



Exploring predictors of translation performance

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Abstract: The study reported on examined the question of whether translators' cognitive faculties might be able to predict their performance on a translation task. Research on individual cognitive differences in translation has been a new issue in the realm of Translation Studies. However, the majority of previous studies have targeted single cognitive faculties for the purpose of investigation and we therefore know little about how sets of cognitive faculties can affect the process of translation from one language into another. In this study, three individual cognitive differences were targeted: emotional intelligence (EI), tolerance of ambiguity (TA), and working memory (WM). For the purposes of the study, 54 Iranian MA students of Translation Studies were sampled as participants. The participants completed measures of their EI, TA, and WM. In addition, they were requested to translate an excerpt from English (Source Language) into Persian (Target Language). The results of multiple regression analysis indicated that the regression model, incorporating EI, TA, and WM as its predictors, was able to predict a significant amount of variance in participants' translation performance. Of the three predictors, the contributions of TA and WM to the total variance in the participants' translation scores were statistically significant, while the contribution of EI to the total variance was not. The findings of the study have some implications for research and practice in the field of Translation Studies.

Keywords: Emotional intelligence; tolerance of ambiguity; working memory; translation performance; regression analysis; Translation Studies.

1. Introduction

The psycholinguistics of translation has strongly appealed to translation researchers in recent years, with some scholars beginning to realize that psychological mechanisms and characteristics may have influential effects on different translation processes (Rojo, 2015; Rojo & Caro, 2018). These researchers have come to the realization that the translation processes and their final product (i.e. translation quality) are highly affected by translators' cognitive traits (Risku, 2002). This is not surprising, Risku (2002 p. 523) also defines translation and cognition as "symbolic activities"; therefore, it can be tenably hypothesized that they influence each other.

One branch of this new field of Translation Studies is concerned with the influences that translators' psychological characteristics may have on their translation quality. Translation researchers have come to find that translation quality is not only the by-product of the translator's command of the source language and the target language, but is also affected by the translator's cognitive predispositions (e.g. Jääskeläinen, 2010; Risku, 2002; Shreve, 2002). These individual cognitive differences are believed to play a significant role in the process of translation, particularly through the choices that a translator has to make with respect to appropriate translation strategies (Jääskeläinen, 2010; Shreve, 2002).

Based on these new trends in the field of Translation Studies, the present study was undertaken to see whether a particular set of cognitive faculties might influence the quality of translation delivered by first year students of Translation Studies at the graduate level. The set of cognitive faculties targeted in this study included emotional intelligence (EI), tolerance of ambiguity (TA), and working memory (WM). EI and WM were targeted as this study proposes pieces of theoretical arguments and empirical evidence that these two cognitive factors have potential effects on translation performance. TA was also included in the present study as cognitive researchers contend that it plays an important role when a person has to make subjective choices in uncertain decision-making situations, as it is the case in translation where the translator has to make choices on appropriate translation strategies and equivalents. In addition, there is evidence that there is a positive relationship between TA and the extent to which translators are successful in the process of rendering the message from the source language (SL) into the target language (TL). In the following paragraphs, we present a review of the arguments on the role of the targeted cognitive faculties in translation processes and performance.

2. Literature review

This section will review the individual cognitive traits of EI, TA, and WM as conceptualized in the literature on cognitive sciences and translation. Updated definitions of these three differences are presented, along with a review of the theoretical arguments and empirical evidence as to the relationship between these three cognitive traits on the one hand, and translation processes and performances on the other hand.

2.1. Emotional intelligence

Emotional intelligence (EI) can be defined as a person's ability to control their own emotions and feelings, to understand other people's emotions and feelings, and to use these emotions and feelings to control thoughts and behaviours (Sparrow & Knight, 2009). EI has appealed significantly to researchers working on the effects of emotional states on people's behaviours and learning in different fields of study. However, in the realm of Translation Studies, the concept of EI has been largely neglected in part because researchers have considered emotions as a feature of the text to be translated (i.e. target text) rather than a trait of the person doing the translation (i.e. translator) (see Hubscher-Davidson, 2016; Lyu & Wang, 2018; Varzande & Jadidi, 2015). This is disappointing because, as mentioned above, nearly all fields of studies in Humanities and Social Sciences have targeted EI as a fruitful area of research and the results of these studies have provided evidence that EI is a strong predictor of success in learning and profession.

For translation, it is assumed that levels of EI would probably have repercussions for both the translation process and the final product of this process

(Hubscher-Davidson, 2013). For example, it is hypothesized that a translator with a high level of EI is likely to render the illocutionary or intended meaning of the SL text into the TL more successfully. This is because people with high EI are more sensitive to both linguistic and non-linguistic relations in a language (Ożańska-Ponikwia, 2013), and thus, if these people are translators, they may be able to transfer these relations from the SL to the TL as appropriately as possible.

The studies on EI and translation by Hubscher-Davidson (2013) and Varzande and Jadidi (2015) present two exceptions in this research area. Hubscher-Davidson (2013) presents a theoretical argument for studies on the effects that a translator's EI exerts on the quality of translation they deliver. Hubscher-Davidson (2013) argues, "Being able to appraise and communicate one's own and other people's emotions is a key aspect of intercultural communication, and therefore a key skill for translators and interpreters" (pp. 332-333). Consequently, Hubscher-Davidson (2013) hypothesizes that translators with higher levels of ability to understand their own and other people's emotional states (i.e. higher levels of EI) are more successful in choosing appropriate strategies for translating SL texts into the TL. She contends that EI exerts its influences on translation quality through dimensions of intuition, empathy, and creativity. Hubscher-Davidson (2013) says "if there are certain emotional and personality-related attributes (e.g., intuition, sensitivity, and empathy) that successful creative writers have been found to share, there may possibly also be certain attributes that successful literary translators may also share" (p. 334). Hubscher-Davidson (2013) argues that, as a stylistic skill, translation quality is highly dependent on how creative the translator is in transferring the message intended in the SL into the TL. She goes on to hypothesize that, since psychologists have unanimously found people with high levels of EI to be more creative, translators with high EI are more successful in translating literary texts because of their higher levels of creativity (pp. 333-334).

Hubscher-Davidson's (2013) study remains at the level of theoretical argument and does not test whether her claims about the effects of EI on translation quality hold true or not. Varzande and Jadidi (2015), however, did move on from the level of theoretical argumentation by designing an experiment to test the relationship between EI and translation quality. The researchers asked a group of Iranian translators to fill out a questionnaire of EI and then perform a translation task that involved an excerpt from Orwell's 1984 novel. Their results indicated no significant relationship between EI and translation quality, a finding that was in contrast to Hubscher-Davidson's (2013) predictions about the relationship between EI and translation performance. However, one must be cautious when interpreting Varzande and Jadidi's (2015) results. First, the researchers chose professional translators as the participants in their study. It may be that the participants' professional skills in translation prevented the effects of EI on translation quality from emerging (Bar-On & Parker, 2000; Nelis, Quoidbach, Mikolajczak & Hansenne, 2009; Shangarffam & Abolsaba, 2009). In fact, one could argue that "an experienced translator will probably have useful inferential intuition to rely on" and, therefore, his/her personality traits may play little role in the final translation product (Hubscher-Davidson, 2012, p. 225; see Hokkanen, 2017). Second, the translation excerpt in Varzande and Jadidi's (2015) paper was taken from a novel (Orwell's 1984) that has been translated by several different Iranian translators and the translations have been read by a large number of Iranian readers. Therefore, it may be that the participants in the Varzande and Jadidi (2015) study had background knowledge of the translation excerpt because of their previous encounter with translations of Orwell's *1984*. Such background knowledge could have strongly affected the results obtained by Varzande and Jadidi (2015). In addition, Orwell's *1984* is a dystopian social science-fiction novel with a political

storyline. These features of the novel may be the ones that required the least imagination and creativity on the part of the translator, while imagination and creativity are characteristic traits of people with high levels of EI (Hubscher-Davidson, 2012; see also Bar-On & Parker, 2000; Hubscher-Davidson, 2016; Lyu & Wang, 2018; Shangarffam & Abolsaba, 2009; Varzande & Jadidi, 2015). These interpretations of Varzande and Jadidi's (2015) results are speculative because the researchers themselves fail to present convincing reasoning for their results. This may be an argument for further empirical investigations into the relationship between EI levels and translation processes. (See Hansen, 2005)

2.2. Tolerance of ambiguity

In Humanities and Social Sciences, ambiguity refers to uncertain situations that require a person to make decisions or direct his/her mental resources towards certain stimuli at the cost of the others (Norton, 1975). How ambiguous a behaviour or learning situation can become to the person depends on the type of the cues provided in the context in which the behaviour or learning occurs. In this sense, the degree of ambiguity is high when the cues are completely contradictory (i.e. conflicting cues), the degree is low when the number of the cues is large (i.e. too many cues), or when the cues are new in nature (i.e. unfamiliar cues) (Norton, 1975). As Norton (1975) contends, the complexities of these situations entail a sense of unease and discomfort in terms of the person's cognitive processes and require them to tolerate relative levels of ambiguity in making decisions. In a similar fashion, McLain (1993) defines tolerance of ambiguity as "a range, from rejection to attraction, of reactions to stimuli perceived as unfamiliar, complex, dynamically uncertain or subject to multiple conflicting interpretations" (p. 184).

The literature has generally shown that tolerance of ambiguity (TA) is a significant predictor of human learning and behaviour (e.g., Furnham & Marks, 2013; Furnham & Ribchester, 1995). In theory, TA is a concept that plays a significant role in the process of translation performance. Translation is a fluid process, as the translator consistently finds himself/herself in the process of making decisions about appropriate translation strategies and TL equivalents. In fact, Bassnett (2013) goes on to claim that translation is one of the most challenging cognitive tasks, since it requires the translator to deploy an assimilated number of cognitive mechanisms to make sure that the best has been achieved in the process of rendering the message from the SL into the TL. In an empirical study, Hubscher-Davidson (2017) explored the relationship between TA and EI, on one hand, and job satisfaction in translation, on the other hand. She found that, for professional translators, TA and EI are positively correlated, while TA had no significant correlation with the participants' satisfaction with their job as translators. However, it should be noted that Hubscher-Davidson's (2017) results do not tell us anything about the effects of TA on actual translation performance. Therefore, the present study targeted TA as one of the cognitive traits in translation task performance.

2.3 Working memory

Working memory (WM) can be defined as a temporary cognitive tool which helps us retain and rehearse information in real-time so that other cognitive mechanisms (e.g., induction, deduction, elaboration, and assimilation) can process the information for learning and behaviour (Baddeley, 2000). Some researchers contend that WM is the most important cognitive mechanism because, without it, it is impossible to learn anything (e.g., Baddeley, 2000; Gathercole & Baddeley, 2014). Therefore, a large number of studies have been undertaken in the fields of psychology and education to examine the effects of WM on human learning. The results of these studies have generally shown that WM is one of the most powerful

predictors of human learning. Besides learning, WM is also found to be significant in performing tasks where the information load on the task performer's cognition is deemed high. For example, in the realm of arithmetic and mathematic problem-solving, Logie, Gilhooly and Wynn (1994) and Ashcraft and Krause (2007) found that children with higher levels of WM capacity would do better than their peers with lower WM capacity in solving arithmetical and mathematical problems. In the same ways, some researchers have found that WM could have effects on performing different aspects of music, language, and other cognitive tasks (e.g., Angelone, 2010; Berz, 1995; Daneman & Carpenter, 1980).

The concept of WM has also entered the field of Translation Studies; however, most of the studies in this trend have been conducted on the role of WM in interpreting (i.e. oral translation) (e.g., Köpke & Nespoulous, 2006; Liu, Schallert, & Carroll, 2004; Schjoldager, 1993). This is not surprising given the fact that interpreting is more immediate than written text translation, which presupposes that interpreters with higher levels of WM would be probably more successful in rendering an oral message from the SL into the TL. WM has also been investigated with respect to written materials, but the investigative attempts have been restricted to the translation of single words (e.g., Tokowicz, Michael, & Kroll, 2004) which does not help us understand the effects of WM on the translation of longer stretches of the SL. Therefore, the present study chose WM as one of the independent variables to examine to what extent it might affect quality in translation performance by Iranian MA students of Translation Studies.

3. Method

The purpose of the present study was to investigate whether Iranian first year MA translation students' cognitive traits has an impact on the quality of their translation performance. As far as translation theory is concerned, Bassnett (2013) stresses that a comprehensive model of translation should also be able to account for translator-internal factors that may affect both the selection of translation strategies and the quality of translation products. Findings of the study can also be useful for translation training. Tan (2008) calls for a humanistic approach to translator training which takes translation trainees' strengths, weaknesses, and personality characteristics into account so that the trainee can receive an individualized training. By understanding how EI, TA, and WM influence translation quality and processes, the study can make translation instructors aware of the possibilities that attention to the trainees' individual cognitive differences can have for more effective translation instruction (see Angelelli & Baer, 2016; Saldanha & O'Brien, 2013).

The following research questions were posed to examine the effects of the targeted variables on the participants' translation performance.

Research Question 1: Can a combination of translator cognitive traits incorporating EI, TA, and WM predict the quality of a translation task undertaken by Iranian MA translation students where that task is assessed based on Waddington's (2001) translation assessment rubric?

Research Question 2: If the answer to the above question is 'yes', how much of the variance in the participants' scores on the translation performance is explained by each of the targeted cognitive traits?

3.1 Participants

The participants consisted of 54 Iranian MA translation students who were following Translation Studies at three different campuses of the Azad University in

Tehran, Iran (i.e. South Tehran Campus, Central Tehran Campus, and the Science and Research Campus). The participants were sampled from the MA level of Translation Studies because of the authors' assumption that these students were more L2 English proficient, which allowed them to control for the intervening effects of the second language (here, English) on the participants' translation performance. The course of Translation Studies at the Azad University in Iran is planned to run as a two-year course (two terms per academic year), although it sometimes takes up to three years for students to complete their MA thesis or pass their failed or remaining courses. Moreover, a combination of both Persian (to a larger extent) and English is used to teach the course, and the students participating in the current study were sampled from the first year of the course because first-year students were more available for the purpose of data collection. The demographic information of the participants was as follows: the participants' ages ranged from 23 to 31, with a mean age of 26.4. Of the 54 participants, 35 were female while the remaining 19 participants were male. Persian was the first language of all participants. The participants' attendance in the study was optional so that only those MA students who were willing to take part in the study were included in the research project. It is noteworthy that all willing participants signed a consent form issued by University of Boston for research purposes¹. This consent form consisted of two parts: an information sheet and a consent certificate. In addition, participants reported that they did not work as professional translators while participating in the study.

3.2 Instruments

Four instruments were utilized in this study to collect the required data; i.e. the Trait Emotional Intelligence Questionnaire–Short Form, Tolerance for Ambiguity Scale, a memory-span task, and a translation task. The instruments used to collect the required data are explained below.

3.2.1 Trait Emotional Intelligence Questionnaire—Short Form

The instrument used in this study to measure the participants' EI was Trait Emotional Intelligence Questionnaire–Short Form (TEIQue–SF) which had been developed and validated by Cooper and Petrides (2010). The TEIQue–SF consists of 30 Likert-type items. The questionnaire is assumed to be based on the four factors 'emotionality,' 'sociability,' 'self-control,' and 'well-being' which Cooper and Petrides (2010) believe to be the foundational components of EI. Of the available EI measures, the TEIQue–SF was selected because of the fact that it has been one of the most commonly used EI measures in recent years. The rating scale of the TEIQue–SF ranges from 1 (strongly disagree) to 7 (strongly agree). As for the reliability of the questionnaire, the results indicated that the TEIQue–SF had a reliability coefficient of .92 for the participants in the present study.

3.2.2 Tolerance for Ambiguity Scale

The instrument used to measure the participants' levels of TA was the Tolerance for Ambiguity Scale (TAS) developed by Herman, Bird, Mendenhall, and Oddou (2010). The TAS entails 12 items using a five-point Likert scale. When Herman et al. (2010) tested their questionnaire they identified four factors in TA: valuing diverse others, change, challenging perspectives, and unfamiliarity. The results indicated that the TAS had an acceptable reliability coefficient of .89 for the participants in the present study.

1. The consent form approved and published formally by the University of Boston was chosen in this research as a readily available, reliable and validated consent form.

3.3.3 Memory-span task

The instrument used in this study to measure the participants' WM capacity was a modified version of Daneman and Carpenter's (1980) test of WM. This task was chosen because it has been the most widely used instrument for measuring WM in verbal behaviour studies (Conway et al. 2005). The test consisted of 24 Persian sentences that were constructed in such a way that half of the sentences in the test were ungrammatical. This was done to ensure that the participants' would listen to the sentences for comprehension, since the meaning of the sentences would not be immediately obvious to them. By way of a grammaticality judgment test, 12 of the sentences were grammatically correct while the remaining 12 sentences were grammatically incorrect based on the grammatical structure of the Persian language (for information on Persian language grammar, see Khanlari, 1991). Based on the findings of a pilot study (see Ghobadi, Madadi, & Najafian, 2017), the lengths of the sentences ranged from 13 to 15 words for each sentence. This word range was set to allow for the readability of the sentences (La Pointe & Engle, 1990). The sentences were randomly bundled so that bundles of three (one bundle), four (one bundle), five (one bundle), and six (two bundles) sentences were included. The total score in the memory-span task ranged from 0 to 24.

3.3.4 Translation task

The excerpt to be translated in the following study by the participants was taken from the novel "Salvage the bones" written by Jesmyn Ward. In this study, a literary text was sampled for translation task because translation of literary texts is a common practice in both academia and in the market for translation in Iran. Jesmyn Ward's novel was selected for this study based on the assumption that the novel would be less familiar to the participants and therefore, background knowledge would not influence their performance on the translation task.

3.4 Procedure

3.4.1 Pilot study

Before collecting the required research data, a pilot study was undertaken, which involved six MA students of Translation Studies from the same universities as the participants in the main phase of the study. The purpose of the pilot study was to experiment with the translation task and WM-span task in order to revise the tasks based on the feedback received from the pilot study and set time for the participants' performance on these tasks. One of the researchers was always present in the pilot-study sessions to take notes and monitor the time spent by the students to complete the tasks. Consequently, revisions were made in the tasks based on such feedback, and the most time taken to complete the tasks in the pilot study was set as the time limit for the participants in the main phase of the study.

3.4.2 Data collection

The procedure of the study was undertaken as follows. First, the researchers approached first year MA translation students in different Azad universities in Tehran, Iran, and asked them if they were willing to participate in the research project. The students were informed about the purposes of the study and were told that their attendance in the study was optional, with no obligation whatsoever. Those students who were eager to participate in the study were asked to sign a consent form issued by the University of Boston for research purposes. Once a student agreed to take part in the study, a meeting was set up between the student and one of the researchers so that the researcher could collect the research data from that participant. In the meeting, the participant was first asked to complete the TEIQue-SF and TAS as measures of the participants' level of EI and TA. It took

participants approximately 20 to 30 minutes to complete the two questionnaires. Next, the researcher administered the working memory-span task. The WM-span task required participants to listen to the sentences played on a computer. The sentences were presented to the participants in bundles all separated by three-second intervals. The bundles consisted of three (one bundle), four (one bundle), five (one bundle), and six (two bundles) sentences. The participants' responsibility was to listen to the sentences in each bundle, and say whether or not the sentence was grammatically correct once it had been played, and also recall the last words of the sentences in each bundle. It is necessary to emphasize that the grammaticality judgment test was integrated into the WM-span task only to make sure that the participants would listen to the sentences for comprehension; however, their performance on the grammaticality judgment test was not rated though the participants were not aware of this fact. The total score in the memory-span task ranged from 0 (recalling none of the last words) to 24 (recalling all of the last words). The memory-span task took about 12 to 15 minutes to be performed by the participants.

After the completion of the questionnaires and performing the memory-span task, the participants performed the translation task. The translation excerpt to be translated was taken from Jesmyn Ward's "Salvage the bones" and consisted of about 400 words. Based on the results of a pilot study (see Ghobadi, Madadi, & Najafian, 2017), the participants were allowed 30 minutes to translate the translation task from the SL (English) into the TL (Persian). The participants were informed that they would be free to make use of their paper English-Persian dictionaries during the process of translating the text.

3.5 Translation rating and inter-rater reliability

To score the participants' performance on the translation task, Waddington's (2001) rubric was employed as the criterion. In the present study, Waddington's (2001) rubric was preferred over other translation assessment rubrics because the authors felt that its holistic approach to translation assessment would ensure its external validity. In addition, Waddington (2001) conducted a factor analysis to support the construct validity and reliability of his rubric. The details of the rubric have been presented in the checklist in Table 1. It is necessary to point out that the raters were provided with this checklist when rating the participants' performance on the translation task. In addition, the researchers held meetings with the raters to discuss the details of the rubric with them. Waddington's (2001) rubric assesses translation quality on 10-point scale (i.e. totally inadequate = 1-2; inadequate = 3-4; Adequate = 5-6; almost completely successful = 7-8; and successful = 9-10). The scoring was done by two independent raters (i.e. two translation experts) who were native speakers of Persian and had graduated with a PhD in Translation Studies, to ensure the reliability of the results. The inter-rater reliability of the scoring done by the researchers was calculated to be .94, which shows that the participants' translation task performance was rated reliably across the raters. For further information about Waddington's rubric and assessment parameters applied by the raters in the present research, please refer to Waddington (2001).

4. Results

4.1 Descriptive statistics

The descriptive statistics for both the independent variables (EI, TA, and WM) and the dependent variable (translation task) have been given in Table 1. In Table 1, the participants have a mean score of 168.43 and a standard deviation of 9.42 on the EI

measure, a mean score of 43.07 and a standard deviation of 4.77 on the TA measure, and a mean score of 16.30 and a standard deviation of 3.54 on the WM measure. On the other hand, the participants have a mean score of 7.14 and a standard deviation of 2.06 on the measure of translation performance.

Table 1: Descriptive statistics

Variable	Minimum	Maximum	Mean	Std. Deviation
EI	146.00	184.00	168.43	9.42
TA	37.00	49.00	43.07	4.77
WM	14.00	21.00	16.30	3.54
Translation task	5.00	9.00	7.14	2.06

4.2 Multiple regression analysis

Multiple regression analysis was used to address the research questions. Before conducting regression analysis, certain requirements must be met (Pallant, 2011). The assumption of normality requires that the distribution of all the variables included in the regression model be normally distributed. In the literature on statistics (see Pallant, 2011), the Kolmogorov-Smirnov index of normality is used for this purpose. According to Pallant (2011), the Kolmogorov-Smirnov index should be insignificant to be able to claim that the distribution of the scores is normally distributed. In Table 3 below, the Kolmogorov-Smirnov statistic for all the variables in this study are insignificant at $p < .05$. This shows that the distributions of the variables in the regression model are all normally distributed.

The assumption of multicollinearity indicates whether predictors in a regression model have strong relationships with each other. According to Pallant (2011), the predictors in the regression model should not be multicollinear so that their inclusion in the model can be justified. Variance inflation factor (VIF) is usually reported as a measure of multicollinearity; the predictors in the model should have a VIF less than 10. The results of the analysis indicated that all the predictors in the present study had a VIF less than 10. EI had a VIF of 2.05, TA had a VIF of 1.89, and WM had a VIF of 2.53, in other words the VIFs for the three predictors in the regressions model is less than 10. Therefore, the inclusion of the predictors in the regression model in the present study is substantiated.

Once the assumptions of regression analysis were checked, the analysis was conducted to find answers to the research questions posed in this study. The results of the analysis of the hypothesized regression are presented in Table 4. Table 4 shows that the regression model was able to predict 34% of the variance in the participants' performance on the translation task. The results of the follow-up analysis of variance (ANOVA) showed that the regression model was statistically significant; $F(3,49) = 4.11, p < .05$. This shows that the answer to Research Question 1 was 'yes', meaning that the regression model of EI, TA, and WM was able to predict a significant amount of the variance in the participants' scores on the translation task.

Research Question 2, on the other hand, was posed to determine the individual contributions of the predictors to the total variance in the participants' scores on the translation task. The results for these individual contributions are also displayed in Table 4. The results of the analysis showed that the contributions of TA and WM to the total variance of the scores on the translation task were statistically significant, whereas the contribution of EI to the total variance was not statistically significant. TA was able to predict 11% of the total variance in the scores ($r^2 = .11, p < .05$) and WM could predict 7% of the total variance in the scores ($r^2 = .07, p < .05$).

On the other hand, EI was only able to predict .6% of the total variance in the participants' scores on the translation task ($r^2 = .11$, $p > .05$).

Table 2: The Rating Checklist for Translation Quality (Waddington, 2001, p. 315)

Level	Accuracy of transfer of Source Text (ST) content	Quality of expression	Degree of task completion	Mark
Level 5	Complete transfer of ST information; only minor revision needed to reach professional standard.	Almost all of the translation reads like a piece originally written in Persian. There may be minor lexical, grammatical, or spelling errors.	Successful	9, 10
Level 4	Almost complete transfer; there may be one or two insignificant inaccuracies; requires certain amount of revision to reach professional standard.	Large sections read like a piece originally written in Persian. There are a number of lexical, grammatical or spelling errors.	Almost completely successful	7, 8
Level 3	Transfer of the general idea(s) but with a number of lapses in accuracy; needs considerable revision to reach professional standard.	Certain parts read like a piece originally written in Persian, but others read like a translation. There are a considerable number of lexical, grammatical, or spelling errors.	Adequate	5, 6
Level 2	Transfer undermined by serious inaccuracies; thorough revision required to reach professional standard.	Almost the entire text reads like a translation; there are continual lexical, grammatical, or spelling errors.	Inadequate	3, 4
Level 1	Totally inadequate transfer of ST content; the translation is not worth revising.	The candidate reveals a total lack of ability to express himself adequately in TL (in the present study, Persian).	Totally inadequate	1, 2

Table 3: Kolmogorov-Smirnov test of normality

Variable	Statistic	Sig.
EI	.094	.185
TA	.122	.063
WM	.081	.155
Translation task	.146	.081

Sig. <.05

Table 4. The results of the regression analysis

Regression Model	R	R ²	F	t	r ²	Sig.
EI, TA,WM	.59	.34	4.11			.002
EI				.94	.006	.828
TA				3.48	.11	.017
WM				1.76	.07	.030

5. Discussion and conclusion

In this study, Research Question 1 asked, “Can a combination of translator cognitive traits incorporating EI, TA, and WM predict the quality of a translation task undertaken by Iranian MA translation students based on Waddington’s (2001) translation assessment rubric?” The results of this study indicated that, as a regression model, the three individual cognitive differences of EI, TA, and WM among Iranian MA students of translation studies were able to predict the quality of participants’ translations from the SL (English) into the TL (Persian). This result was to be expected since, as the literature review indicated, these three cognitive traits are among the most powerful predictors of human behaviour and learning (e.g., Ashcraft & Krause, 2007; Furnham & Marks, 2013; Furnham & Ribchester, 1995; Sparrow & Knight, 2009). This finding is also consistent with Risku’s (2002) proposition that translation is a symbolic activity and thus, it is expected that translation be highly influenced by the translators’ cognitive processes and the extent to which they are willing to deploy these processes when carrying out a translation task. In the same way, according to Shreve (2002), it would be misleading to think that the process of translation is totally restricted to the texts (i.e. SL text and TL text) and the translator’s only responsibility to transform one type of the text into the other as he/she can adopt a more active role in the process.

Research Question 2 asked “If the answer to the above question [i.e. Research Question 1] is ‘yes’, how much of the variance in the participants’ scores on the translation performance is explained by each of the targeted cognitive traits?” The results of the study demonstrated that the participants’ level of TA and WM could contribute significantly to the total variance in participants’ scores on the translation task performance, while EI did not serve this purpose. Based on the findings of the present study, TA and WM proved to be significant predictors of translation task performance, whereas EI was not a significant predictor.

The fact that TA was a significant predictor of the participants’ performance on the translation tasks provides further evidence that the fact that TA contributes to the processing of uncertain behaviour situations (Furnham & Marks, 2013; Norton, 1975) is also applicable to the realm of translation. In other words, translation imposes ambiguity on the cognition of the translators and those translators who are more ambiguity-tolerant will be more successful in tackling the task of translation. The authors suggest that translators with higher levels of TA are better able to differentiate between effective and ineffective translation strategies and more sensitive to appropriate equivalents for SL words, structures, and other linguistic units. The study also found WM to be a significant predictor of the participants’ performance on the translation task. As mentioned in the literature review, WM is responsible for online processing of information in real-time situations. Though the act of translation is not necessarily time-restricted in real-life situations (Bassnett, 2013), the participants in the present study found themselves in an assessment-like situation in which they were required to translate the SL text in a certain amount of time. The authors argue that this assessment-like situation has allowed the effects of WM on translation performance to emerge. In other words, participants had to process both the incoming information from the SL text and the information from their knowledge of the TL (i.e. their own native language) in real-time so that they could satisfy the time requirements of the translation task. Finally, the results of the study indicated that EI was not a significant predictor of participants’ performance on the translation task. This last finding is consistent with the results of Varzande and Jadidi’s (2015) study in which no significant relationship was found between the participants’ EI levels and their performance on a given translation task. This can be attributed to the proposition

that EI plays an important role in real interactive situations (e.g., speaking situations) in which people assess their interlocutors' emotional states to be able to interpret the message intended (see Sparrow & Knight, 2009) and is less relevant to written texts in which people (in this study, translators) have more limited clues for interpreting the intended message as pragmatically correctly as possible.

This study had a number of limitations that might restrict the extent to which its findings can be generalized. First, the study assumed that the targeted cognitive traits are independent constructs. Even though these constructs are defined independently in the literature on psychology, there is some evidence that they may interact with each other when it comes to translating texts (Köpke, & Nespoulous, 2006; Furnham, & Marks, 2013; Hubscher-Davidson, 2017). Second, the participants of the present study were all selected from the setting of postgraduate studies in translation in Iran. Finally, the researchers were not able to control for a number of intervening variables that may have had effects on the results of the study (such as cross-linguistic influences, cross-cultural differences, text types, etc.). The results of the present study indicated that individual cognitive differences could have some potential effects on translation performance. However, the study was too small to be able to generalize any of the findings. Further and larger studies will be needed, involving multiple language pairs and genres to assess the effects of translator-internal factors on translation performance. In addition, it is recommended that translation trainers pay attention to students' internal psychological traits when designing translation-training programs so that they could align the programs with the strengths, weaknesses, and personality characteristics of their trainees (Tan, 2008). Although the assessment of these factors may pose practical challenges to the trainers with respect to some cognitive traits (e.g., WM, intelligence, etc.), there exist a number of other faculties (e.g., TA, EI, etc.) that can be easily accessed by practical data collection instruments such as questionnaires.

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