AIMING FOR COGNITIVE EQUIVALENCE – MENTAL MODELS AS A *TERTIUM COMPARATIONIS* FOR TRANSLATION AND EMPIRICAL SEMANTICS

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Abstract
This paper introduces my concept of cognitive equivalence (cf. Mandelblit, 1997), an attempt to reconcile elements of Nida's dynamic equivalence with recent innovations in cognitive linguistics and cognitive psychology, and building on the current focus on translators' mental processes in translation studies (see e.g. Göpferich et al., 2009, Lewandowska-Tomaszczyk, 2010; Halverson, 2014). My approach shares its general impetus with Lewandowska-Tomaszczyk's concept of re-conceptualization, but is independently derived from findings in cognitive linguistics and simulation theory (see e.g. Langacker, 2008; Feldman, 2006; Barsalou, 1999; Zwaan, 2004). Against this background, I propose a model of translation processing focused on the internal simulation of reader reception and the calibration of these simulations to achieve similarity between ST and TT impact.

The concept of cognitive equivalence is exemplarily tested by exploring a conceptual / lexical field (MALE BALDNESS) through the way that English, German and Japanese lexical items in this field are linked to matching visual-conceptual representations by native speaker informants. The visual data gathered via this empirical method can be used to effectively triangulate the linguistic items involved, enabling an extra-linguistic comparison across languages. Results show that there is a reassuring level of inter-informant agreement within languages, but that the conceptual domain for BALDNESS is linguistically structured in systematically different ways across languages. The findings are interpreted as strengthening the call for a cognition-focused, embodied approach to translation.

Keywords: translation equivalence, cognitive translation studies, translation processing, empirical semantics, cross-linguistic comparison, simulation semantics, perceptual symbol systems, re-conceptualisation

1. Introduction

In a context such as the present one, it is probably not necessary to spell out an argument for the continued importance of a debate on the nature of equivalence

in translation studies. I will nonetheless devote part of this chapter to this endeavour, as I feel that my concern with this topic is far from a consensus in the field of translation studies at large and that those with a continued or renewed interest in it – such as scholars working from a cognitive or comparative perspective – are still a minority. Personally, I believe that a thorough revision of what we mean by equivalence and how we envision its role in the process leading from source texts (STs) to target texts (TTs) is a necessary stepping stone for translation studies as a whole to advance. Furthermore, I am convinced that adopting a psychological, cognitive perspective on the issue at hand is the right way to proceed, which is why I propose the concept of *cognitive equivalence* (borrowing the term from Mandelblit 1997) as a novel way of looking at equivalence in the context of translation theory. A thorough explanation of what I mean by this and how this concept can be empirically substantiated will be central to the present chapter.

2. The demise of equivalence?

As a look into virtually any textbook on translation studies will show, equivalence can look back on an impressive but rocky career as a major theoretical concept in the field. It is one of the central issues in traditional translation studies, in early forms dating back all the way to antiquity, but assuming its modern role in the context of a scientific discipline over the course of the last century, prominently marked by Vinay and Darbelnet's use of *équivalence* in 1958 (see Pym, 2010: 8). As an assumed link existing between ST and TT – the specific nature of which varies from theory to theory – it played an important role as a criterion for defining translation, as well as a promising basis for translation quality assessment (see Pym 2010 for a detailed overview). Despite this pivotal role, the concept has fallen from favour over the following decades, either regarded as an aspect of minor importance to translation theory (e.g. in Skopos theory, see Reiss and Vermeer, 1984) or as a concept that is considered ill-defined or entirely vacuous and that has so far failed to advance translation studies at large (see Snell-Hornby, 1988). Although many of these developments can be traced back to sociological or ideological changes in the field (cf. the various "turns" of translation studies), there appears to be a real problem with traditional theories of equivalence that justifies a sceptical view, as I will argue in the following.

Most theories of translation equivalence tend towards a bipolar view of equivalence, namely a (complementary) focus on either the ST or the TT side of the equation. This general principle can be found in Schleiermacher's classic model distinguishing between *verfremdend* (foreignising) and *verdeutschend* (domesticating) translation types (Schleiermacher, 1813), and it has been reintroduced under various names in modern translation theory, e.g. in concepts put forward by Nida or Newmark, and variations of it in House, Nord, Toury,

and Venuti (see Pym, 2010: 31–32). It would be surprising if this structural polarity was a mere artefact of scientific description, given that it reflects the natural dyad between the two texts involved in the process, as well as the two corresponding languages and the respective cultural contexts. If we accept that intrinsic differences between the two cultures and languages involved usually play a central role in translation, and that furthermore the translator's task is to strategically balance these differences through his[1] translation decisions, then naturally there is a need to compromise one side or the other in the process. Either the translation modulates elements of the source culture as to make them more easily understandable to the target culture reader (domestication), or it confronts the reader with unfamiliar elements that bring him into closer contact with the source culture (foreignisation). The sum of translation decisions made in this manner can potentially add up to a clear example of either foreignising or domesticating translation, but of course a balanced result as the overall outcome is also possible. The overall "style" of translating in turn may or may not coincide with an overall translation strategy intentionally chosen by the translator, although professionals tend to be aware of such aspects.

I mention these age-old insights about equivalence as they help to emphasise an idea that is central to this volume: Any given pair of languages is commensurable only to a certain degree, which entails that the semantic and conceptual contents of the source language (SL) material can only be partially recreated in the target language (TL). Classic theories of translation, such as the one by Vinay and Darbelnet mentioned above, did not generally see this as a fundamental problem, as they assumed that *natural* equivalence relations exist independent from any translator's activities, available as an objective basis to all translation decisions. Correspondingly, Vinay and Darbelnet's work centrally revolves around a list of procedures (translated in Pym, 2010: 13) meant as tools for translators to re-establish natural equivalence where the linguistic properties of language pairs obstruct the transfer of textual material from ST to TT. As natural equivalence relations exist a priori and independent of any practical translation work, this means that "[t]he individual translator does not really have much choice." (Pym, 2010: 15) From this perspective, the optimal solution to any given translation problem is predetermined – just not always accessible to the myopic eyes of a given translator. Translation studies, in turn, is responsible for discovering and documenting these natural equivalence relations, thus mapping out the problem space of inter-language translation item by item.

Contemporary theories of equivalence can no longer resort to this view, insofar as natural equivalence in the strong sense has been put into question. According to Pym, the very core of the concept of natural equivalence needs to be critically tested, as one of its problematic entailments is the claim of perfect

[1] Use of the male pronoun and other male forms for "translator" are purely a matter of grammar, not at all intended to present male translators as normal or ideal (or even prototypical).

reciprocity of translation (Pym, 2010: 8). It turned out, however, that removing this element from translation theory opened a niche that was immensely difficult to fill. Subsequent theories, steering away from a natural equivalence point of view, still needed to answer the question "Equivalent to what?", and their answer could no longer rely on pre-existing links between language systems. Some frameworks attempted to sidestep the problem by shifting their attention to a variety of equivalence types (most famously Koller, 1979), which allows for partial equivalence caused by selectively attending to some equivalence dimensions rather than others. Other academics reacted more aggressively by denouncing the validity of the concept of equivalence altogether, suggesting that translation studies should focus on other, more rewarding topics instead (see e.g. Snell-Hornby, 1988, Holz-Mättanari, 1990). Still others highlighted the role that ideology and imperialistic desires play where the label equivalence is deceptively employed (see e.g. Venuti, 1998) or underlined the predominant importance of the TT and its functional role as opposed to striving for fidelity towards the ST (see e.g. Reiss and Vermeer, 1984).

None of these alternatives, however, succeeded in finding a suitable replacement for the outdated idea of natural equivalence as a basic principle for distinguishing translations from any other kind of secondary text. This is more than a problem of academic classification, as it entails a fundamental lack of certainty about what makes a translation attempt successful, both in the eyes of the translator and as judged by others. In my view, this leads translation studies into a critical direction, accepting an essentially hermeneutic account of translation where the translator as co-author himself determines the criteria by which his work can be judged (as argued e.g. by Vermeer, 1994: 13). Even assuming that the vast majority of translators have a genuine interest in preserving the ST's message to some degree, following this line of reasoning we lose all criteria for differentiating translations from non-translations (cf. the discussion in Pym, 1997: 77–78). What is needed is an alternative account of translation equivalence that retains the explanatory power of natural equivalence without inheriting its questionable aspects, an account that – I would argue – will remain elusive unless we take a cognitive perspective on translation.

3. Cognitive equivalence as an alternative framework

Only a small group of researchers and theoreticians have attempted to redefine equivalence from a cognitive point of view, i.e. primarily concerned with the processes inside the minds of agents involved in communicative acts revolving around translated texts. When interpreted accordingly, such an account is foreshadowed by what House called "response-oriented, behavioral approaches" (House, 1997: 4), most centrally in Nida's famous principle of dynamic equivalence (see e.g. Nida, 1964). Important elements of a cognitive perspective can also be found in Wilss rendering of translation as a problem-solving process

(see, e.g. Wilss, 1990). And whereas a shift towards cognitive linguistics, even a "cognitive turn" have been variously discussed over the last two decades[2] (see e.g. Risku 2000, Halverson 2014), a revised concept of equivalence embedded in a comprehensive model of translation has yet to emerge from these endeavours.

One researcher to explicitly spell out a new type of translation equivalence is Lewandowska-Tomaszczyk, whose work on translation as re-conceptualisation (see, e.g. 2010) finally offers a novel perspective promising to avoid the drawbacks of models based on natural equivalence. Similar to my own approach, she adopts concepts and insights from cognitive linguists, specifically Langacker and Fauconnier, as a basis for a revised version of equivalence grounded in a psychologically realistic account of linguistic and conceptual processing. As both the parallels and differences are enlightening, I will briefly summarise some central aspects of her model in the following, contrasting her concept of re-conceptualisation with my own notion of cognitive equivalence.

3.1. Construal, re-conceptualisation and embodied meaning

From a cognitive perspective, the central question has to be where to situate the locus of what we call equivalence, i.e. the theoretical or empirical domain in which this phenomenon can allegedly be found. Despite a long tradition in so-called linguistic theories of translation of identifying equivalence as existing between texts (e.g. House, 1997) – a ST in one language and a TT in another as the standard scenario – this seems questionable upon closer inspection. Lewandowska-Tomaszczyk accordingly argues that "the main effort in translation goes into retaining a similar cognitive effect on the addressee of the original and the addressee of the translation" (2015: 23). With this positioning, she essentially reformulates Nida and Taber's classic definition stating that "[d]ynamic equivalence is therefore to be defined in terms of the degree to which the receptors of the message in the receptor language respond to it in substantially the same manner as the receptors in the source language" (Nida and Taber, 1969: 24). The focus, however, is slightly different in that Lewandowska-Tomaszczyk is primarily interested in the translator's efforts in establishing a satisfactory degree of equivalence, more so than envisioning an actual comparison of ST and TT readers' cognitive responses.

In my view this subtle shift is tremendously important, not only because it helps deflect criticism that Nida and Taber's original proposal provoked (see e.g. House, 1997: 5), but also because it focuses the discussion on a domain where equivalence can be located in a meaningful sense. As I argue elsewhere (Sickinger to be published), mental processes in the minds of translators and consequent actions informed by them are the only domain in which

[2] Complementing research into translation processing based on psycholinguistic methodology – see e.g. Krings, 2005, Göpferich et al. 2009

considerations of equivalence actually have an impact on the eventual constitution of a translated text. Admittedly, other observers may have an indirect influence, with TT readers being only marginally influential, translation scholars later analysing the material in question even less so. The cognitive processes leading to concrete translation decisions, however, are where translation studies' primary interest should lie, as this determines the kind of textual material even available for study (as well as TL reception). Correspondingly, I think that a contemporary theory of translation needs to be centrally informed by a model of translation processing (in this concurring with e.g. Krings, 2005 and Göpferich, 2008). Insights gained from textual analyses of originals and translations should be treated as a "window into the mind" of the translator (in the spirit of Fauconnier, 2000: 96), as this is where constitutive decisions about translations are made[3].

If traditional theories of translation equivalence did not even consider this point, it is probably because they still entertained an externalist or objectivist model of linguistic meaning, i.e. one that axiomatically assigns meaning directly to linguistic units, irrespective of human minds processing or memorising them. This is one of the first tenets that a newly formed cognitive linguistics set out to challenge (see e.g. Lakoff, 1987: 266, cf. Lakoff and Johnson, 1999: 79), and the role of construal and perspectivity in linguistic meaning has been a central point on its agenda ever since (cf. Geeraerts, 2006). Some theories of translation are following this lead, emphasising the relative nature of linguistic meaning. Similar to Lewandowska-Tomaszczyk's claim that "language is not directly linked with the extralinguistic world" (2010: 105), I elsewhere argued that "(h)uman beings do not interact directly with the world; the interaction is mediated by an elaborate network of mental models in human minds." (Sickinger, 2012: 128, footnote omitted) In my own framework, this means that "language is an additional functional layer within cognition that can be used to organize, activate or navigate conceptual content" (2012: 129). This is in full agreement with Lewandowska-Tomaszczyk stating that "(l)exical meanings on the other hand are *stimulators*, which are responsible for concept activation to different depth and range." (2010: 106). A precursor to both positions can be found in Langacker's work, who portrays the semantic value of lexemes as the way that they provide selective and preferential access to domains of world knowledge, an approach that he calls "encyclopedic semantics" (Langacker, 2008: 39).

Applied to the question of translation equivalence, this position entails that there is no simple, mechanistic way of transferring meaning from ST to TT, given that there is no fixed, stable meaning to begin with. According to Lewandowska-Tomaszczyk, "(o)n each occasion meanings of linguistic units

[3] This, of course, entails that contextual factors influencing the mental states of translators are valid objects of study, too, including translator training and the study of translation workspace environments and technology (see e.g. Risku and Windhager 2015).

(…) are individually re-created and negotiated among the participants of the communicative act." (2010: 107, footnote omitted) While this might appear to be a radical claim, it follows naturally once we accept that linguistic input merely provides cues that recipients have to use as a basis for their own interpretative conceptualisations[4] (*instructions* in Lewandowska-Tomaszczyk's terminology, see 2010: 106).

There is no basis for natural equivalence in such a view on translation, of course. If anything, the question needs to be answered how any degree of accordance between individual acts of reception can be possible under these conditions, an assumption without which translation becomes a virtually pointless endeavour. Luckily, in as much as a cognitive perspective introduces a relativist element into translation theory, it also provides a solution to the threat of communicative solipsism. Agreeing with Lewandowska-Tomaszczyk on this matter, I appeal to shared extra-linguistic, embodied experience as a guarantor for a sufficient degree of homogeneity between individuals to generally ensure communicative success, both in translation and other types of communicative interaction. Inspired by Jerome Feldman's account of embodied meaning, I call this the *tip of the shared iceberg argument*, which is elegantly put by Feldman as follows:

> Each of us has rich experience with our bodily actions and perceptions, but we can say only a very restricted set of things about them. Since speakers and listeners share both the experience and the frame parameters, however, a word or expression can convey a great deal of meaning. (2006: 147)

In this view, the linguistic layer of communication can have an extremely low information density, counterbalanced by the fact that it enables access to vast and quite detailed domains of encyclopaedic knowledge[5]. Lewandowska-Tomaszczyk, too, invokes cognitive linguistic theories of meaning to explain how translation can function under these conditions, when she states that such theories "reach to the level of common prelinguistic structures (Lakoff, 1987) to guarantee *tertium comparationis* of language commensurability, understanding and, consequently, translation." (2015: 16)

I find that this line of argument, incidentally, relates back to a – often discredited – theory of interpreting, namely the so-called *theory of sense* associated with French theorist Danica Seleskovitch (see Seleskovitch and Lederer, 1989). In Seleskovitch's terminology, *sense* is what emerges from ST reception and what is expressed anew in TL, ideally in total disregard of the

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[4] Cf. the role that inference has in re-creating speaker meaning in relevance theory (e.g. Sperber and Wilson, 1986).

[5] Terence Deacon describes this relation as follows: "[t]he way that language represents objects, events, and relationships provides a uniquely powerful economy of reference." (Deacon, 1997: 22)

original SL formulation (cf. Pym, 2010: 19). It is the extra-linguistic element that indirectly links ST and TT, and only on this level can equivalence be created and assessed. What Seleskovitch rather diffusely described as sense becomes substantiated in theories and empirical findings put forward in cognitive linguistics and the cognitive sciences, including those mentioned above. And whereas the link between translation theory and cognitive science thus introduced might appear coincidental, in my view it is the only way to make sense of the fact that interlingual translation is evidently possible, without a need to resort to natural equivalence or objectivist accounts of linguistic meaning.

3.2. The role of perceptual simulation in language processing

To arrive at a convincing description of the translation process in cognitive terms, another element has to be introduced, one that is central to my own framework and that in my opinion complements Lewandowska-Tomaszczyk's thinking about translation. It is well captured in another quote from Jerome Feldman, despite the fact that Feldman himself is not a major proponent of the respective field of research: "language primarily operates at the level of frame parameters and understanding involves imaginative simulation invoked by these frames." (Feldman, 2006: 147) I consider what Feldman calls *imaginative simulation* (*mental* or *perceptual simulation* in my own terminology) a crucial concept that elegantly links insights from the cognitive sciences, psychology, neuroscience and linguistics. The way that I understand mental simulation – and correspondingly employ it in a model of translation processing – is centrally informed by two sources, namely *perceptual symbol systems* theory by Lawrence Barsalou and *simulation semantics* as developed by Zwaan and Bergen, among others. For the sake of brevity, I will only sketch their contributions below and then focus on the way mental simulation can be used to explain crucial aspects of the translation process, including equivalence in a cognitivist sense.

The basic idea of mental simulation is laid out and thoroughly described in Barsalou's seminal 1999 paper "Perceptual Symbol Systems". It offers a procedural account of human minds establishing, reactivating, and creatively utilising conceptual knowledge, based on contemporary findings in neuroscience and cognitive psychology. The entire framework is explicitly *grounded* in the sense of "embodied cognition" (see e.g. Lakoff and Johnson, 1999), in that it rejects "the standard view that amodal symbols represent knowledge in semantic memory." (Barsalou, 2008: 618) Barsalou defines simulation as follows: "[s]imulation is the reenactment of perceptual, motor, and introspective states acquired during experience with the world, body, and mind." (Barsalou, 2008: 618) Experience with the outside world usually involves more than one sensory modality, so the ongoing experience is mentally represented via its neural activation pattern distributed (but coordinated) across several modal areas of the brain. This distributed neural activity is captured in "conjunctive neurons in

association areas […] for later representational use." (Barsalou, 2009: 1281) Memory, the mental retrieval of past experience, is constituted by reactivations of the neural activity correlated with the original experience. According to Barsalou, this representational system on its own is capable of implementing a variety of cognitive processes, "including high level perception, implicit memory, working memory, long-term memory, and conceptual knowledge." (Barsalou, 2008: 622)

The role of language in this framework is that of (re-)activating such neural activation patterns, which – on a functional level – Barsalou labelled *simulators* (cf. the similar role of *ICMs* in Lakoff, 1987, *mental models* in Johnson-Laird, 1983 and *frames* in Fillmore, 1985). Conceptual activity, whether triggered by linguistic input or otherwise, is the dynamic generation of *simulations* by simulators that cover the relevant conceptual domains (Barsalou, 2009: 1282). Simulations are generated in specific situations to achieve relevant cognitive goals, i.e. their activity is highly context-dependent. This is a natural source of dynamic variability of both conceptual contents and linguistic meaning, and it perfectly matches Lewandowska-Tomaszczyk's idea of re-conceptualisation: Every instance of a simulation produced is, in effect, a re-conceptualisation in that it dynamically re-creates the original meaning in a contextually modulated fashion.

The focus in Barsalou's work is on cognition in general, not specifically on language or the linguistic-conceptual interface, which he only discusses occasionally (but see Barsalou et al. 2008). However, a dedicated theory of simulation in language processing has been developed under the name simulation semantics. One of its proponents, Benjamin Bergen, describes the central tenet of the approach as follows:

> (…) understanding a piece of language is hypothesized to entail performing mental perceptual and motor simulations of its content (…). This implies that the meanings of words and of their grammatical configurations are precisely the contributions those linguistic elements make to the construction of mental simulations. (Bergen, 2007: 278)

This account has obvious similarities with what is usually called *mental imagery*, but whereas mental imagery is mostly portrayed as a conscious and optional cognitive process (cf. Barsalou, 2008: 619), proponents of simulation semantics such as Bergen stress that all linguistic meaning lies in the activation of mental simulations. Rolf Zwaan, maybe the most influential researcher originally involved in simulation semantics, in his framework stresses the role of the "immersed experiencer" (Zwaan, 2004), i.e. a focal entity whose perspective is taken in the simulation process, with perceptual and interactional features of other elements in the simulation directly dependent on their position relative to the focal entity (2004: 43). This position aligns perfectly with Barsalou's claim that conceptual processing and representation (i.e. perceptual simulation) are

always situated (see e.g. Barsalou 2002). When activating one specific concept in their mind, what cognisers do is to "construct a multimodal simulation of themselves interacting with an instance of the concept." (2002: 9)

The models put forward in simulation semantics generally deal with language perception, which means that on their own, they cannot explain the entirety of processes involved in acts of translation (which obviously also include the creation of a TT, i.e. language production). I think it is safe to assume, however, that the same principle of linguistic-conceptual interaction can be applied to production processes: If linguistic input is interpreted by means of the activation of simulators, then simulator activity is also the conceptual substrate to language production. Barsalou briefly comments on this extension of simulation semantics, claiming that if we accept the simulation view of linguistic meaning then "examining a simulation and categorizing its components would be central to the process of language production." (Barsalou, 2012: 241) The linguistic output in question is derived from preceding (or simultaneous) simulator activity, in the sense that the "simulation activates associated words, which are produced in utterances to describe the simulation." (2012: 241)

3.3. The role of cognitive equivalence and mental simulation in translation

To conclude this part of the present chapter, let me tie all these strands together by presenting an abridged version of the model of translation processing put forward in the context of my PhD thesis. In my view, the central problem in translation is ultimately one of decision making (cf. Wilss, 1990 on this perspective), more specifically of selecting exactly one TL formulation to replace a corresponding SL formulation out of a large, potentially infinite, number of options available. The genesis of a (successful) translation can be directly linked to such decision making processes, and a better understanding of their procedural nature would surely be a valuable asset to translation studies. Whereas translation process research provides a variety of answers to this question (see e.g. Krings, 2005, Göpferich et al. 2009), these answers are situated on the level of operations carried out by the translator, either externally observable or introspectively available to the translator himself (and thus recordable in the form of "verbal-report data", cf. Krings, 2005). I am much more interested in the basal mechanisms behind linguistic decision making that underlie all translation processing, specifically comprising the parts not consciously accessible to translators. This is what Lewandowska-Tomaszczyk refers to when she states that for re-conceptualisation operations, the "label 'strategies' would not always be particularly adequate, as it implies a conscious act on the part of the translator" (Lewandowska-Tomaszczyk, 2010: 141).

My proposal for how translators are able to perform the impressive feat of deciding on TT formulations relies on the premises described above: Conceptual meaning is embodied, realised in perceptual simulations that are dynamically created each time a concept is activated, and linguistic units acquire their

respective meaning by activating in a specific manner a simulator representing a conceptual entity or domain. From such a cognitive perspective, then, what exactly happens in the mind of a translator during translation processing?

Building on the framework laid out in simulation semantics, the first step is fairly straightforward: As a recipient of the ST, the translator actualises (or re-conceptualises, *pace* Lewandowska-Tomaszczyk) the meaning encoded in the linguistic surface of the ST in the form of a mental simulation. Here, obviously, different translators can arrive at different simulations based on the same ST, at least diverging in detail – depending on the level of vagueness inherent to the text and the differences in cognitive background between the translators in question. This type of variation seems quite natural to assume if we take into account the important role of construal and inference in interpreting linguistic input (again, see Geeraerts, 2006, Sperber and Wilson, 1986). I assume that the simulation resulting from ST reception is no longer bound to linguistic form or structure, i.e. that it is realised entirely within the conceptual system[6]. This is where a *tertium comparationis* for translation purposes can be found, reminiscent of Seleskovitch's notion of sense (Seleskovitch and Lederer 1989). The basic process is depicted in figure 1 below, with "SimTr:ST" standing for a mental simulation of the ST meaning as understood by the translator (Tr).

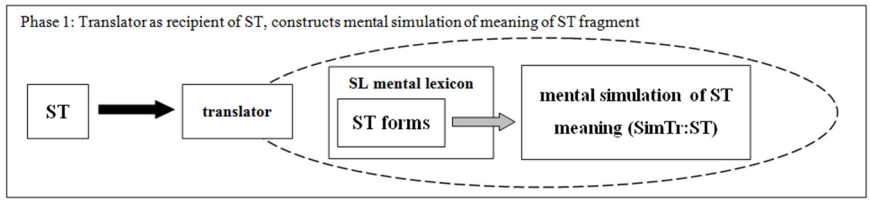

Figure 1. Phase one of the translation process

In the next step, this conceptual representation (i.e. active simulation) is used as an associative basis for activating matching TL formulations, similar to what Barsalou describes as simulations activating "associated words, which are produced in utterances to describe the simulation." (Barsalou, 2012: 241) Note, however, that this most likely only pertains to what is often called *free translation*. There is nothing speaking against employing a dual-route structure for this part of the process, with SL linguistic forms either priming or directly activating TL forms associated with them strictly on the linguistic level[7]. This is

[6] Although it is safe to assume that the corresponding linguistic form remains in memory at least for a short amount of time, potentially available to activate the simulation anew (cf. the corresponding research in psycholinguistics, e.g. Lombardi and Potter 1992).

[7] This is the processing route that Barsalou et al. (2008) emphasise in their LASS model, although I am very sceptical if purely linguistic co-activation plays a significant role outside laboratory experiments and, potentially, early phases of language acquisition.

probably the case where SL technical terms have a designated counterpart in the TL (terms with "standard equivalents" in Wilss' [1990: 29] terminology). It also applies to cases of word-by-word translation, with a continuum connecting this type of translation and maximally free translation at the other end, describable within the terms of my model as a bias towards one of the two routes available for generating TL formulations (see figure 2 below).

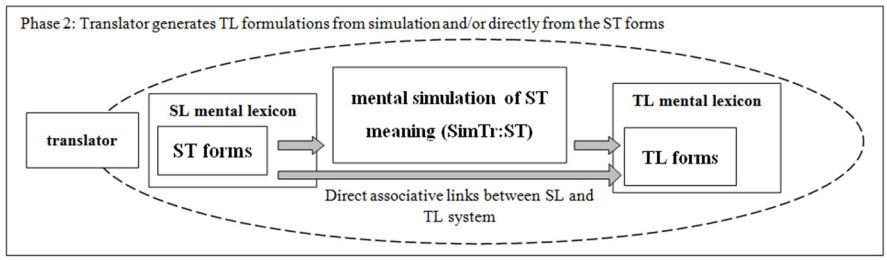

Figure 2. Phase two of the translation process

This, incidentally, is where my version of a cognitive account of the translation process subtly diverges from the one offered by Lewandowska-Tomaszczyk. She assumes that, generally,

> (…) what translators do is transduce the mental SL model they develop on hearing or reading a SL text into one in the TL, which they consider most suitable to the TL audience and, at the same time, most faithful to the original, intended meaning of the message. (2010: 108)

On my account, as mentioned above, the model is derived from the ST, but is independent from it in the sense that it is no longer bound to the SL surface form. I would also not expect translators to mentally entertain two versions of the meaning derived from the ST, i.e. generate a copy of the ST-triggered conceptual activity only for the purpose of activating corresponding TT formulations. Rather, the simulation exists in between the two languages, functioning as a *tertium comparationis* that allows for bridging the gap between two languages in the first place (abstractly depicted in figure 2 above). This should be true whether we discuss this phenomenon in terms of mental events and representations or in terms of their physical instantiation in brain structures and neural activity patterns. From a mentalist point of view, the mode of thinking that crucially enables translation between two languages is a non-linguistic type of mental activity procedurally linking two linguistic mental actions. Correspondingly, on the physical level specific areas of the brain that can be functionally differentiated from others are responsible for this part of the process as opposed to its linguistic aspects. Following Barsalou (1999, 2009), these are assumed to be associative networks of neurons directly linked to or engaged in perception, introspection and motor activity. The neural connections

between areas concerned with conceptual simulation and the brain areas responsible for language processing in SL and TL are the physical correlate of the sense relation that connects linguistic expressions in translation or interpreting (cf. Seleskovitch and Lederer, 1989).

If language-specific modifications to the mental simulation occur, I propose, it is likely due to actively employed translation strategies, e.g. after detecting culture-specific concepts and attempting to lessen their impact on the intelligibility of the TT. Even in these cases, I expect that the automatic process of generating TL formulations associated with the mental simulation will immediately commence, with strategic interventions by the translator occurring as reactions to disruptions of automatic, non-conscious processing, i.e. cases where associative links do not co-activate any viable counterpart in the TL. This mismatch in turn alerts the system and attracts attention, including executive control and potentially conscious deliberation in the process, which necessarily entails additional processing cycles and therefore takes place on a notably larger time scale (tens of seconds to minutes, rather than a few seconds or less).

The above account outlines a – psychologically realistic – mechanism for deriving translation options, but it still leaves open the question of how translators select one of these options with the (ideally adequate) feeling that the option chosen is a valid way of translating the ST. The ability to do so – at more than chance level – is central to what we call translation competence, alongside the linguistic and cultural knowledge necessary to generate viable TL formulations in the first place. As for the mechanism implementing this competence, I suggest that this, too, is based on simulation, although in a slightly different sense. More precisely, I posit that translation decisions are based on the internal simulation of the effect of a prospective formulation on an imagined recipient – roughly in the spirit of Nida and Taber (1969). Based on the simulation created in phase one (see figure 1 above), a derivative simulation is created that represents the cognitive impact of the ST on SL recipients as imagined by the translator. This simulation (SimR:ST), in the simplest possible case, can be fully identical to the translator's own simulation (SimTr:ST), although it is very likely that seasoned translators automatically assume a more "naïve" perspective here, using a mechanism that in simulation theory is called *quarantine* (see Goldman, 2006). The process of evaluating recipient reactions based on simulation most likely employs a theory of mind routine normally used for what is known as *mindreading* (Goldman, 2006: 3). Concurrently, a mental simulation of the first TL formulation generated is created based on input from the TL linguistic system (without this formulation having been externally produced yet), plus a derived simulation representing the reception of TT recipients based on it. As the process is fairly complex, it might help to refer to the diagram in figure 3 below.

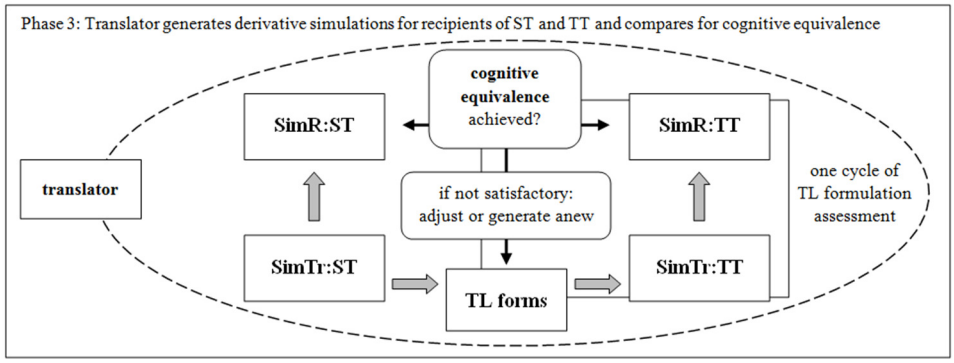

Figure 3. Phase three of the translation process

The outcome of this procedure is a simulation of the ST meaning and a – more or less corresponding – simulation of the TT translation attempt currently entertained. These two simulations are now available for internal comparison, resulting in a measure of similarity (or divergence, respectively). This comparison of TT simulation with ST simulation is where I posit that translation equivalence can be found – notably on the conceptual level, not between the SL and TL linguistic system. In my own terminology, the simulations are being compared for assessing cognitive equivalence, which I define as follows[8]:

> *Cognitive equivalence* is the (temporary) result of a comparative cognitive process involving two texts[9] and their respective reception, simulated in the minds of translators during translation activity. Its role is centrally that of an evaluative criterion which directly guides decision making processes in translation work.

There are several options how this process could play out in real-time, either sequentially as a series of consecutively modulated attempts, or – more realistically given the massively parallel nature of human cognition in general – simultaneously in a kind of horse race, in which several TL options are competing and the one achieving the highest level of cognitive equivalence will be initially chosen. This last part of the process, at least temporarily completing the cognitive task at hand by producing the formulation thus selected (TL form X), is displayed in figure 4 below.

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8 Note that there are discernible parallels with Nili Mandelblit's "cognitive translation hypothesis" (1996: 486), and that the specific term "cognitive equivalence" furthermore appears in Al-Hasnawi (2007) and Taheri-Ardali et al. (2013).

9 One of the texts at this stage only exists as a translation attempt mentally entertained by the translator that, in case of revision due to perceived lack of cognitive equivalence, may never be physically realised elsewhere.

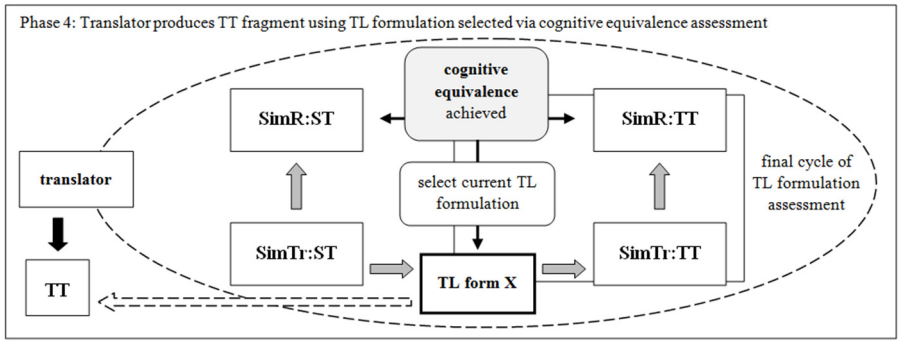

Figure 4. Phase four of the translation process

Interestingly, I find parallels between my own account and the concept of translation as a Third Space proposed by Juliane House (2008). House formulates her own perspective as follows:

> (…) the realization of a discourse out of a text available in writing then involves imaginary, hidden interaction between writer and reader in the mind of translator, where the natural unity of speaker and listener in oral interaction must be imagined in the face of the real-world separateness in space and time of writer and reader (2008: 156)

In her description, the translator's task is to recontextualise the ST in an encounter with the target language and culture, creating a kind of virtual context during translation activity. In this sense, "context in translation is not dynamic" as it would be in dyadic interaction "as it solely and simply emerges from the translator's creatively imagining a virtual context – which is neither here nor there but in Third Space." (House, 2008: 156) Note the similarities to the position taken by Lewandowska-Tomaszczyk when she states that "translation involves a number of cycles of re-conceptualization of an original SL message, expressed eventually in the TL." (2010: 107) She further elaborates that the SL original as received is then

> (…) mediated by translators, who, inspired both by the author and by their own perception of the SL audience, re-create, according to their own conceptualization model, a TL version in a new TL context. (2010: 144)

My own addition to the theoretical debate is the mechanism and procedural model briefly described above, spelling out in some detail what this ability of translators is based on and how a revised concept of equivalence can be embedded in a cognitive theory of translation. In the final section of this chapter, I will address the question how to empirically assess the viability of the cognitive perspective on translation and linguistic meaning adopted here.

4. BALDNESS across languages – an attempt at making mental models observable

Another claim formulated by Lewandowska-Tomaszczyk is that "(t)he degree of equivalence between SL and TL structures can thus be measured in terms of the reference categories mentioned" (2015: 54), referring to a number of concepts adopted from cognitive linguistics such as prototypicality and construal. The proposal that equivalence can be measured, of course, leaves open the question of how this could be undertaken, both in theoretical and in practical terms. Unless there is at least one successful demonstration of such measuring, Lewandowska-Tomaszczyk's claim can easily be rejected as a thought experiment without relevant implications for translation research or practice. Indeed, this is one of the lines of criticism that Nida and Taber's model of dynamic equivalence was originally subjected to (see e.g. House, 1997).

The methodological problem in question turns out to be an intricate one. The general inaccessibility of mental phenomena (cf. Fauconnier, 2000) makes it not merely impractical to take such measurements, but rather calls for a proof-of-concept demonstrating that it is possible in principle. The empirical study reported below is an attempt at such a measuring procedure, with the explicit aim of making equivalence relations of the kind referred to by Lewandowska-Tomaszczyk not only visible, but quantifiable for explicit comparison across languages. Naturally, such a precarious endeavour has to be pursued under controlled conditions, initially examining a test case that does not necessarily capture the complexity of all imaginable real-life scenarios. Such a controlled procedure is necessary not only to ensure the undertaking is manageable, but also to isolate the relevant factors at work without confounding them. In the case at hand, I wanted to test whether the organisation of conceptual material as it is linked to linguistic expressions can be made observable in a laboratory experiment revolving around visual material created by informants. This meant I had to focus on a concept that has a strong visual core, and that furthermore can be assumed to exist in very similar form across the cultural backgrounds of informants involved in the study. I opted for the concept (or mental model) of MALE BALDNESS in its most basic sense, i.e. the phenomenon of natural loss of hair on the head of male individuals over the course of their lives and, more specifically, the visible effects of this process.

In line with the model of conceptual meaning described above, I posit that every (adult) human being has mental access to a simulator concerned with various states and forms of male hair loss, based on previous sensory experience with the phenomenon (i.e. a perceptual symbol in the sense of Barsalou, 1999). This simulation is called upon when such states of baldness are necessary for internal processing – e.g. when remembering the appearance of a balding acquaintance – or, more importantly in this context, when triggered by linguistic input referring to BALDNESS. As described in simulation semantics (see e.g.

Bergen, 2007), the meaning of such linguistic input lies in the way it activates a corresponding simulator in a specific manner, as discussed in section 3.2.

The premise of my study, accordingly, was that upon reading a sentence such as “He has a bald pate.”, informants would mentally create a simulation of the appearance of such a person based on visual data in their long-term memory. I operationalised this in a methodological setup that is an inversion of William Labov’s famous cup experiment (Labov, 1973) and also builds on more recent work in semasiological and onomasiological studies carried out by Geeraerts and colleagues (Geeraerts et al., 1994). In contrast to Labov who had informants name drawings of cup-like containers, I presented linguistic stimuli such as the sentence above to informants and asked them to create a visual representation best matching the sentence’s meaning.

To achieve experimental rigor and comparability between informants, these representations could not be pencil drawings or other free forms of depiction. Rather, the generation of visual material took place in a virtual online environment specifically created for this study. Informants basically manipulated two slide controllers that modulated the distribution and amount of hair on the depiction of a male figure’s head. As to make the model as neutral and at the same time as naturalistic as possible, the effects of this visual manipulation are based on an established chart used for medicinal diagnosis, the so-called Norwood-Hamilton scale (Norwood, 1975). The study was distributed online, with 232 native speakers of German, 168 native speakers of American English and 169 native speakers of Japanese participating. A screenshot of the experimental program as experienced by the participants can be seen in figure 5 below.

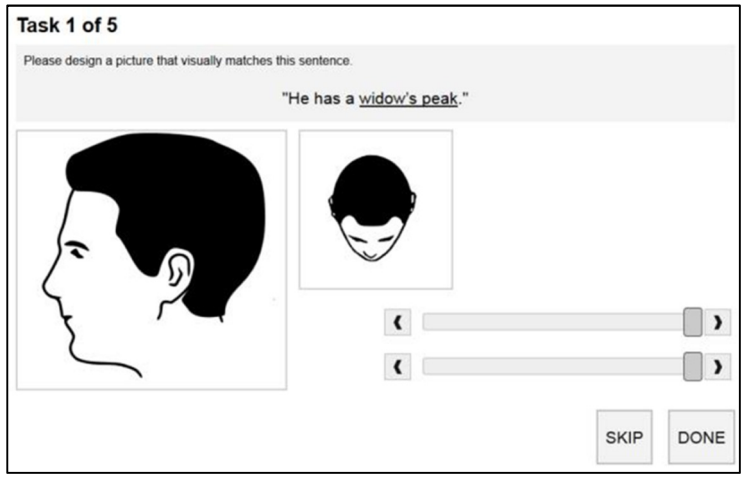

Figure 5. The experimental program used to study the mental model for BALDNESS

This method was intended to provide insights into ordinary language users' conceptual representation of MALE BALDNESS and the way that specific sub-regions of it are selectively activated by what I call *baldness terms*. More specifically, I was interested in the internal structure of the conceptual category and its linguistic activation routes compared between English, German and Japanese, all of which have their respective means of referencing baldness phenomena via a language-specific inventory of baldness terms. A collection of these terms had been previously gathered in interviews conducted with native speakers of all three languages. The concrete aim of the study was to capture the conceptual activation routes for a given language's baldness terms in a non-linguistic format, resulting in a "mental map" for the concept that, due to its independence from linguistic description, can be validly compared across languages.

For the purpose of quantitative comparison, the resulting visual material had to be transformed into a numerical format, with values based on underlying visual features. The result is one data point located in a two-dimensional metric space for each visualisation created by an informant. More precisely, the two dimensions represent state changes along two feature dimensions also derived from the Norwood-Hamilton scale, namely a specific pattern of hair loss occurring in the frontotemporal area of the scalp and on the vertex, respectively. The resulting numerical data is of the interval type, which means that the degree of difference (or similarity) between data points can be measured in terms of their Euclidian distance within the metric space. This makes it possible to quantify the degree of visual difference between any pair of visualisations – the further away they are located within the model's matrix, the less similar their appearance. Applied to a large number of results, this enables an assessment of how homogenous the native speakers of a given language are in terms of their mental representations of the baldness term in question, e.g. "bald spot" or "widow's peak". Treating each data point as a prototypical representation of the term in question according to one informant, it was possible to derive aggregate prototypes averaging over the entire population tested in the respective language (the *centroid* of one such category). An exemplary result is shown in figure 6 below, namely the summary of the experimental data gathered for the baldness term "bald patch" in the American English data set.

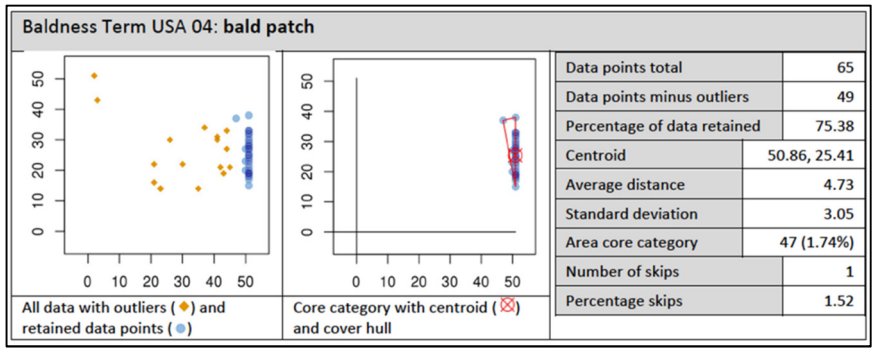

Figure 6. Data obtained for the baldness term "bald patch"

This method of describing the data might not appear to be specifically enlightening in its own right, but it becomes highly informative once compared with other baldness terms from the same language, or with baldness terms in other languages. The main virtue of the approach, after all, is that results obtained in one language are directly comparable with experimental data from another language, as all use the same underlying visual model[10]. Using this method, it is possible to determine the degree of conceptual similarity between e.g. the American English "bald pate" and the German "Kahlkopf" by determining the relative size of overlap between the two categories and the distance between their respective centroids. This way closest equivalents (within the limitations of the concept selected and the experimental model used) between languages can be determined experimentally, based on a quantiative measure of their respective goodness of fit.

Unfortunately, the overall findings are very complex and difficult to convey in a condensed format, making it impossible to reproduce them here. E.g. the sheer number of baldness terms tested – 15 to 16 per language, a total of 46 – and the correspondingly huge number of potential comparisons between terms makes it difficult to adequately summarise the outcome. As an exemplary insight into the results, however, a diagram displaying the relative position of the centroids for all baldness terms tested in American English can be found in figure 7 below. Furthermore, two selected comparisons across languages are reproduced in table 1 and 2 beneath. "lichter werden" (BT GER 12) is a good example for a conceptual near-synonym across languages, as in addition to an almost identical centroid position, it also has a category overlap of almost 80 percent with "hair is thinning out" (BT USA 10), as visible in table 1. Similarly, "receding hairline" (BT USA 06) is the closest available equivalent for both

[10] Which, again, is presumed to be universally valid across languages, a premise that was generally confirmed by pilot study informants and during the interviews.

"hohe Stirn" (BT GER 06) and "Geheimratsecken" (BT GER 04), although closely followed by other English terms such as "widow's peak" (see table 2).

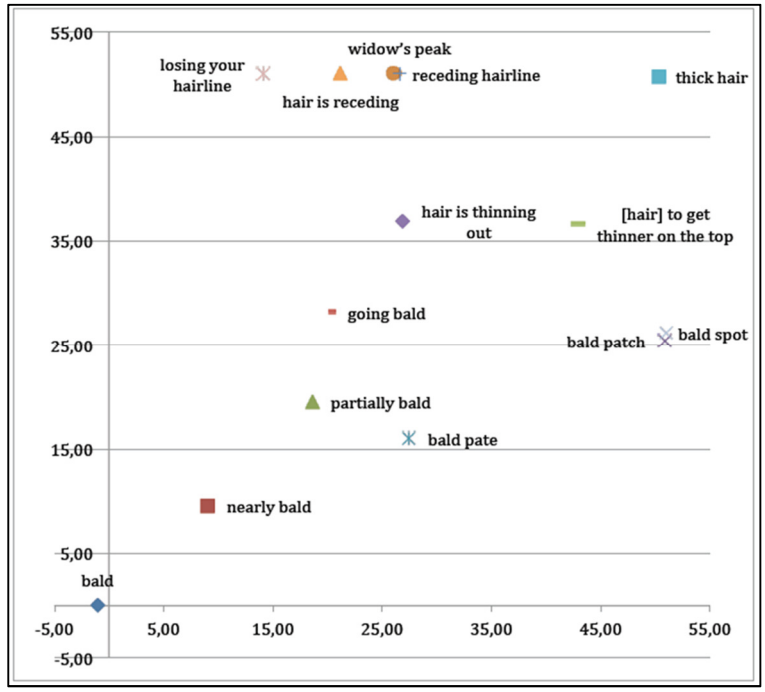

Figure 7. Centroids for American English baldness terms tested

Table 1. Near-synonyms between German and American English data (excerpt 1)

Baldness term GER	Centroid distance	Best equivalent baldness terms USA
BT GER 12: lichter werden	1.63	BT USA 10: hair is thinning out
BT GER 14: sein Haar verlieren	2.49	
BT GER 13: schütteres Haar	6.48	

Table 2. Near-synonyms between German and American English data (excerpt 2)

Baldness term USA	Centroid distance	Best equivalent baldness terms GER
BT USA 06: receding hairline	0.9	BT GER 06: Hohe Stirn
	2.62	BT GER 04: Geheimratsecken

5. Conclusion

As the brief extract from my study on conceptual meaning across languages shows, it is possible to systematically investigate the relations between linguistic units (signifiers, as it were) and the conceptual activity that instantiates their meaning in natural languages. This, in turn, can be used to establish equivalence relations between terms across languages by measuring the degree of similarity between the perceptual simulations activated by their reception. Variation between individual language users and – assumedly – within individuals across occasions means, of course, that the figures derived from such a procedure are only rough predictors, which arguably is not a flaw of the method, but mirrors real-life variation and fluidity in meaning. It also needs to be stressed that the experimental tool used for this purpose does not easily generalise across concepts, in the same way that BALDNESS is not necessarily a representative choice for all concepts existing as mental models in human minds (specifically as I have disregarded its higher-level cultural implications). Accordingly, the method applied here is not meant as a blueprint that can be utilised to compile a universal lexicon of conceptual meanings – at least I do not see a feasible and ecologically realistic way of implementing it as such at this point.

Despite these limitations, however, the study serves as a proof-of-concept that equivalence of linguistic meaning can be anchored and empirically assessed in the domain of conceptual knowledge. In a more general sense, I hope to have shown that my notion of cognitive equivalence is a viable proposal for revising the traditional concept of equivalence in translation studies. It has noticeable parallels with Lewandowska-Tomaszczyk's re-conceptualisation approach (2010), but goes beyond it in that it posits mental simulation based on perceptual symbols as the central mechanism enabling cross-linguistic processing. It is exactly this level of mental simulation that functions as a *tertium comparationis*, which is necessary to explain the specific competence and corresponding activities that characterise the profession of translating. This, I propose, is a solid starting point for establishing a cognitive approach to translation, as demanded by a number of scholars in the field (see e.g. Risku, 2000, Halverson, 2014), potentially contributing to the eventual formation of a cognitive translation studies. As even Juliane House now begins to advocate (House, 2015), a shift in translation studies that opens it to new perspectives coming from the cognitive sciences, psycholinguistics, cognitive and neurolinguistics is necessary to prevent the discipline from becoming increasingly self-enclosed and stagnant. The model and empirical method proposed here are intended as a step into this direction.

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