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**Abstracts**

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Fabio Alves/Adriana Pagano/Igor Silva (Universidade Federal de Minas Gerais/Brazil)

## **A new window on orientation in the translation process: mapping translators' metacognitive activity through the combined use of eye-tracking data and retrospective protocols**

The use of verbal protocols in translation process research has a long tradition dating back to Ericsson & Simon's seminal work (1984). Different varieties of verbal protocols, including concurrent, dialogued, guided, and retrospective protocols, have been reported in the literature (see, among others, Fraser 1996; Tirkkonen-Condit & Jääskäleinen 2000; Alves 2003; Hansen 2006; Göpferich 2008), with little consensus achieved on the most efficient modality. Jakobsen's (2003) study showing that concurrent think-aloud activity has an impact on translation speed and revision problematized the use of verbal protocols at all and opened up discussions as to which would be the most productive form of tapping into translators' metacognitive activity and into the way they metarepresent their own translation processes. Orientation, in particular, as defined by Jakobsen (2002), is one of the most challenging phases within the translation process and one that has largely escaped scrutiny. Only more recently, with the introduction of eye-tracking as a tool to gather a new type of data on the translation process (O'Brien 2006; Jakobsen & Jensen 2008), did the investigation of orientation in the course of the translation process become possible from an experimental perspective. This paper reports on a study using eye-tracking in conjunction with retrospective protocols as a methodology for tapping into the orientation phase. The study was carried out under experimental conditions and targeted ten professional translators, performing a direct (English into Portuguese) and an inverse (Portuguese into English) translation task. The source texts were selected according to the criteria of size (approximately 300 words), domain knowledge (sickle cell disease) and rhetorical complexity (based on Rhetorical Structure Theory - RST). To avoid the impact of a likely facilitating effect, task order was randomly shifted, direct translation being the first task for five of the subjects, while inverse translation into English was the first task for the remaining five. After task completion, subjects were first asked to comment freely on their performance as they read the source and target texts, made available to them on two horizontal windows on the computer screen. A Tobii T60 eye-tracker was used to map gaze movements across source and target texts while subjects carried out this task, their verbalization being synchronized with eye movements and facial expressions. In a second task, the same equipment and methodology were used to record guided protocols elicited through questions focusing on five language features in each text related to logical and cohesive relations, nominal group structure and domain knowledge. Results point to potential insights on the orientation phase to be gathered through mapping pause length in retrospection onto fixation length. The study also shows the feasibility of synchronizing comments, gaze movements and fixations as well as subjects' facial expressions as their gaze moves across the screen from source to target text. On the whole, verbal protocols generated in conjunction with eye-tracking data prove useful into probing the relation between

the allocation of effort and the level of metacognitive activity in the unfolding of the translation process.

**Gerrit Bayer-Hohenwarter (TransComp Research Group, Department of Translation Studies, University of Graz/Austria)**

## **Comparing translational creativity scores of students and professionals: flexible problem-solvers and/or fluent routine translators?**

The question of how creativity develops is at the heart of my PhD study, conducted within the research project TransComp (Göpferich et al. 2008; Göpferich forthcoming). Creativity, however, is a concept that is difficult to define and even more difficult to measure. In Bayer-Hohenwarter (forthcoming), where results of a first pilot study are reported, I have proposed to measure translational creativity according to the fundamental criteria *novelty* and *acceptability* and within a framework of creativity dimensions (Guilford 1950). From these creativity dimensions, *flexibility* and *fluency* are considered to be essential. In order to measure *flexibility*, it was deemed necessary to develop a concept of cognitive shifts: *abstraction*, *modification* and *concretisation* indicating “directions of thought” are proposed to be the central indicators for translational flexibility. This concept of cognitive shifts is believed to be firmly anchored in cognitive science and to be compatible with translation theory and practice. As for *fluency*, it is suggested to analyse the translation process for *spontaneity* and *automaticity*. How this can be operationalized will be described in this paper. Further indicators on the product and process levels will be presented, that can be attributed to Guilford's dimensions and are commonly considered creative and translation-relevant. These indicators, such as *imagination*, *optional shift* or *rareness* will be used to refine and extend the analysis of translational creativity. It is believed that with this approach the creativity scores sufficiently reflect the multi-dimensional nature of the creativity concept.

The methodological framework presented is subsequently tested in an analysis of translational creativity in a sample of 10 translations (5 student, 5 professional) of two ST units and the pertaining sets of all intermediate (partial) translations by all translators. One of the ST units is selected for its creativity potential, the other one because it has potential for routine behaviour. The focus of the methodological analysis is on the comparability of the resulting creativity scores and the compatibility with the underlying hypotheses. It is assumed that in successful translators we can observe a balance of flexible problem-solving and fluent routine translating: Whereas sections of text that present difficulties require the translator to identify the difficulty and apply creative procedures, non-problematic sections of text require to be processed with a minimum of cognitive effort (=routine). Routine is believed to free cognitive capacities that are essential for creative problem-solving. It is assumed that more students will tend to overlook, underestimate and/or mishandle “real” translation problems and waste effort with routine sections. Professionals, on the other hand, are assumed to be able to balance their efforts efficiently.

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**Allison Beeby/Amparo Hurtado/Willy Neunzig (GRUPO PACTE, Universitat Autònoma de Barcelona/Spain)**

## **Applying the scientific method to Translation Studies: Problems and solutions in research into translation competence**

In the hour we have been given to present our project, we propose to focus on the methodology used in our research as follows:

1. Presentation of our model of Translation Competence, the general objectives of our research, and some thoughts on the application of a "scientific" method of research in our field.
2. Presentation of how our research has progressed, the problems found when trying to ensure unbiased results, and some examples of the solutions found to these problems.
3. An overview of the main problems encountered on undertaking an empirical-experimental approach to research in Translation Studies, in particular the need to:
  - Develop measuring and data-collecting instruments suitable for our purposes and validate them prior to carrying out the experiment
  - Define indicators for the descriptive analysis of data
  - Determine indices for the triangulation of data
4. Summary of the most relevant results obtained.
5. Problems arising in the design of the study to be carried out into the Acquisition of Translation Competence (ACT) - all ideas and suggestions are more than welcome!

**Maureen Ehrensberger-Dow/Alexander Künzli (Institute of Translation and Interpreting, Zurich University of Applied Sciences/Switzerland)**

## **Methods of accessing metalinguistic awareness: a question of quality?**

Progression analysis, a method combining ethnographic observation, interviews, computer logging, graphical representations of writing processes (“progression graphs”), and cue-based retrospective verbalizations, has proven valuable in studies of the writing processes of journalists, communication professionals, and schoolchildren (e.g. Gnach et al. 2007; Perrin 2003; Perrin & Ehrensberger-Dow 2008). Our research group has supplemented progression analysis with screenshot recordings and eye-tracking in order to capture diverse aspects of translation and revision processes. In particular, we have been accessing metalinguistic awareness in different ways to identify which are most likely to reveal the strategies translators use when they encounter challenges translating from and into their L1 or L2.

The present paper reports on a small study that compares two different methods of accessing metalinguistic awareness: cue-based retrospection (used in progression analysis) and concurrent verbalization (“thinking aloud”, one of the earliest methods in translation process research). In two separate sessions at least a month apart, recent graduates from our translation program translated short news items at a computer while keystroke logging software (*InputLog 4.0*), screenshot software (*Camtasia*), and eye-tracking software (*Tobii T66*) recorded data in the background. In one condition, they translated from German into English (their L2) and immediately afterwards, while watching the screenshot replay of their translation process, told a researcher what they had done (cue-based retrospection). In the other condition, they translated from English into German and commented on their translation process as they did so (thinking aloud).

Because of the potential of cross-linguistic influence on thinking aloud in one language while translating into another, no attempt has been made to counterbalance the verbalization conditions and language directions in this study. Instead, the data from this group of students are compared to those from another group of students who translated the same texts without thinking aloud (but commented on their translation processes with cue-based retrospective verbalizations). In addition, we compare the practices and verbalizations of the present group to those they demonstrated and mentioned when they translated a similar text a year before.

In order to assess whether the verbalization conditions have an affect on the product and the quality, we have asked independent native-speaker translation teachers to evaluate the translations produced by these students. The inclusion of an equal number of translations of the same texts by other students, matched as closely as possible with respect to final grades in translation courses, ensures an extra measure of objectivity for the evaluation process. A global score assigned to each translation as well as separate scores for the solutions to specific translation problems previously identified in the source texts are the measures of translation quality.

In attempting to operationalize translators’ metalinguistic awareness of their translation practices and strategies when translating from and into their L1 or L2, we

also address the possibilities and limits of the various methods and combinations of methods that we have been using.

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**Birgitta Englund Dimitrova/Elisabet Tiselius (Institute for Interpretation and Translation Studies & Centre for Research on Bilingualism, Stockholm University/Sweden)**

## **Strategies in the translation process and the interpretation process: a pilot study of retrospection as research method**

For studying the processes involved in translation and in interpreting, various research methods are available. However, few methods are equally suitable for process research in both areas. Retrospection is one of those few methods. This presentation is a pilot study of retrospection as a research method to study and potentially compare the processes involved in translating and in simultaneous interpreting. The study involves data from 2 groups, each with 9 subjects, interpreter subjects vs. translator subjects, all with Swedish as their L1. In both groups, the subjects represented three different levels of professional experience in interpreting vs. translating: around 15 years, around 2 years, and without any professional experience. The source text was a plenary speech in English from the European parliament. For the interpretation part of this study, the speech was re-recorded by a native speaker, in order to adjust its presentation rate. The speech is 10 minutes long, being read at an average pace of 119 words per minute. For the translation part of the study, the original European parliament transcript of the speech was used. This written version comprises 1112 words and is presented as a normal written text, i.e. with normalized orthography and punctuation.

The 9 interpreter subjects interpreted the speech simultaneously from English into Swedish. The interpretations were taped and then transcribed. The 9 translator subjects translated the written version of the text into Swedish. The translations were written in Translog. Other conditions of the task were kept as similar as possible. All subjects did immediate retrospection, cued by a written version of the source text. They were asked to read the text, sentence by sentence, and verbalize everything they could remember. By using the written source text as cue, instead of their own recorded interpretation or logged writing process, we wanted to avoid them

generalizing, suggesting explanations or drawing conclusions regarding their processing from their own output.

**Susanne Göpferich (TransComp Research Group, Department of Translation Studies, University of Graz/Austria)**

## **The longitudinal study TransComp: Transcription and Asset Management**

The research project TransComp, funded by the Austrian Science Fund (FWF) from September 2008 till August 2011, is a longitudinal study which investigates the development of translation competence in twelve students of translation over a period of three years and compares it with that of ten professional translators with at least ten years of professional experience in translation/interpretation.

After a presentation of the experimental design used in TransComp, the methods employed, and the model of translation competence on which the generation of hypotheses in this project is based, the question of how data collected in translation process research can be made re-usable and verifiable will be focused on. This is a major issue in translation process research since, in the past, data collected in investigations into translation processes have not been made available to the scientific community in most cases, with the consequence that findings based on such data cannot be reproduced and verified and that the data cannot be re-used in other investigations. In an attempt to solve this problem, (1) a text annotation system based on the *Guidelines for Electronic Text Encoding and Interchange* (<http://www.tei-c.org/Guidelines/P5/index.xml>) of the Text Encoding Initiative (TEI) will be presented for the transcription of verbal data and (2) asset management systems (AMS) will be advocated to make translation process data accessible on the Internet.

The text annotation system will be illustrated using transcription examples from TransComp. Special emphasis will be placed on the meta-data required for translation-process transcripts and the different phenomena to be transcribed.

AMS are electronic systems for storing, archiving, annotating, and analyzing digital resources of any type. The advantages and functionality these systems offer will be described both from the perspective of research and from the perspective of translation pedagogy. As an example of such an AMS, the one developed for TransComp with its specific functionality will be presented. One specific feature is the option of linking sections of transcripts to the respective sections in the sound or video files on which the transcripts are based, so that, for example, a section of the video file can be displayed by clicking on the corresponding section in the transcript. The AMS used for TransComp was developed using Fedora open-source repository software (cf. <http://www.fedora.info>) and is on-line already (cf. <http://gams.uni-graz.at/container:tc>), but the data stored in it have been password-protected to make sure that our subjects cannot access the material they will be confronted with in future experiments. Password protection will be removed at the end of the longitudinal study in August 2011.

**Gyde Hansen (Copenhagen Business School, Copenhagen/Denmark)**

## **Longitudinal studies in translation and revision**

Longitudinal studies are well-known especially from social sciences and medical research but recently they are also applied in Translation Studies. Between 1997-2007, I carried out two different longitudinal studies in translation and revision – at first, a comparison of different groups of students in their last year of their studies at the CBS, and secondly, I did experiments with a group of students when they were last year students and again with the same persons as professionals.

In 2007, some of them worked as translators, others had found different kinds of professions. In my contribution, I will present different designs of longitudinal studies, and discuss methods and some of the results.

**Riitta Jääskeläinen (University of Joensuu, Department of Foreign Languages and Translation Studies, Joensuu/Finland)**

## **Looking for a working definition of ‘translation strategies’**

‘Translation strategies’ tend to be used to refer to many different things in translation studies. Englund Dimitrova (2005) sums the situation up by saying that translation strategies mean things that happen to texts (domesticating; cultural adaptation; paraphrase) as well as things that take place during the translation process. Process researchers (Krings 1986; Lörcher 1991; Jääskeläinen 1993, 2007) have proposed their own definitions of ‘translation strategy’ which seem to be based on different views of the nature of translation processing. The aim of this paper is to try to make sense of the different uses and definitions of ‘strategy’, particularly with regard to what happens in the process and how that is reflected in the product.

**Ricardo Muñoz (PETRA Research Group, University of Las Palmas/Spain)**

## **Subject profiling in translation process research**

Empirical translation process research has evolved into a thriving branch of translatology – witness the large array of topics and data collection procedures (cf. Göpferich 2008) – and it could be said that we are making our way into a second stage of scientific research, perhaps even contributing to the slow, cautious emergence of a new, promising paradigm in Kuhn’s (1962) sense. In this transition, however, many of the problems faced by our forerunners in the eighties and the nineties are still there. Scientific research in the social sciences has to deal with human factors and constructs, some times as the very object of research (e.g. evaluating, revising, proofreading, and the like), other times as concepts which simply cannot be dispensed with and need to be operationalized (e.g. quality, expertise). In a clever move that temporarily sets aside some of these problems, some research teams, such as LETRA and TransComp, have taken to develop storage and codification systems which will make data available for new analyses in the future.

But, apart from its epistemological sense, the term *paradigm* has a second meaning, associated to the expression *experimental paradigm* which, in the behavioural sciences,

refers to the precise ways experiments are conducted. And this second sense points to certain shortcomings in our works which might be overcome. Some of these shortcomings refer to the enormous variation in terms of ecological validity, original texts, test duration or data collection procedures (cf. Rodrigues 2002). While it is true that some of these factors may be irrelevant in certain research goals, others are pervasive and threaten to maintain current endeavors as a heterogeneous set of juxtaposed attempts which cannot be interconnected, nor built upon. Such is the case of subject profiling.

All human translation process experiments deal with subjects, but differences in age, education, background, experience, motivation and the like make it doubtful whether different test results can be compared. Hence, strategies to profile subjects which will let scholars compare them to others seem in order. The goal of this contribution is to propose a practical way to profile subjects which should suit our needs. First, language skills might be reported in a way different from the customary systems of national education traditions. Internationally available, standardized tests, such as TOEFL for English, seem optimal candidates to fill the need. Second, sociolinguistic information collected in questionnaires should contain the items which may have an influence on subjects' behavior and performance. PETRA's online questionnaire will be shown as an example for open discussion, in the hope that contributions during the exchange will help improve it, in a move towards standardization. Third, the very nature of our research demands that we find some way to cognitively characterize subjects. Again, normalized tests seem the easiest, perhaps most convenient way to do so. Stanford-Binet (SB) and Wechsler Adult Intelligence Scales (WAIS) are a case in point. WAIS seems more suited to pinpoint differences between adults in the average range. Converting intelligence into a score is rightfully mistrusted, but the WAIS test consists of several subtests, and the combination of some of them provide indexes such as mental processing speed and verbal comprehension, all of them relevant for the tasks usually tested in translation process research (cf. Rothe-Neves 2003 for working memory capacity); further, WAIS has been translated into and validated in most European languages, so their results can be reliably compared; finally, it has been applied in large populations, so translatology scholars can also tap data from experimental psychology, therefore making it easier to contrast experimental subjects with other populations. Data relating WAIS subscores with some features of test subjects' behavior collected in PETRA's research will be presented, together with a computer adaptation of the test which makes it easier to administer.

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**Aljoscha Neubauer/Anna Kanape (Department of Psychology, University of Graz/Austria)**

## **Neurophysiological and psychological approaches to human performance and expertise - Implications for research on translational processes and outlook on a research project**

This presentation comprises two major topics: First, a general introduction to intelligence, expertise and neuroscientific research from a psychological perspective and second, a review of an ongoing study encompassing the aforementioned areas and extending into the field of translational processes.

In the first part, Aljoscha Neubauer will review the current psychological and neuroscientific status of research on concepts of abilities (like intelligence or aptitude), expertise (in various domains) and effects of training on performance variables on one side and on neuro-scientific indicators of brain functioning on the other hand. Abilities as well as expertise in certain domains can be assessed validly through psychometric tests and other indicators. Moreover, during the last 20 years neuroscientific studies have shown how the brains of individuals with higher vs. lower aptitude for certain domains work when individuals perform demanding tasks. Furthermore, the effects of higher vs. lower expertise in several well-studied performance domains will be reviewed. Recent studies have, in addition, revealed important insights about the interplay of aptitude and expertise, on a psychological level but also with respect to brain usage. All these findings shall be presented with regard to potential implications for psychological and neuro-scientific approaches to the hitherto understudied domain of translational expertise.

In the second part, Anna Kanape will present the outline of a research project dealing with these issues. More precisely, the proposed study aims at a further evaluation of the frequently-posed question whether translating is a competence innate to bilingualism or whether it should rather be regarded as a special form of expertise based on bilingual abilities. In this study advanced students of interpreting will therefore be compared to laywomen while performing linguistic tasks. Additionally to evaluating their behavioural responses also their brain activation will be measured in order to give insights into possible neurophysiological differences between these two groups or, respectively, to show which areas of the brain are involved in cross-language tasks regardless of expertise in translation. Thus, the study connects the research fields of expertise, translation and neurosciences in a hitherto unexplored way. By doing this it might be shown whether interpreting can be regarded as a special form of expertise knowledge also from a neurophysiological viewpoint. The methods used and the potential implications of the expected results of the ongoing study shall also be discussed.

Sharon O'Brien (School of Applied Language and Intercultural Studies, Centre for Translation and Textual Studies, Dublin City University/Ireland)

## Eye Tracking in Translation Process Research: a Discussion of Methodological Challenges and Solutions

This paper will first present an overview of the type of translation process research that is currently being conducted with the use of eye-tracking technology. We mention, for example, research into the measurement of cognitive effort when translating different match types in translation memory tools, including machine translation generated matches (O'Brien 2008) as well as research into the readability of texts that have been edited using Controlled Language (CL) rules (O'Brien 2006). We then draw on our experience in conducting such research to highlight the challenges involved in using eye-tracking methodology for translation process research. Our objective is not only to highlight the challenges, but also to provide suggestions for how each of these challenges might be addressed.

Eye-tracking offers the translation process research community an interesting addition to the existing methods of Think-Aloud Protocols (Jääskeläinen 2002), keyboard logging (Jakobsen 1999) and qualitative methods such as contextual enquiry (Désilets et al. 2007), questionnaires or surveys. However, it brings with it significant methodological challenges. We have grouped these challenges into the following categories:

- appropriate research environment
- issues concerning participants
- ethics
- data explosion and
- validity

Under appropriate research environment we discuss the challenge of finding appropriate accommodation for the execution of eye-tracking research, taking into consideration the fact that light and sound can influence eye movements and, in particular, pupil dilations. Issues concerning the selection and recruitment of participants for research studies are many and varied. Under this category we will address the topics of participant competence, appropriateness and training. The latter category is necessarily related to the category of ethics, where ethical approval is often required before engaging in studies involving human subjects. We discuss the concerns that can arise when engaging in eye-tracking research in translation.

Since eye trackers sample and record eye-movement data on a millisecond basis, the resulting data from even a short translation session can be challenging to manage. Add to this the necessity to record sessions for multiple participants, then one has an interesting data management challenge. If another layer of quantitative data is added (collated, for example, through keyboard-logging or screen-recording software) in addition to layers of qualitative data (collated, for example, through think-aloud protocols or interviews), then the researcher has a significant data management and analysis challenge. We suggest ways of coping with these challenges.

Finally, we will discuss the important topic of validity in translation process studies in general and eye-tracking studies specifically, touching on topics such as the number of participants, the size of text segments, randomisation, the working environment and statistical reporting of small sample sizes.

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**Friederike Prassl (TransComp Research Group, Department of Translation Studies, University of Graz/Austria)**

## **Translators' decision-making processes in research and knowledge integration**

The analysis of empirical data linked with information retrieval showed the necessity of an instrument to categorize, systematically, the various research processes and behaviors that occur during the experiments. External research and knowledge integration are two integral parts of the translation process. There are cases where the translator must do without the first. There is no case, however, where translation can be carried out without the latter. The translator may be lucky if his thoughts present him immediately with an apt option, he may also have to make a choice between various options, retrieved internally (from what he has in mind) or externally (from sources outside) and with differing qualities, or in some cases he may even have to create options in order to have something to choose from. Some of these processes of choice take place consciously whereas others seem to happen automatically. In search for the decisive, explanatory cognitive skills required for both of these, the decision making process is worth looking at. Once the psychology of decision making is integrated into translation studies, some hitherto unclear processes can be unravelled.

The TransComp Research Project, is a longitudinal translation process study focusing on the development of translation competence in the course of a BA in Translation Studies at the University of Graz. Twelve students will take part in translation experiments throughout the three years of the project, translating ten texts each. The

data gained with Translog, screen recording, think-aloud, retrospective interviews, and questionnaires are compared with the same corpus of data gained from ten experts.

The comparison of the individual investment of necessary components such as concentration, time, flexibility, and cognitive efforts and the analysis of the mental representations already available or yet to be built, have led to a system of four decision-making processes.

In a first step, these four decision-making processes (routinised, stereotyped, reflected and constructed) will be introduced. In the following step, a descriptive analysis of decision-making as performed by the students in their first term and by the experts will be presented. Two interesting translation problems will thereby be discussed, first a culturally-specific phrase, and second a seemingly simple conjunction. These have been chosen due to their, when being analysed according to the above mentioned four categories, highly descriptive character.

The analysis of the resulting research and decision-making processes is expected to show massive differences between beginners' and experts' behaviour. Different proportions of routinised, stereotyped, reflected and constructed behavior during the reception as well as the production phases are expected from the two samples. Where the novices will not be able to resort to routinised and knowledge-based stereotyped processes the experts will show plenty of these processes. Furthermore, the differing quality of reflected and constructed decision-making processes within the expert group will be lined out and compared with the supposedly fuzzy approach of the students. The results will be presented for further discussion.

**Johanna Stadlober (TransComp Research Group, Department of Translation Studies, University of Graz/Austria)**

## **Measuring problem awareness in translation process research: a process- and product-oriented approach**

The TransComp Research Project investigates the development of translation competence in twelve students of translation at the Department of Translation Studies of the University of Graz over a period of three years and compares it to that of ten professional translators. In my paper, I will concentrate on one component of translation competence: problem awareness. I will follow both a product-oriented and process-oriented approach.

The product-oriented approach starts from the subjects' target texts. These are assessed by three evaluators with a university degree in translation studies. The process-oriented approach starts from the subjects' translation process protocols (TPP), i.e. think-aloud protocols that also include the documentation of the subject's research processes and other activities during the translation process.

Process-oriented methods such as the analysis of the translation process protocols permit to take a look at the underlying reasons for the product-oriented results. In order to allow a truly exhaustive analysis of problem awareness, the two approaches should be combined. Furthermore, for a comprehensive analysis, quantitative

approaches have to be complemented with qualitative analyses. The present paper introduces several tools that have been developed within TransComp to measure problem awareness. These include the quantitative measurement of mistakes, the creation of individual error profiles to determine the strengths and weaknesses of the singular subjects, the categorization of errors into reflected and non-reflected ones, the determination of error causes and the characterization of translation strategies by looking at the translation problems.

The findings presented in this paper result from the analysis of eleven translations of a popular-science text (Text A1), six of which are part of the experimental wave t1 (students) and five of the experimental wave t8 (professionals).

The qualitative analysis will focus on three different translation problems encountered in the majority of the TPPs. These include a lexical problem, the translation of a proverb, and the etymology of a term.

Firstly, as the initial step of the product-oriented analysis, the primarily linguistically-oriented evaluation scheme and its four main evaluation categories (formal errors, semantic errors, text level errors, others) will be introduced. Then, the results of the evaluation will be presented. I will not only outline them for the whole corpus, but also for two individual subjects who will be a student and a professional respectively.

Secondly, the results of the process-oriented approach will be outlined. After a presentation of the quantitative results (reflected and non-reflected errors, error causes) the focus will be on the description of the translation strategies the subjects employed.

As far as the overall number of errors in the students' and the professionals' target texts is concerned, the results are expected to differ significantly (students: about two thirds more mistakes). As earlier analyses have already shown, semantic errors will occur most frequently in the students' as well as in the professionals' texts. Regarding the proportion of reflected and non-reflected errors, the results are expected to be similar for both control groups (around seventy percent). However, the error causes as well as the translation strategies are expected to differ greatly among students and professionals.

**Hubert Stigler (Centre for Information Modelling in the Humanities, University of Graz/ Austria)**

## **Asset Management as a research strategy**

Due to the progressing digitization in science, the topic of modelling scientific content is increasingly discussed in Humanities and Cultural Sciences. Digital Asset Management Systems (DAMS) support researchers in processing, filing (citability) and analyzing digital sources and data (image files, sound files, movie files, text documents etc.). From a technological perspective, XML-based systems are particularly suited to flexible, metadata-enriched methods of document storage: The primary content of the document is augmented with additional descriptive elements, based on modelling standards like TEI (Text Encoding Initiative), RDF (Resource Description Framework), OWL (Web Ontology Language) or SKOS (Simple

Knowledge Organization System), an RDF-based formal language for coding thesauri, classifications or other controlled vocabularies. These standardizations lay the foundations for the semantization and, consequently, the automated processing and analysis of specialist knowledge, incorporating domain-specific knowledge ontologies and vocabularies. Unlike Content or eLearning management systems, DAM systems place special emphasis on sustainable, quotable (long term-)storage and flexible access (through controlled authorization models) to digital resources.

Heterogeneous requirement profiles are characteristic of the application of DAM systems in scientific contexts: possible (and common) fields of application include collections of Learning Objects, digital editions, image and movie archives or (morphosyntactically) annotated, multimodal text corpora. Despite being subject to controversy in the linguistic field, multimodal corpora are becoming increasingly popular in various disciplines as reference points in scientific theory construction. In addition to literary works, newspapers and other texts, textual and audio-visual survey data accumulated through interviews or observations are sources that are commonly used in corpus construction. The use of XML-based technologies allows for the automated linkage of textual and audio-visual raw material and its contained meta-information from various descriptive layers (e.g., morphology, syntax, discourse, interpretations, narrative structures, etc.) with diverse representation formats. DAM systems provide object-oriented management for data accumulated in such IT scenarios.

This contribution aims at exploring the prospects of using XML-based mark-up languages in the context of DAM systems in empirical translation process research and empirical social research, beyond mere storage scenarios.

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## **Application of Computer-Controlled Experiments in Translation/Interpreting Process Research**

The cognitive processes involved in translation and/or interpreting consist of processes available to conscious experience and of processes running below the consciousness threshold. The primary method for tapping subconscious processing is performance on cognitive tasks assumed to measure a hypothesised underlying construct (function, process, etc.). The tasks are very often presented in an experimental design. In this contribution, I would like to demonstrate how such tasks can be usefully employed in translation/interpreting process research by drawing on published research and by providing examples of research questions that this approach is appropriate for. Secondly, I would like to demonstrate a tool for implementing this type of research in a format known as computer-controlled experiments. I will introduce E-Prime<sup>®</sup>, a piece of commercial software which has become an industry standard in experimental psychology. The software helps the researcher to design experiments and present them in a highly uniform manner by running them on a personal computer. The software also collects specified responses (e.g. accuracy of response, response time with millisecond accuracy, etc.), and contains modules for merging data from a number of participants, for data analysis

and for export to other software packages (e.g. statistical packages). I will provide practical examples of tasks implemented in E-Prime. Finally, I will discuss advantages and limitations of computer-controlled experiments in the general framework of process research.