively metaphorical English original.

Once again, these absolute figures do not mean anything here, because the “corpus” is too small. But if the considerable differences shown in our counts here turned up in investigations of a larger corpus of originals and translations, it would indicate substantial differences in grammatical metaphoricity along the lines postulated in our hypotheses.

### Table 10: Rank-based flat constituency analysis of examples (E7) and (E8)

<table>
<thead>
<tr>
<th></th>
<th>Clause Complex</th>
<th>Clause</th>
<th>Phrase</th>
<th>Group</th>
<th>Word</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>English</strong></td>
<td>2</td>
<td>18</td>
<td>31</td>
<td>98</td>
<td>216</td>
</tr>
<tr>
<td><strong>German</strong></td>
<td>11</td>
<td>23</td>
<td>12</td>
<td>97</td>
<td>192</td>
</tr>
</tbody>
</table>

As we can see here, the German translation expresses the ideational meaning of the English original much more on the higher ranks of clause complex and clause than the English original, which seems to rely on phrases and groups much more - and possibly even individual words. As in our examples above, our hypothesis is that the more highly metaphorized variants should have more groups and phrases per clause, and more of these three types of unit together per clause complex than the congruent ones.

\[
\frac{\text{number of groups + phrases}}{\text{number of clauses}} : \text{number of clause complexes}
\]

The resulting figures for our examples are:

English Original: \((129:18):2\) = roughly 3,5
German Translation: \((109:23):11\) = roughly 0,4

Once more, our hypothesis is strikingly confirmed.

Our second hypothesis here is:

\[
\frac{\text{number of units headed by a nominal head}}{\text{number of units headed by a verbal head}}\]

is higher for metaphorical than for non-metaphorical texts.

English Original, 1st sentence : 12 : 7
German Translation, 1st sentence: 12:10
In this figure as well, we see that the German translation comes out as more congruent than the English original.

Let us now consider constituency-based statistics comparing corresponding (translational) units. If we did this for our two texts at hand, we would get a very clear picture of demetaphorisation in the sense of information expressed at “higher” ranks in the German text than in the English. However, let us look at the following passage only because it provides examples of one or two interesting and relatively general phenomena occurring in that area:

It must explain the smoothness of the overall operation. It must also achieve the following

Man muß zeigen können, warum der Gesamtvorgang derart reibungslos ablaufen konnte, und dabei zugleich.....

It must explain the smoothness of the overall operation => Man muss zeigen koennen, warum der Gesamtvorgang derart reibungslos ablaufen konnte,

CL => CC

It => 0 (note: Man is not a translation of it, but newly inserted to achieve the non-metaphorical impersonal construction in German)

NG => 0

must explain => muss zeigen koennen

VG (modality + process) => VG (modality +( process + modality))

the smoothness of the overall operation => warum der Gesamtvorgang derart reibungslos ablaufen konnte

NG => clause (finite)

the smoothness => derart reibungslos

NG => AdvG

0 => derart

0 => Adv

of the overall operation => der Gesamtvorgang

PP => NG

It must also achieve the following. => zugleich
This short analysis translational unit by translational unit shows two methodological properties: in the first place, the general tendency towards de-metaphorisation is again very clear. In the second, locally we get the opposite, as in the translation of *It must also achieve the following* by the adverb *zugleich* as a constituent of the following clause. We also find a case here, in the translation of no direct source into the intensifying ”derart”, of something which may be compensation – or else simply an addition to the target language text. This particular case merits further investigation in the future, as the nominalisation as such seems to add a meaning of intensification to the quality of *smoothness* which is compensated for by the German intensifying particle with scope over the adverb *reibungslos*.

If we undertook, finally, a full SFL Analysis of these passages – which we shall not show here for reasons of space – some of the results which we would find are the following (cf. Steiner 2000 for an analysis of a greater part of this an adjacent passages):

- In terms of transitivity, the English text has a very high percentage of directed-action predicates with “explanation” or a pronominal reference to it as actor/agent. The German text has a wider variety of predicates and first participant roles.

- In the English text, 9 of the 18 clauses have a modal auxiliary encoding deontic modality as highest ranking head of their verbal groups, whereas this is true of only 6 of the 23 German clauses.

- In terms of logical meaning, the German text has a far higher percentage of logico-semantic relations expressed in tactic relationships between clauses.

- As far as thematic progression is concerned, the English text has a fairly constant experiential theme, referring to “explanation”, as opposed to the German, which has a more variable thematic progression.

- Finally, in terms of affective meaning, English has four explicit references in fully lexical items to “perpetrator/ perpetration”, where the German has only 2 to the corresponding “Täter”.

We continue our exploration, as in our earlier examples, with a consideration of the two texts after they have been hand-coded for grammatical metaphor using the categories of Figure 2. We shall, for reasons of space, only discuss one clause complex, so as to illustrate the methodological issues involved:

*It (2.1.) must identify features (1.) common to the perpetrators (2.1.) that would explain both why such relatively uniform (13.2.) action (2.1.) and why these particular discrete (13.2.) actions (2.1.) would emerge (9) in varied settings among a large number of heterogeneous individuals.*

*Sie (2.1.) muß die Züge (1.) herausarbeiten, die den Tätern gemeinsam sind und die erklären, warum sich auf verschiedenen Schauplätzen mit vielen unterschiedlichen Beteiligten sowohl ein relativ gleichförmiges (13.2.) Handeln (2.1.) als auch ganz besondere (13.2.) Einzeltaten (2.1.) entwickelten (9)*
We can see in this passage that grammatical metaphoricty in the sense of (non-) congruent mapping of ideational semantic units onto grammatical ranks is very similar in the original and the translation. A second type of metaphoricty lies in the participant and circumstantial functions assigned to these grammatical units, and it is here that, because the translation is relatively literal, the German text may be more metaphorict (relative to German usage) than the English one is (relative to English usage).

By way of a conclusion for section 4 of this paper, let us attempt a summary assessment of the extent to which we have been able here to address issues and solve problems related to the empirical testing of high level hypotheses about translated text using data in electronic corpora:

In 4.1., we have given an overview of what are, to our knowledge, state of the art tools for reducing the gap between data and hypotheses for the phenomenon of textual properties of translated text. In 4.2., we have taken a particularly high-level notion in modelling properties of translated text, the notion of "understanding". We have then used one way of modelling important aspects of "understanding", namely the concept of "grammatical metaphor". To what extent this notion may be ideal for that modelling is of course open to dispute, but it seems clear to us that, even if grammatical metaphor is not accepted as a central modelling concept, it would be highly interesting if we found, in the research outlined here, significant differences in information packaging across languages, across registers, and between translated and non-translated text. The onus would then be on those rejecting the validity of the notion of grammatical metaphor to explain the differences found in some other way — which is an interesting way of making progress in scientific research and argumentation.

As far as the dependent variables to be investigated are concerned, our state of the art appears to be the following:

As far as the WordSmith-type and Biber-type techniques we have applied are concerned, their application seems to be relatively well tested and established. They are furthermore inexpensive in terms of the human coding efforts that have to go into that kind of work. They can certainly be used in the research outlined here, yet have, at least for a testing of effects of "understanding" and "grammatical metaphor" the disadvantage that the relationship between these high-level notions and the effects measured in texts is relatively indirect — which in the worst case might mean that we are measuring something different from what we intend to measure. Significant results would still be of great interest, but the interpretation would have to be undertaken carefully.

One step further, we considered tagging the examples with word class labels and then evaluating those data. This kind of technique is currently becoming much less expensive than hitherto in terms of human labour involved, due to the availability of taggers for English and German which begin to offer sufficient reliability to replace hand-coding. We have also seen that the gap between our hypotheses and the data can thus be narrowed further, constituting a significant step towards improved testing. Admittedly, the relationship between the information contained in the data and our hypotheses is still rather indirect and invites further tightening.
In yet another step, we investigated tagging the examples manually with a set of labels giving a flat phrase structure analysis and then looking at motivated differences in distribution of certain configurations. This kind of annotation of corpora still has to be done by hand, possibly with good support by electronic tools. The resulting statistics represent a further improvement towards narrowing the gap in question here.

Next we investigated the possibility of carrying out analyses of corresponding grammatical units, and in that sense "translational" units, in terms of phrase structure and the translational relationships between them. This method is even somewhat more expensive in terms of human labour, yet could be significantly improved upon by the accessibility of high-quality alignment tools. It seems to us to be a considerable advantage of this method, though, that it allows a fairly direct observation of the relationships between originals and translation posited by our model. Given that the considerable initial effort has gone into annotating aligned corpora, the gap between hypotheses and data is very significantly reduced.

In another step, we investigated giving something like a full SFL analysis of the examples, again aligned on at least the clause level, including hand-coding them for grammatical metaphor along the typology given in Figure 2. This would certainly be a very direct method of testing our hypothesis, but has the disadvantage of a) being expensive in terms of human analyses and annotation, and b) having to face the challenges of inter-coder consistency. This method, which almost eliminates the gap between hypotheses and data, is interesting for small exemplary corpora, but also still problematic because of problems relating to the "quality" of the data.

Finally, we have said in various places here that in explanations of whatever we observe empirically in our data, it will be very difficult to attribute the results independently to the three variables of typological relationship, relationships between registers in the two cultures, and understanding as one part of the translation process. However, with the existence of registerially comparable corpora of original texts in our two languages, we have the means of extracting comparable statistics for our variables. If we then compare the two statistics, i.e. differences in metaphoricity between translated and non-translated texts, these should be due to the translation process, as language pair and registers have been held constant.

5. Questions of norms: what translations are and what they should be...

We have said above that corpus-based studies of (translated) text at first sight appear to be a clear case of empirical, inductive and descriptive, rather than hermeneutic and norm-dependent activity, but that both hermeneutic processes and questions of norms enter the methodology directly and indirectly. As far as hermeneutic processes on the part of the investigator are concerned, we have seen that methodologies which are fully restricted to the untagged corpus do not seem to be able to bridge the gap identified between hypotheses and phenomena. As soon as we allow any form of tagging, though, human interpretation sets in, even if much less so on lower levels than on higher ones. Ideally and in some strongly inflecting languages, there is nowadays reliable word-class tagging. The same is true of a few
weakly inflecting languages with strong constraints on word order, such as English. But we have seen that a restriction to word class tagging still leaves a fairly wide gap between our hypotheses and our data, even if help towards narrowing this gap is provided by working with syndromes of word classes to identify higher-level grammatical categories. Yet the next step in annotation, the one towards a shallow phrase structure tagging, if done fully automatically, already takes us beyond the threshold at which the data is reliable enough to count as data, in the sense of good precision and recall relative to our research hypotheses. And even a testing of hypotheses relying on corpora tagged for shallow phrase structure has limitations, as shown in the preceding section. As soon as we bring in tagging techniques which are semi-automatic or only tool-supported, for example in decisions about what are relevant translational units in the sense of experientially matching phrases, or if we even use any of the techniques involving some fuller (in our case SFL) linguistic coding, the coder becomes involved in processes of interpretation and decision making, which are hermeneutic processes by a human subject, rather than any kind of fully automatic procedure or pattern matching. There is no solution to this dilemma in sight, and in the absence of one, all we can hope for is a maximally transparent way of making coding decisions, so as to have some amount of understanding of the effects these decisions have on the data, and so as to make these decisions challengeable and thus open to further methodological development.

But norms come into the process of corpus selection at an even earlier and more fundamental stage than that at which (a part of) the corpus is possibly tagged: this is the stage at which decisions are made about which texts belong in the corpus, and which ones do not. Let us look at two extreme strategies here and briefly consider the consequences for the nature of the reality we are observing in each case.

The first – extremely “liberal” – strategy would admit any text into the corpus which is called “a translation” by some arbitrary authority, usually publishers, editors etc. If we follow that strategy, we shall probably not miss much in terms of data constituting “translations”, but we shall also include a substantial amount of data which would not be a translation under any meaningful constraint. If working with a corpus of this nature, we would have to take into account a host of phenomena which are not due to the nature or process of translation, such as arbitrary gaps in texts, (partially) newly composed texts, texts with a high amount of fairly basic translation mistakes etc.

The second – extremely “dogmatic” – strategy would admit into the corpus only those texts, which count as translations according to some pre-existing norm of what constitutes a (good) translation. These norms might be justified either by claiming a competence-like intuition about what does and what does not constitute a stylistically valid text (cf. Doherty 1991), or else they might be justified by constraining different types of translation heavily along lexical and semantic relationships that may obtain between source language and target language texts, constraints of the type we have postulated for translations on lexicogrammatical, semantic, and registerial levels (cf. Steiner 2001).

In reality most approaches to corpus-design follow some middle path, such as e.g. requiring that the translation should have been carried out by a professional translator, which in turn is a highly problematic criterion if we think about the vagueness of the term “professional”, especially interculturally, and if we become aware of the fact that even professional translators may employ very different strategies on their translation, depending on a range of factors.
And there is a final context in which we must be careful about whether and about which norms we introduce in accepting or in ruling something out as a translation: if we made seamless functioning in the target culture the one and overriding aim of all translation, then translations - or those texts that we admit into the corpus - could indeed be expected to show the property of (over-)conforming to target language and target culture norms. And quite a few first results seem to point into that direction. To the extent, though, that we apply such a norm to whatever we classify as a “translation”, translation cannot be a force of creativity in intercultural communication, and it cannot be one of the driving forces of language change. However, the answer to this question does not lie in what is “externally given” in translations, but rather, in what we count as a translation – and in this sense, our norms of what we admit and what we do not admit into the corpus should be explicit, but of such a nature that they admit the creative and unusual into the corpus (and into translation), rather than keeping them out.

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- COSMAS I – German Corpus (http://www.ids-mannheim.de/kt/corpora.html)
- Negra – German Corpus (http://www.coli.uni-sb.de/sfb378/negra-corpus/negra-corpus.html)
- Cobuild – English Corpus (http://www.cobuild.collins.co.uk/about.html)
- BNC – English Corpus (http://info.ox.ac.uk:80/bnc/)
- ICE – English Corpus (http://www.ucl.ac.uk/english-usage/ice/index.htm)
- ICAME – English Corpus (http://www.hd.uib.no/icame.html)
- CSPA – English Corpus (http://www.athel.com/cspa.html)
- the SPRIGG-corpora (cf. Johansson et al. eds. 1998)
- Tractor-Network – Multilingual Corpus (http://www.tractor.de/)
- TEC – English Translational Corpus (http://ceylon.ccl.umist.ac.uk/tec/)
- Chemnitz English-German Translation Corpus (http://www.tu-chemnitz.de/phil/InternetGrammar/)
- Canadian Hansard (French – English) : (http://www-rali.iro.umontreal.ca/TransSearch/TS-simple-uen.cgi)
- Mauranen (2000)