

Adaptation to Portuguese and Initial Validation of the *O*NET Interests Profiler - Short Form* in a Sample of Brazilian University Students

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Abstract

The assessment of vocational interests is a central issue in career counseling. This study aimed to adapt to Brazilian Portuguese the *O*NET Interests Profiler - Short Form* using a sample of 603 Brazilian university students from 28 different undergraduate degree programs, and obtain evidences of validity and reliability for the instrument. Two different instruments resulted from this work. The instruments evaluate vocational interests according to the RIASEC model, which includes six dimensions (Realistic, Investigative, Artistic, Social, Enterprising and Conventional). This model proposes that the six dimensions can be organized in a hexagonal structure following the R-I-A-S-E-C order, where adjacent dimensions should be more strongly related to each other than non-adjacent dimensions. Validity evidence was obtained through Principal Components Analysis (PCA), Multidimensional Scaling (MDS), correlations between secondary concepts from the theoretical model, and contrasts between groups. PCA results were in accordance with theoretical expectations (differentiation of the six dimensions), while MDS results did not confirm the hexagonal structure. Other correlational results were in consonance with theoretical predictions. The contrasts between selected groups indicated concurrent validity of the instruments. Internal consistency indexes for each subscale were good. Overall results suggest the instruments have acceptable evidences of validity and reliability. Further studies are suggested in order to increase the suitability of the instruments.

Keywords: *career choice, interests, O*NET, psychological assessment, RIASEC.*

Resumen

La evaluación de intereses vocacionales es un tema central en asesoramiento de carrera. Este estudio tuvo como objetivo adaptar al portugués brasileiro el *O*NET Interests Profiler - Short Form* en una muestra de 603 estudiantes universitarios brasileiros, de 28 programas diferentes de pregrado, y obtener evidencias de validez y confiabilidad. De este trabajo surgieron dos instrumentos. Estos evalúan intereses de acuerdo al modelo RIASEC, que incluye seis dimensiones (Realista, Investigativo, Artístico, Social, Emprendedor y Convencional). Este modelo propone que las seis dimensiones pueden ser organizadas en una estructura hexagonal, siguiendo la secuencia R-I-A-S-E-C, donde las dimensiones adyacentes deben estar más fuertemente relacionadas que aquellas q no son contiguas. Las evidencias de validez se obtuvieron a través de un Análisis de Componentes Principales (PCA), Escalonamiento Multidimensional (MDS), correlaciones entre conceptos secundarios del modelo teórico, y contrastes entre grupos. Los resultados del PCA (distinción de las seis dimensiones) fueron coherentes con la teoría, pero los resultados del MDS no confirmaron la estructura hexagonal. Otras correlaciones estuvieron de acuerdo con las expectativas teóricas. El contraste entre grupos seleccionados indicó validez concurrente en los instrumentos. Los índices de consistencia interna fueron buenos. En general los resultados sugieren que los instrumentos tienen evidencias de validez y confiabilidad aceptables. Se sugieren nuevos estudios para incrementar la idoneidad de los instrumentos.

Palabras clave: *elección de carrera, evaluación psicológica, intereses, O*NET, RIASEC.*

Resumo

A avaliação dos interesses vocacionais é um ponto central no aconselhamento de carreira. O objetivo deste estudo foi adaptar ao português brasileiro *O*NET Interests Profiler - Short Form* utilizando uma amostra de 603 estudantes universitários brasileiros de 28 diferentes cursos de graduação, e obter evidências de validade e fidedignidade para o instrumento. Dois instrumentos resultaram da pesquisa. Os instrumentos avaliam interesses vocacionais de acordo com o modelo RIASEC, o qual inclui seis dimensões (Realista, Investigativo, Artístico, Social, Empreendedor e Convencional). Este modelo propõe que as seis dimensões podem ser organizadas em uma estrutura hexagonal seguindo a ordem R-I-A-S-E-C, onde dimensões adjacentes devem ser mais fortemente relacionadas entre si do que dimensões não adjacentes. Evidências de validade foram obtidas através de Análise de Componentes Principais (PCA) e de Escalonamento Multidimensional (MDS), correlações entre conceitos secundários do modelo teórico, e contrastes entre grupos. Os resultados da PCA mostraram-se de acordo com as expectativas teóricas (diferenciação das seis dimensões), enquanto os resultados da MDS não confirmaram a estrutura hexagonal. Outros resultados correlacionais estiveram de acordo com as previsões teóricas. Os contrastes entre grupos selecionados indicaram a validade concorrente dos instrumentos. Os índices de consistência interna para cada subescala foram bons. De um modo geral os resultados sugerem que os instrumentos adaptados possuem evidências de validade e fidedignidade aceitáveis. Novos estudos são sugeridos para melhorar a adequação dos instrumentos.

Palavras-chave: *avaliação psicológica, escolha de carreira, interesses, O*NET, RIASEC.*

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1. Introduction

Vocational interests have a central role in the career choice process. It is difficult to think that anyone would choose to do something that somehow does not attract him or her at all. In this way, every career decision should involve an assessment of interests. This assessment may be done in a formal or informal way, and some people may even do not realize that they did consider their interests to make choices related to career, but the decision making process always involves an evaluation on how much personal characteristics “match” with the characteristics of the occupations. The term interests, in the vocational context, refers to groups of specific interests fairly homogeneous and related to each other. This grouping of specific interests constitutes a disposition, which tends to be more stable than a particular interest (Savickas, 1999).

The assessment of vocational interests has a long history in North America and Europe. In fact, the development of vocational psychology is closely related to the development of career assessment tools, and interests were one of the first career constructs proposed by theorists. The development of career assessment instruments connect theory to practice, as they are operationalize theoretical constructs and incorporate them into career interventions (Harrington & Long, 2013; Whitfield, Feller, & Wood, 2009).

However, research and development of interest assessment tools have few examples in Brazil. Only recently, one of the international most widely used instruments, the *Self-Directed Search* (SDS), was published in the country (Primi, Mansão, Muniz & Nunes, 2010). Nonetheless, this version is now discontinued. Anyway, the Brazilian SDS was aimed for high school students only, and its size and cost do not stimulate its use in research.

This study adapted to Brazilian Portuguese the *O*NET Interest Profiler - Short Form*, an instrument issued by the US Department of Labor/Employment and Training Administration (USDOL/ETA). Some advantages of using this instrument can be listed: it is of public domain, the items of this instrument include work activities from different areas and levels of complexity and there is wide evidence of validity and reliability of the instrument (Armstrong, Allison & Rounds, 2008).

1.1. Vocational Counseling and Psychological Assessment

The term *interest* has multiple meanings (Savickas, 1999). In a more general psychological sense, the concept of interest refers to the position of an individual in relation to a specific object, in terms of the attention that the object awakens in the subject, the feeling about the object that comes to mind (pleasure / displeasure) and the tendency to move closer or not to the object (to want to interact or not with it).

Interests are closely related to the concepts of need and value. Needs are the initial impulse for behavior, and emerge from a sense of incompleteness or lack that request satisfaction. The values specify the types of reward that may be obtained from the environment in which the subject is inserted. Interests, in turn, reveal how the individual act in the environment, to fulfill their values and meet their needs. Compared with needs and values, interests are less stable because they depend of the context of stimuli or objects in which the subject is inserted (Savickas, 1999). Thus, vocational interests can be understood as the individual tendencies to engage in occupational activities that somehow include the person's values and needs.

When the term *interests* is used in a vocational context refers to fairly homogeneous specific interest groups related to each other, which constitute a disposition (usually more stable than a particular interest). In this way, understood more as trait than as state, interests constitute a fairly stable, consistent and persistent response trend that increases the willingness of an individual to attend to certain environmental stimuli and act towards them (Savickas, 1999). Vocational interests can also be defined as the individual's dispositions to engage in occupational activities that somehow include individual values and needs.

The idea of combining personal characteristics with the occupations' characteristics inspired the so-called trait-and-factor models in career counseling (Brown & Brooks, 1996). In general, these models are based on some kind of objective assessment of the individual's characteristics (usually interests and skills) and, as a result of this objective assessment, a suggestion of occupational alternatives that would be more appropriate to the client (that is, congruent with his or her profile) is made.

The systematic assessment of vocational interest can be first traced back to 1927 when Edward Kellogg Strong Jr. published the *Strong Vocational Interest Blank for Men* (SVIB), an empirically based inventory that compared the individual's likes and dislikes

from a variety of different occupations (Zedeck, 1989).

Another important point in the history of interest measurement was the introduction of the *Kuder Preference Record* in 1934 by Frederic Kuder. This instrument is made up of a series of content scales assessing preferences for specific activities. The most recent version is called the *Kuder® Career Interests Assessment*TM (Kuder Inc., 2012) and as the SVIB, has a wide impact in different areas of psychological research and practice (Gibbons, 2013).

Another important theoretical development was proposed by Holland (1959). He theorized that vocational behavior is a function of interest, personality and social environments. For Holland, the choice of an occupation is an expression of the personality of each individual, and by consequence he considered that interest inventories reflected personality characteristics. This theoretical approach has demonstrated to be fruitful in the many instruments drawn upon it, such as the Holland's Self-Directed Search (Holland & Rayman, 1986), the ACT Interest Inventory (Swaney, Lamb, Prediger & American College Testing Program, 1995), the Harrington and O'Shea System for Career Decision Making (Campbell & Raiff, 2002) and the Career Assessment Inventory (Lohnes, 1982), among others.

This dissertation proposes the adaptation to Brazilian Portuguese of one of the instrument that evaluates interests according to the typological model of Holland, the *O*NET Interests Profiler - Short Form*. Holland's theory maps six main dimensions of vocational interests, considered as expressions of the personality and the work environments too. First, it is going to be exposed the Holland model of vocational interest; after that, a brief history of the *O*NET* development and research outcomes is described.

1.2. Holland's Interest Theory

1.2.1. Main Concepts.

According to the model of vocational interest made by Holland (1997) an optimal vocational choice results from a combination of individual characteristics with the features of the work environment. According to the theory, people tend to seek out for environments in which they can use their skills, express their attitudes and values and take roles and problems that are congruent with their interests. In addition to this, individual behavior is

not determined only by personal characteristics or by the environment features, but results from an interaction between personality and context (Spokane, 1996).

He theoretically postulated and empirically identified six main vocational interests and work environments: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. The initials of each of these dimensions form the acronym by which the model is also known: RIASEC (Holand, 1997). Although all people present nuances of the six dimensions, the RIASEC model postulates the dominance of one over the other, characterizing “personality types” or “vocational personalities.” The descriptions of the types, however, are only prototypes that characterize extreme cases; most people present a mixture of the six types of the model.

The prototypical types are generally described below, according to Spokane (1996) and Ferreira, Rodrigues, and da Costa Ferreira (2015).

Realistic type: has mechanical and athletic skills, and prefers to work with objective data, rather than subjective assumptions. Value material things and usually does not give much importance to feelings. Enjoys activities where they could see more immediate results. It tends to be conservative and self-controlled. In general, shows interest in activities that involve manipulation of objects, tools, machinery or animals.

Investigative Type: presents refined mathematical and scientific competencies, but usually lacks leadership skills. Appreciates science and research situations or occupations, and enjoys working with the reasoning, using words or ideas. Tends to be analytical, rational, independent, introverted, critical, intellectual, inventive, curious and scientific. Research, mechanical and arithmetic skills can also characterize this type.

Artistic type: interacts with the environment using feelings, emotions, intuition and imagination. Tends to be creative, sensitive, original, dreamy, idealistic, rebellious and unconventional. The artistic type generally lacks skills bureaucratic organization and tends to avoid conventional occupations and situations. Reveals interest in free and unsystematic activities involving the manipulation of physical, verbal or human materials to create art forms or products.

Social type: demonstrates helping and teaching skills, and tends to have deficits in mechanical and scientific skills. Shows the need for social interaction. Their features are enthusiasm, kindness, persuasion, sincerity, understanding, generosity, warmth. Tends to be

extroverted and cooperative, although may possibly be somewhat dependent on others. Tend to help people, often sacrificing themselves for others. Demonstrates interest in activities involving contact with others like training, healing or education.

Entrepreneur type: has business and leadership skills of argumentation, but tends to have little scientific skills. Tries to act on the world to get what they want. Tends to be adventurous, enthusiastic, dominant, extrovert, impulsive, persuasive, versatile, ambitious, leader, responsible, dynamic, and self-confident. Usually value policy, economics and business issues, and shows interest in activities where they can command or control, seeking to establish contact with others to achieve organizational or economic goals.

Conventional type: reveals mainly bureaucratic and arithmetic-related interests and lacks artistic abilities. Interact with the environment by choosing goals, attitudes and values that are accepted by society. The most striking features are the practical sense, conservatism and meticulousness. Prefers activities that involve systematic and orderly handling of data, such as storage and organization of records, document completion and use of data processing equipment in order to achieve your goals.

Holland (1997) proposed a hexagonal model for these six dimensions of vocational interests. To Holland, those dimensions presents a pattern of interrelationships in a two-dimensional graphic plane that presents the shape of a hexagon, with the types appearing in the sequence R, I, A, S, E and C. That is, the distances between adjacent types (IR, IA, SE, CE, CR) should be smaller than the distance observed between alternating types (RA, IS, AE, SC, ER, CI), which in turn would be smaller than the distance between opposite types (RS, IE, AC). This means that the closest dimensions among themselves also exhibit greater similarity in the types referred to (for example, type I is closer to the types R and A than S, and farther to E and C).

Thus, people who have salient features on adjacent dimensions have greater consistency of interest than those that have salient features of nonadjacent dimensions. In fact, research has shown that the consistency of vocational interests as well as the congruence (similarity) between personal characteristics and environment are factors associated with career decision and persistence (Holland, 1997; Spokane, 1996).

1.2.2. Vocational Environment Classification

When it comes to classify occupations, usually the incumbent method has been used to assign RIASEC categories to occupations, and will be briefly described based on the work of Rounds, Smith, Hubert, Lewis and Rivkin, (1999).

The incumbent method uses individuals' RIASEC interest scores to code occupations. This method is closely related to Holland's idea that the people in the environment are the environment itself. In essence, this method involves the application of a RIASEC measure to a sample of people in an occupation, calculating mean RIASEC scores, and assigning high-point codes, usually three letter codes, to the occupation based on these average RIASEC scores. The first letter goes to the RIASEC category with the highest mean score among the sample, the second highest mean score determines the second letter, and the third highest mean score determines the third letter. Holland (1997) believes that the RIASEC codes from the incumbent method are the criterion against which to judge other methods for assigning RIASEC codes to occupations. The main disadvantage of the incumbent method is that it becomes impractical to extend Holland's classification to all occupation, because of reasons of cost and differentiation beyond several hundred occupations (Rounds et al., 1999).

To remedy this limitation Gottfredson and Holland (1996) used an empirical method to extend the RIASEC classification to a wider span of occupations. This method analyzes occupational data to assign RIASEC codes to a set of occupations. A discriminant function analysis is used to develop classification equations using occupational analysis data on a developmental sample of the given set of occupations that had been previously assigned single high-point RIASEC codes. These equations are then applied to new occupations, so it could be estimated the belonging probability of those occupations to each Holland category, to lastly assign a three-letter Holland code by using the RIASEC category with the highest classificatory function scores to determine the first letter, the second highest function score to determine the second letter, and the third highest function score to determine the third letter (Rounds et.al. 1999).

The main limitation of these approach is that the ordering of RIASEC codes, beyond the first letter may be arbitrary because some occupations have a strong resemblance only to one RIASEC environment and not to other environments, and this may

lead to arbitrary assignment of codes beyond the first letter, leading to less confidence in the ordering of the second and third-letter RIASEC codes.

1.2.3. Secondary Concepts

Besides the conceptualization of the main types for persons and environments, the RIASEC model also have the usually called secondary assumptions, used to evaluate the prediction of the outcomes resulting from the RIASEC person-environment fit (Ohashi, 2009). Three secondary concepts are important in Holland's theory: *congruence*, *identity* and *differentiation*.

Congruence is an important aspect of Holland's theory because it refers to the correspondence between an individual's personality profile and the profile of the environment. The term is generally used to suggest a degree of similarity between the individual and the requirements of the individual's chosen professional environment. In Holland's model, somebody is congruent when the vocational personality type is identical or highly similar to the work environment type, and quite the opposite is true: an individual is incongruent when the vocational personality type and the work environment are totally different. In the present study congruence refers to the degree of similarity between the student's career average profile and his own interest test profile. However, many indexes are used to assess congruence, that is, the match between the individual and the context (Hutchinson, 2014). There are a myriad of different indices which have been used to examine congruence, and there are some authors that had demonstrated that the support for the congruence–outcome relation varies with the congruence measure used (De Fruyt, 2002; Tsabari, Tziner, Elchanan & Meir, 2005). In general, the three most used congruence indices are: Holland's High Point Code (HPC) Agreement (Bowles, 2008), the Compatibility Index (Bowles, 2008), and Iachan's M Index (Iachan, 1990).

Secondly there is the *identity* concept. According to Ohashi (2009), identity refers to the clarity and stability of a person's goals and self-perceptions, and indirectly includes clarity and explicitness of the type of environment in which the person works and interacts better. The quantitative expression of this construct is expressed in an individual's score in an instrument made to that end, such as the Vocational Identity scale of My Vocational Situation (MVS; Holland, Daiger, & Power, 1980a, cited in Ohashi, 2009) or the Career Identity subscale of Career Development Scales for University Students (*Escalas de*

Desenvolvimento de Carreira para Universitários, Teixeira, 2010). Higher scores on either scales indicate stability of decision making and confidence in one's ability to make good decisions in the face of confusing environmental ambiguities. Conceptually, Holland (1997) proposed vocational identity as a construct closely related to personality patterns as expressed in a person's interest structure in terms of interest differentiation and consistency. Individuals with well-differentiated profiles should have more crystallized vocational identities and, as a result, make career choices with less difficulty.

Finally, the *differentiation* is a measure of the level of definition or distinctness of a person's test profile. Profiles are undifferentiated when there is little difference in the strength of a person's highest and lowest interests (Nauta & Kahn, 2007). Holland (1997) hypothesized that differentiated profiles are associated with greater clarity of career goals, stability of careers, and career satisfaction, and those with undifferentiated interest profiles may have difficulty choosing careers because they feel conflicted between multiple dissimilar interests or have difficulty prioritizing their interests.

Given the theoretical clarity and the well validated instruments constructed in accordance with the theoretical model, Holland's RIASEC have been widely applied in career counseling psychology and in vocational development research. Besides that, the theory's explanation potential come out to stimulate the development of new research topics, such as the relationship between vocational interest and the vocational aim selection (Bonitz, Larson, & Armstrong, 2010; Lent & Brown, 2006), research over the hexagonal structure of the model (Armstrong et al., 2008; Day & Rounds, 1998), among others.

The investigation of Holland's interest model have also been performed into different populations to determine if it is identifiable in the observed ordering and shape of the RIASEC configuration (for a Greek population example see Sidiropoulou, Mylonas, & Argyropoulou, 2008; for an Icelandic sample see Einarsdóttir, Rounds, Egisdóttir, & Gerstein, 2002). However, as Boerchi and Magnano (2015) point out, there are some investigations in which the structure of vocational types could not be described with the circular model (for examples see Darcy & Tracey, 2007; Turner & Lapan, 2003; du Toit & de Bruin, 2002; Glidden-Tracey & Parraga, 1996). So, the replicability of the hexagonal structure of the model in different samples is still a theoretical question that deserves further investigation.

1.3. O*NET Interest Profiler: History and Validity

In 1938, the U.S. government first published *The Dictionary of Occupational Titles* (DOT), a vocational lists and employment matching offered book, focused more in an industrial economy and emphasized more in blue-collar jobs. Updated periodically the DOT provided useful occupational information for many years.

But as the economy shifted more and more to an information and service demand, its usefulness decreased, and was established the need to set a plan to replace the book format of the DOT with an online database (Mariani, 1999). The public edition of the Occupational Information Network (O*NET) system came into public in 1998 to replace the DOT.

The O*NET system presents several differences from the DOT. The O*NET, being a digital database offers a flexible system, opposed to the "fixed format" of the DOT; also, the O*NET system is easier to update as new data is collected, and offers definitions based on incoming information from the labor market (Mariani, 1999).

The O*NET system nowadays includes the O*NET database, O*NET OnLine, and the O*NET Career Exploration Tools. The O*NET Database is a comprehensive source of descriptors, with ratings of importance, level, relevance or extent, for more than 900 occupations. O*NET descriptors include: skills, abilities, knowledge, tasks, work activities, work context, experience levels required, job interests, work values/needs, and work styles. Different tools and technology data provides information on machines, equipment, tools, and software that workers may use for optimal functioning in a high performance workplace. This ensures that O*NET information links directly to other labor market information, such as wage and employment statistics (Mariani, 1999).

The O*NET OnLine is a web-based viewer that provides information to explore occupations, to search for occupations that use designated skills, to browse occupations by high growth industry, to identify key in-demand occupations, to view occupation summaries and details, to use crosswalks from other classification systems such as military or apprenticeship finding corresponding O*NET occupations, to view related occupations, create and print customized reports outlining their O*NET search results, and link to other online information resources.

The O*NET Career Exploration Tools are a set of career exploration and assessment tools that help individuals to identify their work-related interests and abilities and what they consider important on the job, so that they can explore occupations that match their interests, abilities, and preferences. Among the Career Exploration Tools, the O*NET Interest Profiler (O*NET IP) is included.

The O*NET IP measures the six types of Holland occupational interests (Rounds et al., 1999). It is a self-scored interest assessment and has been adapted for computer-based assessments. During all stages of the development of the Interest Profiler, extensive efforts were made to include client and counselor input.

To construct the O*NET IP, a pool of 453 items was drawn from the USES Interest Inventory, the Interest Checklist, and the Job Search Inventory, all of them previously owned interest instruments of the US government agencies (Rounds et.al., 1999). After that, adding 288 new items to the initial pool of items, two pilot studies and a final study with 1123 individuals, was achieved The Interest Profiler with 30 items per RIASEC scale (called the Long Form) for a total of 180 items. The internal consistency reliabilities for the Long Form scales range from .95 to .97 (Rounds, Su, Lewis & Rivkin, 2010). Some studies were conducted to provide construct validity and reliability evidence (Rounds et.al., 1999; Rounds et al., 2010).

Based on an application of the Spearman-Brown formula to the reliabilities of the Interest Profiler, a decision was made to develop 10-item Interest Profiler RIASEC scales. According to Rounds et.al. (2010), the Short Form achieve Cronbach's Alpha for each of the subscales ranging from .78 to .87 ($M = .81$). The test-retest correlations for the Short Form ranged from .78 to .86 ($M = .82$) (Rounds et.al. 2010). All this results are considered acceptable for practical applications.

The O*NET IP has shown evidence of its validity and usefulness in a variety of research. For example, Tay, Drasgow, Rounds, and Williams (2009) made an analysis of the O*NET IP Long Form under a IRT ideal point model, and found that there was a fairly good model-data fit for the items. Also, Wille, Tracey, Feys and De Fruyt (2014) found moderate levels of stability in interests and occupations and that the person-environment fit measured by de O*NET IP maintained its congruence all over a 15 year-time interval.

Only one adaptation of the O*NET IP for other cultures was found, the work of

Mudarra Sanchez (2007), in the context of a validation study of the Self-Assessment System Career Areas of the Spain Educational System and Occupational National Classification. The RIASEC scales of the O*NET IP in this Spanish adaptation showed consistency coefficients in the range from .86 to .93. In the same study, the author used the SDS for convergent validity evidence, and found out acceptable indicators of convergence between the instruments (Mudarra Sanchez, 2007).

As part of the processes of career counseling, career assessment is considered a procedure of information gathering, aimed to achieve self-knowledge and a vital project planning, that extend throughout the life and the contexts in which the individual develops, being flexible enough to incorporate all relevant information that allows him or her to take advantage of the possibilities of the environment and optimize the occupational decision processes. In order to achieve that goal, resources that improve the level of vocational information are necessary. Therefore, career assessment instruments should be considered as useful tools. As Mudarra Sanchez (2007) indicates, the purpose of using assessment instruments in career counseling is to open new possibilities for the client to explore, to encourage self-reflection, to facilitate the follow-up of the personal trajectory, helping the client to find his or her own answers.

Research on the Holland model in Brazil suffer from a lack of instruments with robust evidences of validity. Only recently the most used international instrument related to the model, the Self-Directed Search (SDS), was published in the country (Primi et al., 2010), but the available version is primarily aimed at high school students. Moreover, the size and cost of the SDS do not stimulate its use in research. Another published instrument by Teixeira, Castro and Cavalheiro (2008) did not reproduce faithfully the model of the hexagonal structure. So, the career counseling area could benefit if there was a public domain tool that could be used in research.

1.4. Instrument Validation: General Overview

The general concept of validity has been defined in many ways. For example, for Brown (1996) it is considered as "the degree to which a test measures what it claims, or purports, to be measuring" (Brown, 1996, p. 231). Validation has also been considered as the process of collecting enough evidence to verify that an instrument measures the

construct what it is intended to measure (Adáñez & González, 2010) or the degree to which accumulated evidence and theory support a specific interpretation of test scores for a given use of a test (APA, AERA & NCME, 2014). In general, these definitions highlight the prominence of both evidence and theory to support inferences and interpretations of test scores. The *Standards for Educational and Psychological Testing* (AERA et al., 2014) points out five main sources of validity evidence that can be used to evaluate a proposed interpretation of test scores: Validity evidence based on test content, on internal structure, on response processes, on relations to other measures, and on testing consequences

As would be seen, a single validation source cannot provide a conclusive body of evidence to support the use of a test for a particular purpose. However, by understanding all five sources of validity evidence, assessment users can be empowered to conduct research to develop a sound validity argument. Here is going to be taken into account five articles, each one describing one source of validity evidence: the article of Sireci and Faulkner-Bond (2014) that describes the various conceptualizations of validity evidence based on test content; the article of Rios and Wells (2014) that focus on validity evidence based on internal structure; the article of Oren, Kennet-Cohen, Turvall, and Allalouf (2014) that focus on validity evidence based on relations to other variables; the article of Lane (2014), that focus on a relatively new conceptualization of a source of validity—validity evidence based on testing consequences; and the article of Padilla and Benitez (2014) that focus on one of the most difficult sources of validity evidence to gather and analyze—validity evidence based on response processes.

1.4.1. Validity evidence based on test content.

To understand what validity evidence is, it is first necessary to keep on mind what a construct is. A psychological construct refers to something that is not itself directly measurable but rather must be inferred from their observable effects on behavior (Adáñez & González, 2010).

Validity evidence based on test content, commonly named “content validity,” will represent the foundation of any validity argument about the use and the inferences of the scores with respect to the targeted domain. It is composed by four elements: domain definition, domain representation, domain relevance, and appropriateness of test construction procedures, which configure a framework to evaluate the content of any test

(Sireci & Faulkner-Bond, 2014).

A *domain definition* provides the details about what the test intent to measure and so it transforms the theoretical construct to a more concrete content domain. In order to evaluate domain definition, it's required to get external consensus that the operational definition underlying the test match with the prevailing concepts of the domain held by experts in the field (Sireci & Faulkner-Bond, 2014).

The *domain representation* refers to the degree to which the construct, as defined by the theory and in the test specifications, is adequately characterized by the measures (Sireci & Faulkner-Bond, 2014).

The *domain relevance* focuses on the extent to which the test's items are relevant to the targeted construct or domain. Each item should measure an important aspect of the content domain, and so it would receive high ratings with respect to domain representation, but if the item is only tangentially related to the domain, it would receive low ratings with respect to relevance (Sireci & Faulkner-Bond, 2014).

Finally, the *appropriateness of test construction procedures* refers to all processes and techniques used in the test construction that ensures that test content faithfully represents the construct intended to be measured, and that also does not measure irrelevant material (Sireci & Faulkner-Bond, 2014). It can be warranted if there are strong quality control procedures during the test development, and also if there is a well-built rationale for the item formats used on the test.

In order to evaluate the degree to which the content of an assessment is congruent with the testing purposes, there are a variety of methods that could be used, but in general, almost all methods involve "subject matter experts" (SMEs). The main difference that could be found between methods will essentially stem from (a) the tasks presented to the experts, (b) the type of analysis that is going to be driven from the data, (c) the level of detail in the content domain that is the focus of the analysis, and (d) how the data is summarized (Sireci & Faulkner-Bond, 2014).

1.4.2. Validity evidence based on internal structure.

According to Rios and Wells (2014), evidence based on internal structure is the support of the relationships among items and components of the selection procedures, or

scales measuring an intended constructs. To assess internal structure, there are three basic aspects: dimensionality, measurement invariance, and reliability.

When assessing *dimensionality*, the main objective is to found if the inter-relationships among the items support the intended test scores that will be used to draw inferences (Rios & Wells, 2014). So, a test that aims to report one composite score is supposed to be unidimensional. The most common statistical method used to assess the dimensionality is factor analysis, but there are also other methods, such as multidimensional scaling, that can provide visual representations emphasizing the continuous nature of interrelations among variables. (Tucker-Drob & Salthouse, 2009).

For *measurement invariance*, the evidence that is look forward should support the idea that the item characteristics (e.g., item discrimination) are comparable, or are fair across different groups such as sex or race (Rios & Wells, 2014). Psychometrically speaking, fairness could be defined as the absence of systematic bias (measurement invariance). Bias is the technical term that comes about when there are systematic deficiencies in the test that lead to differential interpretation of scores by subgroup (Rios & Wells, 2014). There are various levels of invariance such as configural invariance, metric invariance, scalar invariance, strict factorial invariance and item uniqueness.

The last aspect, *reliability*, provide evidence to consider that, under the same administration conditions, the test scores are consistent across repeated applications (Rios & Wells, 2014). Even though there are many different methods to estimate reliability of a composite or subscale score, Cronbach's α coefficient is arguably the most commonly used statistic. Reliability itself is not an evidence of validity but is a necessary condition for a measure to be considered valid.

1.4.3. Validity evidence based on relationships to other variables

Evidence of the relation of test scores to a relevant criterion will looks towards how accurately do test scores predict a specific criterion performance (Oren et al., 2014). That criterion variable should be a determined measure of some attribute or outcome that is of primary interest to the test users. Those variables can include criteria that the measure is designed to predict, that predict or even cause the measure, and other measures that are designed to assess similar constructs to the one is ought to be measured (McCoach, Gable,

& Madura, 2013). For example, the university grades could serve as an external criterion, in relation to which the validity of a selection system can be evaluated.

As the aforementioned kinds of validity evidence, it is important that the measures also exhibit patterns of external relationships to specified variables, such as scales from other known tools, or other external criteria, consistently with theoretical expectations (McCoach et. al., 2013).

Statistics as multiple linear regression, simple and multiple correlations, the multitrait-multimethod matrix (MTMM) and Structural Equation Modeling could be some of the main tools used to study validity evidence based on relations to other variables.

1.4.4. Validity evidence based on testing consequences.

Consequential validity in testing describes the intended and unintended aftereffects and possible social and societal results from a particular assessment or measure when used for a particular purpose (Lane, 2014). In order to find out if an assessment tool has consequential validity, in general the developers or user should look after negative social consequences that seem abnormal. If this kind of events takes place, it suggests that the tool is not valid or is not measuring things accurately. Conversely, the use of a test is said to have consequential validity to the extent that society benefits from that use of the test (Lane, 2014).

However, the social consequences of using a test as an aspect of validity had been questioned by authors such as Pophom (1997), who claims that the inclusion of consequences in determining validity would only confuses, rather than clarifies, the soundness of the measurement. For a start, the solely task of connecting a test to its intended goal is already a difficult task, then connecting a cause-effect model of test to the unintended consequences is hard to establish, as there may be infinite events that can affect human behaviors, besides than the test itself. Another point to take into account is that the impacts of the intended use may take some time to be evident, and it wouldn't be clear how long should be the waiting period (Pophom, 1997).

1.4.5. Validity evidence based on response processes

Evidence of validity based on response processes concerns an examination of the

extent to which the cognitive skills and processes identified in the test developer's defined construct domain are prompted at the moment of taking the assessment (Padilla & Benitez, 2014). For example, if a test allegedly elicits evidence of students' critical evaluative thinking about evidence-based arguments, during the test the test applicants should be engaged in the cognitive process of examining argument claims, evidence, and warrants, and the relevance, accuracy, and sufficiency of evidence.

Padilla and Benitez, (2014) point out that often the evidence is gathered through methods that implies respondent think-aloud procedures, where respondents verbally explain and rationalize their thought processes and responses concurrently during the test completion. One method is protocol analysis, in which respondents think aloud their solution processes as they solve problems, or retrospectively. Another method is the analyses of students' rationales for their answers and ways of responding (analyses of reasons). A third method is the analysis of errors, in which the researcher draws inferences about processes from incorrect procedures, concepts, or representations of the problems.

In general, this kind of evidence is collected in the field of educational testing, as the rationale for the test use and score interpretation depends on premise about the cognitive operations used by examinees.

As seen, taken together these five sources of evidence illustrate approaches to validation that are instructive for test developers and researchers. They illustrate not only the comprehensiveness of the different approaches, but also the possibilities available to reinforce the trustworthiness on the tools developed for different purposes.

2. The present study

The broad purpose of this study was to adapt to Brazilian Portuguese the O*NET *Interest Profiler - Short Form*, and obtain evidences of validity and reliability for the instrument. Validity evidence based on internal structure was explored using two procedures to check the dimensionality of the instrument: Principal Component Analysis was employed in order to check if the proposed items could be organized according to the six RIASEC dimensions, and Multidimensional Scaling was used to verify if the six types could be organized according to the hexagonal structure proposed by the theory.

Validity evidence based on relationships with other variables was explored in two

ways: correlating secondary measures derived from the instrument (congruence and differentiation) with career identity; and comparing specific pairs of groups on each scale (R, I, A, S, E, C). Based on theory, two correlational evidences were expected: a moderate or small positive correlation among career identity and congruence, as the model would predict higher career identity levels in the situation of high person-environment congruence; and a moderate or small positive correlation between career identity and differentiation, as the theory predicts higher career identity in the situation when the individual manifest a more distinct profile of interests. The expectation for a moderate magnitude for both correlations instead of a higher one is driven by the ideas of Tracey (2007), who points out that it is frequently found a modest relation between person-environment congruence and different occupational outcomes, and proposes the reason of this on possible moderators of this relation, such as individual differences, environmental differences and changes across time between the subject and the context. The other evidence of validity based on relationships with other variables was obtained contrasting pairs of programs that supposedly should present statistically significant mean differences in each dimension of the model (more details described in results section).

2.1. Aims of the Study

2.2.1. General Purpose

This study proposes to adapt to Brazilian Portuguese the *O*NET Interest Profiler - Short Form*, an instrument issued by the US Department of Labor/Employment and Training Administration (USDOL/ETA) (<http://www.onetcenter.org/overview.html>).

2.2.2. Specific Purposes

In detail, this study aims to:

- a) translate and adapt to Brazilian Portuguese the *O * NET Interest Profiler - Short Form*, applying it to a sample of undergraduate students;
- b) provide validity evidence based on internal structure of the instrument assessing the dimensionality by factor analysis (it is expected to emerge the six factors of the theory);
- c) validity evidence based on internal structure assessing the reliability of the obtained scales;

- d) provide validity evidence based on internal structure assessing the dimensionality by investigating the adequacy of the data to the hexagonal model proposed by the theory,
- e) provide validity evidence based on relations to other variables by checking the relationship between career identity with the differentiation profile obtained with the instrument;
- f) provide validity evidence based on relations to other variables by checking the relationship between career identity with the person-environment congruence index obtained with the instrument;
- g) provide validity evidence based on relations to other variables by checking the discriminative power of the instrument, discerning between groups of students from different graduate programs.

3. Method

(Nota: Metodos suprimidos desta versão, pois serão publicados como artigo.)

4. Results

(Nota: Resultados suprimidos desta versão, pois serão publicados como artigo.)

5. Discussion

The aim of this study was to adapt to Brazilian Portuguese and obtain some initial evidences of validity for the O*NET – IP Short Form, and examine the structure of interests in a sample of university students, in order to determine the relative fit of the RIASEC hexagon, and therefore validity, of Holland's (1997) structural model as operationalized by the O*NET-IP. The inclusion of experimental items led to the final result of two instruments, the O*NET-IP with 30 items (five per type), and the Brazilian Interest Profiler (BIP) with 48 items (eight per type), in which both original O*NET-IP items and several VIS and new items take part.

The results of this study partially support the validity of Holland's model in Brazil, as the exploratory factor analysis and the reliability analysis for both versions provided validity evidence for the internal structure, concretely about the existence of the six types of the Holland model of occupational interests. Also, in both instruments, some results were in accordance with expectations from theory and empirical research, such as the gender differences, with men presenting higher scores in Realistic, Entrepreneur and Conventional

types, and women higher scores in Social type. These results are somehow similar to those found by Okino (2009) in a Brazilian sample, who found that the Realistic, Entrepreneur and Conventional types were predominant in the male sample, and for the female sample the predominant type was Social.

Another theoretical expectancy confirmed in the study that added validity evidence based the relationship of the RIASEC types with other variables, was the low to moderate size association between some secondary concepts measured by the instrument (congruence and differentiation), and another secondary concept, namely vocational identity, as an external criterion. In fact, both measures of congruence and differentiation correlated low or moderately with vocational identity, except in the case of differentiation level in the O*NET-IP instrument. These results are similar to others already published in the literature (Rose & Elton, 1982, Nauta & Kahn, 2007, Hirschi, 2011). This suggests that people who perceive themselves more similar to their environments and have a more differentiated idea of their interests also have more certainty of their career objectives and a sense of belonging to the profession.

Also, the contrasts between the programs, although limited, provide some initial evidence about the power of the instrument to differentiate diverse occupational groups. In both instruments, significant differences were found for all scales of the RIASEC model, providing evidence of validity for the instrument. It is also interesting to notice that, although there were found gender differences for three out of six RIASEC types, gender effects were not confounded with major effects when pairs of majors were compared.

However, there are other findings that drawback the validity of the O*NET IP and de BIP instruments. One objective of the study was to provide additional validity evidence based on the dimensionality structure of the test, checking if the RIASEC structure, as operationalized in the instruments could be represented by the data. The expectation was to obtain the hexagonal structure proposed by theory and reported in several studies (Gupta, Tracey & Gore, 2008; Hedrih, 2008). According to the result of the MDS in this study, this expectation was not met. It seems that a circular model is somehow organized, but the circular arrangement does not fit the theoretical configuration (R-I-A-S-E-C).

The first difference between the research results and the theory expectative that appears may be the RIASEC hexagonal arrangement in the studied sample, specifically the

order of the Artistic and Social types in the O*NET-IP, and the Realistic and Conventional types in the BIP. Similar results are found in the work of du Toit, and de Bruin (2002), who worked with a South African sample. And, as in this work, only one of the solutions, correspondent to the women's sample, approximated the hexagonal shape in the expected order. The reported findings may confirm Holland's assumptions that the hexagonal model, with real-world data, would look more like a distorted polygon than a regular hexagon (Holland, 1997). But why do the types are switching places in both versions? One possible explanation could be placed on the uncanny mean and standard deviation values for the Realistic and Conventional types. It seems that the items in both instruments were way underscored, compared to the other types, and the variance of this answer pattern was quite low. This could be a sign of social undesirability of both types, or of the activities related in the items in them. Du Toit, and de Bruin (2002) hypothesized, explaining the "ubuntu" concept, that cultural values may influence the way that individuals organize occupational mental concepts, and how they are placed in it. It could be possible that the meaning of the six vocational personality types in the Brazilian culture or context may be different from the meaning of the types in the U.S. or European countries.

But besides the order, the other piece of evidence to be taken into account in the MDS analysis is the Young Stress values in all six arrangements evaluated, all of them above the cut-values considered minimally acceptable, which means that there's a discrepancy between the values gathered in the research and the values that would be expected under the model in question. This evidence could be joined to the suggestion made by the Parallel Analysis in the Principal Components Analysis. The Parallel Analysis is a simulation technique that compares the observed eigenvalues extracted from the correlation matrix to be analyzed with those obtained from uncorrelated random generated normal variables, in order to suggest the number of factors to retain. In the Parallel Analysis performed in this work, it was recommended seven factors (for the O*NET-IP) or nine factors (for the BIP), indicating that maybe there is still valuable information that is not gathered by the six-factor model. Okino (2009) also found a low percentage (33.5%) of explained variance in her factorial analysis of the Self-Directed Search (another RIASEC instrument), which suggests that six factors are not sufficient to explain a large amount of variance present in interest inventories. But in her study it is also appealing the fact that,

while the variance explained is low, the grouping results were coherent with the theory content of each type.

The main goal when building a model such as the RIASEC is to explain and predict phenomena in a parsimonious way. However, in this process, some information is lost in name of efficiency. An alternative to expand the RIASEC model without changing its essence could be to use the concept of facets as used initially in the Big Five personality model (Costa & McCrae, 1995). A facet is the term designated to a unique lower level trait grouping into a broader personality trait. The facets and the factor are organized hierarchically, with the narrower, more specific traits combining to define a broader, more global factor. These kind of strategy could be useful to keep the broad overview of interest dimensions that is valuable in the six-factor RIASEC model in research terms, but if one's theoretical or pragmatic requirement ask for more details, or a more differentiated perspective, maybe the facet strategy should become an alternative to be considered.

Another alternative hypothesis is that the context, maybe even over the culture, might also moderate the structure outcome. Holland's interest model has been performed into different populations to determine if it is identifiable in the observed ordering and shape of the RIASEC configuration. Nevertheless, as Boerchi and Magnano (2015) has pointed out, there are some investigations in which the structure of vocational types could not be described with the circular model (for examples see Darcy & Tracey, 2007; Turner & Lapan, 2003; du Toit & de Bruin, 2002; Glidden-Tracey & Parraga, 1996).

The investigations of Rounds and Tracey (1996) and Gupta et al., (2008) may help to shed some light on this issue. Rounds and Tracey (1996) conducted a structural meta-analysis to evaluate the fit of Holland's circular order model for 20 U.S. ethnic matrices, 76 international matrices, representing 18 countries, and a U.S. benchmark sample of 73 matrices. Fifteen of the eighteen countries failed to follow the model and potential moderators such as cultural values did not explain model differences between countries. The authors raised questions about how well the circumplex-hexagonal model describes interest structure for non-US samples. These is a contrasting result to the research of Gupta, et al., (2008) who examined the structural validity of Holland's interests model, as assessed by the UNIACT-R, across five racial/ethnic groups (Caucasian/Euro-Americans, African Americans, Asian Americans, Latinos, and Native Americans), but this time in the

population of high school juniors in two states in the United States. The results indicated that no differences in fit were found across ethnicity, supporting the usage with U.S. ethnic groups.

As a conclusion, two RIASEC- based instruments, the Brazilian O*NET-IP and de BIP, presented in this paper were designed for research and practice purposes, but in their current form, evidence shows that if they are meant for use in career counseling and other basic or applied settings, they should be used with caution. Although evidences of validity have been found based on relations to other measures (vocational identity) and on the discriminative power of the scales (major differentiation), validity evidence based on internal structure seems to be ambiguous (PCA supports the model but MDS does not support the hexagonal organization), putting the suitability of the use under doubt for the Brazilian population, at least for now.

The purpose in adapting the O*NET IP to Brazilian Portuguese is not to fill in the function of commercial test, but instead to enhance the construction of both research and commercial measures with a set of scales that are more suitable for a wide range of purposes. There are a number of issues that need to be addressed in future research. Foremost is the question of why the RIASEC structure is not replied neither by the O*NET-IP nor the BIP scores. Are there additional basic interests that are important for studying careers? Is it an issue related to the sample? Or it is about the context? These results may speak about the need for emic investigations based on how Brazilians evaluate vocational interest.

Another issue that requires further investigation is the replicability of the model in other samples of the Brazilian population. Most research about vocational interests in Brazil is based on high school and university students; there is a need to recruit samples from a variety of settings. In addition to providing validity evidence for the RIASEC model, research with diverse populations also provides answers to important questions about the role of culture and social factors in the development of vocational interests.

Some limitations of this study should be noted in order to provide a context for the results of the study. First, the range of the sample was restricted to one university, Federal University of Rio Grande do Sul, leaving behind other populations that could show interesting results, as working professionals or high school students. Also, investigating

people who are in different moments of career development, like exploration or establishment phases of career, may provide different information. The generalizability may be highly restrictive, insofar as regional differences may affect how members of various groups develop vocational interests. Also, the results indicate support for Holland's model as operationalized by the instruments. However, as there are not many alternatives to study vocational interest measures in Brazilian Portuguese, testing and scrutiny may need to be continued in this instrument.

6. References

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Appendix A: Ficha de Caracterização da Amostra

Este questionário faz parte de um estudo sobre desenvolvimento de carreira de estudantes universitários. Gostaríamos de contar com a sua colaboração para responder com atenção a todas as questões. É **MUITO IMPORTANTE** que você seja sincero ao responder. Todas as informações são anônimas.

1. Idade: _____ 2. Sexo: Feminino Masculino 3. Número de irmãos e/ou irmãs: _____ (indique zero se não tiver irmãos ou irmãs)
4. Sua posição entre os irmãos ou irmãs: é filho(a) único(a) é o(a) mais novo(a)
 é o(a) mais velho(a) está entre o mais novo e o mais velho
5. Escolaridade do pai: 1º grau incompleto (ou equivalente)
 1º grau completo (ou equivalente)
 2º grau incompleto (ou equivalente)
 2º grau completo (ou equivalente)
 3º grau incompleto (faculdade incompleta)
 3º grau completo (faculdade completa)
6. Escolaridade da mãe: 1º grau incompleto (ou equivalente)
 1º grau completo (ou equivalente)
 2º grau incompleto (ou equivalente)
 2º grau completo (ou equivalente)
 3º grau incompleto (faculdade incompleta)
 3º grau completo (faculdade completa)
7. Renda familiar aproximada (pode incluir sua renda própria, se for o caso): até 500 reais de 501 a 1000 reais de 1001 a 1500 reais de 1501 a 2000 reais de 2001 a 2500 reais de 2501 a 3000 reais de 3001 a 3500 reais de 3501 a 4000 reais de 4001 a 4500 reais de 4501 a 5000 reais de 5001 a 5500 reais de 5501 a 6000 reais de 6001 a 6500 reais de 6501 a 7000 reais acima de 7000 reais
8. Você é o primeiro em sua família de origem (pai, mãe, irmãos) a cursar uma faculdade? Sim Não
9. Atualmente você mora: com os pais (ou um dos pais) com amigos com família própria
 com outros parentes em casa de estudante (companheiro/a e/ou filhos)
 sozinho(a) em pensão
10. Curso que frequenta: _____ 9. Ano de ingresso: _____
11. Qual semestre você está cursando (aproximadamente)? _____
12. Este curso é a sua opção de curso preferencial no momento (o curso que você mais queria fazer)? Sim Não
13. Você já iniciou algum outro curso superior? não, este é o meu primeiro curso sim, e estou cursando
 sim, mas abandonei sim, e já concluí
14. Você exerce trabalho remunerado regular (exceto bolsas e estágios)? Sim Não
15. Se exerce trabalho remunerado (exceto bolsas e estágios), qual sua carga horária semanal? _____
16. Qual é, em média, o seu desempenho no seu curso, em termos percentuais de aproveitamento? (assinale apenas uma)
 inferior a 50% de 50 a 59% de 60 a 69% de 70 a 79% de 80 a 89% de 90 a 100%
17. Você participa ou participou de pesquisas em seu curso como aluno assistente de pesquisa (bolsista ou não)? Sim Não Se sim, por quantos meses? _____
 Sim Não Se sim, por quantos meses? _____
18. Você participa ou participou de atividades de extensão em seu curso? Sim Não Se sim, por quantos meses? _____
19. Você participa ou participou de estágios extracurriculares em seu curso?

Appendix B: O*NET Perfil de Interesses - Forma Reduzida

O*NET Interest Profiler Short Form

Read each question carefully and decide how you would feel about doing each type of work:

1	2	3	4	5
Strongly Dislike	Dislike	Unsure	Like	Strongly Like

Realistic	
Build kitchen cabinets	1 2 3 4 5
Lay brick or tile	1 2 3 4 5
Repair household appliances	1 2 3 4 5
Raise fish in a fish hatchery	1 2 3 4 5
Assemble electronic parts	1 2 3 4 5
Drive a truck to deliver packages to offices and homes	1 2 3 4 5
Test the quality of parts before shipment	1 2 3 4 5
Repair and install locks	1 2 3 4 5
Set up and operate machines to make products	1 2 3 4 5
Put out forest fires	1 2 3 4 5
Investigative	
Develop a new medicine	1 2 3 4 5
Study ways to reduce water pollution	1 2 3 4 5
Conduct chemical experiments	1 2 3 4 5
Study the movement of planets	1 2 3 4 5
Examine blood samples using a microscope	1 2 3 4 5
Investigate the cause of a fire	1 2 3 4 5
Develop a way to better predict the weather	1 2 3 4 5
Work in a biology lab	1 2 3 4 5
Invent a replacement for sugar	1 2 3 4 5
Do laboratory tests to identify diseases	1 2 3 4 5
Artistic	
Write books or plays	1 2 3 4 5
Play a musical instrument	1 2 3 4 5
Compose or arrange music	1 2 3 4 5
Draw pictures	1 2 3 4 5
Create special effects for movies	1 2 3 4 5
Paint sets for plays	1 2 3 4 5
Write scripts for movies or television shows	1 2 3 4 5
Perform jazz or tap dance	1 2 3 4 5
Sing in a band	1 2 3 4 5
Edit movies	1 2 3 4 5
Social	
Teach an individual an exercise routine	1 2 3 4 5
Help people with personal or emotional problems	1 2 3 4 5
Give career guidance to people	1 2 3 4 5
Perform rehabilitation therapy	1 2 3 4 5
Do volunteer work at a non-profit organization	1 2 3 4 5
Teach children how to play sports	1 2 3 4 5

Teach sign language to people with hearing disabilities	1	2	3	4	5
Help conduct a group therapy session	1	2	3	4	5
Take care of children at a day-care center	1	2	3	4	5
Teach a high-school class	1	2	3	4	5
Entrepreneur					
Buy and sell stocks and bonds	1	2	3	4	5
Manage a retail store	1	2	3	4	5
Operate a beauty salon or barber shop	1	2	3	4	5
Manage a department within a large company	1	2	3	4	5
Start your own business	1	2	3	4	5
Negotiate business contracts	1	2	3	4	5
Represent a client in a lawsuit	1	2	3	4	5
Market a new line of clothing	1	2	3	4	5
Sell merchandise at a department store	1	2	3	4	5
Manage a clothing store	1	2	3	4	5
Conventional					
Develop a spreadsheet using computer software	1	2	3	4	5
Proofread records or forms	1	2	3	4	5
Load computer software into a large computer network	1	2	3	4	5
Operate a calculator	1	2	3	4	5
Keep shipping and receiving records	1	2	3	4	5
Calculate the wages of employees	1	2	3	4	5
Inventory supplies using a hand-held computer	1	2	3	4	5
Record rent payments	1	2	3	4	5
Keep inventory records	1	2	3	4	5
Stamp, sort, and distribute mail for an organization	1	2	3	4	5

Appendix C: Career Identity subscale

Responda os itens abaixo marcando (com um X) o número que melhor representa a sua opinião, de acordo com a chave de respostas. Você pode usar os números 1, 2, 3, 4 ou 5, dependendo do quanto você acha que cada afirmação corresponde ao modo como você pensa, sente ou age. Se você acha que a sentença é falsa a seu respeito, marque "1". Se você acha que a frase é verdadeira, marque o "5". Se você considerar que a frase não é falsa nem verdadeira, marque "3". Considere que quanto mais você acha que a frase é verdadeira a seu respeito, maior deve ser o valor a ser marcado na escala (respostas 4 e 5); quanto mais você achar que a frase é falsa a seu respeito, menor será o valor a ser registrado na escala (respostas 1 e 2). Note que todos os valores da escala podem ser marcados. Não existem respostas certas ou erradas. É importante que as suas respostas sejam sinceras e que você responda de acordo com o modo como você se sente, pensa ou age no momento atual. Por favor, responda a todos os itens.

A frase é totalmente falsa a seu respeito (não corresponde de maneira alguma ao modo como você se sente, pensa ou age)	1	2	3	4	5	A frase é totalmente verdadeira a seu respeito (corresponde perfeitamente ao modo como você se sente, pensa ou age)
---	---	---	---	---	---	--

1	Eu escolheria outra carreira profissional se pudesse voltar no tempo.	1	2	3	4	5
2	Fico imaginando se outras profissões não estariam mais de acordo com meus interesses e valores.	1	2	3	4	5
3	Tenho dúvidas se realmente quero seguir carreira na profissão que escolhi.	1	2	3	4	5
4	Eu me sinto satisfeito e tranquilo com minha opção profissional.	1	2	3	4	5
5	Eu me sinto comprometido e envolvido com a minha opção profissional.	1	2	3	4	5
6	Eu consigo me imaginar no futuro trabalhando na profissão que escolhi.	1	2	3	4	5
7	Trabalhar na profissão que escolhi é muito importante para minha realização pessoal.	1	2	3	4	5
8	Eu não me sinto motivado com a carreira profissional que escolhi para mim.	1	2	3	4	5

Appendix D: Termo de Concordância Institucional para Realização de Pesquisa

Autorizo a realização, no âmbito do curso de _____ (nome do curso) da _____ (nome da instituição) da pesquisa “Adaptação para o português e validação inicial do Perfil de Interesses O*NET Forma Reduzida [O*NET Interest Profiler - Short Form] em uma amostra de universitários”, coordenada pelo professor Marco Antônio Pereira Teixeira, do Instituto de Psicologia da UFRGS, conforme consta no projeto encaminhado pelo coordenador.

Data: ____ / ____ / ____

Responsável: _____

Appendix E: Termo de Consentimento Livre e Esclarecido

Estamos realizando uma pesquisa a fim de adaptar um instrumento (escala) que avalia interesses ocupacionais. Para tanto estamos aplicando um questionário que pedem alguns dados sociodemográficos e que avaliam as três dimensões mencionadas (planejamento de carreira, personalidade e auto-eficácia). O questionário leva cerca de quarenta minutos para ser respondido e não pede identificação nominal, garantindo a privacidade das informações fornecidas por você. Embora este estudo não traga nenhum benefício direto aos participantes, a sua colaboração poderá contribuir para a construção do conhecimento científico e beneficiar perspectivas de intervenção psicológicas futuras. O único incômodo previsto é o de disponibilizar algum tempo para responder ao questionário. A participação na pesquisa é totalmente voluntária. Esta pesquisa é coordenada pelo Prof. Marco A. P. Teixeira, do Instituto de Psicologia da UFRGS, com quem podem ser obtidas maiores informações (Rua Ramiro Barcelos, 2600 sala 117, Bairro Santana, Porto Alegre, RS - e-mail: mapteixeira@yahoo.com.br ou telefone: 51 33085454). Se você tiver dúvidas em relação à pesquisa ou quiser comentar algum aspecto relacionado à mesma pode perguntar ao aplicador do questionário ou contatar o pesquisador responsável. A participação na pesquisa é voluntária. Portanto, caso não queira responder ao questionário, você não precisa assinar este termo nem participar da pesquisa. O fato de não querer participar da pesquisa não lhe trará nenhum prejuízo. Como se trata de um instrumento anônimo, não há possibilidade de fazer nenhuma devolução de resultados individuais. No entanto, os resultados globais da pesquisa serão publicados posteriormente em algum periódico ou evento científico da área de psicologia. Este documento foi revisado e aprovado pelo Comitê de Ética em Pesquisa do Instituto de Psicologia da Universidade Federal do Rio Grande do Sul (Rua Ramiro Barcelos, 2600, Bairro Santana, Porto Alegre, RS - fone 51 33085441, e-mail: cep-psico@ufrgs.br).

Pelo presente Termo de Consentimento, eu, _____ declaro que sou maior de 18 anos e que fui informado dos objetivos e da justificativa da presente pesquisa, e estou de acordo em participar da mesma. Fui igualmente informado: a) da liberdade de participar ou não da pesquisa, bem como do meu direito de retirar meu consentimento, a qualquer momento, e deixar de participar do estudo, sem que isso me traga qualquer prejuízo; b) da garantia de receber resposta a qualquer dúvida acerca dos procedimentos e outros assuntos relacionados com a pesquisa; c) da segurança de que não serei identificado e de que se manterá o caráter confidencial das informações registradas; d) que as informações obtidas com os questionários serão arquivadas sem identificação pessoal junto ao banco de dados do pesquisador responsável no Instituto de Psicologia (sala 117) da Universidade Federal do Rio Grande do Sul, ficando disponíveis para futuras análises; e) que os questionários respondidos serão arquivados sob a guarda do pesquisador responsável por cinco anos e depois destruídos.

Data ___/___/___ Assinatura do participante: _____

Assinatura do pesquisador responsável: _____

Appendix F: Compatibility Index

Score	Decision Rule
8	The letters and ordering of both codes match exactly (e.g., ASE – ASE).
7	The first letters match. The second and third letters of one code are reversed in the other code (e.g. ASE – AES), or the first and second letters of both codes match in the same order (e.g., ASE – ASI).
6	All three letters of both codes match, but the first letters are not the same (e.g., ASE – SEA)
5	The first letters match, with the second or third letter of one code matching the third letter of the other code (e.g., ASE – AIS), or the first and second letters match in reverse order (e.g., ASE – SAI), or the first and second letters of one code match the first and third letters of the other code in reverse order (e.g., ASE – SIA).
4	The first and second or third letters of one code match any two letters of the other code in any order (e.g., ASE – SIA), or the first letter of one code matches the first letter of the other code (e.g., ASE – AIR).
3	The second and third letters of one code are found in the other code in any order (e.g., ASE – EIS), or the first letter of one code matches the second letter of the other code (e.g., ASE – RAC).
2	The first letter of one code matches the third letter of the other code (e.g., ASE – RCA), or the second letter of one code matches the second or third letter of the other code (e.g., ASE – IRS).
1	The third letters of both codes match (e.g., ASE – ICE).
0	No letters match in either code (e.g., ASE – CRI).

Calculation example: CAE – CRI

The types in the first-letter positions match each other (i.e., C).

The second and third letters of the codes (i.e., A, E, R, I) are unique and do not match in any combination.

The CI calculation of CAE – CRI therefore equals a congruence score of 4.

Appendix G: Iachan's M Index

	First Letter	Second Letter	Third Letter	Other Letter
First Letter	22	10	4	0
Second Letter	10	5	2	0
Third Letter	4	2	1	0

Calculation example: CAE – CRI

The types in the first-letter positions match each other (i.e., C) = 22

The second letter of the code (i.e., A) is unique and do not match in any combination = 0

The third letter of the codes (i.e., E) is unique and do not match in any combination = 0

The M calculation of CAE – CRI: $22 + 0 + 0 = 22$

Appendix H: Research Ethics Committee Approval

Imprimir

<https://br-mg6.mail.yahoo.com/neo/launch?.rand=a71o01soahon4#mai>

Assunto: Projeto de pesquisa na Comitê de Ética em Pesquisa do Instituto de Psicologia

De: cep-psico@ufrgs.br (cep-psico@ufrgs.br)

Para: mapteixeira@yahoo.com.br;

Data: Terça-feira, 7 de Maio de 2013 16:42

Prezado Pesquisador MARCO ANTONIO PEREIRA TEIXEIRA,

Informamos que o projeto de pesquisa Adaptação para o português e validação inicial do Perfil de Interesses O*NET Forma Reduzida em uma amostra de universitários, encaminhado para análise em 30/03/2013, foi aprovado pelo Comitê de Ética em Pesquisa do Instituto de Psicologia com o seguinte parecer:

Projeto Aprovado pela Plataforma Brasil.

Atenciosamente,

Comitê de Ética em Pesquisa do Instituto de Psicologia

Appendix I: O*NET – IP Authors' Authorization

Enc: Permission to translate RIASEC scales in Brasil

Marco Teixeira <mapteixeira@yahoo.com.br>
 Responder a: Marco Teixeira <mapteixeira@yahoo.com.br>
 Para: Sergio Armando Lopez Castillo <salopezca@unal.edu.co>

8 de marzo de 2016, 13:14

Prof. Marco A. P. Teixeira
 UFRGS - Instituto de Psicologia
 NEIC - Núcleo de Estudos e Intervenções em Carreira (www.ufrgs.br/neic)
 NAE-UFRGS / Núcleo de Apoio ao Estudante da UFRGS (www.ufrgs.br/nae)
 SOP / Serviço de Orientação Profissional (www.ufrgs.br/sop)

----- Mensagem encaminhada -----

De: James Rounds <jrounds@uiuc.edu>
Para: Marco Teixeira <mapteixeira@yahoo.com.br>
Cc: "Lewis, Phil - ETA CTR" <Lewis.Phil@dol.gov>; "jrounds@illinois.edu" <jrounds@illinois.edu>
Enviadas: Terça-feira, 16 de Agosto de 2011 17:00
Assunto: Re: Permission to translate RIASEC scales in Brasil

Prof. Marco A. P. Teixeira--

Here is how I would proceed: I would translate the IP Long form (180 items, 30 items per RIASEC type). Translating the IP Long form allows you to also use the short form (60 items, 10 per RIASEC type). I agree with your statement that "the Interest Profiler [Long form] would show better psychometric properties if adapted in our culture." Long form would also provide you with the opportunity to drop items that did not fit the Brazilian experience or translated poorly.

I have worked on two IP short forms, the Armstrong RIASEC marker paper and the ONET official form of the IP. Both IP short forms came from my unpublished research in 2004. These two forms are almost identical with only a few items difference. The occupational title items come from Armstrong's lab at Iowa State.

My preference is to use work task items (for translation/international purposes) than to use occupational titles. Because occupations may not be identical across cultures and more importantly, our experience in China, shows that students respond to the prestige/status of occupations not their interests.

As for item response format I prefer a five point scale (Strongly Dislike, Dislike, Unsure, Like, Strongly Like) over the traditional three-point scale of (Dislike, Indifferent, Like).

You may already have these pdfs (attached), they are the technical support for the 180 item IP and can be found on ONET resource center.

If you have other technical questions, drop me a note. Finally, I may be in Florianopolis late December early January. We might be able to meet and talk further.

Jim

On Tue, Aug 16, 2011 at 6:09 AM, Marco Teixeira <mapteixeira@yahoo.com.br> wrote:

<https://mail.google.com/mail/u/1/?ui=2&ik=fd41b88b30&jsver=9ZpQOW73OIE.es.&view=pt&msg=15357028918b7f3c&q=ONET&qs=true&search=query&sim=1>

5/4/2018

Correo de Universidad Nacional de Colombia - Enc: Permission to translate RIASEC scales in Brasil

Dr. Lewis and Dr. Rounds,

Thank you for your answer. I am interested in adapting to Brazilian Portuguese an instrument for assessment of the RIASEC model mainly for research purposes (short form, non-commercial, free-access). Reviewing the literature, I found the article about the RIASEC markers [Armstrong, P. I., Allison, W., & Rounds, J. (2008). Development and initial validation of brief public domain RIASEC marker scales. *Journal of Vocational Behavior*, 73, 287-299]. As I understood, the RIASEC items available on the site are a selection of items from the Interest Profiler, plus a set of occupations. So, I don't know exactly what difference exist between using the RIASEC markers and the Interest Profiler (except the number of items and the set of occupations). Looking at the content of the items, it seems to me that the IP is more rich in content than the two versions of the RIASEC markers alone. Possibly the Interest Profiler would show better psychometric properties if adapted in our culture. So, I would like to ask for permission to adapt the Interest Profiler in Brasil.

Thank you again for your attention.

Best regards,

Prof. Marco A. P. Teixeira
 UFRGS - Instituto de Psicologia
 NAE-UFRGS / Núcleo de Apoio ao Estudante da UFRGS (www.ufrgs.br/nae)
 CAP-SOP / Centro de Avaliação Psicológica, Seleção e Orientação Profissional

De: James Rounds <jrounds@uiuc.edu>

Para: Marco Teixeira <mapteixeira@yahoo.com.br>

Cc: "Lewis, Phil - ETA CTR" <Lewis.Phil@dof.gov>

Enviadas: Sábado, 13 de Agosto de 2011 18:59

Dr. Teixeira

I believe you are asking permission for the Interest Profiler Short Form (60 items). I developed that form for ONET: <http://www.onetcenter.org/>

There is also a long form of the Interest Profile.

Go to ONET site (above) and click on Products. You can download the measure (long and short forms). You can get permission to translate from Phil Lewis (I have Cced him with this email).

I hope this helps. If you need further assistance, drop me another email (Phil also would be willing to answer questions).

Best, Jim

btw. On the ONET site you can click on "My Next Move" to take a computerized version.

On Sat, Aug 13, 2011 at 4:17 PM, Marco Teixeira <mapteixeira@yahoo.com.br> wrote:

Dear Dr. Rounds

I would like to ask for your permission to translate/adapt to Brazilian Portuguese the RIASEC scales you have developed and are available at

<https://netfiles.uiuc.edu/jrounds/IIP/home.htm>

I am professor at Federal University of Rio Grande do Sul (Brasil) and career counselor, with interest in psychometry. I think making this instrument available to researchers in Brasil can help to improve research in career counseling in my country.

I would also like to receive more information about the scales, like instructions and response format, as well as other relevant material related to it that eventually is not available in the homepage.

Thank you for your attention.

Best regards,

Prof. Dr. Marco A. P. Teixeira

UFRGS - Instituto de Psicologia

NAE-UFRGS / Núcleo de Apoio ao Estudante da UFRGS (www.ufrgs.br/nae)

CAP-SOP / Centro de Avaliação Psicológica, Seleção e Orientação Profissional

3 arquivos adjuntos

 **IP.pdf**
274K

 **IP_RVS.pdf**
916K

 **CIP_RVC.pdf**
410K