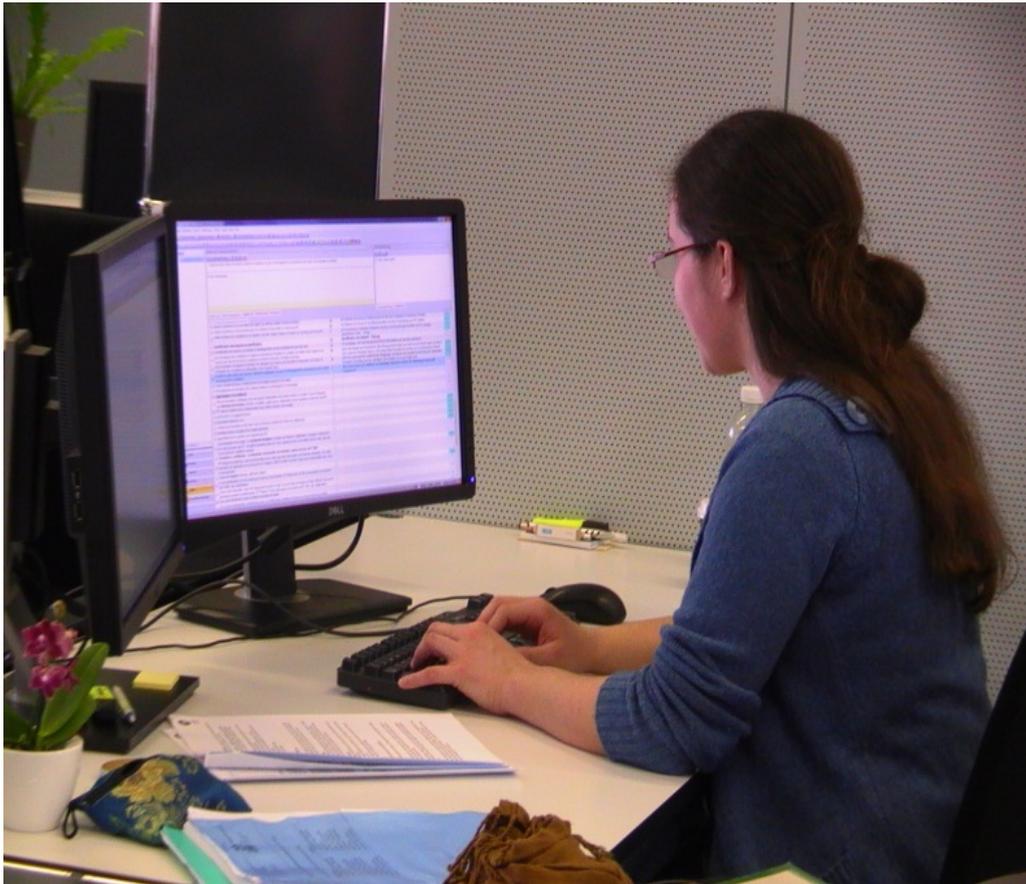


## Final report

### *Cognitive and Physical Ergonomics of Translation (ErgoTrans)*

January 2013 – June 2015



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## 1. Introduction

In the interdisciplinary study *Physical and Cognitive Ergonomics of Translation*, researchers from translation studies, occupational therapy, and usability studies have been studying the ergonomic factors that affect professional translators at their workplace. The study comprises five partially overlapping phases (see Table 1). The first phase, completed in the first half of 2013, was an in-depth analysis of an existing corpus from the precursor study in order to develop hypotheses and refine the instruments for the second phase. The data collection in the second phase, completed by the end of the first half of 2014, involved video recordings, computer screen recordings, ergonomic assessments, and interviews at translators' workplaces. The third phase, testing hypotheses generated from the workplace data in the usability lab. The fourth phase, an international survey, was first pilot-tested with a collaborator from Dublin City University before being launched in August 2014 on the occasion of an international conference of professional translators and translation scholars in Berlin. The closing date of the international survey was extended to the end of 2014 because of the overwhelming response on the part of participating professional associations in various countries. The results of the final phase of the project, in-depth interviews with representatives of the different groups of translators studied in the previous phases, were combined with the findings from the other phases of the study to answer the research questions, as outlined in the next section.

*Table 1. Overview of project phases and data collection methods (n=number of participants)*

Phase 1 (2013)	Analysis of existing corpus from the <i>Capturing Translation Processes</i> project; screen recordings, eye tracking, keylogging (n=18)
Phase 2 (2013-14)	Collection of data at commercial, institutional, and freelance translators' workplaces; screen recording, video recording, ergonomic assessment, interview (n=31)
Phase 3 (2014)	Testing of hypotheses in usability lab; eye tracking, keylogging, screen recording, stimulated-recall commentary, interview (professionals: n=18; MA students: n=12)
Phase 4 (2014)	Ergonomics of professional translators' workplaces worldwide; online survey in English, French, German, Italian, Portuguese, Spanish (n=1850)
Phase 5 (2015)	Validation of previous phases; in-depth group and individual interviews(n=19)

## 2. Main research results and implications

Drawing on perspectives from translation studies, occupational therapy, and usability studies the project addressed the following research questions with respect to typical profiles of professional translation:

- (1) What are the indications of disturbances to the translation process at the workplace?
- (2) Which cognitive and physical ergonomic factors are related to those disturbances?
- (3) How do professional translators cope with disturbances, and which practices seem to be most successful?
- (4) Which disturbances seem most difficult to compensate, which cannot be compensated at all, and which might actually have a positive impact on translation performance?
- (5) Which health complaints might be related to the ergonomics of the translation workplace?

The typical profiles that were identified in our project for commercial, institutional, and freelance translators are indicated by the shaded cells in Table 2. For example, most commercial translators in our study work at language service providers, use CAT tools a lot, and share an open-plan office with several colleagues. The institutional staff translators have their primary workplace at a governmental institution, work alone or share an office with one other person, and use CAT tools regularly. By contrast, most freelance translators work alone and may or may not use CAT tools, depending on their clients' needs. During the course of the project, it became clear that a profound appreciation of the differences between these profiles is crucial to optimizing the workplace ergonomics of professional translation.

Table 2. Typical workplace profiles of participants in the study (shaded cells)

Group 1	commercial staff translator			
Office size	3 or more people		1-2 people	
CAT tool use	high	low	high	low
Group 2	institutional staff translator			
Office size	3 or more people		1-2 people	
CAT tool use	high	low	high	low
Group 3	freelance translator			
Office size	3 or more people		1 person	
CAT tool use	high	low	high	low

The results of this interdisciplinary study of the ergonomic conditions of professional translation suggest that the physical aspects of the workplace are being taken into consideration quite well at institutions and commercial enterprises but that there is still some scope for improvement (see Section 3). Workplaces of freelance translators were not as well equipped as those of commercial and institutional translators, resulting in the more frequent health complaints reported in the workplace assessments and the survey. With respect to the office situation of the translators who participated in the first phase of the study, for example, the office layout, furniture, and equipment were ergonomically sound but had not necessarily been adjusted appropriately. Not being able to control the office temperature and distractions from colleagues moving around were identified in the online survey as problematic by a large proportion of institutional translators. Physical activity and ergonomic awareness emerged as key factors in maintaining health and reducing stress.

The linguistic and domain-knowledge challenges associated with the bilingual activity of translation were considered positive aspects of cognitive ergonomics whereas poor quality source texts and interruptions from email (although not interruptions by people) were considered negative. Language technology was mentioned as a stress factor, both with respect to the difficulty in using certain features and the constraints on creativity that certain settings and features impose, which was validated in experiments in the usability lab. The majority of the translators use computer-assisted translation (CAT) tools and virtually all of those that do (96%) find the tools helpful at least some of the time. However, more than half of the freelancers and institutional translators use the default settings. This contrasts with commercial translators, who are more likely to customize the layout, colors, etc. to suit their particular needs, perhaps because they have received special training. The ergonomics of these tools obviously needs to be improved, since more than half of the translators who use CAT tools said that there were things about them that were irritating.

With respect to organizational ergonomics, the institutional translators seem better off than the commercial and freelance translators in our study. They are better networked with colleagues, with various opportunities for face-to-face and remote contact in both formal and informal contexts, and are more likely to receive feedback on their work. Although they are exposed to stress caused by organizational workflow and technical problems, job security, flexible working-time arrangements and institutionalized breaks of variable length seem to help counteract this. Nevertheless, the interview data indicate some frustration at a lack of consultation on infrastructural procurement and workflow design, especially language technologies and their implementation. From an organizational perspective, the interview data suggest that the institutional translators would benefit not only from more involvement in decisions about the tools they use, but also from a clearer rationale of translation policy (especially in respect of quality and efficiency). For all three groups of translators, heightened organizational and client awareness of what translation involves could alleviate stress resulting from unrealistic deadlines and generally low appreciation of their work.

### 3. Synthesis of ergonomic factors, disturbances, and coping strategies

The synthesis during Phase 5 of the project resulted in an overview of physical, cognitive, and organizational ergonomic issues and disturbances that were identified at institutional, commercial, and freelance translators' workplaces as well coping strategies that (partially) compensated for them.

Level		Institutional translators	Commercial translators	Freelance translators
Physical	workplace	Mostly well-equipped, dedicated workplace in single offices; half not happy with their chairs.	Mostly well-equipped dedicated workplace in shared or open-plan offices.	Non-ergonomic equipment common; mostly with dedicated workspace at home; most not happy with chairs and many unhappy with desks.
	disturbances	Hardly disturbed by discussions, phone calls or people moving around; frequent interruptions by people moving around judged negatively. Half cannot control the office temperature and one-third cannot control airflow themselves.	Disturbed by discussions, phone calls, and people moving around; more frequent interruptions by people moving around judged negatively. Half cannot control the temperature or airflow themselves.	No disturbances through discussions or phone calls; infrequent disturbances by people judged positively. Can control the temperature and airflow themselves.
	coping strategies	Rather organized management of breaks because of peer pressure; usually leave workplace during breaks; do not ignore own needs for pause. Take micro-pauses and engage in regular sports activities.	Rather loose management of breaks leads to neglecting needs; pauses less regular; one-quarter do not leave their workplaces during breaks. Engaging in sports activities and addressing problems such as office noise.	Rather loose management of breaks but can decide when to do what; change positions, take breaks, or do other tasks; short pauses to move around, regular sports activities. Listening to music and switch hands for the mouse as compensation.
cognitive	tools	Usually use CAT tools and find them helpful; do not necessarily customize settings; seldom have to switch between tools.	Almost all use CAT tools and find them helpful; often customize settings; sometimes have to switch between tools.	Fewer use CAT tools but those who do find them helpful; sometimes customize settings; often have to switch between tools.
	disturbances	More than half find certain CAT tool functions irritating as well as staff e-mail unrelated to translation tasks; most find e-mail disturbing at least sometimes; monotony and poor source texts are perceived as stress factors; over 50% mostly or always experience time pressure.	More than half find certain CAT tool functions irritating; most find e-mail disturbing at least sometimes; poor quality source texts are perceived as stress factors; almost 60% mostly or always experience time pressure.	Fewer than half find certain CAT tool functions irritating; necessity to react quickly to e-mails to ensure incoming work is stressful; most find e-mail disturbing at least sometimes; screens too small for all the programs and tools; font too small to see easily; just under 50% mostly or always experience time pressure; poor source texts and lack of IT support are stress factors.

Level		Institutional translators	Commercial translators	Freelance translators
	coping strategies	Secure position and infrastructure; often have the possibility of having the source text pre-processed; music helps concentration.	Training in CAT tools and individualized settings; often have the possibility of having the source texts pre-processed; take breaks away from the computer; talk to colleagues about translation problems; ask for tips from others.	Only turn on e-mail and cell phones during office hours; set a timer for breaks at certain times and take them away from the computer; prioritize tasks; implement clean desk policy; organize workday.
organizational	workflow	Interactions and exchanges in person, by e-mail or by phone; organized institutionalized communication forms; almost half usually or always receive feedback for their work. Some concern expressed about translation policy issues (quality and efficiency). Lack of organizational and client awareness of translation leads to stress (low appreciation, unrealistic deadlines).	Interactions and exchanges usually in person or by e-mail (less often by phone); only one-quarter usually or always receive feedback for their work.	Almost no personal or informal interactions and exchanges; no organized communication form; less than 20% usually or always receive feedback for their work. Stress factors include price pressure, agencies' electronic bidding systems. More effort for organization and administration.
	self-determination	Just under one-third usually or always decide when they work; some have the possibility to work from home; under one-quarter can decide which translation jobs they do. Some concern expressed about lack of consultation over technologies and their implementation.	Just over one-third usually or always decide when they work; a few have the possibility to work from home; just over one-quarter can decide which translation jobs they do.	Over 80% usually or always decide when they work; most work from home; over 80% can decide which translation jobs they do.
	coping strategies	Determine the order of translation jobs themselves; whenever possible, work from home.	Determine the order of translation jobs themselves; whenever possible, work from home; make a list of questions to ask colleagues in order to prevent disturbing them too often.	Organize (online) networks; share infrastructure and jobs with other freelancers; seek feedback actively; negotiate deadlines; only accept appropriate jobs; specialize but keep up with developments in the profession and the market (CPD); incorporate sports and active breaks into workday.

## 4. Conclusions

When people are doing work that demands close attention and concentration, they have to exert energy and ultimately cognitive resources to compensate for the distraction of any physical discomfort or frustration with organizational problems. The potential for poor physical, cognitive, and organizational ergonomics to have detrimental effects on translation quality and translators' job satisfaction seems obvious. Between the initial assessments at the workplace in Phase 2 and the in-depth individual and group interviews in Phase 5, a marked increase in awareness on the part of the participants and their employers was noted. Although professional translators have developed effective coping strategies for dealing with some disturbances (see Section 3), others seem to be much more difficult to compensate for and would seem to motivate changes in technological tools and organizational structures.

The importance of this topic and the relevance of study findings are reflected in the enormous response from practising translators and their employers as well as the impact in the international research community. The project has been praised because of its interdisciplinarity, multi-method approach, high ecological validity, and large corpus of high-quality data.

## 5. Acknowledgements

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