Comparing L2 translation, translation revision, and post-editing competences in translation trainees : an exploratory study into Dutch–French translation

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Comparing L2 translation, translation revision, and post-editing competences in translation trainees: An exploratory study into Dutch–French translation

Isabelle S. Robert[1], Iris Schrijver[1], Jim J. J. Ureel[1]

[1] University of Antwerp

Abstract. Translation proper is rarely the sole activity that translators undertake in today's translation market. Translators regularly function as revisers or post-editors, requiring them to check human or machine translations to make or recommend changes to improve translation quality. Various construct and performance models of and studies into translation competence (TC), translation revision competence (TRC), and post-editing competence (PEC) exist. However, a fundamental question that has remained unanswered to date is *how* similar--or different--TC, TRC, and PEC actually are. Using indirect translations (L1 Dutch, L2 French), we collected and analyzed translation, translation revision (TR), and post-editing (PE) data from 11 graduate translation trainees. Our exploratory study shows that TRC and PEC appear to be different competences, with trainees performing overall better for TR than PE. However, TRC and PEC do appear to have a common core, which does not differ significantly across tasks: problem detection.

Keywords: translation, translation revision, post-editing, construct models, quality

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Résumé. La traduction est rarement la seule activité des traducteurs professionnels. Les traducteurs jouent régulièrement le rôle de réviseurs ou de post-réviseurs : ils contrôlent alors des traductions humaines ou automatiques pour apporter ou recommander des modifications afin d'en améliorer la qualité. Il existe divers modèles de compétence en traduction (CT), de compétence en révision de traduction (CRT) et de compétence en post-édition (CPE), mais une question fondamentale reste sans réponse : dans quelle mesure ces compétences sont-elles différentes ? En utilisant des traductions retour (L1 néerlandais-L2 français), nous avons recueilli et analysé les données de traduction, de révision et de post-édition de 11 étudiants de Master en traduction. Nos données montrent que la CRT et la CPE semblent être différentes, les performances globales des étudiants étant meilleures pour la révision que pour la post-édition. Il s'avère que la CRP et la CPE ont un noyau commun, qui ne diffère pas de manière significative d'une tâche à l'autre : la détection des problèmes.

Mots-clés: traduction, révision , post-édition, modèles de compétence, qualité

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Introduction

In the translation industry, translation[i] proper is nowadays rarely the sole activity in the translation process in the broad sense of the word, that is, from order to delivery. Translators regularly also *revise*, which entails reading a human translation to "find features of a draft translation that fall short of what is acceptable ... and make or recommend any needed corrections and needed improvements" (Mossop 2020, 115). This activity is also known as *other-revision*, as opposed to *self-revision*, which refers to translators checking their own translations. In this paper, *revision* will consistently refer to other-revision.[ii] In addition, with the development of computer-assisted translation (CAT) tools, translators increasingly rely on translation memories. They can reuse translated segments and revise them when needed, which is also a form of revision. Finally, CAT tools often integrate machine translation (MT) when there are no adequate stored translations. This means that translators, in addition to translating and revising, are also post-editing, that is, revising MT output.

The view that translators work increasingly less from scratch is shared by many translation studies (TS) scholars, such as Jakobsen (2018) and Koponen et al. (2021). In view of this evolution, one could expect TS scholars to have investigated the competences[iii] required to cope with these new working conditions and, in particular, the difference(s), if any, between translation competence (TC), translation revision competence (TRC), and post-editing competence (PEC).

TS scholars have been investigating TC for a long time. Although TC models such as PACTE (2003), Göpferich (2009), or EMT (2009, 2017) are common in TS, research interest

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in translation revision (TR) and post-editing (PE) has been gaining momentum only in the last two decades. The numbers of TR and PE publications is growing (for an overview, see Koponen et al. 2021). However, even in light of this positive evolution, research into TRC and PEC is still limited. To our knowledge, there are currently four TRC models (Hansen 2009; Robert et al. 2017a; Robin 2016; Scocchera 2017) and three PEC models (Nitzke et al. 2019; Nitzke and Hansen-Schirra 2021; Rico and Torrejón 2012). These models share some components/subcompetences, while still being fundamentally different (see below). This is because scholars have generally built on existing models to design their own. For example, Robert et al. (2017a) developed their TRC model, using existing TC models. Likewise, Nitzke et al. (2019) based their PEC model on existing TC and TRC models. In other words, one can expect that the creators of existing models hypothesize that TC, TRC, and PEC are different but share common ground. As TS scholars, we support this hypothesis, but the fundamental question about *how* different the three competences (TC, TRC, PEC) are has not yet been addressed. Consequently, investigating how close or similar the three competences are to one another appears a logical line of research.

We initially hypothesized that TRC and PEC are more similar to each other than to TC, since TR and PE, contrary to TC, share the same starting point: an existing target text. Our rationale is based on Pym's (2003, 489) minimalist definition of TC:

> The ability to generate a series of more than one viable target text (TTI, TT2 … TTn) for a pertinent source text (ST); The ability to select only one viable TT from this series, quickly and with justified confidence.

If generating and selecting a target text is at the core of TC, this is where TC differs from TRC. In the initial revision process, text generation and selection are not required, since (a

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version of) the target text has already been created. The same holds true for PEC, except that the text created has been produced by a machine and not a human translator. This is also the view of Pym (2013) in his discussion of the translator's skill sets in the current machine-translation age. However, we decided to abandon our initial directional hypothesis and opted for a non-directional one, drawing on do Carmo and Moorkens's (2021, 35) plea for "a re-understanding of PE as a translation process rather than a revision one", the argument being that

> PE represents an evolution of industrial translation processes and because it fulfils the same purpose as translation (to produce a good target text in an efficient and effective way), but also because it requires advanced writing and reading skills in two different languages (42)

Instead, we decided to work in a more exploratory way to answer the following research question: To what extent are translation competence (TC), translation revision competence (TRC), and post-editing competence (PEC) different from one another?

To answer our research question, we conducted an exploratory study with translation trainees, investigating the relationships between the three competences. In the next section, we briefly describe the main TC, TRC, and PEC models currently in use and relevant to our study, also highlighting scholars who have compared these models. Next, we discuss methodological considerations and explain how we operationalized TC, TRC, and PEC and, in particular, defined variables and developed indicators. We then present our results and we end with a discussion and concluding remarks.

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Theoretical framework: Models of translation, translation revision, and post-editing

In translation studies, the concepts of translation competence (TC), translation revision competence (TRC), and post-editing competence (PEC) are often operationalized using construct or performance models. Construct models define constructs underlying actual performance, whereas performance models describe concepts in behavioural or functional terms, rather than in terms of (theoretical) constructs. An abundance of research on TC and TC acquisition (TAC or ATC) exists in TS. Therefore, when discussing TC, researchers often provide overviews of existing TC models. Such overviews almost always include the multicomponential construct models developed by the PACTE research group (2003, 2005; Hurtado Albir 2017), Göpferich (2009) or the EMT board (2017), in addition to Pym's (2003) minimalist definition of TC (see, for example, Kornacki 2018; Massey 2017; PACTE 2020; Tiselius and Hild 2017). We will not address these models in detail again. Suffice it to say that they all include a series of common subcompetences. For a detailed comparison, see, for example, Kornacki (2018) or Chodkiewicz (2020).

There is much less research on translation revision competence (TRC) than on TC. As far as TRC is concerned, researchers at the University of Antwerp (Robert et al. 2017a) designed a model based on established TC models (EMT, Göpferich, PACTE) and related research on revision training and competence (Bisaillon 2007; Horguelin and Brunette 1998; Kelly 2005; Künzli 2006; Mossop 1992) or existing TRC models (e.g., Hansen 2009). Their multicomponential TRC model consists of nine interconnected subcompetences, as well as

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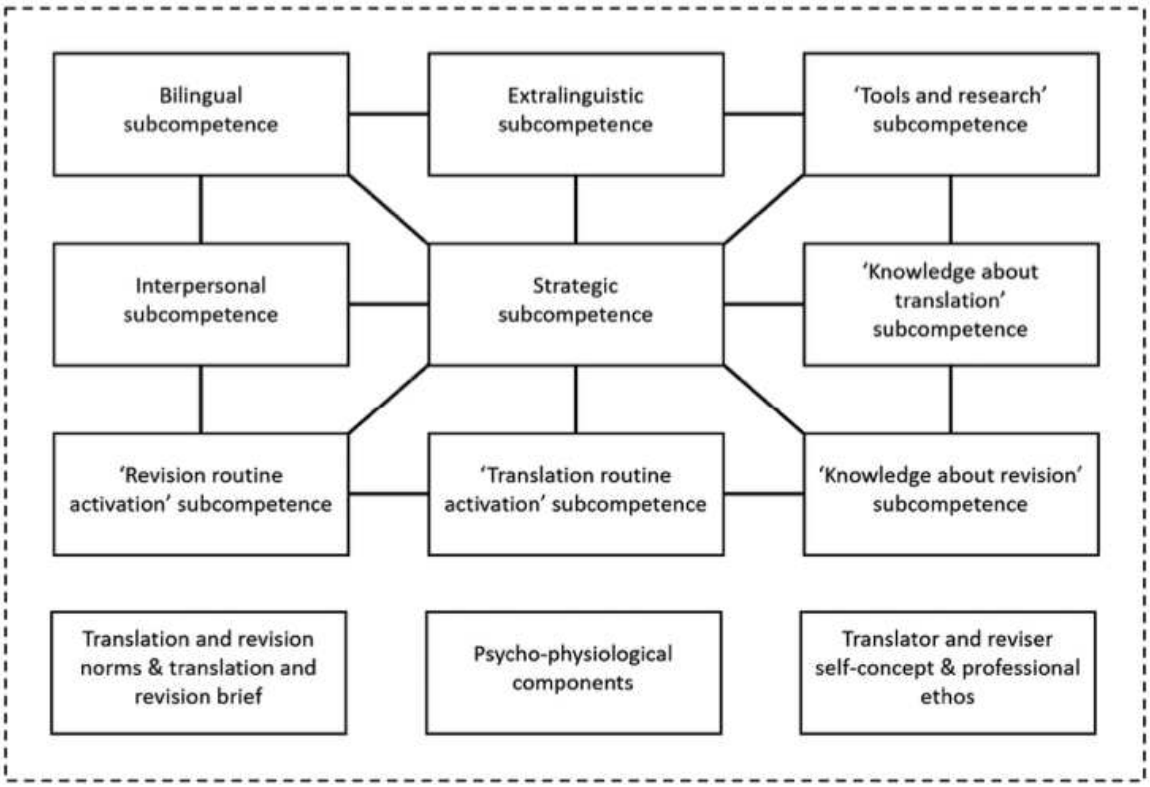
three factors that determine and control the use of all subcompetences are included (see Figure 1).

Figure 1

Robert et al.'s (2017a) model of translation revision competence



The first validation pilot studies of the TRC model (Rigouts Terryn et al. 2017; Robert et al. 2017b; Robert et al. 2018) showed that revision trainees used the same search tools as translation trainees (with no revision training), but did so more frequently. Revision trainees also conducted more searches to justify their changes, and their searches were more rigorous.

Robin (2016) also proposed a TRC model, consisting of seven subcompetences, entitled ameliorative, evaluative, translation, comparative-contrastive, corrective, linguistic, and

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decision-making. The model appears more process-oriented, with all the subcompetences describing the process or the steps described in Robert et al.'s strategic revision subcompetence (Robert et al., 2017a). More recently, Scocchera (2017) suggested a multicomponential TRC model, also similar to Robert et al.'s (2017a), consisting of six subcompetences: (1) analytical-critical, (2) operational, (3) metalinguistic-descriptive, (4) interpersonal, (5) instrumental, and (6) psycho-physiological. The model draws on approximately the same findings from previous research (e.g., Hansen 2009; Horguelin and Brunette 1998; Künzli 2006; Mossop 1992; PACTE 2003). To our knowledge, no other TRC models exist. However, there are several studies in which researchers report on revision training experience (for an overview, see Koponen et al. 2021; Mossop 2020; Robert 2018).

Research on PEC is relatively limited, although the PE process has been extensively investigated (for an overview, see Koponen 2016; Koponen et al. 2021, 1–17; Nunes Vieira et al. 2019). To our knowledge, the first PEC model is Rico and Torrejón's (2012), who integrate O'Brien's (2002, 2010) insights into three sets of competences: (1) core competences, (2) linguistic skills, and (3) instrumental competence. Core competences consist of, on the one hand, "the attitudinal or psycho-physiological competence that allows the post-editor to cope with subjectivity issues involved in defining and applying PE specifications" (Rico and Torrejón 2012, 170) and, on the other hand, "the strategic competence that helps post-editors reach at [sic] informed decisions when choosing among different PE alternatives (2012, 170)". Linguistic skills are "related to skills usually demanded of a translator", but Rico and Torrejón (2012, 170) also include "familiarity with post-editing directions/guidelines" as well as "cultural and intercultural competence and subject area

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competence". Instrumental competence is related to technical skills, the idea being that "in order to understand MT output and develop a positive attitude/tolerance towards the machine, the post-editor should understand what MT is about" (2012, 170). To our knowledge, this model is the first tentative PEC model. In many subsequent publications on aspects of PE training or competence, O'Brien (2002, 2010) and/or Rico and Torrejón (2012) are generally referred to (e.g., Guerberof and Moorkens 2019; Sánchez-Gijón 2016), as is the work of Pym (2013).

The second PEC model is Nitzke et al.'s 2019 model, which consists of four 'core competences' and eight 'subsidiary subcompetences'. The first core competence is the risk assessment competence. The second one is the strategic competence, based on risk assessment, which is the post-editor's decision to apply either full or light PE for the translation task or to use MT only. The third core competence is the consulting competence, which is, depending on risk assessment and strategic decisions, the post-editor's ability to "inform the customer or project manager about potential risks as well as problem-solving strategies" (Nitzke et al. 2019, 248). Finally, the fourth core competence is the service competence, which refers to the idea that post-editors "should be able to calculate prices competently, consciously, and transparently considering the quality of the MT output and the necessary PE effort" (2019, 248). This competence also includes the ability to use state-of-the-art CAT and revision tools as well as integrated MT systems. In addition, Nitzke et al. (2019) list eight subsidiary subcompetences: (1) bilingual, (2) extralinguistic, (3) instrumental, (4) research, (5) revision, (6) translation, (7) machine translation, and (8) post-editing. As is the case in PACTE's (2003) and Robert et al.'s (2017a) models, Nitzke et al.

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also include factors such as psycho-physiological components, post-editors' self-perception, the PE brief including guidelines for the PE task, and an affinity for ICT. Nitzke et al.'s 2019 model was recently updated (Nitzke and Hansen-Shirra 2021). In this update, PEC is represented as a "house of PE competences" (p. 69), whose architecture is grounded on translation competence (including bilingual, extralinguistic and research competence). The authors expect post-editors to be skilled translators since "they need the same basic skill set" (2021, 70). The house model further consists of three pillars corresponding to three additional competences (error handling, MT engineering, and consulting), which can play a major or minor role depending on the post-editor's profile. For example, error handling (i.e., error spotting or problem detection), error classification, and error correction (i.e., problem solving) will be the focus of the task when practical PE is at the core of the job profile. The house model also includes soft skills for post-editors, such as risk assessment and service provision. Again, psycho-physiological components, such as stress resistance or quick-wittedness, are also part of the model.

As mentioned in the introduction, some scholars interested in TC, TRC, and/or PEC (training) sometimes compare the different competences. As recently as 2021, Konttinen et al. conducted a detailed comparison of TR and PE skills, leaving aside those subcompetences that are shared with TC and focusing on TR- or PE-specific subcompetences: strategic, interpersonal, and instrumental. They further distinguish between aspects common to both activities and aspects specific to either revision or post-editing. Within the strategic subcompetence, common aspects are the detection, identification, and evaluation of errors, as well as information seeking. Subsequently, Konttinen et al. (2021) mention 'knowledge about

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revision' and 'typical human translation errors' as revision-specific aspects, and 'knowledge about MT systems' and 'typical MT errors' as PE-specific. This approach is particularly interesting: it not only recognizes the importance of specific knowledge of TR or PE, different from the knowledge of translation, but also considers such specific knowledge part of strategic subcompetence.

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Methodology

Data collection

To investigate the relationships between translation competence (TC), translation revision competence (TRC), and post-editing competence (PEC), we conducted a small-scale exploratory study with students (L1 Dutch, L2 French) in the Master's in Translation program at the University of [removed to ensure anonymity]. We worked in a didactic/training context with a convenience sample of 11 students, enrolled in the course *Dutch--French Translation and Revision*, a weekly 2-hour on-campus course (13 weeks, Semester 2, Academic Year 2018--2019). The course focuses on L1 Dutch--L2 French translation, translation revision, and post-editing. All students enrolled in the course were expected to have C1 level in French, which is the level expected at the end of the Bachelor's in Applied Linguistics at the University of [removed to ensure anonymity]. Generally speaking, students in the Master's in Translation come from the Bachelor's in Applied Linguistics. This was the case for 10 of the 11 participants (one participant had an Educational Bachelor's degree in French). In other words, the group was relatively homogeneous as far as French proficiency was concerned.

The quasi-experimental study took place in June 2019 and consisted of tasks planned as the final evaluation for the course, with informed consent from the students. All students performed three tasks (Dutch--French): (1) a didactic TR task (Appendix 1a), (2) a didactic PE task (Appendix 1b), and (3) a translation task (Appendix 1c).[iv] 'Didactic' in this context meant that students had to justify their changes by adding comments (using the *Review* ribbon

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in MS Word), mentioning the revision parameter related to the change according to Mossop's typology (2020: 136--137) of revision parameters,[v] which they had previously seen and practiced in class. The decision to have students justify changes draws on a study (Robert and Brunette 2016), which showed that revisers tend to detect better when they verbalize diagnoses and/or when they verbalize problem representations together with problem-solving strategies. By analogy, it was hypothesized that students would revise (and post-edit) better when they had to write (instead of verbalize in this case) brief justifications of their text interventions. Besides, being able to justify changes is also one of the most important principles in translation revision (see Mossop 2020) and one of the learning outcomes of the course. Students were free to complete the tasks in any order, but all students chose to work in the following order: TR, PE, and translation. They were allowed to work for approximately four hours on the task set.

All students had access to the same tools: *Le Grand Robert* (monolingual French dictionary), *Van Dale* (bilingual Dutch--French dictionary), and *Antidote* (writing assistance software package, including language corrector, dictionaries with search tools, and language guides, all directly integrated into MS Word, see https://www.antidote.info/en. No other tools were allowed, for several reasons. First, to ensure that the 'tools' as a potential covariate remained constant for the three tasks. Second, research has shown that translation trainees and revision trainees use the same tools but slightly differently (e.g., Robert et al. 2017b). Third, we decided not to allow any internet use; otherwise, students would have translated using DeepL or Google Translate and their translations would no longer have been translations 'proper', that is, starting from scratch. We applied the same reasoning for TR. The PE task

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was based on a DeepL translation, which we provided to the students. Any necessary additional information on the topic of the text was provided, so that internet searches were unnecessary (see documentation in Appendices 1a and 1b). Finally, translation without tools is still used in professional practice for the recruitment of translators, for example, at the Belgian Court of Audit.[vi]

Product (MS Word files) and process data were collected using Inputlog 8.0.02 (https://www.inputlog.net/, Leijten and Van Waes 2013) for all three tasks. Inputlog generates IDFX files (one per student), which we used for all process-data analyses. In this study, we used 'summary analysis' to measure task duration and 'source analysis' to check if students had followed the instructions about the tools allowed for the tasks.

Data analysis

When discussing our theoretical framework above, we addressed TC first, followed by TRC and PEC, since TC models have been used as foundations for TRC and PEC models. However, in this section, we will address the competences in a different order: TRC, PEC, and TC, because this was the order in which the students chose to complete the tasks.

Translation Revision (TR) task

To measure TRC, we draw on the work of PACTE (Hurtado Albir, 2017; PACTE, 2019), in which they measure TC. PACTE uses indicators of *strategic* subcompetence--the central subcompetence of TC--to measure variables of translation competence. One of the indicators

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is 'acceptability', which is "linked to translation product quality" (PACTE, 2019, 249) and is measured through *rich points* in a translation task, which are specific source-text segments containing prototypical translation problems. In a similar vein,[vii] we started from what Robert et al. (2017a) also consider the central subcompetence of TRC, that is, the strategic revision subcompetence, defined as follows:

> Procedural and conditional knowledge to guarantee the efficiency of the revision process and solve the problems encountered. [...]. Its functions are to (1) plan and carry out the revision task: selecting the most adequate procedure in view of the task definition, reading for evaluation, applying a detection strategy (anticipation and/or comparison), applying an immediate solution or problem-solving strategy, making only the necessary changes, taking the main revision principle into account; [...]. (p. 14)

Accordingly, we measured TRC, using a revision task and considering two distinct perspectives: (1) the item-based assessment method or *rich points* method and (2) revision interventions typology.

The revision task consisted of revising the translation of a newspaper article containing 13 errors or 'items' inserted by us into an existing published translation. The task included three transfer-and-content errors and ten language errors (see Appendix 1b). Items in our study were specific text segments (words, sentences), requiring revision to adhere to the revision brief provided. Items were similar to errors to be detected and corrected in previous tasks in class and were related to Mossop's (2020, 136--137) revision parameters (transfer & content, language). Mossop's Parameters 10 and 12 (Group D, *Problems with the Visual and Organizational Aspects of the Text*) and Parameters 13 and 14 (Group E, *Problems Related to Specifications and Policies*) were not included.

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Item validation was conducted by an independent external professional translator (L1 French), who received remuneration. As expected, she identified all errors or 'items' that had been introduced; since item selection was based on typical errors made by Flemish translation trainees in L2 French and thus relatively easy to detect for an L1 French professional translator.

The second perspective for measuring TRC draws on revision intervention type and in particular on the strategic subcompetence for revision (see Robert et al.'s 2017a TRC model), whose definition (see above) focuses on the fact that 'only necessary changes' must be made (Robert et al. 2017a, 14). Given the didactic and training-oriented set-up of our study, we focused on two types of revision intervention: (1) necessary revision (i.e., changes necessary to comply with the revision brief) and (2) underrevisions (i.e., errors for which an attempt to revise had been made, indicating the error was *at least detected*, but not solved appropriately). Taken together, these two types of revision intervention allowed us to measure what has been labelled 'revision detection potential' by Robert (2012) and Robert and Van Waes (2014). In other words, we chose to exclude other revision intervention types, such as hyperrevisions or overrevisions. Hyperrevisions are changes that do not make the translation better or worse and overrevisions are reviser-introduced errors in the translation. Whereas hyperrevisions do not make translations better or worse, they do take time. However, they can be excluded from calculations of revision scores, especially in a didactic (training) context such as ours. The rationale behind this is that you cannot solve a problem until it has been detected and that problem detection is therefore the first goal of training. By contrast, overrevisions do make the translation worse and could, therefore, be considered. However, in the same vein, we

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decided to focus on students' potential to detect errors, not on final products.[viii] Therefore, measuring TRC draws on

1. the number of necessary revisions only (which we refer to as 'revision quality score' below), as compared to the number of items and
2. the number of necessary revisions plus (+) the number of underrevisions (sum score, 'revision detection score' below), as compared to the number of items.

Post-editing (PE) task

PEC was measured in the same way as TRC, but item selection, or item identification to be more precise, was different. We translated the source text using DeepL and identified the items that we thought students should be able to post-edit. The identification process was far from straightforward. As observed in our TR and PE classes at the University of [removed to ensure anonymity], errors in neural MT are not easy to detect by L2 language users. We had originally identified 18 items. We submitted the ST and TT for item validation to the professional translator who also validated items for the TR task. In the debriefing session, we retained 16 items. In other words, only items on which *both* parties (translator and researchers) agreed were included in the evaluation. The MT included seven transfer-and-content errors and nine language errors (see Appendix 1b), similar to the TR task (see Appendix 1a). However, for the PE task, we were dependent on what DeepL had produced and we did not manipulate the text.

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Translation (T) task

To quantify TC, we did not apply item-based assessment (like we did for TR and PE), but we opted for error analysis. Our error analysis as an assessment method consisted of three steps: (1) error identification, (2) error classification, according to a pre-determined error typology, and (3) calculation of raw scores based on error frequencies.

The translations were evaluated by the first author and then by the professional translator who also evaluated the TR and PE tasks. Our own evaluation approach was based on what we call *vertical* evaluation (i.e., all translations are completely evaluated and annotated one after the other), followed by *horizontal* evaluation (i.e., each first sentence of every translation is reread, then each second sentence, etc.). The aim of horizontal evaluation is to ensure that similar errors in one translation are annotated similarly in other translations. The translations were evaluated by the professional translator *after* the validation of the TR and PE items. Again, a debriefing session followed to reach consensus about the translation errors to consider for scoring. Accordingly, we calculated translation scores[ix] based on the number of errors (called 'translation quality scores').

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Results

The aim of our study is to explore to what extent TC, TRC, and PEC are different from one other, and whether one of the competences is closer to another one than to the third one.

Process data

Students worked approximately as long for the translation task as for the TR task, but less long for the PE task, as shown in Table 1.

Table 1

Summary Task Times: Absolute Comparisons (Hours:Minutes:Seconds, per Task) (N=11, for Each Task)

Task	*M*	*SD*	Min	Max
Translation revision	1:27:35	0:12:30	0:57:33	1:45:30
Post-editing	0:53:06	0:10:42	0:39:41	1:17:42
Translation	1:28:23	0:16:45	0:44:07	1:45:55

Students were free to work on each task for as long as they wanted, but they were informed that they had a limit of four hours total (with a tolerance margin of 10 minutes). Although it may seem strange that students appear to translate as fast as they revise, one must not forget that the TR task was of a didactic nature. This meant that all changes introduced had to be justified, mentioning Mossop's parameters as seen in class (see Methodology). However, this was also the case for the PE task. All students worked on the tasks in the same

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order (i.e., TR, PE, translation). The fact that they worked less long on the PE task may be due to poor time management. Because all students had already worked long on the TR task, the professor present during data collection reminded students that they still had two tasks to complete and were expected to remember the most important revision principles discussed in class (i.e., do not look for what *can* be changed, but for what *must* be changed). In other words, students may have felt the need to carry out the PE task faster, knowing that the translation task would take longer. Besides, because not all students worked for the full four hours, comparing total task times by means of percentages reflects actual task times more accurately (see Table 2).

Table 2

Summary Task Times: Relative Comparisons (Percentage of Task Times Combined) (N=11, for Each Task)

Task	*M*	*SD*	Min	Max
Translation revision	38.3	4.6	29.8	48.0
Post-editing	23.3	4.2	17.2	32.2
Translation	38.4	5.6	26.6	45.8

Because of our small sample size (*N*=11), we conducted a non-parametric test (Friedman's ANOVA) to determine if the differences between the task time percentages were statistically significant. Since the test was significant ($\chi^2(2) = 16.91$, $p < .01$), we followed up the result with three paired sample tests (Wilcoxon signed-rank tests) to determine where the difference was statistically significant. A Bonferroni correction[x] was applied and all effects are reported at a .017 level of significance. The difference in relative duration between the

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translation task and the TR task was not significant (z = --.445, p > .017), but the difference in relative duration between the translation task and the PE task and between the TR task and the PE task were significant (z = --2.934, p = .001; z = --2.934, p = .001).

Consequently, we decided that we would consider both the absolute and relative durations of each task to calculate the scores for each task. In other words, all scores, calculated as described above, will be reported as both time-*independent* scores (task duration not considered) and time-*dependent* scores (task duration considered). The time-dependent scores were calculated as follows: we divided each score by the number of minutes devoted to the task and multiplied the resulting quotient by 60 to report a score per hour.

Product data

Before reporting the results, it is important that we underline that different evaluation methods often lead to statistically significantly different results, as shown in a previous methodological study related to the present research (Robert et al. 2022). Therefore, it is vital that we report thoroughly on the evaluation methods and compare scores calculated using the same method. That is precisely what we do for the analysis of the results.

The analysis consists of two types of tests: tests of comparison and correlation tests. Statistical tests of comparison can be applied only to the TR and PE scores, which are based on the numbers of items to be detected/corrected and which can subsequently be converted into percentages. This conversion is not possible for translation scores, since they do not start from a fixed total and are 'simply' the sum of errors. Consequently, they cannot be compared

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with TR and PE scores. In other words, in those instances where *all three* competences (TC, TRC, PEC) are compared, only correlation tests were conducted.

Translation revision and post-editing tasks: Tests of comparison and correlation tests

Although our study is exploratory, we decided to conduct significance testing, being well aware that, with the small number of participants (N=11), we lose statistical power[xi]. In other words, all the following test results have to be considered with caution and are more indicative than confirmatory.

To compare the scores for TR and PE tasks, we conducted non-parametric tests of comparison of two related samples (Wilcoxon signed-rank tests). We opted for non-parametric tests because of the low number of participants. We first compared time-independent scores across both tasks. Subsequently, we investigated time-dependent scores across both tasks, since we observed that task duration between the TR and PE tasks varied considerably. In addition, for both types of scores, we conducted correlation tests. Time-independent and time-dependent scores are shown in Figure 2.

Figure 2

Time-Independent (TI) and Time-Dependent (TD) Translation Revision (TR) and Post-Editing (PE) Quality and Detection Scores

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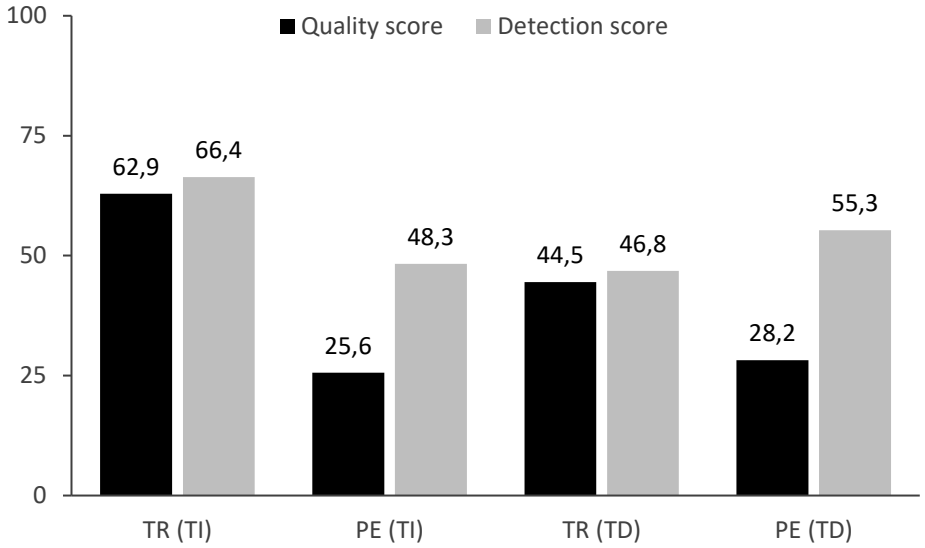

The non-parametric tests of comparison of two related samples (Wilcoxon signed-rank tests) for time-independent and time-dependent scores (Table 3) show that all tests were statistically significant, except for the time-dependent detection scores. In other words, comparison tests for TR and PE seem to indicate that TRC and PEC are different and that students appear to be better at revising than at post-editing. However, when we use the time-dependent *detection* scores to compare both competences, TRC and PEC seem similar. As far as correlation tests are concerned, no significant correlation was observed, which once again points in the direction of two different competences (Table 4).

Table 3

Wilcoxon Signed-Rank Tests for Time-independent and Time-dependent Translation Revision (TR) and Post-Editing (PE) Scores

Time-independent	Quality score	Detection score

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Z			-2.937	-2.845
	Sig.		**.001***	**.002***
Monte Carlo Sig. (2-tailed)	99% CI	LB	.000	.001
		UB	.002	.003

Time-independent			Quality score	Detection score
Z			--2.312	--1.867
	Sig.		**.018***	.070
Monte Carlo Sig. (2-tailed)	99% CI	LB	.014	.063
		UB	.021	.076

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Table 4

Spearman Correlations for Time-independent and Time-dependent Translation Revision (TR) and Post-Editing (PE) Scores

Time-independent	Quality score	Detection score
Spearman's rho	.497	.257
Sig. (1-tailed)	.060	.223
Time-dependent	**Quality score**	**Detection score**
Spearman's rho	.150	--.149
Sig. (1-tailed)	.330	.331

Since the TR and PE tasks were of a didactic nature, implying the justifications of changes in revision balloons (using the *Review* ribbon in MS Word), we also looked at the relationship between the quality and detection scores and the number of correct justifications in both tasks. Results show a significant positive correlation between the number of correct justifications in the revision task and all revision scores (see Table 5). In other words, the results seem to confirm results from a previous study (Robert and Brunette 2016), showing that revisers tend to detect better when they verbalize diagnoses, in this case, in the form of brief written justifications in revision balloons. However, the results are less clear for PE: there is only one significant correlation between the number of correct justifications in the PE task and the PE scores, that is, with the time-independent detection score (see Table 5). It seems that the better students justify changes in the PE task, the better they detect problems in the PE task. From a pedagogical perspective, this is an interesting result, pleading for the didactic nature of revision or PE task for translation trainees.

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Table 5

Spearman Correlations for Time-Independent and Time-Dependent Translation Revision (TR) and Post-Editing (PE) Scores and the Number of Correct Justifications in TR and PE Tasks

Number of correct justifications in the TR task	TI TR Quality score	TI TR Detection score	TD TR Quality score	TD TR Detection score
Spearman's rho	**.843***	**.801***	**.691***	**.780***
Sig. (1-tailed)	.001	.002	.009	.002
Number of correct justifications in the PE task	**TI PE Quality score**	**TI PE Detection score**	**TD PE Quality score**	**TD PE Detection score**
Spearman's rho	.369	**.762***	.159	.338
Sig. (1-tailed)	.132	.003	.320	.155

To address the different types of items (transfer & content vs language) and to determine whether the previous observations still hold when we focus either on transfer-and-content issues or language issues, we conducted additional comparison and correlation tests for each category. Results (Figure 3 and Table 6) show that when we focus on transfer-and-content issues, students are still significantly better at revising than at post-editing, whether task duration is considered or not. However, this is true only when quality scores are used to measure competence. When detection scores are used, there is no difference between TR and PE performance. When the focus is on language issues, students are again better at revising than post-editing (for both quality and detection scores), but only when task duration is not considered. When task duration is considered, there is no difference between both tasks. Finally, as far as correlation tests are concerned, no significant correlation was observed,

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which points once again in the direction of two different competences (Table 7), except when it comes to problem detection.

Figure 3

Translation Revision (TR) and Post-Editing (PE) Time-Independent and Time-Dependent Percentage Scores, per Category of Items (Transfer & Content vs Language)

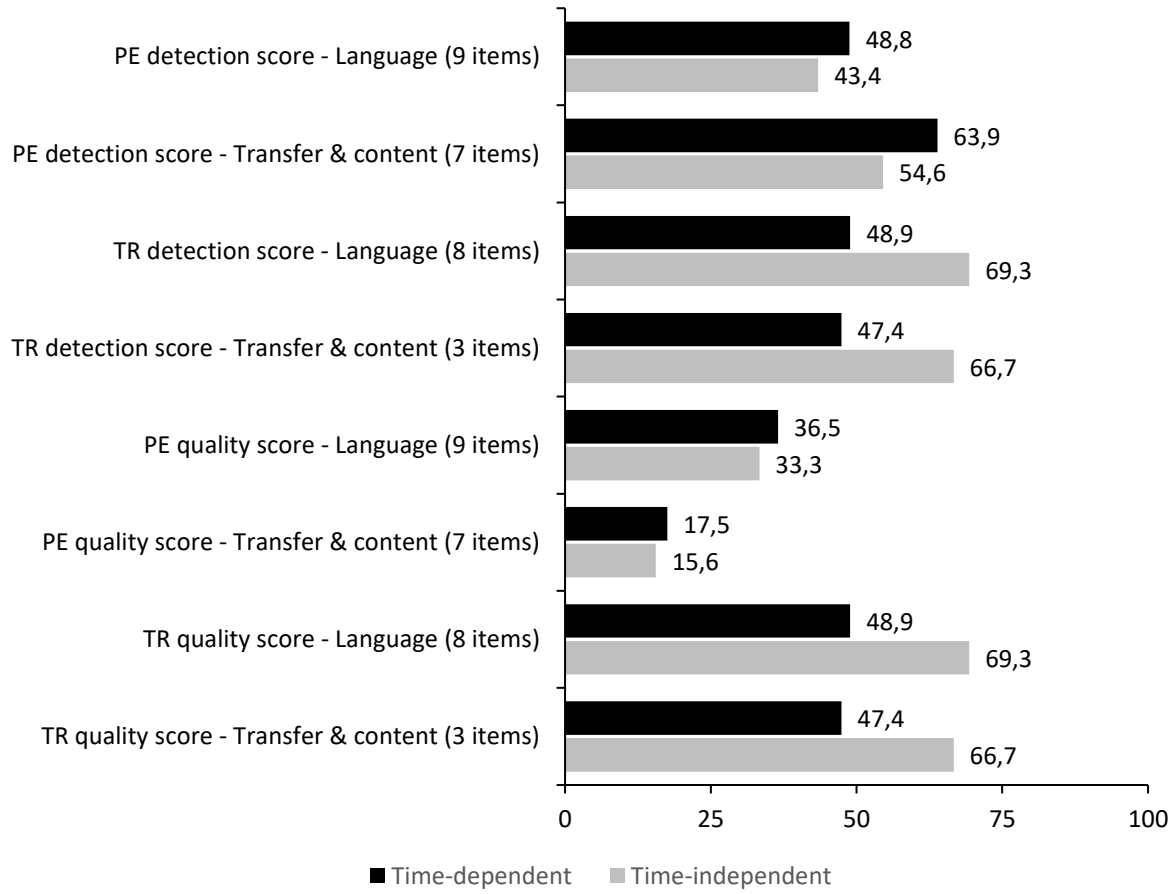

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Table 6

Wilcoxon-Signed Rank Tests for Time-Independent and Time-Dependent Translation Revision (TR) and Post-Editing (PE) Scores Based on Transfer & Content Items vs Language Items

			Transfer & Content		**Language**	
Time-independent			Quality score	Detection score	Quality score	Detection score
Z			--2.897	--1.292	--2.847	--2.848
Monte Carlo Sig. (2-tailed)	Sig.		**.002***	.221	**.002***	**.002***
	99% CI	LB	.001	.210	.001	.001
		UB	.003	.231	.003	.003
Time-dependent			Quality score	Detection score	Quality score	Detection score
Z			--2.578	--1.600	--1.511	--1.067
Monte Carlo Sig. (2-tailed)	Sig.		**.008***	.123	.146	.316
	99% CI	LB	.005	.114	.137	.304
		UB	.10	.131	.155	.328

Table 7

Spearman Correlations for Time-Independent and Time-Dependent Translation Revision (TR) and Post-Editing (PE) Scores, for Transfer & Content and for Language

	Transfer & Content		**Language**	
Time-independent	Quality score	Detection score	Quality score	Detection score
Spearman's rho	--.354	--.369	.499	.431
Sig. (1-tailed)	.143	.132	.059	.093
Time-dependent				
Spearman's rho	--.124	--.333	.223	--.051
Sig. (1-tailed)	.358	.159	.255	.441

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Translation revision, post-editing and translation tasks: Correlation tests

As shown in Table 8, there is a significant correlation between the *time-independent* T quality score and two *time-independent* TR scores. In addition, there is one significant positive correlation with PE, that is, with the PE quality score. In other words, the fewer errors that students make in the translation task (i.e., the better they translate), the better they revise and post-edit, unless PEC is measured through PE detection scores. When we look at time-dependent scores, the picture is different: there is no significant correlation between the T score and the TR scores, but one significant correlation with PE, that is, with the PE quality score. Again, we observe no correlation with PE detection scores.

Table 8

Spearman Correlations for Translation (T), Translation Revision (TR) and Post-editing (PE) Quality and Detection Scores

Spearman's rho		TR		PE	
	Time-independent	**Quality score**	**Detection score**	**Quality score**	**Detection score**
Translation Quality score	Correlation Coefficient	.551*	.709**	.755**	.298
	Sig. (1-tailed)	.039	.007	.004	.187
Spearman's rho		TR		PE	
	Time-dependent	**Quality score**	**Detection score**	**Quality score**	**Detection score**
Translation Quality score	Correlation Coefficient	.073	.164	.820**	.260
	Sig. (1-tailed)	.416	.315	.001	.220

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Finally, we also looked at the correlation between task time and tasks scores. We observed no significant correlation between the TR duration and the TR scores, no significant correlation between the translation duration and the translation scores, but a significant correlation between the PE duration and the PE scores, as shown in Table 9.

Table 9

Spearman Correlations for Translation (T), Translation Revision (TR) and Post-editing (PE) Quality and Detection Scores and Respective Task Duration

Spearman's rho		TR		PE		T
		Quality score	**Detection score**	**Quality score**	**Detection score**	**Quality score**
Task duration	Correlation Coefficient	.131	.265	**.606***	**.665***	.120
	Sig. (1-tailed)	.351	.215	.024	.013	.363

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Discussion and conclusion

Our results allow us to formulate a tentative answer to our research question: To what extent are TC, TRC, and PEC different from each other? Drawing on the results of the comparison tests, we can state that TRC and PEC do indeed appear to be different competences, at least among translation students working from their L1 (Dutch) into an L2 (French). Quality scores for both TR and PE used to measure TRC and PEC are significantly different: students achieve better results for TR tasks than PE tasks, regardless of whether task duration is considered or not. However, when TRC and PEC are measured using detection scores, the results are slightly different, that is, time-dependent detection scores are not significantly different, but time-independent detection scores are. In other words, when you consider task duration, TRC and PEC are not different when it comes to the first step in TR or PE processes: problem detection.

A somewhat similar result is found when we focus on transfer-and-content issues. Students are better at revising than at post-editing, regardless of task duration, unless detection scores are used to measure competence. In that case, again, there is no difference anymore between both TRC and PEC. When the focus is on language, the results are slightly different, with students being better revisers than post-editors only when task duration is not considered. In that case, students revise better and also detect better. We believe that this may indicate that both TRC and PEC, although different, do indeed share a common core: problem detection. This confirms what Konttinen et al. (2021) have shown in their comparison of TRC and PEC.

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The fact that students appear better at revising than at post-editing may be due to participant profiles, that is, students revising and post-editing in their L2 (French). Common errors made by non-natives may be easier to detect than errors in neural MT. It may also be due to the types of items (errors) that students had to detect. The TR task included spelling and grammar items, the PE task did not, simply because DeepL did not produce those error types for the selected source text. When we look at transfer-and-content errors only, we observe the same trends, that is, both TRC and PEC are different, except when detection scores are used and that, whether the task duration is taken into account or not. When we look at language issues only, the picture is slightly different, with TRC and PEC being different, when we use time-independent quality and detection scores, but similar for time-dependent scores.

Consequently, our findings may indicate that, when faced with a TR or PE task, students are generally able to detect problems, but not able to solve all detected problems 'properly' (i.e., accurately, meaningfully and appropriately), in particular in the PE task. Solving problems properly is probably more dependent on TC, since this process is production-based and no longer only detection-based. In other words, this finding may indicate that to be a good revisor and/or post-editor, you actually need TC too, particularly when it comes to solving detected problems in PE tasks (i.e., producing solutions). This probably explains why we found a positive correlation between the time-independent translation quality score and the time-independent TR and PE quality scores, and between the time-dependent translation quality score and the time-dependent PE scores.

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All in all, we can conclude that our exploratory study has provided some preliminary evidence that TC, TRC, and PEC are similar in certain respects and different in other respects and that TRC and PEC do seem to share a common core, that is, problem detection, with TC helping students to solve problems provided those problems have been detected. Future research must shed light on the intricate relationships between the competences required to translate, revise, and post-edit. In addition, future research should address the limitations found in our exploratory study. These include the limited number of participants -- hence the need to consider the results with caution and regard them more as indicative than confirmatory --, the limited number of items in the TR and PE tasks, the relative homogeneity in the participant educational profiles (students were expected to have the same proficiency level, but that level was not measured), and the exclusive focus on indirect translation (L1 Dutch--L2 French). This might seem less ecological, since translation into the L1 is generally considered good practice in European countries. However, in countries where translators' L1 is a language of a lesser diffusion, translation into an L2 is a must. Besides, the three competences should also be tested in a hybrid task, where they all come together in a CAT-tool environment: revising a TM segment, translating from scratch when no TM suggestion is provided, and post-editing when the tool includes MT suggestions. These limitations should be considered in a larger study to allow for higher degrees of generalizability.

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Appendix 1a

Translation revision task

Mandat de traduction : à traduire pour le site Daar Daar, la date reste la même. Tout le texte, niveau de langue locuteur natif (comme en classe). --> Révision pour répondre au mandat.

Vlamingen betalen hun factuur vaker te laat dan Walen	**La Flandre compte d'avantage de mauvais payeurs que la Wallonie**
Vlaanderen telt meer wanbetalers dan Wallonië, zo becijferde het incassobureau Intrum. Nochtans zijn de armoedecijfers niet recht evenredig. 'Wanbetalingen hebben zeker niet alleen met armoede te maken. De Belg neemt het niet altijd even nauw met zijn facturen.'	**Selon le bureau de recouvrement Intrum, la Flandre compte d'avantage de mauvais payeurs que la Wallonie. Un constat que ne reflète que partiellement les statistiques de la pauvreté. « Les retards de paiement ne sont pas uniquement liés avec la pauvreté. Le Belge n'est pas toujours très à cheval sur le règlement de ses factures. »**
In Vlaanderen betaalde bijna één op de tien huishoudens de afgelopen vier jaar een rekening te laat. Dat berekende het incassobureau Intrum op basis van meer dan vier miljoen dossiers tussen 2015 en dit jaar. Opvallend: in Wallonië ligt het aantal wanbetalers lager. Daar ondervond 0,62 op de tien huishoudens problemen, in Vlaanderen bedroeg dat aandeel 0,79.	Au cours des quatre dernières années, près d'un sur dix ménages flamands a réglé une facture avec retard. Cela a calculé le bureau de recouvrement de créances Intrum sur la base de plus de quatre million de dossiers depuis 2015. Fait marquant : le taux de mauvais payeurs est moins élevé en Wallonie. Alors que la part de ménages flamands ayant connu des problèmes de paiement s'est chiffrée à 0,62 sur 10, cette proportion s'est élevée à 7,9 en Wallonie.
De problemen situeren zich vooral in en rond de centrumsteden. In Vilvoorde kreeg net geen kwart van de huishoudens de afgelopen vier jaar een aanmaning van het incassobureau (2,37 op de 10). Ook in buurgemeente Machelen zien we gelijkaardige cijfers. Het aantal wanbetalers ligt er hoger dan in de armste gemeenten van Brussel – Molenbeek en Sint-Joost-ten-Node – waar respectievelijk 0,95 en 1,26 op de 10 betalingsproblemen ondervond. Ook in Gent en Antwerpen zien we de problemen uitdijen naar de stadsrand.	Les problème se concentrent dans les centres urbains et leur périphérie. Ainsi, au cours des quatre dernières années, le bureau de recouvrement a donné une injonction de paiement à près du quart des ménages habitant Vilvorde (2,37 sur 10). Des chiffres comparables ont été observés dans la commune voisine de Malines. La proportion de mauvais payeurs est dès lors plus élevée dans ces communes qu'à Molenbeek et Saint-Josse-ten-Noode, les communes bruxelloises les plus pauvres, qui subissent respectivement un score de 0,95 et 1,26 sur 10. À Gent et à Anvers aussi, les problèmes prennent plus d'ampleur en bordure de la ville.
[...]	
Bron: https://www.demorgen.be/nieuws/vlamingen-betalen-hun-factuur-vaker-te-laat-dan-walen~b7fb866a/	

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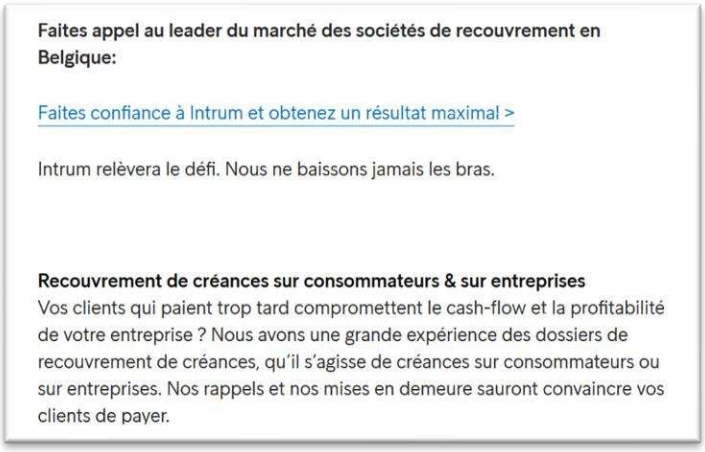
Documentation:



Faites appel au leader du marché des sociétés de recouvrement en Belgique:

Faites confiance à Intrum et obtenez un résultat maximal >

Intrum relèvera le défi. Nous ne baissons jamais les bras.

Recouvrement de créances sur consommateurs & sur entreprises
Vos clients qui paient trop tard compromettent le cash-flow et la profitabilité de votre entreprise ? Nous avons une grande expérience des dossiers de recouvrement de créances, qu'il s'agisse de créances sur consommateurs ou sur entreprises. Nos rappels et nos mises en demeure sauront convaincre vos clients de payer.

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Appendix 1b

Post-editing task

Mandat de traduction : à traduire pour le site Daar Daar, la date reste la même. Tout le texte, niveau de langue locuteur natif (comme en classe). --> PE complète (Full PE) pour répondre au mandat.

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Politicoloog Dave Sinardet: 'De N-VA werpt zich nu op als woordvoerder van de kiezers van het Vlaams Belang'	**Le politologue Dave Sinardet : " La N-VA se présente maintenant comme le porte-parole des électeurs du Vlaams Belang ".**
De verkiezingen liggen nog geen week achter ons en de verwijten tussen Vlaamse en Waalse politici vliegen alweer over en weer. Leven we stilaan in twee verschillende democratieën? Niemand die daar beter op kan antwoorden dan professor politicologie Dave Sinardet (VUB en Université Saint-Louis).	**Les élections sont derrière nous depuis moins d'une semaine et les accusations entre les politiciens flamands et wallons font déjà des allers et retours. Vivons-nous progressivement dans deux démocraties différentes ? Personne ne peut mieux répondre à cette question que le professeur de science politique Dave Sinardet (VUB et Université Saint-Louis).**
Eerder deze week ging hij op de Franstalige commerciële zender RTL-TVI nog in debat met Marc Uyttendaele, professor grondwettelijk recht (ULB) en de man van PS-kopstuk Laurette Onkelinx. "Die vond dat de koning het cordon sanitaire had doorbroken door Vlaams Belang-partijvoorzitter Tom Van Grieken uit te nodigen. Dat is dan toch een zeer brede definitie van het cordon. Het politiek interessante feit is niet zozeer dat de koning het Vlaams Belang heeft uitgenodigd, maar dat de partij daarop is ingegaan."	Plus tôt cette semaine, sur la chaîne commerciale francophone RTL-TVI, il discutait encore avec Marc Uyttendaele, professeur de droit constitutionnel (ULB) et l'homme de la coupe PS Laurette Onkelinx. "Il pensait que le roi avait rompu le cordon sanitaire en invitant le président du parti du Vlaams Belang, Tom Van Grieken. C'est une définition très large du cordon. Le fait politiquement intéressant n'est pas tant que le roi a invité le Vlaams Belang, mais que le parti a répondu à cela."
Het typeert Sinardet. Sinds hij tien jaar geleden zijn doctoraat over de rol van de media in de communautaire conflicten verdedigde, maakt de Antwerpse politicoloog er een punt van aan beide kanten van de taalgrens zijn licht te laten schijnen op het politieke bestel. "Je kunt de complexe Belgische politiek niet goed begrijpen als je maar één kant van de taalgrens kent." Telkens probeert hij het grotere plaatje in het oog te houden.	C'est typique de Sinardet. Depuis qu'il a défendu son doctorat sur le rôle des médias dans les conflits communautaires il y a dix ans, le politologue anversois s'est fait un devoir de mettre en lumière le système politique des deux côtés de la frontière linguistique. "On ne peut pas vraiment comprendre la politique complexe de la Belgique si l'on ne connaît qu'un côté de la frontière linguistique. Il essaie toujours de garder un œil sur l'ensemble de la situation.
Ook op het moment dat Onkelinx de polarisatie op de spits dreef door het Vlaams Belang een racistische partij te noemen, waarop Van Grieken dreigde met een klacht wegens laster en eerroof. "We veralgemenen de uitspraken van één politicus te vaak tot de houding van de helft van het land. Lang niet alle Franstalige politici zijn het met Onkelinx en haar man eens dat koning Filip het Vlaams Belang niet mocht uitnodigen." [...]	Même à une époque où Onkelinx exacerbait la polarisation en qualifiant le Vlaams Belang de parti raciste et où Van Grieken menaçait de porter plainte pour diffamation. "Nous généralisons trop souvent les déclarations d'un homme politique à l'attitude de la moitié du pays. Tous les hommes politiques francophones ne sont pas d'accord avec Onkelinx et son mari pour dire que le roi Philippe n'était pas autorisé à inviter le Vlaams Belang. [...]
Bron: https://www.demorgen.be/politiek/politicoloog-dave-sinardet-de-n-va-werpt-zich-nu-op-als-woordvoerder-van-de-kiezers-van-het-vlaams-belang~be694d14/	*Traduction DeepL*

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Documentation


Le professeur de sciences politiques Dave Sinardet a expliqué dans une interview à DaarDaar que le bourgmestre Bart De Wever (N-VA) pourrait avoir des difficultés à conserver la majorité actuelle à Anvers après les élections communales d'octobre. Une situation qui pourrait par ailleurs avoir des répercussions au fédéral.

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Appendix 1c

Translation task

Traduction N-F : instructions de traduction

1. **Variables d'équivalence**
    a) Fonction : Vous êtes traducteur freelance. Le site du Soir vous demande de traduire l'article « Bijna 1 op de 5 volwassenen volgt opleiding of cursus » (https://www.cbs.nl/nl-nl/nieuws/2018/47/bijna-1-op-de-5-volwassenen-volgt-opleiding-of-cursus) pour son site. Il s'agit de publier l'article dans un dossier sur la formation des adultes, à paraître une semaine après la publication sur le CBS (Imaginez que nous soyons en décembre 2018).
    b) Contenu : tout le texte
    c) Forme : conserver les paragraphes
    d) Style : même style
    e) Révision du TS pour correction d'erreur : oui
    f) Statut : autonome
2. **Variables de langue cible**
    a) Acceptabilité : style natif considéré comme bon.
    b) Localisé ou non : non
    c) Mis en parallèle : non
3. **Variables de traducteur**
    a) Visibilité : non, pas de notes en bas de page, explicitations dans le texte autorisées
    b) Traduction individuelle
    c) Locuteur natif pour le TS (néerlandophones)
    d) Apprenant
4. **Variables situationnelles spéciales**
    a) Espace disponible : ± idem
    b) Média : publication sur le site
    c) Outils autorisés : Van Dale, Le Grand Robert, Antidote (sauf correcteur)

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Bijna 1 op de 5 volwassenen volgt opleiding of cursus

In 2017 volgden ruim 1,7 miljoen personen van 25 tot 65 jaar enige vorm van scholing. Het gaat zowel om formeel onderwijs, zoals een opleiding in het mbo* of hoger onderwijs, als om cursussen en workshops. Dit blijkt uit recent gepubliceerde cijfers van het CBS over scholing van volwassenen.

De overheid stimuleert 'leven lang leren', zodat volwassenen - al dan niet werkend - voldoende kennis en vaardigheden opdoen om duurzaam inzetbaar te worden of te blijven op de arbeidsmarkt. In vergelijking met andere EU-landen volgen in Nederland relatief veel volwassenen onderwijs: ruim 19 procent in 2017. Alleen in de Scandinavische landen is dit aandeel nog groter. In Zweden volgen ruim drie op de tien volwassenen een opleiding of cursus, gevolgd door Finland en Denemarken. Nederland maakt met Frankrijk de top vijf compleet.

Stijging deelname aan scholing door volwassenen

In 2017 volgde ruim 19 procent van de volwassenen een cursus of opleiding. Ruim tien jaar eerder was dit nog ongeveer 16 procent. Nederland voldoet hiermee al geruime tijd aan de Europese doelstelling voor leven lang leren van 2020, gesteld op 15 procent. Het EU-gemiddelde lag in 2017 op bijna 11 procent. Nederland heeft zich tot doel gesteld dat 20 procent van de volwassenen van 25 tot 65 jaar deelneemt aan 'leven lang leren' in 2020. Deze nationale doelstelling is nog niet behaald. Het aandeel volwassenen dat scholing volgt ligt al jaren ruim boven het gemiddelde van de 28 landen van de EU.

Meeste opleidingen korter dan een week of langer dan 3 jaar

In 2017 nam 23 procent van de volwassenen deel aan een opleiding of cursus met een duur korter dan een week. In de afgelopen vier jaar is het aantal deelnemers aan dergelijke korte opleidingen het meest gegroeid.

[...]

Bron: https://www.cbs.nl/nl-nl/nieuws/2018/47/bijna-1-op-de-5-volwassenen-volgt-opleiding-of-cursus

* MBO is in het buitenland vergelijkbaar met het Vlaamse *Technisch secundair onderwijs (TSO)*

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[i] In line with PACTE's work on translation competence, we view translation as "a communicative activity, directed towards achieving aims (e.g., Nord 1997), that involves making decisions and solving problems (e.g., Wilss 1988, 1996), and requires expert knowledge" (Hurtado Albir 2017, xxvi).
[ii] Revision is also the term used in the European Standard EN 15 038. Translation Services - Service Requirements (2006) and its successor, the ISO 17100:2015 standard for this activity.
[iii] We are aware of the debate about the notion of competence in translation studies, especially in relation to expertise. We consider competence "a pedagogical construct used to describe ideal skill/ability/knowledge sets for education and training purposes" (Shreve et al. 2018, 47).
[iv] Translation task (300-word ST), translation revision task (247-word TT), post-editing task (303-word TT).
[v] Mossop's (2020) parameters are categorized as follows: Transfer (accuracy and completeness), Content (logic and facts), Language (smoothness, tailoring, sub-language, idioms and mechanics; the latter include spelling, grammar, punctuation house style and correct usage).
[vi] Personal communication, *Cel Human Resources en Organisatie* (February 2022).
[vii] We also draw on insights from educational research. As explained by Eyckmans (2017), "[w]ithin educational methodology it is generally accepted that the assessment of a competence in any field entails five steps: (1) defining the competence, (2) defining its sub-components (sub-competences), (3) formulating competence descriptors for each of the sub-competences, (4) linking the competence descriptors to observable behaviour, and (5) developing instruments to elicit and score this behaviour (Bachman 1990)" (217--218). Steps 1, 2 and 3 have been described in Robert et al. (2017a). Steps 4 and 5 are described in the present paper.
[viii] For a comparison of additional evaluation methods, see Robert, Schrijver, and Ureel (2021, 2022).
[ix] All translation scores are negative numbers, since these are scores that could be deducted from a fixed total if we had decided to have one.
[x] The Bonferroni correction is a method commonly used in statistics to reduce the negative effects of conducting multiple statistical analyses on the same dataset (Loewen and Plonsky 2016). When researchers conduct multiple analyses on the same dataset, they run the risk of falsely determining that statistically significant relationships exist, when, in fact, they do not. Such errors are known as Type I errors. To reduce the incidence of Type I errors, researchers will use a more conservative significance level, by dividing the commonly used alpha value .05 by the number of comparisons. The resulting conservative alpha value is then used to determine the significance of *p*-values.
[xi] For more details about power considerations, see, for example, Brysbaert (2021)