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Old Habits Die Hard: Towards Understanding L2 Translation[1]

1. Introduction

In this article it will be argued that the still prevalent view that translators should translate only into their native language (L1) and avoid translating into their foreign language (L2), because they are not native speakers of that language needs to be reassessed and subjected to empirical research. The axiom that translators should not work into their L2, especially when their L2 is English that is the language of international exchange and globalized communication networks, seems unrealistic and can no longer be afforded by speakers of minor languages. Apart from being impractical, the conviction that L2 translation is always inferior to L1 translation is also outdated and undermines the ideals of foreign language teaching methodologies, namely that one can achieve a high level of proficiency in a foreign language. The same critical attitude to L2 translation questions the very notion of translation expertise in which language proficiency in both working languages is an essential component but one among other components of expertise [Muñoz 2014]. The

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argument which will be developed in this article is that translating into English as one's foreign language, has been vilified without solid empirical evidence and without due care put into understanding the impact of the direction in which translation proceeds on the cognitive process in the translator's mind. Below some theoretical background is presented together with the EDiT research project which was designed to fill the empirical niche around L2 translation.

1.1 Why we need to understand the L2 translation process

The primary reason why we need to conduct empirical studies on how the direction of translation affects the way translators solve problems and make strategic decisions while working on a specific translation task is that the need for L2 translation will not go away. Translation will remain the only means of reaching the international community in research, business, literature and other areas of life for many speakers of languages of low diffusion such as Polish, Danish, Hungarian, Czech, Croatian and many others. Even if more and more people learn English worldwide and can use this language for general communication purposes, not all users of English as a foreign language, or English as a *lingua franca* (ELF) will be able to write well-structured texts aimed at international readers. On the other hand, the number of English native speakers who learn a minor language and become highly proficient in that language is very low and unlikely to grow. Since bilingual competence is the essential prerequisite for the acquisition and development of translation expertise, having a sufficient number of translators who can translate from a minor language as their foreign language into English (their native language) is not attainable. In today's multilingual and multicultural communities translating out of one's native language into one's second or third language either already is, or might become a part of the translator's practice [Ferreira and Schwieter 2017]. The demand for translating into English as the translator's L2 means that translator training institutions will continue to educate translators who can successfully handle translating into their native language as well as into their foreign language. As observed by Pavlović [2010: 64], "[f]or translation teachers in settings where L2 translation is a regular practice, the main dilemma is, therefore, not whether translators *should* work into their L2, but rather how to help them do it well". This requires a closer inspection of bilingual sub-competence as a part of

translation competence [PACTE 2003], as well as an insight into the cognitive complexity of the translation process [Diamond and Shreve 2017; Hurtado et al. 2015; Muñoz 2016].

1.2 Bilingual sub-competence and language processing in translation

The major reason for the criticism against L2 translation has been its low linguistic and communicative quality [Newmark 1981; Duff 1989]. Interestingly, there is much less documented criticism of translations into the translator's native language (L1). One obvious reason for this disproportion is the fact that translations into English as the translator's L2 can be assessed by the global English language readership while translations into the translator's L1 can be assessed only by a much lower number of its native speakers.

Although it is tacitly assumed that translators should be equally proficient in their working languages (L1 and L2) to translate, both languages rarely, if ever, enjoy the same status. For most bilinguals, whether natural ones, in the sense that they acquired their two languages simultaneously from birth due to being raised in a bilingual family, or those who are classified as bilinguals in the liberal sense of being able to function in two languages on an everyday basis, one language is usually more dominant than the other. This is a natural consequence of the complementarity principle formulated by Grosjean [2002] according to which:

> it is essential to remember that a bilingual uses his/her two languages (separately or together) for different purposes, in different domains of life and with different people. Because the needs and uses of the two languages are different, the bilingual is in fact rarely equally or completely fluent in the two languages [Grosjean 2002: 2].

Initially, translators are no exception to this principle. It is only through their professional experience that they might reduce the asymmetry in their bilingual lexicons (internal L1 and L2 vocabulary stores) to some extent and in some domains, for example those in which they specialize. Since language proficiency, including the efficiency of access to one's mental lexicon, is a product of experience in using that language, translators in fact might be more proficient in some registers in their L2 (for example technical, legal, medical discourse) than the native speakers

of that language without the specialized knowledge and terminology. They might also be much less proficient in some registers of their L1 in comparison with specialists in certain domains and areas of practice. In consequence the functional asymmetry between L1 and L2 proficiency in translators is the resultant outcome of their professional experience.

Although there is not a robust body of research on how translation experience affects the functional organization of the translator's mental lexicon [see for example Chmiel 2016], there is little doubt that "the scope and strength of the two bilingual vocabularies is a critical factor" [Diamond and Shreve 2017: 490]. There is also some evidence that translators and interpreters outperform other bilinguals (e.g. advanced language learners/users) in terms of the speed of lexical access and efficient selection of competing equivalents from their mental lexicons.

Notwithstanding, the possible bilingual advantage of translators over non-translators is still a subject to processing conditions which are unique for translation in comparison to other tasks such as general communication, reading or writing in either of the two languages. The translation process itself, because of its dynamic nature which requires a high level of activation of both working languages and integration of knowledge [Whyatt 2012] creates precarious conditions which require executive control to efficiently switch from one language to another and avoid interference at all levels of language use [Dong and Zhong 2017; Diamond et al. 2014]. Translation Process Research (TPR) has shown that expert translators self-monitor their performance to filter out interference and ensure good quality translation [Diamond and Shreve 2017]. The question to what extent the direction of translation modulates the translator's performance and what strategies are used by translators to overcome language asymmetry during the process of translation still awaits a thorough investigation, but some research on L2 translation is available [Ferreira and Schwieter 2017; Pavlović 2010].

1.3 Review of the research into L2 translation

Since translating into one's foreign language has been perceived, as if by default, to be inferior to translating into the translator's native language and consistently discouraged by theorists and practitioners [Whyatt and Kościuczuk 2013; Pokorn 2005], there has been very little empirical research into the process of L2 translation and into how it differs from the

process of L1 translation. The niche in the understanding of directionality was recognized by Pokorn [2005: 112] in her ground-breaking book entitled *Challenging the traditional axioms*. Pokorn reported that 46 English native speakers could not decide whether the sections of texts translated from Slovenian into English were produced by translators for whom English is a native language (L1) or a foreign language (L2). This allowed her to conclude that the mother tongue of the translator cannot be the only criterion for judging the quality and accuracy of the translation [Pokorn 2005: 123]. The conclusion is in line with the present understanding of translation expertise which does not ascribe primary importance to the translator's native language. Expertise in translation is perceived as a cluster concept involving a fine combination of knowledge, experience and problem-solving skills [Shreve and Diamond 2017; Muñoz 2014; Ericsson 2010; Shreve 2002].

Since translation as a final product is an outcome of a cognitively demanding process of solving problems and making decisions, the question of how the translator's decisions are modulated by the direction in which translation proceeds has been taken up by several scholars working within the framework of Translation Process Research. Buchweitz and Alves [2006] investigated graduate students with limited professional experience and post graduate students and reported that L2 translation was slower and included more segments showing that the participants processed smaller chunks of texts when working into their L2. A similar conclusion was reached by Ferreira [2012] who investigated professional translators working into English as their foreign language and Brazilian Portuguese as their native language. This finding confirmed the general assumption that L2 translation is cognitively more demanding [see also Fonseca 2015: 123].[2]

Pavlović [2010, 2007] used collaborative think aloud protocols and showed that her translation students voiced similar types of arguments

[2] There is a terminological inconsistency in the literature. L2 translation is also known as 'inverse translation' and L1 translation is called 'direct translation' [Ferreira and Schwieter 2017]. The problem of terminology also exists across other disciplines. For example in psycholinguistics, the term 'direct translation' refers to translating from one's L1 into L2, while 'backward translation' means translating from L2 into L1. In this article the term L1 translation is used to describe translating into ones native language (L1) and L2 translation refers to translating into one's foreign language (L2).

when making decisions in both L1 translation (from English into their native Croatian) and L2 translation (from Croatian into English). For example, they used "the sounds better" argument which pointed to their intuitive processing when selecting the final equivalent for their target texts. Generally, the students verbalized more about their tentative solutions in L1 than in L2 translation and relied more on their internal resources when translating into L1.They searched more for information in external resources (dictionaries, etc.) when working on their L2 translation. Another interesting finding was that students made even slightly more comments on the perceived meaning of the source text (ST) ("what the author wanted to say") when the ST was in their L1. This finding questions the assumed ease of understanding a ST in one's native language.

Pavlović and Jensen [2009] further explored whether the amount of attention paid to the source text differs depending on the direction of translation. They used eye-tracking and demonstrated that measures such as gaze time, average fixation duration and pupil dilation, which are used as indicators of cognitive effort invested in processing the ST, did not differ significantly for both directions of translation. Although the data from only four translation students and four professional translators (out of eight in each group) were fit for analysis and therefore the results could not be generalised, the authors noted that "ST processing in L2 translation can be just as demanding as in L1 translation" [Pavlović and Jensen 2009: 107].

From this brief review of research into the process of L1 and L2 translation it becomes clear that the issue requires a more systematic empirical approach.

2. The EDiT Project

2.1 Aims, participants, procedure

EDiT stands for Effects of Directionality in the Translation Process and Product, and is a grant project financed by the National Science Centre Poland (DEC - 2015/17/B/HS6/03944). The overarching aim of the project is (1) to investigate whether the direction of translation has a significant impact on the cognitive effort invested in the translation process by professional translators; (2) to investigate whether L2 translations require more editorial changes by proof-readers who are native speakers of the

target language than L1 translations. To meet the above aims an experimental study was designed involving 30 professional translators with at least 3 years of experience on the translation market who translate a minimum of 50 pages of text per month. The experiment took place in the Eye-tracking Lab at the Faculty of English, Adam Mickiewicz University in Poznań between February and June 2017. Translators came for individual sessions which included a series of tasks:

1) a verbal fluency test to check the speed of vocabulary retrieval in Polish
2) a text copying task to get used to the keyboard and the experimental set-up in Polish
3) translating 2 texts into English
4) a short break
5) a verbal fluency test to check the speed of vocabulary retrieval in English
6) a text copying task to get used to the keyboard and the experimental set-up in English
7) translating 2 texts into Polish
8) a short post-task questionnaire with demographic questions
9) the LexTALE language proficiency test

The order of tasks 1-2-3 and 5-6-7 was counterbalanced across participants to avoid the impact of fatigue or the spill-over effect, so that half of the participants started with verbal fluency and a text copying task in Polish (L1) and then translated 2 texts from Polish (L1) into English (L2), and the other half started with the same tasks in English (L2) and then translated 2 texts from English (L2) into Polish (L1). Also the order of the 4 texts for translation (2 in each language) was randomized across participants so that the sequence of texts was not the same for the 30 participants. Each participant spent about two hours in the lab to carry out all the experimental tasks. The translators worked in the same conditions and were remunerated for their work.

2.2 Materials and description of the experimental tasks

The rationale behind the experimental tasks was based on the assumption that translators are expert users of their working languages who use their professional expertise to produce translations which in their estimation are of acceptable quality. The set of tasks prepared for the experiment was pre-tested on translation trainees.

The purpose of the verbal fluency (VF) task was to test the so called verbal ability, that is the ability to retrieve words in a given language, an absolutely indispensable skill in any language task and immensely important for translators. The task involves the production of words in a given language, which either start with a specified letter, for example 't' (letter fluency task) or belong to a specified category, for example 'animals' (category fluency task) within one minute [Lezak 1995]. This simple task tests the speed of lexical access to one's mental lexicon and has been found to correlate with the vocabulary size [see Sauzéon et al 2011]. It also tests the so called executive control ability, i.e. "a set of functions that regulate one's thoughts and direct behavior toward a general goal" [Shao et al. 2014: 772]. In verbal fluency tasks participants, while tapping into their mental lexicon to provide as many unique words as possible, have to control for some constraints. To quote:

> To perform the task, participants must keep the instructions and the earlier responses in working memory and they must suppress irrelevant responses and repetition. Moreover, participants often produce sets of related words in succession (e.g., first name some pets, then switch to farm animals, then to birds), which involves the ability to create clusters based on a systematic memory search and the ability to alter the search criteria and switch from one category to the next [Shao et al. 2014: 772].

For professional translators doing verbal fluency tasks in one of their working languages also meant that they had to inhibit the language which was irrelevant for the task. In a bilingual context verbal fluency tasks also correlate with the so called language dominance. Participants are usually able to provide more words within the one-minute limit in their stronger, or dominant language (L1) than in their weaker, or foreign language (L2) – this being indicative of their unequal vocabulary size in the two languages. In the EDiT project the participants had to provide as many words as possible beginning with the letter s, a, p and words belonging to the category: fruit, animal, tools in the English VF task. In the VF task in Polish the words started with the letter p, o, t and the categories were vegetables, clothes and flowers.

The text copying task involved copying a short text (about 3 sentences) in a selected language (either L1 or L2) and apart from being a warm-up activity to get used to the computer keyboard it was used to compare the typing speed of the participants in both languages. The performance

on the text copying task as well as the VF scores were treated as important indicators of the participants' L1 and L2 proficiency.

The key materials for the experiment were texts for the translation task. Each participant translated two short texts (approximately 162 words each) from English into Polish and two texts from Polish into English. The texts which were selected for the experiment belonged to two text types – a product description and a film review. This was done to rule out the text type as a confounding variable. In effect, the L2 translation involved translating a description of a mop cleaning set and a review of the Polish film drama "Powidoki" (Afterimage) directed by Andrzej Wajda. The L1 translation involved translating a description of a ceiling fan and a review of "Silence", a historical period drama directed by Martin Scorsese. Both products belonged to everyday use and both reviews concerned quality cinema productions by renowned film directors. Every effort was made to make the two sets of texts comparable in terms of the length and readability scores so that the measures collected from the translation process could be compared with the direction of translation and text type being the independent variables. Table 1 shows the combined readability measures of the two texts for each direction of translation:

TABLE 1. Readability measures for both source texts in each direction of translation

Number of words	Characters without spaces	Sentences	Words per sentence	Characters per word	Gunning Fog (text scale)
EN>PL 324	1646	15	21.6	5.0	14.1
PL>EN 326	1932	15	21.7	5.9	14.2

Both texts for the L1 and L2 translation tasks together gave similar measures in terms of the number of words, sentences, words per sentence, characters per word and the Gunning Fog readability index (14 shows that the texts were fairly difficult).[3] The only measure which differs is the number of characters without spaces and this difference is due to the typological differences between Polish and English, with Polish words being usually longer because of their inflectional endings as compared to

[3] Texts which receive below 12 are judged as being accessible to a wide audience.

English, in which articles are also counted as words. Although the readability rating is not directly indicative of how easy or difficult a text will be to translate, it has some bearing for the translator. For example, the money charged for a translation is calculated from the number of words in a source text – in most countries, or from the number of characters with spaces – in Poland [Nadstoga 2016].

The post-task questionnaire was carried out after the two texts were translated in each direction. The translators were asked to rate the level of difficulty of the texts they translated on the Likert scale from 1 to 5, where 1 means very easy, 2 means easy, 3 is medium level of difficulty, 4 is difficult and 5 is very difficult. Collecting this subjective assessment gave the indication of a self-perceived level of difficulty and provided additional information about the texts to the readability measures described above. The last questionnaire included also demographic data of the participants such as years of professional experience, whether or not they translate into L2 in their everyday professional work and which types of texts they are usually commissioned to translate.

The LexTALE test was the last experimental task for the participants. The test is a lexical decision task in which participants are asked to decide whether a given string of letters is a word in English or a non-word.[4] The LexTALE test takes about 5 minutes but it has been found to be a valid measure of vocabulary knowledge and general language proficiency for advanced learners of English [see Lemhöfer and Broersma 2012]. What is more the LexTALE scores were found to correlate highly with L1-L2 and L2-L1 translation tests and are considered good predictors of translation performance [Lemhöfer and Broersma 2012].

The experimental tasks were designed to objectively describe the language profile of each translator which is important for the understanding of translation performance in both directions. What is more, such objective measures can be easily replicated in other language combinations.

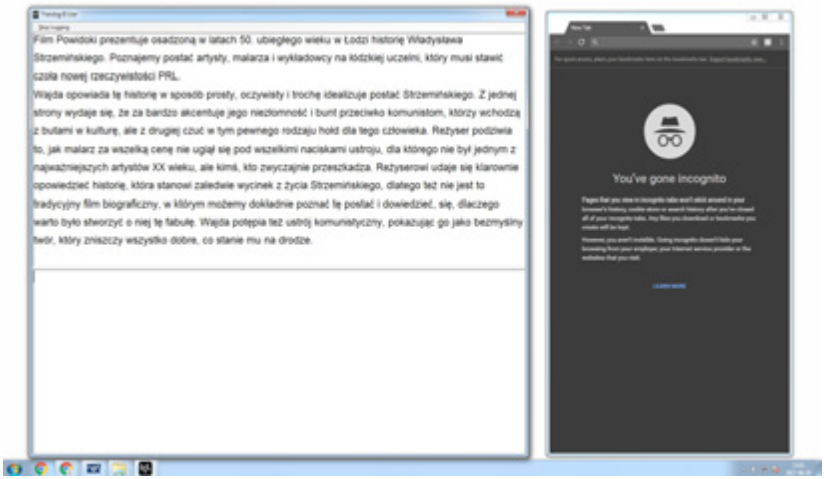
2.3 Methodology

A multi-method approach was applied with the use of modern research tools for unobtrusive data collection from the translation process. These included key-logging (Translog), eye-tracking (EyeLink 1000 Plus) and the screen-capture software (Morae). The participants performed the

[4] http://www.lextale.com/

verbal fluency task, typing test and translated texts in Translog, which is a key-logging programme [Jakobsen 2014] that records all the keyboard activity during the translation process and gives access to the temporal progression including time spent on the task, typing speed, erased text and the number and duration of pauses during the target text production. Following the cognitive principle that more difficult problems need more time to be solved [Jakobsen 2014: 76] such measures as total task duration, typing speed and the number of long pauses can be taken as indicators of cognitive effort, and can be then compared to assess the effort in L1 and L2 translation. Another source of data on cognitive effort was obtained from the eye-tracking measures. Following the eye-mind hypothesis [Just and Carpenter 1980] eye-movements correlate with the mental effort made by the mind to process information which is currently being focused on, or in the eye-movement research terminology, which the eye is fixating on. Longer gaze time, i.e. time spent looking at the text and longer average fixation duration, that is time spent per one fixation are indicative of more effortful processing needed to solve a translation problem. Finally, the screen capture software recorded all the instances of searching for information in external resources, such as dictionaries or data bases. Having access to such data, it is possible to calculate how often and for how long translators use external resources and whether the amount of time taken up by consultations is in any way determined by the direction of translation. Figure 1 shows the computer screen layout during the experiment.

FIGURE 1. Computer screen layout. The Translog window on the left shows the source text in the top half with an empty box underneath for the translation. The Internet browser is available on the right-hand side.



The Translog window on the left is horizontally divided into the ST window in the top half and the space for a translation is directly underneath. The Internet browser is available on the right-hand side and can be used by the translator to search for information.

2.4 Data Analysis

The analysis of the data planned for the entire project takes into account measures related to cognitive effort from the process of translation as well as the assessment of the final product, that is the target texts produced by the translators. The assessment of the quality of translated texts is based on the corrections introduced by experienced proof-readers who were asked to make all the necessary corrections/improvements to the translated texts to make them publishable. They were also asked to indicate the amount of time they spent correcting each text. The time spent by proof-readers on each text is then taken as a measure of their cognitive effort. As the project is in progress, below only a sample analysis of selected measures of cognitive effort is presented. It is based on the data collected

from 10 participants, and it provides evidence to answer the following research questions: (1) Is L2 translation cognitively more demanding than L1 translation? and (2) Do L2 translations require more time spent on editing (correcting) by native language proof-readers than L1 translations?

3. Sample of the results

3.1 Participants' professional profile

Although translation expertise as a cluster concept including knowledge and skills cannot be equated with the length of professional experience [Diamond and Shreve 2017], years of professional experience are frequently used as an indicator of expertise. The range of professional experience for the 10 participants was 5 to 35 years of experience in translation (M = 13.5 years). Six translators declared that they translated into English (their L2) more than 50 % of their entire working time and for the remaining four translators, L2 translation took up between 30% to 40% of their work load. Only one translator declared that he/she prefers to translate into Polish (L1), five said that they did not prefer to translate into Polish and four stated that they had no preferences in terms of the direction of translation. The average score on the LexTALE test was 94.75% with a range of 85%-100%. On the verbal fluency task the participants produced more words in Polish than in English but the difference was rather small (99 words compared to 94 words). They typed faster when providing words in Polish (135 keystrokes per minute) than in English (125 keystrokes per minute). A similar disproportion in typing speed was observed when they were copying a text in Polish (217 keystrokes per minute) and in English (211 keystrokes per minute).

3.2 L1 and L2 translation

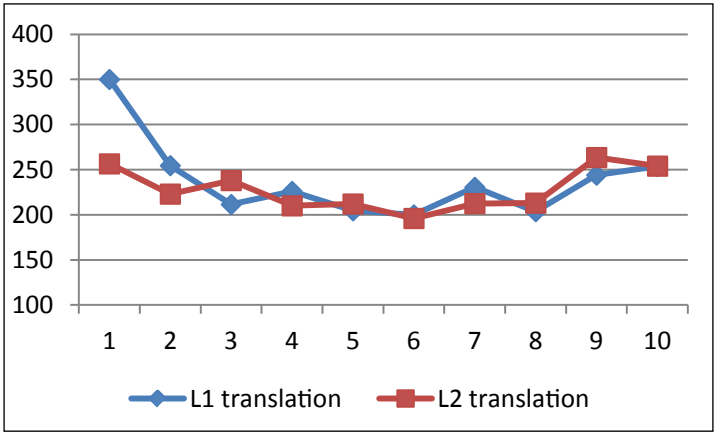
Four measures of cognitive effort were compared for each direction of translation (1) average fixation duration on the source text during the first reading prior to translation (2) typing speed during target text production (3) number of pauses longer than 5 seconds during target text production and (4) the percentage of the entire task time devoted to the final revision of the target text. These measures operationalized cognitive effort during the three stages of the translation process described by Jakobsen [2002] as orientation, drafting and revision. They are reported in detail for both

directions of translation. It should be remembered that data for both directions include measures from the translation process of two texts to rule out the text type effect as a confounding variable.

3.2.1 Orientation in L1 and L2 translation

The eye-tracking data showed that the mean fixation duration was longer when the translators read the source text in their L2 prior to translating it into their L1. Figure 2 shows the difference in fixation duration when reading the ST for all ten participants.

FIGURE 2. Average fixation duration for all participants when reading the ST



The results show uneven disproportions in the average fixation duration when reading the ST for individual participants. For example, participant 1 made much longer fixations when reading the ST in L2 to translate it into L1 than in L1 before translating into L2, while there was virtually no difference between the fixation durations when reading both source texts for participant 10.

3.2.2 Drafting in L1 and L2 translation

The average typing speed was higher when the translation was done into the participants' L1 (85.8 keystrokes per minute) in comparison with translating into L2 (81.5 keystrokes per minute). Interestingly, this difference in the typing speed corresponds with faster typing during the verbal

fluency test and the text copying task in the participants' L1. Figure 3 shows the typing speed for the three tasks in each language. The more complex task, the slower the typing speed.

Since drafting is the stage when all the translation problems have to be solved online, the second measure which was compared for both directions included pauses longer than 5 seconds, as this length of pauses is assumed to reflect problem-solving [Jakobsen 2016; Kumpulainen 2015; Buchweitz and Alves 2006]. The difference in the average number of pauses which lasted 5 seconds or more was very small – 32.4 in L1 translation and 34.1 in L2 translation. Figure 4 shows the number of such pauses for each participant.

It is noticeable that there is huge individual variation in the number of long pauses in both directions of translation. For example, participants 2, 3, 5 and 10 made a very similar number of pauses in both L1 and L2 translation. Participants 1, 4 and 6 made more long pauses in L1 translation and participants 7, 8 and 9 made more such pauses in L2 translation, but it was only participant number 9 who made far more such pauses in L2 translation.

FIGURE 3. Differences in the typing speed in L1 and L2 during text copying, verbal fluency tasks and translation

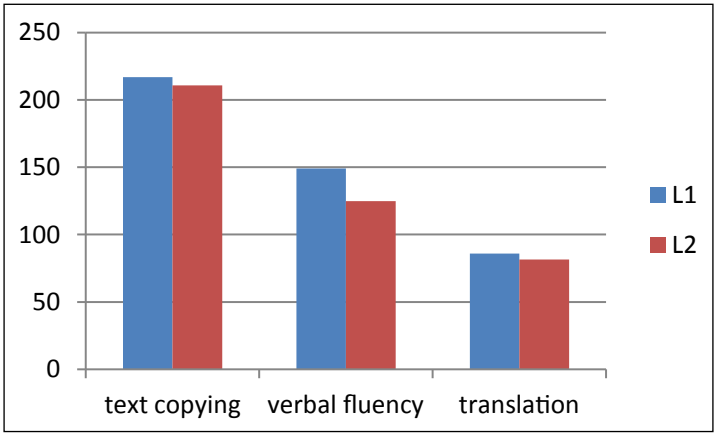
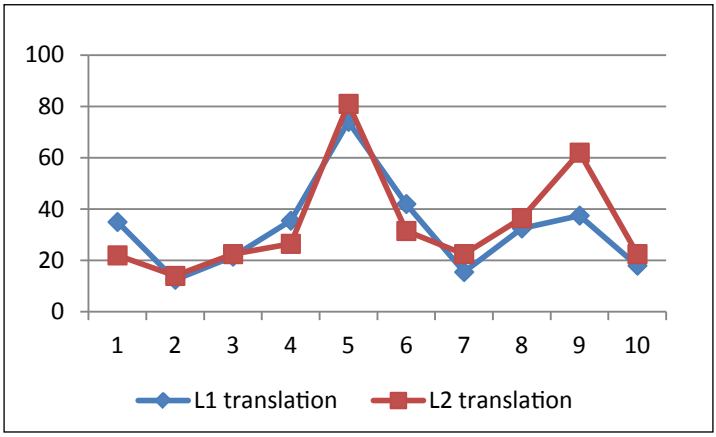


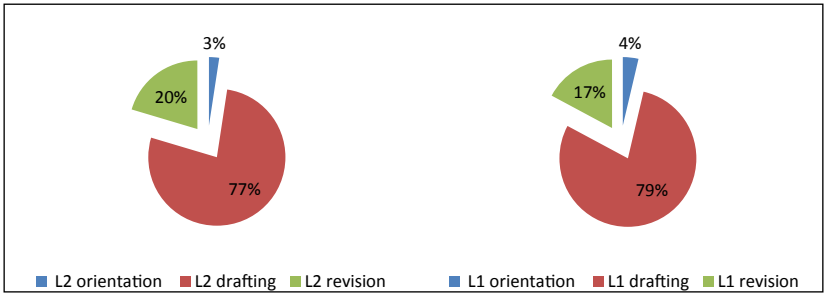
FIGURE 4. Number of pauses longer than 5 seconds in L1 and L2 translation for all participants



3.2.3 Revision in L1 and L2 translation

The end revision is the final stage of the translation process when the translator makes his/her final changes to the draft translation to filter out all mistakes as a part of the internal quality assurance procedure [Mossop 2014]. The average time spent on revision in L2 translation amounted to 3 minutes 96 seconds in comparison to 3 minutes 15 seconds in L1 translation. Figure 5 shows the average duration of the three stages of the translation process as a percentage of the entire process.

FIGURE 5. The time spent on orientation, drafting and revision in L2 and L1 translation

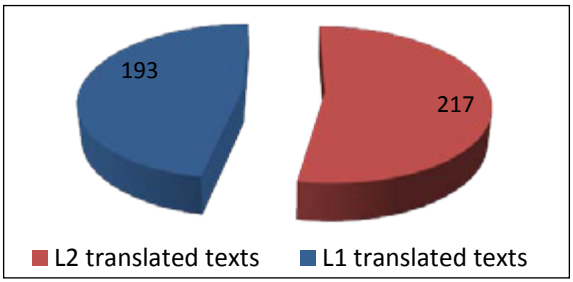


The participants devoted 20% of the entire task time to revise when they translated into their L2 and 17% of the total task time when they worked into their L1.

3.2.4 Proof-reader's effort

All the translated texts were proof-read by two experienced proof-readers who are native speakers of the target language. In effect, there were four proof-readers – two for each language to make the assessment more objective. The time spent to proof-read L2 translations was added for both proof-readers and compared to the joint time spent to proof-read L1 translations by two L1 proof-readers. Figure 6 shows the difference in the amount of time the proof-readers used to correct the translated texts – 217 minutes for L2 translations versus 193 minutes for L1 translations.

FIGURE 6. Time spent by proof-readers to correct translated texts



4. Discussion of the results

The sample analysis presented above included only several selected measures which were used as indicators of cognitive effort involved in the production of L1 and L2 translations by ten professional translators, therefore the results are treated as illustrations of potential tendencies and no claims are made towards generalizations. The professional profile of the participants shows that L2 translation is a part of their professional practice and a vast majority of the translators who participated in the experiment, either do not prefer to translate into their L1, or have no preferences concerning the direction of translation. This attitude shows that there is no negative bias or anxiety towards translating into the translators' foreign language which could affect their decision-making. The LexTALE test proved that all the participants are highly proficient users of English. The verbal fluency tests showed that L1 is the dominant language for all the translators as they produced more words and typed them faster in L1 than when performing the same tasks in their L2. A similar language dominance effect was demonstrated in the text copying task in which translators typed faster in their L1, despite the fact that some Polish letters which have diacritics (e.g., ą, ę, ć, ó, ż, ź) require a combination of keystrokes (Alt + letter keystroke) to be produced and therefore typing is naturally slowed down. It is expected that this asymmetry in processing L1 and L2 observed in the simple tasks such as the verbal fluency test and text copying task might have a bearing on language processing in a cognitively more demanding task such as translating [Whyatt 2018].

Relying on the central assumption in TPR that the mental effort needed to solve a translation problem has observable correlates in the task performance, selected measures from each stage of the translation process – orientation, drafting and revision were compared for both directions of translation. The comparative analysis of average fixation duration as a common indicator of cognitive effort showed that although there are individual differences between the translators, the difference within each translator is hardly visible with only some exceptions. Only participants 1 and 2 show longer fixation duration when reading the ST in their L2 and preparing to translate into their L1. The result is indicative of more effortful ST processing when the text is in L2. Interestingly, Figure 4 shows that the overall proportion of time devoted to orientation, that is becoming familiar with the ST before the first keystroke is made to type

the translation is very similar in both L1 (4% of the entire task time) and L2 translation (3%). This result is in line with the results reported by Pavlović [2010] and Pavlović and Jensen [2009].

The difference in the time to draft the translation in both directions (Figure 5) is also fairly similar, although, on average, slightly higher in L1 translation. When typing the draft translations, the participants typed faster when working into their L1 and made fewer long pauses but again the differences were not striking. This shows that for the 10 translators whose data have been analysed, the direction of translation made hardly any difference in the selected measures which operationalize their cognitive effort. In other words L2 translation does not seem more effortful than L1 translation. Yet, the time devoted to end revision was longer for L2 translation and this might point to the translators' self-awareness of the asymmetry in their language proficiency in their native and foreign language; this factor most likely makes them pay more attention to filter out mistakes and inadequate solutions to translation problems when working into their L2. However, judging by the amount of time spent by the proof-readers of the translated texts some infelicities still remain in all the translations irrespective of the direction.

Two proof-readers who are native speakers of English spent 217 minutes to correct L2 translations and make them publishable, as compared to 193 minutes spent by two native speakers of Polish who corrected L1 translations. If time is used to operationalize cognitive effort, it can be said that correcting L2 translations was more effortful than correcting L1 translations. The disproportion in time needed to correct the translated texts definitely requires a more thorough investigation to show the nature of corrections and the gravity of detected errors. The results could prove extremely informative for pedagogical purposes – if some areas remain problematic for experienced professional translators, they clearly need more attention in the programmes which train future professionals. Furthermore, since proof-reading L1 translations was also time consuming, a closer analysis of the problems detected when translating into one's

native language could point out that it is not only the disproportion in language proficiency which is responsible for inappropriate translations, but the translation process itself. As discussed earlier on in the theoretical background to the present article, the translation process creates precarious conditions that are favourable for cross-language interference which, if under-supervised by the translator, may result in structural calques, inappropriate selection of vocabulary and odd language use irrespective of the direction of translation. For this reason, all translated texts should be checked as stipulated by the ISO 17100:2015[5] standard for translation quality assurance. A qualitative analysis of the corrections introduced by the proof-readers in L1 and L2 translations produced by the participants is necessary and will be carried out for the larger group of translators planned in the EDiT project.

5. Conclusion

To sum up at this point, the purpose of the EDiT project is to provide empirical evidence for the impact of directionality on the course and outcome of the translation process. The sample analysis presented here reported selected measures which were treated as indicators of cognitive effort made by the translators and proof-readers to produce translations of publishable quality. For the ten participants the disproportion which could be ascribed to the direction of the translation was visible only in end revision – the final stage of the translation process which is the time devoted to filtering out translation errors and other minor infelicities of the target text, before it is judged acceptable by the translator himself/herself. A similar disproportion was also present in the time devoted by proof-readers who were asked to correct the L1 and L2 translations. The sample analysis presented here will be repeated on a larger group of professional translators planned in the EDiT project. More measures of cognitive effort will be added together with a qualitative analysis of the translated texts. It is expected that the results will make a significant contribution to the present understanding of L2 translation and the old habits of stressing its inferior quality will be replaced by a more thorough understanding of how its process differs from L1 translation. The EDiT team[6] would like

[5] https://www.iso.org/obp/ui/#iso:std:iso:17100:ed-1:v1:en.

[6] The EDiT team includes the following investigators and research assistants: Bogusława Whyatt (principal investigator), Tomasz Kościuczuk (co-investigator),

to encourage replicating the experimental study in other language pairs to improve the external validity of the results.[7]

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Marcin Turski (co-investigator), Olga Witczak (technical research assistant, Olha Lehka-Paul (research assistant for the data collection), Ewa Tomczak (statistical analyst).

[7] The raw data collected in the project together with the documentation and experimental tasks will be made available to the research community via the project webpage (currently under construction).

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Abstract

The prejudice against L2 translation has become an old habit and old habits die hard. In this article the axiom that translators should translate only into their native language, that is the language of their habitual use, is being challenged on the grounds that it is outdated, impossible to attain and most importantly lacking in empirical evidence. Since the processing demands of L1 and L2 translation have rarely been compared, the EDiT project has been designed to investigate how professional translators proceed when they translate into their L1 (Polish) and L2 (English). The article describes the research design and reports on a sample analysis of data collected by key-logging and eye-tracking which provide quantitative measures of cognitive effort when translating in both directions. The translated texts are then corrected by experienced proof-readers to show that both L1 and L2 translations are not flawless and need to be improved.

Key words: directionality, L2 translation, key-logging, eye-tracking, proof-readers' corrections