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A Comparative Assessment of Listening Span and Self-Efficacy in Simultaneous Interpreting Training

Evaluación comparativa de la capacidad de retención auditiva de palabras y la autoeficacia en la formación de intérpretes simultáneos

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ABSTRACT

This study compares the results obtained from a group of interpreting trainees in an adapted listening span test (cognitive dimension), with those obtained from this same group in two self-efficacy tests (personality dimension). The objective is to assess the predictive value of these tests with respect to the scores obtained by the subjects in a simultaneous interpreting test. The analysis of data leads us to the conclusion that, at least in an initial training phase in simultaneous interpreting, only the cognitive factors (measured here in terms of listening span) show a significant and positive predictive capacity of the quality in simultaneous interpreting. In this regard, personality factors (measured here in terms of self-efficacy) offer results contradictory to the expectations or no significant correlation values.

Keywords: simultaneous interpreting, interpreter training, working memory, self-efficacy, listening span

RESUMEN

En este estudio se comparan los resultados obtenidos por un grupo de aprendices de interpretación en un test adaptado de retención auditiva de palabras (dimensión cognitiva), con los obtenidos por este mismo grupo en dos test de autoeficacia (dimensión de personalidad). El objetivo es evaluar el valor predictivo de estas pruebas con respecto a las puntuaciones obtenidas por los sujetos en una prueba de interpretación simultánea. El análisis de los datos nos lleva a la conclusión de que, al menos en una fase inicial de formación en interpretación simultánea, sólo los factores cognitivos (medidos aquí en términos de capacidad de retención auditiva de palabras) muestran una capacidad predictiva significativa y positiva de la calidad en la interpretación simultánea. A este respecto, los factores de personalidad (medidos aquí en términos de autoeficacia) ofrecen resultados contradictorios respecto a las expectativas o ninguna correlación significativa.

Palabras clave: interpretación simultánea, formación de intérpretes, memoria de trabajo, autoeficacia, retención auditiva de palabras

1. Introduction

Interpreting, and particularly the modality of simultaneous interpreting, has been reported to be an activity for which special cognitive skills and specific personality traits are required (Jiménez Ivars, Pinazo Calatayud & Ruiz I Forés, 2014). The exploration of cognitive and personality factors is a reasonable objective, both for the recruitment of candidates to professional interpreting and for the purpose of designing interpreter-training activities. There may be different ways of combining these factors to establish their relative weight for this purpose.

The two generic types of factors referred to above usually point to differentiated lines of research. Jiménez Ivars. Pinazo Calatayud and Ruiz I Forés (2014: 170) distinguish, in this regard, between research focused on the "hard" and on the "soft" skills of the interpreter. On the one hand, we find studies centred on the operational component (i.e. studies that examine the cognitive factors), identified as the "hard dimension" of the interpreting process. And on the other hand, there are studies focusing on the psychological aptitudes or attitudes that supposedly influence the efficiency and quality of interpreting. These aptitudes or attitudes are personality factors that could be identified as the "soft dimension" of the interpreting process. Obviously, language proficiency is a crucial factor that must also be taken into account.

The "hard" and the "soft" dimensions are basically dissociated (cf. Bontempo & Napier, 2011: 86-87), given that individuals with a high performance in the cognitive tasks involved in interpreting can show personality traits that reduce the efficiency of interpreting, such as emotional instability; vice-versa, suitable individuals from the point of view of personality factors can show a deficient performance in interpreting as a consequence of a limitation in their cognitive skills. López Gómez et al. (2007) contrast the relative importance of these two dimensions for sign language students. The authors conclude that both dimensions contribute to explaining quality in interpreting, although cognitive factors seem more influential than personality factors. Assuming this line of empirical research, the present paper compares the scores obtained in a listening span test (a working memory task) and the scores obtained in a self-efficacy scale (a personality parameter). The objective is to determine their predictive value with respect to the efficiency of students in simultaneous interpreting.

2. Cognitive factors: the "hard" dimension of the interpreting process

In what concerns the operational component, the process of simultaneous interpreting has been modelled from different perspectives (Gerver, 1975, 1976; Moser, 1978; Chernov, 2004; Setton & Dawrant, 2016). In the case of simultaneous interpreting, the empirical accessibility to data presents some particular constraints that exclude techniques commonly used for the examination of the mental processes involved in the translation of written texts such as key stroke logging or eye tracking. Dimitrova and Tiselius (2014) refer, for example, to the renewed interest in retrospective verbal reports, which serve as clues to the mental process inherent to interpreting. Verbal and non-verbal activities concurrent with interpreting are also considered. In this sense, Wang and Li (2015) emphasize the importance of the examination of pauses as instruments supporting the mental process and as indicators of the particular cognitive load of a given task. Zuo (2014) proposes the examination of visual schemes concurrent

with interpreting as an element of support to the mental process in which the interpreter is in-volved. Another research line highlights the potential contribution of neuro-physiological data as correlates of the mental processes associated with interpreting (Moser-Mercer, 2010). The possible transferability of cognitive abilities developed in interpreting to other types of tasks has also been an object of research (Yudes, Macizo & Bajo, 2011; García, 2014).

Another line of research centres on the relationship between working memory abilities and simultaneous interpreting. A detailed presentation of this issue can be found in Timarova (2008) and Timarova et al. (2014). Timarova (2008) discusses the different models (Baddeley, 2000; Ericsson & Kintsch, 1995; Cowan, 1988) which describe the cognitive space of work-ing memory. Working memory introduces an additional executive dimension to the cognitive space of short-term memory. Working memory interrelates short-term data storage with some kind of mental process for which such data are required. The special demand that simultaneous interpreting imposes on the working memory seems clear and justifies the interest in including this psychological construct into the processing models of simultaneous interpreting. A tenet of the empirical studies carried out on this topic is to assume (cf. Timarova, 2008: 18ss) that not only good working memory capacities are required in the profile of prospective simulta-neous interpreters, but also that this professional activity would reinforce working memory skills. Since the first empirical study usually cited on the subject, Padilla et al. (1995), a gen-eral procedure has been to compare groups of novice and expert interpreters with regard to working memory skills.

The critical contribution of Köpke and Nespoulous (2006) should be highlighted in this respect for its theoretical and methodological implications. The study proposes a battery of exploratory tests involving a large spectrum of tasks: those focused on the short-term storage component (e.g. digit span) and those that involve a higher integration of retained data in high-er psychological processes (e.g. a task that includes a semantic condition to identify a word from a list: "A category and rhyme probe task" under "semantic condition"); working memory tests specific to interpreting (e.g. listening span) and less specific tests (e.g. Stroop test). With respect to previous studies, Köpke and Nespoulous (2006) point out some deficiencies in the samples of subjects submitted to exploration. In some cases, the number of individuals was considered as very limited, and in others, the degree of experience in interpreting was not clearly determined to differentiate novices from experts. In the study by Köpke and Nespou-lous (2006), four groups were compared with different age range and different professional experience: 21 interpreting professionals with an average age of 44.4 years, 18 interpreting students with an average age of 26.2 years, 20 bilinguals with university training but no pre-vious experience in interpreting with an average age of 44.7 years and 20 university students without special training in foreign languages with an average age of 21.5 years.

Among the results of the study carried out by Köpke and Nespoulous (2006), it is worth highlighting the fact that significant differences were observed in favour of interpreters ba-sically in what concerns working memory tasks linked to processing activities or involving high-level psychological functions, but not in those that focus on simple storage tasks. No significant differences between groups were observed in tasks considered as non-specific to interpreting, such as the Stroop test. But perhaps the most remarkable aspect about the tests where interpreters showed advantage, such as the listening span test or the rhyme probe task,

is that the average scores of novice interpreters were higher than those of expert interpreters (Köpke & Nespoulous, 2006: 12). This fact leads one to reconsider the condition of the expert interpreter and the extent to which the process of initiation and expert professional practice of interpreting are cognitively comparable. Supposedly, the strategies used by experts are qualitatively different from those used by novices.

The fact that the junior interpreter may be more efficient than the mature professional interpreter in the working memory tests normally used may find origin in the still restrictive view of the data source that feeds the working memory tasks. In the model proposed by Cowan (1988), working memory is guided by a focus of attention that can be redirected from the source of external stimuli (outward) to the domain of long-term memory (inward). The common tests for evaluating working memory skills largely ignore this inward direction, which could be very relevant for the expert interpreter. Following on from the findings by Timarova (2008), it is assumed here that working memory tests must go beyond the assessment of a simple function of short-term data storage to be valid, and that to correlate working memory tests with specific tests of interpreting will be convenient. With these assumptions and considering working memory tasks within the general scope of the executive function, Timarova et al. (2014) conclude that working memory capacity is an essential factor for the efficiency of interpreting.

3. Personality factors: the "soft" dimension of the interpreting process

Regardless of what the studies concerned with the operational component of simultaneous interpreting may offer, another line of research on efficiency in interpreting from the point of view of the personal aptitudes and work context has emerged in parallel. If we assume the theoretical framework of the extended mind (Clark & Chalmers, 1998), cognitive processes cannot respond in terms of a simple solipsist thinking machine, but they point to an integral interaction of the persons with the environment, and particularly with other thinking minds ("other-awareness", as proposed by Macnamara, 2012:13-14).

In this sense, situated learning is proposed as essential in the training of translators and interpreters (cf. González-Davies & Enríques-Raído, 2016) and the variables of social environment or "situated cognition" are considered highly relevant for the interpreter's decision-making and the subsequent efficient practice of interpreting (cf. Jiang et al., 2014). All these variables are included in the general table of cognitive aptitudes that, according to Macnamara (2012), must be considered for the selection and the training of candidates for the professional practice of interpreting. Complementarily, an assessment of the interpreter's self-concept can also be especially significant. Hild (2014), for example, claims the importance of examining aspects of self-awareness and the reflective activity of interpreters through the use of retrospective verbalizations and interviews as a source of data. In this same line, in a study on Australian Sign Language Interpreting, Wang (2016) concludes that retrospective verbal reports may be more significant than working memory assessment tests in establishing qualitative differences in interpreting.

A specific test to assess self-awareness of interpreters with a Likert scale, the self-efficacy test (Bandura, 1995), was used recently to examine the correlation of self-concept with the efficiency and quality of interpreting. The self-efficacy test offers a subjective view of our ability to face and solve practical problems. Psychological variables such as self-confidence, control of anxiety and management of situations that generate stress are components associated with this scale. Jiménez Ivars, Pinazo Calatayud and Ruiz I Forés (2014) conclude that high scores on a scale of self-efficacy adapted to simultaneous interpreting can be considered a partially explanatory factor of efficiency in this practice, but only on the condition that the subjects have a good command of the foreign language. For subjects with a low level in the foreign language (the study ignores subjects with an intermediate foreign language level) this scale loses, however, its predictive power with respect to efficiency in interpreting. Lee (2014) designs a specific scale of self-efficacy addressed, in this case, to consecutive interpreters and statistically validates this test with a large sample of Korean students. Regarding sign language interpreting, Bontempo and Napier (2011) propose the use of a general self-efficacy scale (Chen et al., 2001) combined with other measures that address personality traits, namely "goal orientation" (Dweck & Leggett, 1988) and negative affectivity (Watson, Clark & Tellegen, 1988). According to Bontempo and Napier (2011), the measure of affective negativity is a significant predictor of the trait of emotional stability involved in the quality of interpreting. In this study, the self-efficacy scale correlates positively, but shows no statistical significance with relation to the quality of interpreting.

4. Rationale and objective of this study

It is assumed in the present study that the operational component (hard dimension) and the component relating to aptitudes or other contextualising factors of interpreting (soft dimension) should receive joint empirical exploration, and should be studied together. Macnamara's proposal (2012) is endorsed in this regard. In Macnamara (2012), socio-cognitive aptitudes and operational capacities are combined, including the foreign language proficiency as an essential factor for interpreting.

It is possible - and recent research points in this direction - that the transition from novice to expert interpreting is affected by a change of the relative weights attributed to operational components as those assigned to a working memory, and to components that define interpreters' aptitudes and interactions with the professional environment. The skills developed by interpreters in their interactions involve not only declarative but also procedural knowledge stored in the long-term memory of professional interpreters. That is, long-term memory is not only a repository of knowledge of which interpreters can be explicitly aware (declarative knowledge) but also a repository of behavioural habits related to the environment of the activity, which are difficult to render explicit in a conscious way (procedural knowledge).

In this vein, the objective of this study is to make a comparative assessment of operational and self-concept aspects for beginners in interpreting training. The most common research orientation is to compare groups of subjects with different degrees of experience in interpreting, while examining each one of these two dimensions independently. It seems appropriate, however, to complement this way of proceeding by comparing the relative weight of cognitive and personal factors in a single group of subjects. Obviously, if the hypothesis to be handled

is a possible reconversion of the relative weights of these factors, the research will have to incorporate, later on, longitudinal studies associated with the training process and which include novices and expert interpreters.

The idea is to explore a single group of subjects, to determine the relative contribution that can be assigned to cognitive factors (i.e. the hard dimension of the interpreting process) and personal factors (i.e. the soft dimension of the interpreting process) with respect to quality in simultaneous interpreting. The group under study, as described below, is made up of students who have received training in foreign languages and translation during three academic years, but who have just started their interpreting training course.

It is obvious that in order to provide a general view of this initial phase, a series of cognitive and personal psychological variables should be explored, but it is not easy to determine the final list of variables that should be included, nor the relationship that might exist between them. This is a far-reaching objective for future studies. For the time being, and in order to make this research viable, the idea is to select two specific tests whose role in predicting quality in interpreting has been considered in previous studies. On the one hand, a test clearly illustrative of the component of attention associated with working memory: i.e. an adapted listening span test; and, on the other hand, a test for the evaluation of the interpreter's "self-concept": i.e. self-efficacy test.

5. Methodology

Assuming the limitations of this general objective, this paper proposes a comparative evaluation of two factors involved in interpreting: a cognitive operational factor, namely working memory and an attitudinal factor. The aim here is to determine the relative weight of these two factors with relation to the grades obtained by students in a specific simultaneous interpreting activity. Methodological triangulation, as a criterion used in many of the studies edited by Muñoz (2014), is adopted in this research. The idea is to approach the same object of research, in this case, simultaneous interpreting, by offering more than one explanatory perspective. With this methodological criterion, this study tries to contribute to the systemic vision required to investigate the cognitive processes involved in interpreting, and also to set the basis for course planning for interpreters training.

5.1. Hypothesis

Based on previous research, the hypothesis of this paper is that in an initial phase of simultaneous interpreting training, the relative weights of cognitive factors and personal aptitudes are significantly different. Furthermore, it is assumed that, at this early stage of training, operational cognitive factors would show an advantage over personal skills as a predictor of efficient simultaneous interpreting practice.

5.2. Participants

Twenty students finishing their first French-Spanish interpreting training course participated in this study. The age of our respondents ranged between 21 and 23 years, and 77% of them were females. The group was homogeneous in terms of social, cultural and academic back-

ground. In relation to academic background, all of the students have attained a C1 level of the European Framework of Reference for Languages in French as a foreign language and all participants have received identical training (for three academic terms) in French as a foreign language, as well as in general and specialised translation They are all undergraduate students in translation and have passed the same type of tests with regard to proficiency in French and translation from French.

5.3. Tests used

The tests used to assess simultaneous interpreting and the factors under consideration are described below.

5.3.1. Evaluation of an interpreting activity

The activity under evaluation consisted of a simultaneous interpreting from French into Spanish of a 3:45-minute video-clip. This activity was carried out after four months of training in simultaneous interpreting. The topic of the video-clip was about the differences between translation and interpreting. The topic was selected to attract the students' attention, create interest and facilitate comprehension. The interview was in standard French without any accent variation, to avoid distractors or elements of anxiety. The activity was rated on a scale from 1 to 10. Nine aspects relative to the process and the final result of the task were evaluated, that is: clarity in the vocalization, intonation adaptation to the contents, pauses, hesitations, grammatical correction, lexical adequacy, discourse coherence and style and, finally, fidelity to the content of the original discourse. The mean score of two assessors was established, with an inter-judge agreement of 0.89.

5.3.2. Listening span test

In order to assess working memory capacities, a listening span test was used as an exploratory instrument. The test was adapted from the ECCO reading span subtest (López-Higes, Del Río Martín-Aragoneses, & Mejuto, 2012) inspired in the original proposal by Daneman and Carpenter (1981). The test consisted of the reading out aloud of 10 sets of sentences. The subjects were required to recall the last word of each sentence in each series, and write them down after listening to the sentences included in each one of the series. The series were structured into two blocks. The first block comprised 5 series, which ranged from 4 sentences to 8 sentences, with the intention of increasing the difficulty of the task. Conversely, the second block was made up of 5 series, which went from 8 sentences down to 4 sentences, to reduce the difficulty of the task. The subtest was used in two versions, one in the mother tongue (Spanish) (EccoSP) and the other, in the foreign language (French) (EccoFR), with a clear equivalence of items, except for the cases of obvious interlinguistic differences.

The rationale behind the use of an adapted version of the Ecco test for this research as well as some aspects relating to its administration and results will be detailed hereunder. The initial instrument, as it has just been pointed out above, is the reading span subtest integrated in the ECCO test (López-Higes, Del Río Martín-Aragoneses, & Mejuto, 2012). The original ECCO test is in Spanish and it was conceived to evaluate the syntactic comprehension in the normal adult, or in subjects with cognitive impairment. The selection of this test is justified taking into

account the theoretical and methodological framework of this study, which proposes a contrastive examination of the relationship between the executive functions and language in two different contexts: one associated with neurodegenerative process that implies a deterioration of this relationship (with possible compensatory strategies) and the other, with a maximum demand on the connection between executive functioning and language, paradigmatically represented in simultaneous interpreting.

The original ECCO subtest is composed of 10 series of sentences and subjects are required to read the sentences and recall the last word of each sentence and write them out after reading each of the series. The series are ordered by first increasing (from 2 to 6) and then decreasing (from 6 to 2) the number of sentences. A previous pilot study was carried out by administering the sentences orally in the native language, i.e. Spanish, in order to adapt the test to the characteristics of a listening span task and to make the test more consistent with the type of activity in which a simultaneous interpreter is normally involved (cf. Köpke & Nespoulous, 2006; Nordet & Voegelin, 1998). In this pilot study, 10 interpreting trainees participated, with an average age of 21.8 years. The results showed an inter-subject variability only in series with 5 and 6 sentences but null variability for series composed of 2, 3, or 4 sentences as long as all respondents gave the right answer. The sum of the scores was not discriminating and the data obtained were similar to those obtained from the general population samples of the same age range in the original ECCO test. Table 1 shows the results obtained in the pilot study, where the null discriminant capacity is clearly observed in series containing 2 (A2/B2), 3 (A3/B3) and 4 (A4/B4) sentences.

Table 1. ECCO subtest scores

SUBJECTS	A 2	A 3	A 4	A 5	A 6	B 6	B 5	B 4	B 3	B 2	SUM
1	2	3	4	5	5	6	4	4	3	2	38
2	2	3	4	5	5	5	4	4	3	2	37
3	2	3	4	5	6	6	5	4	3	2	40
4	2	3	4	3	4	4	4	4	3	2	34
5	2	3	4	5	6	6	5	4	3	2	40
6	2	3	4	4	4	4	4	4	3	2	35
7	2	3	4	5	6	6	5	4	3	2	40
8	2	3	4	5	6	6	5	4	3	2	39
9	2	3	4	4	5	5	5	4	3	2	36
10	2	3	4	4	6	6	5	4	3	2	38

Obviously, the subjects evaluated in this study are young people who are in the age range with the best performance in the ECCO test for the general population. Interpreting trainees are, of course, part of that general population but they assume tasks with a particular demand on the working memory. In view of the results of the pilot test, the adapted version (referred to above) was developed to make it more discriminating in the target population. To this end, the number of sentences in each series was increased by two units. In the new version, the ten series were thus ordered by first increasing (from 4 to 8), and then decreasing (from 8 to 4) the number of sentences. The series were read out aloud by the test administrator and at the end of each series the subjects were asked to write down the words they recalled.

It also seemed appropriate to introduce in the test another dimension congruent with the interlinguistic context in which interpreters use their working memory. Given the type of activity to be evaluated, it seemed very appropriate to administer two linguistic versions of the ECCO listening span test: one in the native language of the subjects, i.e. Spanish, and another in the foreign language, i.e. French. Even though the working memory can be considered as a general capacity, it manifests differently depending on the type of task required from the subjects. In this sense, possible listening span differences according to whether the stimuli source was in a native language or a foreign language were explored. In order to avoid interference from other possible variables, the two versions contained similar sentences in Spanish and French (French translation of Spanish sentences). However, considering the morphosyntactic singularities of the two languages it was not possible to provide inter-linguistic correspondence for the last word in each sentence.

The answers offered by the subjects to these adapted versions of the ECCO test deserve also a brief comment. When scoring the answers to assign listening span values for each of the series, errors or deviations from the target word were observed. On many occasions the subjects offered answers where the word provided did no correspond to the original item in the sentence. They did not recall the word in its inflected form, but a word of the same lemma or dictionary entry, for example "remember" for "remembered." This type of deviation was not evaluated as an error, whereas deviations where the lemma was not retained were considered as errors even when the word in the answer and the word to recall were semantically related, such as "water" for "flow" (semantic paraphasia), or formally related, such as "resist" for "insist" (literal paraphasia). Another deviation observed in the answers, is to recall the word with its syntactic environment, as is the case in "the house" for "house", or "ten minutes" for "minutes." This deviation was not evaluated as an error either, as long as the word object of recall was part of the answer. Another deviation in the answers, clearly classified as an error, is when subjects provided words from previous series. It is also worth noting that nouns were recalled more frequently than other lexical categories.

Of additional interest was to observe the marked contrast between the recalled and the forgotten words that brought up a kind of "bathtub effect" in each of the series. That is, the final words of the first or last sentences of each series tend to be better recalled than the final words of sentences that appear in intermediate positions. In series with 7 and 8 sentences this effect can have a double manifestation with an appreciable peak in the central part of the series. This is a generic effect on the ability to recall a string of verbal stimuli, already pointed out by Aitchison (1989), although referring specifically to the initial or final syllables of words: it is easier to recall initial or final syllables of words than syllables in the middle.

An exhaustive analysis of deviations or errors in a listening span test would be undoubtedly worthwhile, but this analysis is beyond the scope of the present study. However, it can be asserted that the abovementioned errors or deviations offer evidence that the listening span task is more than a simple short-term unit storage. The subject is required to perform selective attention operations on the last word of each listening sentence. The syntactic environment of the targeted words, or those coming from the preceding series are distractors, which should be inhibited. Attention conditions for stimuli storage explain the bathtub effect in the answers. The deviations where the lemma is maintained, the retrieval of related words, or the prev-

alence of recalling a lexical category such as nouns, also provide evidences of the specific involvement of language processing in a listening span task.

5.3.3. Psychometric test of self-efficacy

This is a psychological scale to test out the subjective vision of the generic capacity to solve practical problems (Bandura, 1995). As previously mentioned, this scale has been used in some studies to assess translators' and interpreters' self-image as a dimension that correlates positively with efficient interpreting practice (Jiménez Ivars, Pinazo Calatayud & Ruiz i Forés, 2014; Lee, 2014; Bontempo & Napier, 2011).

In this case, different versions of this scale were at our disposal for data collection. The discussion was about the choice between a general self-efficacy scale and a scale adapted to interpreting (cf. Jiménez Ivars, Pinazo Calatayud & Ruiz i Forés, 2014: 169-170). Considering that the subjects were at an initial training phase, and not mature enough to have a critically established self-concept about their capacity as interpreters, the use of a general version of self-efficacy scale seemed appropriate. This general scale would, however, be less adequate compared with the adapted version, and the adequacy of a test to the type of the task it evaluates is a prerequisite for its validation. After weighing up the advantages and disadvantages, and in order to contrast the results, it was finally decided to administer the general version and the adapted version of the test. The two versions were administered in the native language, i.e. Spanish. For the general version, the generic self-efficacy scale proposed by Baessler and Schwarzer (1996) was selected, following the criterion of Bolaños-Medina (2014). Whereas, for the adapted version, the proposal in Jiménez Ivars, Pinazo Calatayud & Ruiz i Forés (2014) was chosen.

6. Results

The variables analysed in this paper are: Interpreting proof (Iproof)), French Ecco test (EccoF), Spanish Ecco test (EccoS), general self-efficacy test (GenEf) and self-efficacy test adapted to the interpreting context (IntEf). The tests were administered to the 20 participants in differentiated sessions: one per week during five consecutive weeks. The order in which the tests were administered was as follows: EccoS, GenEf, EccoF, IntEf and Iproof. The results obtained are set forth below.

All variables show a normal distribution with the Kolmogorov-Smirnov test. Table 2 reflects the basic statistical values.

Table 2. Basic statistical values

	N	Mean	SD
Iproof	20	4.7	1.102
EccoF	20	33	9.666
EccoS	20	43	10.050
GenEf	20	31	3.694
IntEf	20	37	7,287

The values for the correlation coefficients are presented in table 3:

Table 3. Correlation coefficients

r (x,y)	Iproof	EccoF	EccoS	GenEff	IntEff
Iproof	1				
EccoF	.617**	1			
EccoS	.396	,798**	1		
GenEf	-,602**	-,348	-,387	1	
IntEf	-.019	.163	.342	.285	1

** Significant correlation at .01

It is worth mentioning the significant and high correlation value observed between Iproof and EccoF. The correlation between Iproof and EccoS is positive, but does not attain statistical significance. There is also a significant but negative correlation between Iproof and GenEf, and a correlation value close to 0 between Iproof and IntEf.

It is, also, noteworthy that the variables EccoF and EccoS show a significant high correlation value (.798). These variables show, however, a significant difference between means (t(19) = 6,839; p= .000). With respect to the GenEf and IntEf variables the correlation value (.285) lacks statistical significance, but the difference in means between these variables is also significant (t(19) = 3.368; p= .003). These additional analyses of mean differences allow us to guarantee the independence of the two differentiated measures of listening span and self-efficacy proposed for the study.

A regression analysis was carried out to investigate whether EccoF, EccoS, GenEff and IntEff could significantly predict participants' interpretation performance scores (Iproof). The results of the regression analysis indicated that the model explained 64% of the variance (R^2 = 0.64) and it was a significant predictor of Iproof performance. However, not all the predictors contributed significantly to the model, as shown in table 4.

Table 4. Regression analysis

	F	p value
General	6.660	.003
Intersection	17.973	.001
EccoF	9.982	.006
EccoS	3.641	.076
GenEff	9.554	.007
IntEff	1.191	.292

It follows from these results that the variables EccoF and GenEff contribute significantly to explain the variance of the data obtained in the Iproof test. This is not the case for the EccoS and IntEff variables.

7. Discussion

Among the observed results, it is worth highlighting that, as mentioned earlier, the academic performance shows a positive and significant correlation (r(x,y) = .617**) with the results of the EccoF test. This correlation remains positive, but does not reach statistical significance with the results of the EccoS test (r(x,y) = .396). This difference could be partially attributed

to the specific direction of the required interpreting activity: from French into Spanish. EccoF and EccoS correlate significantly and very highly (r(x,y) = .798**), but also show significant mean differences (t(19) = 6.839; p= .000), in as much as EccoF scores are uniformly and significantly lower than the EccoS scores. As is already known, working memory should be evaluated differently on the basis of the type of tasks under examination. In this regard, our data confirm that the language source of stimuli (mother tongue vs foreign language) for working memory tasks is a relevant factor. It can be suggested by now that training working memory with foreign language activities (to get close to the results obtained with native language activities) could be a crucial factor in improving interpreting performance. This would be tantamount to planning language mastery enhancement with specific working memory activities. Or to put it differently, if we consider the regression analysis values, we also observe that only the results of the listening span task in foreign language, French (EccoF), contribute significantly to the variance of the results of the test measuring academic performance (Iproof). In this sense it is proven that at least one aspect of the operational component associated with the working memory is highly and positively involved in the initial training phase of interpreting.

If we move from the operational component to the personal factors, the situation is very different. The results of general self-efficacy test present an unexpected, high and significant, negative correlation with the results of the interpreting test (r(x,y) = -.602**). On the other hand, the correlation between specific self-efficacy and academic performance is practically null. The regression analysis shows that general self-efficacy is relevant as an explanatory factor for the results of Iproof, but given the negative and significant correlational value between these two variables (-.602), this explanatory capacity is contradictory with what was expected: the better the results are in general self-efficacy task, the worse results are for academic performance. It should be added here, in view of the results, that general self-efficacy and adapted self-efficacy are independent variables (t(19) = 3.368; p= .003) and that the correlational values between Iproof and the adapted self-efficacy test partly neutralise the unexpected discordance manifested between general self-efficacy and quality in interpreting. It can be postulated that this attitudinal component becomes more relevant and positively involved for interpreting performance with age increase, on the one hand, and with professional experience, on the other. The relationship between self-confidence in problem solving and effective problem solving is a matter of maturity and experience. New comparative and/or longitudinal studies are required to determine the relevance of a self-efficacy attitude in interpreting practice.

In short, the results obtained allow us to confirm the hypotheses previously considered. At least for the subjects under study and with the tests used, in the initial training phase:

• The relative weight of cognitive factors and personal aptitudes is significantly different in explaining academic performance in interpreting.
• Cognitive factors have a clear advantage over personal factors for this effect.

The results of the study allow us to suggest that the discriminant value of the operational cognitive component for efficiency and quality in interpreting is manifested above all with the variable blending working memory task with the foreign language as data source, i.e. EccoF. It could be assumed that not only the knowledge of foreign language (cf. Jiménez Ivars, Pinazo Calatayud & Ruiz i Forés, 2014), but more specifically the association of this knowledge with

the operational component (working memory) is a prerequisite for personality factors to have a positive discriminant value with respect to interpreting efficiency.

8. Conclusions

Personality factors could especially contribute to the diversification of routes in becoming a good interpreter. It is, however, complex to determine how these factors correlate with the quality of interpreting. In any case, the use of personality factors can be problematic in the recruitment of future interpreters. The relevance of the anxiety factor, for example, cannot be determined without first observing a good command of the foreign language and appropriate development of operational skills. This is not to say that personality factors are no longer significant for the development of interpreting abilities.

As far as the operational dimension is concerned, it may be of interest to design practical activities to approximate the results obtained for working memory tasks in the foreign language to those obtained in the mother tongue (in order to reach a non-significant statistical mean difference between them). In fact, it could be postulated that to reach a native-like command of a foreign language, would entail similar results in working memory tasks for the native and for the foreign language as a source of stimuli.

Obviously, the conclusions of this study are limited to the particular case analysed and the specific tests selected. Future research with a focus on the relative weight of cognitive and personal factors should be pursued in two directions: by increasing the number of cognitive and personal variables that define the initial training phase and, and by carrying out longitudinal studies for the same group of subjects, or studies to compare subjects with different degrees of experience.

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