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SEMANTIC, CONCEPTUAL, EXPERIENTIAL AND IDIOMATIC EQUIVALENCE OF SENSORY PROCESSING MEASURE FOR PRESCHOOLERS

Equivalencia semántica, conceptual, experiencial e idiomática de la medida de procesamiento sensorial para preescolares

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Abstract: Expert Committee is the stage IV for the process of cross cultural adaptation. The expert committee's role is to consolidate all the versions of the questionnaire and develop what would be considered the prefinal version of the questionnaire for field testing. In this article, the method aims to obtain semantic, idiomatic, experiential and conceptual equivalence of the Sensory Processing Measure - Preschool source and target version by an expert committee. A purposely selected group of professionals, composed of four occupational therapists specialized in sensory processing disorders intervention with more than ten years' experience in paediatrics, together with a specialist in the translation and validation of instruments, formed the focus group. They compared the two versions (SPM-P Home Form and School Form) and made significant changes to the instrument at a weekly meeting for a consecutive month in order to adapt it to Portuguese culture. The expert committee achieved equivalence between the source and

target version in four areas: Semantic equivalence, Idiomatic equivalence, Experiential equivalence and Conceptual equivalence. Several items were adapted and the instrument can now be pre-tested and can start collecting a sample of a hundred children.

Key words: focus group; semantic equivalence; idiomatic equivalence; experiential equivalence; conceptual equivalence.

Resumen: El Comité de Expertos es la etapa IV del proceso de adaptación intercultural. El rol del comité de expertos es consolidar todas las versiones del cuestionario y desarrollar lo que se consideraría la versión prefinal del cuestionario para pruebas de campo. En este artículo, el método tiene como objetivo obtener la equivalencia semántica, idiomática, experiencial y conceptual de la Medida de Procesamiento Sensorial - preescolar versión casa y versión escuela, por un comité de expertos. Un grupo de profesionales seleccionado a propósito, compuesto por cuatro terapeutas ocupacionales especializados en trastornos de procesamiento sensorial con más de diez años de experiencia en pediatría, junto con un especialista en traducción y validación de instrumentos, formaron el grupo focal. Compararon las dos versiones (casa y escuela) e hicieron cambios significativos en el instrumento en una reunión semanal durante un mes consecutivo para adaptarlo a la cultura portuguesa. El comité de expertos logró la equivalencia entre la versión de origen y la de destino en cuatro áreas: equivalencia semántica, equivalencia idiomática, equivalencia experiencial y equivalencia conceptual. Se adaptaron varios elementos y el instrumento ahora puede probarse previamente y puede comenzar a recolectar una muestra de cien niños.

Palabras clave: grupo focal; equivalencia semántica; equivalencia idiomática; equivalencia experiencial; equivalencia conceptual.

1. Introduction

With the increase in the number of multinational and multicultural research projects, the need to adapt health status measures for use in other than the source language has also grown rapidly (Beaton, Bombardier, Guillemin and Ferraz, 2000). There is no universal agreement on how to adapt an instrument for use in another cultural setting. However, there is agreement that it is inappropriate to simply translate and use a questionnaire in another linguistic context (Gjersing, Caplehorn and Clausen, 2010). The cross-cultural adaptation of a health status self-administered questionnaire for use in a new country, culture, and/or language necessitates use of a unique method, to reach equivalence between the original source and target versions of the questionnaire. It is now recognized that if measures are to be used across cultures, the items must not only be translated well linguistically, but also must be adapted culturally to maintain the content validity of the instrument at a conceptual level across different cultures (Beaton *et al.*, 2000). Sensory processing is described as a process that refers to how the central and peripheral nervous system manages the sensory information that enters through the organs, namely, vision, hearing, touch, taste and smell, proprioception and vestibular.

This process includes the reception of information, modulation, integration, discrimination, organization of sensory stimulus and behavioural responses to this sensory input (Ayres, 1979, 2005; Tomchek and Dunn, 2007).

Children with sensory processing difficulties have problems modulating sensory input. They can over or under respond to the stimuli of their environment (Miller, Anzalone, Lane, Cermak and Osten, 2007; Miller, Schoen, James and Schaaf, 2007) as such, instruments that assess the difficulties of sensory processing in various environments through parents and educators are essential for a better understanding of the child's performance in their daily occupations and contexts. It is not uncommon to find that children present different performances at home and at school and using instruments that compare the child's scores in various contexts is critical to a holistic understanding of the child (Olson *et al.*, 2016).

The Sensory Processing Measure for Pre-Schoolers (SPM-P) consists of a set of domains that evaluate sensory processing, praxis and social participation in pre-school children between two and five years of age. It consists of two joint forms: Home Form (WPS Product No. W-497B) and School Form (WPS Product No. W-497B). Together, these two forms provide a global perspective of the child's sensory functioning at home, at school and in the community (Glennon, Kuhaneck and Herzberg, 2011; Henry and McClary, 2011).

The SPM-P is designed to assess children of preschool age (ages 2 trough 5). The test items cover a wide range of behaviours and characteristics related to sensory processing, social participation and praxis. Each item is rated in terms of frequency of the behaviour on a 4-point, Likert-type scale. The responses options are *Never, Occasionally, Frequently, and Always.* The SPM-P Home Form consists of 75 items and is completed by the child's parent or home based care provider. The SPM-P School Form also has 75 items and is completed by the child's primary preschool teacher or day care provider. Each form requires about 15 to 20 minutes to be filled out by a rater and an additional 5 to 10 minutes to be scored by an occupational therapist (Parham, Ecker, Miller, Henry and Glennon, 2007).

The SPM-P is intended to support the identification and treatment of children with sensory processing difficulties. It is therefore appropriate for use in a wide range of educational, clinical and research settings. The SPM-P was developed by occupational therapists but the information it provides will also be of value to other professionals, including school psychologists, clinical psychologists, social workers, counselors, physical therapists, speech and language pathologists, early intervention specialists, psychiatrists, paediatricians and nurses. The SPM-P can be administered itself as a screening instrument but the examiner should not use the results to make diagnostic or treatment decisions without firs assembling the widest possible spectrum of information about the child (Parham, Cohn and Spetzer, 2007; Parham, Ecker *et al.*, 2007).

In Portugal, within the area of occupational therapy in particular, there is still a need for validated instruments for the Portuguese population. With the aim of greater objectivity in the evaluation of Portuguese children, the validation process of SPM-P was initiated due to its relevance in the evaluation of the sensory processing of preschool children.

When adapting an instrument, the conceptual, semantic, operational, measurement and functional equivalence should be considered (Beaton *et al.*, 2000; Hambleton, 2005; Reichenheim and Moraes, 2007).

The first three phases (translation, Synthesis and back translation) of the Processing Measure-Preschool validation process (SPM-P) were developed and described by Gomes and fellow collaborators (2016) based on international guidelines referred to by several (Beaton *et al.*, 2000; Hambleton, 2005; Reichenheim and Moraes, 2007) being the Stage IV-expert committee and its results that will be described in this article giving relevance essentially to the results of the expert committee evaluation carried out through a focus group.

Since the translated version by Gomes and collaborators (2016) was tested in a pilot study of a hundred typlical children and have no variability of responses, the investigators decided to considered the cross-cultural adaptation to avoid erroneous comparisons of results across translated version (Beaton *et al.*, 2000; Guillemin, Bombardier and Beaton, 1993).

The expert committee will achieve equivalence between the source and target version in four areas: Semantic equivalence, Idiomatic equivalence, Experiential equivalence and Conceptual equivalence (Beaton *et al.*, 2000; Gjersing *et al.*, 2010). The cross-cultural adaptation process is important when an instrument is used in a different language, setting and time to reduce the risk of introducing bias into a study and after this phase the instrument should be field tested (Beaton *et al.*, 2000).

2. Method

To reach the proposed objective, a qualitative study was developed using an expert committee as a method of collecting relative data on semantic, experiential, idiomatic and conceptual equivalence. The expert committee discussion consisted of four steps: research design (defining the research objectives of the study, identifying and recruiting participants); identify a suitable location; data collection (pre-session preparation, facilitation during meeting); analysis and reporting of results (Nyumba, Wilson, Derrick and Mukherjee, 2017).

The expert committee is a research technique that allows for the obtaining of data of a qualitative nature, through group sessions in which the participants share a common work and discuss aspects of a specific theme (Silva, Veloso and Keating, 2014). Given the specificity of the theme of "Sensory Processing" it was important to emphasize this methodological process after Phase I of the validation study of the SPM-P (Gomes *et al.*, 2016).

After translation and back translation of the original Sensory Processing Measure for Pre-School instrument, the intention was to listen to a group of specialists in the area regarding the items of the various dimensions of the instrument that were deemed necessary and relevant to be the subject of a qualitative scrutiny (Aschidamini and Saupe, 2004; Breen, 2006; Silva e*t al.*, 2014).

2.1. *Participants*

In order to carry out the Expert Committee, is crucial to have experience and knowledge about the topic being discussed – Sensory Processing – and is very important focusing on the choice of participants according to criteria inherent to the study problem and with common characteristics that qualify for the discussion of the question (Breen, 2006): culturally adapt specific terms of the area of sensory integration within a kindergarten context and a home context, associated with clinical practice with children of early ages, and who have sensory processing dysfunctions (Ecker and Parham, 2010).

The composition of this committee was crucial to achievement of cross-cultural equivalence (Beaton *et al.*, 2000). The minimum composition comprises methodologists, health professionals, language professionals, and the translators (forward and back translators) involved in the process up to this point. The original translater of the questionnaire were in close contact with the expert committee during this part of the process.

Considering these aspects, the recruitment of the five participants fulfilled the following criteria: a) occupational therapists with extensive experience in clinical practice with children with sensory processing dysfunctions; b) occupational therapists with specialized and postgraduate training in the area of sensory integration; c) English proficiency; d) a translator of the original instrument, lecturer in occupational therapist course with extensive experience in sensory processing dysfunctions and also had postgraduate training in the area of sensory integration as suggested by Miller-Kuhaneck, Henry and Glennon (2011). Since it was difficult to locate experts who fulfilled all these criteria we opted for the focus group technique instead of the delphi technique which requires a larger number of participants (Hsu and Sandford, 2007).

An individual approach was applied to these professionals and it was possible to directly contact four occupational therapists who fulfilled these criteria.

The four occupational therapists selected for this process had more than ten years of experience in school based services, home and clinical settings and all of them with postgraduate training in the area of sensory integration. The translator, Occupational therapist with a PhD in Child Studies – Special Education, was also included in these criteria (Reichenheim and Moraes, 2007). The need of occupational therapists in the group was related for all being experts in sensory integration intervention and some of them were school based experienced. These professionals were willing to review the items and offer guidance in all process. They were considered the experts to offer a better explanation about the interpretation of the questions without forgetting the "sensory integration vulnerability" of the items. One of the occupational therapists was mother of a child with Sensory Processing Disorder; one occupational therapist is a school based therapist giving crucial feedback along the way and lots of experience in work together with teachers.

Since we have no teachers in this committee we ensure that the occupational therapist school based was familiar enough to analyse the SPM-P items.

In addition to these four occupational therapists, all female, aged between thirty-five and forty, was a professor of nursing with a PhD in psychology and with

thirteen years of experience and posgraduate in the area of construction and cultural adaptation of instruments. Its main function was in the moderation of the group – in the conduction and maintenance of the discussion – in a thorough impartial analysis of the various suggestions given by the experts, devoid of prejudices and with a relevance and neutrality in the questions posed in relation to the topics discussed.

Five participants were used as the number suggested by Nyumba *et al.* (2017) and the moderator was part of them.

2.2. *Instrument*

The *Sensory Processing Measure-Preschool* (SPM-P) is a set of rating forms that enables assessment of sensory processing issues, praxis and social participation in children of preschool age (2 to 5 years old). The SPM-P consists of two forms: the Home Form and the School Form. Together, these rating forms provide a broad perspective on a young child's sensory functioning in home, preschool and community environments (Parham, Ecker *et al.* 2007).

The Home form and School Form each yeld eight norm referenced standard scores: Social Participation (SOC), Vision (VIS), Hearing (HEA), Touch (TOU), Body Awarness (BOD), Balance and Motion (BAL), Planning and Ideas (PLA) and Total Sensory Systems (TOT). The body awareness, Balance and Motion and Planning and Ideas scales are lay terms for proprioception, vestibular function and praxis, respectively. The standard score for each scale enables classification of the child's functioning into one of the three interpretive ranges: *Typical, Some Problems* or *Definite Dysfunction.* In addition, an Environment Difference (DIF) score allows direct comparison of the child's sensory functioning between home and preschool/day care environments.

The Social Participation (SOC) scale has 8 items on the Home Form and 10 on the School Form. Unlike all other SPM-P items, the *SOC items* are phrased with positive valence. For example, Home Item 2 ("Shares things when asked") is phrased so that a rating of *Always* indicates positive, healthy behaviour. The rest of the SPM-P items are phrased with negative valence, so that a rating of always indicates problematic, dysfunctional behaviour. On the Home Form, the SOC items measure the child's participation in social activities in the home and the community.

The Vision (VIS) scale has 11 items on the Home Form and 10 items on the School Form. The items represent a range of visual processing vulnerabilities including over and under-responsiveness to visual stimulation inordinate seeking of visual input and problems with perception.

The Hearing (HEA) scale has 9 items on the Home Form and 10 items on the School Form. The items reflect the auditory processing vulnerabilities of over and under-responsiveness and seeking behaviour as well as perceptual problems.

The Touch (TOU) scale has 14 items on the Home Form and 10 items on the School Form. The TOU scale includes many items representing tactile defensiveness, or over-responsiveness to tactile stimulation. There are also items addressing

under-responsiveness and tactile seeking behaviors, such as seeking out sensations that other children would experience as painful.

The Body Awareness Scale (BOD) has 9 items on the Home Form and 10 items on the School Form. *Body awareness* is a lay term that refers to proprioceptive sensory system. Proprioception describes a child's ability to sense the position in space of limbs, fingers and other body parts. The BOD scale includes items that assess sensory integration vulnerabilities in proprioception: inordinate sensory-seeking behaviour, in wich the child seeks intense inputs into the muscles and joints (through pushing, pulling, jumping, hanging); and disordered perception, in which the child is unable to judge and control the forcefulness of his or her motions.

Tha Balance and Motion (BAL) scale has 11 items on the Home Form and 10 items on the School Form. Balance and Motion is a lay term that refers to the vestibular system. The vestibular system comprises a child's ability to maintain balance and upright posture by sensing his or her own orientation with respect to gravity. The BAL items on the SPM-P address several vestibular integration vulnerabilities: excessive seeking of intense vestibular input, poor postural control (difficulty maintaining an upright position without slumping or leaning) and problems with the perception of body movements in space. Bal items also reflect vestibular over and under-responsivity.

The Planning and Ideas (PLA) scale has 9 items on the Home Form and 10 items on the School Form. *Planning and Ideas* is lay terminology that refers to *praxis*, the ability to conceptualize, plan, and organize movements in order to complete a unfamiliar motor tasks. *Praxis* is not itself a sensory system, but rather it is a higher level cognitive function that depends on the integration of multiple sensory systems, particularly tactile perception and proprioception to function efficiently. For example, if a child is having a trouble climbing in and out of the car seat (Home Item 75), the underlying process may involve deficiencies in both praxis and the body awareness (proprioception) necessary to support such activity.

Reliability of SPM-P is robust because all coefficients are greatrer than .70 (Cronbach, 1988). In SPM-P Home Form the lowest value of Cronbach alfa was on BAL scale (.75) and the highest value was on SOC scale (.89). The same happens in SPM-P-School Form, wich lowest value was on BAL scale (.72) and highest value was on SOC scale (.93).

Test-retest reliability coefficients were highly correlated across the 2 week retest interval (all $rs \geq 90$) wich indicate excellent temporal stability. Content validity is enhanced when the item-writing process is guided by a comprehensive and coherent theory of the measurement domain. The SPM-P item set, in turn, was a unión of item sets from two previous measures: the *Evaluation of Sensory Processing* (ESP; (Parham and Ecker, 2002) and the *School Assessment of Sensory Integration* (SASI; [Miller Kuhaneck, Henry, Glennon and Mu, 2007]). In both of those, the items were written to reflect the principles of Ayres Sensory Integration Theory (Ayres, 1979). Analysis of scale structure and intercorrelations supports the scoring of separate sensory systems, praxis and social participation scales on the Home and School Forms. The SPM-P Home and School scales correlate, in expected ways, with the tree measures of children's sensory processing: the *Short Sensory Profile*, the *Infant/Toddler Sensory*

Profile, and the *Sensory Profile School Companion*. Finnaly, the SPM-P scales distinguish between typically developing and clinic-referred children, with robust and clinically meanningful effect sizes.

2.3. *Procedure*

This phase had particular importance given the specificity of certain terms and some cultural adaptations to the instrument, which will be described in the chapter pertaining to the results.

In this online study focus group was used conference calling as an adaptation of traditional methods once some participants were from different areas of the country and could only meet after working hours (Nyumba *et al*., 2017).

The online focus group was conducted for one consecutive month every Wednesday starting at 9:00 p.m. and finishing close to 00:00.

The moderator sought to facilitate the conductivity of the group work to meet the research objectives through the diversification and deepening of the contents related to the SPM-P.

The SPM-P consists of seventy-five items in the Home version and seventy-five in the School version distributed through eight dimensions: Social Participation, Vision, Hearing, Touch, Taste and Smell, Body Consciousness, Balance and Motor Planning and Ideas. The translations of all items were the subject of analysis and discussion, moving on to the analysis of the following items. The final version of each item was obtained after 100% agreement of all the participants.

All participants were clearly informed about the objectives of the study and had access to copies of the translations prior to the first meeting as well as the instructions for analyzing the equivalences. Before each of the following meetings a summary of the previous meetings and the consensus reached was made.

In the case of these experts, the decision to participate in the focus group was individual and free of any coercion, in addition there was a need for clarity regarding the explanation of the study and the ethical care included in the process.

In order to enhance participation in group sessions, some of the actions recommended by Dillman were put forward (1978, cit. in Gunther [1999]), including participant reward through a certificate of collaboration recognized by School of Health Sciences of Polytechnic Institute of Leiria. There was also the concern of reducing any costs, particularly in this case, all the original and translated instruments would reach the participants via email.

3. Results

The expert committee's role was to consolidate all the versions of the SPM-P questionnaire and develop what would be considered the prefinal version of the questionnaire for field testing. The committee reviewed all the translated items (seventy-five

items on SPM-P School Form and seventy-five Items on SPM-P Home Form) and reached a consensus on any discrepancy. The material at the disposal of the committee included the original questionnaire, each translation (SPM-P School Form and Home Form) together with corresponding written reports (which explain the rationale of each decision at earlier stages). The expert committee made critical decisions so, again, full written documentation was made of the issues and the rationale for coming to a decision about them. Decisions were needed to be made by this committee to achieve equivalence between the source and target version in four areas:

1) *Semantic Equivalence*: Do the words mean the same thing? Are their multiple meanings to a given item? Are there grammatical difficulties in the translation?

An example of semantic equivalence is in the original version of item 22 of the School Form "Shows distress (trouble or upset) when others sing or use musical instruments" which was initially translated to "Is bored when others sing or use musical instruments". However, in the original version of item 30, of the same form (home), "Is bothered by or comments on constant background sounds that others ignore (e. g., fans, ticking clocks)" the first translation was also "Shows distress or comments on constant background sounds that others ignore (e. g., Fans, ticking clocks)". As can be seen, the terms "Shows distress" and "Is bored" were equally translated in the same expression "Fica incomodada" *(in Portuguese)*. With the new analysis by the committee of experts, they considered the two concepts to be different and therefore needed to differentiate between the two. Thus item 22 was altered and translated to "Shows distress (trouble or upset) when others sing or use musical instruments" differing from item 30 "Is bothered or comments on constant background sounds that others ignore (e. g., fans, ticking clocks)". In this way, certain terms along the two forms were standardized, being that all the items where "shows distress" were accordingly translated to "Shows distress" and in the items that began with "Is bored" standardized to "is bored". In the initial translation, the term "Shows distress" was indiscriminately used for two different expressions. This standardization added coherence to the questionnaires as the initial translation did not include this distinction.

2) *Idiomatic Equivalence*: Colloquialisms, or idioms, were difficult to translate. The committee had to formulate an equivalent expression in the target version. For example, in item 3 of the SPM-P School Form the item "Participates appropriately in circle time", "circle time" has often been difficult to translate into Portuguese, resulting in an item with similar meaning having to be found by the committee. "Participates appropriately in circle time/Blanket"; also, item 57 of the form "Leans on walls, furniture, or other people for support when standing" originally translated into "Leans on walls, furniture, or other people for support when standing" has been amended by the committee to "Supports itself on walls, furniture, or other people to be standing". The term "supports itself" was chosen by the experts as a more realistic term of equivalence for the expression that is intended in the item. Another example of this idiomatic equivalence is in item 66 of the School Form "Gets stuck on one activity to the exclusion of others". Initially this item was translated to "Gets stuck on one activity to the exclusion of others" and with the specialists' contribution, this expression changed its idiomatic configuration of the item to "Always do the same

activity excluding others". Still in this framework we have item 71 of the same form (home) whose original version stated "Plays own games, avoids imitating others" whose initial translation was "Plays own games, avoids imitating others" and after the experts' analysis the term *"games"* was added to the item thus being constituted to "Plays own games/plays, avoids imitating others". According to the experts' analysis, the term "games" and "play" differ being that one is a term which implies rules (a game) while the other term "play" implies doing an action (for entertainment/distraction) devoid of structure (playing/playfulness = "brincadeiras" in Portuguese). Both terms are encompassed in the concept of playing, however the term "play" in English is a term that in itself already has this degree of comprehensiveness.

3) *Experiential Equivalence*: Items that are seeking to capture and experience daily life; however, often in a different country or culture, a given task may simply not be experienced (even if it is translatable). The questionnaire item would have to be replaced by a similar item that is in fact experienced in the target culture. An example of this can perhaps be seen, for example, in item 4 of the Home Form "Takes part in appropriate mealtime interactions" originally translated "Takes part in appropriate mealtime interactions" which has been modified to "Participates appropriateately in the interactions that occur in meal (interacts appropriety at meal times)" with additional information added in order to reinforce the issue of appropriate interaction in this sentence. Similarly, item 70 of the Home Form initially translated "Fails to complete tasks with multiple steps", three examples in parentheses were added in the Portuguese version "Fails to complete tasks with multiple steps (e. g., change clothes, pack the bag, toilet…)".

4) *Conceptual Equivalence*: Often words hold different conceptual meanings between cultures. Item 35 of the School Form "Does not clean saliva or food from face" originally translated to "Does not clean saliva or food from face", in the expert's analysis the item was modified to "Does not clean saliva or food from face (because don't notice)" having additional information added in parentheses in order to clarify the reader about the concept.

Also in this sense, the committee of experts changed the initial translation of item 51 from the School Form "Bumps into peers excessively (e. g., while in line or moving around the playground)" to "Shocks into others excessively (e. g., while in line or moving around the playground)". In this sense, it is perceived that the concept "Bumps" translated literally to "Shocks" undergoes cultural transformation insofar as this concept in Portuguese is more easily understood if it is "Shocks".

Still referring to the School Form also, item 54 "Knocks over other peer's building projects (e. g., blocks, marble runs, tracks, cars)" originally translated to "Drop down other's children's building projects (e. g., blocks, marble runs, tracks, cars)", was unanimously changed by experts to "Destroys peers's building projects (e. g., blocks, marble runs, tracks, Legos, cars)". The term "Drop down" was replaced by "destroys" and marble runs is a type of game that culturally does not have as much participation in regards to Portuguese children and as such, the experts whose daily practice it is to interact with kindergartens, came to the conclusion that Lego could be more representative of the reality amongst Portuguese children.

The committee examined the source and back translated questionnaires for all such equivalences.

Their analysis focused on the language adopted and the practical value of the items present to evaluate the dimensions of the construct. Therefore, suggestions were made for the addition of examples placed between parentheses in several items, perceived as more difficult to understand in the various dimensions of the questionnaire and also made changes in the wording of the items in view of a greater intelligibility of the item itself or its idea. These changes sought to address the future use of the inventory by educational caretakers, together with the fact that this clarity was especially a necessity mainly for families from lower socioeconomic status (Beaton *et al.*, 2000).

The final version of SPM-P Home Form and School Form revised by these experts will now be appropriate to proceed to a *Thinking Aloud method with* a group of educators (SPM-P School Form) and a group of parents (School Form) in order to to verify: 1) ambiguities felt in the content and format of the items; 2) the verification of the appropriateness of the instructions given at the beginning of the questionnaire; 3) the identification of particular difficulties experienced in the contents of the items; and the time of completion required for the questionnaire.

After the *Thinking Aloud* method with this two groups, the final stage of adaptation process will be the fieldtest. This field test of the "new" SPM-P Home and School Form seeks to use the prefinal version in children from the target setting. Ideally, between 30 and 40 for both (parents and teachers) should be tested. The meaning of the items and responses would be explored. This ensures that the adapted version will still retaining its equivalence in an applied situation.

After this analysis the purpose will be the standardization sample.

4. Final considerations

The present article aimed to illustrate one of several steps in the validation process of the Sensory Processing Measure for Pre-Schoolers using the online group's data collection method. With this project, we intend not only to enrich the shortage of validated instruments in Portugal, but also to provide an instrument to be used in the elaboration of individual intervention programs outlined by professionals specialized in the area of Sensory Integration.

The validation of an instrument is a time consuming and complex process, and we rigorously follow the various steps that, according to the literature, tend to assure the reliability and validity of the results obtained (Almeida and Freire, 2010; Horwath and Basarab-Horwath, 2009; Pasquali, 1999). Therefore, using qualitative methodologies in the area (the focus group), we consulted professionals with extensive experience in the field to ensure the content validity of the dimensions and items of the questionnaire.

With the validation of this instrument, we intend to obtain a more complete and real evaluation of pre-school children, since the items that constitute it integrate a broad set of characteristics or competences that can be evaluated in the various

natural contexts of the child's life and filled by the various intervention agents (parents and professionals). This complementarity between performance at home and in kindergarten, as well as in the charge of the educational educator, will be one of the gains of this questionnaire.

The importance of the focus group as well as the adequate recruitment of experts for the successful cultural validation of measurement instruments is to be highlighted.

Bibliographic references

Almeida, L. and Freire, T. (2003). *Metodologias da investigação em psicologia e educação* (3ª ed.). Braga: Psiquilíbrios.

Almeida, L. and Freire, T. (2010). *Metodologia da investigação em psicologia e educação* (6ª ed.). Braga: Psiquilíbrios.

Aschidamini, I. and Saupe, R. (2004). Grupo focal - Estratégia metodologica qualitativa: Um ensaio teórico. *Cogitare Enfermagem*, 9 (1).

Ayres, J. (1979). *Sensory integration and the child*. Los Angeles: Western Psychological Services.

Ayres, J. (2005). *Sensory integration and the child*. Los Angeles, CA: WPS.

Beaton, D., Bombardier, C., Guillemin, F. and Ferraz, M. (2000). Guidelines for the process of cross-cultural adaptation of self-report measures. *SPINE*, 25 (24), 3186-3191.

Breen, R. (2006). A practical guide to focus-group research. *Journal of Geography in Higher Education*, 30 (3), 463-475.

Cronbach, L. (1988). Internal consistency of tests: analyses old and new. *Psychometrica*, 53, 63-70.

Dunn, W. (2007a). *Living Sensationally: understanding your senses*. London: Jessika Kingsley Publishers.

Dunn, W. (2007b). Supporting children to participate successfully in everyday life by using sensory processing knowledge. *Infants and Young Children*, 20 (2), 84-101.

Ecker, C. and Parham, D. (2010). *Sensory processing measure-preschoolers.* Los Angeles: Western Psychological Services.

Gjersing, L., Caplehorn, J. and Clausen, T. (2010). Cross-cultural adaptation of research instruments: language, setting, time and statistical considerations. *BMC Medical Research Methodology*, 10 (13), 0-10.

Glennon, T., Kuhaneck, H. and Herzberg, D. (2011). The Sensory Processing Measure-Preschool (SPM-P)-part one: description of the tool and its use in the preschool environment. *Journal of Occupational Therapy, Schools and Early Intervention*, 4 (1), 42-52.

Gomes, M., Fernandes, P., Dixe, M., Pinto, B., Sousa, M. and Batista, S. (2016). Translation and Cross-cultural Adaptation to Portuguese of the Sensory Processing Measure - Preschool (SPM-P). *Research and Networks in Health*, 2, 1-6.

Guillemin, F., Bombardier, C. and Beaton, D. (1993). Cross-cultural adaptation of health-related quality of life measures: literature review and proposed guidelines. *Journal of Clinical Epidemiology*, 46, 1417-1432.

Gunther, H. (1999). *Como elaborar um questionário*. Brasília: Laboratorio de Psicologia Ambiental.

Hambleton, K. (2005). Issues, designs, and technical guidelines for adapting tests into multiple languages and cultures. In K. Hambleton, P. Merenda and C. Spielberger (Eds.),

Adapting educational and psychological tests for cross-cultural assessment (pp. 3-38). Mahwah, NJ: Lawrence Erlbaum.

Hambleton, K. and Patsula, L. (1998). Adapting tests for use in multiple languages and cultures. *Social Indicators Research*, 45 (1-3), 153-171.

Henry, D. and McClary, M. (2011). The sensory Processing Measure-Preschool (SPM-P)-part two: test-retest and collective collaborative empowerment, including a father's perspective. *Journal of Occupational Therapy*, *Schools and Early Intervention*, 4 (1), 53-70.

Horwath, J. and Basarab-Horwath, J. A. (2009). *The child's world: the comprehensive guide to assessing children in need*. Jessica Kingsley Pub.

Hsu, C. and Sandford, B. (2007). The Delphi Technique: making sense of consensus. *Practical Assessment*, *Research and Evaluation*, 12 (10), 1-8.

Miller Kuhaneck, H., Henry, D. A., Glennon, T. J. and Mu, K. (2007). Development of the sensory processing measure-School: initial studies of reliability and validity. *American Journal of Occupational Therapy*, 61 (2), 170-175.

Miller, L., Anzalone, M., Lane, S., Cermak, S. and Osten, E. (2007). Concept evolution in sensory integration: a proposed nosology for diagnosis. *American Journal of Occupational Therapy*, 61 (2), 135-140.

Miller, L., Schoen, A., James, K. and Schaaf, R. (2007). Lessons learned: a pilot study of occupational therapy effectiveness for children with sensory modulation disorder. *American Journal of Occupational Therapy*, 61 (2), 161.

Nyumba, T., Wilson, K., Derrick, C. and Mukherjee, N. (2017). The use of focus group discussion methodology: insights from two decades of application in conservation. *Methods in Ecology and Evolution*, 9, 20-32.

Olson, C. H., Henry, D. A., Kliner, A., Kyllo, A., Richter, C., Charley, J., ... Walworth, J. (2016). Effectiveness and usability of the Sensory Processing Measure-Preschool Quick Tips: data-driven intervention following the use of the SPM-Preschool in an early childhood, multiple-case study. *Journal of Occupational Therapy*, *Schools and Early Intervention*, 9 (2), 142-162.

Parham, D., Cohn, S. and Spetzer, S. (2007). Fidelity in sensory integration intervention research. *The American Journal of Occupational Therapy and Health Care*, 61, 216-227.

Parham, D. and Ecker, C. (2002). Evaluation of a sensory processing. In A. C. Bundy, S. J. Lane and E. A. Murray (Eds.), *Sensory Integration Theory and Practice* (2nd ed., pp. 194-196). Philadelphia, PA: F. A. Davis.

Parham, D., Ecker, C., Miller, H., Henry, D. A. and Glennon, T. J. (2007). *Manual of sensory processing measure*. Los Angeles, CA: Western Psychological Services.

Pasquali, L. (1999). *Instrumentos psicológicos: manual prático de elaboração*. Brasília: Universidade de Brasília.

Reichenheim, M. and Moraes, C. (2007). Operationalizing the cross-cultural adaptation of epidemological measurement instruments. *Revista de Saúde Pública*, 41 (4), 1-9.

Silva, I., Veloso, A. and Keating, J. (2014). Focus group: considerações teóricas e metodológicas. *Revista Lusófona de Educação*, 26, 175-190.

Tomchek, S. D. and Dunn, W. (2007). Sensory processing in children with and without autism: a comparative study using the short sensory profile. *American Journal of Occupational Therapy*, 61, 190-200.