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Psychometric Study of the Scale of Interests by Areas of Psychology - Portuguese Version

Psychological Evaluation

Psychometric Study of the Scale of Interests by Areas of Psychology - Portuguese Version

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Abstract: Considering the need to understand the variables related to the choice for Psychology specialties, this study aimed to present the adaptation process and to verify validity evidence based on the internal structure for the Portuguese version of the Scale of Interests by Areas of Psychology (EIAPsi) and relate it to personality. The sample consisted of 340 Portuguese university students, using the EIAPsi and the NEO *Five-Factor Inventory* (NEO-FFI). Exploratory Factor Analysis and correlations between instruments were performed. There was a factorial structure formed by 10 factors for the EIAPsi with satisfactory precision indexes. The dimensions of openness and agreeableness were the most frequently correlated to the areas of Psychology. We have concluded that evidence of initial validity of the instrument were presented, indicating possibilities of its use in the Portuguese context, specifically in situations aimed at self-knowledge (classroom or clinic/office) and guiding students in choosing their area of expertise.

Keywords: professional interests, vocational guidance, psychology, higher education, personality traits

Estudo Psicométrico da Escala de Interesses por Áreas da Psicologia - Versão Portuguesa

Resumo: Ao considerar a necessidade de compreensão das variáveis relacionadas à escolha por especialidades da Psicologia, este estudo teve por objetivo apresentar o processo de adaptação e verificar evidências de validade baseadas na estrutura interna para a versão portuguesa da Escala de Interesses por Áreas da Psicologia (EIAPsi) e relacioná-la com personalidade. A amostra foi composta por 340 universitários portugueses, utilizando a EIAPsi e o *NEO Five-Factor Inventory* (NEO-FFI). Foram realizadas Análise Fatorial Exploratória e correlações entre instrumentos. Verificou-se uma estrutura fatorial formada por 10 fatores para a EIAPsi com satisfatórios índices de precisão. As dimensões abertura e amabilidade foram as mais frequentemente correlacionadas às áreas da Psicologia. Conclui-se que evidências de validade iniciais do instrumento foram apresentadas, indicando possibilidades de sua utilização no contexto português, especificamente em situações que visem o autoconhecimento (sala de aula ou clínica/consultório) e direcionamento dos estudantes para escolha da área de atuação.

Palavras-chave: interesses profissionais, orientação vocacional, psicologia, ensino superior, traços de personalidade

Estudio Psicométrico de la Escala de Intereses en Áreas de la Psicología - Versión Portuguesa

Resumen: Considerando la necesidad de comprender las variables relacionadas con la elección de las especialidades en Psicología, este estudio tuvo como objetivo presentar el proceso de adaptación y verificar las evidencias de validez basadas en la estructura interna de la versión portuguesa de la Escala de Intereses en Áreas de la Psicología (EIAPsi) y relacionarla con la personalidad. La muestra constó de 340 estudiantes universitarios portugueses, a la cual se aplicó la EIAPsi y el *NEO Five-Factor Inventory* (NEO-FFI). Se llevaron a cabo un análisis factorial exploratorio y correlaciones entre los instrumentos. Se observó una estructura factorial formada por 10 factores para la EIAPsi con índices de precisión satisfactorios. Las dimensiones apertura y amabilidad fueron las que más se correlacionaron con las áreas de la Psicología. Se concluye que el instrumento presentó evidencias iniciales de validez, lo que indica su potencial de uso en el contexto portugués, sobre todo en situaciones dirigidas al autoconocimiento (aula o clínica/oficina) y el soporte a los estudiantes en la elección del área de actuación.

Palabras clave: intereses profesionales, orientación vocacional, psicología, educación superior, rasgos de personalidad

Professional interests have been studied since the mid-twentieth century, with John Holland (1997) as one of the main representatives in the subject. From Holland's perspective, professional interests can be understood as an expression of the personality traits in the world of work. Therefore, the author developed a typological model to explain the professional choice, based on six personality characteristics (Lamas, 2017). This model is known as RIASEC, an acronym for the types of vocational personality

Realistic, Investigative, Artistic, Social, Enterprising and Conventional (Holland, 1997).

After this, the professional interests have been defined by Lent, Brown and Hackett (1994) as patterns of affinity, indifference or aversion, related to professional activities. According to these same authors, interests are formed by beliefs in capacities and expectations of results from certain actions by the individual, which are reassessed every time the subject goes through a new experience. Still in this perspective, Rounds and Su (2014) consider that professional interests can be understood as preferences for activities and contexts, and that they can also motivate the achievement of goals, besides being an important predictor of performance and success.

A meta-analysis study carried out by Low and Rounds (2007), found out that professional interests are relatively stable during someone's lifetime, even more stable than the individuals' own personality. The years of strong growth in the stability of interests occur in the beginning of adulthood (18 to 22 years old), which corresponds to the moment when the young person enters university and the labor market, thus restricting the environments, which ends up limiting the formation of new interests.

There are different ways of assessing the professional interests, with two main classifications in this regard, the assessment of the expressed and inventoried interests. The first ones are assessed through an individual's responses to open-ended questions about which professions interest him or her most. But the inventoried/tested interests are measured through the person's scores in the psychometric tests to assess global interests, which are likely to remain relatively stable over time and to better agree with the professional choice itself (Lamas, 2017).

In this sense, some researches have been committed to the assessment of inventoried interests through general samples, often neglecting the importance of also evaluating interests in specific domains, as in the case of Psychology, in which students present different interests between possible areas of action. About this, some studies have assessed the general interests of Psychology students (Bueno, Lemos, & Tomé, 2004; Espírito & Castro, 2012; Magalhães, Straliotto, Keller, & Gomes, 2001), indicating interest and need for study of this population.

One of the reasons for conducting investigations on Psychology students may be due to the diversity of areas of activity that the course presents, which requires the student and/or professional to have a very broad contact with information, theoretical lines and methods, with the need for choices as well as continuing education, which begin during graduation. In this sense, the curricular grids of undergraduate courses in Psychology seek to include various specialties in the training, which requires the students and professionals to choose areas, for a continuous investment in view of the individual, educational and/or social demands (Bedin, Sarriera, & Paradiso, 2013).

To contextualize Psychology in Portugal, the training of the first psychologists took place in the early 1980s, and the Portuguese Psychologists Order (OPP) was created in 2008,

through the Decree-Law No. 57/2008 (Mendes, Abreu-Lima, & Almeida, 2015). In April 2015, there were 20.643 psychologists enrolled in the OPP (2015).

In Decree-Law No. 42 (2005), in coherence with the commitments resulting from the Bologna Declaration (signed by the country with 29 other European countries on June 19, 1999), regulatory standards for Portuguese higher education courses were instituted, among which: the structure of three cycles (Bachelor's, Master's and PhD degrees) and the creation of a new system of curricular credits. Thus, in accordance with the country's legislation, in order to practice the profession, in Portugal, training in Psychology must include at least two study cycles, being three years at the undergraduate level plus two years at the Master's level. The third cycle (optional) refers to the Doctor's level. The performance of the profession also requires the accomplishment and approval in a professional internship of one year, in one of three possible areas: clinical and health psychology, educational psychology, and psychology of work, organizations and society. Universities have progressively been integrating these same areas in the curricula of the second and third cycles of higher education in Psychology. In addition, the process of professional specialties was put into practice by the OPP in 2016, recognizing and certifying the training and qualification of psychologists for the professional practice as specialists in one of those areas of Psychology (European Federation of Psychologists' Association [EFPA], 2018; OPP, 2016).

Rodrigues, Ferreira and Bártolo-Ribeiro (2013) have developed the Psychology Interest Scale in Portugal, which assesses the professional interests of Psychology students. The sample in the study was of 573 students from nine public and private higher education institutions. After Principal Component Analysis, the authors found the structure composed of 21 items as the best structure for the scale, divided equally into three areas of activity: Clinical, Educational and Organizational.

Two years later, a study with the same scale was published to verify the relationship of these interests by areas of Psychology with the RIASEC model (Ferreira, Rodrigues, & Ferreira, 2015). For this, these authors surveyed a sample of 304 Psychology students of the first three years of the undergraduate course. Positive and significant correlations were observed between interests in the Clinical and Educational areas and the Social type of the RIASEC model. The interests in the Organizational area showed a positive and significant correlation with the Enterprising type.

Another scale, also in Portuguese, which assesses professional interests in the different activity areas and possibilities in Psychology, was developed in Brazil by Ambiel and Martins (2016), and called the Scale of Interests by Psychology Areas (EIAPsi). The authors had the participation of 392 Brazilian Psychology students. The results showed that the scale evaluation correctly discriminated the expressed interests of people. In addition, good accuracy indexes were reported for the 11 factors of the scale, with alpha values higher than 0.84 obtained in all

factors. However, there are still no psychometric studies with EIAPsi in Portuguese samples, nor evidence of validity based on the relationship with other variables.

As previously indicated, Holland (1963) highlights that the individual's personality is expressed in work activities. Furthermore, Savickas (1995) points out that interests are a form of expressing personality, considering that they can perform an intermediation between the individual and the world of work. This relationship was verified in the study by Shimada, Melo-Silva and Taveira (2016). In turn, the meta-analysis carried out by Hurtado Rúa, Stead and Poklar (2019), indicated that the *Big Five* dimensions most related to RIASEC's interests were Opening and Extroversion. In view of this issue, it becomes necessary to discuss the interface between professional interests, personality and areas of Psychology, considering the need to understand the existing variables and the possibility of offering training that can manage the demands that arise during the process, due to the choice among the specialties of Psychology.

Few studies have set out to investigate these constructs in the context of Psychology, most of which are aimed at the general population, only analyzing possible differences according to schooling (Pedroso-Lima et al., 2014). Bueno et al. (2004), in turn, found that there was a tendency, among new students of the Psychology course, to contest the norms, openness to experience, extroversion and low tolerance to frustration, in addition to a greater interest in social activities as opposed to activities related to calculation.

Associated with this, the psychologist's stereotype still relates to the professional who works mostly in the clinical, educational and organizational contexts (Magalhães et al., 2001; Yamamoto & Costa, 2010). Considering the requirements for the training of psychologists, whether in the Portuguese or international context, with specific skills and competences, ethical principles and contextualization with the socio-cultural aspect, a wide number of possibilities for the performance of this professional has been generated. It becomes useful to develop instruments that assess, with good psychometric characteristics, the interests in specific areas in Psychology, aiming to offer a complementary tool to assist the process of choice in the areas (Campos, Catão, & Fujii, 1999), an objective proposed by the EIAPsi (Ambiel & Martins, 2016, 2019).

In this sense, the objective of this study was to present the adaptation process and verify evidence of validity based on the internal structure for the Portuguese version of the EIAPsi. Moreover, in view of the strong relationship between personality characteristics and professional interests, we sought to analyze, in an exploratory way, the association between personality traits in the *Big Five* model and areas of interest assessed by the scale.

We expect to find a factorial structure of EIAPsi similar to the one found in the Brazilian version, formed by 11 factors/areas of Psychology (Ambiel & Martins, 2016, 2019); as well as positive correlations between personality traits Openness, Extroversion, Conscientiousness and Agreeableness and areas of interest measured by EIAPsi (Ambiel, Noronha, &

Nunes, 2012; Bueno et al., 2004; Bullock & Reardon, 2008; Hurtado Rúa et al., 2019; Wille & De Fruyt, 2014); finally, the Neuroticism personality trait is expected to correlate negatively with the areas of interest measured by the EIAPsi (Bueno et al., 2004; Bullock & Reardon, 2008; Hurtado Rúa et al., 2019; Wille & De Fruyt, 2014).

Method

Participants

This study was conducted using a convenience sample, in which 340 Portuguese Psychology students participated, mostly female (85%), from public (80.9%) and private (19.1%) universities. The participants' ages ranged from 18 to 53 years ($M = 20.99$, $DP = 4.42$). There were participants attending the 1st (31.2%), 2nd (33.2%), 3rd (12.1%) undergraduate years and the 1st (23.5%) year of the Master's program. There was an attempt to collect data from students of the 2nd year of the Master's program. However, since they were doing their mandatory internships outside the place where the survey was being carried out, it became unfeasible.

Instruments

Sociodemographic Questionnaire. It was designed for this study. It sought to assess the sociodemographic and academic characteristics of the participants, by asking questions about sex, age, type of institution and year of schooling.

Scale of Interests by Areas of Psychology – Portuguese version (EIAPsi-PT; Ambiel, Martins, & Taveira, 2020). EIAPsi assesses the interests of Psychology students and professionals, regarding the different areas of the profession. The 90 items of the Brazilian version were adapted, answered on a *Likert* scale with five points, ranging from "I hate/would hate to perform this activity (1)" to "I love/would love to perform this activity (5)". The Brazilian version of the EIAPsi is composed of 11 factors, which are: Clinical ($M = 3.94$; $SD = 0.71$; $\alpha = 0.83$), Health ($M = 3.56$; $SD = 0.86$; $\alpha = 0.89$), Educational ($M = 3.38$; $SD = 0.86$; $\alpha = 0.91$), Organizational ($M = 3.19$; $SD = 1.00$; $\alpha = 0.95$), Social ($M = 3.53$; $SD = 0.79$; $\alpha = 0.89$), Psychological Assessment ($M = 3.57$; $SD = 0.77$; $\alpha = 0.87$), Teaching and Research ($M = 3.18$; $SD = 0.88$; $\alpha = 0.92$), Traffic ($M = 2.80$; $SD = 1.04$; $\alpha = 0.89$), Sports ($M = 2.80$; $SD = 0.97$; $\alpha = 0.93$), Legal ($M = 3.25$; $SD = 0.95$; $\alpha = 0.90$) and Neuropsychology ($M = 3.48$; $SD = 0.92$; $\alpha = 0.88$) (Ambiel & Martins, 2019).

Initially, the content of the 90 items of the Brazilian EIAPsi version was revised by a Psychology Ph.D. and a specialist in the field, to adapt the scale to the Portuguese context. A total of 20 items had some kind of change related to their writing/semantics. The biggest changes were registered in the items "doing a teaching internship", changed to "qualify for university training or education", "participate in multiprofessional teams in the planning and implementation of traffic safety policies", which was

changed to "participate in multiprofessional teams focused on planning and implementing traffic policies", and "giving feedback from evaluations", which was changed to "communicating evaluation results". The other items had just one word changed. Some examples of these changes are the words: detainees, sports, teams, doctorate, dismissal, planning. It is worth to mention that all the changes made were carefully thought out, so that the characterization of the professional activity that the item represented was not lost.

After adapting the items, the scale went through a process of spoken reflection, to assess the understanding of the items, as well as the response process to the instrument. The evaluation of the understanding regarding the items was carried out independently, by two Portuguese students of the 1st year of the master's program in Psychology. In two items, a need to change was identified, to make them more understandable. So the item "working in NGOs guaranteeing psychological support to its members" was changed to "working in Non-Governmental Organizations (NGOs) guaranteeing psychological support to its recipients" and the item "developing and implementing professional skills training" had the writing changed to "planning and executing professional skills training sessions". The response to the instrument occurred satisfactorily by both students, suggesting the possibility to start the empirical collection.

NEO Five-Factor Inventory - NEO-FFI (Lima & Simões, 2000; Magalhães et al., 2014). This instrument, which has adaptations in different languages and cultures and is available for use in Portugal, was conceived to be a brief measure for personality assessment through the *Big Five* model. It consists of 60 items, equally divided into five personality dimensions, namely Neuroticism (e.g., I often feel inferior to other people), Extroversion (e.g., I like having a lot of people around me), Agreeableness (e.g., I try to be gentle with all the people I meet), Openness to experience (e.g., I am in awe of the models I find in art and nature) and Conscientiousness (e.g., I keep my things clean and in order). The answer key is given on a Likert scale that ranges from "strongly disagree (0)" to "strongly agree (4)". The adaptation study for the Portuguese version indicated satisfactory internal consistency indexes, with alpha coefficients ranging from 0.71 (Openness) to 0.81 (Neuroticism and Conscientiousness)

Procedure

Data collection. The empirical collection was carried out in person, in paper and pencil format, in a classroom with an average of 40 students for each application and an approximate duration of 30 minutes, after the approval of the professor responsible for the discipline and the participants' informed consent. The instruments were applied in the following order: Identification questionnaire, EIAPsi and NEO-FFI. Participants were instructed to respond attentively and following the order of presentation of the instruments.

Data analysis. The data were tabulated and analyzed with the software SPSS 25, Factor Analysis 10.8.04 and Mplus 7. Initially, the methods, Parallel Analysis, Hull and Minimum Average Partial (MAP) were used to guide decision making on the number of factors to be extracted. The possibility of the data set being fitted to a factorial model was verified by the Kaiser-Meyer-Olkin index (KMO). Then an Exploratory Factor Analysis was performed, with WLSMV estimator and Geomin rotation of the Portuguese version of the EIAPsi. Thus, only items with factorial loads equal to or greater than 0.35 were maintained, this value being adopted to minimize possible confusion in the maintenance of items, thus avoiding the permanence of items with loads too close to the acceptable minimum (0.30; Pasquali, 2003). To interpret the model's adjustment indexes, the following values indicated by Hu and Bentler (1999) will be used: chi-square ratio for degrees of freedom ($X^2/gl < 3$), Confirmatory Fit Index (CFI > 0.95), Tucker-Lewis Index (TLI > 0.95), Root Mean Square Error of Approximation (RMSEA < 0.05) and Standardized Root Mean Square Residual (SRMR < 0.08). The precision of the factors was verified using alpha and omega coefficients. Finally, Pearson correlations between EIAPsi and NEO-FFI factors were calculated.

Ethical Considerations

The project was submitted and approved by the Research Ethics Committee (Opinion No.: 770.173, No. CAAE: 34976414.4.0000.5514). The students were informed about the research objectives and, after signing the Free and Informed Consent Form, they responded to the instruments.

Results

The KMO index of 0.90 indicated the factorability of the data set formed by the 90 items of the Portuguese version of the EIAPsi. Then the Hull method indicated one factor, the MAP indicated six factors and the Parallel Analysis indicated nine factors as the best factor structure. However, as the items were constructed to represent professional activities in 11 areas of Psychology, this one was adopted as a factorial structure to be tested in the Exploratory Factor Analysis. When analyzing the content of the items that grouped in each factor, it was seen that despite the good adjustment indexes for the model (X^2/gl = 1.38; CFI = 0.96; TLI = 0.95; RMSEA = 0.03; SRMR = 0.03), the solution was poorly interpretable in terms of grouping the items. For this reason, we chose the structure formed with 10 factors for the analysis execution.

When analyzing the content of the items for each factor, we noticed that three items presented factorial loads in areas not consistent with their respective theoretical contents. For this reason, we decided to exclude these three items. They are: the item "collaborate in the integration of workers with new equipment or work teams" with a load of 0.38 (Teaching and Research), the item "assist in the assessment and guidance in conciliation hearings" with a load of 0.46 (Clinic and Health) and the item "plan and execute professional skills training sessions" with loads of 0.43

(Sports) and 0.36 (Organizational). In addition to these, two more items were excluded due to factorial loads of less than 0.35 ("acting in the understanding of the social construction of the subjectivity of the subjects" and "writing documents reporting results of assessment procedures").

After this, the Exploratory Factor Analysis was performed again with the remaining 85 items. The ten-factor structure explained 66% of the variance. The model's adjustment indexes were good (X²/gl = 1.44; CFI = 0.96; TLI = 0.94; RMSEA = 0.04; SRMR = 0.03), indicating that this is an adequate model for representing that sample's data. No item was excluded because it had a factor load lower than 0.35. The factorial loads of the items and the factor that each item represents will be described in Table 1.

Table 1

Grouping of items in the factors of the EIAPsi-Portugal

Items	Loads	Factors
25 Work with hospitalized terminal patients	0.86	Clinic and Health
7 Carry out psychotherapeutic consultations in private offices or clinics	0.84	Clinic and Health
10 Assist families with terminally ill patients, assisting in the acceptance process	0.82	Clinic and Health
74 Assist the patient, his or her family and the health team. in a health unit	0.82	Clinic and Health
45 Give assistance to people who have gone through a major disaster	0.78	Clinic and Health
28 Assist people who had some type of accident	0.74	Clinic and Health
81 Work in health centers and services in the community, hospitals, psychiatric clinics or mental health care	0.74	Clinic and Health
23 Promote psychosocial rehabilitation of individuals with depression	0.72	Clinic and Health
33 Carry out psychotherapeutic care with individuals, couples, families and groups	0.72	Clinic and Health
67 Assist in preparing patients for entry, stay and discharge from hospital	0.70	Clinic and Health
57 Work for public health devices	0.60	Clinic and Health
40 Intervene in the psychological phenomena of the individual	0.50	Clinic and Health
51 Assist patients/clients based on a specific theoretical approach	0.36	Clinic and Health
27 Supervise other clinical psychologists	0.35	Clinic and Health
39 Give assistance to prepare an athlete for the performance of the activity	0.93	Sports
35 Collaborate for the understanding and transformation of inter and intrapersonal relationships in sporting environments	0.90	Sports
46 Apply instruments to determine individual and collective profile for the practice of sports	0.86	Sports
60 Help athletes, coaches and technical commissions to achieve an optimal level of mental health	0.85	Sports
84 Develop actions to improve individual psychic abilities with a view to optimizing the performance of high competion athletes	0.81	Sports
70 Collaborate for the adhesion and participation of the general population in physical activity programs	0.71	Sports
21 Help the population to participate in physical activities	0.51	Sports
30 Guide parents or guardians about the choice of sport and the implications for the child's development cycle	0.56/0.46	Sports/Educational
13 Write scientific reports and papers	0.85	Teaching
49 Advise the work of undergraduate, master's and doctoral students	0.81	Teaching
1 Publish scientific articles	0.78	Teaching
36 Develop research problems and hypotheses	0.78	Teaching
73 Give opinions about manuscripts to scientific journals of the area	0.78	Teaching
65 Participate in the case for a master's and doctoral degree	0.67	Teaching
6 Propose innovative research projects to answer questions in psychology	0.62	Teaching
44 Communicate evaluation results	0.61	Teaching
26 Constantly updating in relation to scientific literature	0.59	Teaching
85 Perform data collections using different techniques	0.58	Teaching
56 Perform statistical analyses	0.51	Teaching
43 Teaching classes on specific contents	0.81/0.50	Teaching/Educational
31 Get trained to be a university professor	0.63/0.44	Teaching/Educational
8 Assist in teaching-learning processes	0.87	Educational
75 Analyze and intervene in the educational climate	0.85	Educational
22 Facilitate the development and integration of students in the school context	0.79	Educational
79 Work preventively in daycare centers and schools	0.72	Educational
19 Work on family-community-school integration	0.70	Educational

Table 1

Continuation

Items	Loads	Factors
38 Analyze the different segments of the educational system	0.70	Educational
41 Assess the efficiency of educational programs based on psychological tests and appropriate instruments	0.61	Educational
55 Guide the application of specific teaching programs for individuals with special needs	0.56	Educational
58 Working with children with difficulties and / or delays in global development	0.51	Educational
14 Assessing detainees who are on probation	0.89	Legal
3 Work with individuals in situations of legal proceedings	0.86	Legal
5 Prepare reports on the mental functioning of individuals in legal proceedings	0.76	Legal
9 Collaborate in the formulation of criminal policies	0.72	Legal
24 Promote activities that detainees can carry out in penal establishments	0.70	Legal
18 Acting on psychological support for the families of detainees	0.63/0.41	Legal/Clinic and Health
52 Engage in research that expands psychological knowledge applied to law	0.47/0.38	Legal/Teaching
54 Perform assessment of neuropsychological functions	0.85	Neuropsychology
4 Understand the relationship between brain functioning and behavior	0.83	Neuropsychology
47 Develop a treatment plan for the patient's neuropsychological rehabilitation	0.73	Neuropsychology
17 Assist in deciding on medical treatment for neurological patients	0.70	Neuropsychology
11 Develop games and activities for assessment, prevention and neuropsychological rehabilitation	0.56	Neuropsychology
64 Perform clinical research work, using neuropsychological tests and exercises	0.50/0.38	Neuropsychology/Teaching
71 Work with the relationships between subjects in the work environment	0.83	Organizacional
76 Facilitate the relationship between people and organizations, contributing to the development of both	0.81	Organizacional
50 Take responsibility for improving working conditions in the organization	0.80	Organizacional
68 Understand the subjective meaning attributed by employees to the work performed	0.77	Organizacional
37 Work in companies	0.76	Organizacional
82 Select employees for a new job	0.73	Organizacional
29 Assist employee welfare	0.69	Organizacional
16 Intervene in conflict situations between employees	0.68	Organizacional
59 Participate in the dismissal process of company employees	0.66	Organizacional
83 Identify the social representations that mediate individuals' relationships with their environments	0.44	Organizacional
42 Advising NGOs and working cooperatives	0.58/0.55	Organizacional/Social
77 Enable decision-making based on evaluations	0.48/0.42	Organizacional/Psychodiagnosis
78 Privileging group processes in assessments and interventions	0.43/0.40	Organizacional/Psychodiagnosis
61 Plan evaluation processes in different performance contexts	0.45	Psychodiagnosis
15 Conduct evaluations to arrive at a psychodiagnosis	0.44	Psychodiagnosis
62 Use various techniques to improve the efficiency of psychotherapeutic practices	0.42	Psychodiagnosis
2 Know and apply various psychological tests	0.40	Psychodiagnosis
53 Know how to properly select instruments for different assessment situations	0.37	Psychodiagnosis
12 Work in NGOs providing psychological support to their recipients	0.68	Social
66 Plan, evaluate and execute public policies and community programs	0.50	Social
72 Mediate the interventions of multiprofessional teams in community contexts	0.50	Social
20 Conducting social and community research	0.49	Social
34 Work with vulnerable groups in community centers	0.51/0.44	Social/Clinic and Health
80 Design and implement traffic health, education and safety programs	0.77	Traffic
32 Participate in multiprofessional teams focused on planning and implementing trafficpolicies	0.65	Traffic
69 Assess driver's license candidates' abilities, skills and aptitudes	0.64	Traffic
63 Work as an expert in driver's qualification exams, rehabilitation or professional readaptation	0.62	Traffic
48 Analyze the different factors involved in traffic accidents	0.58	Traffic

In Table 1 it is possible to observe that the number of items per factor ranged from five (Traffic) to 16 items (Clinic and Health), with some items being computed in two factors, as is the case, for example, of item "64 - carry out clinical research work, using neuropsychological tests and exercises", representing the factors Neuropsychology and Teaching and Research. The set formed by the remaining 85 items, represented ten areas of Psychology. This factorial structure is similar to the one found in the Brazilian version of EIAPsi, except for the Clinic and Health factor, which in this version was represented in two separate factors. Thus, the factors of EIAPsi Portugal are Clinic and Health, Sports, Education, Teaching and Research, Legal, Neuropsychology, Organizations, Psychodiagnosis, Social and Traffic.

In the sequence we presented descriptive statistics of the variables, besides the correlations between the factors of the EIAPsi and the factors of the NEO-FFI. Next, in Table 2, the mean values, standard deviation and precision of the ten EIAPsi factors and the five NEO-FFI dimensions are presented, as well as the correlations between the constructs.

Table 2
Descriptive and correlations of the variables used

	Mean(DP)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.Legal	3.61(0.80)	0.86														
2.Teaching and Research	2,88(0.79)	**0.17**	0.92													
3.Clinic and Health	3.66(0.68)	**0.29**	**0.23**	0.91												
4.Educational	3.22(0.76)	**0.11**	**0.37**	**0.34**	0.91											
5.Sports	3.08(0.92)	0.05	**0.20**	0.07	**0.46**	0.93										
6.Organizational	3.12(0.74)	0.06	**0.31**	0.10	**0.39**	**0.47**	0.92									
7.Neuropsychology	3.58(0.87)	**0.20**	**0.51**	**0.46**	**0.34**	**0.13**	0.09	0.88								
8.Social	3.34(0.71)	**0.35**	**0.41**	**0.27**	**0.44**	**0.25**	**0.49**	**0.27**	0.80							
9.Psychodiagnosis	3.55(0.58)	**0.26**	**0.52**	**0.45**	**0.36**	**0.14**	**0.35**	**0.45**	**0.38**	0.77						
10.Traffic	2.55(0.86)	**0.15**	**0.33**	**0.32**	**0.45**	**0.50**	**0.57**	**0.29**	**0.37**	**0.33**	0.88					
11.Neuroticism	1.93(0.65)	0.09	-0.07	**0.14**	0.03	-0.05	**-0.11**	-0.01	0.02	**-0.12**	0.01	0.84				
12.Extroversion	2.60(0.46)	0.07	0.07	0.02	0.10	**0.16**	**0.12**	0.07	0.08	**0.13**	0.01	**-0.45**	0.75			
13.Openness	2.46(0.49)	**0.14**	**0.42**	0.09	**0.14**	0.04	0.10	**0.33**	**0.31**	**0.22**	-0.04	-0.02	**0.15**	0.68		
14.Agreeableness	2.79(0.45)	0.04	-0.02	**0.13**	0.09	0.01	-0.01	0.10	**0.18**	**0.18**	-0.04	**-0.28**	**0.31**	0.06	0.70	
15.Conscientiousness	2.88(0.51)	-0.03	0.09	0.11	0.03	0.06	0.05	**0.13**	0.01	**0.18**	0.07	**-0.33**	**0.26**	0.01	**0.32**	0.83

Note. Correlations marked in bold are significant for $p < 0.05$. Diagonally are the precision of the factors measured by the alpha.

Table 2 shows that the areas Traffic and Teaching and Research scored less by the participants and the Clinic and Health area, in turn, scored higher, followed by Legal, Neuropsychology and Psychodiagnosis. These results indicate a tendency of the sample to present less interest in the areas of Teaching and Traffic while, in turn, to report greater interest in Clinic and Health, which are the most disseminated and characteristic areas of the profession.

Regarding the precision, satisfactory alpha values were found for all factors of the EIAPsi, with a variation in the alpha coefficients from 0.77 (Psychodiagnosis) to 0.93 (Sports). The internal consistency of the EIAPsi factors was also verified through the omega coefficient, which indicated satisfactory values, ranging from 0.77 (Psychodiagnosis) to 0.93 (Sports). Yet in the NEO-FFI dimensions, the alpha coefficients were considered acceptable, since they presented values equal to or above 0.68.

Analyzing the correlations between the factors of the EIAPsi and NEO-FFI, it may be observed that all dimensions of personality correlated significantly with at least one area of interest in Psychology. Most of the significant correlations were weak. It could be observed, for example, the negative correlation between Neuroticism and interests in the Organizational area, as well as the positive correlation between Openness and interests in the area of Psychodiagnosis. Noteworthy are the positive and moderate strength correlations that had the Openness dimension as a common factor. This personality dimension was the one with the highest number of significant correlations with the areas of interest of the EIAPsi (total of six). Among these correlations, three are of moderate strength, with the areas of Teaching and Research, Neuropsychology and Social.

Discussion

This study aimed to adapt and verify validity evidence based on the internal structure for the Portuguese version of the EIAPsi. Additionally, the objective was to analyze the association between personality traits and areas of interest assessed by the scale. Therefore, the hypotheses raised for this study were corroborated, partially or totally, since it was possible to find good psychometric properties for the Portuguese version of the EIAPsi, as well as to observe the correlations between personality dimensions and the areas of Psychology measured by the scale.

Based on the 85 items that were included in the Exploratory Factor Analysis, which refer to professional activities performed by psychologists, it was possible to represent ten areas of work in Psychology. This diversity of

areas assessed is an advance in the assessment of specific interests in Psychology, since other instruments reported did not set out to measure the areas in detail, as occurs by means of the EIAPsi. In the Portuguese context, the existence of a single instrument developed for this purpose was reported, which assesses the interest of Psychology students exclusively through three areas, namely Clinical, Educational and Organizational (Ferreira et al., 2015; Rodrigues et al., 2013), areas also covered by the EIAPsi.

We observed that the first hypothesis of this study was not fully corroborated, because the factorial structure of the Portuguese version of the EIAPsi is formed by ten factors, and not by 11 as was expected (Ambiel & Martins, 2016, 2019). This difference occurs because the items from the Clinical and Health areas are grouped in a single factor, called Clinic and Health. This result can be better understood from the areas of activity defined by the *European Federation of Psychologists' Association* (EFPA), which joins the Clinical and Health areas in the same specialty. Moreover, it points to the areas of Clinical and Health Psychology, Educational Psychology and Work and Organizational Psychology, as the three main areas of activity of the profession (EFPA, 2018). In the same way, the Portuguese Psychologists Order (OPP, 2015, 2016) adopts the same areas as performance and expertise areas.

In view of the configuration of the activity areas of the Psychology profession in Portugal, it is possible to understand that the students who participated in the research probably understand the Clinical and Health areas as belonging to a single major area of activity, represented in the EIAPsi evaluation as the Clinical and Health factor. Another complementary data for the evidence of this factor's validity can be noted by the higher average obtained in comparison with the others, indicating the students' continuous preference for the Clinical area (Ambiel & Martins, 2016; 2019; Campos et al., 1999; Ferreira et al., 2015; Magalhães et al., 2001). In contrast, other areas understood jointly by the OPP, such as Social and Organizations, were broken down in the responses of the research participants, thus forming separate factors in the evaluation of the EIAPsi.

Another relevant result in terms of evidence of validity for EIAPsi, consists of positive correlations, mostly of moderate and strong magnitudes, between the scale factors. An association between the factors was expected, since specific domains of psychologists' performance are assessed, with Psychology as a common area of knowledge for all. In addition, the values of the alpha and omega coefficients pointed to satisfactory levels of accuracy through internal consistency in all factors of the EIAPsi.

Similar to what happened in the studies by Bullock and Reardon (2008), Hurtado Rúa et al. (2019) and Wille and De Fruyt (2014), this research also found positive correlations between the areas of interest in Psychology and the *Big Five* dimensions, with negative correlations observed only with the Neuroticism factor. It is worth to highlight the positive and moderate correlations between Openness and the areas of Teaching and Research, Social and Psychodiagnosis.

Thus, the most curious, creative students, with a preference for unconventional activities (DeYoung, Quilty, Peterson, & Gray, 2014), possibly perceive in these three areas a possibility of acting more dynamically in Psychology, being consistent with this personality trait.

Regarding the dimensions of the NEO-FFI, it was found that the averages of each dimension are close to the normative average of Portuguese higher education students (Pedroso-Lima et al., 2014), with differences whose effect size, measured by Cohen's *d*, ranged from 0.03 (Openness) to 0.20 (Agreeableness), all of them considered low and null (Cohen, 1992). Neuroticism was also noted as the lowest score and the dimensions Agreeableness and Conscientiousness as the most scored in this sample, similar to what was found in the normative sample.

The failure to verify different scores for Psychology students is an indication that there would not be an exclusive profile for the course, as verified by Espírito and Castro (2012). However, for Pedroso-Lima et al. (2014), subjects with a higher level already present higher traits of Openness to Experience and Conscientiousness, when compared to lower levels of education. This indicates that, more than a specific training area, the insertion in higher education itself would already be more frequent in subjects with a certain personality profile, as indicated in the model of Holland (1963) and Savickas (1995). This observation by Pedroso-Lima et al. (2014) would also be an explanation for the Openness factor to have presented more correlations with the areas of interest in Psychology.

Some limitations are identified in this study as the absence of 2nd year students of the Master's program in Psychology. As these students would be closer to obtain the title of psychologists, it is possible to understand that it is necessary to investigate the relationships between personality traits and interest in areas of Psychology to test the hypothesis that these data would remain proportional to the ones observed here. The factorial structure of the EIAPsi with 10 factors can be verified in a larger sample, with Psychology students and professionals, through a Confirmatory Factor Analysis, so as to verify if this is the best configuration for the instrument, besides verifying whether the factorial structure of the instrument remains the same when comparing undergraduate students with Master's degree students in Psychology, due to possible differences in the understanding of the professional activities represented in the items.

Although it was not the aim of this study, we consider that in future research, other variables could be included to verify evidence of convergent validity (such as other scales of interest) and divergent validity (for example, cognitive instruments). The development of predictive models to explain the areas of choice would also make it possible to develop career interventions focused on Psychology students.

This study was able to contribute with an instrument for the evaluation of the interests for areas of Psychology, with important evidences of transcultural validity and satisfactory accuracy. Besides providing a preliminary description of the profiles of Portuguese Psychology students, regarding their

personality traits and interests in areas of Psychology, also verifying the relationship of these two constructs in this sample. We expect that the EIAPsi can be a useful tool for teachers and professional advisors who intend to promote the self-knowledge of Psychology students about areas within the profession, to assist them in the choice of the areas where they intend to do their internships and perform when graduated. However, it is noteworthy that other areas of training also allow several possibilities of action, such as medicine and law, which also require investigation.

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Appendix

Escala de Interesses por Áreas da Psicologia – versão portuguesa (EIAPsi-PT)
Rodolfo Augusto Matteo Ambiel, Gustavo Henrique Martins e Maria do Céu Taveira (2020)

A seguir, encontrará listadas atividades que os psicólogos podem exercer profissionalmente. Por favor, leia atentamente cada uma e marque o número que corresponde ao seu grau de interesse por essa mesma atividade (quanto gosta ou gostaria de exercer cada atividade), de acordo com a seguinte escala:

Detesto/detestaria exercer essa atividade	Não gosto/não gostaria de exercer essa atividade	Imparcial/neutro em relação a essa atividade	Gosto/gostaria de exercer essa atividade	Adoro/adoraria exercer essa atividade			
1	2	3	4	5			

1. Publicar artigos científicos	1	2	3	4	5
2. Conhecer e aplicar diversos testes psicológicos	1	2	3	4	5
3. Atuar com indivíduos em situação de processos judiciais	1	2	3	4	5
4. Compreender as relações do funcionamento cerebral com o comportamento	1	2	3	4	5
5. Elaborar relatórios sobre o funcionamento mental dos indivíduos em processos judiciais	1	2	3	4	5
6. Propor projetos de pesquisa inovadores para responder a questões da psicologia	1	2	3	4	5
7. Realizar atendimentos psicoterapêuticos em consultórios ou clínicas particulares	1	2	3	4	5
8. Auxiliar nos processos de ensino-aprendizagem	1	2	3	4	5
9. Colaborar na formulação de políticas penais	1	2	3	4	5
10. Atender famílias com pacientes em estado terminal, auxiliando no processo de aceitação	1	2	3	4	5
11. Desenvolver jogos e atividades para avaliação, prevenção e reabilitação neuropsicológica	1	2	3	4	5
12. Trabalhar em ONGs garantindo suporte psicológico aos seus destinatários	1	2	3	4	5
13. Escrever relatos e artigos científicos	1	2	3	4	5
14. Fazer a avaliação de detidos que estão em liberdade condicional	1	2	3	4	5
15. Realizar avaliações para se chegar a um psicodiagnóstico	1	2	3	4	5
16. Intervir em situações de conflitos entre funcionários	1	2	3	4	5
17. Auxiliar na decisão sobre o tratamento médico para pacientes neurológicos	1	2	3	4	5
18. Atuar no apoio psicológico das famílias dos detidos	1	2	3	4	5
19. Trabalhar na integração família-comunidade-escola	1	2	3	4	5
20. Realizar pesquisas no âmbito social e comunitário	1	2	3	4	5
21. Ajudar na integração da população em atividades físicas	1	2	3	4	5
22. Facilitar o desenvolvimento e integração de alunos no âmbito escolar	1	2	3	4	5
23. Promover a reabilitação psicossocial de indivíduos com depressão	1	2	3	4	5
24. Promover atividades que os detidos possam realizar em estabelecimentos penais	1	2	3	4	5
25. Atuar junto a pacientes terminais hospitalizados	1	2	3	4	5
26. Atualizar-se constantemente em relação à literatura científica	1	2	3	4	5
27. Supervisionar outros psicólogos clínicos	1	2	3	4	5
28. Ajudar pessoas que sofreram de algum tipo de acidente	1	2	3	4	5
29. Auxiliar no bem-estar do trabalhador	1	2	3	4	5
30. Orientar pais ou responsáveis quanto a escolha da modalidade desportiva e às implicações no ciclo de desenvolvimento da criança	1	2	3	4	5
31. Capacitar-se para a formação ou o ensino universitário	1	2	3	4	5
32. Participar em equipas multiprofissionais viradas para o planeamento e realização de políticas de segurança rodoviária	1	2	3	4	5
33. Realizar atendimentos psicoterapêuticos com indivíduos, casais, famílias e grupos	1	2	3	4	5
34. Atuar atendendo grupos em situação de vulnerabilidade, em centros comunitários	1	2	3	4	5
35. Colaborar para a compreensão e transformação das relações inter e intrapessoais em ambientes desportivos	1	2	3	4	5
36. Elaborar problemas de pesquisa e hipóteses	1	2	3	4	5
37. Trabalhar em empresas	1	2	3	4	5
38. Analisar os diversos segmentos do sistema educacional	1	2	3	4	5
39. Realizar atendimentos com o intuito de preparar um atleta para o desempenho da atividade	1	2	3	4	5
40. Intervir nos fenómenos psicológicos do indivíduo	1	2	3	4	5
41. Avaliar a eficiência de programas educacionais a partir de testes psicológicos e instrumentos adequados	1	2	3	4	5
42. Assessorar ONGs e cooperativas de trabalho	1	2	3	4	5

43. Ministrar aulas sobre conteúdos específicos	1	2	3	4	5
44. Comunicar resultados de avaliações	1	2	3	4	5
45. Atender pessoas que passaram por um grande desastre	1	2	3	4	5
46. Aplicar instrumentos para determinação de perfil, individual e coletivo, para a prática desportiva	1	2	3	4	5
47. Elaborar um plano de tratamento para reabilitação neuropsicológica do paciente	1	2	3	4	5
48. Analisar os diferentes fatores envolvidos em acidentes de trânsito	1	2	3	4	5
49. Orientar trabalhos de alunos de iniciação científica, mestrado e doutoramento	1	2	3	4	5
50. Responsabilizar-se em melhorar as condições de trabalho na organização	1	2	3	4	5
51. Atender a pacientes/clientes com base numa abordagem teórica específica	1	2	3	4	5
52. Envolver-se em pesquisas que ampliam o conhecimento psicológico aplicado ao direito	1	2	3	4	5
53. Saber selecionar adequadamente instrumentos para diferentes situações de avaliação	1	2	3	4	5
54. Realizar avaliação das funções neuropsicológicas	1	2	3	4	5
55. Orientar a aplicação de programas específicos de ensino para indivíduos com necessidades especiais	1	2	3	4	5
56. Realizar análises estatísticas	1	2	3	4	5
57. Atuar em dispositivos de saúde pública	1	2	3	4	5
58. Trabalhar com crianças com dificuldade e/ou atrasos no desenvolvimento global	1	2	3	4	5
59. Participar no processo de despedimento de funcionários da empresa	1	2	3	4	5
60. Ajudar atletas, técnicos e comissões técnicas a alcançarem um nível ótimo de saúde mental	1	2	3	4	5
61. Planear processos de avaliação em diversos contextos de atuação	1	2	3	4	5
62. Utilizar diversas técnicas para melhorar a eficiência das práticas psicoterapêuticas	1	2	3	4	5
63. Atuar como perito/a em exames de habilitação, reabilitação ou readaptação profissional do motorista	1	2	3	4	5
64. Realizar trabalhos de investigação clínica, utilizando testes e exercícios neuropsicológicos	1	2	3	4	5
65. Participar de juris de arguição de mestrado e doutoramento	1	2	3	4	5
66. Planear, avaliar e executar políticas públicas e programas comunitários	1	2	3	4	5
67. Auxiliar na preparação de pacientes para entrada, permanência e alta hospitalar	1	2	3	4	5
68. Compreender o significado subjetivo atribuído pelos funcionários ao trabalho exercido	1	2	3	4	5
69. Avaliar capacidades, habilidades e aptidões de candidatos à carteira de motorista	1	2	3	4	5
70. Colaborar para a adesão e participação da população em geral em programas de atividades físicas	1	2	3	4	5
71. Trabalhar com as relações entre os sujeitos existentes no ambiente de trabalho	1	2	3	4	5
72. Mediar as intervenções de equipas multiprofissionais nos contextos comunitários	1	2	3	4	5
73. Dar pareceres de manuscritos para as revistas científicas da área	1	2	3	4	5
74. Assistir o paciente, a sua família e a equipa de saúde, numa unidade de saúde	1	2	3	4	5
75. Analisar e intervir no clima educacional	1	2	3	4	5
76. Facilitar as relações entre pessoas e organizações, contribuindo para o desenvolvimento de ambas	1	2	3	4	5
77. Possibilitar a tomada de decisão a partir de avaliações	1	2	3	4	5
78. Privilegiar os processos grupais nas avaliações e intervenções	1	2	3	4	5
79. Atuar preventivamente nas creches e escolas	1	2	3	4	5
80. Elaborar e implantar programas de saúde, educação e segurança do trânsito	1	2	3	4	5
81. Atuar em centros e postos de saúde na comunidade, hospitais, clínicas psiquiátricas ou de atendimento à saúde mental	1	2	3	4	5
82. Selecionar funcionários para um novo emprego	1	2	3	4	5
83. Identificar as representações sociais que medeiam as relações dos indivíduos com os seus ambientes	1	2	3	4	5
84. Desenvolver ações para a melhoria das capacidades psíquicas individuais com vista a otimizar o rendimento de atletas de alta competição	1	2	3	4	5
85. Realizar coletas de dados utilizando diferentes técnicas	1	2	3	4	5