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Psychological consequences of the digital transformation of the translation industry: an exploratory study of technostress among Danish certified translators

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Abstract

Based on survey data, the study explores the consequences of digital transformation for the well-being of Danish certified translators, focusing on the level of technostress related to translators' adoption of CAT tools, neural machine translation tools or no tools, as well as to translators' professional translation experience.

Keywords: digital workplace transformation, technostress, techno-insecurity, translators, translation industry, translation technology.

Resumen

Basado en datos de encuestas, este estudio explora las consecuencias de la transformación digital para el bienestar de los traductores daneses certificados, centrándose en el nivel de estrés tecnológico relacionado con la adopción de herramientas TAO, herramientas de traducción automática neuronal o la no utilización de herramientas, así como en la experiencia profesional de los traductores.

Palabras clave: transformación digital del lugar de trabajo, estrés tecnológico, inseguridad tecnológica, traductores, industria de la traducción, tecnología de la traducción.

Resum

Basat en dades d'enquestes, l'estudi explora les conseqüències de la transformació digital per al benestar dels traductors danesos certificats, centrant-se en el nivell d'estrès tecnològic relacionat amb l'adopció d'eines TAO, eines de traducció automàtica neuronal o la no utilització d'eines, així com en l'experiència professional dels traductors.

Paraules clau: transformació digital del lloc de treball, estrès tecnològic, inseguretat tecnològica, traductors, indústria de la traducció, tecnologia de la traducció.

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1. Introduction

The digital transformation of society is influenced by megatrends such as rapid globalisation and neoliberal policies. Organisations adopt digital solutions to improve productivity, competitiveness and, thus, future economic success. Hence, many organisations are evolving into increasingly digital workplaces (Zimmer et al., 2023; Baptista et al., 2020).

In the translation industry, computer-assisted translation (CAT) tools, including translation memory (TM) systems, neural machine translation (NMT) and translation management systems (TMSs), have had a particularly transformative or even disruptive effect on the translation workplace, as they have automated parts of or entire translation tasks that were previously controlled by human translators (see Briva-Iglesias and O'Brien, 2022). Large language models (LLMs), such as Gemini from Google and ChatGPT from OpenAI, appear to be the latest disruptors that are now also being integrated into CAT tools.

There is no doubt that the introduction of powerful translation technologies will (continue to) affect the work routines and cognitive processes of translators, challenging their roles and familiar workflows and requiring new skill profiles. Among translators and, not least, in society at large, there is an ongoing debate about whether AI will replace human translators, because translation is often mentioned as a profession that is threatened by automation. For example, the website "Will Robots Take My Job?" (2024) rates the risk of automation for interpreters and translators as "high risk" (61-80%), indicating that many translation tasks can be easily automated using current or near-future technology. Public discourse is likely to have an impact on the well-being of translators, as most people feel threatened by the worst-case scenario of losing their jobs. Although Vieira (2020) found that technology tends to replace specific tasks rather than entire professions, and that translators do not fear being overtaken by machine translation (MT), we know that translators have often felt threatened by the introduction of technology: for example, CAT in the 1980s, NMT since 2016, and generative AI (GAI) since 2022 (LeBlanc, 2017; Sakamoto, 2019 and 2020; Sakamoto et al., 2024; Vieira, 2020). In terms of AI-based technologies, Eloundou et al. (2023: 15) highlight that LLMs could potentially reduce the time translators and interpreters spend on three quarters of their tasks by at least 50%, although the impact of LLMs may be overestimated. Arguably, the recent development of GAI tools and the ongoing integration of AI features into CAT tools, for example, may lead professional translators to speculate whether automation poses a significant threat to their jobs. Such worries add to other concerns related to professional translators' working conditions, stemming not particularly from the quality of AI-generated output, but from, for instance, the uberisation of translation work (Firat, 2021).

In this paper, we use organisation theory to describe digital workplace transformation in the translation industry as an agent of change and a potential generator of technostress. In so doing, the paper explores the adoption of translation technology by Danish certified translators, dealing with technology-induced change as a source of stress.

The aim of this study is twofold: to investigate the relationship between technostress and 1) translators' professional translation experience and 2) translators' adoption of new translation technologies. Hence, like Baumgarten and Cornellà-Detrell (2017) and Braidotti (2013), we adopt a posthuman critical approach to translation automation, recognising that the boundaries between user performativity and technology performativity are blurring (Baptista et al., 2020: 3). As highlighted by Spreitzer et al. (2017), there is a need for more research dealing with so-called alternative work arrangements, as more and more people are working as, for example, freelancers, which is the case for 70% of translators (Pielmeier and O'Mara, 2020).

Based on organisation theory, in the following subsection we describe the impact of digital transformation on the translation industry, distinguishing between two approaches to managing technological change and three orders of effects of technology implementation, before the concept of technostress is defined. Section 2 explains the study design and research questions. Section 3 presents and discusses the results of the study, while section 4 concludes the paper.

1.1 The effects of the digital transformation in the translation industry

Organisation theory is a field concerned with understanding the organising practices and processes that create organisations (Hatch, 2018; Daft et al., 2021). A prevalent focus within organisation theory is the transformation brought about by digital technologies. According to Zimmer et al. (2023), organisations can take two different approaches to managing technological change, namely an addition or a subtraction logic. Most often, organisations accumulate and layer new technologies on top of existing ones, without necessarily removing old systems, and focus on the benefits and capabilities added by the new technologies. This reflects an addition logic. The aim is to streamline processes, reduce costs and improve productivity. However, digital transformation typically does not just bring benefits and make working life easier. This reflects the so-called subtraction logic, which recognises that simply adding more technology can lead to complexity, inefficiency and redundancy. Moreover, it addresses the need to remove outdated technologies and practices as new solutions are implemented and recognises the importance of not only adopting new technologies but also continually evaluating and updating the organisation's technology portfolio to maximise efficiency and effectiveness. We argue that the translation industry generally seems to adopt an addition logic. For example, this seems to be evident in the adoption of CAT tools, MT systems and TMSs, which are often integrated into the workflow without removing older systems. The overall aim of this approach is to speed up the translation process and reduce effort.

In a recent article, Bundgaard and Christensen (in press) discuss the impact of digital transformation on the translation workplace, particularly focusing on the so-called three orders of effects, drawing on a framework developed by Baptista et al. (2020) which categorises the changes brought about by the integration of new technologies. Each order of effects builds on the others, showing how technology can lead to progressive layers of change. First order effects are so-called convergent changes, i.e. immediate

and anticipated changes that represent improvements to existing organisational practices and work patterns that increase productivity and efficiency. For example, technologies such as CAT tools and MT systems have increased the productivity of translators by streamlining and automating parts of the translation process, enabling reuse of earlier translations and faster turnaround times (Christensen et al., 2024b). Another first order effect is that the adoption of new technologies has contributed to the overall growth of the language industry, with larger language service providers (LSPs) benefiting significantly — and more than small translation companies — from economies of scale and technological advantages (Pym and Torres-Simón, 2021).

Second order effects are defined as unintended and unexpected effects that transform work. They involve changes in the patterns and nature of work itself, which can stimulate new ways of thinking about work within the existing organisational context. In the translation industry, for example, MT and CAT have shifted the job of translators from primarily translating to editing and correcting machine-generated output, thereby transforming their daily work activities and professional identities. For instance, Kirov and Malamin (2022), who used a survey to explore Bulgarian translators' perspectives on AI and its potential impact on their profession, found that new technologies have taken over routine activities while creating new jobs for translators, who are in demand for new services offered by, for example, LSPs.

Third order effects involve fundamental changes in the structure and design of organisations. In the translation industry, the entire translation workflow has changed. From project intake to delivery, it is increasingly mediated by technological tools such as TMSs, which automate many aspects of the translation process, such as project management and quality control. Such changes are altering the way organisations work and think about work at a systemic level. Bundgaard and Christensen (in press) point out that digital technologies have caused organisational restructuring within translation companies, changing the organisational dynamics and leading to a more peripheral role for translators, who increasingly serve as agents in a complex technology-enabled workflow. As a result, translators are increasingly assisting machines. The new and more marginalised role of translators seems to be exacerbated by the increasing precariousness of the translation profession and the move towards digital labour platforms. Firat et al. (2023) investigated the impact of the platform economy on translation work, focusing on how it aligns with decent work standards established by the International Labour Organization. By analysing questionnaire data from translators in Turkey who use various digital platforms, the study reveals significant gaps in compliance with six key aspects of decent work. These include inadequate pay, long and irregular working hours, challenges in maintaining a work-life balance, lack of a safe and healthy working environment, restricted access to social security, and limited opportunities for social dialogue, representation and workplace democracy. The findings highlight that digital transformation and hybrid working platforms may lead to exploitative and unsustainable working conditions for translators. Focusing on the quality of translators' working lives and their motivation to work, Sakamoto et al. (2024) delved into how translators' attitudes towards technology affect their work satisfaction and motivation. Key findings include that

translators who perceive their careers as successful are less likely to have negative perceptions of technology. However, a positive view of technology does not seem to correlate significantly with translators' perception of career success. Furthermore, the data suggests that more experienced translators show a tendency to be more averse to technology, including MT. This could indicate a generational or experiential divide in the acceptance and integration of new translation technologies. At the same time, translators who engaged more frequently in MT post-editing tended to have a more positive attitude towards translation technologies, in particular MT. This correlation suggests that familiarity and regular engagement with translation technologies might lead to more positive perceptions of such tools. The study also found that translators who felt that technology dominated their work did not necessarily view this impact negatively. Those who believed technology played a dominant role in their work were also more likely to have positive views of MT, indicating an acceptance or adaptation to technological integration in the translation process. However, the study indicated that a positive attitude towards technology and MT seems to have very little impact on translators' overall job satisfaction, but the authors stress that further research is needed to learn more about translators' attitudes towards translation technology (Sakamoto et al., 2024). Likewise, Bundgaard and Christensen (in press), who, to our knowledge, are the first to address technostress in the field of translation, emphasise that we lack research dealing with the psychological impact of technology on translators. They suggest that the digital transformation taking place in the translation industry should be viewed through a technostress lens.

1.2 What is technostress?

The concept of technostress was first introduced by the psychologist Craig Brod and is defined as "a modern disease of adaptation caused by an inability to cope with the new computer technologies in a healthy manner" (Brod, 1984: 16). Today, technostress is used as a multidimensional concept relating to technology anxiety and/or information overload (Urukovičová et al., 2023). Like Ragu-Nathan et al. (2008), we define technostress as the negative psychological reaction that individuals experience from using or adapting to new technologies. It encompasses the various ways in which technology can induce stress, including the pressure to adapt to constant technological change, the need to acquire new skills, the increased pace of work, and the invasion of work into personal life through digital connectivity. According to Bondanini et al. (2020), technostress is characterised by a range of symptoms and effects on mental health and work performance, such as anxiety, fatigue, reduced job satisfaction, lower job engagement, reduced productivity, and even physical symptoms such as headaches or eye strain. Interestingly, a meta-study by Nastjuk et al. (2023) found that technostress significantly affects psychological outcomes, such as job satisfaction, more than behavioural outcomes, such as performance and organisational commitment, although their study did not specifically focus on the translation industry.

Tarafdar et al. (2011) argue that the use of digital technologies can result in challenging situations (so-called technostress creators) that people perceive as threats

to their health when they do not have adequate resources to cope with the situation. The authors identify five types of technostress creators: *Techno-overload* is a state of mind that occurs when users feel compelled to work faster and longer than they would without technology. It leads to a feeling of being overwhelmed by the amount of work or the pace at which it must be completed. *Techno-complexity* occurs when new technologies are difficult to understand and use, requiring users to spend considerable time and effort learning how to use them effectively. *Techno-invasion* occurs when technology causes people to be available 24/7, blurring the boundaries between personal and professional life. *Techno-insecurity* occurs when people feel that their job security is threatened by technology, fearing that their skills will become obsolete. *Techno-uncertainty* includes stress due to constant upgrades and changes in technology, hindering users' proficiency with a system. In other words, users struggle to build a stable knowledge base as the technological landscape evolves.

Based on a review of workplace-oriented studies of professional translators, which are few in number, Bundgaard and Christensen (in press) conclude that several technostress creators seem to be at play in the translation industry. Techno-overload seems to be the most frequently mentioned technostress creator, followed by techno-complexity and techno-invasion. Techno-uncertainty was not touched upon in the reviewed papers. In terms of techno-insecurity, research seems to point in different directions. Due to this, and because techno-insecurity is a central topic in times of automation, the present paper will focus on whether Danish certified translators suffer from this type of technostress.

2. Methodology

The present study aims to explore the possible relationship between technostress caused by techno-insecurity among Danish certified translators, their use of translation technology, and their number of years of professional translation experience. Based on the findings of Sakamoto et al. (2024), we assume that 1) less experienced translators are more likely to adopt translation technology, 2) more experienced translators tend to have a more negative attitude towards technology and, therefore, experience more technostress than less experienced translators, and 3) translators who use translation tools will experience less technostress than translators who do not use such technologies. As mentioned above, to our knowledge, technostress has not yet been studied empirically in translation studies. Therefore, the study is exploratory in nature.

The study is based on data from an online survey investigating Danish certified translators' use of and experience with translation technology (Christensen et al., 2024a). The survey was distributed to all members of the Danish Association of Certified Translators and Interpreters. Prior to distribution, two members of the association tested the questionnaire. They were chosen by the association's secretariat based on their reliability and interest in translation technology. In the light of their feedback, a small number of questions were rephrased. Next, the secretariat sent the 212 members of the

association an email on our behalf, inviting them to complete an online questionnaire. The email invitation included a URL that took respondents to the SurveyXact website. The link was open between 12 October and 25 October 2023. A reminder was sent three days before the end of the survey period. In total, 82 answered the questionnaire completely or in part, resulting in a response rate of 38.7%.

2.1 Survey design

The overall aim of the survey was to explore the use of translation technology (CAT tools with or without MT, browser-based MT, and MT in GAI tools such as ChatGPT), translators' experiences with technology, and the impact of technology on individual translators and the profession. The questionnaire consisted of four parts and was designed with both open and closed questions. Part 1 focused on educational background, working languages, subject areas and genres, professional translation experience and employment. Part 2 dealt with translators' adoption of the three types of translation technology and their explanations for using or not using translation tools. In Part 3, respondents were asked about the positive and negative consequences of the adoption of translation technology, their perception of MT quality, whether they informed clients about the use of MT, whether their clients prescribed the use of certain translation tools, what their clients thought about MT, what attitudes towards MT and GAI they had encountered in society and in the profession, and how the translation industry was changing due to the ongoing digital transformation. Last but not least, Part 3 asked respondents whether the digital transformation had had psychological effects in the form of technostress. In Part 4, respondents could provide additional information.

The question dealing with technostress drew on the widely used Technostress Creators Inventory (TCI) developed by Ragu-Nathan et al. (2008). The TCI consists of four to five items for each technostress creator, and all items are measured on a five-point Likert scale — from 1 ("strongly disagree") to 5 ("strongly agree"). Additionally, an "I cannot answer this question" option is provided. The TCI aims to determine the level of technostress among respondents, to identify the most important technostress creators, and to explore the relationships between technostress creators and outcomes such as job satisfaction, performance and well-being.

To limit the rather comprehensive survey, our questionnaire included only one question dealing with technostress. Inspired by the TCI, it asked respondents to use a five-point Likert scale to rate six technostress items – one item for each of the technostress creators: techno-overload, techno-invasion, techno-complexity and techno-uncertainty, and two for techno-insecurity. When reducing the number of items, we aimed to condense the meaning of the items in the TCI. The techno-insecurity items asked about the translators' potential fear of losing their jobs and about insecurity related to job performance. The wording of the items was as follows (translated from Danish):

- Technology makes me fear that I will lose my job (techno-insecurity)
- Technological development makes me insecure about my job performance (techno-insecurity)

- I cannot find the time to upgrade my technology skills (techno-complexity)
- Technology forces me to be available and/or online all the time, including outside of normal business hours (techno-invasion)
- Technology forces me to work much faster and/or more often (techno-overload)
- I feel uncertain about the constant new developments in the technologies I use or am asked to use (techno-uncertainty)

2.2 Data analysis

Our study takes a combined quantitative and qualitative approach. To test whether our three assumptions were correct, we initially aimed to conduct statistical tests to determine whether translation experience or the use of different types of technology could significantly explain the variation in technostress as measured by the five-point Likert-scale survey questions. Our sample consists of respondents who answered all the questions on technostress, years of experience and use of technology. This was the case for only 63 of the 82 respondents. To test whether any of our analysis results were statistically significant, we first estimated ordered logit models for the two items relating to techno-insecurity, using experience and intensive technology use as explanatory variables. However, the lack of statistical power associated with only 63 respondents made it impossible to find statistically significant relationships — even if they might exist in the general population. Ignoring the ordinal nature of Likert-scale variables, we also conducted one-tailed and two-sided tests for differences in mean survey responses by experience and technology use groups above and below the mean. Using this method, a single individual test produced significant p-values (the relationship between translators' level of techno-insecurity and their use of MT in CAT). However, given the number of statistical comparisons, the risk of committing a type-I error was simply too great to conclude that any coefficients were statistically significant. The same applies to Spearman tests for rank correlations between Likert-scale questions. We have therefore acknowledged that we are generally unable to detect statistically significant relationships. For this reason, we have chosen to use a descriptive statistical approach that focuses on describing central tendencies using mean scores.

To provide further insight into the impact of translation technology on translators' well-being, we also conducted a thematic analysis (Braun and Clarke, 2006) of respondents' qualitative comments on technostress and provide some illustrative examples of comments from respondents who use translation technology either quite regularly or quite infrequently.

3. Results

In section 3.1, drawing on the findings of the survey presented in Christensen et al. (2024a), we first give background information about the respondents, their professional experience in translation, their use of different types of translation tools, and their level of technostress. Next, in section 3.2, we present the results of the current descriptive study, which explores the relationship between 1) translators' years of experience and

adoption of translation technology, 2) translators' years of experience and their level of techno-insecurity, and 3) translators' use of translation technology and their level of techno-insecurity. Moreover, we provide illustrative examples of respondents' comments about technostress.

3.1 Background information

The survey found that 89% of the Danish certified translators have a master's degree in Language and International Business Communication (cand.ling.merc.), while 9% have a master's degree in Interpreting (cand.interpret.). Typically, the translators have a degree in only one language, with English (57%) being the most common. This is followed by German (15%), French (12%), Spanish (6%) and Italian (5%). A very small proportion of respondents have a degree in Czech or Dutch, or in a combination of two or three languages.

Respondents work with up to 12 language pairs. However, it is most common to work with one language pair (51%), two language pairs (22%) or three language pairs (16%). The study shows that 76% work with legal translation, making it the most common subject area, followed by financial translation (50%), technical translation (46%) and marketing (43%). The genres most frequently translated by respondents are instructive texts, marketing texts, contracts, and judgments.

Regarding employment, the study shows that 95% work as independent translators running their own business. Hence, very few are employed by an LSP or by another type of company. Of the independent translators, 94% have translation as their main occupation. A total of 52% of the independent translators work both for their own clients and LSPs. A total of 34% work exclusively for their own clients, while 14% work exclusively as subcontractors for LSPs or the EU. The study thus shows that most Danish translators have their own clients, but many also work, to a greater or lesser extent, as freelancers for (e.g.) LSPs. It can therefore be assumed that many Danish certified translators work in online and hybrid working environments.

3.1.1 Professional translation experience

As shown in Figure 1, there are significant individual differences in terms of the respondents' professional translation experience. Of the 82 respondents, the three with the least experience have worked in translation for five years, while the most experienced respondent has worked in translation for 45 years. Hence, some respondents have been in the industry long enough to remember when translation was a process that did not involve digital tools. However, as shown in the figure, most respondents have between 20 and 35 years' experience as translators. In terms of translation technology, this suggests that many translators have been working professionally in the translation industry when first CAT, then MT and, more recently, AI have made significant advances. The most experienced respondents may remember when tools such as MT produced

texts of quite low quality, whereas the less experienced respondents have grown up in the digital age. It may therefore be more natural for the latter to integrate technology into their workflow and to have a more positive attitude towards technology than more experienced translators, as demonstrated by Sakamoto et al. (2024). We assume that respondents' individual translation experience may affect their motivation to adopt new technologies and their level of technostress.

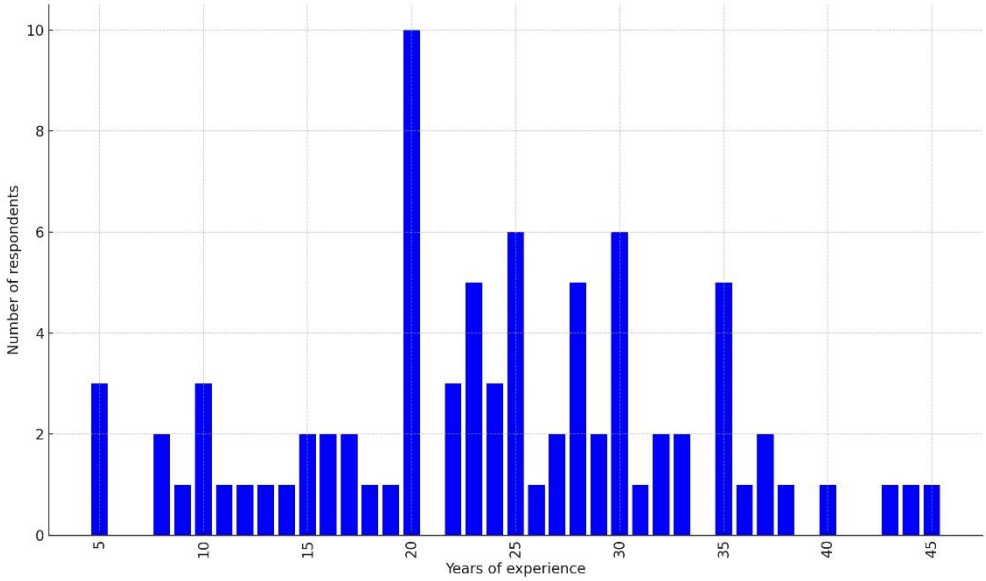

Figure 1: Years of professional translation experience

3.1.2 Use of translation technology

As for the adoption of translation technology, Table 1 provides a breakdown of the percentage of translation jobs where Danish certified translators apply CAT tools with and without MT, browser-based MT, MT in GAI, and no tools, ranging from full (100%) to no use (0%).

Table 1 shows that only 8% never use a translation tool, while 51% always do. Almost half (48%) use a CAT tool for all their tasks and only 14% never use a CAT tool. This means that 86% use CAT tools to varying degrees. Regarding the MT function in CAT tools, 9% activate it for all translation tasks, while 46% never use it. This means that 54% use this feature for a variable number of tasks. Browser-based MT tools are never used by 53% of translators, i.e. 47% use them to varying degrees. Only 4% use them for all their jobs. MT in GAI is used very sparingly, with 94% never using such tools. A total of 6% use GAI for translation purposes for a varying number of tasks. Interestingly, 1% (one respondent) use GAI tools for all translation jobs. In summary, the study shows that CAT tools are the preferred tool of Danish certified translators, although some never

use them. As far as MT is concerned, the MT function integrated into CAT tools seems to be the translators' first choice, although almost half of the translators never use this function. However, they are even more reluctant to use browser-based MT and MT in GAI.

Use for translation jobs	CAT (n=79) %	MT in CAT (n=67) %	Browser-based MT (n=79) %	MT in GAI (n=79) %	No translation tools (n=78) %
100 percent	48	9	4	1	8
90 percent	17	6	7	0	4
80 percent	6	6	3	0	3
70 percent	5	4	1	0	0
60 percent	1	4	1	0	0
50 percent	5	6	4	1	5
40 percent	0	0	1	0	1
30 percent	0	4	4	0	3
20 percent	1	6	9	1	8
10 percent	3	9	13	3	17
0 percent	14	46	53	94	51

Table 1: Translators' use of translation technologies as a percentage of all translation jobs

3.1.3 Technostress

In the part of the survey about technostress, 72 respondents ranked the six items on the Likert scale. Table 2 below shows the percentage of respondents who chose each option.

As shown in Table 2, the questionnaire indicates that technostress is quite widespread among respondents. In total, 42% of respondents agree or strongly agree that they fear losing their job. The table also shows that 39% agree or strongly agree that they do not have time to develop their skills, while 27% agree or strongly agree that they experience uncertainty because technology is constantly changing. A total of 36% feel that they are expected to be available outside of normal working hours, and the same percentage feel pressured to work more and faster due to the technological changes in the translation industry. It is worth noting that only 12% agree or strongly agree that they have doubts about their own abilities due to technological development, and that between 5% and 9% of respondents were unable to rate each of the six statements.

Techno-stress creators	Item	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree	I cannot answer this question
		%	%	%	%	%	%
Techno-insecurity	Technology makes me fear that I will lose my job	5	27	21	32	10	5
Techno-insecurity	Technological development makes me insecure about my job performance	22	51	10	8	4	5
Techno-complexity	I cannot find the time to upgrade my technology skills	1	21	32	30	9	7
Techno-invasion	Technology forces me to be available and/or online all the time, including outside of normal business hours	4	32	16	32	4	7
Techno-overload	Technology forces me to work much faster and/or more often	4	19	34	21	15	7
Techno-uncertainty	I feel uncertain about the constant new developments in the technologies I use or am asked to use	7	23	34	23	4	9

Table 2: Technostress among Danish certified translators

3.2 Exploring the three assumptions

In this section, we explore the three assumptions mentioned above, which are intended to contribute new knowledge about the possible relationship between translators' years of experience, their use of translation technology, and their level of technostress owing to the technostress creator techno-insecurity.

We focus on the two technostress items relating to techno-insecurity, because we find it interesting that the survey by Christensen et al. (2024a) revealed that a substantial number of translators fear losing their jobs to technology but very few feel that they do

not possess relevant skills to successfully fulfil translation tasks. In our view, both items represent external anxiety factors, but the former can be said to reflect a consequence that might ultimately manifest itself, while the latter reflects a current state of mind in which translators already feel threatened by technology. Both undoubtedly have an impact on translators' well-being.

3.2.1 Relationship between years of experience and use of translation technology

To explore the relationship between professional translation experience and the use of translation technology, we divided the 63 respondents who answered the survey questions regarding experience and use of technology and who also rated all six technostress statements on the five-point Likert scale into two groups, based on the average number of years of experience (23.68 years): group A, with below average experience, consists of 32 respondents, and group B, with above average experience, consists of 31 respondents.

As shown in Table 3, as regards the use of technology, groups A and B use CAT tools for 83.87% and 84.06% of all translation jobs respectively. For CAT with MT, the figures are 33.55% and 28.44% respectively. For browser-based MT, the figures are 28.38% and 16.56%. As a very limited number of respondents (6%) use GAI tools for translation purposes, we have decided not to include this category in our analyses. The values indicate that the number of years of experience does not seem to affect the adoption of CAT. When MT is integrated into a CAT tool, less experienced translators seem to use this technology more often than more experienced translators, but the difference is relatively small. Regarding browser-based MT, the values indicate a more profound difference, as those with less experience use this technology in 28.38% of all jobs, while those with the most experience use it in 16.56% of all jobs. The results therefore indicate that those with less experience have a slightly more positive attitude towards new technologies than more experienced translators, supporting assumption 1 that less experienced translators are more likely to adopt translation technology.

Translation technology use	**Group A (n=32)**	**Group B (n=31)**
CAT	83.87%	84.06%
MT in CAT	33.55%	28.44%
Browser-based MT	28.38%	16.56%

Table 3: Professional translation experience and translation technology use

3.2.2 Relationship between years of experience and level of techno-insecurity

To explore assumption 2 that more experienced translators tend to have a more negative attitude towards technology and, therefore, experience more technostress than

less experienced translators, in Table 4 below we have compared the level of techno-insecurity of groups A and B.

Techno-insecurity item	Group A (n=32)	Group B (n=31)
Technological development makes me insecure about my job performance	1.94	2.25
Technology makes me fear that I will lose my job	3.06	3.13

Table 4: Professional translation experience and techno-insecurity

As can be seen in both groups, respondents' fear of losing their job is higher than their uncertainty about being good enough at their job. For both items, group A, with below average experience, has less technostress (1.94 and 3.06) than group B, with above average experience (2.25 and 3.13). Thus, the results suggest that assumption 2 is also supported. However, the difference between the two groups is very small. To test whether our findings reflect a tendency, we need to carry out large-scale analyses of more data.

3.2.3 Relationship between use of translation technology and techno-insecurity

Assumption 3 posited that translators who use translation tools will experience less techno-insecurity than translators who do not use such technologies. To explore this, we divided the respondents into two groups for each tool (CAT, MT in CAT, and browser-based MT): those who do not use the specific tool (group C) and those who use it for at least 10% of all translation jobs (group D). For each group, we calculated the mean technostress score for the two items "Technological development makes me insecure about my job performance" and "Technology makes me fear that I will lose my job".

Techno-insecurity item	CAT		MT in CAT		Browser-based MT	
	Group C (n=4)	Group D (n=59)	Group C (n=31)	Group D (n=32)	Group C (n=30)	Group D (n=33)
Technological development makes me insecure about my job performance	2.25	2.08	2.39	1.81	2.13	2.06
Technology makes me fear that I will lose my job	3.75	3.05	3.16	3.03	3.30	2.91

Table 5: Translation technology use and techno-insecurity

Table 5 shows that translators' fear of losing their jobs seems to be more profound than their insecurity about their own ability to do their job well enough, regardless of

the tools they use. With respect to the statement "Technological development makes me insecure about my job performance", the results show that for both groups, the level ranges from 1.81 to 2.39. Hence, the level of technostress is quite similar regardless of whether translators use translation tools and, if they do, of the tool used. In relation to the statement "Technology makes me fear that I will lose my job", translators who do not use tools seem to be more likely to feel techno-insecure than those who do use them. Translators who do not use CAT (3.75) appear to be the most likely to fear losing their jobs to automation. However, as the number of respondents in this group is very limited, it is not possible to make any generalisations based on this analysis. But for all translation tools and both items, the results indicate that translators who do not use the specific technology seem to be more techno-stressed than those who use it, although the difference is quite small. Hence, assumption 3 also seems to be supported.

3.2.3 Qualitative comments on technostress

To shed more light on the impact of translation technology on translators' well-being, we include below some qualitative comments from respondents on technostress. A total of 18 respondents provided comments. We give four illustrative examples of comments from respondents who use translation technology either quite regularly or quite rarely.

The following translator, who has been working in professional translation for 10 years, uses browser-based MT for 10% of all translation jobs and no other translation technologies. They agree that technological development makes them insecure about whether they are still good enough at their job and strongly agree that technology makes them fear that they will lose their job. This translator therefore experiences a fairly high level of techno-insecurity. At the same time, the translator argues that the reason for this is not so much that MT quality has improved, but rather that financial motives to automate the translation task have prevailed in the translation industry:

> "I don't believe that technology can replace human skills, a machine doesn't translate as well as translators, but I do fear for the future because decisions about whether to use a translator or a machine are made from an economic point of view." (Respondent 41)

Another translator also highlights market dynamics as the driving force behind changes in the industry. This translator has 27 years' experience and uses CAT for 90% and MT in CAT for 10% of translation tasks. The translator disagrees that technological development makes them insecure about whether they are still good enough at their job, but, interestingly, at the same time agrees that technology makes them fear that they will lose their job:

> "It is obvious that AI is affecting both the number of jobs and translation fees, and that the number of jobs offered as post-editing of machine-translated texts has increased significantly." (Respondent 10)

If we compare the above comments with those made by translators who are fairly heavy users of translation tools, we see very similar concerns. For example, the following

translator with 20 years' experience, who uses CAT and MT in CAT for 100% of their translation work and browser-based MT and MT in GAI for 10%, reports the same level of techno-insecurity as Respondent 10. However, the translator also maintains that machines will never be as good as professional translators who specialise in fields such as legal and financial translation:

> "I can be a little worried about the development in relation to my work, but at the same time I'm very aware that no matter how good the tools become, they can never replace a real translator. There will always be a need for a human to check translations. I foresee that the tools will be used by lay people for everyday translations where no one would use a translator anyway. If you are a translator working with highly specialised documents, I doubt that you'd dare to let a machine handle, for example, financial statements, legal documents, etc." (Respondent 69)

The following translator agrees that specialised texts, such as legal documents, will most likely continue to be translated by professionals, while less complex material will be handled in-house by clients, indicating that the translator expects this to be done using MT. This translator has 28 years' experience and uses CAT and MT in CAT for 90% of their translation work and browser-based MT for 50%. The translator reports the same level of technostress as Respondents 10 and 69:

> "I do worry that technology will mean that only the very heavy stuff (legal) will be sent for translation and that customers will handle the lighter stuff in-house. I think I've noticed this development over the last year or so." (Respondent 7)

The above comments suggest that these four translators are worried about technology threatening their livelihood as translators. Interestingly, the translator who uses technology the least is the one who is most concerned about their own skills and the future. It is also worth noting that the translators who regularly use several tools still believe in their own skills, but at the same time expect market dynamics to drastically change the translation profession. Thus, in contrast to Vieira's (2020) findings, these translators seem to fear that their jobs will be overtaken by technology and not just that the nature of the jobs will change.

4. Conclusion

In this paper, we report on a survey of Danish certified translators and explore technology-induced change as a source of stress. More specifically, we have examined how translators' feelings of techno-insecurity are related to their professional translation experience on the one hand and technology use on the other. Using a descriptive statistical method, this exploratory study has suggested that less experienced translators are more inclined to adopt translation technology than their more experienced counterparts. It also indicates that experienced translators tend to experience higher levels of techno-insecurity than less experienced translators, and that translators who adopt technology experience less technostress than translators who do not adopt

translation tools. In the future, we aim to study technostress on a larger scale and with more items for each technostress creator, drawing on the full TCI.

Based on this exploratory study, we believe that the concept of technostress is a promising approach to take to explore translators' well-being in an era of technological disruption. We would like to emphasise that, from both a research and psychological prevention perspective, it will also be relevant to explore the feasibility of different technostress prevention measures or inhibitors (Tarafdar et al., 2011; Berger et al., 2024), not least in the translation industry, which is characterised by precarious working conditions and platformisation. As many translators already experience technostress, this work should focus on both preventing and combating different types of technostress, although this may be difficult in an industry where many translators work as freelancers. However, there seems to be no alternative, as technostress can have serious negative psychological consequences. According to Tarafdar et al. (2011), preventing and combating technostress in a broad sense involves educating, supporting and involving people and helping them to learn to accept the constantly evolving technological landscapes. Investigating these strategies in a professional translation environment could offer a deeper understanding of their effectiveness in an ever-changing digital workplace.

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