Construction and Validity Evidence of a Socioemotional Skills Scale for University Students

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ABSTRACT

The aim of this study was to construct and investigate validity evidence for a measure of socioemotional skills for university students. Of the 60 items initially designed to represent six factors of the construct, 42 of them showed theoretical consistency. To analyze the structure of the instrument, exploratory factor analysis was carried out, based on the application of the instrument with 365 students. The analysis revealed six factors that presented groupings of items theoretically consistent with the definitions of the proposed hypothetical model: Self-Management of Emotions, Social Awareness, Responsible Decision-Making, Perseverance, Emotional Self-Awareness and Relationship Skills. The final structure, with 35 items, was able to explain 45.16% of the total variance. Confirmatory factor analysis was performed, based on the application of the instrument with 712 undergraduate students. The proposed structural model was confirmed, with adequate fit indices. Precision indices varied between .69 and .78. It is suggested that further studies investigate other types of validity evidence.
Keywords: confirmatory factor analysis; non-cognitive skills; measurement.

RESUMO – Construção e Evidências de Validade de uma Escala de Competências Socioemocionais para Universitários

O objetivo deste estudo foi construir e buscar evidências de validade de uma medida de competências socioemocionais para estudantes universitários. Dentre 60 itens inicialmente elaborados para representar seis fatores do construto, 42 deles apresentaram consistência teórica. Para análise da estrutura fatorial do instrumento, realizou-se uma análise fatorial exploratória, a partir da aplicação do instrumento em 365 estudantes universitários. A análise revelou seis fatores que apresentaram agrupamentos de itens teoricamente consistentes com as definições do modelo hipotético proposto: Autogerenciamento das Emoções, Consciência Social, Tomada de Decisão Responsável, Perseverança, Autoconsciência Emocional e Habilidades de Relacionamento. A estrutura final foi capaz de explicar 45,16% da variância total, a partir de 35 itens. Posteriormente, procedeu-se a uma análise fatorial confirmatória, a partir da aplicação do instrumento em 712 estudantes de graduação. O modelo estrutural proposto foi confirmado, apresentando índices de ajuste adequados. Os índices de precisão variaram entre 0,69 e 0,78. Sugere-se que novos estudos busquem outros tipos de evidências de validade.
Palavras-chave: análise fatorial confirmatória; competências não cognitivas; medida.

RESUMEN – Construcción y Evidencias de Validez de una Escala de Habilidades Socioemocionales para Estudiantes Universitarios

El objetivo de este estudio fue construir y buscar evidencias validez de una medida de habilidades socioemocionales para estudiantes universitarios. Entre los 60 ítems inicialmente desarrollados para representar seis factores del constructo, 42 de ellos mostraron consistencia teórica. Para analizar la estructura factorial del instrumento, se realizó un análisis factorial exploratorio, basado en la aplicación del instrumento a 365 estudiantes. El análisis reveló seis factores que presentaron agrupaciones de ítems teóricamente consistentes con las definiciones del modelo propuesto: Autogestión de las Emociones, Conciencia Social, Toma Responsable de Decisiones, Perseverancia, Autoconciencia Emocional y Habilidades de Relación. La estructura final fue capaz de explicar el 45,16% de la varianza total, basada en 35 ítems. Posteriormente, se realizó un análisis factorial confirmatorio, basado en la aplicación del instrumento a 712 estudiantes de grado. Los índices de precisión variaron entre 0,69 y 0,78. Se confirmó el modelo estructural, con índices de ajuste adecuados. Se sugiere que los estudios adicionales busquen otros tipos de evidencias de validez.
Palabras clave: análisis factorial confirmatorio; habilidades no cognitivas; medida.

Socioemotional skills have piqued the interest of researchers and mainly of agents concerned with socioemotional learning. The term "Socioemotional Learning", or "Social and Emotional Learning" (SEL) was created by the Fetzer Group institute, focused on studying behavioral problems and student academic performance (Greenberg et al., 2003), opening a vast field of research. One of the most representative programs in the field

emerged in 1994 at the University of Illinois at Chicago. Called Collaborative for Academic, Social and Emotional Learning (CASEL), it aimed to promote research and the practice of social-emotional learning. Since then, CASEL has influenced the creation of educational and mental health policies in the United States (Collaborative for Academic, Social and Emotional Learning, 2008).

Socioemotional competences have been understood as a multidimensional construct that can present numerous factors, which generally include emotional, cognitive, and behavioral variables, which aid in one's healthy development throughout the life cycle (Weissberg et al., 2015). Socioemotional skills cover a set of competencies, including: the recognition and management of our emotions; the development of care and concern for others; the establishment of positive relationships; making responsible decisions and knowing how to deal with challenging situations in a constructive and ethical way (Collaborative for Academic, Social and Emotional Learning, 2008). They are identified as a set of traits, behaviors and skills that include variables such as attitudes and values; temperament and personality; social skills such as leadership; constructs aimed at self-efficacy and self-esteem; work habits such as persistence, as well as emotions directed to specific tasks, such as enthusiasm, for example (Abed, 2014). According to Gondim et al. (2014), socioemotional skills are knowledge about oneself and about others, which aim at regulating and using emotions with the purpose of increasing personal well-being, quality of life and efficiency in social relationships. Such definitions highlight the multifactorial nature of the construct.

The concept of socio-emotional competence can be understood as the ability that a person has in knowing how to regulate and deal with their own reactions in the face of conflicts and tensions arising from interpersonal relationships, either with problem situations, or with people (Albuquerque, & Vasconcelos, 2019).

People with a high level of socioemotional skills have an adequate image of themselves and others, easier to regulate emotions at interpersonal and intrapersonal levels, with the aim of maintaining satisfactory relationships and adopting responsible behaviors in search of personal and social well-being (Pérez-Escoda et al., 2018). Socio-emotional competences and skills are formed through the development of interpersonal and affective relationships, based on how the person perceives, feels and names the association between situations and behaviors (Marin et al., 2017).

Socio-emotional competences have been studied by areas of developmental psychology and health prevention and promotion, being a concept widely used in the development of prevention programs in schools (Justo et al., 2017).

Its greatest investment has been in the educational context, with a focus on preventing emotional problems, through the development of socioemotional education programs (Ahmad et al., 2019; Berger et al., 2014; Greenberg et al., 2003; Hromek, & Roffey, 2009; Lipnevich, & Roberts, 2012; Willemsens, 2016). Above all, these programs have focused on the development of socioemotional skills in children and adolescents, neglecting the need to support the emotional development of university students.

Reinforcing the need to create intervention programs for higher education, Moro et al. (2005) affirm that most university students experience difficulties and emotional illness during their academic trajectory, as well as stress and emotional overload (Nogueira et al., 2018). Therefore, the existence of psychological support programs would be important as a strategy to promote mental health, with the aim of reducing the prevalence of depressive symptoms, anxiety, suicidal ideation and relationship difficulties. Another important investment is in the identification of dimensions that contribute to the minimization of these feelings, such as, for example, the identification of character strengths that impact the well-being of these students (Noronha, & Batista, 2020).

Attending a higher education institution is the goal of many Brazilians, who are usually in their adolescence and/or youth phase. With an average duration of 4 to 6 years, students in these courses have the possibility of different individual and collective experiences that demand accountability and sociability. This period can also be marked by special events in life, such as family distancing, experiencing conflicts, decisions, choices and attitudes that will be decisive in the lives of these students (Assis, & Oliveira, 2011).

In adapting to academic life, which is often accompanied by emotional difficulties, these students may be affected by suffering and/or mental illness with possible occurrence of depression, stress, anxiety, eating disorders, among other factors. Studies confirm that this community should be considered as an especially overloaded and vulnerable group and that institutions should be concerned with the protection and promotion of their mental health (Facundes, & Ludermir, 2005; Furegato et al., 2005; Neves, & Dalgalarrondo, 2007).

Literature shows that educational institutions have been concerned with developing strategies for mental health intervention with their students. However, efforts seem to be insufficient and are focused on creating sectors of psychological care aimed at the student. In 1999 and 2000, the Forum of Pro-Rectors of Community and Student Affairs, a body linked to the National Association of Rectors of Brazilian Federal Universities, carried out a mapping of forty federal and state institutions, which sought to identify the existence of health care practices aimed at the university student. The results showed that only 34% of the institutions offered some type of mental health care to students (Fonaprace, 2004). Cerchiari et al. (2005) point out that the number of epidemiological

studies on psychiatric morbidity and emotional issues in university students lacks scientific rigor, which hampers the analysis of the phenomenon, its understanding and, consequently, the promotion of intervention and prevention strategies.

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Data from more recent research shows that university students continue to have emotional problems. In a collection carried out with 378 university students from an institution in the interior of São Paulo, Gomes et al. (2020), found that 39.9% of the university students studied had a classification score for suspected cases of mood, anxiety and somatization disorders. Nascimento (2020) found similar data in a sample of 271 Health students, noting that around 17.3% were symptomatic for major depression, and 13.6% showed some degree of suicide risk.

The university student's routine can lead to mental illness principally due to time demands for academic activities and workload. Thus, the unavailability of time for leisure-related activities can aggravate the situation, causing emotional strain (Carvalho, 2015; Souza et al., 2017).

One strategy that has been adopted in the educational context to prevent emotional problems is the development of socioemotional education programs (Berger et al., 2014; Greenberg et al., 2003; Hromek, & Roffey, 2009; Lipnevich, & Roberts, 2012; Willemsens, 2016). However, as already mentioned, these programs have focused on the development of socioemotional skills in children and adolescents, neglecting to support the emotional development of university students.

The efficiency of these programs has been the subject of research. Coelho (2014) analyzed the efficacy and effectiveness of a set of programs for the development of socioemotional skills in primary and secondary school students. The results have mainly shown an improvement in students' self-esteemand the programs have shown consistant results over the years, but with differences for boys and girls. In general, men have shown more socioemotional skills than girls. Regarding the types of intervention methodologies for promoting mental health in the educational context, socioemotional development programs have been shown to be a great strategy with the best cost and benefit ratio (Knapp et al., 2011).

Regarding the existence of instruments for measuring socioemotional competences, (Souza, & Faiad, 2021), carried out a study that sought to identify the instruments available in national and international literature geared toward assessing the socioemotional competences of children, young people, and adults, with the purpose of analyzing and developing a specific factor model for university students in their educational context. To this end, a systematic review was conducted through the analysis of articles, theses, and dissertations published between 2004 and 2019 and made available in the following electronic databases: Scientific Electronic Library Online (SciELO), Latin American and Caribbean Health Science Literature (Lilacs), Web of Science, Brazilian Digital Library of Theses and Dissertations, and ScholarGoogle.

The survey identified 17 instruments out of a total of 855 references surveyed. None of these instruments were built specifically for university students in their academic context. The existing factors in these instruments were listed, analyzed, and categorized in order to develop a broad model that considered the existence of all the factors proposed and researched in the scientific literature. From this fact, 41 factors were grouped by nominal and conceptual similarity, in six major factors, which gave rise to the hypothetical model used in this study. The constitutive definitions of the factors will be presented below.

Factor 1. Emotional self-awareness: ability to recognize one's own personal characteristics related to a pattern of responses to life situations in the face of positive and negative emotions, as well as the ability to identify their values, strengths, weaknesses, impulses, and potentialities in the management of emotions to reach personal goals.

Factor 2. Self-management of emotions: skills in managing emotions and impulses in personal life situations, with the aim of controlling the expression of emotions to establish healthy social relationships and maintain balance in pursuit of the achievement of personal goals.

Factor 3. Perseverance: skills to maintain motivation in an attempt to achieve personal life goals, permeated by a culture of optimism, initiative, self-efficacy, self-esteem, and tolerance of frustration in the face of life situations.

Factor 4. Social awareness: skills related to the ability to perceive social situations, as well as the feelings and emotions of people with the aim of correspondingly efficiently in relationships with peers.

Factor 5. Relationship skills: skills for developing and maintaining healthy and rewarding social relationships with the efficient use of communication, assertiveness, leadership, cooperation, conflict management, and absence of social anxiety.

Factor 6. Responsible decision-making: ability to make decisions based on ethical standards in an attempt to build good social relationships by promoting safe behaviors, monitoring risks and the negative consequences of attitudes.

However, it appears that there is no specific instrument in the literature to diagnose socioemotional competences for the academic context of university students. In light of the need for a diagnostic tool to support the creation of programs to promote socioemotional skills for university students, this work proposes to build and search for internal validity evidence for a socioemotional skills scale for this academic context.

Method

In order to verify the factor structure of the instrument, an exploratory factor analysis was initially carried out with a primary sample of university students. Subsequently, data from a secondary sample of university students were subjected to structural equation modeling to confirm the instrument's structure.

Participants

The sample for the exploratory factor analysis consisted of 365 undergraduate students from a private higher education institution in Brazil's Federal District. Data were collected in eleven courses: Psychology (18.6%); Accounting Sciences (1.6%); Law (13.7%); Business Administration (11.0%); Nursing (10.1%); Biomedicine (3.6%); Nutrition (6.3%); Pharmacy (3.0%); Pedagogy (9.6%); Physical Education (15.1%) and Public Management (7.1%), all between the 2nd and 10th semesters of their courses. The mean age was 24.55 years ($SD=7.47$), and 60.8% were women.

A second sample for confirmatory factor analysis consisted of 712 undergraduate students from two private higher education institutions in the Federal District. Data were also collected in eleven courses: Psychology (22.8%); Accounting Sciences (5.9%); Law (18.1%); Business Administration (8.6%); Nursing (5.2%); Biomedicine (1.8%); Nutrition (3.2%); Pharmacy (1.5%); Pedagogy (15.4%); Physical Education (7.8%) and Public Management (9.6%), between the 2nd and 10th semesters of their respective courses. Participants were between 18 and 66 years old ($M=25.50$, $SD=8.08$), with 64.0% being women.

Instruments

The structural model proposed by (Souza, & Faiad, 2021) was used to build the scale for measuring socioemotional skills. The items were constructed based on the organization of a focus group, based on the literature and through an interview with three professors from the Psychology course at a higher education institution in the Federal District, who agreed to participate in the activity on a voluntary basis. The instrument's initial structure consisted of 60 items, 10 items for each of the factors. The items were submitted to an analysis by judges. This procedure was carried out by five undergraduate Psychology professors from different higher education institutions in the Federal District. The objective was to judge the relevance of the item in relation to the factor (content analysis) and the understanding of the meaning (semantic analysis). The criterion for accepting the item was 80% agreement among the judges. From that, a semantic analysis was also carried out with the target audience (five volunteers), to verify the understanding of the items and the instructions of the scale. No changes were made to this process.

The final instrument, identified as the Socioemotional Skills Scale for University Students, was composed of 42 items to assess the following factors: Self-management of Emotions; Social Awareness; Responsible Decision-making; Perseverance; Emotional Self-awareness; and Relationship Skills, assessed using a scale of 1 (Strongly disagree); 2 (Disagree partially); 3 (Neither agree nor disagree); 4 (Agree partially) and 5 (Strongly agree).

Procedures

The data were collected in classrooms, collectively with all students who attended subjects in the courses that comprised the sample. A research protocol was organized that contained three parts: two terms of free and informed consent; a questionnaire to collect personal information to characterize the sample; and the Socioemotional Skills Scale. The protocol was applied and collected immediately, with an average response time of 5 minutes.

Data Analyses

The data collection was initially vetted for typing errors and missing data. The internal structure was analyzed through exploratory factor analysis, using the Statistical Package for the Social Sciences (SPSS), version 22. For factor rotation, the varimax orthogonal method was applied, due to a finding of little correlation between factors. Minimum factor load was .30. Factor precision was calculated by the alpha values.

Next, a confirmatory factor analysis was performed using the AMOS software. The Maximum Likelihood estimation method was used and, after specifying and estimating the model, its adequacy was assessed by the following adjustment indices: chi-square (χ^2); degree of freedom (df); the chi-square ratio for degrees of freedom (χ^2/df); TLI - Tucker-Lewis Index; CFI - Comparative Fit Index. Regarding the χ^2/df criterion, this ratio must be less than 5.0 (Byrne, 1989), though less than 2.0 is desireable (Tabachnick, & Fidell, 2007). Regarding TLI and CFI, an adequate model must present values above .90 (Hu, & Bentler, 1999). The following parsimony indices were also used: RMSEA – Root Mean Square Error of Approximation, and SRMR – Standardized Root Mean Residual. These values range from zero to one. Adequate models have values below .05 (Byrne, 1989), however values up to .08 are acceptable (Hu, & Bentler, 1999).

Results and discussion

In the data analysis, both the Kaiser-Meyer-Olkin sample adequacy measure (KMO=.846) and the Bartlett Sphericity Test (χ^2=4927.951; df=861; p<.001) indicated that there are sufficient conditions for conducting factor analysis. An analysis of the main components indicated the presence of 11 factors, according to the Kaiser normalization criterion, which presented eigenvalues greater than 1. These 11 factors explained 59.64% of the accumulated variance. Scree Plot showed up to 8 factors. The best structure was that of six factors, in line with the theoretical proposal, with orthogonal analysis and varimax rotation, according to the data presented.

Items 26 and 29 were excluded because the withdrawal contributed to the increase in the alpha value. The factor had a structure of five items, with loads ranging from .51 to .65 and an alpha of .77. The items deal with emotional control.

Table 1
Factor Load (FL), Description and Commonality (h^2) of Factor 1 – Self-management of Emotions

Item	FL	Description	h^2
12	.65	*I have already lost emotional control because of the pressures of college.	.49
08	.65	*I tend to lose emotional control when I'm under pressure in college.	.50
32	.62	*I feel like crying due to college committments.	.48
19	.54	*I can't keep calm in difficult situations I face in college.	.36
09	.51	*I tend to be angry with my classmates when I have to work in a group.	.31
% of total variance			18.28
Alpha			.77

Note. Items with * indicate negative issues that should have their values reversed in the data tab

Table 2
Factor Load (FL), Description and Dommonality (h^2) of Dactor 2 – Social Awareness

Item	FL	Description	h^2
17	.70	I care about the feelings of my college classmates.	.52
28	.60	If a classmate relates personal difficulties, I am touched by his/her situation.	.41
33	.59	I am attentive to my classmates regarding their feelings.	.49
41	.52	I have the sensitivity to identify what my college classmates are feeling.	.44
07	.45	I can sense if my college classmates are experiencing emotional difficulties.	.24
22	.38	I try to understand my college classmates, even though I disagree with their opinions.	.30
10	.31	In group work, I am understanding of classmates' difficulties.	.25
% of total variance			9.63
Alpha			.74

The Social Awareness factor, with seven items, indicated loads between .31 and .70. It presented an alpha of .74. The factor's items describe a student's concern for classmates.

The Decision-making factor had six items, with loads between .39 and .58, and an alpha of .71. Its items describe a responsible student.

The Perseverance factor, with seven items, indicated loads between .37 and .68, and indicated an alpha of .78. The factor deals with the student who strives to continue the course.

The Emotional Self-awareness factor presented 5 items, with loads between .38 and .70 and an alpha of .69. It describes a student who knows himself, both in terms of his potential and his weaknesses.

The Relationship Skills factor was made up of five items, which describe a student who finds it easy to relate. It presented loads between .36 and .51 and an alpha of .74. In the general process, seven items (6; 13; 14; 20; 26; 29 and 40) were eliminated because the withdrawal contributed to the increase in the alpha value or because they did not theoretically make sense. The final structure with six factors was able to explain 45.16% of the total variance. The complete instrument had 35 items. Table 7 presents the means of the factors, as well as the standard deviation.

Table 3
Factor Load (FL), Description and Commonality (h²) of Factor 3 – Responsible Decision-making

Item	FL	Description	h²
23	.58	I try to do the right things in college, so I don't have problems in the future.	.50
35	.53	I am a person who is concerned with the professional ethics of my course.	.44
24	.51	I try not to do anything wrong in my academic environment.	.38
34	.48	I am responsible for my college commitments.	.45
30	.42	I know that my personal values are compatible with the professional career I am pursuing.	.27
27	.39	If members of the work group propose to circumvent the rules of the discipline, I refuse to participate.	.21
% of total variance			5.63
Alpha			.71

Table 4
Factor Load (FL), Description and Commonality (h²) of Factor 4 – Perseverance

Item	FL	Description	h²
21	.68	* I think about giving up studying.	.59
11	.56	I am motivated to continue my studies.	.47
37	.53	I'm sure I'll be able to finish my course.	.47
31	.44	I feel capable of graduating from the course I'm taking.	.38
18	.42	I feel very motivated to be studying.	.44
01	.42	* The difficulties I face in college discourage me from continuing my studies.	.34
02	.37	* The most difficult subjects make me want to give up my course.	.30
% of total variance			4.03
Alpha			.78

Note: Items with * indicate negative issues that should have their values reversed in the data tab

Table 5
Factor Load (FL), Description and Commonality (h²) of Factor 5 – Emotional Self-awareness

Item	FL	Description	h²
04	.70	I can identify my strengths in relation to my academic life.	.52
03	.55	I know my potential related to my academic career.	.38
15	.42	I know myself to the point of knowing what I like and don't like about my course.	.23
16	.40	I know myself to the point of being sure of what I want in my professional future.	.25
05	.38	I can identify my emotional weaknesses in relation to my academic life.	.19
% of total variance			3.91
Alpha			.69

Table 6
Factor Load (FL), Description and Commonality (h²) of Factor 6 – Relationship Skill

Item	FL	Description	h²
38	.51	I find it easy to make friends in the academic environment.	.50
36	.50	I am a person who likes to participate in academic activities with my classmates.	.39
39	.46	I find it easy to work in groups.	.50
25	.41	When I am developing group work, I am participatory.	.37
42	.36	I have a good relationship with the institution's professors.	.28
% of total variance			3.65
Alpha			.74

Table 7
Means and Standard Deviations of the Scale Factors

Factors	Mean	Standard Deviation
Self-management of Emotions	3.21	1.09
Social Awareness	3.72	.68
Responsible Decision-making	4.26	.61
Perseverance	4.18	.73
Emotional Self-awareness	4.10	.69
Relationship Skills	4.05	.73

Confirmatory Factor Analysis

A first analysis of the structural equation did not reveal a good fit of the model. The modification indices were analyzed and nine adjustments were made in the following correlations even between errors. Four items were removed from the scale due to the factorial loads being less than 0.40. They were items 18 and 9 of the Social Awareness factor; item 5 of the Emotional Self-awareness factor and item 22 of the Responsible Decision-making factor. The final scale consisted of 31 items, being Social Awareness (5 items, alpha .76); Self-management of Emotions (5 items alpha .76); Responsible Decision-making (5 items, alpha .70); Emotional Self-awareness (4 items, alpha .67), Relationship Skills (5 items, alpha .72) and Perseverance (7 items, alpha .75). After these modifications, the model showed good adjustment rates.

The results of the confirmatory factor analysis indices can be seen in Table 8. There was a significant improvement in all the adjustment indices comparing the initial model with the adjusted model.

The final structure of the instrument can be seen in Figure 1, which presents the factors, final items of the scale and the correlations between errors.

Table 8
Model Ddjustment Indexes

Models	χ^2	df	χ^2/df	CFI	TLI	RMSEA	SRMS
Intitial Model	1542.895	545	2.831	.84	.83	.05	.05
Adjusted Model	935.410	408	2.223	.91	.90	.04	.05

The results of the confirmatory factor analysis showed that the factor structure proposed in the theoretical model and found in the exploratory factor analysis, remained in the initial six hypothetical factors. Of the 35 items investigated initially, only 4 were excluded for the composition of the final structure of the Socioemotional Skills Scale for University Students. The removal of these items, together with the insertion of nine correlations between errors, led to a result with good adjustment rates.

From the analyses performed, it was possible to verify that among 60 items designed to represent six facets of the construct, 42 of them showed theoretical consistency, after an analysis by judges. Of the 42 theoretically validated items, 35 of these constituted a scale with factorial validity evidence. From this process, it was possible to verify the adequacy of the hypothesized theoretical model to the scale structure, which showed good psychometric properties. This fact is relevant, since there are low options of instruments for assessing socioemotional skills, especially with regard to the university population.

Some limitations to this study can be raised. As it is a self-report measurement of competencies, social desirability is an aspect that must be considered in the process of building measures of this construct. It is suggested that further research may seek to improve the accuracy indices of the factors of this instrument, mainly of dimension 3: Responsible Decision-making ($\alpha=.71$) and Emotional Self-awareness ($\alpha=.69$). Another important investment would be to seek validity evidence from studies that cover other regions of Brazil and analyses based on external variables.
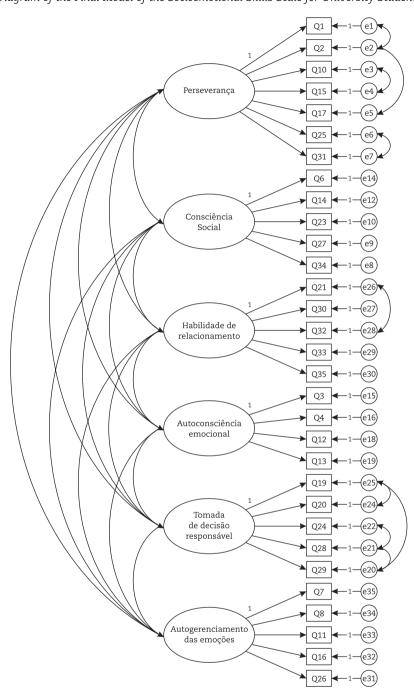
Figure 1
Diagram of the Final Model of the Socioemotional Skills Scale for University Students

Authors' contributions

All authors participated in the elaboration of the manuscript. Specifically, the authors Rodrigo Rodrigues de Souza, Cristiane Faiad and Fabian Rueda participated in the initial writing of the study. The author Rodrigo Rodrigues de Souza participated in the data analysis and the authors Cristiane Faiad and Fabian Rueda participated in the final version of the manuscript.

Availability of data and materials

All data and syntax generated and released during this research will be discarded in full secrecy due to the requirements of the Ethics Committee. However, the dataset and syntax that support this manuscript is available upon request to the first author.

Conflict of interests

The authors declare that there are no conflicts of interest.

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