Translation, equivalence
and cognition

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19.1 Introduction: A historical perspective

An exploration of a core notion—and one at times controversial—such as “equivalence” usually gains from some historical grounding. In the following brief historical sketch focusing on recent developments, different notions of “equivalence” will be reviewed as well as some implications they have had for conceptualizing relationships between texts. One implication is a differentiation between paraphrase, variation and translation as related, yet different, notions. The questions will then be addressed of whether and in what sense “equivalence” between source texts (ST) and target texts (TT) has been regarded as an essential property of translation, and if so, equivalence with respect to what. Implications of multimodality for the concept of equivalence will be mentioned, before we focus on a brief overview of equivalence in models of cognition in translation up to now.1

19.1.1 Different notions of “equivalence” and different notions of “translation”

Different notions of equivalence, or even the outright dismissal of such a notion as being relevant, will lead to different notions of translation, especially in comparison with paraphrase and variation. “Equivalence” has often been left vague and/or has been given different meanings according to different approaches, but in its more precise formulations, it allows us to make some important distinctions between translation and other forms of multilingual text production. Such distinctions are a prerequisite for models of cognition in translation, if they are to be translation-specific and different from models of text understanding and production in language processing in general.

The concept of equivalence has a long and controversial history in Translation Studies (see, among many others, Halverson, 1997; House, 1997, p. 24, 2015, p. 5; Koller, 1995, 1997, p. 159; and for a more comprehensive historical overview, Munday, 2001, Ch. 3), but it is not easy to define translation entirely without it. Even in approaches shifting the domain of equivalence away from any level of textual structure to “equivalent effect” between the receptors and STs and TTs, respectively (Nida, 1964, p. 159), the question arises of how we ensure identity or similarity between source and target contexts, because receptors and contexts cannot simply
be presupposed in their common-sense meanings as tools for explicit models of translation. If, with relevance theory, translation is considered as “interlingual interpretive use” (Gutt, 1991, p. 100), we again move away from levels of linguistic encoding as such, but once more we must assume some sort of equivalence between contexts and between assumptions, implicatures or propositions in which these can be expressed. The concept of equivalence has thus sometimes been shifted away from structural encoding to processing and/or context, but without explicit models of the latter, this simply means shifting the burden of definition to other disciplines, or falling back on common-sense notions—not a viable strategy for a scientific discipline. Without a clear notion of the specifics of the object translation, we cannot expect models clear and specific enough for research hypotheses and empirical investigations.

Halverson (1997, p. 209) in a representative survey article reminds us that at least three points need to be clarified for any discussion of equivalence:

a) specification of entities, between which the relationship holds, and in what sense they are comparable
b) specification of the specific nature and the degree of “likeness/sameness/similarity/equality” between entities compared
c) specification of the quality in terms of which the sameness is defined.

Bearing in mind Halverson’s requirements, an attempt will be made to relate translation to other relevant forms of textual relationships through the role played by equivalence (see Steiner, 2001). Paraphrase is a truth-condition-preserving, and in that sense equivalent, relationship among sets of propositions intra- or interlingually. Paraphrases do not preserve the text-building patterns, such as information structure, and they have no very clear relationship towards the interpersonal semantics (mood, speech acts, illocutionary acts and appraisal) of the encoding. Paraphrases as sets of propositions are possible for texts within and across languages, preserving important aspects of their experiential and logical semantics (Halliday & Matthiessen, 2014, p.85; Matthiessen, 2001, p.100ff). Yet the notion of “equivalence” as paraphrase alone under- and over-determines a relevant notion of translation.

Variation as dealt with in variation theory and register theory (see Biber, 1993; Halliday & Hasan, 1989; House, 1997, 2015) is possible within sets of intertextually related texts, both intralingually and interlingually. But these texts are not translationally equivalent precisely because at least some aspect of their overall meaning (field, tenor, mode of discourse, or Biber’s functional dimensions) must by definition vary.

Translation, for the present purposes, is taken as a relationship between STs and TTs (or smaller translation units) which approximates equivalence in a combination of the dimensions of field, tenor and mode of discourse, and ideational, interpersonal and textual meaning in terms of clause semantics and grammar. These dimensions will usually be ranked depending on the context of the translation brief (similar to Koller’s 1997 model). The approximation thus is a multi-dimensional optimization task rather than one single right-or-wrong solution. Especially in a model oriented to cognitive processes, the TT may show additional traces of the process of understanding (e.g. explicitation) and other aspects of the translation process. Translation is different from paraphrase in respect to interpersonal and textual meanings in addition to experiential (propositional) and logical meaning. And translation is different from variation by keeping many of the parameters of variation maximally stable. In the end, we may say that translation is an approximation to a multi-functional paraphrase of the ST by some TT—rather than the mono-functional paraphrases of logic-oriented semantics—under the constraints of the process of understanding and of the typology of the language systems involved. Each individual
translation, i.e. situated language (instantiation), is text production under the constraints of a ST. To what extent “instantiation” here is the same as “[translator’s] reading of a text” is a question to which we shall return.

19.1.2 Equivalence between source texts and target texts as a defining property of translation?

Has equivalence so far been regarded as a defining property of translation, or has it been dismissed, given its inherent difficulties? The notion of equivalence has more recently been relativized (Halverson, 1997, p. 217f), and its domain has sometimes been shifted from levels of text representation, including context, to postulated translation units or even to the process itself. Catford (1965), in his classic account, already diversified the notion across an entire range of linguistic ranks and levels. Matthiessen (2001, 2014) took that approach substantially further within a highly developed model of systemic functional linguistics with a wider semiotic background. Frame-based approaches give a privileged place to the frame as a key locus of equivalence of meaning (Czulo, 2017). Nida (1964) and Gutt (1991) shifted it outside structural encoding, locating it in behavioural reactions and interpretations in the translation process. Transfer-based models of (machine) translation (MT) relied on notions of equivalence-based transfer on a hierarchy of levels (EUROTRA as in Durand et al., 1991), as did other MT systems based on stratificational models (see Carl & Schaeffer, 2017), or in the extreme case on an interlingua which would neutralize language-dependent differences. More recent statistics-based MT models incorporate equivalence under “adequacy” (vs. fluency) in MT evaluation (Banchs et al., 2015; Chungyu & Tak-ming, 2015), as do current models of neural-networks-based MT with some modifications (see Gupta et al., 2015). For a model of cognition in translation, it has been said that removing equivalence altogether simply leaves us with notions of text production, text comprehension, bilingual processing—or a combination of these at best (see Schwieter & Ferreira, 2017, p. 144; Shreve & Lacruz, 2017, pp.129, 134 on the notion of “transfer”). This may be true even if we extend the notion of translation across different modes of meaning (Bateman, 2008; Kress, 2010, introducing the notion of “transduction” across modes; Matthiessen, 2001, p. 50). Multimodal semiotic objects are objects of translation, and they pose a creative challenge to any form of text production (Hiippala, 2012), but the very different codes employed in the different modalities caution against a premature full-scale extension of the notion of equivalence to all of these. If we want to speak of “multimodal translation”, though, a motivated notion of equivalence across modes needs to be developed.

19.1.3 Cognition and translation

To what extent have models of translation so far included a perspective on the wider context of human cognition? A number of fairly detailed studies exist by now on specific aspects of equivalence: for example, several of those brought together in Shreve and Angelone (2010). Yet, many publications have been programmatic rather than empirical and methodologically mature (Halverson, 2010; Muñoz Martín, 2010; Steiner, 2012). Even the more recent overview articles of Alves and Hurtado (2017) and Muñoz Martín (2017) show that the precise identification of the objects and above all, methods of research are not yet clear enough. In order to test anything empirically, in terms of corpus-based work (product) or of experiments (process), models are needed from which to derive sufficiently specific hypotheses. Too few, if any, such models exist.
so far, because the existing models of the translation process are—understandably in view of the recent history of empirical Translation Studies and in view of the overall complexity of the process of translation—not fine-grained enough to derive research hypotheses from. In order to arrive at such models, certain key issues need clarification, in particular:

- Textuality: Levels of abstraction, syntagmatic vs. paradigmatic axes, intra-level ranks
- Potential vs. instance; Text vs. reading
- Explicitness vs. implicitness of meaning
- Models of translation and cognition

The place of equivalence along all these dimensions will be discussed later, as well as its potential implications for cognition.

19.2 Core issues

Some core issues arise out of recent debates and appear important for making progress towards models of translation, equivalence and cognition.

One of these is the issue of textuality, more specifically “what are STs and TTs, and what are translation units?” Languages, registers and individual texts can be represented on different levels of abstraction (lexicogrammar, semantics, context/register), on syntagmatic vs. paradigmatic axes, and within levels even on ranks (sentences, clauses, phrases, words and morphemes). The precise number and kind of levels of textuality depend on the model of language used, but equivalence and cognitive processes can be modelled on any of these levels. The ST in a translation relationship cannot be a pre-theoretically-given unanalysed object of everyday perception; it is a highly structured semiotic web of texture.

Another issue will be that of potential vs. actual (system and instance): it is a fundamental assumption that translation (studies) deals with texts (instances) rather than with language systems (potential). This needs some elaboration, and in particular, we need to ask whether there is a further distinction between the “text” (instance) and the “reading” of a text. Equivalence can be located on any of these dimensions, but the question is which cognitive aspects of the translation process are responsive to which dimension.

A third issue will be the distinction between explicitness and implicitness of meaning, another way of saying “encoded vs. inferred” meaning. Again, which is the domain of equivalence, and which of the two types of meaning lead to which cognitive processes?

A fourth issue directly addresses the question of where, in a model of translation (studies), cognition finds its place. The obvious place would seem to be the translation process and accordingly, process-related studies. Yet, there are more possible answers, such as, for example, a model of translation based on some version of cognitive linguistics (see Geeraerts & Cuyckens, 2007). Whichever of the approaches is taken, Translation Studies needs to make itself familiar with methodologies of empirical disciplines, both corpus-based and experimental, which means considerable methodological refinement. At the same time, a development of methodologies appropriate to its own object of research is necessary, rather than simply taking over methodologies from adjacent fields. One of the typical and unique properties of translations, once again, seems to be equivalence. Contrastive linguistics (see König and Gast, 2018) has developed the system side of equivalence (correspondence), but Translation Studies needs to develop the instance side, along with intercultural register studies.
19.2.1 Textuality: Levels of abstraction, syntagmatic vs. paradigmatic axes, intra-level ranks

An ST is not simply a sequence of letters, morphemes, words, phrases or clauses mapped onto some TT unit under some notion of sameness, or even equivalence. This was already recognized in versions of translation procedures and methods (see Fawcett, 1997 for an overview), it was programmatic in Catford’s (1965) notion of translation diversified on different levels and ranks, and it is clearly recognized in approaches relating micro and macro translation units to grammatical units and shifts (Alves et al., 2010, p. 129ff). Yet, against the background of more elaborate semiotically based models (e.g. Halliday & Matthiessen, 2014), the semiotic text as an object of translation can be modelled on different levels of abstraction (phonology, lexicogrammar, semantics and context), each of these levels may be stratified by metafunctions (ideational, interpersonal and textual; or conceptual vs. procedural encoding in terms of relevance theory as applied in Alves et al., 2014), the focus may be on the syntagmatic axes (structure) or the paradigmatic axes (system of features), both system and structure can be dealt with in different degrees of specificity, and within the levels of abstraction, we may even assume different ranks. Questions of equivalence and cognition can be raised separately for each of these dimensions (see Matthiessen, 2001, 2014; Halverson, 1997, p. 212ff). And quite importantly, even with relatively stable ideational meaning between source and target, category change in the syntax-to-semantics mapping within and between languages plays a central role both in understanding and in translation (Serbina et al., 2017; Steiner, 2004, p.125ff). Another type of approach, relying on an elaborate but quite different architecture of textual structure, is cognitive-grammar-based approaches (Halverson, 2010, 2017; Sickinger, 2017). Elaborate notions of textuality such as those mentioned here allow us to ask the question of equivalence on different levels of representation. And depending on the particular type of translation context (including the translation brief, but also the level of expertise of the translator and constraints of time, resource, media, etc.), the search for equivalence by the translator and by the reviser can be expected to focus on different levels and ranks. And whatever shows up as macro- and micro-level translation units in processing can be expected to be directly responsive to the location of translation strategy in terms of levels and ranks (e.g. grammar-, semantics-and register-based translation strategies and methods).

19.2.2 Potential vs. instance; Text vs. reading

Another refinement of notions of “text” has to do with the opposition between “potential” and “instance”: along each of the dimensions identified earlier, we can focus either on the system of possible options (e.g. the grammar, the lexicon or the inventory of registers) of a language, or, more typically for Translation Studies, on the instantiation of these systems (e.g. one text in its particular context of situation). Along this cline, Translation Studies clearly investigates instances that are in an assumed relationship of translation, ST and TT bound by some notion of equivalence. The potential (grammars, lexicons, repertoires of cohesive devices, genres and types of register) is important as a set of resources and constraints for the translator, and between units of these systems, there are relationships of correspondence, rather than the instantiated relationship of equivalence (see Munday, 2001, p. 47, following Koller), but the process itself deals with ST and TT as instances. It is these processes that are the object of research in studies using, for example, eye tracking, keylogging, (functional) magnetic resonance imaging ((f)MRI) patterns, etc. The patterns that we see there, hopefully reflecting relevant processes in the mind of the
translator, are patterns of behaviour relating an ST instance to a TT instance—an extended version of the “eye-mind hypothesis”.

As a further refinement, though, we need to distinguish “text” from “reading”: even the individual text, e.g. as an object of pre-translational text analysis or of translation evaluation, is still full of ambiguities and vagueness; it allows different readings by the source-text audience, by the target-text audience and, particularly, by the translator. This is true for the mapping of frames/scripts to linguistic texts, for disambiguation of cohesive relationships in discourse, and even for merely sentential instantiations. Let me take here the problem of determining the semantic reading of a given lexical form, taken from a larger project on cohesion (Kunz et al., 2017; Steiner, 2015).

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Assumptions can be dangerous, especially in science. They usually start as the most plausible or comfortable interpretation of the available facts. But when their truth cannot be immediately tested and their flaws are not obvious, assumptions often graduate to articles of faith, and new observations are forced to fit them. Eventually, if the volume of troublesome information becomes unsustainable, the orthodoxy must collapse.


When analysing this example, say in a pre-translational text analysis, the translator is faced with determining the reading of all of the lexical items. Importantly, in the example text, lexical items such as assumptions, science, comfortable, interpretation, available, facts, truth, flaws, etc. are vague and/or ambiguous on a simple dictionary look-up, and they need to be instantiated/disambiguated in the process of understanding and then translating, the latter also depending on the target language. This involves integrating the lexical items into relevant chains and fields of items. The result of this process is a “reading” of one textual instance such as the example text, and it is this reading that is input to the translation process, rather than the textual instance as a chain of words or phrases. Ideally, the translator might attempt to arrive at a TT version having exactly the same ambiguities as the ST—but this ideal can hardly ever be reached, other than in individual sample sentences. Each reading of such a text disambiguates, instantiates its meaning—and a model of translation ultimately needs to be clear about whether the object of a translation is the individual text or the reading of it by the translator. As Muñoz Martín (2010, p. 175) says, “It is interpretations, not texts or discourses, that are translated and interpreted” (see also Venuti, 2009, p. 162).

And furthermore, readings can be governed by readers’/translators’ dispositions and choices; they can be ‘tactical, resistant, compliant’ and thus subjectified readings (see Martin & Rose, 2003, p. 269ff) of instantiated texts, and so important for translators’ choices in decision making (Munday, 2012). Obviously, this is a core area where the active role of the translator finds its place. And once more, in terms of cognitive processes, we need to look for traces of translators’ choices of this type in our data, yet these will be choices under the constraints of equivalence between translation units, if they are translators’ rather than other text producers’ choices.

19.2.3 Explicitness vs. implicitness of meaning

Another debate under core issues has to do with explicitness vs. implicitness of meaning. If, against the background of relevance theory (Alves et al., 2014; Gutt, 1991), or the “iceberg metaphor” of textuality (see Linke & Nussbaumer, 2000, p. 435), we assume that the encoded meaning in a text is only a part of its overall meaning, then translators continuously need to make choices as to how much of the overall meaning they want to encode explicitly or else
leave to inferencing (the “reading” referred to in Section 19.2.2). Translation Studies, like linguistics, needs to develop models to account for these types of meaning. To “account for” means to take semantic presuppositions, implications, implicatures, pragmatic presuppositions, conversational maxims, speech acts, etc. seriously by applying them to models of translation. The same applies for the interface between any text and its context, whether this context be modelled as script, frame or some form of contextual configuration underlying register choice. It is in the interaction between encoded meaning, implicit meaning and contexts that the overall meaning underlying translation lies. And it is a fascinating, yet at this stage not very well-modelled, issue how far the constraint of “equivalence” extends across all these types of meaning. The models to be developed for integrating explicit and implicit meaning in translation need to allow for both conscious choice, reflected in metacognition or awareness as revealed by recall protocols within a translation process approach, and non-conscious coding behaviour by the translator. This requirement arises not only if we want to empower translators, but also, and beyond this, as a descriptive requirement—translators make choices with regard to implicitness/explicitness, even if these choices are frequently unconscious. Work relying on relevance theory in process studies, as well as work investigating “explicitation”3 in the product (Hansen-Schirra et al., 2012), provides important areas of development here.

19.2.4 Models of translation and cognition

There are two obvious further key questions here: (why) do we need the notion of “cognition” in models of translation, and how do we model it?

Traditionally, translation has often been studied with an emphasis either on translation theory or else on the product and function of translation. The “applied branch” of Translation Studies as conceived of in Holmes’s “map” of Translation Studies (see Toury, 1995, p. 10) focused on training, translation aids or criticism. This was probably the dominant view on Translation Studies at least until the 1980s. Out of the types of Translation Studies, 13 altogether, mentioned in Holmes’ taxonomy, only the “process-oriented descriptive” kind had a clear orientation towards cognition, but with an underdeveloped methodology compared with that in psycholinguistics. This process-oriented type of Translation Studies has since become much stronger and diversified, as shown in e.g. Shreve and Angelone (2010), in Schwieter and Ferreira (2017b) or in Hansen-Schirra et al. (2017). The notion of “equivalence” is often hidden in the procedures that are the prime object of study (see Shreve & Lacruz (2017, pp.129–134) on the notion of “transfer”), and cognition as such is their main object of study. We need to be aware, though, that process-oriented studies rely on observable behavioural data (eye movements, keylogging, reaction time, electroencephalography (EEG) patterns, fMRI patterns, etc.) to “infer” cognition. It is uncontroversial, for at least this growing family of approaches, that these data reflect cognition, and that cognition is a prime object of research for Translation Studies.

The second question is how we model translation and cognition against the broad background of existing models in cognitive science, psychology and linguistics (Czulo, 2017; Muñoz Martín, 2017, p. 558ff; Shreve & Angelone, 2010, p. 12). This raises questions not only of objects of research, but also of the methodologies involved. The history of research in cognitive processes in translation is relatively recent, although there has been a significant growth from the process studies of the 1980s, through models based on relevance theory (Alves & Gonçalves, 2003; Gutt, 1991), systemic functional linguistics (parts of Alves et al., 2010; Bell, 1991; Serbina et al., 2017) or frame theory (Czulo, 2017), to a much wider field by now. If, however, we look at relevant disciplines with an earlier start in researching language and cognition (linguistics, cognitive linguistics and psycholinguistics), we find a few central questions that need answers:
How realistic/naturalistic do we need our translational data and their elicitation to be? So far, data used in experimental work on language processing are generally created under very artificial (usually laboratory) conditions, and are very small scale, hardly ever more than one sentence, or certainly very few. Is that kind of data valid for the study of a process as complex and context dependent as translation? Data in current studies in translation process research still tend to be far too complex for classical accepted psycholinguistic methods but already too small scale and artificially controlled for classical accepted Translation Studies.

What is the temporal scale of experiments, a full translation session vs. a minute, a second or milliseconds of activity, and what is the level of activities (outwardly observable symbolic data vs. neurophysiological data vs. other behavioural data such as eye movements)? Classical psycholinguistic studies operate with milliseconds of activity, whereas most studies in translation process research still operate with longer time scales—which is a methodological problem. As far as the level of activities is concerned, process research in Translation Studies is not markedly different from cognitively oriented research in psycholinguistics, so there does not seem to be a major problem here.

How wide is the gap from corpus findings to possible cognitive explanations? Corpus findings have the advantage of working with naturalistic data, and if the sampling procedure is adequate—which has not always been the case in corpus-based translation research—then problems of naturalness or time scale do not arise. One problem with corpus data is, though, that there is initially a gap between observed phenomena in the data and cognitive explanations. Phenomena to be observed, such as, for example, explicitation (e.g. Hansen-Schirra et al., 2012), or register properties and translation direction (Evert & Neumann, 2017) can be diagnosed, yet it takes fairly elaborate statistical techniques to relate them to one or two specific variables. And finally, do current models of translation make specific predictions about any product or process data? The overview in Carl and Schaeffer (2017, especially p. 66) concludes that at least for process data, this is hardly the case as yet.

19.3 Recent developments pointing to the future

Finally, a few recent developments are identified, pointing to the future of Translation Studies. In the first place, we would like to mention here the expanding methodologies in cognitive translation research as hopefully enabling us to learn more about the highly complex process of translation. A second and important perspective is that of integrating product and process research, as they mutually complement each other rather than constituting rival candidate methodologies for translation research. The third important development has to be a considerable strengthening of competence in empirical research methods. This process has only just begun and can be expected to gain momentum. And finally, a perspective on traces of “equivalence” in translation-related cognitive processes will be discussed, because this is a distinctive area for Translation Studies and hence also an area where translation can teach us something about language processing that other phenomena cannot.

19.3.1 Triangulation—multiangulation

The first promising developments are combinations of different methods, and even methods from different disciplines, to study translation. Research into translation and cognition may have started with early think-aloud-protocols (TAPs), but since then, it has been developed further through “triangulation” of methods such as keylogging, eye tracking and verbal protocols in experiments on translation (e.g. Alves et al., 2010) combined with corpus data,
further progressing through increasing use of a common time-stamp to enable multi-layer recording and analysis, and most recently, increasing interfaces with translation technology (Alves & Hurtado, 2017, p. 544; Carl et al., 2016). The general possibility is, of course, something like “multiangulation”, because additional methods may be involved: linguistic analyses, MRI, EEG or electrocardiography (ECG) recordings, reaction time experiments and other classical psycholinguistic methods. They open a wide potential for interdisciplinary studies of translation in the sense of multiangulation, but they also require much more methodological competence than is usually included in the training of translation researchers. Hence, research-oriented teaching of students must adapt to these requirements. Evaluation of data obtained through these methods requires competence in standard techniques of statistical evaluation (Evert and Neumann 2017; Levshina, 2015). And there is a concern relevant to all the methods discussed here: cognition is a process of the mind, yet none of the methods discussed here observes such processes directly (see Schlesewsky, 2009; Steiner, 2012). Product data show the outcome of cognitive processes at best, and process data such as keylogging, eye tracking, EEG and (f)MRI data all show (hopefully) correlates of cognitive processes, but not these processes directly. And, at least for process data, the question of ecological validity remains: in order to conform to standards of experimental research, the realistic process of translation must be reduced to an observable configuration of explanatory (independent) and response (dependent) variables, and this means very artificial data. Corpus data are at an advantage here, because the data can be natural realistic data.

19.3.2 Process and product

The second of these recent developments has to do with recognizing translation not only as system and instance on different levels of abstraction, but also as product and process. Whereas investigations of the product have been very much at the heart of Translation Studies from its beginnings, and have gained in methodological refinement since the advent of corpus-based work (see Menzel et al., 2017), studies of translation processes have only been undertaken since the 1980s and have only recently reached any degree of methodological refinement. It is a widespread paradigm in empirical linguistics and psycholinguistics that hypotheses about language production are initially tested on product data (corpora), which usually yields correlations between situational variables and patterns in the product. Any further progress towards causal explanations involves experiments and predictions, and it is this combination of product and process data that brings us closer to causal in addition to correlational explanations (see Hansen-Schirra et al., 2017; Schlesewsky, 2009; Steiner, 2012)—if we have models of the translation process that make predictions specific enough to be tested through our methods. In product data, our particular interest as translation scholars is in data showing the typical constraint of equivalence, such as aligned ST-TT translation units, or histories of attempts at interim solutions before the translator arrives at a final solution (see also Serbina et al., 2017). This presupposes that we define relationships of (non-)equivalence on our aligned data, for example on typologically motivated shifts (grammatical metaphor) and on “crossing lines” and “empty links” in alignments (see Hansen-Schirra et al., 2012, p. 268ff). In process data, we can then test whether the observed phenomena from corpora (e.g. grammatical shifts, grammatical metaphor, word order changes, explicitation, simplification, etc.) are indeed arising out of specific hypothesized stages in the process, and which of these may be due to the search for equivalence by the translator, mirrored in parallel processing of STs and TTs, in specific histories of revisions and gaze patterns. It is this intersecting of data that begins to bring us closer to something like causal explanations—which are, after all, what we want in the end.
19.3.3 Empirical methods

The third of these recent developments has to do with the movement of at least some strands of Translation Studies in the direction of empirical disciplines: these involve techniques needed for corpus building, including annotation and querying, and for experimental methodologies, still underdeveloped in Translation Studies. Our sense of “empirical” here is more specifically oriented to corpus-based and experimental methodologies than the sense of “descriptive” in Holmes’ map of Translation Studies (Toury, 1995, p. 9ff). Examples can be found in de Sutter et al. (2017) or in Hansen-Schirra et al. (2017). Techniques are being developed for corpora, involving sampling, representation, representativeness, annotation and consistency checking, querying, evaluation of results, multivariate analyses, isolating individual explanatory variables from several explanatory sources in the product, scales of measurement on data (nominal, ordinal, interval and ratio; see Levshina, 2015, p. 16) and interfaces with translation technology (see Lapshinova-Koltunski, 2017). We also need to move forward in transparent documentation of work that has been done, not least because studies need to be repeatable to be fully convincing.

For experiments, we need to move forward on questions such as naturalness of experimental situation, size of sampled text material, hypothesis formulation and interpretation of results. Progress in experimental design needs to include competence in handling tools such as eye tracking and multi-layer integrated corpus building, formulation of testable hypotheses, operationalization of relevant variables, interfacing with translation technology, and contacts with the relevant research communities in interdisciplinary contexts. For all this, the enormous complexity of the translation process needs to be controlled—which is difficult without making the object of study un-natural. There are frequently too many interdependent variables in translation research, and any successful attempts at reducing these for the purpose of a given experiment will help towards a better methodology. And as in the case of corpus-based work, we need to introduce transparent documentation and replicate experiments in order to increase the sustainability of research design in process studies (see Alves and Hurtado, 2017, p. 547). Once more, as a community of translation researchers rather than researchers in writing research or in traditional psycholinguistics research, we need to keep the equivalence constraints between source and target units in focus (explicit vs. implicit meanings, grammar vs. semantics vs. context, and translation units vs. linguistic units), and we need to specify precisely whether and where they show up in our data. Translation involves both understanding and production, but it is different from other forms of understanding and production through the double-bind of the translation relationship both to the ST and to the TT, and additionally through the involvement of at least two language systems, even if the latter is shared by research into bilingual communication.

A final point needs mentioning, which is the construction of models of the translation process that are specific enough to generate research hypotheses in sufficiently high granularity, and which can interface with models of text production, including writing, and understanding. These models will have to be a merging of models from linguistics and models from processing, plus the specific components of the translation process, and again “equivalence” will have to play a key role here. The neglect in branches of Translation Studies to work towards such models is a hindrance to making progress on that front.

19.3.4 Tracing “equivalence” in translation-related cognitive processes

Equivalence is not “sameness”, so there cannot be a question of simply transferring any element of structure or features unchanged from STs to TTs. Equivalence may not even be located in any
level of encoding of the message, but instead may reside in patterns of interpretation or in con-
textually equivalent patterns of behaviour. If we subscribe to this notion of equivalence, then we
must find ways of comparing patterns of behaviour in communicative forms other than language
(see Section 19.1.2)—which is certainly not easy, at least in the case of “interpretations”, which
points us back towards linguistic encoding.

Most models of translation focusing on linguistic encoding are stratificational. They usually
take the form of two parallel syntagmatic and paradigmatic axes and involve levels such as phon-
ology, lexicogrammar, semantics, context (situation) and transfer between them. If an interlingua
is involved, the model approaches a U-shape with the interlingua at the bottom (see Figure 19.1).

In such models, transfer happens intralingually between more formal and more contextual
levels in analysis and production, and it happens interlingually between languages holding the
level constant. “Equivalence” then means transfer between these levels, ideally without loss of
meaning. Now, translation as interlingual transfer is the only form of text production that takes
as an input a fully specified and instantiated linguistic text on all levels, with the ideal aim of
producing a maximally complete “quotation” of it in a different language. This quotation is
different from a paraphrase or a variant; it is like “quotation” but unlike “paraphrasing” and
“retelling”, in the sense of Martin (2006). Some models of translation operate with notions
like “re-instantiation” (De Souza, 2013, following Martin, 2006; Matthiessen, 2014, p. 322) or
“transfer”, “reconstitution” and “translation competence” for the competence side (Shreve &
Lacruz, 2017, p.127). Whichever metaphor we prefer for translation, even the wording indicates
the specific property of the process: equi, trans, re-, para, all of which refer to something which is
(relatively) unchanged.
Research in language understanding shows us traces of moving from a phonetic input to some form of deeper semantic representation, and the overall final interpretation of the message is the contextualized interpretation of all the levels involved (for one of the classical models, see van Dijk and Kintsch (1983) and later elaborations by Kintsch), its “reading” in the sense of what was presented in Section 19.2.2. Research in language production shows the reverse, and the end product of the production pipeline is the encoded text (see one of the classical models in Levelt, 1989; for models of writing see the summary in Shreve & Lacruz, 2017, p. 131), where the term translation is even used intralingually between adjacent levels of representation). Research in multilingual language processing shows all the above under conditions of two or more language systems. None of these processes, though, show patterns of “equivalence” in the stricter sense of moving from a linguistically fully specified input to an output in another linguistic system. In the sense of Figure 19.1, language understanding is the left-hand side of the schema, and language production is its right-hand side. Yet, transfer of readings, which is not simply the same as correspondence of structure, is the province of translation. And the processes arising out of transfer are unique to translation. My suggestion, therefore, is that this is a core area of promising research in translation-related cognition for the immediate future.

Where, then, do we locate traces of equivalence in natural language processing ((see Shreve & Lacruz, 2017) for a related, though different, perspective on this)? Reading for pre-translational text analysis is one case in point. It is to be expected that texts will be read differently depending on whether they are read for translation or for understanding without a translation brief. This should show up in various patterns of eye tracking, in tests involving recall of specific properties of the ST, in patterns of typing onset and pauses, and in neurophysiological patterns identifying problems during reading. Through the entire translation process, we would expect frequent and iterative coupling of ST and TT. Another very interesting source of relevant data should be histories of the development of translation units, both in the sense of behavioural units (Dragsted, 2010) and in the sense of aligned units of product data (for an attempt at integration, see Alves et al., 2010). The first type of data would essentially be process data, the second would be product data, and we would definitely expect histories of translation units to be different from histories of the production of text units in writing research, precisely in the sense that they reflect the search for equivalence between two linguistic encodings (ST-TT) rather than between meaning representations in other modalities (visual, propositional, auditory, etc.) and their linguistic encoding in non-translational forms of text production (e.g. audio descriptions, forms of interpreting, and straight multilingual text production in multilingual technical writing). The search for equivalence should also show up in data from drafting and revision, either in straight annotated linguistic data or in advanced forms of keylogging and eye tracking. Above all, once we have available data in multi-level corpora, involving linguistic data, eye-tracking and keylogging data, magnetic resonance imaging and user-activity data of various types, and if these different levels of data are mapped onto one common time-stamp, and if we then compare translational data with data from other forms of multilingual text production, the specifics, in particular the search for equivalence, should show up clearly ((see Carl & Schaeffer, 2017, p. 63), though without a discussion of equivalence). It will, of course, be challenging, but highly interesting, to look at data that indicate which of all of these processes are governed by conscious problem solving, because it can be expected that precisely the search for equivalence in problematic cases requires translation-specific recourse to specific types of knowledge and of strategies. In all the process data we have mentioned here, we must, of course, presuppose that the behavioural data we are observing are direct traces of cognitive processes—a major assumption, indeed, but this risk we share with most methods of psycholinguistics and cognitive studies.
Notes

1 Some arguments in this chapter rely on concepts from systemic functional linguistics (see House, 2015:25f, 63f, 126; Steiner & Yallop, 2001). This applies in particular to the concepts of “potential vs. instance, text vs. reading, and multifunctional paraphrase” as used in Sections 19.1.2, 19.2.1 and 19.2.2. In SFL usage, “potential” refers to the linguistic system, as opposed to situated texts (“instance”). The “reading” of a “text” is the hearer/reader/translator’s interpretation of a linguistic encoding, and a “multifunctional paraphrase” is a paraphrase which preserves not only truth conditions, but in addition interpersonal (“pragmatic”) meaning and textual meaning (information structure and thematic progression).

2 To what extent information-theory-based models (e.g. Martínez Martínez & Teich, 2017; Teich et al., this volume) need all these clarifications is currently unclear to me. The notion of equivalence in such a kind of approach seems to be hidden under the low surprisal of a given translation solution. If the language model there is trained on a corpus of “good” translations, low surprisal of a given translation would also be an indicator of equivalence, without having any explicit model of the term.

3 For the distinction between explicitness and explicitation, cf. Hansen-Schirra et al. (2012, p. 59):
   We assume explicitation if a translation (or language-internally one text in a pair of register-related texts) realizes meanings […] more explicitly than its source text—more precisely, meanings not realized in the less explicit source variant but implicitly present in a theoretically-motivated sense. The resulting text is more explicit than its counterpart.

Further reading


A rich source for recent developments in empirical methodologies, albeit with a focus on product studies.


This is more than 20 years old, but it remains a valid source for fundamental issues concerning “equivalence” in Translation Studies.


This presents a range of recent studies of cognition in translation and interpreting.


This is more than 20 years old, but it remains a valid source for fundamental issues concerning “equivalence” in Translation Studies.


A comprehensive and reasonably recent source for our topic as a whole.


This gives a representative survey of the field, at least for the time up to 2010, with much of it still not outdated.

References


Steiner, E. (2001). Intralingual and interlingual versions of a text—how specific is the notion of translation. In E. Steiner, & C. Yallop (Eds.), Exploring translation and multilingual text production: Beyond content (pp. 161–190). Berlin: Mouton de Gruyter.


