11

Translation Process Research and Methods

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Objectives

- Learn that the translation process is a broad notion is investigated by different branches of translation studies (cultural and sociological, linguistic, cognitive, and technological).
- Understand a large set of methodological tools and their advantages and disadvantages.
- Explore some basic theoretical models about the translation process.
- Engage with and reflect on translation processes.

11.1 Introduction

The final chapter in this book focuses on the written interlingual modality only, which does not imply that the interpreting process would be less relevant. Processes, however, are fairly complex phenomena, and it is just simpler to start investigating one very specific main type of mediation between people. Although a close study of a translation *product* may indeed resemble taking a picture of the target text (TT) and measuring all its features, which are then related to its context, the study of the translation *process* can be compared to shooting a film of the development of a new object created by human beings. In its broad sense, a study of the translation process therefore covers the description and explanation of all activities that are consciously or unconsciously carried out to arrive a translation that is read by and may have an impact on its target audience. It thus covers the moment when one person initiates a translation project; the time when the translator entertains initial thoughts on the project until the translation is finished and sent off to the client, project manager, or employer; and all feedback stages that may take place afterwards. The wide variety of these activities necessarily requires a wide variety of studies, each of which pays attention to a particular part of the process and employs the means that are most suited for that particular part.

Frequently, two main research strands are distinguished from each other because they inquire into perhaps the most diverging aspects of the translation process and hence start out by requiring completely different investigation methods. They are also related to the distinction that has been made by Toury (1995/2012) between the **translation act**, which is embedded in the **translation event**. Whereas the former refers to the actual production of the translation by the translator, the latter refers to the set of social conditions that govern that act. The former is the study object of one main strand and focuses on the translator only and, in particular, on the brain's activities while a

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person is actually writing the TT. Researchers who probe into the general context in which a translator produces their work may also study the impact that may have on a translator's work, also including the reactions of the users of translations, sometimes even across centuries. The former takes a *cognitive* approach to translation, whereas the latter investigates translation from a *socio-cultural* angle.

There are, however, at least three more approaches that refer to different stages of the translation process: there are *linguistic* studies, which start from observations into mainly the linguistic features of the text and generate hypotheses about the cognitive process; there are *technology-related* investigations, which study the impact of tools and machine translation (MT) on the translation process; and there are *pedagogically* oriented investigations, whose findings are aimed at improving the translation process in translation training by means of strengthening the translator trainees' competences. The five approaches are equally necessary to gain a fundamental understanding of translation as a process. Treating the pedagogically oriented studies in a different publication, this chapter will now discuss four of them in more detail.

11.2 Socio-Cultural Translation Process Questions

Since the 1990s, increasingly more scholars interested in translation have widened the scope of research to include not only cultural but also sociological considerations. This has led to more research being carried out to uncover the principles that determine the translators' observable behavior when they translate, an undertaking whose field was mapped by Wolf (2011).

This type of investigation into translation as a social practice relies on methods that involve the close observation of various agents from the translation process, in which not only the translators are paid attention to but also editors, translation project managers, revisers, and readers. In other words, the notion of a "practice" was now regarded as "an institutionalized system of social conduct in which tasks are performed by actors fulfilling roles, under contextual conditions which include a striving for quality" (Chesterman 2006, p. 19). Put differently, translators are studied as social agents interacting with each other. Often, these socio-cultural investigations inquire into the social norms that govern translation events (Toury 1995/2012) or underpin their findings with sociological conceptual frameworks, such as Bourdieu's culture theory or Latour's actor network theory (1996). A recent study by Valdez (2018), for instance, explores whether the observed and perceived translational norms of novice and experienced translators, revisers, and readers are similar or different regarding source and target orientation in the contemporary biomedical Portuguese translation market. From Bourdieu, concepts such as *habitus* and *capital* appear in many an investigation. Within a translation context, the first term **habitus,** usually refers to the set of long-lasting characteristics or dispositions that translators have acquired as the product of social conditions such as their education and social experiences and that are (partially) common to all of them. One way to interpret the second term, **capital**, is by seeing it as a principle that underlies "the immanent regularities of the social world" (Bourdieu 1986, p. 241). In translation process studies, it is often cultural capital (e.g., ideas and skills, educational qualifications, pictures, books, instruments) and social capital (e.g., social connections such as membership of a group) of translation events that are being explored, described, and theorized.

Actor network theory, in comparison, stresses the connections between actors in a network, which is different from a social network in that an actor network does not focus on the social relations between individual humans, but aims "at accounting for the very essence of societies and natures ... and rebuild social theory out of networks" (Latour 1996, p. 369) by including non-human

and non-individual entities as well as humans – whether it is the translators themselves or any of the people around them, such as the initiator, commissioner, source text (ST) producer, user, or receiver – into the networks.

Some new theoretical models were proposed. Holz-Mänttäri's **translatorial action theory** with its cooperation model (1984) asserts, for instance, that the production of a translation needs the agreement of all participants (or agents or actants or actors) involved. Abdallah and Koskinen (2007) focus on the trust that is a prerequisite among all agents for a translation process to become successful. Cronin stresses the translators' and other agents' ethical and socio-political responsibilities by reconfiguring their relationships in terms of resilience and sustainability (Cronin 2017). A clear-cut case arguing for a translator's taking responsibility is where their translations voice criminal or perpetrators' minds. A study into such a translation event was carried out by Spiessens (2012) by means of rhetoric and discourse analysis. She discovers certain discursive strategies that allow a translator to insert their own voice into a text, thus producing a view that opposes that of the ST writer or perpetrator. She illustrates this among others by means of two English translations of the autobiography of Rudolf Hoess, the commandant of Auschwitz who was sentenced to death in 1947.

Reflection Question

Some people would argue that an ironical translation, which opposes the views of the ST writer, is no longer a translation but an adaptation. They would be reluctant to produce such ironical translations themselves, arguing that they do no longer convey the ST writer's ideas. Which position would you take in this debate and why?

The methods used in these studies are often of an ethnographical nature: they carry out fieldwork in the translation environment and observe participants' practices. They employ simultaneous **think-aloud protocols (TAPs)** as well as **retrospective and even dialogued verbal reports**. The former method requires that translators express all of their thoughts aloud while they are in the process of translating. The latter method enquires into participants' thoughts and reflections after the translation, sometimes in writing, sometimes in dialogue with another translator, or at other times following a protocol of set questions with the investigator.

They also conduct interviews, whether structured, semi-structured, or free. Davier (2015), for instance, conducts semi-structured interviews at a French and a Swiss press agency to inquire into news reports on the cultural Other in Switzerland. Participants' responses thus contextualized the corpus of news dispatches on the minaret ban in Switzerland that was analyzed by means of the text-linguistic oriented appraisal theory. Although interviews are usually conducted in a one-on-one setting, **focus groups** allow a researcher to gain data from more people at the same time. In her study of the Finnish in-house translators of the European Commission in Luxembourg, Koskinen (2008/2014) organizes focus groups to stimulate interaction and discover group opinions and attitudes.

For his ethnographic study, Pedersen (2019) observed a group of transcreation managers at a London marketing implementation company; in addition, Pedersen himself participated in some of the activities that he reports on (**researcher participation**). Alternatively, a researcher can set up a **case study** and identify socio-cultural features of a translation event in one particular geographical area and at one particular period in time. Bednárová-Gibová (2020), for instance, revealed the affective feelings of literary translators in Slovakia. She submitted a **questionnaire**

from psychology, the IWP Affect Questionnaire (Warr et al. 2014), to literary translators and related these data to a description of the participants' habitus.

As such, these materials may often be considered highly subjective when the degree of intersubjectivity or generalization rarely belongs to the possibilities because of the difficulty of obtaining a high number of participants. In addition, **self-reports** may also suffer from a certain degree of "twisting the truth": what we *say* we did is not always exactly the same as *what* we did. However, these materials are ecologically valid materials and cannot be completely dismissed. They can be complemented by other data to arrive at a fuller picture of the translation event.

Ehrensberger-Dow and Heeb (2016), for instance, focus on the conditions in translators' workplaces, inquiring into their ergonomic aspects. Not only do they employ retrospective verbal protocols, an online survey, qualitative interviews, and ethnographic interviews but also some screen recordings and an ergonomic assessment carried out by an occupational therapy researcher. Others engage in a corpus study (Bisiada 2018), in which, for instance, a manuscript and its edited translations are compared with each other.

This line of enquiry within the workplace itself is often referred to as *situated* activity of translation and belongs to the field of studies of work (SW), which originates from ethnomethodology (Garfinkel 1986). The aim of this branch of study is to describe and explain actors' actions and relationships by means of a meaningful structure and order. As Risku et al. (2017) write:

> SW use observations, descriptions, and analyses of real work processes to determine the situated, embodied practices in which the specific knowledge and skills required materialise (Bergmann 2005, pp. 639–640). Accordingly, alongside the temporal, spatial, material, and social context of an activity, SW also look at the embodied knowledge that becomes evident when an activity has been carried out successfully and the specific practical skills that are needed to do so (Risku et al. 2017, p. 6).

It is clear that such studies may have a direct impact on future translation events. Ragni and Nunes Vieira's investigation (2020) into translators' perceptions on the use of activity-tracking in translation practices includes, for instance, recommendations for translation practices.

But it should be noted that it is not only the translation production features that are being described. There are also studies that observe later stages. One such stage is the quality assurance process of a translation. In a professional reviser study by Robert and Van Waes (2014), different procedures to revise a translation were studied: a bilingual procedure in which the ST is consulted, a monolingual procedure that does not rely on the ST or a combination of both in either order (first a bilingual revision followed by a monolingual revision and, vice versa, first a monolingual revision followed by a bilingual one). It turned out that the bilingual procedure yielded better results than the monolingual procedure in all revision settings, except what was called the "functional revision setting." Although the monolingual procedure turned out to be faster, the two two-step procedures were significantly more efficient and hence more relevant when the quality of the translation was considered more important than the time spent on the revision. The different revision procedures in a "functional revision setting," however, in which revisers were asked to focus on language and readability only rather than content and transfer of the ST, showed a different picture: they all yielded similar results both in terms of time and quality.

A similar revision-oriented case study can be found in Feinauer and Lourens (2017). They place their investigation within the literary field and aim at discovering the features of different types of self-revision in the translation process of one translator of three Afrikaans works of fiction into English. Here, a metatextual discourse analysis was conducted of archival material, in particular

the email correspondence between and personal notes of the translator, the reviser, and the editor at different stages of the process. Their results question the traditional view in translation revision research that translators aim at achieving a balance between loyalty to the ST and acceptability of the translation to the TT audience, while revisers only address the TT readers' needs.

Another stage is that where the receiver of the translation comes into contact with the translation. How does this take place? How did it take place in the past? In their state of the art on cultural mediators, Verschaffel et al. (2014), for instance, designed a model of a cultural mediator – which is supposed to include a translator as "a person active across linguistic, artistic and geographical borders and as the carrier of cultural transfers" (p. 1255) – in multilingual 19th and early 20th century Belgium. They claim that the traditional view of seeing a translator as translating from one language into another language only does not reflect the complexity or multi-directionality of their practices and is therefore reductionist. They argue for a reconstruction of agency networks in which cultural mediators operate. To collect data, they recommend archival research (e.g., letters or testimonies), whose results should be analyzed in terms of networks of people and practices, rather than focusing on just one transfer activity, by means of discursive approaches and concepts from translation sociology such as *habitus, capital*, and *beliefs*.

In addition, there are studies that look into readers' behavior after having read the translation. Receivers of a translation could be any translation reader, whether it is a Korean speaker of a French novel (within the literary approach to the translation process, such studies are often called reception studies) or the user of translated measures and instructions related to the COVID-19 pandemic by the World Health Organization[1] (studies within this area are often referred to as usability studies). Interest in this area is very vivid, as testified by the recent call for papers by the translation studies journal *Translation Spaces* to submit articles on the reception of translated cultural products. Their central value is their revelation of the impact of contextual factors such as clients' instructions, censorship, and revision practices, including editorial interventions on the translation process.

11.3 Linguistic Translation Process Questions

Although a sociological approach clearly contributes to the study of the translation process, the role of linguistics may at first sight seem somewhat less obvious. Nevertheless, various linguistic studies have been undertaken to reveal translation process features; witness, for instance, the volume by Rojo and Ibarretxe (2013) and Haidee Kruger's plea for renewed cognitive linguistic translation research (Kruger 2016).

One of the harder questions often posed in translation studies is how translators make their choices and thus whether they have their own style when they are translating texts. The difficulty of this question arises from the fact that a translator style must also obviously be heavily influenced by the ST style, too. In her much-cited article, Baker (2000) claims that it is possible to recognize certain patterns in literary translators' work such as the use of a narrative past tense for a ST that uses a present tense. This can be detected when several of their translations are investigated electronically and the findings are interpreted within the framework of what is known about the

1 https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/q-a-coronaviruses.

translator and about the relationship between the source and target cultures of the works under investigation.

A similar research question was asked by Mastropierro (2018) in his case study comparison of two Italian translations of Lovecraft's *At the Mountains of Madness*. Here, the ST is similar for both translations, so differences between them may be attributed to the translator's own style. Both translations were submitted to a key cluster analysis – clusters being repeated sequences of words – which revealed that the two translators had indeed different styles of translating with respect to certain elements. Differences turned up in the following linguistic sequences in the target language: their use of euphonic -d (the non-obligatory insertion of a *d* to a conjunction or preposition if the next word starts with a vowel, such as *ad un* instead of *a un* ("to a"), locative clitics (the use of *ci* or the less frequent *vi* to express *there*), and distal demonstratives (the use of *quel-* compared with *quest*, which in one translation leads to more emphasis on the narrator as focalizer of the scene than in the other translation) was consistently different from each other. Hence, it can be said that the translators have different linguistic habits in their translations. However, this claim is still far away from maintaining that the two translators have a different translation style across all of their works.

Another successful way to identify a translator's style was shown by Gilbert (2020). In this study, a Google neural machine translation (NMT) engine was customized with a parallel corpus in order to retrieve distinct features of a particular translator such as whether they used contractions instead of full forms, borrowed words, or translated certain words systematically in the same way or not.

Reflection Question

How would you define a translator's style? Which types of linguistic elements are suitable to speak in terms of style: grammatical, lexical, or phonetic? Which are more relevant to the field of translation studies?

A post-editing context, too, can be investigated with linguistic research questions. Schaeffer et al. (2015) drew a connection between the linguistic make-up of the ST and the effort necessary to translate. In other words, to confirm that the ST itself may predict translation difficulty, they calculated **word translation entropies** and looked for a relation between that measure and the post-editor's process activities by means of eye tracking (see next § 11.4). The concept of word translation entropy denotes "the number of alternative translations for a single source word" and is usually abbreviated as *HTra*:

> It describes the degree of uncertainty regarding which lexical TT item(s) are chosen given the sample of alternative translations for a single ST word: if the probabilities are distributed equally over a large number of items, the word translation entropy is high and there is a large degree of uncertainty regarding the outcome of the translation process. If, however, the probability distribution falls unto just one or a few items, entropy is low and the certainty of the TT item(s) to be chosen is high (Schaeffer et al. 2015, p. 193).

However, word translation entropy or **translation variation** is not the only factor that they hypothesize to be a predictor of translation difficulty. A second measure they investigated was that of word order differences between the ST and TT, which is referred to as **translation distortion** and abbreviated as *HCross*. A statistically significant effect of both measures on effort was

confirmed in some of the eye-tracking data. Toledo-Báez and Carl (2020) are now inquiring into the linguistic features that may cause this variability in translation variation and distortion in a corpus of English-to-Spanish post-edited translations.

This type of data source for their study, a corpus, is actually the typical means used by the most prolific linguistic branch within translation process studies, that of corpus-based translation studies. Such studies of the language features in translation corpora have revealed certain linguistic patterns, which in their turn have generated hypotheses that involved processes to be considered typical of translation. Serbina (2015), for instance, found that the English construction [$NP_{research}$ V_{show} *that*-clause/NP] occurs much more frequently than its German counterpart. Because similar differences between language pairs already showed that more cognitive effort was needed to translate a construction whose equivalent in the target language only has a low degree of frequency, she hypothesized that the translation of the pattern just mentioned into German is cognitively more effortful than the translation of the pattern [NP_{human} V_{show} *that*-clause/NP], in which the verbs of showing are combined with human agents. This hypothesis turned out to be confirmed by eye-tracking data but not by keystroke-logging findings.

Corpus-based translation scholars usually go about by comparing features of translated texts either with their STs in their source language in parallel corpora or with texts originally written in the target language in comparable corpora. One of the early, well-known examples is the study by Olohan and Baker (2000) of complement clauses following the verbs "say" and "tell." They compared two corpora, the Translational English Corpus (TEC) and the British National Corpus (BNC), with respect to whether these verbs were followed by *that* or by zero, as in *He tells her during their conversation that...* . They found that the complementizer *that* occurs more frequently in the translational corpus and explain this as an example of conscious or unconscious explicitation processes in translation, which they argue can be seen as a translation universal.

Although explicitation as a process has been investigated in many a translation study after Olohan and Baker, another feature typical of translation, or translation universal, has been studied much less frequently: conventionalization or normalization. An example, however, is Delaere et al.'s (2012) study of the Dutch Parallel Corpus. By means of profile-based correspondence analysis (Plevoets 2008), they revealed a consistent use of more standard forms in translations. In addition, the data also showed that text type also played a role in the degree with which normalization took place: fiction and journalistic texts with much editorial control contained more standard language than the text types with fewer editing practices such as administrative texts and external communication.

Some scholars even go further and integrate different branches of linguistics into their research: usage-based linguistics, variationist linguistics, probabilistic grammar, cognitive socio-linguistics and comparative linguistics, research on second language acquisition, and bilingualism. They do not restrict their research to translation corpora but also include other types of writing such as L1 and/or L2 writing. Dam-Jensen et al. (2019), for instance, argue for a view in which translation, writing, and adaptation are three types of text production.

Equally focusing on similarities between textual activities, other scholars group together activities that can be called constrained varieties of language use because they are all produced in very specific circumstances and constrain the language user to a certain extent. Some research has already shown that they often contain similar characteristics, such as being more explicit than texts produced in a monolingual context. Kotze (2022) suggested using the term *varioversals* for the common characteristics of mediated language, recommending comparative studies into mediated language varieties produced in different settings, which will lead to a model of constrained communication.

Applied studies of the translation process, too, may depart from research questions that are operationalized linguistically. This is the case with Karakanta, Negri, and Turchi's inquiry (2020) into subtitling in the special setting of volunteer subtitling to establish whether the subtitling quality (in terms of subtitling constraints) in TED Talks improved as a result of a thorough quality assurance process. Their study clearly showed that the length of subtitles much better conformed to the norms after introducing well-defined subtitling guidelines, training materials, and the use of a subtitling tool.

Summarizing, the corpus-based approach discovers certain linguistic patterns in the translation products and relates them to general mental processes. This means that the approach can be considered as a strong hypothesis-generating branch of translation process research.

Looking back on the history of corpus-based translation studies, De Sutter and Lefer (2020) return to the *that*-complementizer clauses, showing how their findings do not confirm Olohan and Baker's early findings. Relying on the Dutch Parallel Corpus, they adopt recently developed methods that now allow researchers to investigate other multiple quantitative variables besides the presence of *that* and translated status, such as the register in which the sentence appears, the length of the full complement clause, the length of the matrix–clause subject, the distance between the matrix–clause verb and the complement clause subject, the length of clause–initial material, the length of the complement–clause subject, the length of the complement–clause remaining material after the complement–clause verb, and the distance between the matrix–clause subject and the matrix–clause verb. These variables are all related to the complexity of the sentences under investigation and were then submitted to a series of statistical tests called generalized linear mixed-effects model. Although the translated English part of the corpus *did* show more occurrences of explicit *that* than the non-translated part, a difference that is statistically significant, it turned out that only four variables impacted the presence of explicit *that* significantly: register and the length of the full complement clause, the distance between the matrix–clause verb and the complement clause subject, and the length of the matrix–clause subject. This also means that translated status did not play a role at all. De Sutter and Lefer therefore conclude that linguistic researchers now have data and investigation methods with a more robust generalization power, which means that they can predict the impact of features in similar circumstances more reliably. In other words, in contrast to many case studies that are not generalizable, and many early mono-factorial corpus-based studies, studies now have some probabilistic power. In setting the agenda for future research, they suggest investigating translated language using multifactorial methods for research questions to explain variation among different types to a certain extent. In addition, these studies should be based on theoretical questions and involve other methods such as experiments. Kruger (2016), for instance, combines different corpus data with methodologies such as eye-tracking and keystroke logging, submitting the data to statistical techniques to develop a comprehensive theory of bilingual language processing in a multilingual world. Such a theory would also cover the interrelation between social and cognitive aspects of translation, the topic of our next section.

11.4 Cognitive Translation Process Questions

Probably the most dynamic research into the translation process is taking place with a cognitive angle, which has the aim to unravel (some of) the brain activities that translators engage in. These activities were ignored by behaviorists as black box activities and therefore considered irrelevant for science. However, with the development of cognitive studies and the technology to register and measure reading and writing activities, translators' cognitive processing also became a study object

with a higher degree of measurability. Consequently, it has been observed by scholars whose theories were based in fields such as cognitive psychology, psycholinguistics, cognitive linguistics, and sometimes even neuropsychology or neurology and has led to the publication of a fair number of articles in established journals, separate volumes on translation and cognition (Shreve and Angelone 2010; O'Brien 2011; Carl et al. 2016; Muñoz-Martin 2016; Schwieter and Ferreira 2017; Walker and Federici 2018; Alves and Jakobsen 2021), and the publication of a journal devoted to the topic journal, *Translation, Cognition & Behavior*. Different local and international research groups have also been formed: TRA&CO or the Center for Translation and Cognition (Mainz), TREC or the Thematic Network on Empirical Research in Translation and Cognition (Barcelona) with its CRITT TPR-DB or the Centre for Research and Innovation in Translation and Translation Technology Translation Process Database, the TRICKLET project or Translation Research In Corpora, Keystroke Logging and Eye Tracking (Köln), and the MEMENTO project (Kent, OH), which consolidates communication channels with its yearly international "bootcamps" at which scholars investigate and discuss -translation process research hypotheses during three or four weeks and its successive Translation in Transition conferences.

11.4.1 A Developing Methodology for Cognitive Translation Studies

In the previous century, cognitive studies interested in the thought processes of translators used adopted data collection methods such as concurrent TAPs as well as retrospective and dialogued verbal reports or protocols (e.g., an integrated problem and decision report log; see Gile 2004). They provided ecologically valid materials, some of which were completely spontaneous and contributed to ethnographical studies. This led to studies aimed at disclosing mechanisms underlying translators' behavior. They mainly aimed at the description of what it is that the translators pay attention to, such as individual knowledge related, how they try to resolve any text-related comprehension or production obstacles they come across (use of resources), and how they make their decisions (decision making or problem solving). The absence of systematic research designs, however, did not yield data that were liable to generalizations.

Reflection Question

The method of TAPs was also adopted in ethnographical studies. Can you illustrate its use in relation to two or three specific ethnographical research questions in such a way that you demonstrate that the TAP may serve both a social and a cognitive purpose?

However, some theory-induced initial hypotheses were formulated that were taken up again in later work. Jääskeläinen and Tirkkonen-Condit (1991) found that the longer years of experience the participants in their study had, the less time they spent on translation. They explained this by attributing more automated processes to participants with more experience. One exploratory TAP study turned out to be very influential for later cognitive post-editing studies. With his *Repairing Texts* (2001) monograph, Krings investigated verbal reports of post-editors, which led to his distinction between three types of post-editing effort (see Section 11.5).

TAP methods have, however, also been found to interfere with the translation process and to reveal not only thoughts that reflect on the actual translation task but also many other thoughts such as arguments for their choices, memories, or emotions (Hansen 2005). Hence, as soon as **keystroke logging** was technologically possible, it was added to the verbal (retrospective)

protocols. Typing activities in real time with mouse clicks, insertions, additions, and deletions were now made observable to the investigator. In Section 11.3, the investigation into an individual translator's style was mentioned from a linguistic point of view. Keystroke logging now enabled to relate these data to translators' keyboard activities as observable features of their thoughts. In Hansen's long-term study (Hansen 2013), some of the data – and, in particular, participants' commentaries during a retrospection protocol with replay of the recorded translation process – indicated that translators do undergo some development as professionals. However, unexpectedly, the study also revealed that their individual translation style had already developed during their 5- to 6-year-long course of studies, leading to the hypothesis that the individual cognitive processes are derived from the participants' personality from the start (Hansen 2013). This richer dataset was improved again with the introduction of **screen capture**, which enabled researchers to identify every website and resource translators used during their task.

Such a keystroke data study was soon combined with a linguistic (corpus) analysis of the source and TT involved and provided better insight into the final translation. Such analyses were carried out either in terms of linguistic or translational features (Halverson 2010) or to define and compare the degrees of adequacy (traditionally also referred to as "accuracy") and acceptability (or "fluency").

The total collection of data now yielded clear empirical evidence of what went on during the process of writing, and a translator's technical effort (to use Krings' term) could be measured in terms of keystrokes mouse clicks, insertions, and deletions in both the writing and revision stages of the process. However, the first stage of a cognitive translation, that of reading the ST while translating, was left in the dark.

When **eye tracking** was introduced into the field about a decade ago, researchers were able to get a glimpse into the reading processes during translation, too. With eye tracking, by means of tools such as Tobii and Eyelink, keylogging, screen capture, and eye tracking data were all unified, which also yielded stronger statistical results. Now, although it is clear that most keystrokes can be directly related to the words and therefore also the conscious thoughts that translators entertain in relation to the translation, eyes may move in all directions, and not every eye movement needs to be related to a thought about the translation assignment. If, for instance, a translator hears a dog barking outside, her eyes may go toward that direction without there being any connection to the translation at all. Nevertheless, many findings in different domains of research have resulted in the assumption of the eye–mind hypothesis that eye movements show what an individual's mind is cognitively processing and, consequently, that whatever is being fixated by the eyes is also what is currently being processed by the brain (Just and Carpenter 1980). Hence, researchers either submit the whole source and TTs to eye tracking, or they outline specific "areas of interest," whose eye data are focussed on. Mostly, it is measures such as average and total fixation count, fixation duration, and regression count, besides pupil dilation, that are being recorded and interpreted. And we saw earlier, keystroke-logging studies can be combined with a linguistic text study; so, too, can an eye-tracking study be combined with a product study to compare the two sets of data with each other (e.g., Angelone and Shreve 2011).

In the past decade, both functional magnetic resonance imaging (fMRI) and electroencephalography (EEG) studies have also been added as methods for translation studies. They can be seen in the light of Tymoczko's (2012) call for a neuroscience of translation, combining both macro and micro research. In fact, Chang's (2009) was one of the earliest investigations to explore the inclusion of physiological and neurological measures provided by fMRI in an eye-tracking study. His enquiry into the validity of the revised hierarchical model (Kroll and Stewart 1994) for texts rather than single words involved measuring cognitive load for by different translation directions.

Similarly, Zheng et al. (2020) carried out a study to identify functional connectivity in the brain when two different translation directions are taking place. They found that whereas translating into the L2 triggered increased functional connectivity between semantic processors and more domain-general brain networks such as brain networks that are involved in attention and vigilance, translating into the L1 only revealed automatic relaying of sensory information to cortical regions. An example of a translation-related study in which EEG is used is one by Kruger et al. (2013). They recorded the electrical brain activity of viewers watching a lecture in English with or without English subtitles and had them self-report on the cognitive load they experienced. Contrary to common beliefs that subtitles increase a viewer's cognitive load, the EEG data revealed that an audience presented with subtitles showed decreased levels of cognitive load or frustration compared with those who did not have the subtitles. These data were confirmed by both the participants' self-reports and the participants' pupil dilation data.

11.4.2 Descriptive Results

Summarizing the findings by these cognitive studies is a delicate matter, and in what follows, some work may have been overlooked. However, it is clear that cognitive processes at various stages in individuals' translation processes have been covered. And besides traditional written translation, the innovations in the industry with the introduction of MT into the process have been followed up closely by investigators. Since *post-editing* appeared as a new activity that translators may be typically asked to engage in and because it was experienced to be quite different from translation from scratch, its cognitive features were also very often the topic of research (see Section 11.5).

Perhaps the bulk of the research has gone to the translator's own reading and writing processes, certainly in the early period. Both processes were compared with the reading and writing processes for other types of linguistic activity, whether they are monolingual or bilingual. Reading for translation has been compared with reading for comprehension (Jakobsen and Jensen 2008) and for summarizing (Winfield, et al. 2019). In addition, the reading and writing processes for translation have been compared with each other and how they are distributed during a particular translation assignment (Dragsted 2010).

Studies of the production stage were mainly oriented to describe the processes involved in translation difficulty: how do translators solve their problems, and what can we learn from them? Although it was shown that translation production duration at textual level is not always associated with text difficulty (Hvelplund 2011), the translation processes of some very specific language problems were investigated such as metaphorical expressions (e.g., Fougner Rydning and Lachaud 2010, 2011; Vandepitte and Hartsuiker 2011) or some specific translational sub-process such as web searches (Enríquez Raído 2011).

Finally, the reception of a translation by the target audience has also been investigated empirically by means of eye-tracking data. Probably the first studies of this type are to be situated in the field of audiovisual translation and, more specifically, in the field of subtitling. Orrego-Carmona (2019), for instance, had participants eye tracked while they were watching various TV clips and found that professional subtitles were read more quickly than non-professional subtitles. In the area of written translation, there is Walker's (2018) proof-of-concept study, with which he aimed to show that the empirical cognitive methods from translation process research in its narrow sense can be applied to the reception process of reading translations. He compared eye fixation data from French-speaking readers of the French novel by Raymond Queneau *Zazie dans le métro* (1959) text with those from English-speaking readers of its English translation by Barbara Wright (Queneau 1959/960). At specific points in the ST, Queneau introduced some words and phrases from a French

writing style that reflects a spoken style more literally (e.g., *cexé* instead of *ce que c'est*). To obtain an acceptable degree of ecological validity of his study, Walker set up a quasi-experimental reading study with two participant groups and reduced control over variables and even abandoned control over the text around the areas of interest. This allowed him to measure first fixation durations, gaze durations, and total fixation durations of both participant groups' natural reading processes. The reading data from the passages that contained these phrases were then compared with the reading data from the corresponding passages in the translation. Because the change of style was not always reflected in the TT, the data revealed that the spoken writing style triggered significantly longer fixations among the ST readers than the corresponding standard English passages in the target readers.

11.4.3 Theoretical Developments

Many of the cognitive studies have underlying theoretical questions. In the first place, questions arose as to how does translation takes place: What are the units of translation? What are the temporal characteristics of the processing of these units: are they processed consecutively or in parallel? Is there something that can be considered to represent the default translation method and is that default method that of literal translation? The latter has been claimed by Tirkkonen-Condit et al. (2008) and Halverson (2015) and corroborated by many investigations.

Another question was whether empirical data could be found that support cognitive mechanisms behind translation studies concepts. Translation universals – for instance, such as explicitation and simplification – were investigated by Kruger and De Sutter (2018) and Kajzer-Wietrzny et al. (2016), respectively. Venuti's pairs of concepts of resistancy/fluency and foreignization/domestication were placed under a cognitive looking glass by Haidee Kruger (2016). She related fluency and domestication to a lower degree of cognitive effort to be exerted by the reader of the translation than resistancy and foreignization. This effect was also observed in Walker's study, which departed from a connection between the notion of cognitive effort and that of "equivalent effect" by Walker (2018; see Section 11.4.2).

In fact, the question of effort is the topic of the majority of cognitive studies. Translation is a bilingual language processing activity, and, as such, it takes place in a cognitive environment in which languages are in competition with each other and translators undergo processes of selection, switching, and inhibitory control. Hence, it is a more effortful cognitive environment, inducing higher processing costs (Costa and Sebastián-Gallés 2014) than monolingual processing. The result is that the cognitive resources available to the translator are reduced, which may have an effect on translation production. This may, for instance, explain the presence of the translation "universals" such as simplification (observable In translations as a restricted lexical range and grammatical complexity), explicitation (which may be induced by a restricted lexical range), and standardization (because of a diminished alertness to stylistic or register features). Toury's **law of interference** (ST characteristics that are foreign to a target audience will always appear in a translation), too, can be explained cognitively by the higher processing costs, leaving a translator more liable to the influence from the ST on the TT. This influence is also called **priming**, which happens not only at lexical level but also at structural level. Maier et al. (2016), for example, found that both English-German and German-English participants in an experiment translated sentences such as "The little boy wrote the neighbor the letter" and "The little boy wrote the letter to the neighbor" in German in such a way that they retained the same sentence word order even when that rendered unidiomatic English sentences such as "The little boy wrote the letter the neighbor."

Other effort studies assume a relation between translation problems and higher effort. The notion of a **translation problem**, however, is something to reflect on because it was already distinguished from that of **translation difficulty** by Nord (1991) and Jensen (2009): whereas the former is related to the effort exerted by many a translator in the same situation with similar technical conditions and hence a more objective type of notion, the latter is reserved to refer to individual, more subjective experiences during the translation process. Both concepts cannot be used interchangeably; a lack of expertise or a different area of specialization may contribute to translators finding certain texts difficult, but translation problems may occur regardless of training or language proficiency. Although this distinction is not reflected in all effort studies, which may lead to ambiguity and some terminological confusion among scholars, empirical results have led to the following theoretical claims.

The directionality of translation, whether it goes from L2 to L1 or from L1 to L2, has been claimed to play a role in the degree of effort. TAPs, keylogging, and screen capture data collected by Buchweitz and Alves (2006) showed that translating into L2 took more time and, possibly, also more effort from participants. Assuming that retrospective verbal protocols reflect effort (the more translators reflect on a translation, the more effort they need for the translation), Ferreira et al. (2018) present mixed findings, however. With respect to the claim that translating from L1 into L2 requires more effort than translation form L2 into L1, they found that the difficulty of the ST plays a crucial role rather than translation direction. More knowledge of the L1 target may, indeed, trigger better awareness of potential shortcomings of that TT. Whyatt (2019) investigated both the process and the end product of L2-to-L1 and L1-to-L2 translations. She did not find a significant difference between the two translation directions either, whether in the time necessary to produce the translation or in the quality of the translations; instead, an analysis of proofreaders' corrections revealed editing of different translation quality aspects.

Contextual information was another element that was claimed to have an impact on the translation process. Fougner Rydning and Lachaud (2010), for instance, showed that context reduces polysemy at the ST comprehension stage but allows for more creativity during the writing stage.

Another factor that was often taken under scrutiny was the impact of translator characteristics on the translation process. Early work had already revealed that beginning translators' processes are different from those of professionals (Englund-Dimitrova 2005) and Buchweitz and Alves (2006), for instance, confirmed that a translator's proficiency or expertise can be detected by measuring the chunk of text length and the degree of recursion (how often they went back to previous passages).

The most basic ontological question – which type of activity is translation basically? – has also been covered. There are two main views on this. Halverson (2021) maintains that translation is mainly a cognitive linguistic activity, holding the view that it is words that bring meaning, but Muñoz Martín and Martín de León (2021) take a purely cognitive view, regarding translation as an activity related to meanings in the first place. Both views seem to be encompassed in Shreve's CAS model (2021), in which translation is modeled as a complex adaptive system.

11.4.4 Summary of Questions on Cognitive Translation Processes

The cognitive studies clearly provided empirical data of the translation process that led to theoretical implications. Experimental designs also became more robust. However, some methodological pitfalls remain: some studies do not reach a sufficiently high degree of ecological validity, there are experiments with few participants that do not yield enough data (lack of sufficient participants,

loss of data because of technological problems), or it is not clear whether the data adequately represent the process features which they claim to represent.

Many (early) eye-tracking studies further lack verbal reports or data about translators' research activities online and therefore restrict the investigation into the translators' metacognitive activities. They also often restricted the type of translation task to be performed by participants. In their call for papers for a special issue of *LANS-TTS* titled "Cognitive Translation Studies – Theoretical Models and Methodological Criticism," Xiao and Muñoz (2019) pointed out that the reliability and ecological validity of empirical methods need to be questioned much more frequently and suggested "ethnographic approaches such as field work and participant observation" to be implemented (Xiao and Muñoz 2019). Echoing Hansen's (2009) plea to include dialogue as a research method, besides all the new quantitative methods, Alves (2020) noted that the level of "accuracy and reliability" has gained height, however at the expense of intersubjective analyses to tap into metacognitive activity during translation task execution. In addition, although cognitive studies stimulated the interdisciplinary exchange of knowledge, Alves argued for more interdisciplinary interaction: discussions among translation scholars and neuroscientists should be initiated on the relationship between brain and language as well as more interaction between researchers and computer scientists for issues related to human-computer interaction.

11.5 Technological Translation Process Questions

The development of MT, or mechanical translation as it was called in the 1950s, almost immediately went hand in hand with the introduction of pre-editing and post-editing stages (e.g., Dodd 1952). It was clear that a machine would not be able to translate a text in acceptable fashion as easily as calculators were introduced to help people solve mathematical problems. Researchers tried to identify the features of what they called a "model language," whose rules would be applied to a text (**pre-editing**) by a human, which was then translated by a machine, after which the **post-editing** stage would involve the remaining adaptations of the TT to what was expected of a text by readers with the target language. The results of these early studies, however, did not promise much hope for MT, until the 1980s, when MT went through various stages of development from the input of phrases to the use of statistical data about words and phrases to what we now know as NMT. Although the quality of the machine-translated texts has much improved, for many areas in the MT sector, the presence of (pre-) and post-editors is still required so as to deliver an acceptable product.

Twenty-first century research in translation studies has therefore concentrated on post-editors' behavior. Influential work in this area has been carried out by Krings in his *Repairing Texts: Empirical Investigations of Machine Translation Post-Editing Processes* (2001). In particular, he distinguished between three types of effort that was expected from a post-editor: temporal effort, cognitive effort, and procedural effort. Temporal effort is related to the time that the post-editor needs to perform the task, which will show some individual variation that may also depend on the two other types of effort. The longer you need to identify what's exactly unacceptable with a particular translations solution, the more time you will need. It is measured in ratios of number of words per second (cf. typists time units [usually seconds, sometimes even milliseconds]). Now, although a typist can copy a text of about 4,200 words per hour, and a translator's temporal effort is on average about 300 words per hour, a post-editor's temporal effort is usually measured in words per second at the level of a translation segment. The cognitive effort of post-editing, in contrast, has been measured in different ways, the variety of which reflects the different

developmental stages in which instrumental tools were developed. Whereas the first studies employed TAPs and other types of verbalizations, keystroke logging identified pauses, which were assumed to be related to the thinking process of the post-editor. As with translation process research, here, too, the measures have recently been complemented by eye tracking data, such as average fixation count. Procedural or **technical effort**, finally, focuses on the output of the post-editing: the edits themselves, their number, and how much effort needs to be exerted to reach an acceptable translation. The latter is often measured by means of a human-targeted error rate metric, which was originally developed by Snover et al. (2006).

Early work often focused on the differences between human translation and post-editing. For the translation of technical texts, benefits have been well established, even with statistical machine translation. However, this is not the case for all text genres. Quite a comprehensive study was carried out by Daems et al. (2017), who aimed at a better understanding of the differences between human translation and post-editing of newspaper texts, which also included the degree of expertise as an independent variable, intending to optimize the training of post-editing. Processes were registered by means of eye tracking and keystroke logging to investigate temporal and cognitive effort, as well as the use of external resources, an element often neglected in other studies. In addition, the quality of the final translation as well as translators' attitude toward both methods of translation were investigated. Although both human translation and MT methods were more similar than expected and although both participant groups did not reveal widely diverging results, one striking feature was detected: different errors (against the grammar, lexicon, spelling or [macro-] structural coherence) clearly required different types of effort.

In later studies, however, the comparison between human translation and post-editing seems to disappear into the background, foregrounding the post-editor and their supporting technical environment. In these studies, post-editors are often regarded as the users of a machine-translated text, as a consequence of which studies are often referred to as user studies. Having their main interest in the post-editor's task load, such studies usually take the different types of effort of post-editors and their post-edits as dependent variables. The independent determinants are mainly contextual factors such as the type of MT tool, any other devices employed, any external resources, and the type of translation mode as to whether the ST is a written text or an audiovisual one modes. An example is a study by Jiménez-Crespo and Casillas (2020), who investigated whether non-literal translations were more effortful to process than literal ones.

In NMT, for instance, the edits that are applied to a translated text may actually also be fed into the underlying system. This results in what is referred to as machine learning. In other words, the automated system adopts the new information from those edits and integrates it within its system, so that the outcome of the following translation takes that new information into account and the error no longer has to be edited. Several research teams (e.g., Domingo et al. 2019; Vela et al. 2019) have designed improved (N)MT systems and performed user studies, respectively experiments with translators and post-editors asking them for their experiences.

Other issues were of a methodological nature. Moorkens (2018) illustrated this approach when investigating whether there were strong correlations between human assessment of effort and eye measurements. Moorkens found them between temporal effort and mean fixation counts on the one hand and cognitive effort and mean fixation duration on the other hand, meaning that the eye data do reflect translators' efforts.

Although much of this scholarly work is experimental, Macken et al. (2020) returned to a more ecologically valid study. Like Krings (2001), they inquired into the impact of MT in the workflow of a translation setting of the largest institutional translation department in the world, the

Directorate-General of Translation (DGT) of the European Commission in Brussels. The DGT, which produces translations of the highest quality, has a long tradition in the use of MT among its highly professional translators in their normal everyday work situation. Twenty of these translators participated in this study and provided the data. They are related to either of two MT systems: statistical MT for English-into-French translators and NMT for English-into-Finnish translators. In fact, the ST is always fed into the MT engine, which produces a translation memory exchange (TMX) file, which is commonly used for translation memories. This file is integrated in the SDL Trados Studio environment, in which both sets of translators work. Besides this file, translators can also access another TMX file, which is produced by EURAMIS, DGT's huge translation memory, and contains the relevant translation matches. Next, all translators can enable or disable MT and were asked to do so for half of each document of their real translation tasks. One more variable was included in the study: SDL Trados Studio allows its users to interact with the MT in two ways. Either they apply *full segment mode*, which yield a MT suggestion in those cases in which EURAMIS fails to yield perfect or sufficiently high fuzzy matches, or they apply *autosuggest*, which offers words or phrases in context while the translator is typing, in the same way that mobile phones give suggestions to make texting more comfortable. A final set of data was collected by means of a post-task survey at the end of the logging period of one month. All the data were then compared with each other to investigate the relationship between technical effort, temporal effort, and translators' perceptions.

Within the technological approach to the translation process, too, different stages of the translation process as a broader notion can be highlighted. A reader-oriented study was, for instance, carried out by Warburton (2020) and Guerberof Arenas and Toral (2020). Warburton aimed to improve terminology management by a company so that it can reduce translation costs and suggests making a term base more effective by selecting only terms that are statistically and semantically relevant. In a pilot experiment, Guerberof and Toral (2020) wanted to know whether readers' reactions were different depending on whether the literary text was translated by MT, by post-edited MT, or by human translation only. By means of an existing questionnaire devised by Busselle and Bilandzic (2009), they discovered that human translation obtained higher scores with respect to narrative engagement. In other words, human translation led to readers finding the story logical, experiencing a moment of lost self-awareness, or feeling empathy with (one of) the characters more than MT did. However, scores for enjoyment were higher with post-edited MT. In addition, the statistical differences only appeared when raw MT was compared with either human translation of post-edited MT; they did not obtain when human translation and post-edited MT were compared with each other.

Some studies aim to improve NMT by developing an algorithm to increase the accuracy of NMT of rare words (Garg et al. 2020) or setting up a platform called interactive neural machine translation (INMT), which allows for human–machine interactive collaboration. One such model has just been developed for English–Hindi and English–German by Gupta et al. (2020).

Reflection Question

What will be the role of the translator if NMT is improved?

At their most recent Translation in Transition conference (Carl et al. 2020), scholars were prompted to communicate their findings not only about questions such as the ones dealt with in research just mentioned that probe into "the effect of technology on the translation process,

translation performance, job satisfaction, the translation product, and society" but also more fundamental ones: "How can humans cope with machine intelligence that is being developed? Also, how *do* humans cope with machine intelligence, and how can machines adapt to the human condition? What are the fundamental mechanisms that underlie human translation performance?" (p. iv).

Description methodologies, too, are being reviewed. Do Carmo (2019), for instance, analyzes different descriptive methods for the process of editing, claiming that the **edit distance** – the number of operations necessary to arrive from the MT at an acceptable translation – does not describe editing, though it could be usefully integrated in a description of editing process, that related to the translation product more closely.

Within this domain of translation technology, which investigates the impact of the new technologies on the translation sector, too, the need for converging methods is felt and explored. Sakamoto (2019), for instance, collects data in a focus group study, a typically ethnographic socio-cultural method. The meeting about business practices of 16 translation project managers revealed that feelings of uncertainty reached a high level with regard to the consequences of technology on the use of MT by translators, pricing rates for post-editing, changing profiles, and new power struggles in the industry. Williams (2013) already pointed out the ethical dimensions of translation technological developments because questions arise such as whether translators can share their TMs or whether they even have ownership of the TMs they created. In fact, a survey with a discussion of sociological approaches to the introduction of technology in the translation market can be found in Olohan (2020).

Assuming that the measures of *Htra* and *HCross* predict the difficulty to translate a word and a sentence, researchers have also started to develop translatability prediction systems for certain language pairs. Vanroy et al. (2019), for example, aim to do so for English–Dutch translations not only to arrive at a system that can predict translatability of a given ST but also identifies the passages that are hard to translate.

11.6 Converging Data and Methods

Besides approaching the translation process from just one angle – whether it is a socio-cultural, linguistic, cognitive or technological – translation scholars have been looking to put all these different pieces of the puzzle together into one coherent picture since the beginning of the second decade of the 21st century. Aiming for convergence on the topic of translation, the founders of the new journal *Translation Spaces* stress the complexity of the translation event and call researchers from all fields involved to enhance our knowledge about translation as a practice in a global world with different communities with their own changing values and beliefs.

When surveying the literature on the translation process, at least three trends can be discovered: first, better recognition of the translation event as an instance of complexity, which, second, necessarily requires a collaborative approach from different domains, and, probably following from that, recognition of similarities between different modalities of communication.

First, translation process researchers have now clearly shown that ecologically valid studies require an approach that does not only take the translation act into account but also many other pertinent features of the translation event. Whichever study object is focused on and whichever approach is taken, each **translation process study** involves meticulous data collection and the

recording of many types of metadata. It also often involves appropriate statistics to analyze the data and generalize the findings.

Reflection Question

Let us say you want to study a particular translation problem, for instance, a construction for which the default literal translation is not acceptable in the target language. Which process measures would you include in your own research design and why? And let's say that, to your surprise, this construction does seem to prop up more frequently in the target language, and you suspect it may be paving its way into the target language, how would you go about to show that empirically? How would you explain this phenomenon and, perhaps more important, what would it mean for the translation process of this construction?

Second, it is clear that most approaches have resigned to mixed-methods approaches in such a way that some of the methods can be found in the various approaches: ethnographies and TAPs may serve both socio-cultural and cognitive approaches, for instance. In other words, translation process scholars are increasingly aware that they cannot "live with their backs toward each other" (Muñoz Martin 2017, p. 558, as quoted by Kotze 2020). The calls for interaction between various strands in translation process research made by Toury (1995/2012), Risku and Windhager (2013), and others are gradually being answered in the recognition that process research involves crossing the borderline of one's own approach into the other approaches and even in some research groups, such as, for example, Risku's research team, named Translation: Cognition and Cooperation (TCC). Kotze (2019, 2020) actually identifies two areas in which the research strands need to converge (Figure 11.1):

On the one hand, the findings from both product and process investigations need to be considered together. The aim is to obtain **triangulation**, or, in other words, studying the phenomenon of the translation process from different perspectives with different methods. The ways in which

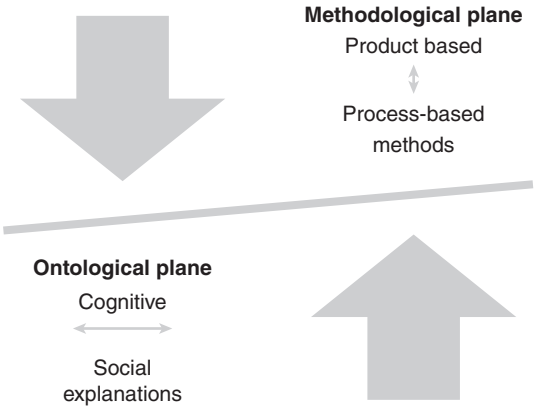

Figure 11.1 Two translation process areas of convergence. From Kotze H. 2020. Converging what and how to find out why: an outlook on empirical translation studies. In: *New Empirical Perspectives on Translation and Interpreting* (eds. L. Vandevoorde, J. Daems, and B. Defrancq), 333–371. London: Routledge.

this can be done, however, are not clear yet (Neumann 2020), but the application of more hybridized methods, in which process data are effectively treated as a corpus and submitted to generalization methods, may be part of the solution as long as they stand the test of replicability, reliability, and ecological validity.

On the other hand, the findings of these mixed-methods approaches need to be interpreted in collaboration, too, so that it becomes clear whether the different methods really capture the same phenomenon. Translation studies urgently needs a translation theoretical framework that reflects translation's socio-cognitive complexity and is scientifically plausible and testable. Kotze (2020) therefore stresses the need for more vision papers.

Finally, it is also important to compare the findings of translation process research against those of similar processes that are involved in other (bi)lingual activities. Such comparisons should not only concentrate on the differences between the various translation activities but also on the similarities.

Although such convergence at different levels is required for translation studies as a whole, it does not mean that every single study now has to apply mixed-method approaches. What is needed is not only the recognition of findings from other research paradigms but also of the multifactorial character of the translation event.

Translation process research has clearly led to a large number of mainly descriptive studies of current translation practices. Some studies find their aims in current translation practices in which translators are asked to perform post-editing or managing tasks that are similar in cognitive load to translation but less well-paid. Other studies, in contrast, aim at a much deeper insight into translation as a phenomenon of cross-lingual communication and raise the question about the uniqueness of translation as a variety of language. The latter question has been raised by various other translation scholars intermittently, such as Gutt (2000) within relevance theory, Baker (2006), and Tymoczko (2012), who argued for a positioning of translation in larger communicative and cultural exchanges. Most scholars agree, however, in their recognition that a single-method approach will not lead to satisfying answers, whichever purpose the question is related to.

Reflection Question

Some people may claim that translation process-oriented research is driven by liberal economic principles that value time, efficiency, and the production of large volumes. Which areas of human translation have not yet been broached by process research? Which situational factors have not yet been investigated?

Questions

1. Name two sociological frameworks that are often used to analyze and interpret the wider context of the translation process.
2. Which methods can be used to recover the translator's thoughts before, while, or after their translation work?
3. Let's imagine you want to find out more about the differences between the translation acts of professional translators and those of translation trainees. What would be a feasible research question, and which method would be essential to find the answer to that question?
4. Name two methods that can be found in different approaches.

5 Kotze identifies two areas of future convergence for process studies. One such area includes the different types of research questions being asked: sociological, technological, cognitive, linguistic, or cultural. What is the other area?

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