Introducing Some Psychometric Tests for Researching on Cognitive Processes of the Translators/Translation Students

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Abstract—The recent interest in Cognitive Translation Studies have entailed a growing number of empirical study in translation process research designs (Jaaskelainen, 2000; Hansen, 2003; Munoz, 2008; Baqi & Mobaraki, 2011). Among other methodological issues, subject profiling has become a key factor if we are to control an experiment. Individual differences can act as independent variables, manipulated by researchers in order to gauge their effect, or extraneous variables not directly related to the purpose of the study, which need to be controlled. In Both cases, it is advisable to quantify them. There are different types of instruments for Psychological Evaluation and Description e.g. test measuring, most used in psychological constructs in Translation Studies; together with some factors to bear in mind when selecting the appropriate test for a given study design. Finally, according to the standards of Educational and Psychological Testing, some recommendations for bettering test administration are given.

Index Terms—cognitive translation studies, cognitive processes of the translator, psychometric testing, research methodology, subject profiling

I. SUMMARY

The growing academic interest in the cognitive translation studies has been accompanied by an increase in empirical researches which designs translator's mental processes (Munday, 2011; Munoz, 2008). Among methodological aspects, in this type of experiment, it is necessary to address the psychological differences of individuals in this study. Depending on the research design, these individual differences can act as independent organismic variables, manipulated by the investigator/researcher to determine their effect(s), or as extraneous variables not directly related to the purpose of the study. In both cases it is necessary to quantify.

This paper describes the different types of psychological assessment instruments available to the researcher. Here are the most commonly used tests to measure different psychological constructs that may be of interest to Translation Studies. Finally, after reviewing the factors to consider when choosing the most appropriate psychometric testing are some recommendations for the administration of standardized tests, in accordance with professional standards of the main international regulatory body in this field.

II. INTRODUCTION

In recent years, the growing academic interest in the cognitive translation studies has been accompanied by an increase in empirical research which designs translator's mental processes (Jaaskelainen, 2000; Hansen, 2003; Munoz, 2008; Baqi & Mobaraki, 2011); also it has raised some concerns about the methodology used. Jaaskelainen (2000) proposes to enrich the empirical studies on translation and translators from the experience of psychological research and, in line with Hansen (2003), asserts that we need more information about the subjects' profile which is so far, mainly, one of the experimental materials in our field. The recent findings of a preliminary investigation of Munday seem to point in the same direction.

Among other methodological aspects, in this type of experiment, it is necessary to address the psychological differences of individuals in the sample. Depending on the research design, these individual differences can act as independent organismic variables, manipulated by the researcher through selection to determine its effect, or as

extraneous variables not directly related to the purpose of the study, which should be checked, too. In both cases it is advisable to quantify. Given the importance of the choice of appropriate instruments for collecting data on the profile of the subjects, and their proper management, this paper describes the different types of psychometric tests available to the researcher which are the most commonly used tests to measure different psychological constructs, responsible for intersubject variability, which may be of interest to translation studies. Finally, after reviewing the factors that must be taken into account when selecting the most appropriate for each research design, there are some recommendations for the administration of standardized tests, in accordance with professional standards of the principal regulator international field.

III. TYPES OF PSYCHOLOGICAL ASSESSMENT INSTRUMENTS AVAILABLE

"Psychological assessment instruments are information-gathering procedures that allow observation and description of certain behaviors and can be classified as self-reports, observation, subjective techniques, projective and objective techniques" (Moreno Rosset, 2005, p. 93).

The types of self-testing are questionnaires, scales, inventories, techniques of self-registration and interview. The former are characterized by collecting the items in question form. Nearby examples of its use in the field of empirical research on translation are the PETRA sociolinguistic group questionnaires and questionnaires of problems and knowledge translation research group PACTE (2009; 2011).

The scales are sets of statements used to measure the degree of agreement or disagreement of an individual to their content and are proper evaluation, among others, of the motivational aspects.

The inventory contains a list of traits, preferences, attitudes, interests and capabilities in order to evaluate the characteristics and abilities of an individual and is used frequently to assess aspects of personality.

The technique of self-registration, one of the most used in the clinical setting, has the great advantage, unlike the interview, allowing the collection of variables of interest at the moment in which they occur. In the same way, the verbalization of thought protocols has been widely used in the field of research on cognitive processes of the translator (Hansen, 2003). The method has evolved and, today, verbalization coexists in real time and retrospective use in conjunction with the dialogue (Hansen, 2008; Defeng and Cheng, 2007). The sessions are recorded for later analysis. Among the most criticized are those who do not take into account the automatic processes involved in translation and distortion that occurs in the translation activity and results verbalization itself (T.Bell, 2009).

The interview involves a conversation and interpersonal relationship with a given purpose, in which each participant adopts a particular role. There are different types, depending on the purpose, which can be distinguished as that to decide on the assignment and not a subject for a specific investigation; the "diagnosis" allows the information gathered to compare with that obtained by other instruments or the advisory to answer a specific question. We can also differentiate between structured, standardized and a pre-established, with the advantage that it can resolve questions that arise every individual on the fly; in the semi-structured, even if there is a script, you can include spontaneous questions during development. Finally, in free meeting, open questions allow the interviewee prefers to decide which aspects abound. It is also necessary to take into account the characteristics of the subjects, especially their age and academic background, and the time of the research process in which they occur, if at the beginning, during the data collection or at the end such as that of retrospective interview PACTE (2009; 2011).

The methodology allows the systematic collection of observational data of reality without exercising any control over the variables. In observation data can be obtained from direct contact with the subject, while the non-participant interaction hardly exists. In the mode of participation and observation, both figures are closely given; the prior relationship between them is a kind of e.g. teacher-student relationship. Caution should be exercised to avoid the emergence of the three major biases: 1) the reactivity or disruptive behavior upon learning of the subjects; 2) the observed influence of the observer's expectations on what it believes to perceive, and 3) technical biases that may affect the equipment used or the organization of the process.

In recent years, thanks to the emergence of new technological tools, it is possible to observe and record the behavior of subjects in a much more accurate way (Dam-Jems & Heine, 2009). Beyond the video recordings, Translog application developed by Jakobsen recorded the writing process of translation to collect the keystrokes in real time; unlike the methods of verbalization of thought, he does not interfere with process. Discussing the rhythm and speed of creating the translated text, and between the parameters investigated so far, are segmentation and textual revision, the connection breaks and actions immediately preceding or following text, the distribution of subtasks and alternating rhythm of the beats and breaks (T.Bell, 2009). The screen capture programs has a high level of ecological validity, allowing recording all activities performed on a computer as digital video, but no information about which segments and images capture the attention of users. This last problem can be solved with the joint use of monitoring tools eyeball, also increasingly used, and allow to relate the cognitive effort and eye movement to calibrate fixed points where the look, the way and the pupil size of subjects (Hansen 2008).

As we know there are subjective methods for collecting information on the psychological structure, contents and processes of subjective views and personal meanings about oneself and the world. The most widespread grid techniques are the semantic differential, hermeneutic and narrative methods, but given their lack of relation to the contents traditionally investigated in our discipline, and the space limitations of this article, we will not stop them. Something

similar happens with projective techniques, traditionally used for the study of personality from the "projections" (perceptions, feelings, etc..) of subjects with a series of standard stimuli (Rorschach test and TAT) in which does not deepen.

When measuring individual differences, standardized psychological tests are often the tool of choice, because they are objective, systematic and standardized ways to compare the behavior of two or more persons with certain guarantees of reliability. They are defined as instruments or procedures that contain a sample of a subject's behavior in a specific area for evaluation by a score assigned according to a standardized process. The instructions given to subjects, the conditions under which the test is performed and the process of assigning scores for each test follow a specific pattern.

There are several categories of psychometric tests, depending on the nature of the construct they purport to measure. Intelligence tests intended to gauge the basic capacity and potential of an individual to understand the world around oneself, assimilate one's functioning and apply that knowledge to improve the quality of life. Personality tests are used for research or diagnosis. They are often used in educational and human resources, and try to measure performance, ability, and the degree of knowledge of a subject on a particular topic or to what extent dominates an area. The neuropsychological tests assess possible deficits in cognitive functioning that may come from some kind of brain damage. The occupational ones try to match an individual's interests with those of different professions to find which one best fits one's profile. Clinicians measure factors such as level of anxiety or depression of an individual. In the next section we will try some tests belonging to the first two categories.

One the most widely used intelligence test is the WAIS III, Wechsler Adult Intelligence Scales, giving three IQ scores (verbal, manipulative and totally from the previous two), and four independent indices, three of which are of interest to our discipline: the scale of working memory, the subtests of arithmetic, digits and letters and numbers, the scale of processing speed of subtests with key numbers and search for symbols, and verbal comprehension scale, with subtests in vocabulary, similarities and information. Given the limited space of this article, I refer the reader to the work of Kaufman & Lichtenberger (1999) on the application and interpretation of evidence and the overall view offered by Martin Munoz (2008) on the applicability of these three factors in Translation Studies researches.

The Tower of Hanoi is a test used to measure executive functioning, by manipulating different increasing radius disks that are stacked on a stake to insert into another in the same order following certain rules. In translation studies, this test has been used in empirical research on creativity and automation to translate to test the relationship between problem solving potential of well-defined and ill-defined problems (Hubscher-Davidson 2006).

Allport coined the term "cognitive style" in 1937, but there were cognitive psychologists in the fifties and sixties of last century, who showed that there are clear individual differences in the usual way in which individuals process information and use their resources, face a process of decision-making or problem solving, but remain consistent and stable throughout life, can be modified through training.

Psychology has identified several categories of cognitive styles, according to the extreme polarity. Among the most studied dimensions in translation studies are the following: impulsivity-reflexivity, as an individual store to demonstrate the first solution that comes to mind even incorrect, ignoring the errors and making decisions quickly or let time pass before proposing a solution to avoid making mistakes independent field-dependent field, to assess whether it serves more to a particular aspect of the information or is perceived as a unitary phenomenon and is more used in context-serial-holistic, depending on whether one analyze in detail all the elements of a problem and ordered sequentially or simultaneously processing multiple complex to form a unit.

Among the most commonly used tests to determine cognitive styles are the following: the Matching Familiar Figures of Test or MFFT (Kagan, 1965), to measure the size of reflexivity impulsivity, in which the subject selects from several alternative figures that adjusts to the reference and get two indices, speed of response and the number of errors; the EFT, Embedded Figures Test, Witkin et al. (1971) to calibrate the field dependence and independence by identifying a simple geometric figure in the context of a more complex, and the Stroop Test (Golden, 1975) to assess cognitive flexibility-rigidity, taking into account the ability exchange of a strategy to inhibit the typical response and deliver a new face of certain stimuli.

Not very often there has been empirically established links between personality and cognitive processes of the translator, which does not mean that this area does some interest and is the subject of study in the coming years. So Jaaskelainen (2000, p. 73) suggests that "some differences found in the performance of some experimental subjects could be due to personality traits". According Tirkkonen-Condit (2000, p. 141), "tolerance to uncertainty, which is part of every cognitive process involving decision-making, is a personality trait that deserves to be taken into account in the training of translators". It is a little studied factor, largely because of the lack of adequate instruments.

Since Bandura (1977) introduced the concept of self-efficacy or belief in one's ability to organize and execute courses of action required to produce concrete results; it became an important piece of research in Social Cognitive Psychology applied to fields such as learning, performance and motivation. It is a mediating variable in processes as diverse as decision making or the success of teaching and learning, objects of interest in translation (Hansen, 2003).

The attention of many researchers has recently led to another construct closely related to previous or perceived collective efficacy trial or assessment of the group members to their performance capabilities when performing a specific task. This is a property that emerges at the group level, not simply the sum of the efficacy beliefs of individual members, and affects, among others, the way the group uses its resources to the effort invested in getting their goals and even one's vulnerability to dissatisfaction with the difficulties (Bandura, 2000). An important finding is the fact that groups highly engaged in collective efficacy are able to persist even after they have faults, showing even more effective relations (Little and Madigan 1997). Although they are still being validated, there are instruments available to measure collective efficacy drives (Huici & et al, 2004).

Finally, following in the field of study of the working groups, their structural and functional complexity is manifested in the phenomenon of group cohesion, singular expression of emotional integration, functionality and value. Traditionally, in applied research, group cohesion has been operationalized as the attraction each of the group members feel about each other and with the group itself, parameters usually measured by self-reports and questionnaires. Carron et al. (1985) distinguished two blocks of aspects of cohesion: the individual-group size and task-related, this is the basis of the Group Environment Questionnaire (GEQ). Along these lines, a preliminary study in the university classroom indicates the existence of a close link between group cohesion and perceived collective efficacy in students of translation (see Baqi & Mobaraki, 2011).

V. KEY FACTORS IN SELECTING APPROPRIATE PSYCHOMETRIC TEST

The starting point when choosing the most appropriate psychometric test for a research design is to define exactly what construct is to assess, for what purpose; for example, whether it is in a first phase of research, pre-select subjects according to their scores for inclusion in different treatment groups, or if necessary obtain the most accurate measure of each of them to triangulate the results, and finally, the main characteristics of the sample specific population to which scholars apply, such as age, availability, socio-cultural level, etc..

The next necessary phase then is documentation of phase of testing, preferably standardized, available to measure this parameter. It may address, in particular, whether they can be applied to subjects of similar ages to those of the selected sample, whether they are individual or group application, time management, formatting, and their appropriateness for purpose of the study; for example if it comes to selecting individuals who obtain higher or lower scores it may be applied to a test group for their detection and then a pre-selected individual subjects. In addition, this phase also involves gathering information on the validity and reliability of psychometric tests to select those that, being applicable under the conditions of our experiment, present the strongest quality criteria.

The validity is directly related to the fact that a test actually measures the dimension that is supposed to be calibrated (see Jafarpour, 2010, chap. 6). "This is an estimate of the veracity of the inferences made from test scores" (AERA & APA, 1999, p. 9), and their often used three strategies of evaluation are not mutually exclusive: the content analysis, the analysis of the construct measured and the contrast of test scores with other measures or criteria of interest.

The purpose of content validity is to analyze how the elements or items that comprise the test are relevant and representative sample of the construct on which you will be making inferences (see Jafarpour, 2010, p. 103) and is usually applied more frequently in performance testing or knowledge. It denotes a group of experts to ensure that the test does not include irrelevant aspects but all the more important ones.

Construct validity seeks to ensure that the variable measured by the test is acceptable within a theoretical system. After defining the scientific concept of interest from existing theoretical bases there are established assumptions about the relationship, on the one hand, between it and certain behaviors directly observable, and, on the other, between one and other constructs given, then designing a measuring instrument to obtain empirical data on the interrelationships between test scores and the variables hypothesized.

Validity refers to the criterion or predictive involves finding out how test scores can be used to infer the behavior of subjects in a different independent variable, called criteria, i.e. it is "evaluating the relationship between test hypothesis and criteria" (Jafarpour. 2010, p. 321) to express the convergence of indicators.

The validity coefficient values are within the range -1 to +1, with values close to 1 indicate a strong positive linear association between two variables, and values close to -1 indicate a strong negative relationship, with no relationship made between the variables when the correlation coefficient is 0. Therefore, the higher it is, the greater the validity, but keep in mind that tend to be lower than the reliability (between 0.20 and 0.30 are considered very low and above 0.90, very high).

Meanwhile, reliability is directly related to the stability and accuracy of the measure, i.e. the extent to which similar scores obtained when assessing the same trait, with the same test in similar conditions, and to what extent we can say these values are free from measurement errors, i.e. the proportion of observed variance explained by the true variance, the variance discounting non-systematic measurement errors.

The procedures used for calculating reliability are four. The method known as "test-retest" measures the stability of the test and the reliability coefficient calculated by the correlation between the scores obtained by a group of subjects in a first application and that found in a second, in this way are taken into account possible measurement errors arising from differences between the two conditions and has the great advantage of not requiring more ways than the same test. The method involves parallel form, as its name suggests, and builds two versions of the test, so that errors can be

avoided due to the reagents and different application times. This time this is given to half of the first test sample and the second half at first to cross in the second application.

The third method is based on internal consistency and only requires an application of the test, so you can control factors such as the interval between tests and memory or learning. After obtaining the scores, the test is divided into two halves of similar difficulty and content to calculate the correlation between the scores of subjects on both sides using different statistical methods. Finally, we can evaluate the consistency between two or more judges or assessors when the test correct, although this method is usually considered as complementary to those described above, not as a substitute.

Jafarpour (2010) recommends rejecting the evidence showing a low reliability coefficient (less than 0.65), use half reliability (between 0.75 and 0.85) only as a screening or preliminary tests and, whenever possible, use evidence of high reliability (above 0.90) when the goal is to take a relevant decision. In any case, do not forget that "a test can be reliable without being valid, but may not be valid without being reliable" (Jafarpour, 2010, p. 65).

Finally, when selecting appropriate standardized psychometric test, it should be considered whether the criteria is to obtain scores, showing a certain degree of skill in absolute terms, and is this all we need, or it would be preferable to refer to the standard scores. In psychometrics, "norm" refers to statistical information that summarizes the distribution (variability) of the scores on a test by a group of subjects. The rule is, in short, the benchmark score of a particular parameter (the measure) for a population group. If we compare the score for a given subject to the standard of their reference group, we will have valuable information for interpreting test results. If we opt for the latter type, it will be necessary to consider regulatory information gained from previous research. For example, in the case of tests from other countries, it is important that they have been suitably adapted to our culture, besides being translated, tests must have been applied to different populations with subsequent statistical analysis.

VI. RECOMMENDATIONS FOR THE ADMINISTRATION OF STANDARDIZED TESTS AND CONCLUSION

When psychometric tests are applied in a teaching context, there are certain restrictions imposed by ethics, for example, the inability to use a control group for a long time, since all students should receive the same methodology, content and teaching load or the limited number of hours, which prevents theoretically necessary time to devote to the administration of psychometric tests and can lead to solutions such as the administration of tests created for an individual application of a group.

Following the standards on the implementation of educational and psychological tests of the American Educational Research Association, the American Psychological Association and the National Council on Measurement in Education (AERA & APA, 1999), the main professional bodies in this field regulators, suggested whether to use a test in a way that has not been fully validated or to modify it in some way of standardized administration procedures; so it is necessary to justify its new use and data are collected much relevant information as data that justify its validity.

In those cases in which, given the absence or unavailability of proven psychometric tests of validity, the use of other reliability or validity of which has not yet been proven in a large enough sample, the results should be interpreted with caution, always be possible, try to triangulate the data.

Special attention requires the use of psychological tests in a language that does not match the student's native language, even if they have some mastery of the language or are supposedly bilingual, a relatively frequent in the field of translation studies. The performance profile is obtained and capabilities may be adversely affected, so that, as the research objective, one might dismiss these scores or use an alternative test.

Also, some tests require that the person who manages or owns interpret certain professional qualifications, training or experience, and so records them in their manuals. A classification of the instruments on three levels, used by publishers for marketing tests: those that require only training and experience in the specific field of application, which require some knowledge of the theory of tests and statistical methods; and those required to possess an advanced degree in psychology, psychiatry or psychology and professional experience. In these cases, we may respect that rule and, in general, whenever deemed necessary, we may seek the advice of a professional.

Finally, it is necessary to inform the subjects tested on the objective of the test, the method of administration, the factors taken into account when scoring their responses, how these scores are used, for how long do we keep the results and under what conditions they will be disclosed.

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