Filozofická fakulta Univerzity Palackého

Katedra anglistiky a amerikanistiky

Výzkumné metody procesu překladu

Process-oriented research methods in translation studies

(bakalářská práce)

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Prohlašuji, že jsem tuto bakalářskou práci vypracovala samostatně a uvedla úplný seznam citované a použité literatury.

V Olomouci dne

…………………………………

In Olomouc ....

List of Abbreviations

A-group	Group of advanced students
fMRI	functional Magnetic resonance imaging
N-group	Group of novices
PET	Positron emission tomography
TQA	Translation quality assessment
ST	Source text
TAPs	Think-aloud protocols
TA	Think aloud
TT	Target text

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*My own brain is to me the
most unaccountable of
machinery - always buzzing,
humming, soaring roaring
diving, and then buried in
mud.*

*-Virginia Woolf, from a letter
dated 28ᵗʰ Dec 1932*

1. Introduction

The question I aim to answer in this bachelor thesis is: How can a translator's mind be measured? Or, more precisely, how can we find out what exactly a translator is thinking about at a given point in time? In other words: How can we determine which conscious and unconscious processes unfold in the translator's mind while s/he is occupied with a translation task?

This bachelor thesis begins with a brief overview of the process-oriented research and its theoretical background. Next, I go on to map the territory – to objectively describe those research methods used for probing the process of translation. I draw on a number of translatological publications, and therefore, the first half of the document is rather compilatory in its nature. The next step was to evaluate these methods – where available, I have accessed research reports and other reliable sources of information regarding the advantages and drawbacks of each method. Where unavailable, I have tried to deduce them myself. Later on, I devote my attention to the ways in which these methods may complement one another and why this is actually desirable. On the one hand, having examined a rich corpus of research designs applying more than one method for data-elicitation, I have been able to identify some of the tried and tested combinations. On the other hand, some particular combinations have not yet been employed in any experiment, but they are theoretically possible and, therefore, included in this thesis as well, as it is hoped they could lead to new insights. Subsequently, I also devote a few lines to the latest trends which have recently emerged in the field of process-oriented research.

The above mentioned mapping and evaluating of methods had a clear purpose. The present thesis encompasses a pilot research project including ten participants. The aim was to test how these methods I read and wrote about work in a real experiment and what data they can provide.

In the Czech translation studies environment, not much attention has been paid to process-oriented research so far. When we compare our efforts to

those of our neighbours in Germany or Austria, we see a major gap on our side. This thesis cannot compensate for this past lack of interest, but I hope that it can ignite some future research within Czech institutions.

There are many reasons why the process-oriented approach is worth of pursuing. If we can determine which problems translation students encounter, which skills and abilities they lack, we may easily tailor the curricula to their particular needs and shift to a more process-oriented pedagogy[1]. Along the same lines, Hansen (2006a: 53) paraphrases Kierkegaard (1848: 96) and writes:

"Denn um einem Mitmenschen wirklich helfen zu können,
muss man mehr verstehen als er – jedoch vor allem das verstehen,
was er versteht. Wenn ich das nicht kann, hilft ihm die Tatsache,
dass ich mehr verstehe, überhaupt nichts."[2]

Among the most insightful works I accessed were: Fabio Alves (2003, 2004), Arnt Lykke Jakobsen (1999, 2003, 2008), Riitta Jääskeläinen (2000, 2011), Gyde Hansen (1999), Sharon O'Brien (2008, 2011) and Susanne Göpferich (2008).

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[1]Excellent examples of how process-oriented pedagogy works are provided in a book entitled *Beyond the Ivory Tower* (2003); see References.

[2]*"Because if you want to really help someone, you have to understand more than he does – but first of all you have to understand the things he understands. If you cannot do this, the fact that you know more than he does, is of no use."* (My translation)

2. Theoretical background of process-oriented research

For a long time, translation product had been the focal point of translation studies. It should not be assumed, though, that scholars of the past found the process of translation completely uninteresting. But, until the second half of the 20th century, methods capable of examining the actual process were not available (see 2.1 History of process-oriented research). Even though the process-oriented approach is now almost three decades old, its influence on the traditional views of translation and translation theory as such has been limited.

Translation theory can be approached from numerous viewpoints, there are many fields and subfields to it. Lörscher, however, manages to describe the situation quite simply (see 1992: 426). He points out that: *"Until very recently, translation theory has been concerned with two phenomena (cf. Lörscher 1991): with translation as a product and translation competence."*

Product-oriented approach focuses on the final product. Among the most popular tools of the product-oriented approach are error analysis, translation quality assessment (TQA) and contrastive analysis (of the source text and its translation; of two independent translations, see Kußmaul, 1995: 7; House 2000: 150). Traditionally, publications in this area include sets of prescriptions, i.e. what the target text should and should not be like.

Competence-oriented approach studies translation competence(s). All translators must wield the necessary declarative knowledge, i.e. knowing what (knowledge of at least two languages and the relevant extralinguistic reality). Apart from this, they must also know how to translate, i.e. have certain procedural knowledge (i.e. being familiar with *the process of translation*). For the latest developments in competence-oriented research, read Fraser's article (2000: 119), the article published by Alves and Gonçalves (2004: 42) or PACTE's study (2000: 99).

As we are able to conclude from the paragraphs above, process-oriented approach deals with the translation process itself. The understanding of the process is deemed to be the first and foremost condition for understanding translation competence as such. To obtain raw data related to the process, researchers design experiments in which they apply data-elicitation methods. These methods can be either introspective or extraspective. Various evaluation methods can be subsequently employed in order to analyse the data. (These evaluation methods are, however, not the subject of the present thesis).

2.1   History of process-oriented research

A kind of a pre-phase of process-oriented research may be seen in Toury's analysis of "revised manuscripts" – non-final versions of the target text (see 1986: 91; similarly, Séguinot examined notes, rough copies and final versions of her subjects' target texts, 1991: 79).[3] Yet, as Toury himself admits, this kind of study was still *"descriptive-proper, not empirical"* (Toury, 1991:58). The problem, in Harris' wording (1977: 106), was that:

> *"[...] even if the investigator was interested in the process of translation, the data has been a source text a finished product, the target text, with the latter in its polished and published edition. What of the stages between the two? Lost, because much of it goes on only inside the translator's head, and because what part of it is traced on paper in the form of rough drafts and corrections is quickly thrown away."*

For a critical overview of various process models, which, however, do not account for the reality of translating, see Lörscher (1991: 7-27). Even as late as the 1980s, there were still no empirical studies which would focus on the translation process. The situation was dire:

> *"Über die mentalen Prozesse, die sich beim Übersetzen in den Köpfen der Übersetzer abspielen, ist so gut wie nichts bekannt."*[4] (Krings, 1986a: 1)
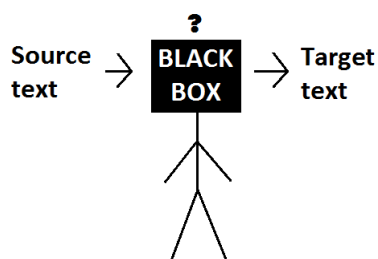
Krings' desperate cry, uttered at the very beginning of his revolutionary book, has resounded in many a translation theorist's ear. In order to find answers to his questions, Krings made use of Think-Aloud Protocols (TAPs),

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[3]Even Jiří Levý makes fleeting remarks about the process of translation as early as in 1963. However, he did not base his statements on any research results; he simply sketched the process as he imagined it worked (see Levý, 1963: 44).

[4]*"We know very little, if not nothing, about the processes which unfold inside the heads of translators while they translate."* (My translation)

i.e. a research method where the subjects are asked to provide verbalisations regarding their mental processes on the go (see 3.1.1 Think-aloud protocols). His work triggered further empirical research and various probes have since been plunged into the translation process. To name just a few early writings: Krings in 1986; focusing on strategies, Lörscher arranged some of the first studies to explore the potential of TAPs in translatology in 1986 and 1991; Königs 1987; Gerloff in 1986 and 1988. We may, therefore, see the year 1986 as a milestone in this area of translation studies. Various methods (mostly borrowed from other disciplines, such as psychology, neurology etc.) have since been employed for measuring the translator's mind at work.

The dawn of empirical research in translation studies was marked by a certain degree of inexperience on the researchers' side, though (see Shreve and Angelone, 2010: 5). The tools for introspection, even with their flaws, were generally accepted as valid research methods in humanities. The way they had been applied in translation process research was, however, often criticised. Back in 2000, Jääskeläinen (71) feared that the majority of translation scholars did not have any real expertise in carrying out empirical research. This often left their projects without any solid empirical grounds and thus rendered the results more or less invalid. By way of an example, the researchers often did not describe the experimental conditions (e.g. What instructions had the subjects been given?) and did not include any actual results. Also, they often failed to sketch the educational, professional and family background of the subjects thoroughly. Jääskeläinen (ibid.) further lamented the researchers' notorious inability to draw reliable generalisations from the raw data which, as she said, are necessary for building viable theories and creating testable hypotheses.

Soon, however, process-oriented research underwent a major shift: While starting with introspective methods, such as TAPs or retrospection, most of the current studies make a very good use of technology in order to generate extraspective data on the subject's cognitive processes (see 3.2 Extraspective methods). With these new methods, attention has gradually shifted from introspection and from the translator's mind only, and rightly so. Risku (in Göpferich, 2008: 16) suggests:

> *"Übersetzende sind nicht Köpfe allein, sondern komplexe Systeme, die auch die soziale und physische Umwelt mit all ihren kulturellen Artefakten umfassen."* [5]

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[5] *"Translators are not just heads; they are complex systems which also encompass social and physical environment with all their cultural artefacts."* (My translation)

Even Jääskelainen seems more satisfied these days. In her recent article (2011) she praises the progress made in terms of empiricism: *"[...] the research designs have become more rigorous, the hypotheses more refined, and the variables more clearly defined."* [6]

The work that researchers have done since 1986 has not been in vain: immense progress in process-oriented studies has been made. Hence, the process of translation as such now has stronger contours than ever before. With solid data corpora at our disposal, testing of hypotheses has become more precise and the conclusions we draw more credible.

2.2   The process itself

Translation process (or the process of translation) is a polysemous term. As Malmkjaer states in her paper (2000: 163):

> *"Translation process may be used to designate a variety of phenomena, from the cognitive processes activated during translating, both conscious and unconscious, to the more "physical" process which begins when a client contacts a translation bureau and ends when that person declares satisfaction with the product produced as the final result of the initial inquiry."*

To somehow delimit this broad definition and instantiate how some of the major scholars in this field thought of the process, I have included two models, both of which are empirically-inductive.[7]

The first such model was produced by Krings in 1986. However, the author himself called it a tentative model with no ambition to be generally valid. He based the model on his think-aloud experiments. Krings' conclusion was that if the translator did not encounter a problem, they just delivered the translation. When a problem was encountered, a strategy to solve this problem had to be applied. The strategies ranged from comprehension strategies to retrieval, monitoring, decision-making and reduction strategies (see Göpferich, 2008: 130). Other scholars have criticized this model because it does not

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[6]For more tips on empirical experiments in translation studies, see Neunzig (2000: 91); for instructions relating to Think-aloud experiments, see Göpferich (2008: 32).

[7]For an extensive overview of various models of translation, see Neubert (1991: 17). He mentions as many as seven categories of translation models: critical models, practical (or performative) models, linguistic models, textlinguistic models, holistic (or discourse) models, sociocultural models, computer (or mixed) models and finally psycholinguistic models.

include any evaluation phase – there is no stage when the translator checks whether their solution fits.

Hönig's (1995: 50) model reflects the fact that each translation begins with source text comprehension and a macrostrategy (i.e. an idea of what the target text should look like, which kind of audience it wants to reach etc.). Later, both uncontrolled and controlled working areas come into play. The controlled working area includes rules, such as "names should not be translated", "repetitions are not desirable in German texts" etc. The macrostrategy then helps the translator decide where they should apply these rules and where they should not. The uncontrolled working area is where associations can be found. When the subject translates, they work with associations and strategies, both of which are then subject to a macrostrategy check – every single segment of the product is continuously compared to the "idea" of what the target text should look like.

It may seem that there are many suitable models of translation process, but the appearance could be deceiving. Shreve and Angelone (2010: 4) claim that *"[...] widespread and commonly-accepted process models of translation have yet to emerge in the discipline."* And indeed, a few pages later (2010: 12) they assert that *"[...] the search for a strong, commonly-accepted model (or even viable competing models) of the translation process will be a paramount concern of the next decade."*

Pym (2003: 489) does not aspire to formulate a whole model, he simply states that translation process: *"[...] is a process of generation and selection, a problem-solving process that often occurs with apparent automatism."*

Scott-Tennent, Gonzáles Davies and Rodríguez Torras (1998: 108) seem to agree with Pym's views when they point out that the process is partly automatic and only partly non-automatic (see above: controlled and uncontrolled working area in Hönig's model). Sometimes the translator does not actually realize that there is a problem nor makes a conscious decision. Rather, they perform automatic information processing which gets only interrupted when the translator detects a problem or reaches a decision point.

For the purposes of this thesis, I have provided a rather loose definition of translation process: Translation process is any cognitive activity which goes on in the head of a subject while s/he is tackling a translation task, be it conscious or not. A translation task ideally begins when a translator receives and considers a translation brief, continues with initial reading and analysing of the source text, includes drafting of a (possibly preliminary) macrostrategy and only after all this has been done, the gradual transformation of a ST into a TT follows. The translation process may also include non-linear, seemingly

random editing of the target text, as well as final revisions.[8] The reason for choosing such definition is simple – as I will be examining various experimental designs (many of which start with definitions of their own), I simply cannot afford to hold onto any narrow definition. Many process-oriented research papers (for example: Tirkkonen-Condit: 2000, and Krings: 1987) deal with the middle phase of translation process only (i.e. the gradual transformation of a source text (ST) into a target text (TT) and non-linear editing). Conversely, other works focus on macrostrategies, revisions and other rather "marginal" tasks (e.g. sources of disturbance in translation process, see Hansen, 2006a).

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[8]For an even more general division we turn to Jakobsen (in Göpferich, 2008: 29, who reports on Jakobsen's research project of 2003). Jakobsen distinguishes between three phases only: the orientation phase, the actual translation phase and the revision phase.

3. Methods

Process-oriented data-elicitation research methods in translation studies

In the following section I will list the data-elicitation methods researchers use to gain insight into the translator's mind at work.[9] In general, there are two kinds of these methods: introspective and extraspective.

3.1 Introspective methods

Verbal protocols

In 1984, Ericsson and Simon published their work called Protocol Analysis. Their introduction provides a handy definition of verbal reports (also verbal protocols) in general:

> *"The terms "verbal reports" and "verbal protocols" are used almost interchangeably to refer to human subjects' verbalizations of their thoughts and successive behaviours while they are performing cognitive tasks. The protocols may be taken concurrently with the task performance, or retrospectively."* (Ericsson and Simon, 1984: 1)

Below are the types of verbal protocols I have encountered while collecting material for this thesis.[10] Even though I have identified numerous modes of verbalisations, I will later discuss only those which have been used and/or written about in the context of translation studies.

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[9]It is important to note here that some data-elicitation methods are used and criticized more often than others. More publications have been devoted to some particular methods and, therefore, a bigger amount of relevant information is available. This compilation is based on such information, the consequence of which is its apparent asymmetry – while some methods have been handled rather briskly, the remaining few take up many pages. This imbalance was unavoidable.

[10]In this thesis, I will deal with methods used mainly for research in translation studies. It is, nevertheless, important to note that verbal reports in various forms have also been used in fields of developmental psychology, clinical psychology (see Ericsson and Simon, 1984: 1), sales psychology (see Buber, 2009: 558) and many other areas.

3.1.1 Think-aloud protocols (TAPs)[11]
aka Monologue concurrent verbal reports

This type of verbalisation is the one which usually comes first to mind when people think of protocol studies. Introduced by Bühler and further developed by Claparède in 1933 (for a more detailed history of TAPs, see Lörscher, 1991: 68), thinking-aloud was initially employed in cognitive psychology, where it has been applied to study various problem-solving and decision-making processes (see Jääskeläinen, 2000: 71). Kovačič (1995: 230) traces back the first use of TAPs in linguistics:

> *"In language-related fields, TAPs began to appear in the 1980s, mainly in three domains: literary reading [...], second language learning, translation as process (Lörscher 1991 – a project started in 1983; Krings 1986; House 1988; Tirkkonen-Condit 1991; Jääskeläinen and Tirkkonen-Condit 1991)."*

Translators are usually asked to verbalise everything that is going on in their minds while they tackle a translation task. The monologues (or possibly dialogues or group verbalisations – see below) are being tape-recorded, the result of which is then called a think-aloud protocol. Such a protocol includes rather spontaneous and uncontrolled statements.

The researcher should avoid interacting with the subject as much as possible. If necessary, they can pose open questions or prompt the subject to verbalise with simple phrases, such as "keep talking" or "don't forget to verbalise your thoughts" (see Göpferich, 2008: 33). When the researcher, for example, asks "why?", the subject is forced to verbalise on processes which might usually be performed automatically, on a subconscious level (see Göpferich, 2008: 26). The researcher should not use formulations which could initiate a dialogue, as collecting pure data relating to mental processes are what most experiments employing TAPs aim at.

In terms of output, Lörscher (see 1991: 38) describes it as a data corpus which includes three independent types of verbalisations: the translation (i.e. parts of the target language text), utterances related to intermediate stages (i.e. comments on certain passages, realized problems, problem-solving and text-processing strategies) and paralinguistic phenomena (i.e. speed, rhythm, key, voice quality, rate of articulation, pauses, repetitions, self-corrections, lapses, etc.).

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[11]These protocols should not be confused with the so-called Talk-aloud protocols. Talk-aloud protocols include only such verbalisations which the subjects might murmur to themselves, even if not asked to do so (see Krings, 2005: 351). *"Talking-aloud refers to verbalising information that is already in a verbally encoded form in STM, whereas in thinking-aloud the thoughts must first be converted into a verbalisable form."* (Ericsson and Simon, 1984: 11)

Dialogue concurrent verbal reports between the researcher and subject(s)

This method will not be further described for the above mentioned reasons (i.e. the researcher should avoid interacting with the subject). There are not many studies using it. The majority of scholars deem the researcher-subject interaction during TAPs highly undesirable. (See 3.1.4 Delayed retrospection for a permissible subject-researcher interaction mode.)

3.1.2   Joint translating
aka Dialogue (or group) concurrent verbal reports among the subjects
or collaborative translation protocols

Joint translating means asking a team of translators to work together on a translation task. Their cooperation is audio-taped and subsequently transcribed into a dialogue (or group) protocol. The participants do not verbalise things which go on in their heads, they simply communicate – this means that they take into account the addressee of their message. They might try to explain to their counterpart(s) the reasons why they think their solution is suitable or negotiate some decisions. Dialogue (or group) protocols do not usually include information on cognitive processes proper.

Regarding monologue retrospective verbal reports without external cues, there are two modes of retrospection:[12]

3.1.3   Immediate retrospection

Immediate retrospection means that the subject has to verbalise her/his thoughts immediately after a short task or a specific part of a task (lasting no more than 5-10 seconds according to Ericsson and Simon (1993: 19); 30 seconds quoted by Cohen & Hosenfeld (1981: 285) has been completed (as opposed to TAPs where the subject has to verbalise while they are processing a task). Based on the assumption that within the above mentioned time period, the subjects can still access cognitive processes which unfolded in their heads while solving a task (now stored in short-time memory), this method has been compared to TAPs in terms of data quality.

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[12]For the so-called (Interviews with) cued recall, see 5.4 Using various methods successively.

3.1.4 Delayed retrospection

Delayed retrospection can be performed at any given point in time after a task has been completed, even if the task was a time-consuming one. The researcher can let the subjects verbalise freely (narrative interview, i.e. monologue), or they can steer their statements by asking specific questions (focused interview, i.e. dialogue). The latter mode makes use of either open-ended or closed-ended questions.

Written media

3.1.5 Notes on translation tasks
aka Integrated Problem and Decision Reporting (IPDR)

IPDR is a specific type of commented translation. Gile (2004: 2), who has used this method for over 25 years, defines it as follows:

> *"IPDR's distinctive features arise from the fact that this report on problems encountered, on steps taken to solve them, and on the rationale for the final decisions made, either in the form of footnotes or as a set of comments and explanations which follow the translation, is an integral part of translation assignments."*

Various kinds of translation diaries and other written comments relating to the translation process are covered in this category as well.

3.1.6 Questionnaires

Traditionally, questionnaires make use of closed-ended questions, where only a limited set of answers (i.e. a/b/c or subjective scales e.g. 1-5) is applicable. Questionnaires can be pre- or post-experimental. With the pre-experimental kind, researchers can collect data on a subject's previous knowledge, personality, professional experience, stays abroad etc. Especially in longitudinal studies, one might also want to include the "life story" of the subject (see Hansen, 2010: 193), i.e. her/his values, feelings, memories – to shed some light on individual differences among the subjects.

3.2   Extraspective methods

3.2.1   Keylogging

Keylogging means logging (i.e. tracking and storing) all keyboard activity. A special piece of key-logging software, Translog, was developed at the Copenhagen Business School (CBS) by Arnt Lykke Jakobsen, in cooperation with the computer specialist Lasse Schou (see Hansen, 1999: 7). This tool facilitates the observation of the text production process:

> *"Whenever a key has been touched, Translog records the time of day and stores the information. In sum, Translog creates a log of every key that was pressed during the composition of the target text, of all revisions made, all (electronic) dictionary lookups, all typos and errors – and when it all happened."*
> (Hansen, 1999: 11)

Another of Translog's features is the "replay facility", which allows the researcher to go through the logs dynamically. In the appendix of Hansen (1999), you will find a comprehensive guide to Translog and its features (or see Göpferich, 2008: 41-47).

3.2.2   Eyetracking

Eyetracking means generating data about the visual behaviour of a subject. The first study (in translatology) which made use of this method dates back to 1981, when a pair of researchers (McDonald and Carpenter; mentioned in Toury, 1991: 58) measured the eye movements of translators. In 1986, Tommola and Niemi (see Chang, 2011: 158) focused on pupil dilation during simultaneous interpreting. However, various techniques for eyetracking, perhaps slightly more primitive, were employed as early as in the mid 1970s in order to gain empirical data about reading. Recently, it has become very popular in the researcher community.[13]

Any research design including eyetracking usually requires an eye-tracking device[14] which follows the subject's gaze and dilation of their pupil. Another software tool[15] is necessary to store and process the output. This

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[13]A whole book including exclusively eye-tracking studies appeared in 2008: *Looking at eyes. Eye-tracking Studies of Reading and Translation Processing*, see References.

[14]For example, Tobii 1750 remote eye-tracker

[15]For example, ClearView records the x-y coordinates of gaze points and pupil dilatation. It also analyses and classifies the data into categories, such as fixations, saccades, etc.

method bestows insight into how the subject's visual attention is distributed (for more information, see Duchowski, 2003).

I am now going to introduce a few terms used in eye-tracking research papers, such as Sjørup's (2008) or O'Brien's (2008) study:

Area(s) of interest	parts of a computer screen, such as the source text window, target text window
Saccades	rapid (20 to 35 ms) eye movements, during which, only little or no cognitive processes take place[16]
Fixation(s)	the state when an eye is relatively still, focusing on a word (the "fixate") for 200 to 300 ms on average[17]
Pupil dilation	changes in pupil diameter
Blink-rate	the sum of all blinks per a given period of time

Usually, eyetracking output comes in two forms: We can either produce gaze plots or heatmaps. Gaze plots are lines which follow the eye movement. When an eye fixates a word, a dot will appear. The longer the eye rests on the word, the bigger the dot will be. Heatmaps, on the other hand, use a colour scale to indicate which parts of a text got the most/least attention (Göpferich, 2008: 56). It is also possible to replay the recorded eye movements on the screen as a movie.[18]

For obvious reasons, it is necessary to note here that any research employing eye-tracking as a data-elicitation method should include information on whether the subjects are touch-typists or not.

3.2.3 Screen recording

There are many programs which allow the researchers to record all that happens on the screen while the subject is translating, as this is what screen recording stands for. One example of such a program is Camtasia Studio (see Christensen, 2011: 6).

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[16]To "feel" saccades, close one eye, put your index finger on the eyelid and read a text. You will feel rapid movements of the eye under the eyelid (see Göpferich, 2008: 57).

[17]Fixation duration is affected by various factors, such as word familiarity, word predictability, word length and complexity (see Jakobsen and Jensen, 2008: 103). The longer the fixation period lasts, the bigger problems the translator might experience and the greater cognitive load is assumed to burden her/him.

[18]To better understand the terminology and the way eye-tracking works, visit http://processresearch2011.com/ and watch the keynote speech by Sharon O'Brien: Eye tracking and process research - opportunities and challenges.

Later on, the output can be converted into a standard file format, stored and subjected to repeated analysis.

3.2.4   Video recording

Video recording is an objective, precise (and perhaps less intrusive) alternative to having the researcher note down what the subject is doing at a particular point in time (see 3.2.7 Non-verbal behaviour charts). In this way, we can record which printed dictionaries or other resources the subject uses for reference, what they are looking for, but also which facial expression they assume, whether they blush or turn white, what they do with their hands, feet, etc.

Göpferich (2008: 53) suggests using two video recorders: one for recording facial expressions, and one which would be directed so as to capture the subject's hands, posture and also record which physical referential works they use.

3.2.5   Physiological methods

Measuring physiological factors can provide data on the subject's attention, level of stress and fear, and other emotions the subject might be experiencing. Apart from Electroencephalography (EEG), functional Magnetic resonance imaging fMRI and Positron emission tomography PET, we can also measure heart-rate, blood pressure, skin conductance and neuroendocrine secretion. Compared to other methods mentioned in this thesis, physiological measurements have been employed only marginally in translation process research. In interpreting experiments, however, they have found a very good use (see 4. Disadvantages and advantages of the most frequently employed methods).

EEG, fMRI, PET and similar

To measure electric potentials in their brains, we can plug the translators onto an EEG device. This "plugging" requires a special kind of a cap which the translator has to wear during the experiment. Inside the cap there are pads which touch the subject's scalp. These pads measure the electric variation resulting from brain activity, including cognitive processes. Ahrens, Kalderon, Krick and Reith (2010: 238) explain that:

> *"Functional Magnetic Resonance Imaging (fMRI) is a recent, non-invasive tool for neuro-imaging. It uses nuclear magnetic resonance (NMR) to measure neural activities in the*

brain of living beings. [...] Thanks to its high resolution and rapid scanning rate, fMRI renders precise images of cerebral activity, thereby allowing objective localization of such activity."

With PET, brain activation patterns can be observed (see Diamond and Shreve, 2010: 295).

These three methods enable the researcher to obtain a record of brain activity during translation (i.e. high/low load), and also to locate where in the brain the work is actually done. Among other methods in this category is the non-invasive fNIRCWS (Functional near-infrared continuous wave spectroscopy) but its use in translation research is very limited (see Diamond and Shreve, 2010: 310).[19]

Cardiovascular activity

Next in this category is the subject's cardiovascular activity: *heart rate (pulse)* and *blood pressure*. These methods tend to be preferred in interpreting research, as they do not interfere with cognitive processes. Data gained in this way are, nevertheless, informative only in terms of attention, information processing, effort, affect and memory (see Diamond and Shreve, 2010: 306).

Most people are familiar with taking blood pressure. The data gained is a number telling us how high the blood pressure is.

Measuring heart rate is now very simple. There are tiny monitors which can be clipped onto a subject's finger. There is a study where changes in heart-rate were monitored during translation of single words which proved that there is a link between task difficulty in translation and heart-rate changes (see Diamond and Shreve, 2010: 307).

Skin conductance
aka galvanic skin response

Skin conductance depends on how much an individual perspires; perspiring in turn depends on the level of stress. Thus, the more cognitive load a subject experiences, the higher skin conductance is predicted (see Chang, 2011: 171).This technique requires a special device called an ohmmeter. The subject of an experiment must wear at least two pads (electrodes) usually on adjacent fingers.

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[19]Some non-invasive brain stimulation techniques, such as TMS (Transcranial magnetic stimulation), tDCS (Transcranial direct current stimulation) have been used to facilitate language-related tasks. Although they cannot be categorized as process-oriented research methods, they undoubtedly have the power to influence the process quite remarkably (see Diamond and Shreve, 2010: 310).

Neuroendocrine secretion

Measuring how much cortisol (stress hormone) there is in the subject's blood (or urine) is another way of finding out how stressful the situation for the translating individual is (see Chang, 2011: 171).

Other extraspective methods:

3.2.6   Task time

Measuring the complete duration of a task-solving activity is one of the oldest ways of assessing the translation process. It can help us determine the difficulty of the task. For example, having a set of translators and letting them first translate in one direction (e.g. L1→L2) and then in the other (e.g. L2 → L1) can support/disprove the thesis that translating into one's mother tongue is quicker and hence easier.

3.2.7   Non-verbal behaviour charts

Observing what the translator does and recording it in charts might prove a rich source of insight, too. Such charts include information as to when the subject interrupts their work; how often they go to the fridge, chat on the phone, surf the Internet; stroke the cat etc. In addition, the researcher should record which referential work the subject uses, such as various dictionaries, thesauruses and so on. It is essential to include a precise timeline.

4. Disadvantages and advantages of the most frequently employed methods

4.1   Introspective methods

Fiery debates have been observed on whether introspective methods are valid empirical instruments, or not.[20] Introspective methods are used as researchers assume that the participating subjects have at least some control over their cognitive processes. The question is: Can the subjects really access their own minds? And even if they could, would their verbalisations correspond to what actually happens in there?

These questions aside, we have to accept the reality: It is impossible to access the complexity of the human mind from outside. Introspective methods with all their deficiencies are the most suitable tools we now have for delving into the translator's mind at work.

Verbal protocols

4.1.1   Think-aloud protocols

Nearly every paper based on TAPs features almost apologetic words, depreciating the empirical value of this research method. As a rule, however, the author then goes on to justify its use, by saying that it is the most suitable of the currently available tools, even if far from perfect (see Christensen, 2011: 9; Angelone, 2010: 25). Why do researchers feel the need to voice their doubts about TAPs? And, perhaps more importantly, why do they still keep using them?

Producing concurrent verbal protocols while translating undoubtedly imposes a heavy cognitive load on the translator's working memory. Even its defenders, Ericsson and Simon (see 1984: 10), admit that thinking aloud may slow down cognitive processes. To explain why it is so, we turn to *"A Capacity Theory of Comprehension"* (see Just and Carpenter, 1992: 123). The authors of this theory claim that if the capacity limits of a person's working memory are about to be crossed, then *"old elements will be deallocated, producing a kind of forgetting by displacement."* To put it simply, if people try to perform numerous cognitive procedures at the same time, thus nearing the working memory border-lines, a kind of security system protecting the subject's brain from being overloaded sets in – processing will slow down and some partial

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[20]For a brief history and criticism of introspection, see Börsch, 1986.

results may be forgotten. Jakobsen (see 2003: 69) determined that thinking aloud delays translation by about 25%.

Unlike Ericsson and Simon, Jakobsen has predicted and found evidence that concurrent verbal reports change the actual cognitive processes: *"It appeared, however, that the TA condition did in fact compel subjects not merely to process more or less identical segments differently in the TA condition, but to process different segments."* (2003: 89)

Krings (2001, quoted in Göpferich, 2008: 28) found out that the number of revisions undertaken doubled when using TAPs, as opposed to normal (no think-aloud) conditions. Next, Jääskelainen paraphrases Ericsson and Simon (1984) when she acknowledges that *"[...] subjects can produce verbalisations only on thoughts that are being actively processed in working memory, i.e. which are to some extent conscious. This precludes reporting on processing which has become automatized due to extensive practice."* (2000: 75).

This also implies that when comparing TAPs of professionals and novices, the protocols may differ substantially, even though the same or similar processes might have taken place – but professionals perform them automatically.

As already stated above, the capacity of human working memory is limited. The subjects of think-aloud experiments might suddenly stop verbalising so they can direct their attention to more urgent processes. House (see 2000: 152) noted that it is only the final results (i.e. products) of subject's procedural thinking that get verbalised. The actual processes still tend to remain hidden and skipped over.

In his research, Jakobsen (see 2003: 80) also detected that the think-aloud condition often provoked more orthographical mistakes. Further, some researchers (for example Neunzig, 2000: 92) voiced complaints about this method as being highly artificial.

What is more, to find a group of translators or students willing to participate in a TAP study might prove to be a very challenging task indeed. Not only does such a group first need to get familiar with this research method, they will also have to take part in a warm-up session to ensure they know what to do. Only then can they join the actual experiment. Therefore extensive time requirements on both the side of the researcher and the subjects, as well as lack of motivation are likely to pose problems.

Despite this, concurrent verbal reports appear to not have lost on popularity among researchers. The most cited reasons why thinking aloud has not yet been completely dismissed are the following:

First and foremost, there is no other tool which would generate such comprehensive and direct data about translation processes as thinking-aloud (see Göpferich, 2008: 22). The subjects do not verbalise merely the solutions they arrive at, but also how they arrived at them, or the reasons why they fail to find an appropriate solution.

It has been proven by Ericsson and Simon (1984, quoted in House, 2000: 152) that the longer the delay between a process and its verbalisation, the less reliable the report will be. This is due to the limited capacity of the short-term memory. When recalling the processes after a task has been completed, the subject has to access their long-term memory, which, however, stores only a part of the processes which actually took place (see 3.4.1 Delayed retrospection). Therefore, if we wish our data to be as reliable as possible, the subjects should access it immediately, using concurrent TAPs.

TAPs have, as House emphasizes (see 2000: 152), a great pedagogical potential. In particular, she praises the following TAPs' features: For one thing, they go beyond the surface – TAPs investigate the underlying cognitive processes. Next, their use prompts the development of descriptive statements and supports empirically-inductive instead of a theoretically-deductive research. Furthermore, they are oriented towards the practice of translation. Last but not least, as already mentioned among the disadvantages, *"[...] the TA condition appeared to provoke more semantic changes during revision and to have a positive effect on content revision. This suggested that audible feedback from the subject's own verbalisation had a stimulating effect on the production of semantic solutions and ultimately might have a positive effect on translation quality."* (Jakobsen, 2003: 80). Verbalising while translating seems to improve the product. For this reason, this effect of TAPs is featured among the advantages.

4.1.2   Joint translating

A fundamental issue with joint translating is the fact that the gained data cannot be regarded as a valid source of information in terms of the "usual" conditions, i.e. translating on one's own. (Séguinot, however, documented a case where there was a pair of translators used to working in a tandem on a regular basis, so the adjective "usual" can be disputed in some rare cases; see Séguinot, 2000: 145).

Because the subjects communicate in natural discourse, i.e. they direct their statements onto others – they do not merely voice their thoughts, they deliver a message: something their co-translators can understand and react to. They cannot be said to comment on their cognitive processes; rather, they explain and justify their decisions, make suggestions for improvement and ask for advice and criticism (see Kußmaul, 1991: 91-92).

Another disadvantage of joint translating is the fact that some individuals are more assertive than other and may thus impose their views and opinions on the less confident colleagues. Also, cases of chivalry – when male participants gave way to females in a dispute – have been observed.

On the bright side, verbalising in pairs or in groups appears to be more natural for the participants than monologue TAPs, thus, increased volume of

verbalisations has been witnessed by some researchers (see Séguinot, ibid). In addition, House reports that this mode of verbalising bestows a much deeper insight into translation strategies (see House, 2000: 159).

4.1.3   Immediate retrospection

As this method poses rather strict time requirements which delimit the duration of solving the task, the researcher who wishes to use this technique cannot but choose simple tasks for their experiment. Simple tasks, of course, are not what the translator has to solve on a day-to-day basis and the danger is that the subjects will find them too easy.

Every eight to ten seconds, as suggested by Ericsson and Kintsch (see 1995: 213), the subjects are expected to verbalise. However, at that exact point in time they might be deep in thoughts or have simply nothing to say. But if they do not verbalise, they shift to delayed retrospection, retrieving the data from their long-time memory. Nevertheless, it might be very challenging to put this method to work in a real experiment.

Shlesinger (2000: 3), who studied interpreting experiments, compares this technique to "time freezing": *"The interpreter is briefly interrupted – which means that the technique can only be used in an experimental setting – and is asked questions about her/his reasoning just before the freeze. There is a good reason to suspect, however, that the very act of interrupting the process will alter it."* The same can be expected in translation experiments.

4.1.4   Delayed retrospection

This research method has often been rejected as error-prone, capable of yielding only incomplete data sets. This assumption is based on the fact that human memory tends to get distorted or completely forgotten after a certain period of time, as it disappears from the short-term memory (5-10 seconds according to Ericsson and Simon, 1993: 19; 30 seconds quoted by Cohen & Hosenfeld, 1981: 285) and gets only partly stored in the long-term memory. Krings (1986a) has proven that the longer the period between completing a task and speaking about it is, the less reliable the gained data will be. More recently, Hansen (2008: 13) seconds to Krings when he states that *"[...] some time after having carried out the experiments, the subjects did not remember their translation processes, products, or comments on problems and decisions."*

Omissions, selective verbalisations, changes in the order of cognitive processes, interpretations, explanations and elaborations, all of which decrease the validity of the gained data, often occur (see Göpferich, 2008: 34).

Moving on to the advantages, using this method causes no interferences with the subject's cognitive processes when translating, so the gained data is

often more comprehensive and fluent. Since this method does not impose any load on the subject's mind while translating, it is possible to apply it with tasks which are demanding in terms of cognition, e.g. complex source texts, interpreting, etc.

If the researcher decides to steer the verbalisations, delayed retrospection turns into an interview: With any kind of researcher-subject interaction, the subjects may tend to change their verbalisations according to what they assume the researcher wants to hear. Sometimes, they may just want to make themselves look better in the eyes of the researcher. On the other hand, the researcher may just as well influence the verbalisations, by asking questions which alter the way subjects think about the translation process. Firstly, the researcher forms the questions; secondly, they order the questions; thirdly, they address only those issues which are interesting for them (see Jääskelainen, 2011: 19).

Written media

4.1.5 Notes on translation task

While extremely undemanding in terms of equipment (the subjects work as they are used to), it might be hard to make conclusions about the processes which had been unravelling during the actual translation process.

Translation diaries can give a good account of the level of translation competence. In terms of process-oriented research, however, they cannot provide the relevant information: subjects tend to mention referential works and other aspects, but often forget to comment on the process itself (see Hansen, 2006: 10, mentioned in Göpferich, 2008: 37). They also often include only those strategies which have proven to be successful (see Gile, 2004: 8).

Moreover, different subjects may choose to comment on different aspects of their translations. What to some participants seems vital, others could regard as irrelevant. The data collected by means of these notes are thus hardly comparable.

On the plus side, this method does not require the researcher to work as hard as the other techniques.

4.1.6 Questionnaires

Questionnaires allow the researcher to navigate the subjects through their statements, make them answer specific questions so that their comments touch on the aspects of translation process the researcher studies. Nevertheless,

compared to verbalisations, data on paper tend to be less rich. Usually, there are only a few options from which the subjects can choose.

On the other hand, if every participant answers the exact same questions, a high level of objectivity will be reached. Such data are easily comparable and reusable. In addition, with some questionnaires it is possible to let a computer process them. A heavy load can be lifted off a researcher in this way.

4.2   Extraspective methods

Generally, extraspective research methods are viewed as more reliable than introspective methods in terms of the collected information. Computers or other devices used for generating extraspective data are objective, automatic, mostly accurate and have no desire to (consciously or subconsciously) manipulate the output. Computers as well as software applications are completely impartial and unbiased.

Some of the methods mentioned below belong to the realm of computer-assisted research. There are many facts speaking in favour of this approach (see Neunzig, 2000: 95). First of all, many professional translators and students of translation are used to working with a computer. Therefore, the subject will not be distracted in any way if the computer just silently records all their activities, provided the stations do not get slowed down by this. Moreover, many dictionaries, thesauri and other resources are nowadays installed on computers or accessible online. Actually, asking the subject to translate just with a pen and paper could breach the ecological validity[21] of an experiment, as this is not the way translators of today work.

Another advantage of extraspective methods is the following: if the experimental design does not require the participants to cooperate in other ways than just translating, we do not have to tell them that their behaviour is being monitored. Thus, we can avoid negative effects of the awareness of being observed, such as nervousness, desire to outperform etc. Of course, the participants' consents to collecting and processing their data must be obtained immediately after the experiment.

However, problems may arise when human factor comes into play – when the collected data have to be interpreted. Just as Hansen (2003: 36) says: *"Log file data are objective third-person observations, but the evaluation of the results of the movements after the pauses are not."*

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[21]Ecological validity is breached when the experimental setting differs from the setting in which the participant is used to working, and thus changes her/his behaviour (see Göpferich and Jääskelainen, 2009: 179).

As opposed to introspective data, where the subjects have the opportunity to explain the reasons why they did what they did, extraspectively collected information provide ground for speculations only.

4.2.1 Keylogging

The first and most prominent disadvantage of this method is that the output – the logs alone – represent too weak a ground to build hypotheses on, which Translog's inventor, Jakobsen, also admits (see Hansen, 1999, 7). It must always be used in a conjunction with other methods. Without any additional data, it would be very hard to determine what actually happened during the pauses (see 6. Latest trends in process-oriented research to follow Translog's current development).

What many researchers appreciate about Translog is its non-invasiveness into the translation process: all it does is that it silently logs all pressed keys.

In addition, Translog makes the researcher aware of lengthy pauses. It records when exactly the subject got stuck and what words they wrote immediately after the pause ended. Thus, the researcher can base some of their assumptions on the logs and does not have to go through the whole file (as has to be done with screen-recording).

Translog's output is the most used and praised source of "cues" for the cued recall method (see 5. Triangulation), especially when using its replay feature.

4.2.2 Eyetracking

First of all, the equipment for an eye-tracking study is often quite expensive. Therefore, low-budget projects may prefer to make use of other methods.

Another discouraging fact is that today's technology is not yet capable of tracking the eyes at all times, especially when the subject looks away from the monitor. In some experiments, data had to be dismissed due to the poor eye-tracking quality.[22] To facilitate eyetracking it is possible to use a head support, chin rest or bite bar. These measures, however, collide with ecological validity of the experiment. New development along these lines constitute wearable eyetracking glasses.

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[22]For example, in the "Where on the screen do translation students look while translating, and for how long?" study, 3 out of 21 participants' data had to be discarded; in the „Processing study matches in TM tools" study, 3 out of 8 data sets had to be dismissed. Both studies can be found in *Looking at eyes. Eye-tracking Studies of Reading and Translation Processing* (2009).

A further obstacle to eyetracking is the fact that reading for the purpose of translation is not linear. Regressions and jumps, which are harder to track, occur much more often. In addition, the eye-tracking device has to be calibrated for each participant's eyes, which might prove to be inconveniently time-consuming. What is more, this method, even with simple tasks, generates a huge amount of data which, if not transformed into heatmaps or gaze-paths, can be challenging to interpret.

Pupillometry (measuring the pupil dilation) introduces additional challenges. Taking care of all factors that might affect the size of the pupil is a demanding task indeed. As Caffrey (2008: 129) states: *"Krüger (2000) lists 20 factors that can influence the pupil, which include anxiety, taste, habituation, schizophrenia, arousal and novelty (Janisse 1977)."* However, we can diminish the impact of some factors – we can, for example, control the lighting, as well as the brightness of a computer screen, and carry out the experiment in a quiet environment (sound also influences the pupil size).

Eyetracking can be praised for its relative non-invasiveness, provided we do not use any head support, chin rest or bite bar. In particular, this method is very well adapted to testing new CAT (Computer-assisted translation) environments: What do users mostly look at? Which features are superfluous? Which visual elements are distracting? Eyetracking also has a good use in sight-translation experiments, especially when the text is displayed on a computer screen. Moreover, eye-tracking outputs (heatmaps, gaze plots) can be used as cues for retrospective verbalisations (see 5. Triangulation).

4.2.3 Screen recording

As Göpferich (2008: 5) suggests, screen recording alone cannot help us determine what the focal point of the subject is. For example, if they open an online dictionary, how can we know which equivalents they are looking at exactly?

Another disadvantage of the data collected by means of screen recording is that when analysing it, the researcher has to constantly pay a great deal of attention, as there are no obvious indicators of inactivity or other potential issues (i.e. you have to watch the recording in order to find out when and where problems arose). In contrast, Translog uses visual representations of pauses, deletions etc. and so helps the researcher by pre-analysing the file.

Nevertheless, screen recording is one of the most suitable methods for tracking the orientation phase, e.g. when the subject accesses various reference works. No additional equipment is required, and thus the level of ecological validity is very high.

It is true that, in contrast to eyetracking, this method does not tell us where exactly the subject looked. However, some translators have a habit of moving the cursor to the word they are reading, they click on links or select certain parts of texts (click and drag). In this way, they show the researcher what they pay attention to (see Göpferich, 2008: 59). So, if the researcher is interested solely in what the subject reads/writes during the process, this method may have certain advantages (lesser breach of ecological validity) over eyetracking.

Some screen-recording applications can be obtained for free, which makes this method suitable for low-budget experiments.

4.2.4   Video recording

Hansen (see 2008: 390) reports that some subjects feel uneasy while being filmed or even refuse to be videotaped. If they, however, agree to being filmed, the researcher can get data on what the subject's face looked like, what posture they assumed and how they moved. Collected with a video-recorder, the data are objective (as opposed to non-verbal behaviour charts) and available for repeated analysis. The tape can be forwarded onto the researcher's colleagues and be analysed from more viewpoints.

On the other hand, if the recorders are static, the researcher might lose some data should the subject move away from its visual angle. Next, as with all extraspectively gained information, and with facial expressions especially, it can be very hard to interpret what exactly happened in the head of a translator, when they grinned, rubbed their nose, etc. (see Christensen, 2011: 6).

4.2.5   Physiological methods

Many a researcher has avoided these methods because they require additional knowledge of the human body and its reactions to stress, emotions, etc. Obtaining the necessary equipment and expertise is another obstacle to conducting an experiment employing these methods. Furthermore, interpreting the gained data may also prove problematic.

However, once all the above mentioned challenges are overcome, these methods can be well employed to tell us more about the state of the translating individuals. Even if rare in translation research, these data-elicitation methods have often been employed in experiments exploring the nature of interpreting, as they do not generate any additional cognitive load on the subject. And since they have been thus far underused, they could offer yet undiscovered views on translation processes.

EEG, fMRI, PET and similar

Ecological validity of these methods is, of course, very low. Not only do the subjects often have to wear special equipment, they might also be limited in movement – if they want to take a break or just stretch, they might have to interrupt the experiment, and with it, the data flow.

Next, all of these methods can provide only basic information about what is happening in the subject's brain, i.e. where there is activity and on how big it is. Not many hypotheses can be built on such grounds (see Göpferich, 2008: 12 and 63).

Diamond and Shreve (2010: 311) admit that *"[...] some of the studies [using these methods] have their limitations, e.g. translation tasks involving single words and participant pools composed of bilinguals and language students rather than professionals [...]."*

But they (Diamond and Shreve, ibid.) also argue that these methods *"[...] suggest important avenues for further research that move us beyond verbal protocols, keyboard logging and eye tracking."* The next advantage of these methods is that they do not interfere with cognitive processes and that is why they are well adapted to interpreting research, as they collect data during the participant's performance (for an example of such a study see Kurz, 1994).

Costs of an experiment employing these methods are likely to be very high, since it is necessary to obtain the equipment and also find a person with expertise in neurology.

Cardiovascular activity

The heart is a muscle which responds rather to emotions than to cognitive processes. Indeed, if the subject's heart begins to race, it was most probably not caused by difficulties in translation (as this activity is not as stressful as, for example, interpreting) but more likely by other factors.

With blood pressure, one hand has to be put inside a cuff and then squeezed. Similarly, the heart-rate monitor has to be clipped onto one finger (if we want to avoid using stethoscope and watches). These restrictions on movement are huge trade-offs, considering that the data gained might provide relatively poor grounds for speculations.

Skin conductance
aka galvanic skin response

Similarly to heart activity, the level of perspiration is more prone to be affected by emotions and other external factors than by the stress caused by translation. Without combining this type of approach with others, viable

theses are likely to be hard to formulate. What is more, two small electrodes have to be worn by the subject. As these are often located on the fingers, they will most probably limit the subject's ability to write.

Neuroendocrine secretion

Cortisol levels depend on the amount of stress the subject faces. As translating is not as extreme as interpreting, it is quite probable that, again, no relevant output will be gained.

To measure cortisol levels, we have to analyse the subject's blood or urine. We may have doubts as to how many people would voluntarily and repeatedly (as it is necessary to take the sample at least twice – before and during the task) provide their blood and/or urine samples.

Similarly to EEG, fMRI and PET, the requirements on equipment are very high. Last but not least, it is also necessary to involve at least one person with expertise in neuroendocrinology.

Other extraspective methods

4.2.6 Task time

Measuring task time is the easiest way to approach the translation process. It does not require much effort on either side. In turn, we cannot expect to gain much data. On basis of mere time information, we can but speculate about the difficulty of the task.

4.2.7 Non-verbal behaviour charts

This method's weak point is that somebody has to observe and record the subject's non-verbal behaviour. Every individual has different idea of what is relevant and what should therefore be included in such charts. It might be a good idea to substitute these charts with videotapes, if affordable. Video recording is much more objective, it includes the time of day and can be shared with colleagues who also engage in process-oriented research.

4.3   Solving the puzzle

As described above, all methods have, on the one hand, the power to explore specific, sometimes rather narrow areas of translation process. On the other hand, however, each method is burdened by undesirable side effects. A metaphor comes readily to mind: Every single method uncovers a bit of the

jigsaw puzzle. The methods used cause the pieces of the puzzle to have odd shapes. Theoretically, if we found two (or more) methods perfectly matching one another, the connection would be seamless and the pieces lying side by side would give a complete picture of translation process without any blemishes. Nevertheless, in the real world, no combination of methods is perfect and unyielding cracks hinder the view of the process. Sometimes the pieces do not match that well and even cause interference. Still, the potential of successfully combining various methods is clear. In the next section, the practice of combining more data-elicitation methods at the same time – triangulation – will be elaborated upon, this time without the metaphor.

5. Triangulation

5.1   Triangulation in general

Jakobsen refers to Smith (Jakobsen and Schou, 1999: 18) when he explains that *"the triangulation metaphor comes from navigation and military strategy, which use multiple reference points to locate an object's exact position."* When we compare and contrast information we gained by means of various data-elicitation methods, we can better understand the object of our research.

In other words, triangulation is a combination of data-elicitation methods. Combining various methods leads to a richer and more reliable information pool (i.e. multi-method approach). The above mentioned deficiencies of individual methods can be made up for by means of triangulation. What one method misses, the other one might just bring.[23] Hence, triangulation helps us build stronger hypotheses.

5.2   Combinability of various methods

We cannot, however, combine all methods simply at will: With some it is just not feasible, other methods are assumed to interfere with the remaining ones. Having gone through the numerous advantages and disadvantages of the individual methods, we may now proceed to identify the most/least fortunate combinations.

With this goal in mind, I created a simple compatibility table which makes it easy to see which pairs of methods can be combined. With some combinations, interference, i.e. undesirable effects of one method influencing the data gained by means of other method(s), is assumed. If we use, for example, joint translating and some of the physiological methods, it should be taken into account that any changes in heart rate or skin conductance could well be induced by other factors than the translation task only. By other factors I mean, for example, the unwillingness of the subject's colleague to accept their solution, amongst other things. In a similar way, it is assumed that when using TAPs, it would not be advisable to use EEG, for example, because the gained neurological data could easily correspond more to the pressure of producing TA verbalisations than to the process of translation as such. TA has been proven to affect typing precision – it causes higher occurrence of

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[23]For example, screen-recording has been lamented for not showing what the subject looked at exactly. However, the subject might be able to recall this during a delayed retrospective session, when the researcher replays her/him what windows s/he opened, what s/he wrote, etc.

orthographical mistakes (see above), and so keylogs might easily be affected by the TA condition, too.

Table of combinations

Legend:
- **P** = possible combinations (green)
- **Phys** = physiological methods – low ecological validity is assumed (light grey)
- **Imp** = impossible combinations (red)
- **Int** = diagonal lines – interference is assumed
- **Sup** = one of the methods is superfluous (purple)
- **■** = same method (diagonal, black)

	TAPs	Joint translating	Immediate retrospection	Delayed retrospection	Notes on translation task	Questionnaires	Keylogging	Eyetracking	Screen recording	Video recording	EEG, fMRI, PET	Cardiovascular activity	Skin conductance	Neuroendocrine secretion	Task time	Non-verbal behaviour charts
TAPs	■	Imp	Imp	P	P	P	Int	P	P	P	Int	Int	Int	Int	Int	P
Joint translating	Imp	■	Imp	P	P	P	Int	Int	P	P	Int	Int	Int	Int	P	P
Immediate retrospection	Imp	Imp	■	P	P	P	Int	P	P	P	Int	Int	Int	Int	Int	P
Delayed retrospection	P	P	P	■	P	P	P	P	P	P	Phys	Phys	Phys	Phys	P	P
Notes on translation task	P	P	P	P	■	P	P	P	P	P	Phys	Phys	Phys	Phys	P	P
Questionnaires	P	P	P	P	P	■	P	P	P	P	Phys	Phys	Phys	Phys	P	P
Keylogging	Int	Int	Int	P	P	P	■	P	P	P	Phys	Int	Int	Phys	P	P
Eyetracking	P	Int	P	P	P	P	P	■	P	P	Phys	Phys	Phys	Phys	P	Int
Screen recording	P	P	P	P	P	P	P	P	■	P	Phys	Phys	Phys	Phys	P	P
Video recording	P	P	P	P	P	P	P	P	P	■	Phys	Phys	Phys	Phys	P	Sup
EEG, fMRI, PET	Int	Int	Int	Phys	Phys	Phys	Phys	Phys	Phys	Phys	■	Phys	Phys	Phys	Phys	Int
Cardiovascular activity	Int	Int	Int	Phys	Phys	Phys	Int	Phys	Phys	Phys	Phys	■	Phys	Phys	Phys	Int
Skin conductance	Int	Int	Int	Phys	Phys	Phys	Int	Phys	Phys	Phys	Phys	Phys	■	Phys	Phys	Int
Neuroendocrine secretion	Int	Int	Int	Phys	Phys	Phys	Phys	Phys	Phys	Phys	Phys	Phys	Phys	■	Phys	Int
Task time	Int	P	Int	P	P	P	P	P	P	P	Phys	Phys	Phys	Phys	■	P
Non-verbal behaviour charts	P	P	P	P	P	P	P	Int	P	Sup	Int	Int	Int	Int	P	■

In addition, there are specific pairs of methods which are not possible to combine at all, such as thinking aloud and immediate retrospection. Thinking aloud requires the subject to verbalise while s/he is solving a problem, but with immediate retrospection the subject should verbalise shortly after s/he has finished solving a task. These two verbalisation modes cannot be employed at the same time.

There are essentially three stages during which the researcher may apply data-elicitation methods: prior to the translation task, during the task's completion and after the task has been completed. The following table puts the data-elicitation methods into three categories, based on when they are applicable.

	Introspection	Extraspection
Pre-task	Questionnaires	Physiological methods
Task	Think-aloud protocols Joint translation Immediate retrospection	Keylogging Eye tracking Screen recording Video recording Non-verbal behaviour charts Task time Physiological methods
Post-task	Notes on translation task ┌Delayed retrospection ├Narrative Interview └Steered Interview Questionnaires	Physiological methods

Based on the table above, we are now going to elaborate on when it is most advisable to use each data-elicitation method and other details of various experimental designs.

Questionnaires have a very high combinational potential. They usually have no side effects and can be applied both before and after the experiment. They might also be applied in the middle (or at any other point) of a task, but that would probably distract the subjects and it would be hard to justify such an interruption.

Physiological methods should be applied at least twice in an experiment, the timing depends on which aspects of translation process are most interesting to the researcher. It is necessary to have at least two comparable data sets (e.g. skin conductance data collected before the task and during the task). With just one set of data, it would be hard to determine whether the measured values are "normal", i.e. similar values can be measured when the subject is not under pressure, or exceptional. In contrast to other extraspective methods, data gained by measuring physiological variables are less likely to be used as cues (see 5.4 Using various methods successively). Such data could, however, help the researcher steer an interview, e.g. if the researcher knows that the subject's brain activity reached a peak at a particular point in time they might ask the subject what the matter was.

Think-aloud protocols, joint translation and immediate retrospection are the three introspective methods which are applicable online, i.e. while the subjects are translating. The red circles around each mean that they are not combinable with one another.

Data gained by extraspective methods inside the green circle can all be used as cues (see 5.4 Using various methods successively). Video recording and non-verbal behaviour charts share another circle, which means that using both methods at the same time is not necessary. If the researcher has a video recorder, it would be superfluous to note down what the subject does, provided the subject does not leave the room.

Notes on translation task have been placed in the upper part of the cell. The position is not entirely random – when making notes on translation task, the subject(s) might find it easier to justify each decision shortly after they make it, and not after the whole task has been finished. In this sense, notes on translation task are nearing immediate retrospection.

Delayed retrospection is only limited by the following: it has to be performed after the task has been completely finished.

Based on whether the data-elicitation methods are employed at the same time or successively, we can distinguish the two following categories:

5.3 Using various methods at the same time

Using two or more data elicitation methods at the same time (e.g. keylogging, eye-tracking and screen recording) allows us to gain data from various sources during the very same process. As exciting as this may seem,

making sure that the experiment complies with the ecological validity requirements might prove to be a challenging task indeed. Unlike successive use of techniques, the "simultaneous" mode entails taking care of more external factors at the same time.

Moreover, when using various tools (e.g. video and screen recording), it often happens that the output is not synchronised (i.e. when watching the 14th minute of a video recording, this 14th minute can actually be the 16th minute of the screen video).

One of the most fruitful experimental designs in this category is thought to be the combination of eyetracking and keylogging (e.g. Lachaud, 2010: 131; Dragsted 2010: 42). It is especially suitable for examining both comprehension and production processes; it has also been appreciated by those who conducted pauses analysis to determine where the subject looked when s/he stopped writing. As Göpferich (see 2008: 51) emphasizes, the subject may be engaged in a processes directed to the future (planning) or in a processes directed to the past (checking, assessing). Without the support of eye-tracking data, we could not be sure which of these two modes the case was.

When it comes to TAPs accompanied by other data-collection methods, some (e.g. Hohenwarter, 2010) use the term TPPs (Translation Process Protocols), so as to indicate that data from various sources had been collected.

5.4   Using various methods successively

The second way of combining two data-elicitation methods entails applying data-elicitation methods one at a time (e.g. pre-experimental questionnaires, keylogging and delayed retrospection).[24]

The most popular combination in this group is called cued-recall, i.e. the researcher gives the subjects data they can hold onto while they are retrospectively verbalising about what went on in their heads whilst they were translating. Cues may include keylogs, screenshots, non-verbal behaviour charts, eye-tracking data, etc. Confronting the subjects with external cues prevents their memories from decaying. Also, verbalising after the task has been completed usurps no cognitive resources and does not distract the translators from the task at hand.

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[24]Of course, researchers employing methods successively may also include two data-elicitation methods at a time, e.g. keylogging and screen-recording. However, if they combine the data with another set of data gained by other means at a different point in time, the mode is described as successive.

"Triangulation has come to be regarded as a desirable "best practice" in process-oriented research."

(Shreve and Angelone, 2010: 6)

5.5   Triangulation: the way to go

If anyone nowadays designed an experiment where the data would be elicited by means of just one method, the person would probably earn criticism for not considering alternative sources of data as well. Where possible, there is a tendency to verify the output generated with one method by comparing it to additional and independent sets of data. Indeed, it seems that more and more techniques are being added to the researcher's toolkit. If we manage to suppress interference issues and make sure that the level of ecological validity remains high, sound data samples will be collected.

6. Latest trends in process-oriented research

It has never been easier to collect complex information, such as eye-tracking data, screen recordings and keylogs, store them, share them, combine them and reuse them. Just a few decades ago, this would have been impossible to do. Researchers interested in process-oriented translation studies are aware of this fact, proof of which is the occurence of numerous experiments which make use of the new technology.[25] To quote Shreve and Angelone (2010: 2) once again: *"Translation process research, once a more solitary endeavor conducted by few individuals, is increasingly collaborative, large-scale, and international."*

On 9th December 2011, an online International Conference on Translation Process Research was held. Some of the presentations are still available at the homepage[26]. Among the speakers were Riitta Jääskelainen (performance of professional translators in experimental conditions), Sharon O'Brien (eyetracking) and Erik Angelone (student self-analysis). Researchers in translatology seem not only to be very flexible and progressive, but, most importantly: they are also willing to share and cooperate.

Indeed, not only do researchers come together to share their data and conclusions, but whole institutions merge their efforts and conduct so-called transinstitutional studies. When a research project is carried out at two (or more) separate institutions, one can compare and contrast the results – if, and to what extent, the institutions succeed in training future translators and interpreters.

Another current trend in process-oriented research is the so-called longitudinal studies. These studies stretch over a relatively long period of time (3 years in TransComp[27]) and focus mostly on the development of translation competence in a group of people. Usually, a control group (group which receives no translation training) is present as well, so that the researcher can measure the progress of the first group. Of course, there are many additional modes.

Regarding the synchronization of data collected from various sources, the tendency is to embed various tracking techniques into a single tool. By way of an example, Translog, is currently capable of communicating with an eyetracker and also includes a screen recording feature (see Doherty, O'Brien and Carl 2010: 4). This means that by using just a single tool, we are able to obtain three independent but synchronized data sets (eye tracking, screen

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[25]For example, there was an ambitious project called "EYE-to-IT", which took three years (2006 - 2009) and included researchers from six European countries, from Norway to Bulgaria.

[26] http://processresearch2011.com/

[27]Susanne Göpferich introduces her project TransComp on this page: http://gams.uni-graz.at/fedora/get/container:tc/bdef:Container/get.

recording and keylogging data), which makes data collection and triangulation much more convenient.[28]

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[28]As a program which assissts process-oriented research, Translog is getting better and better. It is the most comprehensive tool far and wide. For latest information regarding Translog, see other papers by Carl.

7. My research project

In the Czech translation studies environment, process-oriented research and pedagogy are still more or less new developments. Therefore, instead of rushing into a big project, I chose to first explore the territory. Having done that, I will demonstrate how some of the above described methods and combinations of methods work in practice.

I identified those methods I thought would best suit the local environment and would help me confirm or disprove my hypotheses. The central assumption was that advanced students of translatology would manifest behaviour different from that of first-year students.

7.1 Hypotheses

The main idea behind this experiment was that novices (first-year students) will approach the task in ways that will differ from those of advanced students. I had three specific hypotheses:

1.) Advanced students will apply better search strategies (the consequence of which will be that the target text will contain correct terminology).
2.) Advanced students will often jump from one point of the text to another (and hence they will be able to translate the text more freely than novices).
3.) Advanced students will feel the need to tone down the text and lower the number of metaphors.

I tried to come up with hypotheses that would not entail translation quality assessment, as I wanted to stay in the domain of process-oriented research only. However, my third hypothesis obviously encompasses the translation product. Instead of seeing that as an obstacle, I decided to include this hypothesis in order to demonstrate how observing the process can help us evaluate the product. This last hypothesis was the only one to emerge after I had chosen the text for the task. I will return to the reasons why I formulated the third hypothesis as it stands later (see 7.3 Experimental design, Text).

Apart from these three specific hypotheses I also hoped to reveal additional patterns in the behaviour of both groups. I was aware of the fact that the differences between them might not be very prominent, though. Most research projects contrast groups of novices and professional translators with

many years of experience.[29] My population was more consistent (see 7.3 Experimental design, Participants). However, this has not been regarded as a disadvantage. The relative consistency among the participants allows us to focus on variations of a subtler quality. It is assumed that translators develop their skills while studying translatology. How this happens – which development phase follows which – is still more of a mystery. The two groups were chosen deliberately to find out how subjects with varying degrees of experience approach translation.

7.2   Methods

The most important factor I had to take into account was the cost. The research project was not funded and that was why I had to select only those methods that would incur no or just minor costs. Nevertheless, I was aware that in order to test my hypotheses, I would need a solid data corpus. I have chosen no less than four different data-elicitation techniques:

Pre-experimental questionnaires
Screen recording
Video recording
Cued retrospection
Post-experimental questionnaires

The source text was quite challenging and, therefore, I decided not to use TAPs so that the cognitive load would not be too high. Eyetracking was dismissed due to high costs. Physiological methods would not help me in testing my hypotheses.

Pre-experimental questionnaires included questions regarding age, sex, English language skills (subjective assessment; certifications), stays abroad, main and additional occupations (student, teacher, translator, etc.), university education, translation experience (number of years; translated pages; areas of specializations) and hobbies (see 9. Annexes).

Screen recording would generate a film for each participant, containing all that happened on the screen during the translation. This material would later be used to support the participants' memory during delayed retrospection.

Video recording was from the start perceived as an additional measure. Had I envisioned relying on this data source heavily, I would have had to record each subject separately. However, the hypotheses I stated did not require me to collect high-quality videos.

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[29]For example, in Jääskeläinen, 1996 there were translators with 10-15 years of experience.

Cued retrospection presented the opportunity for the participants to give their opinions on various aspects of the task and on the experiment as such. They were given a list of specific instructions (see 9. Annexes).

Post-experimental questionnaires contained for the most part multiple choice questions; only once were the participants encouraged to give their own definition of a specific term (see 9. Annexes).

7.3   Experimental design

Participants

The philosophical faculty of Palacký University offers a 3-year bachelor programme: *English for Community Interpreting and Translating* and a consecutive 2-year Master programme: *English for Community Interpreting and Translating*.

My population included five first-year students in the Bachelor programme, one third-year student in the Bachelor programme who graduates this year and four first-year students in the Master programme (who have completed the above Bachelor programme in Olomouc). Ten people in total.

These two groups of participants were selected deliberately; I wanted to find out whether there is a difference in the translation process as demonstrated by novices and by advanced students. Three years is not a long time, so their behaviour will probably have some elements in common, but since it is assumed that student do improve over the course of their studies, I expected to see some consistent, even if slight, tendencies in both groups.

For factual information regarding the participants (gained by means questionnaires) go to 7.4 Results.

Environment
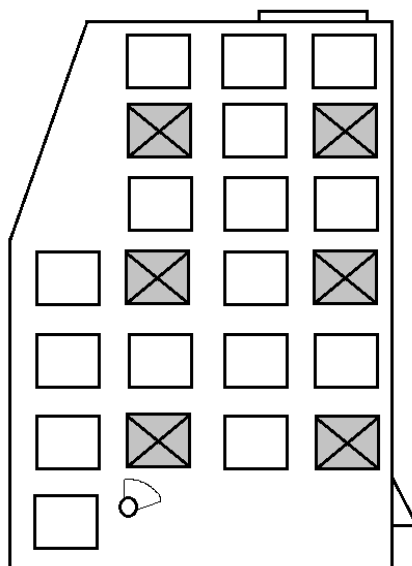
All sessions took place in the same room at Křížkovského 10 in Olomouc, Department of English and American Studies of Palacký University Olomouc. (See the picture on the left.)

Subjects are familiar with the room; they all had one or more seminars there. The crosses designate the computers that were used by the participants. The choice of workstations was motivated by the desire to allow every participant to work as naturally as possible. Every subject had about two metres free space around her/him and it was hoped

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that s/he would not be distracted by the rest. There is a video recorder in the front section of the room which captured the subjects' non-verbal behaviour.

Text

I had a few hypotheses regarding the process of translation as manifested by novices and advanced students of translatology. I had to choose a text that would allow me to test these hypotheses. I finally settled on a paragraph from a study entitled *2010 Data Breach Investigations Report*, conducted by the Verizon RISK Team in cooperation with the United States Secret Service.[30] A single excerpt (861characters with spaces) on page 6 was used as the source text for the translation task:

Cybercrime Year in Review, 2009

2009 was, in many ways, a transformational year in the trenches. As attackers and defenders vied for advantage, there were numerous developments on many fronts around the world. It's difficult to measure who's winning with any certainty but there are, at least, some measurements available. One of them, public breach disclosures, fell noticeably in 2009. Organizations that track disclosed breaches like DataLossDB and the Identity Theft Resource Center reported figures that were well off 2008 totals. Private presentations and hallway conversations with many in the know suggested similar findings. Our own caseload reveals this as well. In a report dedicated to the analysis of annual breach trends, it seems wholly appropriate to reflect on why. It also provides a fitting backdrop for discussing some key 2009 milestones.

Two additional paragraphs of the same text were pasted into the translation brief as well in order to make it easier for the students to understand the context (but these two paragraphs were not marked for translation; see 9. Annexes). The students were also provided with the link to the pdf document from which the text originated.

The given excerpt introduces a one-page summary of cybercrime in 2009. The text is particularly challenging – not only because it involves numerous metaphors, but also in terms of specialized vocabulary of the IT industry (see 7.4.4 Search and translation strategies: public breach disclosure). If a similar document – an official study – had been written and published in the Czech Republic, its style would probably differ quite a lot. In our environment, a study is supposed to be unemotional and sober; its aim is to

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[30]http://www.verizonbusiness.com/resources/reports/rp_2010-data-breach-report_en_xg.pdf

objectively present the results of an investigation. Even though the translation brief instructed the participants to translate the text so that it could be used as an article in a high-quality magazine, I would still expect them to produce a target text that would fulfil the Czech stylistic norms typical of these kinds of documents (studies, reports, etc), i.e. I would expect them to tone down the text and avoid expressive language.

Last but not least, I chose the text because I am familiar with similar documents and often work with this type of texts.

Task time

The participants were given 50 minutes to produce the translation. Translation state exams at Palacký University require the students to translate a text of 1800 characters in 90 minutes. The text I used has 861 characters. Were the conditions equal to those of the state exams, the participants would have to have just about 43 minutes. Therefore, an ample amout of time has been provided.

Data collection

The data was collected in three sessions on two days. Each session lasted about an hour and a half and took place in the room described above. All sessions had the same structure:

Pre-experimental questionnaires	*(10-15 minutes)*
Screen recording + Video recording	*(50 minutes)*
Cued retrospection	*(10-20 minutes)*
Post-experimental questionnaires	*(5-10 minutes)*

After the subjects had completed *pre-experimental questionnaires*, they were asked to launch *screen recording* with Camtasia Studio and start translating. At the same time the researcher started *video recording* their non-verbal behaviour. After 50 minutes, the subjects were instructed to stop translating and turn off the recording. The researcher turned off the video recorder. Next, the participants were asked to launch Audacity, put their headphones on and start recording. On their screens, Camtasia Studio replayed their activity and the participants were encouraged to start *verbalising*. Subsequently, they filled in *post-experimental questionnaires*.

At the very end the subjects were asked to provide their consent to collecting and processing their data for the purposes of this bachelor thesis. The researcher committed herself to processing the data anonymously.

7.4 Results

This section presents some of the collected information. The researcher has striven to convey the data as objectively as possible, but is aware of the fact that by choosing the form and by selecting the data samples she might have influenced it. Every subsection (e.g. 7.4.1 Participants and their backgrounds) includes a discussion at its end.

7.4.1 Participants and their backgrounds

ID	Student for	Age	Sex	Attended seminars	Translation experience (outside university)
N1	1 yr	18-20	f	2 trans. seminars; 1 CAT; 1 theory	3 yrs; 10 pages
N2	1 yr	21-22	m	1 trans. seminars	4 yrs (subtitling)
N3	1 yr	18-20	f	2 trans. seminars; 1 CAT; 1 theory	-
N4	1 yr	18-20	m	1 trans. seminars; 1 theory	-
N5	1 yr	21-22	f	2 trans. seminars; 1 CAT	-
A1	3 yrs	21-22	m	6 trans. seminars; 2 CAT; 2 theory	1 yr
A2	4 yrs	23-24	f	8 trans. seminars; 2 CAT; 3 theory	500 pages
A3	4 yrs	25-26	f	8 trans. seminars; 2 CAT; 2 theory	3 yrs; 100 pages
A4	4 yrs	23-24	f	8 trans. seminars; 2 CAT; 3 theory	3 yrs; 500 pages
A5	4 yrs	25-26	f	8 trans. seminars; 2 CAT; 2 theory	3 yrs; 500 pages

The individual subjects are referred to by codes. N stands for novices, A designates advanced students. The number following the letter is a random 1-5 number.

All subjects are full-time students at Palacký University in Olomouc and they study either in the bachelor programme "English for community translating and interpreting" (N1-N5 and A1) or in the consecutive master programme (A2-A5).

There are some seminars that the students have to pass in order to obtain their Bachelor's and Master's degree respectively. They have translation seminars, each worth 3 ECTS (with the exception of translation seminar 6 which counts for 4 ECTS). They also have to attend CAT (computer-assisted translation) seminars, each worth 3 ECTS and some translation theory seminars which count for 4 ECTS each.

The population included subjects with no field experience as well as subjects who had already translated up to 500 pages.

ID	Interest in data security	Familiar with "data breach"?	Familiar with similar texts?
N1	medium	no	medium
N2	high	yes	high
N3	low	no	low
N4	high	yes	medium
N5	very low	no	medium
A1	medium	yes	medium
A2	medium	yes	medium
A3	low	yes	low
A4	medium	yes	low
A5	medium	yes	medium

The table above helps us understand the subjects' profiles better. In particular, it shows us what their relationship towards data security is. If one of the subjects delivered an excellent target text later on, we could check whether it could be related to their interest in data security or whether they simply performed well.

Discussion

There are many differences even in this relatively consistent population. We could argue that since subjects A2, A4 and A5 have the greatest amount of experience, their behaviour should probably be more automatic than that of others. Conversely, subjects N3, N4 and N5 who have no experience in translating outside university classes should approach the task as something relatively new. Subjects N2, N1, A1 and A3 represent the transition between novices with no experience and advanced students.

Only three subjects were unfamiliar with the phrase "data breach" and all of them were female novices. Both males in the N-group stated that their interest in data security was very high, which could have helped them understand the field-specific terminology. Only N2 had translated a similar text before, though. Indeed, it is not a text that would normally be introduced to students in a translation seminar.

7.4.2 Division of time
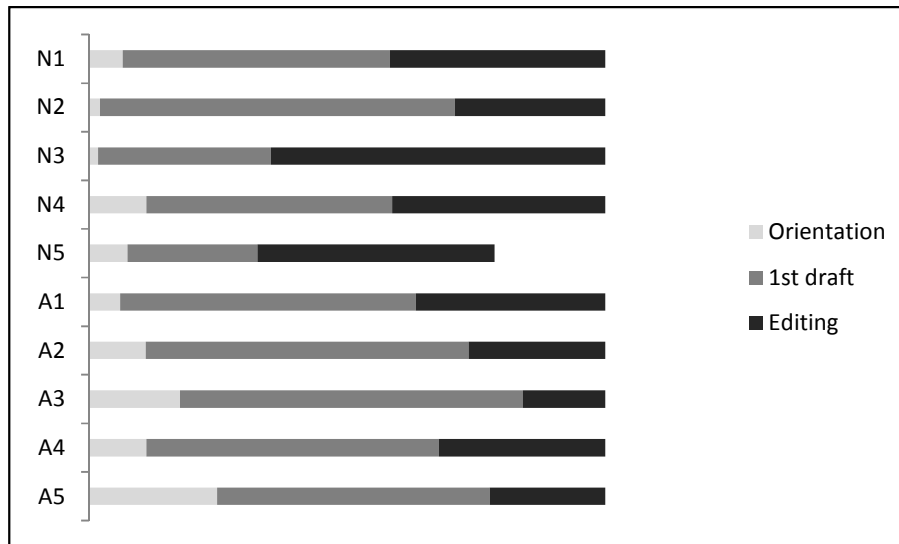
The chart above shows how different subjects divided their time (50 minutes). First was the *orientation phase*, which most of the subjects spent on reading the source text, launching various dictionaries and some of them would also look for context. The *first draft stage* started when the subject wrote the first letter of the target text, and ended with the dot of the last sentence. All subsequent actions are described as *editing*. All except one subject (N5) used the whole 50 minutes.

This division into phases and stages is not completely unproblematic, some subjects started the translation, then looked for context, then went on with the translation, then edited a sentence etc. One cannot really draw strict lines between the various stages. However, Jakobsen (2003, mentioned in Göpferich, 2008: 29) employs the same framework.

There is a general tendency among advanced students to start the work on the first draft later than novices. In average, the orientation phase took about 7 minutes for the A-group, and about 3 minutes for the N-group. But of course, there is the subject A1 who started as early as at 3:03, and N4 who started at 5:34, so even though there is a tendency, it is not a rule. The same goes for the first draft. While it took about 22 minutes for the N-group to finish it, the A-group needed on average 29 minutes. And so logically, the last phase is much longer for the N-group (22 minutes in average) than for the A-group (13 minutes in average). A chart depicting the average times follows:

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Discussion

It seems that novices rush to finish the first draft only to have to edit it heavily later. Their verbalisations[31] confirm this:

N1: *In the first draft, I tend to copy the structure of the English sentence I am translating and I translate the text word-for-word, while in the next phase I am going to change this. Because if I now focused on stylistics as well, I would most probably skip some information. [Later:] it occurred to me that in this type of text, it was vital to get the meaning... and stylistics was secondary. Although I knew from the very start that when I finish the sentence, I will have to change it. [Later:]So, here I am going through the text once again and improving wrong solutions.*

N2 has not commented on editing.

N3: *In the beginning, I had a very rough draft, which means I translated only those words I was sure about and so there were some weak spots. Then I read it again and looked up the words that I omitted. I tried to come up with a term that would be equivalent with the source term or just so that it would make sense. I re-read the text several times and I would always add some words.*

N4: *I have re-read the target text many times. I have edited some bits.*

N5: *I first translated the text in a more or less word-for-word manner so that I knew what it is about and in the second phase I transcribed it so that it would sound more Czech. [Later:] and the final version is a rather free translation, there is quite a big difference between the first draft and the final version.*

It occurs that novices underestimate the orientation phase. They seem to perceive it as something that could hold them up. Some even seem to get the meaning of the source text *while* translating – i.e. not before (e.g. subject N3 spent only 0:52 minutes on the orientation phase). Afterwards, however, they have to wade through their translations and laboriously eliminate the mistakes they had made (often just because they lacked the context). What is more, if they come up with an incorrect solution, they often fail to edit it later – it might fit the sentence or it might even sound logical. Because they focus on editing the target text on the stylistic level, they tend to disregard the source text and leave the real mistakes there.

In turn, let us examine some of the verbalisations of the A-group.

A1: *I re-read the text and edited some parts that didn't sound very Czech to me so that they would feel more natural.*

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[31]All verbalisations were collected in Czech. I translated the verbalisations as faithfully as possible and, where acceptable, I retained the original sentence structure.

A2: *When I read the text again, I focus on commas, look at the mistakes that the text editor underlines. I eliminate typos or incorrect use of objects and predicates. So I first get rid of the grammatical mistakes, then I focus on some decisions I made and occasionally change them.*

A3: *I usually translate texts very roughly at first; the drafts include major mistakes and are heavily influenced by the English sentence structure. After that I create a second version, and then I also have a third phase where I edit the text not only on the stylistic level but also other aspects, such as terminology. Here I managed to create the two first versions only.*

A4's recording was damaged. (See 7.5 Experienced issues.)

A5: *I usually use the spellcheck tool, re-read the text several times. I look for repetitions and typos that spellcheck didn't detect.*

It seems that on average the A-group is somehow more organized and conscious of having reached the editing phase. Some subjects report on using spellcheck and they deliberately focus on sentence structure, commas and other mistakes that are very likely to emerge in a translation. It seems they already know what to look for. I would not say they edit less, but their editing process is certainly much more focused.

7.4.3 Sources consulted

ID	Google translate	Monolingual dictionaries	Bilingual dictionaries	Czech sources	English sources	English forums	Google (only CZ)
N1	10x	4x	9x	1x	1x	0x	3x
N2	1x	1x	15x	0x	0x	0x	0x
N3	8x	0x	16x	0x	3x	0x	2x
N4	0x	2x	14x	1x	0x	0x	3x
N5	0x	0x	23x	0x	2x	1x	0x
A1	8x	0x	18x	0x	3x	1x	0x
A2	0x	1x	18x	0x	2x	0x	0x
A3	0x	0x	21x	6x	0x	0x	0x
A4	4x	2x	14x	3x	0x	0x	3x
A5	0x	1x	13x	5x	3x	0x	2x

Google Translate – None of the participants pasted the whole text in Google Translate. Subject N3 was actually the only one who used it for complete sentences, and that only three times. The tendency was to use Google Translate for phrases with 2-3 words, such as *vied for advantage* or *fitting backdrop*. All participants who used Google translate tried to find the equivalent for *public breach disclosure* there.

Monolingual dictionaries – With only one exception (subject N4), monolingual dictionaries (such as The Free Dictionary; Oxford Learner's Dictionary) were used only as a secondary source of information. When there was no satisfactory equivalent to be found in their primary dictionaries (bilingual), some participants would resort themselves to monolingual dictionaries. The most popular word in this category was *trench(es)*, three out of six participants who used this kind of dictionary entered it in the search.

Bilingual dictionaries – These dictionaries constituted the primary source of information for the majority of the participants (with one exception, subject N1 preferred Google Translate). Subjects made use of online (Seznam slovník; Online slovník, Slovnik.cz) and also pre-installed dictionaries (Lingea Lexicon 5; Professional AČ). Usually, the subjects would look up single words, such as *transformational* or *development*; sometimes they would try to find collocations like *reflect on, well off*; rarely they would also enter terms, e.g. *breach disclosure*; and idiomatic expressions, e.g. *hallway conversation*.

Czech sources – Parallel texts in Czech were popular with participants A3, A4 and A5 who not only skimmed through, but really read into these texts, especially subject A5. Participants N1 and N4 opened one Czech text each, but spent only few seconds reading it.

English sources – Some participants accessed the homepage of the two organizations mentioned in the source text – *DataLossDB* and *Identity Theft Resource Center*. Another popular site was *Wikipedia*.

English forums – In both cases the searched phrase was "in the trenches".

Google (only CZ) – Quite a few participants applied the following strategy: They entered an English word or a phrase and then chose the "Stránky pouze česky" option (i.e. Pages in Czech only). Usually, they searched for *Identity Theft Resource Center*, *public breach disclosure* and *DataLossDB*.

Consulted sources for each group in total:
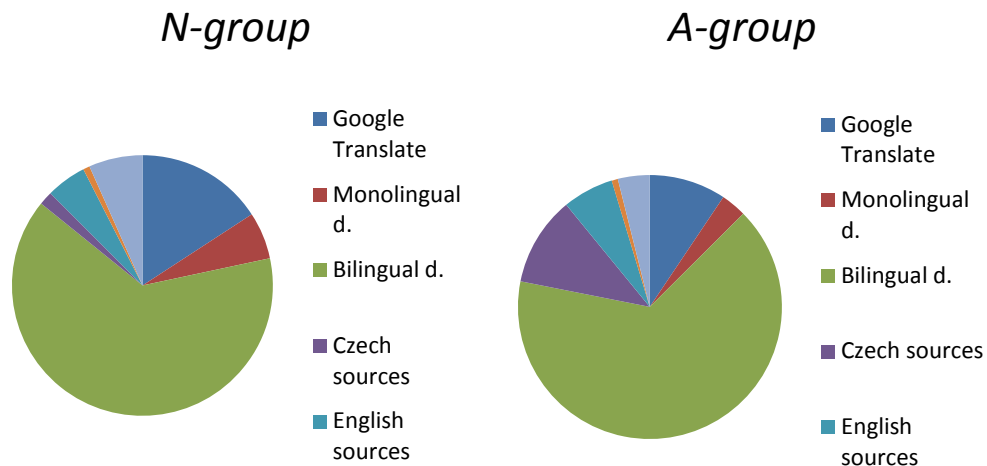
Discussion

The most obvious tendency among the advanced students A3, A4 and A5 is that, in contrast to other subjects, they consulted several parallel texts in Czech. Those A-group members who did not consult Czech sources accessed at least some English parallel texts. Subjects in the N-group prefer English sources, if any. N1 and N4 accessed one parallel text in Czech each, but that of N1 was unrelated to the topic and that of N4 was very poor.

A3, A4 and A5 verbalised that they wanted to find out what terminology and register are typical for this kind of texts. Thanks to this, their versions were the most faithful – i.e. terminology and logical links have been preserved. When evaluating the translations, the products of A4 and A5 proved to be the best. A3's translation includes minor discrepancies but is still superior to the rest (perhaps excepting N5). It would appear that consulting parallel text in the target language might be a very successful strategy.

Regarding the use of bilingual dictionaries, most subjects verbalised later that even if they thought they knew a word in English, they would look it up anyway, just to make sure or to find the right equivalent.

7.4.4 Search and translation strategies: public breach disclosure

As this term – public breach disclosures – constituted for many subjects the most challenging aspect of the text, their search and translation strategies are worth comparing. The source text targets experts in the field of IT security

and so the issuer avoided explaining what is meant by every single term. With public breach disclosure, the authors of the study went even further and omitted the word "data". The expression "breach" has many interpretations. Of course, in the study it was clear to the sender (issuer) as well as to the receiver (IT expert) that it refers to "data breach". Subjects of our experiments (especially those who had not accessed any parallel text), however, had difficulties understanding (and hence translating) the term.

On the next few pages, I would like to compare and contrast search and translation strategies of four subjects. They were not picked at random. I decided to resort to TQA once more and chose two students (A5, N1) who delivered a good solution and another two (N3, A3) who failed to provide an acceptable translation of the term. Perhaps we will be able to pinpoint some of the "successful" and "unsuccessful" strategies.

The data below were collected by means of screen recording and cued recall. Because of space limitations, I include only those steps and verbalisations which are related to the term public breach disclosures. The final translations of public breach disclosures are emphasized.

Subject A5

Screen recording data

	...
7:00	enters "data breach" in Google search
7:23	opens Wikipedia article "Data Breach"
7:52	enters "public breach disclosure" in Google search
8:22	enters just "public breach" in Google search
8:38	looks up "breach" in a bilingual dictionary
9:01	searches "public breach disclosure" in the source pdf document
9:49	looks up "disclosure" in a bilingual dictionary
10:51	looks up "public breach" in an online bilingual dictionary
	...
20:49	Reaches the point where "public breach disclosure" appears in the source text
20:58	Reads document "Rigorózní práce:Technická a infrastrukturní počítačová kriminalita"
21:31	enters "public breach" in google search and chooses "Pages in Czech only"
	...
21:58	browses search results for "public breach"
22:46	enters "breach" in a bilingual dictionary
23:08	...
24:44	browses a webpage entitled "počítačová kriminalita v české republice"
25:20	translates public breach disclosure as "zveřejněné záznamy internetových podvodů"; and translates further
26:17	translates disclosed breaches as "inernetové podvody"; continues translating
28:00	again browses the webpage "počítačová kriminalita v české republice"
28:21	marks "zneužívání osobních dat občanů" with the cursor

28:37	reads the original pdf document
28:59	enters "DataLossDB" in Google Search
29:01	reads the search results, marks "and data breaches worldwide" with the cursor
29:08	again opens the tab with "počítačová kriminalita v české republice"
29:24	edits the tentative translation to "**zveřejněné záznamy zneužití osobních dat**"
30:02	continues translating

Cued recall (verbalisations):

"... and now I am going to look up some terminology, such as public breach disclosure, because I am not familiar with those (terms)."

"... data breach, I was not sure about that.. What I usually do is that I choose the "Czech only" option in Google search. And I try to find out whether it (data breach) occurs in any Czech document..or in a bilingual document.."

"Public breach disclosure was a bit of a problem. I looked it up, I found somebody's dissertation... and then I found another document where they focused on the actions..the crimes that happen in this way... The major problem was the word public... which means that it somehow relates to the public, it relates to misuse of public data... and in the end, it occurred to me .. based on the paper I found... and also the other document.. it transpired that it could be something like misuse of personal data. And so I used this in the text, in the translation."

Subject N1

Screen recording data

	...
10:03	reaches the point where "public breach disclosure" appears in the source text
10:20	enters "public breach disclosure" in Google Translate
10:48	enters "public breach disclosure" in Google Search
11:02	enters just "breach disclosure" in Google Search and chooses "Pages in Czech only"
11:40	looks up "breach" in a monolingual dictionary
12:01	enters "breach disclosure" in Google Translate
12:10	translates public breach disclosure as "zamezení přístupu" and continues translating...
14:07	translates disclosed breaches as "zamezení přístupu"; and continues translating
	...
33:50	again enters "public breach disclosure" in Google Search
34:02	browses the results
34:47	opens a legal document entitled "Review of the Markets in Financial Instrumets Directive"
34:49	browses the document
35:02	searches for "disclosure" in the text
36:59	enters "breach disclosure definition" in Google Search

37:15	opens an English webpage dealing with data breach
37:36	changes the tentative translations to "**počet případů zveřejnění citlivých dat**"
37:42	starts editing the whole translation...

Cued recall (verbalisations):

"Here I was confronted with the term public breach disclosures... and of course, at first my translation of it was incorrect (laugh)... because I was not focusing on searches in parallel texts. But I knew I would have to get back to it later and for that reason... I wrote there something, knowing I will later devote some time to a thorough search and then improve the translation because... I knew that if I get stuck here, I will be pressed for time finishing the rest of the translation."

"From my experience I know that sometimes English terms also occur in Czech texts, so I browsed some Czech sources to see if I could find something. When I established that it's not a term that would be used often, it was clear to me that I would have to somehow solve this and translate it on my own. And when even a thesaurus did not help I decided to come back to this later... and I didn't try to solve this in the drafting phase of translation."

"Here I found a parallel text for the term public breach disclosure. I understood what it was about.. I hope (laugh). So I am now improving the translation, changing the term to published data..but now I have the verb published twice in the sentence, so... I ... change the sentence... and basically... try to avoid repeating the same word."

Both above mentioned subjects succeeded at providing acceptable solutions. Following are the screen recording and cued-recall data of the two subjects who were less successful.

Subject N3

Screen recording data

	...
5:40	Reaches the point where "public breach disclosure" appears in the source text
	...
6:24	writes "porušení veřejné"
6:36	looks up "disclosure" in a bilingual dictionary
7:01	writes "odhalení" and deletes "porušení veřejné"
7:20	looks up "breach" in a bilingual dictionary
7:26	adds "porušení veřejný"
7:49	edits the headline...
8:01	goes back to the word "veřejný"
8:18	edits it to "veřejn ."
	...
8:56	reaches the point where "inernetové podvody" appears in the source text
9:26	opens Google Translator
9:36	enters "Organizations that track disclosed breaches" in Google Translate
9:46	edits the beginning of the sentence

11:07	looks up "disclosed" in a bilingual dictionary
11:23	translates disclosed breaches as "tato porušení"
	... finishes the first draft and starts editing
28:01	again reaches the point in text where "public breach disclosure" appears
28:11	changes "porušení veřejn ." to "porušení veřejné"
28:32	enters "One of them, public breach disclosure, fell noticeably in 2009" in Google Translate
29:09	adds "pokles" in front of "porušení veřejné"
29:26	enters "breach disclosures" in Google Search
29:39	enters "breach disclosures czech" in Google Search
30:00	enters "public breach disclosures czech" in Google Search
30:02	browses the search results
30:30	opens the original pdf document
31:03	tries to look up "data breach report" on the website of the institute that issued the pdf document
31:20	tries to look up "2010 data breach report" on the website of the institute that issued the pdf document
32:00	browses the website, looks for a Czech language version
33:15	looks up "verizon" in Google Search, opens a Wikipedia page; looks at the available language versions
33:47	starts editing the translation...
34:51	changes "odhalení porušení veřejné" to "odhalení porušení veřejných sítí"; goes on editing the translation
40:00	changes "tato porušení" to "tyto přestupky"; goes on editing the translation...
46:37	enters public in a bilingual dictionary
47:49	changes "porušení veřejných sítí" to "**přestupků veřejných sítí**"
48:22	enters "public breach disclosures" in Google Translate; goes on editing the rest of the text

Cued recall (verbalisations):

"...it was clear to me that attackers hack into security companies... into networks of security companies."

"Public breach disclosure... was very hard... how to translate this... because public as the public... breach as a violation... and disclosure means to reveal something. When put together... I could not find any... any phrase that would mean this. So I... had various options with which I wanted to substitute this. However the word public, which was most probably meant as... as ...an adjective. And I also tried to find an adjective, so I looked it up in Seznam[32], I tried Google Translate as well... if it is some frequent phrase. I searched in Google, too, generally... but it didn't find anything. So then I translated it as a public networks misdemeanour. "

"I had problems finding public breach disclosure... this took a great deal of time."

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[32]Seznam is a popular online CZ-EN and EN-CZ dictionary (http://www.seznam.cz)

Subject A3

Screen recording data

	...
2:09	looks up "disclosure" in a bilingual dictionary
	...
6:19	opens the source pdf document
	...
20:00	reaches the point where "inernetové podvody" appears in the source text
20:43	enters "hackeři bezpečnost odhalení veřejný" in Google Search
21:14	translates public disclosure as "veřejně odhalené"
21:25	looks up "breach" in a bilingual dictionary
22:02	adds "útoky" to "veřejně odhalené"
22:15	deletes "veřejně"→("**odhalené útoky**")
23:14	enters "public breach" in Google Search
23:20	enters ""public breach" czech" in Google Search
24:00	continues translating

Cued recall (verbalisations):

"Public breach disclosures was a problematic phrase for me and I think I have not solved it because I had to think about those 50 minutes we had to complete the task. This text... it is not the type of texts I am familiar with... and my vocabulary is very limited in this area. Because it was so unfamiliar to me I had to look for the appropriate way of expressing myself in this context and 50 minutes was just not enough for me."[33]

"This translation is a compromise between the time we had and quality. I am not... very satisfied with it."

Discussion

When it comes to search strategies, advanced students seem to be more capable of identifying the key terms and potential problems in their translations. This allows them to conduct searches in a more "conscious" manner – they know which words exactly they should look up and they often do this *before* arriving at the line which includes this word.

Subject A5, for example, read the source pdf document and established that the expression "data breach" was central. After cybercrime (in the headline), this was the second word she looked up in Google Search.

Subject A3 translated the 3rd sentence and went on to translate the 4th. However, before writing anything, she looked up a word which was located in the 6th sentence. After browsing the results, she returned to the 4th sentence.

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[33]The subject also complained about the computer being very slow, which was confirmed by the recording. I will talk about this issue in 7.4. Experienced Issues.

This confirms my second hypothesis – advanced students tend to jump from one point of the text to another.

In contrast, novices worked in a more linear way – they would usually look up those words and expressions that were in the sentence they were translating.[34] For instance, here is the sequence of words subject N5 looked up:

> *cybercrime – review – transformational – in the trenches – public – disclosure – fell – public breach disclosure – organizator – well off – caseload – reflect – backdrop*

From now on, we are going to disregard the division into A-group and N-group and concentrate on successful and unsuccessful search and translation strategies. This cannot be done without using TQA – i.e. identifying successful and unsuccessful solutions.

What A5 and N1 share is that unlike N3 and A3, they both looked up "data breach", even though this expression was not present in the text that was marked for translation. A5 did this relatively early on (7th minute), N1 read an English text dealing with data breach right before she changed her tentative translation to what could be seen as an acceptable solution (37th minute). As stated above "data breach" is a key term and for those who are not IT security experts "public breach disclosure" might be an unknown term. The only way to understand what it represents is to examine the context. And so one could argue that if a text was written for a very specific group of people (IT experts), it is advisable to first explore similar texts (or, if available, other parts of the same text) to get familiar with the topic.

Let us closely observe subject N3 from 6:24 to 8:18. At first, she does not seem to realise that "public breach disclosure" is one separate item. (In contrast, A5 and N1 both look up all three words together. Realizing the search results are not really helping, they later look up the words separately in dictionaries). Towards the end (31:03), N3 visits the issuer's website and tries to find the study there; she also browses various language versions of the site. However, a Czech version is not available and the subject goes back to editing the text. At 33:51 she edits her translation of public breach disclosure to "odhalení porušení veřejných sítí". This phrase might have been inspired by her faulty translation of the second line.[35] It seems that, instead of looking for

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[34]Indeed, I am not the first person to discover this: *"One insight gained from Krings' comparison was that professionals use holistic strategies involving the text as a whole, whereas non-professionals follow linear strategies involving small translation units such as words and structures. These findings were confirmed by later TAP-studies from Finland (Jääskeläinen 1989, Tirkkonen-Condit 1989), which show that professionals activate their general knowledge and experience and focus on the sense of a text, whereas learners concentrate on words and formal elements."* (Snell-Hornby, 2006: 124).

[35]Zatímco hackeři a obránci bezpečnosti firem spolu bojovali o výhody v síti, došlo ve světě k mnoha vývojům na předních frontách.

external context, N3 tries to deduce what the translation should be from what she has already translated.

A3's translation is not unsatisfactory either, but, she is clearly aware of that (see A3's verbalisations above).

7.4.5   Metaphors and collocations

Metaphors and collocations, typical of literary works, are often hard to translate. The fact that the text used was an official study might have made it even more difficult. As I already mentioned, if a similar study had been produced by a Czech institution, it would undoubtedly contain less metaphors and colloquial language. This subsection resorts to TQA once again, so that we can compare the various solutions regarding the level of colloquiality and originality. The data we gained by means of process-oriented research methods will help us determine how the subjects arrived at their solutions.

ID	in the trenches	vie for advantage	fronts	hallway conversation	those in the know	fitting backdrop
N1	Bojiště	snažili se získat taktickou výhodu	fronty	informace z kuloárů		podklady
N2	v zákopech	přetahovali o výhody	frontách	konverzacích na chodbách		dobré pozadí
N3		bojovali o výhody	frontách	prezentace v halách	experty	vhodné pozadí
N4		mezi sebou přetahovali	frontách	konverzace	povolanými osobami	vhodný prostor
N5	v zákopech internetové války	lítý boj	frontách	hovory	odborníky	pozadí
A1	v kybernetických zákopech	bojovali o lepší postavení	frontách	rozhovory na chodbách	zasvěcenými	vhodné podklady
A2		soupeřily mezi sebou		rozhovory	lidmi, kteří se v tomto světě pohybují	příhodné pozadí
A3	zákopovou válku	bojují o převahu	frontách	kuloární rozhovory	zasvěcenci	vhodným podkladem
A4	zákopové války	souboj o převahu	frontách	kuloární diskuze	zasvěcenými	vhodný základ
A5	zákopové válce	soupeřili o větší náskok	front	rozhovory	lidmi z oboru	vhodný podklad

To better understand the decisions of individual translators, I also include their answers to question number 7 in the post-experimental questionnaire (The text is very rich on idioms, collocations and metaphors. Have you changed this in your translation?):

N1:	*Yes, although it was not my intention. I couldn't always find the right phrase in Czech.*
N2:	*Yes, although it was not my intention. I couldn't always find the right phrase in Czech.*
N3:	*Yes, I consciously toned down the text.*
N4:	*Yes, although it was not my intention. I couldn't always find the right phrase in Czech.*

N5:	*No, I didn't think about this.*
A1:	*No, I felt it was necessary to render those phrases as closely as possible.*
A2:	*Yes, although it was not my intention. I couldn't always find the right phrase in Czech.*
A3:	*No, I felt it was necessary to render those phrases as closely as possible.*
A4:	*No, I didn't think about this.*
A5:	*Yes, although it was not my intention. I couldn't always find the right phrase in Czech.*

In the N-group, four subjects admitted changing the text in terms of metaphors and colloquial expressions. The A-group included only two subjects who stated this as well.

Discussion

Contrary to my initial expectations, advanced students did not tend to tone down the text. It was expected that after considering who the target reader could be, the subjects would feel the need to produce a more sober translation. This was not the case, though. Two of them (A1, A3) even stated that it seemed important to them to render those phrases as closely as possible. It appears they disregarded the fact that stylistic norms for a study in English differ from Czech stylistic norms.

When it comes to the presented solutions, advanced students seem to at least try to incorporate the denotative values of the expressions. Having not found an equivalent in Czech, the novices would often omit the information altogether, which could mean that they approach the text in a more word-for-word manner. Advanced students, on the other hand, seem to be capable of distilling the meaning and thus find it easier to create their own solutions. In other words, as soon as the expression cannot be translated word-for-word, members of the N-group are at loss and have difficulties inventing their own, free translations (e.g. translations of "vie for advantage").

One of the most original translations of the phrase "in the trenches" was provided by A1, who came up with "v kybernetických zákopech".

A1*: In the trenches, it is clear that it is an idiom related to war and so... it was perhaps the biggest problem, that is how to incorporate these trenches into the target text and that's why I decided to retain this idiom so as it is. I just added the word "kybernetických" so that it would be obvious the war goes on between hackers and IT experts.*

A1 added the word "kybernetických" right after he finished his first draft. He does not comment on why he chose this specific word. It seems it was what could be described as a sudden spark of inspiration.

Following are the verbalisations the N-group produced regarding the omissions they had made:

N1: *In the know, I decided to solve this by means of a free translation because... it occurred to me that repeating two similar pieces of information is not necessary. And also it is a very frequent Czech collocation "informace z kuloárů". Such conversations are held among people in the know so I killed two birds with one stone.*

N2: *In the know... Is that a kind of participle? In the know.. such as "vědíce". No, wait... Private presentations and hallway conversations with many in the know... with many in the know. I haven't translated this. Now I see... with many interested... "s mnohými zainteresovanými".. with many affected... or with many who are familiar with this..yes, I suppose "s mnohými obeznámenými".*

N3: *In the trenches, I omitted the phrase because I didn't know how to translate it. Trench means "příkop" and I didn't know how to incorporate it in the sentence, so I omitted it.*

N4: *In the trenches, I omitted this because I found out it means "v zákopech" and I think this does not fit the context at all. So, I omitted this piece of information.*

Subject N1 explains her strategy very well. Subject N2 does not state the reasons why he omitted the phrase, he just offers some possible solutions. N3 and N4, who were confronted with the phrase "in the trenches", seem to underestimate the metaphor. It stretches over the first three sentences. Both later decided to translate "vied for advantage" and "fronts" and, therefore, one could argue they were not consistent in their decisions. One could speculate that they had not seen the link among the "military" expressions: *in the trenches, vie for advantage* and *fronts*. Advanced students, on the other hand, often commented on the link between these expressions:

A1: *Fronts... I left both "in the trenches" and "vied for advantage" in the text and so I thought I should translate the word "fronts" as well, as "na mnoha frontách" is commonly used.*

A3: *I believe the two words "in the trenches" and "fronts" are interconnected and so I tried to translate them.*

A5: *I tried to retain the idiomacity of the source text because they later refer to the metaphor again with the word "fronts". That's why I translated "in the trenches" as "zákopovou válku".*

The question is whether this could be just a coincidence or whether advanced students of translation really develop a mechanism which helps them recognize and follow lengthy metaphors. The data I gained do not allow me to formulate further hypotheses. However, it would be worthwhile to design a study which would test this.

When analysing the verbalisations of N5, one interesting fact stood out. The solution N5 chose for hallway conversations is not very effective. If I had not had any data relating to the process, I would have said she simply failed to

see the connotative value. But upon hearing N5's commentary, I realized this was not the case:

N5: *Hallway conversation... This one.. this was the most difficult phrase, I think. Because how to... With my friends I use the word "pokecávky". Which is, in my opinion, exactly what the translation should be. Its meaning is very broad, "pokecávka". But it does not fit the text at all. The word is very "internal", and it is not appropriate for such an article... In the end I wrote "hovory" which is plain, but whatever.*

Just as the subject states "pokecávky" would be a great solution, if only the text was not so formal. It is obvious that N5 understood what hallway conversations are, but could not find a solution that would fit the desired style norm. Had I employed TQA only, I would assume she had not recognized the connotative value of the phrase and this brings us back to the introduction of this bachelor thesis: If we want to help the students develop, we have not only to understand more than they do, but we have to especially understand the things they understand. N5 would hardly benefit from a lecture on how to recognize colloquial phrases – which is what I would have suggested she take had I applied TQA only.

7.4.6 Non-verbal behaviour

I also collected data on the subjects' non-verbal behaviour, but since they do not directly contribute to testing my hypotheses, I include them just to demonstrate what kind of data this method generates.

ID	smoothing hair	supporting head	scratching (head/neck/body)	touching lips	touching/rubbing the face
N1	3x	2x	1x		1x
N2		30^+x	2x	30^+x	4x (nose)
N3	8x	20x		12x	7x
N4		19x	10x (neck and back)	2x	30^+x (forehead)
N5	10x	6x	5x	11x	
A1		30^+x	2x	30^+x	5x (nose)
A2	1x	27x	6x	11x	4x
A3	6x	14x	3x	12x	4x
A4		28x		30^+x	3x
A5	3x	30^+x	14x	10x	

Apart from the categories in the table above, some (groups of) subjects demonstrated various idiosyncrasies. Subjects N2, A1 and A4 assumed similar positions. They often sat leisurely with their hand supporting their heads.

Most of the time, the hand was located in front of the mouth and from time to time, they would touch, rub or press their hands towards their lips.

Subject A5 touched or rubbed her neck and chest more than 20 times. She also put her left hand on the right shoulder and left it there for tens of seconds three times.

Subject N4 stretched his neck five times. Subjects A2 and N5 were very animated at times, but as N5 sat closer to the recorder, it was easier to analyse her facial expressions and gestures. A table where her non-verbal behaviour is described can be found in Annexes.

Discussion

For the reasons mentioned in 7.5 Experienced issues, I will not try to compare and contrast the subjects. However, suprisingly most subjects tend to touch or rub their lips and support their head. Indeed, they often lay their chin on the lower part of their palm and press their folded fingers to their lips, while their elbow rests on the desk. I suspect that, since translating is an activity dealing with expressing oneself, the subjects might have the urge to verbalise, but, as they are aware of the fact that it is just a translation, they avoid forming words vocally. It would be very interesting to conduct a study where one group of translators would be solving a translation task, while the other group would be asked to do something else, e.g. edit photography. I wonder if the non-verbal data would differ in any way – if, for example, the translating individuals would touch or rub their lips more often.

7.5   Experienced issues

As this was a pilot project, I expected I would have to deal with some difficulties. Below is the list of experienced issues. They will help the reader to better understand the conditions of the experiment, and perhaps also serve as advice to researchers who are thinking of designing their own projects.

Questionnaires – it transpired that some of the questions I posed were irrelevant to the research, such as the subjects' own assessment of their English language skills, but in general the data collected by means of questionnaires were very useful. Without them I could hardly assess how experienced the subjects were, for example.

Screen recording – the data collected by means of screen recording constituted the richest source of information. However, some subjects complained about the computers being very slow which was confirmed by the recordings. I had thought about this before the experiment was carried out, but since the room I used houses the best computers at the Department of English and American Studies, I hoped they would cope. Unfortunately, they did not

and some subjects (A3 in particular) were irritated by this and said it influenced the way they worked

Video recording – due to the location of the recorder, some subjects sat closer than other. While it was easy to read the facial expression of subject N5, it was impossible to evaluate most of the gestures and all facial expression of subjects N1 and N3. It was not possible to analyse their data and hence no general conclusions could be drawn from this data set.

Cued recall – I must say I was surprised to hear how much the subjects verbalised. I feared they would be too shy, but I assume that the video cues they received distracted them and helped them verbalise freely. One recording (subject A4) was empty, though, for no obvious reasons.

Synchronization – Although I had more or less complete non-verbal behaviour data for subject N5, it was not easy to determine which point of the screen recording corresponded to the point of the recording with non-verbal behaviour.

Analysis – when analysing the output, it occured that Translog (keylogging) could be a really helpful tool because it is capable of pre-analysing the collected data. Without it, I had to do all the work myself and at times it was very exhausting. Last but not least, because I know some subjects personally, it was hard to assess the data without seeing the person, so to say, in front of me. I would suggest two researchers should work on a similar study – one who would collect the data and one who would analyse the anonymous data set.

7.6   Tentative conclusions

The research project was designed to test three specific hypotheses:

1.) Advanced students will apply better search strategies (the consequence of which will be that the target text will contain correct terminology).
2.) Advanced students will often jump from one point of the text to another and hence they will be able to translate the text more freely than novices.
3.) Advanced students will feel the need to tone down the text and lower the number of metaphors.

Hypothesis number one was confirmed. Hypothesis number two was confirmed. Hypothesis number three was not confirmed. As mentioned in the discussion of 7.4.5 Metaphors and collocations, there are several possible explanations. First, one might attribute this to the fact that the participants, even those with a relatively high level of experience, are still students. Their translation competence is, therefore, still developing. They might have already shifted from the mere lexical level (to which beginners pay the most attention), but might have not yet reached the point where they view both the

ST as well as the TT as a part of a greater body of publications. Thus, they are unable to reflect the appropriate stylistic norm. Another reason might be the following: The text starts with a metaphor including various interconnected images. Having translated one of them, the subjects might have decided to retain the remaining ones as well, so as to keep the style of the text the same throughout. This would be one of the areas of interest proposed for further research.

Although my population was relatively consistent, there were some observable tendencies which could be attributed to either the A-group or the N-group, for example, the tendency to look for context as demonstrated by the advanced students. In addition, we identified one specific strategy which appears to lead to successful solutions (that is with the text used type – a study intended for IT experts). Subjects who accessed parallel Czech (i.e. target language) texts were much more likely to produce an acceptable target text. To determine what an acceptable target text is, a TQA framework used for evaluating translation products delivered by students in the local translation state exams was used. To combine process-oriented research and TQA is not only possible, but also very promising. In the past, the researcher could only speculate about the steps that led to a good translation. Process-oriented research allows us to observe the actual steps closely. In spite of still being obliged to make speculations at some points, the conclusions we draw from these observations reflect the actual process and therefore tell us more about *how* one arrives at a good solution. We move from simply good or bad to *what leads to good or bad*.

When it comes to other areas, it would be interesting to conduct a similar project once more but include students of all levels, i.e. years of studies. It may be possible to track the slightest changes in subjects' behaviour – we could even track how specific seminars contribute to their development. All it would take would be a motivated researcher(s) and motivated subjects. The methods I have chosen were easy to apply and did not incur any major costs. Next time I would also use Translog which is among other things capable of arranging the output so that it is much easier to analyse.

Nevertheless, with population of ten people, it would be precocious to assume that any of my conclusions are generally valid. This pilot research project merely hinted at the possibility that there might be some differences between novices and advanced students of translatology. It would be desirable to test these (or extended) hypotheses once again. I tried to describe the conditions and present the data as objectively as possible, so that the readers could judge for themselves whether my conclusions are credible or not. The research project will hopefully ignite interest in process-oriented research among student and teachers of translation at Palacký University and pave the way for further projects in this direction.

*[G]aining access to the mind – in our
case the translator's mind – is within the
realms of possibility. But, boy, is it difficult!*

(Göpferich, Jakobsen and Mees, 2009: 2)

8. Conclusion

This bachelor thesis investigates the possibilities and limitations of process-oriented research with particular emphasis on data-elicitation methods. A brief account of the history of the process-oriented approach in translation studies is given, including a sketch of its theoretical background. Subsequently, the most frequently employed techniques are examined. Attention to both introspective and extraspective methods and to their advantages and disadvantages has been paid. Having studied the methods and their most prominent strengths and weaknesses, I have proceeded to demonstrate how various methods can be combined in order to gain a richer and more reliable information pool. The danger is that one might employ methods that cause interference, which negatively impacts the collected data. In order to avoid inappropriate combinations, I have designed a table which makes it easy to identify the most promising pairs of techniques.

The last section includes a research project in which the methods I previously described and evaluated are employed. What even I had perceived as a potential problem of this project – the relative consistency of the population – has actually proved to be a very interesting aspect of this thesis. We have seen that the groups really follow different behaviour patterns at some points. This could encourage further research as described in 7.6 Tentative conclusions.

All said and done, one must not forget that although there are numerous techniques, by means of which we can get closer to the black box (i.e. the translator's mind at work), it is still, and most probably always will be impossible to directly access the cognitive processes proper. But why then should we pursue this task? Unlike product and competence-oriented approaches, process-oriented studies bestow insight into what the (prospective) translators really are doing while they are translating – where the most problems are, which strategies they use and much more. And even if we, after almost 27 years of empirical research, still do not have a commonly-accepted model of translation process, the advances since 1986 have been considerable. Teachers of translation now yield the tools to understand what their students really need. Being one of those students, I think these tools should be employed more extensively. They provide great feedback not only to those who learn, but also, perhaps even more importantly, to those who teach.

9. Annexes

9.1 Translation brief

Přeložte vyznačený text. Překlad je určen pro týdeník typu „Ekonom". Do prvních vět dodejte nenásilně informace tak, aby bylo jasné, že se jedná o boj mezi hackery a těmi, kdo zajišťují IT bezpečnost firmy.

Cybercrime Year in Review, 2009

2009 was, in many ways, a transformational year in the trenches. As attackers and defenders vied for advantage, there were numerous developments on many fronts around the world. It's difficult to measure who's winning with any certainty but there are, at least, some measurements available. One of them, public breach disclosures, fell noticeably in 2009. Organizations that track disclosed breaches like DataLossDB6 and the Identity Theft Resource Center7 reported figures that were well off 2008 totals. Private presentations and hallway conversations with many in the know suggested similar findings. Our own caseload reveals this as well. In a report dedicated to the analysis of annual breach trends, it seems wholly appropriate to reflect on why. It also provides a fitting backdrop for discussing some key 2009 milestones.

In our last report, we observed that massive exposures of payment card data in recent years have effectively flooded the market and driven down the prices criminals can get for their stolen wares. 2009, then, may simply be the trough in a natural supply and demand cycle. If supply has outpaced demand, why release more product? Perhaps cybercriminals are directing their resources elsewhere until market conditions improve. It is also possible that breaches are occurring at the same rate but the criminals are sitting on stolen data until demand picks up. Because fraud alerts are the leading method of discovering breaches, it stands to reason that many breaches could occur without anyone being the wiser if the criminal decided it was in his best interest to be patient.

Another possible reason for this decline is law enforcement's effectiveness in capturing the criminals. The prosecution of Albert Gonzalez was a major event in 2009. He and his accomplices were responsible for some of the largest data breaches ever reported. Taking them off the streets, so to speak, may have caused a temporary (but we can hope for permanent) dip in breaches. It is also possible that their prosecution made other cybercriminals take some time off to reevaluate their priorities in life. 2009 witnessed much discussion and consideration around the world about breach disclosure laws. As seen in the U.S., the creation of these laws can have a huge effect on breach statistics. So can the administration of them. Depending on how the legal environment evolves in this area, it could have a significant impact on the number of known breaches worldwide. While it's highly unlikely that cloud computing or virtualization had anything to do with breach disclosure rates, they were no doubt hot topics in 2009. We continue to search for a link between data breaches and cloud-based or virtualized infrastructure but continue to find none.

http://www.verizonbusiness.com/resources/reports/rp_2010-data-breach-report_en_xg.pdf

9.2   Pre-experimental questionnaire

Identification code:

General

Name: *Age*:   18-20   21-22   23-24   25-26   27-28   29-30
 Sex: male – female

English Language skills

For how long have you studied English (in years):
   a.   less than 3   b. less than 5   c. less than 7   d. less than 9   e. more than 9

English is my **mother – first foreign – second foreign – third foreign** language (choose one).

- English language skills (1 beginner; 2 intermediate; 3 advanced; 4 proficient; 5 native speaker level):

    o   Reading: **1 – 2 – 3 – 4 – 5**
    o   Writing   :   **1 – 2 – 3 – 4 – 5**
    o   Speaking: **1 – 2 – 3 – 4 – 5**
    o   Listening: **1 – 2 – 3 – 4 – 5**

Certification(s):
- FCE
- CAE
- CPE
- TOEFL
- Other: (please specify)

Stays abroad

Have you ever stayed abroad for more than 2 weeks? (If more than once, please fill in information for each stay. You may choose more than one option. If necessary, turn the page and continue there.)

NO	YES		1	2	3	4
	Which country?					
	For how long?					
	Purpose of the stay?	• Exchange student • Work (specify the type of work) • Internship • Travelling • Family trip • Other (please specify)				
	Accommodation	• Hotel • Hostel • Host family • Couchsurfing • Student dormitory • Campsite • Tents • Other (please				

		specify)				
	When I spoke English it was mostly with... (please, also **indicate** the weekly amount of **time** you spoke with the given group of people).	• Native speakers of English *(specify: children-teenagers-university students - adults-adults above 60).* • English speaking students *(specify the average speaking level using the 1-5 scale above)* • English speaking non-students *(specify the average speaking level using the 1-5 scale above)*				
	My English language improved most in terms of...	• Speaking • Writing • Reading • Listening				

Professional experience:
Main occupation (choose one):

- o student
- o language teacher (for 1 – 2 – 3 – 4 – 5 – 6 – 7 years)
- o translator
    - o freelance (for 1 – 2 – 3 – 4 – 5 – 6 – 7 years)
    - o employed in a company (for 1 – 2 – 3 – 4 – 5 – 6 – 7 years)
- o proofreader (for 1 – 2 – 3 – 4 – 5 – 6 – 7 years)
- o copywriter (for 1 – 2 – 3 – 4 – 5 – 6 – 7 years)
- o journalist (for 1 – 2 – 3 – 4 – 5 – 6 – 7 years)
- o office worker (for 1 – 2 – 3 – 4 – 5 – 6 – 7 years)
- o other (please specify):   (for 1 – 2 – 3 – 4 – 5 – 6 – 7 years)

Additional occupation(s) (if more, please specify how much of your working time you spend doing each monthly, e.g. 1/2; 1/3; 3/4; etc.)

- o student
- o language teacher (for 1 – 2 – 3 – 4 – 5 – 6 – 7 years)
- o translator
    - o freelance (for 1 – 2 – 3 – 4 – 5 – 6 – 7 years)
    - o employed in a company (for 1 – 2 – 3 – 4 – 5 – 6 – 7 years)
- o proofreader (for 1 – 2 – 3 – 4 – 5 – 6 – 7 years)
- o copywriter (for 1 – 2 – 3 – 4 – 5 – 6 – 7 years)
- o journalist (for 1 – 2 – 3 – 4 – 5 – 6 – 7 years)
- o office worker (for 1 – 2 – 3 – 4 – 5 – 6 – 7 years)
- o other (please specify):   (for 1 – 2 – 3 – 4 – 5 – 6 – 7 years)

I have attended – underline; I am now attending – circle:

TR01 – TR02 – TR03 – TR04 – TR05 – TR06 – TR07 – TR07 – TR08 – TR09 – TR10
TRM1 – TRM2 – TRT1 – TRT2
CAT1 – CAT2 – CAT3
Překladatelská praxe 1; Překladatelská praxe 2; Překladatelská praxe 3;

Do you have any professional translation experience outside university classes?
- • Yes
- • No

If yes, estimate the number of pages you have translated:

10 – 100 – 500 – more than 500

If yes, circle the relevant field(s):

Agriculture	Nutrition	Cooking	Hygiene	Forestry
Geology	Astrophysics	Weather	Physics	Ecology
IT	Internet	Genetics		
Anatomy	Chemistry	Healthcare	Dental healthcare	Child care
Movies (subtitles)	TV and Radio	Telecomunications	Theatre	
Mathematics	Linguistics	Philosophy	Education	
History	Archaeology	Architecture	Religion	Art
Music	Photography	Literature		
Tourism	Sport	Metal industry	Animals	
Business	Advertising	Management	Sales	Taxes
Humanities	Psychology	Sociology	Statistics	
Politics	Finance	Gender		
Automobile industry		Logistics	Heating	
Law	Patents	Crime		

Other (please specify):

Hobbies

What are your hobbies?
(Be as specific as possible, e.g. reading – who is your favourite author? Which book are you reading/have you read recently?)

Reading (which language do you prefer: Czech – English – German – Spanish – French – Other (specify):
    -if necessary, add percentages
Sports
Movies and TV Series (which language do you prefer: Czech – English – German – Spanish – French – Other (specify):   -if necessary, add percentages
Theatre
Music (which language do you prefer: Czech – English – German – Spanish – French – Other (specify):
    -if necessary, add percentages
Dancing
Computer games (which language do you prefer: Czech – English – German – Spanish – French – Other (specify):   -if necessary, add percentages
Tourism
Pets
Photography
Comics (which language do you prefer: Czech – English – German – Spanish – French – Other (specify):
    -if necessary, add percentages
Creative writing (which language do you prefer: Czech – English – German – Spanish – French – Other (specify):   -if necessary, add percentages

Other (please specify):

Would you count translating as you hobby?   YES/NO

9.3   Post-experimental questionnaire

Identification code:

1.) Do you feel you fully understand the source text?

   a.   yes
   b.   no (why not?)

2.) Have you accessed the original pdf document? Why?/Why not?

   a.   yes
   b.   no (why not?)

3.) Are you familiar with this type of texts? (Do you read similar articles often? Have you ever translated such a text?)

   a.   Yes, I am familiar with this type of texts. I often translate similar documents.
   b.   Yes, I am familiar with this type of texts. I often read them and I have translated a similar text once or twice.
   c.   Yes, I have read a similar article once or twice, but never translated one.
   d.   No, I have never translated a text like this one. I have read a similar document once or twice.
   e.   No, I have never even seen a text like this one.

4.) Was the text easy/hard to translate?

   a.   it was a piece of cake, no problems at all
   b.   it was easy, just some tough spots
   c.   it was challenging
   d.   it was very challenging
   e.   it was near to impossible

5.) Circle the most challenging aspect(s) *(choose no more than 3)*:

   a.   Idioms
   b.   Metaphors
   c.   Terminology
   d.   Syntaxt
   e.   The text as a whole
   f.   Context (or lack of it)
   g.   Other (specify)

6.) How would you describe your translation strategy?

   a.   I translated the text word-for-word.
   b.   I translated the text word-for-word and then just slightly edited the outcome.
   c.   I translated the text functionally.
   d.   I translated the text idiomatically.
   e.   I translated the text freely

7.) The text is very rich on idioms, collocations and metaphors. Have you changed this in your translation?

   a.   Yes, I consciously toned down the text.

b. Yes, although it was not my intention. I couldn't always find the right phrase in Czech.

c. No, I felt it was necessary to render those phrases as closely as possible.

d. No, I didn't think about this.

8.) Target readers: Whom would you expect to read the target text? *(you can choose more options)*

a. age
   i. 10-20
   ii. 20-30
   iii. 30-40
   iv. 40-50
   v. 50-60
   vi. 60-80

b. sex
   i. female
   ii. male

c. profession
   i. CEO *(Chief Executive Officer)*
   ii. CIO *(Chief Information Officer)*
   iii. IT managers
   iv. Security managers
   v. IT solutions vendors
   vi. IT students
   vii. students in general
   viii. people working with sensitive data (e.g. bank personnel)

9.) Who do you think issued the source text?

- an independent institute
- a government agency
- a software producer
- a company management team
- I don't know.

10.) Rate your interest in data security

- very high (I search for and follow recent articles and news about data security.)
- high (I search for and read related articles from time to time)
- medium (I read related articles when I accidentally stumble over them)
- low (I am not interested in data security)
- very low (I avoid news about data security; I am not interested in data security)

11.) Have you ever come across the term "data breach" before?

a) yes
b) no

12.) Briefly explain what "data breach" is in you own words. *(You may use Czech.)*

9.4   Cued recall instructions

When verbalising, comment on the following:

Orientation phase – reading, exploring context
Dictionary/Thesaurus/Online searches
Translating as such:

In particular, describe your translation strategy regarding these words/phrases:

in the trenches
vied for advantage
fronts
public breach disclosures
were well off
hallway conversation
in the know
a fitting backdrop
milestones

Also comment on:
Editing
Polishing

You may comment on any other aspect you deem important.

9.5   Non-verbal behaviour of subject N5

I first provide a complete 5 minute protocol. As the behaviour is often repetitive, I will later mention only those movements that are somehow exceptional:

0:00	The subject is relatively still.
0:13	bites/presses her lips together
0:19	bites/presses her lips together
0:30	leans forward, supports her head but immediately leans back and unbuttons her jacket
0:36	resumes reading, leans forward and supports her head
0:43	smooths her hair
1:17	looks at her mobile phone.
1:23	resumes reading, leans forward and supports her head
1:58	leans backward, crosses her arms and stares at the screen
2:05	leans forward, puts her hands on the mouse and the keyboard
2:06	bites/presses her lips together and writes
2:09	continues writing and navigating the mouse
2:35	scratches her head, leans backward and crosses her legs
2:42	continues writing and navigating the mouse
2:55	tries to adjust the screen
2:57	continues writing and navigating the mouse
3:04	bites/presses her lips together, reads
3:29	writes on the keyboard
3:33	bites/presses her lips together and writes
3:43	navigates with the mouse
3:51	touches her nose
3:55	adjusts her clothes
3:58	brushes through her hair with her hand
4:03	stretches her neck to the right and gets back to writing
4:10	continues writing and bites/presses her lips together
4:25	stops writing, navigates the mouse
4:41	scratches her head, smooths her hair
4:48	continues writing
4:52	puts her legs together
4:55	writes and bites/presses her lips together

At 5:06 the subject crosses her arms and rubs them above elbows.
At 6:14 the subject puts her hand in front of the mouth, makes a fist and presses it on the lips, leaves it there for 10 seconds. (Subjects 312 and 4 made similar gestures repeatedly).
At 7:29 the subject starts writing again and also resumes biting/pressing her lips together, and that till 8:23 then she brushes with her hand through her hair.
Immediately after that, the subjects makes a swift gesture with her right hand, moving

the palm away from her head, while the palm faces the subject. The fingers then go back to the lips.

At 9:12 the subject repeats the gesture from 6:14, leaves the hand there for 20 seconds, then supports her head.

At 11:10 the subject lifts herself, pushes the chair backwards, sits down and puts one knee up and continues working. She remains in the position till 17:53.

At 13:20 the subject makes a swift gesture with her hand that I venture to interpret as "what?!" and then rubs the fingers.

At 19:26 the subject interrupts writing and makes a gesture with her left hand that I venture to interpret as "no-no" (rotates the palm from one side to the other). Then she makes a gesture similar to the famous Italian finger purse[36] (fingertips touch). Suddenly, she stretches the fingers and moves them towards the lips. She rubs her lips, flies her fingers upwards and returns back to the lips. After four seconds she returns to writing.

At 19:40 her right hand shots upwards (as if burned), remains in the air, goes to the lips and stays there for five seconds.

At 21:45 the subject claps her hands together, obviously relieved, then scratches her head.

At 23:12 the subject's right hand flies upward and draws a cricle, then returns to the keyboard.

At 25:10 the subject sighs and leans to the left. She scratches her back and gets back to work.

At 25:36 the subjects opens her mouth, slightly shakes her head, blinks and mouths something.

At 27:30 the subject lifts her hand to hier face, elbow resting on the desk, and stretches the fingers. Murmus something and shakes her head, moves the hand to her lips and starts laughing.

At 20:14 the subject lifts both hands (as if gesturing "I give up" or "Whatever, it's finished"), palms facing the screen, clearly distancing herself from it. She resumes writing.

At 31:33 the subject leans back, lifts both knees to her chest then lets one fall. She remains in this position till 32:17 but still continues working.

At 33:11 she leans back, crosses her arms and stares at the screen. The subject remains in this position till 33:32, then resumes writing.

At 34:56 the subjects makes a disgusted face and slowly draws both hands from the keyboard into her hair and leans backward. She plays with her hair till 35:18 then leans forward.

At 36:29 the subjects sighs, obviously tired.

At 36:35 the subject draws her left hand away from the keyboard and slaps her thigh.

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[36]Interestingly enough, this gesture is interpreted as „What do you mean?" or „What do you realy want?" in Italy.

Summary

Předložená bakalářská práce se zabývá výzkumnými metodami, které bývají aplikovány za účelem získání dat týkajících se kognitivních překladatelských procesů, tedy takových procesů, jež se odehrávají v myslích překladatelů během zpracování překladatelského zadání. Práce obsahuje část teoretickou a část praktickou. V českém prostředí se prozatím žádné studie, které by dané metody využívaly pro výzkum procesu překladu, nevyskytují. Tato práce si klade za cíl na onu mezeru upozornit a případně inspirovat další výzkum v této oblasti.

Úvod práce je zasvěcen historickému pozadí procesně orietovaného výzkumu v translatologii. Vymezuje, do jaké oblasti procesně orientovaný výzkum spadá a uvozuje jej do širšího kontextu. Je také poukázáno na skutečnost, že v minulosti byl proces překladu modelován pouze spekulativně, tj. badatelé se snažili odvodit, které procesy se v hlavách překladatelů odehrávají během zpracovávání zadání tím, že analyzovali podobu cílového textu, popřípadě rozpracované překlady. Rok 1986 byl rokem zlomovým, neboť právě tehdy byly v translatologii poprvé použity Think-aloud protocols, tedy tzv. myšlení nahlas, a odstartovaly tak empirický výzkum kognitivních překladatelských procesů. Následně se práce zabývá ranou historií tohoto přístupu, poté plynule přechází do současnosti.

V druhé části jsou dané výzkumné metody představeny, přičemž je také u některých metod zmíněno, kdo a kdy je použil a který aspekt překladatelského procesu tak sledoval. V současné době používané metody lze dělit na introspektivní a extraspektivní. Mezi introspektivní metody patří již výše zmíněné myšlení nahlas, skupinový překlad, bezprostřední retrospekce, retrospekce s odstupem (či odložená restrospekce), poznámky k překladu a dotazníky. Mezi extraspektivní metody řadíme záznam zmáčknutých kláves, sledování očí, videozáznam monitoru, videozáznam neverbálního chování, fyziologické metody (EEG, fMRI, PET, kardiovaskulární aktivita, kožní vodivost, neuroendokrynní sekrece), měření času překladu a tabulky zachycující neverbální chování (tj. sledování subjektu v reálném čase a zapisování si jeho chování).

Posléze jsou dané výzkumné metody hodnoceny, tedy je poukázáno na hlavní výhody a nevýhody jejich použití. Nejprve se práce věnuje introspekci a extraspekci jako takovým, poté přechází ke konkrétním bodům kritiky jednotlivých metod. Při hodnocení je čerpáno převážně z citované literatury, a to hlavně z aktuálních článků, které se buď odkazují k předchozím výzkumům, nebo samy takový výzkum obsahují. Obecně je kladen důraz na ekologickou validitu, ale ani výhody a nevýhody typické například jen pro jednu metodu nejsou opomenuty. Vzhledem k tomu, že podobně ucelený přehled metod ještě nebyl nikde zveřejněn, je této části vyhraněn dostatečný prostor. Ačkoli podaný seznam metod výzkumu překladatelského procesu není

ani zdaleka vyčerpávající, pokrývá přinejmenším pomyslné ohnisko, tedy ty nejčastěji používané metody.

Čtvrtá část se zaměřuje na triangulaci metod a také je vysvětleno, v čem spočívá. Později je upozorněno na rizika spojená s tímto postupem, zejména pak na interference a jiné nežádoucí efekty, které kombinování metod způsobuje. Pomocí tabulky je ilustrována míra kombinatovatelnosti každých dvou výše popsaných metod, tj. pomocí grafického rozlišení je nastíněno, které metody jsou spolu plně kompatibilní, u kterých je předpokládána interference a jaké spolu nelze kombinovat vůbec. Mimo jiné je v této části také předloženo časové schéma využití metod, tj. kdy je vhodné či vůbec možné tu kterou metodu aplikovat.

Práce pokračuje nastíněním současných trendů v procesně orientovaném výzkumu. Především je zdůrazněna mezinárodní spolupráce, a to jak na úrovni jednotlivých badatelů, tak i na úrovni univerzit, kdy dvě a více institucí porovnávají konkrétní studijní programy a překladatelské postupy studentů z daných prostředí. Výsledkem je objektivní zhodnocení kvality výuky na zúčastněných tělesech (podmíněné dostatečnou kvalitou výzkumu). Další důležitý trend nepochybně představují dlouhodobé studie, kdy je vybraná skupina pozorována po delší časový úsek, přičemž se hodnotí relativní posun účastníků. V neposlední řadě je potřeba zmínit také vývoj technologií navržených k extraspektivnímu pozorování, jmenovitě např. neustálé vylepšování programu s názvem Translog, který sice původně zaznamenával jen zmáčknuté klávesy, v současné době je však schopen také komunikovat se zařízením, které sleduje pohyb očí (eyetracker), a nahráváním obrazovky, čímž zprostředkovává sadu tří nezávislých, a přitom synchronizovaných dat.

Praktickou část práce zastupuje pilotní výzkumný projekt, který byl realizován v místních podmínkách, tj. na půdě Univerzity Palackého v Olomouci. Projekt zahrnoval dvě cílové skupiny s celkovým počtem 10 účastníků, konkrétně se jednalo o začínající překladatele (studenty prvního ročníku bakalářského programu „Angličtina se zaměřením na překlad a komunitní tlumočení") a překladatele pokročilé (studenty prvního ročníku magisterského oboru navazujícího na výše zmíněný program). Jako výchozí text byl zvolen jeden odstavec ze studie porušení bezpečnosti osobních údajů, který pro překladatele představoval výzvu hned ze dvou důvodů. Zaprvé obsahoval poměrně velké množství expresivních výrazů a metafor. Zadruhé se jednalo o odborný text s vysokým počtem termínů, které jsou pro osobu, která se v prostředí informačních technologií nepohybuje, těžce srozumitelné. Byly stanoveny tři konkrétní hypotézy, které byly posléze podrobeny testování. Bylo použito dvou sad dotazníků, videozáznamu monitoru a retrospekce s odstupem. Mimo to bylo na videokameru zaznamenáno neverbální chování subjektů. Posbíraná data byla následně analyzována. Ačkoliv byla skupina účastníků výzkumu relativně konzistentní, jisté tendence charakteristické buď

pro skupinu začátečníků, nebo pro skupinu pokročilých překladatelů se přeci jen objevily.

Ukázalo se například, že se začínající překladatelé orientační fází (tj. čtením výchozího textu, čtením paralelních textů, vyhledáváním kontextu) zabývají v porovnání s pokročilými subjekty poměrně málo. Další oblastí, na kterou se výzkum zaměřil, byly použité zdroje, tj. slovníky, paralelní texty, překladače apod. Mimo jiné bylo také vypozorováno, že překladatelé, kteří ve výsledku odevzdali velmi zdařilé produkty, hojně využívali paralelních textů v cílovém jazyce, tedy češtině. Pokročilí překladatelé navíc vykazovali vyšší povědomí o tom, co zrovna dělají, např. v orientační fázi dokázali rychleji identifikovat termíny, které by jim mohly při překladu činit potíže. Co se týče metafor a expresivních výrazů, pokročilí jedinci si podle výsledků analýzy verbalizací lépe uvědomují, jak spolu tyto prvky souvisí a jakou funkci v textu sehrávají.

Ze tří mnou stanovených hypotéz se potvrdily pouze dvě, třetí hypotéza byla vyvrácena. Během realizace výše popsaného výzkumu se objevilo několik technických problémů. Podáním přesného popisu toho, kde a kdy nastal problém, přispívá práce k lepším návrhům experimentů v budoucnu. V průběhu práce jsou také nastíněny konkrétní oblasti, jež skýtají prostor pro další výzkum, který by byl z našeho pohledu velmi žádoucí. Třebaže byl rozsah výše zmíněného výzkumného projektu značně omezený, přeci jen poukázal na značné rozdíly v počínání začínajících a pokročilých překladatetů a směřuje nás tak k novým hypotézám.

Závěrem je nutno podotknout, že ačkoli je procesně orientovaný výzkum zajisté fascinující oblastí translatologie, která nám zprostředkovává nový pohled na překladatelskou činnost a poodkrývá mnohé, dříve často ani netušené, aspekty překladatelského počínání, přeci jen nelze očekávat, že by nám tento výzkum mohl poskytnout přímý vhled do kognitivních překladatelských procesů. Navíc samotný fakt, že výzkum v mnoha případech probíhá v umělých experimentálních podmínkách, které se od běžných podmínek více či méně liší, výstupy do určité míry negativně ovlivňuje. V jistém smyslu tedy překladatelova hlava i nadále zůstává černou skříňkou, o jejímž obsahu se dozvídáme pouze oklikou. Přesto přese všechno by procesně orientovaný výzkum neměl být opomíjen, neboť jen ten nám přináší podklady k formulaci empiricky induktivních závěrů týkajících se překladatelského procesu. Napomáhá nám například alespoň zčásti porozumět tomu, jak překlady vznikají, jak si při práci počínají překladatelé s odlišným množstvím zkušeností a jaké problémy se při zpravování překladatelského zadání objevují. Vyučující se tak mohou soustředit na to, co studenti v dílčích stádiích osvojování si překladatelských kompetencí opravdu potřebují. Tuto silnou stránku procesně orientovaného výzkumu nelze dost dobře nastavit tradičními přístupy a proto je velmi žádoucí tento relativně nový přístup prosazovat i nadále.

References

Ahrens, Barbara, Eliza Kalderon, Christoph M. Krick and Wolfgang Reith. 2010. "fMRI for exploring simultaneous interpreting." In *Why translation studies matter*, edited by Daniel Gile, Gyde Hansen and Nike K.Pokorn, 237-246. Amsterdam and Philadelphia: John Benjamins Publishing.

Alves, Fabio and José L. Gonçalves. 2004. "Modelling Translator's Competence." In *Doubts and Directions in Translation Studies*, edited by Yves Gambier, Miriam Shlesinger and Radegundis Stolze, 41-55. Amsterdam and Philadelphia: John Benjamins Publishing.

Angelone, Erik. 2010. "Uncertainty, uncertainty management and metacognitive problem solving in the translation task." In: *Translation and Cognition*, edited by Gregory M. Shreve and Erik Angelone, 17-40. Amsterdam and Philadelphia: John Benjamins.

Baddeley, Alan. 1996. *Human Memory.Theory and Practice*. London: Erlbaum.

Bayer-Hohenwarter, Gerrit. 2010. "Comparing translational creativity scores of students and pro-fessionals: flexible problem-solving and/or fluent routine behaviour?" In *New Approaches in Translation Process Research*, edited by Susanne Göpferich, Fabio Alves and Inger M. Mees, 83-111. Kopenhagen: Samfundslitteratur. Accessed in January 2012.
http://gams.uni-graz.at/fedora/get/o:tcp-101-12/bdef:PDF/get

Börsch, Sabine. 1986. "Introspective Methods in Research on Interlingual and Intercultural Communication." In *Interlingual and Intercultural Communication*, edited by Juliane House and Shoshana Blum-Kulka, 195-209. Tübingen: Narr Verlag.

Buber, Renate. 2009. "Denke-Laut-Protokolle." In *Qualitative Marktforschung: Konzepte - Methoden – Analysen*, edited by Renate Buber and Hartmut Holzmüller, 557-566. Wiesbaden: Gabler Verlag.

Caffrey, Colm. 2008. "Using pupillometric, fixation-based and subjective measures to measure the processing effort experienced when viewing subtitled TV anime with pop-up gloss." In *Looking at eyes. Eye-tracking Studies of Reading and Translation Processing*, edited by Susanne Göpfreich, Arnt L. Jakobsen and Inger M. Mees, 125-144. Denmark: Eurographic Danmark A/S.

Carl, Michael. 2012. "Translog-II: a Program for Recording User Activity Data for Empirical Reading and Writing Research." *OpenArchive@CBS*. Accessed in April 2012.
http://openarchive.cbs.dk/bitstream/handle/10398/8435/Michael_Carl_2012.pdf?sequence=1

Chang, Vincent C. 2011. "Translation Directionality and the Revised Hierarchical Model: An Eye-Tracking Study." In *Cognitive Explorations of Translation*, edited by Sharon O'Brien, 154-174. London: Continuum International.

Christensen, Tina P. 2011. "Studies on the Mental Processes in Translation Memory-assisted Translation – the State of the Art." *Journal of Translation and Technical Communication Research*. 4 (2): 137-160. Accessed in January 2012. http://www.trans-kom.eu/bd04nr02/trans-kom_04_02_02_Christensen_Translation_Memory.20111205.pdf

Cohen, Andrew and Carol Hosenfeld. 1981. "Some Uses of Mentalistic Data in Second-Language Research." *Language Learning* 31 (2): 285-313.

Diamond, Bruce J. and Gregory M. Shreve. 2010. "Neural and physiological correlates of translation and interpreting in the bilingual brain." In *Translation and Cognition*, edited by Gregory M. Shreve, and Erik Angelone, 289-316. Amsterdam and Philadelphia: John Benjamins.

Dragsted, B. 2010. "Coordination of reading and writing process in translation." In *Translation and Cognition*, edited by Gregory M. Shreve and Erik Angelone, 41-62. Amsterdam and Philadelphia: John Benjamins.

Duchowski, Andrew T. 2003. *Eye Tracking Methodology: Theory and Practice*. London: Springer.

Ericsson, Anders K. and Simon A. Herbert. 1984. *Protocol Analysis: Verbal Reports as Data*. Cambridge, Mass: MIT Press.

Ericsson, Anders K. and Simon, Herbert A. 1993. *Protocol analysis: Verbal Reports as Data (revised edition)*. Cambridge Mass: M.I.T. Press.

Ericsson, Anders K. and Walter Kintsch. 1995. "Long-term working memory." *Psychological Review* 102 (2): 211-245.

Fraser, Janet. 2000. "What do real translators do?" In *Tapping and Mapping the Process of Translation and Interpreting*, edited by Sonja Tirkonnen-Condit and Riitta Jääskeläinen, 111-121. Amsterdam/Philadelphia: John Benjamins Publishing.

Gerloff, Pamela. 1986. "Second Language Learners' Reports on the Interpretive Process." In *Interlingual and Intercultural Communications. Discourse and Cognition in Translation and Second Language Acquisition Studies*, edited by Juliane House and Shoshana Blum-Kulka, 243-262. Tübingen: Narr.

Gerloff, Pamela. 1988. "From French to English: A Look at the Translation Process in Students, Bilinguals, and Professional Translators." (Unpublished dissertation). Cambridge (MA): Harvard University.

Gile, Daniel. 2004. "Integrated problem and decision reporting as a translator training tool." *JoSTrans. The Journal of Specialized Translation* 2: 2-20. Accessed in January 2012. http://www.jostrans.org/issue02/art_gile.pdf

Göpferich, Susanne. 2008. *Translationsprozessforschung. Stand – Methoden – Perspektiven.* Germany: Narr Francke Attempto Verlag.

Göpferich, Susanne and Riitta Jääskelainen. 2009. "Process research into the development of translation competence: Where are we and we do we need to go?" In *Across Languages and Cultures* (10): 169–191. Accessed in September 2011. http://www.akademiai.com/content/vp3x10p151ru10g8/fulltext.pdf

Göpferich, Susanne, Arnt L. Jakobsen and Inger M. Mees. 2009. "Introduction." In *Behind the Mind: Methods, Models and Results in Translation Process Research*, edited by Susanne Göpferich, Arnt L. Jakobsen and Inger M. Mees, 1-8. Copenhagen: Samfundsliteratur Press.

Hansen, Gyde. 1999. "Editor's Preface." In *Probing the Process in Translation: Methods and Results*, edited by Gyde Hansen, 6-15. Denmark: Narayana Press.

Hansen, Gyde. 2003. "Controlling the process: Theoretical and methodological reflections on research into translation processes." In *Triangulating Translation, Perspectives in process oriented research*, edited by Fabio Alves, 25-42. Amsterdam and Philadelphia: John Benjamins Publishing.

Hansen, Gyde. 2006a. *Erfolgreich Übersetzen. Entdecken und Beheben von Störquellen*. Tübingen: Narr.

Hansen, Gyde. 2006b. "Retrospection methods in translator training and translation research." *JoSTRANs: The Journal of Specialized Translation* 5: 2-41. Accessed in December 2011. http://www.jostrans.org/issue05/art_hansen.pdf

Hansen, Gyde. 2008. "The Dialogue In Translation Process Research." In *Translation and Cultural Diversity. Selected Proceedings of the XVIII FIT World Congress,* 386-397. Shanghai: Foreign Languages Press. Accessed in December 2011. http://translationconcepts.org/pdf/Hansen_ArticleMethods.pdf

Hansen, Gyde. 2010. "Integrative description of translation processes." In *Translation and Cognition* edited by Shreve, M. Gregory and Erik Angelone, 189-212. Amsterdam and Philadelphia: John Benjamins Publishing.

Harris, Brian. 1977. "The Importance of natural translation." In: *Working Papers on Bilingualism*, 96-114. Shanghai: Foreign Languages Press.

Hönig, Hans G. 1995. *Konstruktives Übersetzen. (Studien zur Translation 1)*. Tübingen: Stauffenburg.

House, Juliane. 2000. "Consciousness and the Strategic Use of Aids in Translation." In *Tapping and Mapping the process of translation and Interpreting*, edited by Sonja Tirkonnen-Condit and Riitta Jääskeläinen, 149-162. Amsterdam and Philadelphia: John Benjamins Publishing.

Jakobsen, Arnt L. and Lasse Schou. 1999. "Logging Target Text Production with Translog." In *Probing the Process in Translation: Methods and Results*, edited by Gyde Hansen, 9-20. Denmark: Narayana Press.

Jakobsen, Arnt L. 2003. "Effects of think aloud on translation speed, revision, and segmentation." In *Triangulating Translation, Perspectives in process oriented research*, edited by Fabio Alves, 69-95. Amsterdam and Philadelphia: John Benjamins Publishing.

Jakobsen, Arnt L. and Kristian T. H. Jensen. 2008. "Eye movement behaviour across four different types of reading task." In *Looking at eyes. Eye-tracking Studies of Reading and Translation Processing*, edited by Susanne Göpfreich, Arnt L. Jakobsen and Inger M. Mees, 103-124. Denmark: Eurographic Danmark A/S.

Jääskeläinen, Riitta. 1996. "Hard Work Will Bear Beautiful Fruit, A Comparison of Two Think-Aloud Protocol Studies." *Meta: Translator's Journal* 41 (1), Special Issue: Translation Processes, edited by Frank G. Königs, 60-74. Accessed in October 2011. http://www.erudit.org/revue/meta/1996/v41/n1/003235ar.pdf

Jääskeläinen, Riitta. 2000. "Focus on Methodology in Think-Aloud Studies on Translating." In *Tapping and Mapping the process of translation and Interpreting*, edited by Sonja Tirkonnen-Condit and Riitta Jääskeläinen, 71-82. Amsterdam and Philadelphia: John Benjamins Publishing.

Jääskelainen, Riitta. 2011. "Back to Basics: Designing a Study to Determine the Validity and Reliability of Verbal Report Data on Translation Processes." In *Cognitive Explorations of Translation*, edited by Sharon O'Brien, 15-29. London: Continuum International.

Just, Marcel A. and Patricia A. Carpenter. 1992. "A Capacity Theory of Comprehension: Individual Differences in Working Memory." In *Psychological Review* 99: 122-149. Accessed in December 2011. http://ccbi.cmu.edu/reprints/Just_PsychRev-1992_capacity-theory.pdf

Kovačič, Irena. 1995. "A thinking-aloud experiment in subtitling." In *Translation as Intercultural Communication*, edited by Mary Snell-Hornby, Zuzana Jettmarová, and Klaus Kaindl, 229-238. Amsterdam and Philadelphia: John Benjamins Publishing.

Königs, Frank G. 1987. "Was beim Übersetzen passiert. Theoretische Aspekte, empirische Befunde und praktische Konsequenzen." *Die Neueren Sprachen* 2 (87): 162-185.

Krings, Hans P. 1986. "Translation Problems and Translation Strategies of Advanced German Learners of French (L2)." In *Interlingual and Intercultural Communication*, edited by Juliane House and Shoshana Blum-Kulka, 263-276. Tübingen: Narr Verlag.

Krings, Hans P. 1986a. *Was in den Köpfen von Übersetzern vorgeht.Eine empirische Untersuchung zur Struktur des Übersetzungsprozesses bei fortgeschrittenen Französischlernern*. Tübingen: Narr.

Krings, Hans P. 1987. "The use of introspective data in translation." In *Introspection in second language research,* edited by Claus Færch & Gabrielle Kasper, 159-176. Philadelphia: Multilingual Matters.

Krings, Hans. P. 2005. "Wege ins Labyrinth – Fragestellungen und Methoden der Übersetzungsprozessforschung im Überblick." *Meta: Translator's Journal* 50 (2): 342-358. Accessed in December 2011.
http://www.erudit.org/revue/meta/2005/v50/n2/010941ar.pdf

Kurz, Ingrid. 1994. "A Look into the Black Box - EEG probability mapping during mental simultaneous interpreting." In *Translation Studies: An Interdiscipline*, edited byMary Snell-Hornby, Franz Pöchhacker and Klaus Kaindl, 199-207. Amsterdam and Philadelphia: John Benjamins Publishing.

Kußmaul, Paul. 1991. "Creativity in the translation process: empirical approaches." In *Translation Studies: the State of the Art*, edited by Kitty M. van Leuven-Zwart and Ton Naaijkens, 91-101. Amsterdam and Atlanta: Rodopi.

Kußmaul, Paul. 1995. *Training the Translator*. Amsterdam and Philadelphia: John Benjamins Publishing.

Lachaud, Christian M. 2010. "EEG, EYE and KEY: Three Simultaneous Streams of Data for Investigating the Cognitive Mechanism of Translation." In *Cognitive Explorations of Translation*, edited by Sharon O'Brien, 131-153. London: Continuum International.

Levý, Jiří. 1963. *Umění překladu*. Praha: Československý spisovatel.

Lörscher, Wolfgang. 1986. "Linguistic aspects of translation processes: towards an analysis of translation performance." In: *Interlingual and Intercultural Communication. Discourse and Cognition in Translation and Second Language Acquisition Studies*, edited by Juliane House and Shoshana Blum-Kulka, 277-292. Tübingen: Narr Verlag.

Lörscher, Wolfgang. 1991. "Thinking-Aloud as a Method for Collecting Data on Translation Processes." In *Empirical Research in Translation and Intercultural Studies*, edited by Sonja Tirkkonen-Condit, 67-77. Tübingen: Narr Verlag.

Lörscher, Wolfgang. 1991. *Translation Performance, Translation Process and Translation Strategies*. Tübingen: Narr Verlag.

Malmkjaer, Kirsten. 2000. "Multidisciplinarity in Process Research." In *Tapping and Mapping the Process of Translation and Interpreting*, edited by Sonja Tirkonnen-Condit and Riitta Jääskeläinen, 163-170. Amsterdam and Philadelphia: John Benjamins Publishing.

Neubert, Albrecht. 1991. "Models of Translation." In *Empirical Research in Translation and Intercultural Studies*, edited by Sonja Tirkkonen-Condit, 17-26. Tübingen: Narr Verlag.

Neunzig, Wilhelm. 2000. "The Computer in Empirical Studies for the Didactics of Translation." In *Investigating Translation*, edited by Allison Beeby, Doris Ensinger and Marisa Presas, 91-98. Amsterdam and Philadelphia: John Benjamins.

O'Brien, Sharon. 2008. "Processing fuzzy matches in TM tools." In *Looking at eyes. Eye-tracking Studies of Reading and Translation Processing*, edited by Susanne Göpferich, Arnt L. Jakobsen and Inger M. Mees, 79-102. Denmark: Eurographic Danmark A/S.

PACTE. 2003. "Acquiring Translation Competence." In *Investigating Translation*, edited by Allison Beeby, Doris Ensinger, Marisa Presas, 99-106. Amsterdam and Philadelphia: John Benjamins.

Pavlović, Nataša and Kristian.T.H. Jensen. 2009. "Eye tracking translation directionality." In *Translation Research Projects 2*, edited by Anthony Pym and Alexander Perekrestenko, 93-109. Tarragona: Intercultural Studies Group. Accessed in December 2011.
http://isg.urv.es/publicity/isg/publications/trp_2_2009/chapters/jensenpavlovic.pdf

Pym, Anthony. 1991. "Redefining Translation Competence in an Electronic Age. In Defence of a Minimalist Approach." *Meta: Translator's Journal* 48 (4): 481-497. Accessed in January 2011.
http://www.erudit.org/revue/meta/2003/v48/n4/008533ar.pdf

Séguinot, Candace. 1991. "A study of student translation strategies." In *Empirical Research in Translation and Intercultural Studies*, edited by Sonja Tirkkonen-Condit, 79-88. Tübingen: Narr.

Séguinot, Candace. 2000. "Management issues in the translation process." In *Tapping and Mapping the Process of Translation and Interpreting*, edited by Sonja Tirkonnen-Condit and Riitta Jääskeläinen, 143-148. Amsterdam and Philadelphia: John Benjamins.

Scott-Tennent, Christopher, Maria G. Davies, and Fernanda R. Torras. 1998. "Translation Strategies and Translation Solutions." In *Investigating Translation*, edited by Allison Beeby, Doris Ensinger and Marisa Presas, 107-116. Amsterdam and Philadelphia: John Benjamins.

Shlesinger, Miriam. 2000. "Interpreting as a Cognitive Process: How can we know what really happens?" In *Tapping and Mapping the Process of Translation and Interpreting*, edited by Sonja Tirkonnen-Condit and Riitta Jääskeläinen, 3-16. Amsterdam and Philadelphia: John Benjamins.

Shreve, Gregory M. and Erik Angelone. 2010. "Translation and Cognition. Recent Development." In: *Translation and Cognition*, edited by Gregory M. Shreve and Eric Angelone, 1-16. Amsterdam and Philadelphia: John Benjamins.

Snell- Hornby, Mary. 2006. *The Turns of Translation Studies: New Paradigms or Shifting Viewpoints?* Amsterdam and Philadelphia: John Benjamins.

Sjørup, Annette C. 2008. "Metaphor comprehension in translation: methodological issues in a pilot study." In *Looking at eyes. Eye-tracking Studies of Reading and Translation Processing*, edited by Susanne Göpferich, Arnt L. Jakobsen and Inger M. Mees, 53-77. Denmark: Eurographic Danmark A/S.

Tirkkonen-Condit, Sonja. 2000. "Uncertainty in translation processes." In *Tapping and Mapping the Process of Translation and Interpreting*, edited by Sonja Tirkonnen-Condit and Riitta Jääskeläinen, 123-142. Amsterdam and Philadelphia: John Benjamins.

Toury, Gideon. 1986a. "Monitoring Discourse Transfer: A test-case for a developmental model of translation." In *Interlingual and Intercultural Communication*, edited by Juliane House and Shoshana Blum-Kulka, 79-94. Tübingen: Narr Verlag.

Toury, Gideon. 1991. *Descriptive Translation Studies and Beyond*. Amsterdam/Philadelphia: John Benjamins Publishing.

Toury, Gideon. 1991. "Experiments in Translation Studies: Achievements, Prospects and Some Pitfalls." In *Empirical Research in Translation and Intercultural Studies*, edited by Sonja Tirkkonen-Condit, 45-66. Tübingen: Narr Verlag.

Vik-Tuovinen, Gun-Viol. 2000. "The Interpreter's Comments in Interpreting Situations." In *Tapping and Mapping the Process of Translation and Interpreting*, edited by Sonja Tirkonnen-Condit and Riitta Jääskeläinen, 17-26. Amsterdam and Philadelphia: John Benjamins.

Anotace

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Klíčová slova v ČJ: procesně orientovaný výzkum, introspektivní a extraspektivní metody generující data, pilotní výzkumný projekt, myšlení nahlas, protokolové studie, dotazníky, retrospekce, zaznamenávání zmáčknutých kláves, sledování očí, videozáznamy, fyziologické měření, triangulace, kombinace metod

Klíčová slova v AJ: process-oriented research, introspective and extraspective data-elicitation methods, pilot research project, think aloud, protocol studies, questionnaires, retrospection, eyetracking, keylogging, screen recording, physiological methods, triangulation, combination of methods

Anotace v ČJ:

Tato bakalářská práce představuje úvod do procesně orientovaného výzkumu, zejména se zabývá metodami, které umožňují sledovat překladatelský proces. Práce začíná několika obecnými poznámkami, které se týkají historického pozadí tohoto přístupu. Později se přesouvá k samotným metodám výzkumu, a to tak, že je nejprve zběžně představí a následně hodnotí se zvláštním přihlédnutím k jejich konkrétním výhodám a nevýhodám. Dále je zahrnuta také triangulace, přičemž se dozvídáme nejen o přínosu, který kombinace metod nabízí, ale také o případných problémech, které s ní souvisí. V neposlední řadě práce zahrnuje pilotní výzkumný projekt, jenž v praxi aplikuje vybrané metody výzkumu procesu překladu a navrhuje další oblasti výzkumu.

Anotace v AJ:

This bachelor thesis serves as a brief introduction to process-oriented research. The work begins with several comments regarding the historical background of the process-oriented approach. It presents a list of the most frequently used data-elicitation methods used in this field and assesses their advantages and disadvantages. In addition, the practice of triangulations is discussed, i.e. its benefits as well as issues which might emerge when applied. Last but not least, it reports on a pilot research project conducted by the author using the methods she studied, and proposes areas of interest for further investigation.