

Integrative description of translation processes

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Empirical translation scholars constantly strive to meet the rigorous research requirements of the scientific research paradigm. Studying cognitive processes in translation, however, involves many findings based on highly qualitative data, including subjective observations of very complex psycho-social events. In process research, perhaps the complex issue of "human translation" becomes too simplified when approached from just the framework of the scientific paradigm. The holistic human character of translation is lost if attitudes and methods from disciplines belonging to the liberal arts paradigm are neglected. In this article, the focus is on the process of *integrative description* in cognitive translation studies, a method which combines approaches from both empirical science and the liberal arts.

Introduction

Empirical scientific research means carrying out controlled experiments, obtaining results on at least an inter-subjective level that can be compared, replicated and generalized, and developing theories which can be confirmed and further developed. At present, there are a variety of technical tools and software applications available to translation process researchers for data gathering, but the fact that large amounts of data can be gained by several different methods is no guarantee of added value. A typical problem of research into translation processes is handling the multitude of variables and large quantities of elicited data involved and, especially, obtaining a rational integration of all the data in relation to translation research objectives. This problem can be solved, this paper argues, by a well-planned process of *integrative description*. Via such a process, clarity is obtained with respect to the objectives of a translation research study and the kind and relevance of research questions that can be asked and worked on.

The goal of integrative description in translation studies is to get continually and incrementally closer to a detailed understanding of the issue(s) under investigation. These issues involve, of course, not only the texts that are translated and produced, but also the translators themselves. As a result, translation process research is deeply involved with understanding observable translation behaviors and investigating the cognitive processes underlying them.

The empirical background of this article: My longitudinal study

What is it that characterizes *felicitous translation processes*? What is it that characterizes successful translators, their profiles, competences and skills? Are there pitfalls they are able to avoid, and how? These were questions I asked in Hansen (1997:207), when I started an empirical longitudinal study of students and experts at the Copenhagen Business School (CBS). I submitted that translation processes are cognitive processes; that every translator has his/her individual combination of abilities, skills, and knowledge, an *individual competence pattern*, and that this individual competence pattern can be recognized and identified in both (a) *his/her translation product* and (b) *his/her behavior in the course of the translation process*. In order to discover individual competence patterns, I carried out experiments where I studied the behavior of final year students from CBS during their translation processes in relation to the quality of the result of these processes, the translation products.

Translation in my research means "real live translations" of complete authentic texts that have a social, communicative function in a defined communication situation. The *translation process*, which includes a translation brief, I defined as everything that happens from the moment the translator starts working on the source text until he finishes the target text. It is all encompassing, from every pencil movement and keystroke, to dictionary use, the use of the internet and the entire mental process that is involved in taking a decision, solving a problem, or making a correction – in short, everything a translator must do to transform the source text to the target text (see Hansen 1997:204 and Hansen 2003:26).

My focus was especially on *attention strategies* and the possibility to train attention and control of complex cognitive tasks as it is presented by Gopher (1993:300). He said:

Two major questions can be posed regarding the adoption and execution of attention strategies. One concerns how cognizant performers are about the efficiency of their investments, and about the benefits and costs of alternative strategies. A second question concerns how able humans are in the control and

mobilization of their processing efforts. Related to these questions are issues such as the trainability of attention control and the best methods of training.

In the first part of the longitudinal study (1997–2005), I focused on *sources of disturbance in translation processes (SDs)*, i.e., causes of translation problems that are either overlooked in translator training or that are not addressed properly, often because of lack of time (Hansen 2006).

Felicitous translation processes, I defined as processes where translators have cognitive awareness and control over their actions, so that they realize if they have found an in-the-context and communication-situation appropriate formulation, i.e., a formulation that fits in relation to source text, theme, text type, and register, and in relation to the presuppositions, expectations, and needs of the target text receiver(s) – and what is important – where translators are attentive and also realize if they have not yet found an appropriate solution and that they still will have to work on the task. *Translation competence* means, among others, that problems and errors during the reception and formulation phase are recognized by the translator and that he/she has problem solving and revision strategies available to solve the problems and improve the text (Hansen 1997: 205f.; Hansen 2006: 20).

The longitudinal study now consists of pilot experiments and six series of experiments and control experiments. In total, there are now 360 individual experiments (both directions of translation) with eighty participants. In 2007, in close collaboration with translation bureaus, organizations, and companies in which many of the participants from the earliest 1997 studies now work as professionals, the profiles, translation processes, and products of twenty-eight participants of the earlier sample group were investigated again, this time at their workplaces.¹

Already during the first phase of the longitudinal study, it was confirmed that translators have their individual competence patterns (Hansen 2006: 248). Translation is an individual mental act of intercultural communication in a situation. No two translations are carried out in exactly the same manner because the translators, their translation-relevant cognitive resources (ability to understand and formulate texts), and the translation situations differ, due to social and cultural conditions, dispositions, experiences, and knowledge. These are, of course, aspects which have an impact on all human actions, not just translation.

This also holds for the *reception* of the translation product, the target text. The perception and evaluation of product quality not only depends on the complex interrelationship between the translator's individual profile, theoretical orientation (if any), and translation process, but also to a high degree on the recipient's

1. The project is kindly supported by the Danish Research Council, the Hedorfs Foundation and the CBS.

expectation of the target text and the situation where it is used, as well as the recipient's background and perhaps theoretical orientation (Hansen 2007). In my longitudinal project focusing on *sources of disturbances* and *felicitous translation processes*, the evaluation of the quality of the translation product is an important parameter. With respect to evaluation processes and quality management in translation and revision, see Hansen (2007, 2008 and 2009a).

The *ultimate objective* of my longitudinal study was/is to develop and improve the quality of education programs in translation and to give students and professional translators valuable advice for success in translation. Additionally, the results hopefully are of some value for the research community. The following methodological considerations are based on my experience from this holistic, mainly intra-individual, longitudinal study of the translators' cognitive processes during translation processes and their competence patterns over time.

Translation process research

In research projects, a decision always has to be taken regarding the most relevant research parameters *in relation to the object under investigation and the aim of the study*, i.e., a partial (if not complete) model of the phenomenon under study is necessary. A precondition for making such decisions is some experience with and an understanding of the specific nature of the object of study, i.e., having some idea about potentially relevant parameters and variables, as well as potential connections and correlations between them. In empirical *translation process research*, these parameters and variables derive from two quite different, but closely interconnected areas and appear to be crucial for a proper description of translation processes: (a) experimental research with *human beings* (translators) as subjects and (b) *texts* situated in linguistic and cultural contexts. The former involves establishing connections and correlations between cognition and translation behavior, while the latter focuses on the texts that initiate and result from the act of translation.

Because translation process research involves linking observable behavior with cognition whose processes are not directly observable, it necessarily consists of many elements and steps, e.g., observations, hypotheses, pilot experiments, and core experiments, observations of subjects, and then analyzing, understanding, evaluating, categorizing, coding, counting, interpreting, comparing, integrating, combining, triangulating, concluding, describing, and explaining. Because we are interested in the cognitive resources of the translator, this kind of research also means taking the individual backgrounds of the subjects into consideration. Thus, the research involves working on questionnaires, gathering individual log files,

and creating introspection protocols and transcripts of participant dialogues. A presupposition is the registration, understanding, and categorization of the participants' actions and comments during or shortly after the translation process, and the integration of all these cognitive and behavioral aspects in an integrative description. But, as just mentioned, we also have to work with texts.

In relation to texts, a variety of micro-processes are involved in every translation process. These include understanding languages, cultures, genres, the source text, and the sender's intentions and individual style, as well as the receivers' presuppositions and needs in the communication situation; making decisions and producing coherent, meaningful, stylistically appropriate and well-functioning texts; and, finally, revising and evaluating one's own and sometimes other's translation products.

As a result, *translation studies*, the study of the complex phenomenon of "translation," is truly an inter-discipline. Because translation consists of such a variety of inseparably connected micro-processes, many of its aspects have been investigated and taught in disciplines that have been accepted as a naturally inherent part of the study of both the processes and the products of "translation." The fact that we work with at least two languages and, of course, with texts in those languages implies that we cannot make do without, among others, the disciplines of linguistics (sometimes comparative linguistics, corpus linguistics), pragmatics, semantics, logics, stylistics, hermeneutics, discourse analysis, terminology, and multiple translation theories, or at least different attitudes with respect to the issue "translation" that derive from those disciplines.

Holistic investigation of translation processes

Human translation processes are complex mental processes occurring in social contexts. Any type of study that tries to decompose such processes into constituent isolated phenomena and then observe and analyze them separately under "controlled" conditions simply in order to guarantee more exact results would run the risk of changing the character of these "natural processes" and distort any results gained. However, if we cannot decompose the processes, and they have to be investigated in all their complexity, the observer is confronted with a multitude of variables, among them subjective observations, individual backgrounds, ideals, thoughts, impressions, emotions, and experiences in situations. An investigation of actions carried out by human beings in a longitudinal study is even more complex because of the added dimensions of "life story," i.e., professional careers, personal experiences, values, memories, thoughts, emotions, and the development of knowledge during the course of time in question.

With respect to *mental processes* in translation, the fundamental research questions I raised were the following (Hansen 2005):

- How can we approach complex situations with many variables from quite different areas, human beings and texts in situations holistically without renouncing the possibility of getting results that can be generalized and perhaps even replicated by other scholars?
- How can we move from an individual, subjective level in our research to a level of inter-subjectivity?
- How can we *describe* "subjective" experiences "objectively"?

Especially regarding the fundamental scientific problem that data have to be gathered and interpreted by an observer, I asked:

- How can bias from observers' effects, i.e., his/her interests, prejudices, and attitudes, be minimized or avoided?

And due to the complexity of holistic studies, my question was:

- How can we create a "controlled holistic translation study," i.e., avoid drifting about and getting lost in all the possible relevant parameters, variables, and data?

Based on my experience in empirical translation process research, I would like to propose *integrative description* as a possible answer to these questions.

Relevance of parameters

Even if a study of translation is called "a holistic study," it is impossible to investigate all the interconnected aspects (possible parameters) of such a complex phenomenon. Further, in translation process research, not all parameters we initially look at may later turn out to be of equal relevance. Experience, pilot studies and control experiments during the initial phase of a study can give hints with respect to the relevance of observed parameters in relation to the main research question. Based on pilot experiments with students, professional translators, and translation teachers, and on observations of students during their translation and revision training in my longitudinal project, certain *profile*, *product*, and *process* parameters have shown to be the most relevant (Hansen 2006: 247f.). The investigation and integration of data from these three parameters gave answers to many research questions, among them also questions which appeared *during* the experiments and analyses. The parameters and categorizations identified are now

used in a large number of translation process studies, which demonstrates that they touch fundamental aspects of human translation processes.

Profile parameters include (a) the subjects' individual, cultural, and educational backgrounds, habits, life-stories, and self-evaluation, as well as (b) their experiences and working conditions as professionals (this information I gathered via questionnaires and interviews with the participants).

Product parameters are (a) the results of an evaluation of the final target text, which means primarily *errors* and *good solutions*; (b) categorizations of *types of errors* in the final product, and (c) the results of an evaluation of the subjects' revisions during the translation process. The latter are *product results on the micro-level* because they can be observed and evaluated with respect to the type and quality of the changes, and they can then be evaluated in relation to the final product.

Important *process parameters* are (a) time management, i.e., segmentation into phases and pauses, and position and length of the phases and pauses; (b) cursor movements, changes, and revisions during the translation process; (c) phases, pauses, and the use of translation aids (dictionaries and the internet); (d) comments during retrospection with replay of the translation process; and (e) clarification via retrospection with replay, combined with a dialogue. With respect to phases and pauses, phases are e.g., the preparation phase, the writing phase, and the revision phase; pauses are long pauses and short pauses while writing a sentence, including orientation pauses (before writing a sentence) and control pauses (immediately after finishing a sentence).

Figure 1 is an overview over different kinds of process data. It is written in capitals if the applied method is primarily quantitative or qualitative.

Source	Process a	Process b	Process c	Process d	Process e
	Log file	Log file	Retro + Replay + Log file	Retro + Replay	Retro + Replay + Dialogue
Method	QUAN	QUAN	QUAL + quan	QUAL + quan	QUAL
Aspect investigated	time segments phases pauses	cursor movements changes revisions	use of aids in phases and pauses	comments on: problems changes revisions errors	clarification emotions experience explanations

Figure 1. Sources of process data

Qualitative and quantitative research, methods, and data

In order to get closer to a comprehensive description of translation processes and to obtain a degree of clarity that also allows for adequate explanations, a variety of qualitative and quantitative methods are used. Where qualitative methods are primarily based on *interpretations* of e.g., surveys or reports from the experiences and/or actions of individuals, quantitative methods are based on and proceed from the researcher's ideas and hypotheses about *observed* dimensions, their *measurable* properties, and the categories derived from them.

In qualitative research, the focus is often on relations between many variables that are investigated in smaller samples, while in quantitative research the focus is generally on relations between a few isolated variables in larger samples. Both qualitative and quantitative methods have advantages and limitations, but each mode of research offers a contribution to the attempt to increase knowledge. If we, for example, examine a human body, we can measure height, weight, foot size, blood pressure, etc. (measurable properties of observed dimensions), but as soon as we have to describe the person's complexion, hair color, or internal states such as feelings or perception of pain, we have to rely primarily on interpretations and reports that are based on subjective experience, both the experience of the subject under investigation and/or the experience of the observer/researcher.

Qualitative research is defined by Strauss and Corbin (1998: 10) as "any type of research that produces findings not arrived at by statistical procedures or other means of quantification." It is an in-depth investigation of phenomena, taking as many variables into consideration as possible. It is *interpretive*, employing often naturalistic approaches to, for example, people's lives, experiences, emotions, behavior, as well as cultural phenomena and social or political interaction. According to Denzin and Lincoln (1994: 2), it is "multi-method in focus" and an attempt "to make sense of, or interpret, phenomena in terms of the meanings people bring to them."

We can see from the parameters of translation studies research that we have phenomena that may be approached quantitatively (e.g., pauses, cursor movements, eye movements) and others that, because of their more subjective nature, must be approached qualitatively (e.g., retrospection and dialogue). The choice between qualitative or quantitative methods in translation process research has to be made in relation to the relevant parameters (profile, product, process) and the particular research question being raised. However, because qualitative data can, in most cases, be categorized, coded, and counted, and because quantitative data and results always need to be interpreted and explained, both qualitative and quantitative aspects will always be present in any translation research investigation.

But what does this "double binding" mean? What does it mean that some data have to be categorized based on their measurable properties before they can be coded and counted, and that other data have to be interpreted first? To accomplish the latter, can we use and does translation studies need tools and procedures from disciplines which usually are under the framework of the liberal arts such as, for example, communication, linguistics, and hermeneutics?

Qualitative methods and the scientific research paradigm

Data in qualitative research are derived from a variety of empirical material, such as observations and explanations from personal perception, case studies, field notes, life stories, diaries, interviews, questionnaires, all kinds of texts and documents, as well as films and videotapes. In empirical translation research, questionnaires, introspection via TAPs and/or retrospection, and sometimes interviews or dialogues are often used.

Qualitative methods are also used in social and behavioral sciences. The question has been raised if qualitative research in these disciplines can even be called "real science." According to Reinharz (1992:295), for example, qualitative research has been called "soft, mushy, fuzzy and weak," whereas quantitative research has been called "hard, firm, real and ... strong." In relation to some of the requirements of the "real" scientific research paradigm, qualitative research obviously has the image of being more intuitive, speculative, subjective, and purely interpretive. In other words, it is not very "scientific."

Researchers in psychology and the social sciences, such as sociology, have always been aware of this problem and have discussed it intensely, e.g., Wundt (1911:134), who in the early days of psychology as an independent discipline, regarded psychology and the natural sciences as coordinated disciplines and proposed an investigation of human perception via a common and complementary approach. Even so, Wundt was quite aware of the advantages, but also limitations of self-observation as a research method. Along similar lines, the Danish psychologist and mathematician Tranekjær Rasmussen (1967) and the physicist Nils Bohr (1959 and 1964) can be mentioned.

It is especially in areas of empirical research with human beings as primary subjects, such as the psychology of perception, phenomenology, grounded theory, ethnography, and consciousness studies that great efforts have been made to accommodate qualitative research to the "scientific norms." In such disciplines, and we can include translation studies among them, research becomes a balancing act between the special purposes and conditions of qualitative research

and the requirements of scientific rigor, exactness, reliability, validity, credibility and, what is the most problematic requirement, *the possibility of replication*.

Approaches from psychology and the social sciences can provide translation studies with ideas, issues, attitudes, research methods, techniques, and procedures, such as, for example, coding procedures for classifying behavior. They also provide the idea of using a variety of different methods in *combination* and then *triangulating* the results (combination and triangulation are discussed in detail in a later section). An assumption from phenomenology which is reflected in qualitative research and which is quite useful also for empirical translation studies, is, for example, that a person who experiences or perceives a phenomenon, also must be the person that can give the most precise description of it (Koffka 1935:73).

New quantitative methods in translation studies

Since about 1996, in translation process research, the qualitative methods of introspection, and especially think aloud protocols, have been increasingly combined with computer *keystroke logging* using software such as *Translog*, *ScriptLog*, or *PROXY*. As mentioned in Hansen (2003), the application of such software has added some scientific rigor to the study of translation processes, not only because it yields directly measurable data, but also because of the opportunity to monitor translation processes with much less impact on the "usual" behavior of the translator than earlier methods. These less intrusive methods thus enhance the *ecological validity*. As can be seen from the process parameters described earlier (see Figure 1), these software applications provide us with *quantitative data* about the writing process, i.e., all cursor movements, corrections, and changes, as well as the number, position, and length of phases and pauses during the writing process. All this quantitative data still must be interpreted. It is, for example, possible to register and measure pauses, but determining why the translator stops writing and what he or she is thinking during the pauses, the observer still does not know. In order to understand the quantitative data, researchers must rely on their subject's verbal reports and subjective interpretations. Nevertheless, these quantitative data are considered as being more "objective."

More recently, commercially available *screen logging* software has emerged, which can be used as a supplement to keystroke logging. Screen loggers are a non-intrusive tool which records all changes taking place on the computer screen through screenshot recordings. Thus, the translation researcher can capture a translator's use of the internet and of electronic dictionaries. With this tool, the investigation of the use of the internet by translators has become much more

precise in relation to earlier studies where researchers had to rely on observation, retrospection, TAPs, or video-recording of the translator at work.

An older method, which is now used in translation and interpretation studies, is *eye tracking*. This method had earlier been used in psychology, especially in research investigating children's reading competence, and also in brain research. In translation studies, eye tracking is most often combined with key-stroke logging and with screen logging. By monitoring the fixations and movements of the eye, it is possible to infer what word, or part of a text, or of the screen a person is attending to at any particular moment. Data about fixations and hot spots (most looked at areas), and reading paths can be traced, giving insight into what activities are occurring during pauses. However, eye tracking registers brain processes which are *expressed* by eye movements. It is still necessary to establish the connection between eye movements and fixations and the translation problems encountered and decisions made. So, while new methods from the social and behavioral sciences yield data to get us closer to "scientific" interpretations of directly measurable phenomena such as pauses, it is still necessary to establish the connection between such data and the underlying decision-making processes and the quality of the translation product those decisions yield.

Interdisciplinarity, trans-disciplinarity, and transparadigmatical research

Interdisciplinarity has become a buzz-word in research, and translation studies research is no exception. Sometimes the term interdisciplinarity covers more a kind of *trans-disciplinarity*, i.e., an attempt to *directly* adopt ideas and methods from other disciplines (or even whole paradigms). *Trans-disciplinarity* implies that research issues, apart from and in addition to the usually "inseparable disciplines" (that is, translation studies and linguistics, stylistics, semantics, terminology, etc.), are investigated from different angles, using knowledge, methods, tools, procedures, and techniques from disciplines or paradigms which at first glance sometimes may seem to have little in common with translation.

Some possible answers to the fundamental research question we posed earlier (how can we approach complex situations with many variables from quite different areas, human beings, and texts in situations holistically without renouncing the possibility of getting results that can be generalized, and perhaps even replicated by other scholars?) can be looked for in research paradigms where the research interests and problems bear resemblance to those of translation studies. Some of these trans-discipline research paradigms can also help us with the issues that arise in qualitative research dealing with *complex issues involving human beings* and their individual attitudes, thoughts, emotions, and behavior.

Earlier, we established that empirically-oriented paradigms from psychology, phenomenology, social sciences, cognitive science, and brain research could be used in translation studies. In these disciplines, we find attitudes, procedures, and methods that can enhance our research into processes where human beings are involved as subjects and help translation studies try to increase the degree of reliability and validity of its research results.

But in order to successfully adapt attitudes, procedures, and methods from empirically oriented paradigms and disciplines, it is necessary to be aware of and reflect on the issue of the *character of translation* in relation to these paradigms. The question I would like to ask here is the following: are the empirically oriented, paradigms of the social and behavioral sciences really sufficient for a comprehensive description of *translation* and *mental processes during translation*?

Similar to the debate occurring in other disciplines (Alvesson and Sköldbberg 2000), in translation studies, it can be argued if one or the other of the main research paradigms provides the best approaches to our field of research, the empirical *research paradigm* (ERP) or the *liberal arts paradigm* (LAP) (e.g., Gile 2004, 2009). Taking the complexity and character of *translation* into consideration, the question is if our research issues can or should be pushed into one of these two directions, and if it is reasonable to concentrate mainly on one of these two frameworks. We must ask: how exactly does empirical translation research differ from the most "scientific" disciplines, the natural sciences? How does it differ from its closest neighbors, the social and behavioral sciences? Is empirical translation research really any different from psychology? If we find, in answering these questions, that there is something about translation and translation studies that distinguishes it from the more scientific disciplines, that makes it different from the mere psychology of translation, does that mean that in some parts of empirical translation studies, we simply have to draw on concepts and methods of the liberal arts paradigm? If so, can we at the same time adhere to the criteria of scientificness?

Scientific norms and requirements – and especially replication

The overall, general difference between the two main paradigms is that empirical research is based on an assumption of a reality existing independently of the researcher. Its approach is, among other things, experimental and data-oriented. The liberal arts paradigm is primarily based on theories, ideas, and arguments which can be independent of a potentially existing reality. Generally, empirical research is regarded as more scientific than research carried under the framework of the liberal arts (see Gile 2004, 2009).

In research, as mentioned earlier, there is a line drawn between what is called *hard science* and *soft science*. Expectations regarding the degree of “*scientificness*,” i.e., the requirements to adhere to the norms of science, vary across the different research fields. Natural sciences, such as biology, physics, and chemistry, are usually regarded as “hard sciences,” which means that their investigations and results are expected to be rigorous, exact, accurate, and replicable. Sociology, psychology and political science, for example, are regarded as “soft sciences” with less rigorous norms. In the softer sciences, replication cannot be guaranteed.

This latter situation also holds for research in the disciplines of the humanities. The norms for proper research may be applied differently, but they are not always absolutely failing in rigor and “unscientific.” To a great extent, this depends on the specific research approach taken under the huge umbrella of the liberal arts paradigm (Alvesson and Sköldberg 2000; Stolze 2003; Øhrgaard and Nørgaard 2004). Some disciplines, such as history, may be seen as more rigorous than others, e.g., literary criticism. The requirements with respect to rigor and proper documentation may even be different in different societies and at different times (witness my own experience from German and Danish universities).

The fundamental scientific norms as they are formulated by Gile (2004) that science is: *systematic, careful, logical, objective, critical, collective, communicative*, and *explicit* should be followed in *all* areas of research, independently of the paradigm, because they simply *define* “research” and are not solely a province of the scientific research paradigm. Perhaps some norms which are also important, especially for the liberal arts, could be added, such as “research is *skeptical*” (being skeptical is not the same as being critical).

Replication, reproducibility, testability

The differences between disciplines with respect to expectations regarding scientific rigor are reflected especially in the presence or absence of an important scientific requirement which is a matter of course in the hard sciences: the *replication, reproducibility, or testability* of the results of an experiment or investigation conducted in exactly the same manner with the same or different researchers. This requirement is not mentioned in the requirements of soft sciences, and it is not on the list of Gile’s eight scientific norms (2004).

In many areas of the social sciences and psychology, and especially in areas where qualitative methods have to be used, replication is regarded as problematic not just because of the often mentioned *re-test effect* (Frankfort-Nachmias and Nachmias 1996: 108), but also because of the fact that the phenomena that are investigated may change because they are being observed. In empirical translation

studies, replication cannot be used as a safeguard for the solidity of evidence because replication cannot be guaranteed. Texts differ, subjects differ, and situations differ, and we cannot produce the complete account of the differences required to ensure replicability. In natural science, social science or medical investigations, this can be compensated for by the use of huge samples in order to minimize the effects of such differences. In empirical translation studies, guaranteeing the adequacy of the sample size is problematic because it is so difficult to find subjects for experiments.

Researchers pursuing empirical studies in translation soon realize that it is problematic to meet the *ideal scientific requirements* because whatever part of translation they choose to investigate, that part cannot be isolated from the complex reality of the translation phenomenon, involving, as it does, texts, situations, and human beings as subjects (Hansen 2004: 92f.). Often, several layers of more ambiguous "data" show up beneath the first well-defined, countable, and measurable aspects, as for example the data captured during retrospection or in a dialogue. In research involving human beings, it is necessary to go beyond the exercise of just registering easily gathered and measurable data, especially if the goal is to answer questions about causal relations. How can we obtain "scientific value" under these circumstances? Again we may find some clues and methods in other paradigms.

Trans-paradigm research

As mentioned earlier, considerations with respect to problems like lack of control, the threat of subjectivity, and different kinds of undesired effects in research have been discussed heavily in both the natural sciences and psychology.

Bohr (1959:20), for example, is aware of the subjective influence exerted by observation and communication, and he defines objectivity as equivalent to an *unambiguous exchange of experiences*, a detailed and *unambiguous description of experimental observations*, so that other researchers have the possibility to replicate the experiment, to confirm or deny the validity of the observation. With respect to psychological analyses, he mentions the difficulties that stem from the fact that the content of consciousness inevitably changes, as soon as attention is drawn to a specific feature.

In sociology, Habermas (1987) proposes *communicative action* as a key concept in order to avoid subjectivity. He calls exchange of good and well-founded arguments the broadest, most reflective form of rationality, i.e., communicative rationality, which means that different participants, through their dialogue, overcome their subjective views and reach inter-subjectivity (1987:27). Habermas

(1987:45) defines several *Geltungsansprüche* (requirements regarding claims made) which are: intelligibility, honesty, adequacy, correctness, and sincerity (*Verständlichkeit, Wahrhaftigkeit, Angemessenheit, Richtigkeit* and *Wahrheit*). These requirements are in accordance with the main principles of phenomenological description, as seen in the work of Moustgaard (1981:275), who proposes *description and communication* as a means to overcome subjectivity when investigating human consciousness. He admits that parts of science are necessarily dependent upon *interpretation* and that research will always be marked by the person who describes the phenomenon.

From "hard science," with its rigor, accuracy, controlled experiments, and replication, we have moved to "soft science," where we attempt to decrease subjectivity through the means of communication and argumentation, and by honesty, sincerity and *control through focus on description*, a description which is as precise as possible in its categorizations, so that every recipient of the results of a study is able to decide if he/she agrees or disagrees. *Dissension and conflict* is, in this process of *negotiation*, a valuable tool because it provides the possibility of perceiving phenomena from different angles and reflecting upon them and relating to them in different constellations in order to obtain, if not objectivity, at least inter-subjectivity. Through the use of communication and argumentation based on precise description, we have moved in the direction of the liberal arts paradigm of the humanities and hermeneutics (see also Stolze 2003:301).

This paradigm, which perhaps could be translated as *Geisteswissenschaften* in German, covers a huge area of research. In some liberal arts disciplines, rigor is obtained via precise definitions, meticulous interpretations, criticism of sources, control of plausibility, and via disagreement, negotiation, and argumentation. A complete approach to the complex issue of the liberal arts paradigm would require an exact methodological differentiation between the many disciplines under the paradigm so that not all the disciplines concerned are lumped together and their methodological differences obscured.

Why the liberal arts paradigm in translation studies?

The liberal arts paradigm is important in translation studies because of the central, primary role of *texts*. Every part of the translation process involves texts: source texts and target texts, parallel texts, all kinds of textual aids, illustrations, texts in dictionaries, text books, and texts on screens. Translation is formulating texts, for example, according to appropriate registers (genre analysis), and it is also, of course, understanding and interpreting texts, the main issue of hermeneutics. From the liberal arts view, translation can be seen as a means to reach

inter-subjective consensus with the aim of a coherent, logically consistent, and plausible understanding and interpretation of a text.

Secondly, texts are communicative tools on a meta-level in translation process research for sharing information during the research process. In order to choose proper texts for experiments, at least some pragmatic, linguistic, and stylistic insight is required. Texts are produced in questionnaires, introspection, and dialogues. All such texts have to be understood and interpreted to be used as data. The same is the case when analysing and categorizing the results of qualitative investigations. In empirical translation process research, the evaluation of the products has been an important element of uncertainty (Hansen 2007). Evaluating the products of translation, the target texts, is not reliable without the application of methodology from some of the liberal arts disciplines.

In short, in empirical research into translation or translation processes, it is impossible to achieve reasonable results, if the liberal arts paradigm is neglected.

Integrative description

Recently, there has been a kind of boom in empirical studies in translation, which is probably due to a considerable improvement in data gathering software and the availability of large parallel corpora, a source of quick and reliable quantitative data. As a result of these changes, a higher degree of objectivity can be obtained than was possible earlier, especially as statistics can be applied to the new quantitative data. There are efforts in empirical translation studies to strive for more and more rigor, i.e., to make methods and findings more "scientific," i.e., more valid, exact and, eventually, replicable. However, in our enthusiasm about the new technical capabilities, it seems as if the liberal arts part of translation has been thrown out like the baby with the bathwater. Interestingly enough, at the same time the liberal arts paradigm is being devalued in translation studies, some older "rigorous" approaches to translation, for example comparative linguistics, have also become less popular (Hansen 2009b).

A multi-paradigm approach, which fits the complex character of "translation" as a *process* and a *product* and has a focus equally on *human beings* (and their profiles), *translation processes* and *texts in situations*, would be a solution. Such an approach could be called *integrative description*. A meticulous process of description is a means to keep a complex empirical study with human beings and both qualitative and quantitative methods and data and additional perspectives from the liberal arts under control. This process of description makes it possible to keep the researcher's *focus* on discrete parts of the study, e.g., in translation process research, on time management, or revisions. Simultaneously, it prevents

the possibility that too many (also) important aspects of the *whole* are lost. This could, for example, be the subject's awareness with respect to problems or weaknesses, the subject's use of dictionaries or the internet, or perhaps product data on the quality of decisions or revisions. All these are closely connected.

The process of integrative description is a sequence of subprocesses, such as observation, perception, identification, and categorization, followed by verbalization, communication, and reception. The most important goal of this process is cognitive clarification, which entails pointing out the most important parameters and observations and then finding the expressions for an unambiguous exchange of the observations and data in order to get closer to an optimal understanding of the phenomenon under study, and also to get closer to objectivity or at least inter-subjectivity.

For the sake of rigor, this kind of research requires keeping descriptive, reflective, and explanatory sections apart. This is important because the description part usually is more objective than the reflective part and the observers' explanations. Other researchers must have the opportunity to draw their own conclusions from the described data and to take a stand on the validity of the described observations and data. This requirement implies keeping raw data and notes apart and clean, as well as keeping *all data* and providing running documentation. This is especially necessary because, as mentioned earlier, in the early stages of a complex study, it is not always clear which observations and data may become interesting later in the research process. *Terminological consistency* has to be mentioned as an important aspect in the rigorous process of description, especially in relation to empirical research in the humanities, where the researchers originally are trained in "variation of style and expression." Description in soft empirical research is based on careful and precisely carried out experiments and analyses, but it is also based on both descriptive consistency and a carefully reflective attitude.

Reflective attitude in empirical research means, for example, keeping under control the complex relationship between knowledge production, the context of the research process, and the involvement or influence of the observer. It means awareness as to the most common kinds of bias caused by the experimental situation, such as the observers' attitudes, influences, interests, prejudices, perspectives, and roles during the experiments and afterwards when interpreting the data and results. Additionally, institutional interests can have an impact on experiments and results, as well as unexpected incidents such as, for example, misunderstandings or mistakes during experiments.

A reflective attitude in relation to the translation studies experiments involves controlling the validity of the study with respect to the subjects (is the group of translators representative?), texts (do they include relevant cognitive, pragmatic, linguistic, semantic, and stylistic phenomena and translation difficulties in

relation to the aim of the study?), experimental situation (are the experimental conditions equal for all subjects?), and the translation brief (is it a real life situation, precisely described for the translating participants?).

Complementary description

In order to get closer and closer to an understanding of a complex phenomenon such as translation behavior and the cognitive processes that underly it, two complementary modes of description can be used: analytic description and a synthetic description (this is influenced by Bohr's (1959, 1964) definition of the concept of complementarity). *Analytic description* means initially describing a phenomenon or parts of it in *isolation*. It is a series of discriminating processes aiming at a systematic isolation of the phenomenon under description and a clear identification and categorization of the phenomenon so that there is no doubt as to the boundaries of the "isolated" phenomenon being described. However, as mentioned earlier, division and categorization have their price. The analytic, "isolated" description of an object may be in contradiction to the way the object is experienced in its natural surroundings. As soon as we isolate a phenomenon through analytic description, we risk losing the object, because it is taken out of its real natural and mental context. That is why in holistic studies like translation process studies, is useful to *complement* the analytic mode with a *synthetic description*. This latter form of description means investigating the relations of the phenomenon under investigation to connected phenomena in its surroundings, and to the whole study.

Through a series of complementary analytic and synthetic processes of description, the phenomenon can be incrementally more clearly portrayed. It is important to note that the process of description is dynamic and that both modes of description complement one another, offering different kinds of classifications and categorizations into new patterns, in the attempt to constantly gain more clarity and objectivity and, thus, to obtain new insights and new knowledge.

An example of the necessity for complementation can be taken from translation process research. We can, for example, look at the pauses that are observed in recorded log files (see the *process parameters* discussed earlier). The pauses in the writing processes can be observed and registered precisely. We can define, categorize, describe, and count the pauses as, for example, orientation pauses or control pauses. Through analysis, we arrive at an "isolated" description of a pause. But in order to gain insight into what really may have been going on during a pause, we need a synthetic description, where we bring in additional, possibly important information from the "non-pauses," i.e., the time when the translator is writing.

To obtain a complementary description, we need to know what happens during the process before and after a pause, and what the impact of these complementary events are on the final product. It may also be necessary to rely on additional complementary information obtainable from introspection or a dialogue.

Combination and triangulation

The findings of a study can be affected by the methods used, experimental conditions, experimental set-up, as well as the observers themselves. Such effects can be minimized using the process of *combination*. This is where a specific set of different control experiment methods and set-ups is applied to the same phenomenon. The same phenomenon is investigated under different conditions and by different observers. The results from these different studies can be *triangulated*, thus potentially confirming an observation.

In a complex study, the purpose of combination and triangulation can be confirmation and/or completeness. *Confirmation* means providing increased reliability, validity, and credibility to a study because results from the application of different methods corroborate each other. For example, can qualitative process data from think-aloud protocols be corroborated by quantitative process data from cursor movements visible in the log files. *Completeness* is another advantage of the use of multi-methods because combination and triangulation result in more information.

Triangulation is applied in, for example, the social sciences and health care studies (Mays and Pope 1999), and the terms "combination" and "triangulation" are used as synonyms for using a mix of procedures to grasp complex phenomena. Triangulation can involve a *multimix*, where subjects, material, strategies, methods, purposes, perspectives, or investigators are modified in an attempt to add rigor to a study and to provide confirmation and completeness.

The triangle

In its original meaning, the term 'triangulation' refers to a geometrical procedure where a point is found by calculating the length of one side of a triangle, given measurements of the angles and sides of the triangle formed by that point and two other given reference points. This means that in triangulation, existing reference points, i.e., prior knowledge (observations, descriptions, experimental results), are used in order to gain further results or further insight. Having the meaning of the original metaphor of a *triangle* in mind, in a complex holistic study, it is an advantage to keep the concepts of *combination* and *triangulation* apart.

Where combination is useful for all kinds of information collection, triangulation, in accordance with the original meaning of the term, can be used as an additional procedure for obtaining *new results or new knowledge from already obtained results*, and it can thus provide additional clarity and coherence to the investigation and description of a complex phenomenon. When many aspects have to be taken into consideration, as is the case in translation process research, the differentiation between combination and triangulation is a means to keep the variety of different observations and data under control and to make it easier to plan, discuss, repeat and evaluate the study.

To provide an example, in my long-term longitudinal study described earlier, the focus is on within-subject variance, which implies that the individual is the main starting point. As I am interested in success in translation and the quality of translation products, the personal profile (from questionnaires and interviews) is combined with product data (evaluation of the target texts and of revisions during the processes). In order to get closer to defining the characteristics of successful translators, these first results were triangulated with results from profiles combined with process data from log files and retrospection with replay. Triangulated, the results of both combinations can complete one another or reveal gaps or discrepancies and thus generate new insights into the relationships between profiles, processes, and products. A complex holistic study gains flexibility and scope when new results always can be located via new constructions of new research "triangles" from known reference points (i.e., results). A small illustration is given in Figure 2.

Source	Profile	Product	Profile	Process
COMBINATIONS	Questions	Evaluation TT	Questions	Log file
TRIANGULATION (of already obtained results)	RESULT 1 Quality of the TT		RESULT 2 Management of time	
Goal	Relation between TT QUALITY and TIME management			

Figure 2. Example of combinations and a triangulation

Conclusion

The term "scientific research" covers many disciplines and includes many different kinds of science, such as "hard science," "soft science," and even sometimes "medium science," "sound science," or "pure science." Disciplines from the liberal arts paradigm may have rigorous research methods, even if they are not, strictly speaking, scientific. Translation studies have to draw from both the scientific and liberal arts paradigms.

Every translation is a huge complex of conditions that may alter drastically if only one aspect of the complex, like the translator, the text or the situation changes. Thus, the focus on the particular that drives the hardest of the sciences must be balanced against a concern for the interconnected complicated whole of the act of translation. Translation studies must be simultaneously analytic and synthetic.

Translation studies as a discipline is far from being a "hard science." Much of our important data cannot be strictly derived from quantitative approaches based on discrete, observable, and measurable phenomena. Subjectivity necessarily enters our discipline because we must rely on qualitative methods and must always *interpret* the results. Because of the very nature of translation, *replication*, one of the most important requirements of hard science, cannot easily be fulfilled in translation studies. Nevertheless, we have an obligation to strive for rigor.

The discipline of empirical translation studies involves working with complex issues: human beings and their texts. By its nature, translation requires being studied by both qualitative and quantitative methods; the conduct of translation studies requires both calculating discrete measurable data and interpreting more subjective results. It deserves to be approached in accordance to its character and conditions. In translation studies, the closest we can come to a rigorous, more "scientific" approach is *integrative description*. Integrative description is a means to control a complex empirical investigation using a variety of different kinds of methods and data. It involves combining and triangulating the results of multiple investigations, whether they are oriented toward the liberal arts or the empirical research paradigm. As a result, integrative description can add a needed and important rigor to translation studies.

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