ISSN online 1688-4221 Ciencias Psicológicas January - June 2021; 15(1): e-2349
doi: https://doi.org/10.22235/cp.v15i1.2349

School Subjective Well-Being Scale (EBESE): development and validation of an education assessment measure

Escala de Bem-Estar Subjetivo Escolar (EBESE): elaboração e validação de uma medida para avaliação educacional

Escala de Bienestar Subjetivo Escolar (EBESE): elaboración y validación de una medida de evaluación educativa

João Lucas Dias-Viana[1], ORCID 0000-0002-7626-3937
Ana Paula Porto Noronha[2], ORCID 0000-0001-6821-0299

[1 2] Universidade São Francisco. Brasil

Abstract: The aim of this study was to develop the *Escala de Bem-Estar Subjetivo Escolar - EBESE* (School Subjective Well-being Scale - SSWBS) and investigate its psychometric properties. A process of item development, test content validation, study of evidence of validity based on internal structure, and calculation of internal consistency coefficients was carried out. A total of 434 Brazilian students, from the 7th year of Elementary School (7th grade) to the 2nd year of High School (11th grade), of both sexes, between 12 and 19 years of age (*M*= 14.88; *SD*= 1.70) participated in the study. Exploratory factor analysis results indicated a three-factor structure, with adequate fit indices and Cronbach's alpha = 0.91. The SSWBS presented good internal consistency indices and a factor structure in agreement with the underlying theory. The instrument is important because it allows an assessment of student well-being levels, subsidizing interventions and improvements in the school context.

Keywords: negative affects, positive affects, psychological tests, satisfaction with school, school

Resumo: O presente estudo teve por objetivo o desenvolvimento da Escala de Bem-Estar Subjetivo Escolar (EBESE) e investigar suas propriedades psicométricas. Realizou-se o processo de elaboração de itens e validação do conteúdo, bem como a realização de estudo de evidências de validade com base na estrutura interna e cálculo dos coeficientes de consistência interna. Participaram 434 estudantes brasileiros, do 7ª ano do Ensino Fundamental ao 2º ano do Ensino Médio, ambos os sexos, com idades entre 12 e 19 anos (*M*= 14,88; *DP*= 1,70). Os resultados indicaram, por meio de análises fatoriais exploratórias uma estrutura com três fatores, com índices de ajuste considerados adequados e coeficiente alfa de Cronbach de 0,91. Conclui-se que a EBESE apresentou bons índices de consistência interna e uma estrutura fatorial de acordo com a teoria subjacente. O instrumento tem a sua importância por possibilitar a avaliação dos níveis de bem-estar do aluno, subsidiando intervenções e melhorias no contexto escolar.

Palavras-chave: afetos negativos, afetos positivos, testes psicológicos, satisfação com a escola, escola

Resumen: El objetivo del estudio fue elaborar la *Escala de Bem-Estar Subjetivo Escolar - EBESE* (Escala de Bienestar Subjetivo Escolar) y investigar sus propriedades psicométricas. Inicialmente fue realizado el proceso de construcción de los ítems y la validación de contenido, así como realizar estudio de evidencias de validez con base en la estructura interna y cálculo de los coeficientes de consistencia interna. La muestra contó con 433 estudiantes brasileños que estaban cursando del 7º año de la Enseñanza Primaria al 2º año de la Enseñanza Secundaria, varones y niñas, con edades entre 12 y 19 años (*M*= 14,88; *DE*= 1,70). Por medio de análisis factoriales exploratorios, los resultados indicaron una estructura con tres factores con índices de ajuste considerados adecuados y coeficiente alfa de Cronbach de 0,91. Se concluyó que la EBESE presenta índices adecuados de consistencia interna y una estructura factorial de acuerdo con la teoría subyacente. La importancia del instrumento puede ser observada en relación a la posibilidad de evaluación de los niveles de bienestar del alumno, subsidiando intervenciones y mejoras en el contexto escolar.

Palabras clave: afectos negativos, afectos positivos, pruebas psicológicas, satisfacción con la escuela, escuela

Received: 05/28/2019 Accepted: 10/02/2020

How to cite:
Dias-Viana, J. L. & Noronha, A. P. (2021). School Subjective Well-Being Scale (EBESE): development and validation of an education assessment measure. *Ciencias Psicológicas, 15*(1), e-2349. doi: ttps://doi.org/10.22235/cp.v15i1.2349

Correspondence: João Lucas Dias-Viana; Universidade São Francisco. E-mail: jolucasviana@gmail.com. Ana Paula Porto Noronha. Universidade São Francisco. E-mail: ana.noronha8@gmail.com

Subjective Well-Being (SWB) refers to how people assess and experience their lives in terms of emotional reactions and global judgments. It is a multidimensional construct with a tripartite structure, composed of a cognitive component, life satisfaction, and two emotional components, positive and negative affect (Diener, 1984). The judgment of how satisfied people are with their lives expresses different information, since people are not equal and are influenced by multiple factors, such as current moods, thoughts and feelings (Diener, Lucas, & Oishi, 2005).

In regard to the study of SWB throughout the life cycle, research has confirmed the tripartite structure of the SWB model in children and adolescents (Diener, 2012; Ortuño-Sierra, Aritio-Solana, Luis, Nalda, & Fonseca-Pedrero, 2017). However, differences regarding life satisfaction domains were found. In adults, work, family, leisure, health, finances, and self are the primary factors influencing life satisfaction levels. In child and youth populations, school, family, friends, self, leisure and life environment are the primary factors influencing SWB levels (Huebner, 1991; McCullough, Huebner, & Laughlin, 2000).

The school context is considered an important factor for the psychosocial development of subjects. In addition to developing academic skills, it helps students become more resilient in the

face of adversity, feel more connected with the people around them, and identify their aspirations for the future. School is also the first place where individuals experience society in all its aspects, and these experiences may have a profound influence on the attitude and behavior of students throughout life (Abed, 2016). In order to play this role, students should feel satisfied with their school environment and the relationships they establish in that space (Alves, Zappe, Patias, & Dell'Aglio, 2015).

Thus, considering its role in psychosocial development, the number of years of the schooling process, and the daily hours subjects remain there, school can be considered an important factor influencing the SWB of children and adolescents. Tian, Wang and Huebner (2014), based on the SWB theory (Diener, 1984), proposed a theoretical model of SWB in school, which refers to how students subjectively assess and experience emotions resulting from experiences that take place at school. The model includes a cognitive component - School Satisfaction (SS) - and two affective ones - positive affect in school (PAS) and negative affect in school (NAS). SS is characterized by judgments and assessments that students make regarding school experiences. Affect, similarly to the general SWB model, refers to the frequency with which students experience positive and negative emotions in the school context (King, Huebner, Suldo, & Valois, 2007).

Thus, it is necessary to intensify discussions and investigations on topics related to students' well-being in school, since investigations on this variable can contribute to the promotion of healthy relationships, student engagement, school dropout prevention, and global SWB levels (Cintra & Guerra, 2017; Whitley et al., 2012). In addition, ensuring student well-being is regarded as one of the responsibilities of school institutions (Ministry of Education and Culture [MEC], 2013). In this sense, considering the importance of large-scale educational assessments to evaluate and monitor education systems, studies on the construction and development of a school SWB instrument are expected to assist in the production of indicators to improve education systems and in the formulation of educational public policies focusing on student well-being.

Considering that the development of knowledge regarding a phenomenon depends on the existence of valid and reliable measurement instruments, Dias-Viana and Noronha (2020) conducted a literature review to identify instruments aimed at measuring school SWB. Results indicated that most studies used global measures or only measured the school satisfaction component. The only instrument found was the *Brief Adolescents' Subjective Well-Being in School Scale* (BASWBSS; Tian et al., 2014), which has two factors that measure school satisfaction and affect in school. Even though BASWBSS has two items to assess affect (one for PAS and one for NAS), according to the SWB theory on which the scale is based, positive and negative affect are not polarities of the same dimension, but independent factors.

Although there is no consensus on the ideal number of items that a factor of a psychological instrument should have, it is expected to have at least three items (Pasquali, 2001). Single-item measures fail to address multidimensional and complex constructs, limiting measurement possibilities and compromising instrument reliability (Konrath, Meier, & Bushman, 2014). In addition, positive affect is an important variable contributing to the school experience, correlated with school engagement and academic achievement (Sellstrom & Bremberg, 2006), and coping (Reschly, Huebner, Appleton, & Antaramian, 2008). On the other hand, negative affect is correlated with school dropout, antisocial behavior and substance abuse (Roeser, 2001). Thus, the fact that the BASWBSS has a single item to assess the affective factors of school SWB was identified as a limitation of the instrument. In addition, an instrument with a greater number of items would allow a better measurement and understanding of the importance of affect for education. Thus, the aim of this work is to present the process of construction of the School Subjective Well-Being Scale (SSWBS), and validity evidence based on test content and internal structure.

Method

For item construction, a literature review was carried out, based on the three factors that make up school SWB: School Satisfaction, Positive Affect in School and Negative Affect in School. The information obtained from the available literature aided the proponents of this research in the process of developing 70 initial items for the SSWBS. The theoretical concept used to develop the items was subjective well-being, developed by Diener (1984), and the SWB in School model, proposed by Tian et al. (2014). Item development followed the guidelines of the *International Test Commission*, which recommend the construction of clear and objective items that express a single idea; intelligible to the target population; consistent with the factor to be evaluated; and having face validity (*International Test Commission* [ITC], 2018).

Study 1 - Validity Evidence based on Test Content

Participants

Three psychologists, of both sexes, with undergraduate, master's and doctoral degrees in psychology, participated in the analysis of the judges. Participants had an average of 18 years of professional experience, with knowledge and experience in research in the areas of school psychology and psychological assessment, as well as in the development of instruments. Twenty adolescents, both male and female, with ages ranging from 12 to 13 years (*M= 12.15; SD= 0.36*) participated in the pilot study. They were students of the 7th grade of a public school in the State of Ceará, Brazil. Students who had severe cognitive impairments and /or some disorder that prevented them from participating in the research were excluded from the sample. Information on which students might fit the sample exclusion criteria was obtained from the school coordinator. Upon consultation, it was found that the school did not have any students who met the research exclusion criteria.

Instruments

Assessment Form for Independent Judges. The form sent to the three expert judges included personal identification and education background questions. In addition, there was a brief description of the research and its objectives, as well as the construct - School SWB. Then, there were instructions on how to proceed with the assessment of the items, which were analyzed for language clarity, theoretical relevance, practical pertinence, and theoretical dimension.

School Subjective Well-Being Scale - initial version. The aim of the instrument is to assess student satisfaction with school and the frequency of positive and negative affect experienced by students in the school context. It consisted of two subscales. The first subscale contained 10 initial items aimed at evaluating the School Satisfaction factor (cognitive aspect of School SWB), assessing the positive and the negative pole of the construct, with a five-point Likert scale answer key, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Item examples: "I am satisfied with my school"; "My school is excellent". The second subscale, Positive and Negative Affect experienced by students in the school environment, was composed of 60 initial items, 30 regarding positive affect and 30 regarding negative affect. The items consisted of adjectives, with a five-point Likert scale answer key, ranging from 1 (*never*) to 5 (*always*). Item examples: "Confident", "Motivated", "Tired" and "Upset". In order to assess item understanding by the target population, the following questions were inserted: "Was there any word you didn't know?"; "Was any question (item) unclear to you, and if so, which one was it (Indicate question number)?"; "Were the instructions for completing the test clear to you?"; "Do you have any suggestions regarding the questions or the test in general?".

Procedures

Initially, authorization to conduct the instrument was requested to the board of a public school in the State of Ceará, Brazil. Then, the research project was submitted for consideration by a Research Ethics Committee of a Brazilian university, and approved under CAAE number: 97953218.2.0000.5514. After approval, an email was sent to the expert judges inviting them to participate in the research and assess the instrument's items. Their consent to participate in the study was given by signing an Informed Consent Form. (*Termo de Consentimento Livre e Esclarecido - TCLE*) and an access link to the item assessment protocol was sent to the expert researchers.

After the analysis of the judges, in the pilot study stage, a Free and Informed Consent (TCLE) was signed by one of participant's parents or legal guardians, in addition to a specific Free and Informed Consent Form for minors (*Termo de Assentimento Livre e Esclarecido - TALE*) signed by students themselves, in accordance with the ethical aspects required for research involving human beings. The instrument was conducted in person and collectively, at a time previously scheduled with the school, and included one student group. The SSWBS version used in the pilot study was obtained from the analysis of the judges, in which items were excluded for not meeting the established criteria of content validity. During the session, students were given the necessary guidance as to how the instrument should be completed. The time allowed to conduct the pilot version of the scale was 30 minutes. After participants completed the instrument, the researcher conducted a survey on potential doubts arising from the response process.

Data Analysis

Judges' scores and responses to the *Assessment Form for Independent Judges* were stored on an electronic spreadsheet and analyzed according to the Content Validity Coefficient (CVC; Hernández-Nieto, 2002). Items with a CVC equal to or greater than 0.80 were kept.

In the pilot study, descriptive statistics were used to characterize the sample using the statistical software *Statistical Package for the Social Sciences* (SPSS), v.25. The responses of the 20 students to the SSWBS assessment questionnaire were fully read and qualitatively analyzed, grouped according to content similarity, using the content analysis methodology proposed by Bardin (2011). The doubts and suggestions mentioned by students while responding the instrument were noted for later assessment.

Results of Study 1

The 70 items developed for the initial version of the SSWBS were analyzed by the judges, and items with a CVC equal to or greater than .80 were kept. For the School Satisfaction factor, three items were excluded: "When my friends talk about their schools, I think their school is better than mine" (.76); "My school is close to an ideal school model" (.36) and "In most respects, I am satisfied with my school" (.78). For Positive Affect in School, seven items were excluded: "accepted" (.76), "relieved" (.63), "well" (.76), "comfortable" (.76), "hopeful" (.76), "strong" (.63) and "optimistic" (.69). For Negative Affect in School, eleven items were excluded: "threatened" (.76), "scared" (.76), "guilty" (.69), "depressed" (.76), "bored" (.76), "humiliated " (.76), "misunderstood" (.76), "hurt" (.69), "frightened" (.69), "disturbed" (.63) and "ashamed" (.76). Therefore, 21 items were excluded from the scale.

The pilot study was conducted with a 49-item version of the SSWBS. Participants did not have any doubts regarding instructions, response format and item comprehension. Only the “enthusiastic” item was marked as difficult to understand, which caused it to be removed from the scale. Thus, after the analysis of the judges and the pilot study, 22 items were removed, resulting in a 48-item version of the SSWBS.

Study 2 – Validity Evidence based on Internal Structure

Participants

The study sample was composed of 434 students from the 7th year of Elementary School (7th grade) to the 2nd year of High School (11th grade), with a predominance of females (*n*= 240; 55.30%), and ages between 12 and 19 years (*M*= 14.88; *SD*= 1.70), regularly enrolled in a public school in the State of Ceará, Brazil. Students who had severe cognitive impairments and/or some disorder that prevented them from participating in the research were excluded from the sample. Upon consultation with the school coordination, it was found that there were no students who met the exclusion criteria of this research in the school.

Instruments

Sociodemographic and School Identification Questionnaire. Instrument developed by the proponents of this research. Composed of questions regarding age, gender, school and grade.

School Subjective Well-Being Scale - initial version. Instrument designed to assess student well-being in the school context. The version used in this stage results from the test content validation study (Study 1). Thus, a version of the SSWBS composed of 48 items distributed in three factors: School Satisfaction (7 items), Negative Affect in School (22 items) and Positive Affect in School (19 items).

Procedure

The participation of students under 18 years of age in the research occurred by submitting a Free and Informed Consent Form signed by a parent or legal guardian and a specific Free and Informed Consent Form for minors signed by the students themselves. Students aged 18 or more participated in the survey by signing an informed consent form. The instrument was conducted in person and collectively, at a time previously scheduled with the school.

Data Analysis

Initially, the SSWBS data matrix was tested for factoring, by calculating the Kaiser-Meyer-Olkin index (KMO) and by Bartlett's Test of Sphericity. KMO values equal to or greater than .70 with sphericity test significance levels $p< 0.05$ indicate the matrix is factorable, making it possible to use Exploratory Factor Analysis (Pasquali, 1999). Then, parallel analysis, *Minimum Average Partial* (MAP), and the Hull Method were used to determine the number of factors of the SSWBS (Lorenzo-Seva, Timmerman, & Kaers, 2011; Velicer, 1976).

After that, the parameters of the factor solution were estimated by *Oblimin* rotation and the *Weighted Least Squares Mean and Variance Adjusted* - WLSMV estimator, from the matrix of polychoric correlations between variables. This estimator is considered robust and recommended for categorical and ordinal items, such as Likert scales. Since the SSWBS is intended to be a brief instrument, items of moderate and high discrimination with factor loadings equal to or greater than .40 in at least one of the factors were kept. Then, Exploratory Factor Analysis was performed and the following fit indices were considered: *Root-Mean-Square Error of Approximation* (RMSEA; reference value < .08), *Comparative Fit Index* (CFI; reference value > .90) and *Tucker-Lewis Index* (TLI; reference value > .90; Hair, Black, Babin, Anderson, & Tatham, 2009)

The internal consistency indices of the general scale and for each of its factors were calculated using Cronbach's alpha and McDonald's omega. Internal consistency coefficient values equal to or greater than .70 are considered adequate (Campo-Arias & Oviedo, 2008). Test information curves were also used, as they are more specific than traditional reliability coefficients, allowing the identification of the instrument's reliability for each part of the latent trait. The internal structure of the SSWBS was also analyzed through the Item Response Theory, using the Rasch

model (Bond & Fox, 2015) to investigate the difficulty parameters of the items and people. Items with item-person correlations above .30 are considered adequate. Item goodness of fit was also analyzed through *Infit* and *Outfit* indices, taking values between .50 and 1.50 as a reference (Linacre, 2014). The analyses of this study were performed using the software *Factor Analysis 10.8*, *Mplus* 7.11, *RStudio* and *Winsteps* 3.74.

Results of Study 2

Initially, a Kaiser-Meyer-Olkin (KMO) coefficient of .94 was found, which suggests a sufficient level of common variance between items to perform factor analysis. Bartlett's Test of Sphericity, which assesses the general significance of all correlations in a data matrix, showed statistical significance ($p < .001$). These results indicate the possibility of data factoring. As for the SSWBS factor solution, retention methods were not unanimous, recommending solutions of one (Hull method), three (MAP) and even four factors (Parallel Analysis).

When analyzing these solutions, it was found that 19 items had cross loadings above .30 and one item did not load for any of the factors. Thus, these items were excluded, considering the goal was to develop a brief and high quality psychometric measure. Items with factor loadings equal to or greater than .40 in the expected theoretical dimension were considered (Hair et al., 2009). Therefore, 20 items were excluded, and a 28-item version of the SSWBS was obtained.

Exploratory Factor Analysis was performed on this version to investigate the model's fit indices with one, three and four factors, using RMSEA, CFI and TLI. The one-factor solution showed the poorest fit indices (RMSEA = .13; CFI = .74; TLI = .72). The data showed that the four-factor solution had better indices (RMSEA= .05; CF = .97; TLI= .96) than the three-factor solution (RMSEA= .06; CFI= .95; TLI= .94). However, the interpretability of the values assumed by factor loadings did not allow the identification of a theoretical distribution pattern justifying a fourth factor. Thus, results favored a three-factor model, whose items, loadings and internal consistency coefficients are shown in Table 1.

Table 1

Results of Exploratory Factor Analysis (Oblimin Rotation) and Internal Consistency Coefficients

Item	F1	F2	F3
1. School is a place where I feel well	**.41**	**–**.12	.27
2. My school is bad	**–**.68	.01	**–**.03
3. I am dissatisfied with my school	**–**.66	.08	.06
4. If I had the opportunity to choose a school to study, I would choose mine	**.66**	.10	**–**.01
5. I am satisfied with my school	**.84**	**–**.02	.00
6. My school is excellent	**.72**	.08	.06
7. There are a lot of things I like in my school	**.60**	.01	.05
8. Bored	.00	**.64**	**–**.19
9. Agitated	.18	**.42**	.29
10. Anxious	.23	**.48**	**–**.13
11. Tired	**–**.01	**.44**	**–**.23
12. Annoyed	**–**.03	**.59**	**–**.26
13. Furious	**–**.02	**.88**	.04
14. Impatient	**–**.05	**.61**	.02
15. Irritated	**–**.01	**.87**	**–**.05
16. Angry	**–**.05	**.79**	.00
17. Tense	.11	**.57**	**–**.22
18. Upset	.03	**.95**	.01
19. Able	.12	**–**.04	**.68**
20. Full of energy	.19	.01	**.56**
21. Competent	.04	.02	**.72**
22. Understood	.24	**–**.09	**.46**
23. Confident	.00	**–**.04	**.75**
24. Brave	**–**.02	.05	**.67**
25. Determined	**–**.03	.18	**.85**
26. Integrated	.17	.02	**.45**
27. Interested	.16	.07	**.56**
28. Motivated	.25	**–**.05	**.62**
Cronbach's Alpha Coefficient	.82	.88	.87
McDonald's Omega Coefficient	.87	.90	.89

Note. F1 = School Satisfaction; F2 = Negative Affect in School, F3 = Positive Affect in School

As shown in Table 1, the three-factor solution presented low cross loadings (≤|.29|). The interpretability of factor loadings and the distribution pattern of the items in the factor corroborated the tripartite theoretical model of subjective well-being. The first factor explained items related to students' satisfaction with school, i.e., students' cognitive assessment of their school. Factors 2 and 3 explained items related to the positive and negative affect experienced by students in the school environment. Correlations between factors were moderate ($r_{F1xF2} = -.39$; $r_{F1xF3} = .43$ e $r_{F2xF3} = -.34$), indicating an oblique relationship between variables (Damásio, 2012).

The calculation of internal consistency indices showed Cronbach's alpha coefficients ranging from .82 to .88, and omegas from .87 to .90. Then, the consistency indices for the 28-item version of the SSWBS were calculated, resulting in an alpha of .91 and a McDonald's omega of .93, which indicates good reliability indices for the instrument.

The next step was to investigate more accurately the reliability of the three factors through information curves, using IRT. These analyses showed that the first factor, school satisfaction, presented a higher level of reliability for the interval between −2 and 0 of the theta scale. Negative affect in school, the second SSWBS factor, showed higher levels of reliability for the interval between −1 and +3, with a higher level of information on a broad spectrum of the latent trait, with greater reliability for the population above the population average (standardized as 0). It was found that factor 3, positive affect in school, had greater reliability in the interval between −2 and +1, showing a better functioning of the instrument at the lower pole of the latent trait. The analysis of the information curves shows that the instrument has greater reliability when measuring students with lower levels of school satisfaction and positive affect, and higher levels of negative affect (Figure 1).

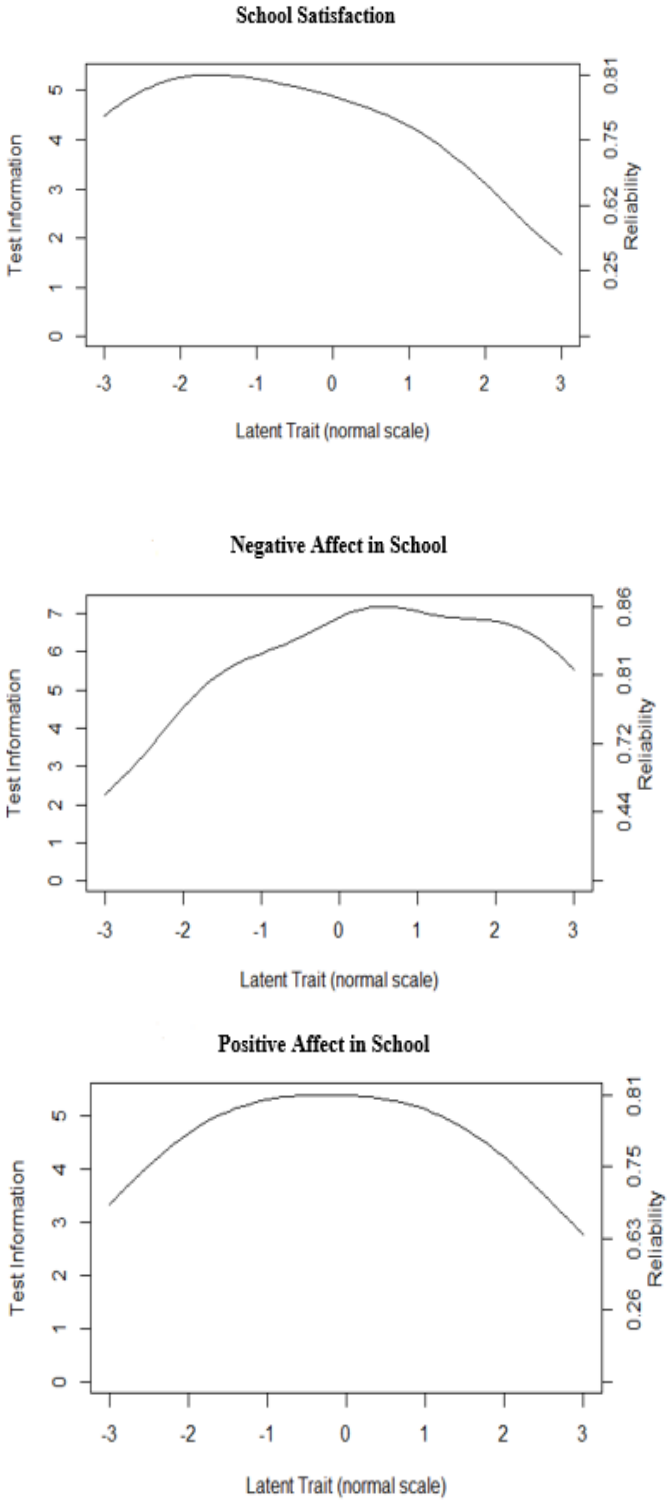

Figure 1. Information Curves of SSWBS Factors - 28 items.

Then, the Item Response Theory (IRT) model was used through a *Rating Scale* analysis (see Table 2). All factors were considered one-dimensional, according to the criteria of Linacre (2014), in which the variance of the first contrast must be lower than the second. The analysis in Table 2 shows that most items are within the expected fit, with *infit* and *outfit* values between .50 and 1.50 (Linacre, 2014). Only item 9 (“agitated”) had fit indices outside the expected range.

In regards to item-total correlations, item 9 (“agitated”) showed the lowest coefficient (r = .35) and *infit* and *outfit* indices outside the reference range, indicating that this item does not represent the assessed construct very well. A new exploratory factor analysis was performed with the 27 remaining items and the scale fit indices improved, with CFI= .96; TLI= .95; RMSEA= .06. As for the other items, correlations ranged from .50 to .81, interpreted as moderate to high. The internal consistency of the items was considered adequate, with a lower value of .96 (F3) and a higher value of .99 (F1 and F2). In regards to people, coefficients were .78 (F1), .84 (F2) and .83 (F3), which were also considered adequate. With regard to item difficulty, item 6 of school satisfaction (“My school is excellent”), item 13 of negative affect in school (“furious”), and item 22 of positive affect in school (“understood”) were the least endorsed. Item 2 of SS ("my school is bad"), item 11 of NAS ("tired"), and item 26 of PAS ("integrated") were the most easily endorsed.

Table 2
Item Analysis by the Rasch Model for the Three Factors of the SSWBS

Items of Factor 1	Coarse Score	Item Difficulty (b)	*Infit*	*Outfit*	Item-Theta Correlation
1	1435	.29	1.19	1.19	.60
2	1731	–1.38	.91	.89	.67
3	1555	–.10	1.11	1.22	.66
4	1353	.61	1.10	1.14	.69
5	1465	.08	.70	.69	.80
6	1331	.67	.95	.94	.72
7	1551	–.17	1.02	1.06	.66
Mean	1488.7	.00	1.00	1.02	-
SD	127.5	1.00	.15	.18	-
Items of Factor 2	Coarse Score	Item Difficulty (b)	*Infit*	*Outfit*	Item-Theta Correlation
8	1329	–.28	.88	.87	.71
9	1360	–.39	1.85	1.98	.34
10	1429	–.73	1.35	1.50	.50
11	1583	–1.13	1.21	1.19	.57
12	1126	.37	.90	.90	.69
13	923	.92	.71	.66	.76
14	1289	–.14	1.05	1.14	.65
15	1076	.48	.60	.60	.81
16	1175	.19	.72	.74	.77
17	1241	.01	1.03	1.04	.66
18	1005	.71	.60	.59	.81
Mean	1230.5	.00	0.99	1.02	-
SD	185.1	.59	0.36	0.41	-
Items of Factor 3	Coarse Score	Item Difficulty (b)	*Infit*	*Outfit*	Item-Theta Correlation
19	1288	.24	.83	.83	.72
20	1321	.07	1.10	1.19	.67
21	1350	–.01	.89	.90	.71
22	1191	0.70	1.07	1.06	.64
23	1333	0	.83	.83	.74
24	1299	.17	1.1	1.10	.64
25	1405	–.24	.87	.86	.72
26	1483	–.51	1.32	1.40	.58
27	1446	–.49	1.12	1.18	.61
28	1313	.07	.82	.81	.74
Mean	1342.9	.00	.99	1.02	-
SD	79.8	.34	.16	.19	-

Note. Factor 1 = School Satisfaction; Factor 2 = Negative Affect in School; Factor 3 = Positive Affect in School

Discussion

The aim of this study was to propose a model to measure school subjective well-being and investigate the instrument's psychometric properties. To that end, content validity study, exploratory factor analysis and IRT were conducted for the scale items. Results showed that the SSWBS presented validity evidence based on test content and internal structure, and adequate reliability coefficients. These initial empirical data suggest that the scale can be used to assess school SWB. Internal structure analysis showed that the three-factor solution was the most adequate.

Item factor analysis showed a three-factor solution, which was the most interpretable and with adequate fit indices. A 27-item version of the SSWBS was obtained, distributed in three factors, namely, school satisfaction (7 items), positive affect in school (10 items) and negative affect in school (10 items). Regarding the factor structure of the SSWBS, the theoretical assumptions proposed by Diener (1984) and Tian et al. (2014), of a tripartite model composed of one dimension for cognitive evaluation (school satisfaction) and two dimensions for affection evaluation (positive affect in school and negative affect in school) were corroborated.

In regards to the fitting of the model's items through a Rating Scale, only item 9 ("agitated") showed infit and outfit values outside the expected range. The misfit of the item in infit indicates that it is not correlated with the latent trait and should be removed from the scale. Outfit misfits indicate participant's endorsement of the item, regardless of ability level (Linacre, 2014). A qualitative analysis of this item indicates that although agitation/agitated has affective repercussions, it is more linked to the behavioral and psychomotor field than to affection itself. In addition, the relative easiness of students' endorsement of this item, regardless of ability level, shows how typical this behavior is during adolescence and is characterized as one of the main school complaints (Carneiro & Coutinho, 2015). Thus, endorsement regardless of students' ability level is justified, as the item represents a typical behavior in this development stage and context.

As for the easiness or difficulty of endorsing items, aspects of both the school context and adolescence can be highlighted. For SS items, data indicated that students tended to feel dissatisfied about school and did not have good perceptions and expectations regarding that space. Several aspects of the school routine influence students' assessment of their school. Structural factors such as thermal and acoustic comfort and lighting quality influence not only learning, but also student well-being (Dalvite, Oliveira, Nunes, Perius, & Scherer, 2007). As for school administration, Vinha et al. (2018) highlight that good perceptions of rules, values and relationships are protective factors against school violence. In addition, SS is positively associated with learning motivation, self-confidence to perform school tasks, emotional development, coping, and social support (Blaya, Deabardieux, & Vidal, 2004), academic performance, and future expectations (Alves et al., 2015). Thus, it is essential that school administration be closer to their students, to identify the main causes of student dissatisfaction and take action to address them.

With regard to affect, "tired" and "integrated" were the most endorsed items for the factors negative and positive affect in school, while "understood" and "furious" were the least marked. Fatigue is a subjective experience that involves physical, cognitive and psychological aspects (Cella & Shalder, 2010). Considering the sample was composed of adolescents, feeling tired is common at this stage of human development, considering the physical and biological changes. In addition, fatigue can also be related to aspects of students' social reality or school curriculum. Since this is a "model" school in the public school system, it has a different curriculum, with more extracurricular activities, attracting students from neighboring municipalities, which increases home-school distances (Conceição & Zamora, 2015)

Feeling part of a group, especially in the school context, expresses a typical characteristic of adolescence, in which there is a closer relationship with peers. In addition, school is one of the main socialization domains (Chaves, 2015). In this context, students' perception of social support

is associated with their relationship with classmates and teachers (Wang & Eccles, 2012). Social support is an important protective factor for adolescents' mental health. Studies show its importance in preventing depressive symptoms and substance abuse (Lardier, Barrios, Garcia-Reid, & Reid, 2018; Lorenzo-Blanco, Unger, Oshri, Baezconde-Garbanati, & Soto, 2016), as well as school and behavioral engagement (Coelho & Dell'Áglio, 2018).

However, although students feel socially inserted in school, results indicated they do not feel understood. This information shows the importance of working on the quality of social relationships in the school context. Understanding obtained in the social environment is an important component of adolescents' self-concept and identity formation (Carvalho et al., 2017), in addition to being a protective variable against school violence (Giordani, Seffner, & Dell'Aglio, 2017).

Adolescence is also marked by feelings and acts of fury, when behaviors of indiscipline, vandalism and incivility are manifested, especially in the school context (Paluck, Sheperd, & Aronow, 2016). The lesser endorsement of the "furious" item reflects a positive aspect of the institution, which might be considered as a healthy space of respect among individuals. It is also an indication of students' self-control, containing this feeling when facing stressful situations (Castro, Vieira, Moura, & Lara, 2018). It is important to provide means of dialogue between students, teachers and pedagogical management. Thus, the analysis of the items that were more and less endorsed by sample participants shows that the SSWBS can potentially be used to produce indicators about specific school realities, while its results can be used to improve such context.

With regard to the instrument's internal consistency, the SSWBS presented adequate coefficients according to the Classical Test Theory and IRT, although the coefficients obtained by the Rating Scal*e* model are lower compared to alpha and omega values. This fact is understandable, because according to the Rating Scale model, there may be different reliability indices at certain points of the scale and the reliability coefficient obtained through this analysis results from the average of these different reliability indices, generating a lower residuals rate and lower coefficient values. Regardless of the model used, the instrument's reliability coefficients remained within the standards. Based on the information curves, it was found that the instrument displayed better reliability rates when measuring students with low levels of school subjective well-being, which is considered ideal, allowing the identification of students for future interventions.

This research enabled the development of a measure that will assist school professionals and large-scale educational assessments. The investigation of students' school SWB levels will favor the identification of students' well-being levels at school and create opportunities to improve the school environment. However, it has some limitations, such as the sample being restricted to a single school. In addition, there was no control over the types of responses when the analyses of the instrument's internal structure were carried out.

Van Vaerenbergh and Thomas (2013) point out that social desirability and acquiescence styles can impact item correlation and generate bias in the parameters of a factor solution. Some studies indicate the influence of these response biases in self-report instruments, mainly in samples of children and adolescents (Soto, John, Gosling, & Potter, 2008; Vigil-Colet, Fabia Morales-Vives, & Lorenzo-Seva, 2013). It is also noteworthy that social desirability bias has been found in SWB self-report measures (Caputo, 2017). Therefore, it would be interesting for future research to assess the impact of these response biases on the SSWBS factor structure, especially with regard to social desirability, as students may feel uncomfortable in responding the instrument because it might be perceived as a school assessment. In addition, it would be important to conduct studies with samples from different regions of the country, so that results are representative and generalizable.

References

Abed, A. L. Z. (2016). O desenvolvimento das habilidades socioemocionais como caminho para a aprendizagem e o sucesso escolar de alunos da educação básica. *Construção Psicopedagógica*, *24*(25), 8-27.

Alves, C. F., Zappe, J. G., Patias, N. D., & Dell'Aglio, D. D. (2015). Relações com a escola e expectativas quanto ao futuro em jovens brasileiros. *Nuances: Estudos sobre educação*, *26*(1), 50-65. doi: 10.14572/nuances.v26i1.3818

Bardin, L.(2011). *Análise de conteúdo*. São Paulo: Edições 70.

Blaya, C., Debardieux, D., & Vidal, D. (2004). Modos de organização da vida escolar nos estabelecimentos de ensino secundário inferior na Europa. In: C. Thelot (Ed.). *Quel impact des politiques éducatives: Les apports de la recherche* (pp. 127-154). Paris: Débat National sur L'avenir del'École.

Bond, T. G., & Fox, C. M. (2015). *Applying the rasch model fundamental measurement in the human sciences* (3rd ed.). Mahwah: Erlbaum.

Campo-Arias, A., & Oviedo, H. C. (2008). Propriedades psicométricas de una escala: La consistencia interna. *Salud Pública*, *10*(5), 831-839.

Caputo, A. (2017). Social desirability bias in self-reported well-being measures: Evidence from an online survey. *Universitas Psychologica*, *16*(2), 245-255. doi: 10.11144/javeriana.upsy16-2.sdsw

Carneiro, C., & Coutinho, L. G. (2015). Infância e adolescência: Como chegam as queixas escolares à saúde mental? *Educar em Revista*, *56*, 181-192.

Carvalho, R. G., Fernandes, E., Câmara, J., Gonçalves, J. A., Rosário, J., Freitas, S., & Carvalho, S. (2017). Relações de amizade e autoconceito na adolescência: Um estudo exploratório em contexto escolar. *Estudos de Psicologia (Campinas)*, *34*(3), 379-388. doi:10.1590/1982-02752017000300006

Castro, L. R., Vieira, C. B., Moura, I. K., & Lara, J. S. (2018). Falas, afetos, sons e ruídos: As crianças e suas formas de habitar e participar do espaço escolar. *Revista Eletrônica de Educação*, *12*(1), 151-168. doi: 10.14244/198271992019

Cella, M., & Chalder, T. (2010). Measuring fatigue in clinical and community settings. *Journal of Psychosomatic Research*, *69*(1), 17-22. doi: 10.1016/j.jpsychores.2009.10.007

Chaves, M. W. (2015). As relações entre a escola e o aluno: Uma história de em transformação. *Educação & Realidade*, *40*(4), 1149-1167. doi: 10.1590/2175-623645958

Cintra, C. L., & Guerra, V. M. (2017). Educação positiva: A aplicação da psicologia positiva à instituições educacionais. *Psicologia Escolar e Educacional*, *21*(3), 505-514. doi: 10.1590/2175-35392017021311191

Coelho, C. C. A., & Dell'Áglio, D. D. (2018). Engajamento escolar: Efeito do suporte dos pais, professores e pares na adolescência. *Psicologia Escolar e Educacional*, *22*(3), 621-629. doi: 10.1590/2175-35392018038539

Conceição, V. L., & Zamora, M. H. R. N. (2015). Desigualdade social na escola. *Estudos de Psicologia (Campinas)*, *32*(4), 705-714. doi: 10.1590/0103-166X2015000400013

Dalvite, B., Oliveira, D., Nunes, G., Perius, M., & Scherer, M. J. (2007). Análise do conforto acústico, térmico e lumínico em escolas da rede pública de Santa Maria, RS. *Disciplinarum Scientia Artes, Letras e Comunicação*, *8*(1), 1-13.

Damásio, B. F. (2012). Uso da análise fatorial exploratória em psicologia. *Avaliação Psicológica*, *11*(2), 213-228.

Dias-Viana, J. L., & Noronha, A. P. P. (2020). *Bem-estar subjetivo de estudantes: Variáveis escolares associadas e medidas de avaliação*. Manuscrito submetido para publicação.

Diener, E. (1984). Subjective well-being. *Psychological Bulletin*, *95*(3), 542-575.

Diener, E. (2012). New findings and future directions for subjective well-being research. *American Psychologist, 67*(8), 590-597. doi: 10.1037/a0029541

Diener, E., Lucas, R. E., & Oishi, S. (2005). Subjective well-being: The science of happiness and life satisfaction. In: C. R. Snyder, & S. J. Lopez (Eds.), *Handbook of positive psychology* (pp. 63-73). New York: Oxford University Press.

Giordani, J. P., Seffner, F., & Dell'Aglio, D. D. (2017). Violência escolar: Percepções de alunos e professores de uma escola pública. *Psicologia Escolar e Educacional*, *21*(1), 103-111. doi: 10.1590/2175-3539201702111092

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., Tatham, R. L. (2009). *Análise multivariada de dados*. Porto Alegre, RS: Artmed.

Hernández-Nieto, R. A. (2002). *Contributions to statiscal analysis*. Mérida: Universidad de los Andes.

Huebner, E. S. (1991). Initial development of the Student's Life Satisfaction Scale. *School Psychology International*, *12*(3), 231-240. doi: 10.1177/0143034391123010

International Test Commission – ITC (2018). *ITC guidelines for the large-scale assessment of linguistically and culturally diverse populations*. Retrieved from https://www.intestcom.org/files/guideline_diverse_populations.pdf

King, A. L., Huebner, E. S., Suldo, S. M., & Valois, R. F. (2006). An ecological view of school satisfaction in adolescence: Linkages between social support and behavior problems. *Applied Research in Quality of Life*, *1*(3-4), 279-295. doi: 10.1007/s11482-007-9021-7

Konrath, S., Meier B. P, & Bushman B. J. (2014) Development and validation of the Single Item Narcissism Scale (SINS). *PLoS ONE, 9*(8), e103469. doi: 10.1371/journal.pone.0103469

Lardier, D. T., Barrios, V. R., Garcia-Reid, P., & Reid, R. J. (2018). Preventing substance use among hispanic urban youth: Valuing the role of family, social support networks, school importance, and community engagement. *Journal of Child & Adolescent Substance Abuse*, 1-13. doi:10.1080/1067828x.2018.1466748

Linacre, J. M. (2014). Winsteps rash measurement computer program. Beaverton, OR: Winsteps.com. Retrieved from http://www.winsteps.com/index.htm

Lorenzo-Blanco, E. L., Unger, J. B., Oshri, A., Baezconde-Garbanati, L., & Soto, D. (2016). Profiles of bullying victimization discrimination, social support, and school safety: Links with latino/a youth acculturation, gender, depressive symptons, and cigarette use. *American Journal of Ortopsychiatry*, *86*(1), 37-48. doi: 10.1037/t03506-000

Lorenzo-Seva, U., Timmerman, M. E. & Kiers, H. A. (2011). The hull method for selecting the number of common factors. *Multivariate Behavioral Research*, *46*(2), 340-364. doi: 10.1080/00273171.2011.564527

McCullough, G., Huebner, S., & Laughlin, J. E. (2000). Life events, self-concept, and adolescent's positive subjective well-being. *Psychology in the Schools*, *37*(3), 281-290. doi: 10.1002/(SICI)1520-6807(200005)37:3<281::AID-PITS8>3.0.CO;2-2

Ministério da Educação, Secretaria de Educação Básica, Secretaria de Educação Continuada, Alfabetização, Diversidade e Inclusão, Secretaria de Educação Profissional e Tecnológica, Conselho Nacional da Educação & Câmara Nacional de Educação Básica (2013). *Diretrizes curriculares nacionais gerais da educação básica*. Retrieved from http://portal.mec.gov.br/index.php?option=com_docman&view=download&alias=13448-diretrizes-curiculares-nacionais-2013-pdf&Itemid=30192

Ortuño-Sierra, J., Aritio-Solana, R., Luis, E. C. de., Nalda, F. N., & Fonseca-Pedrero, E. (2017). Subjective well-being in adolescence: New psychometric evidences on the Satisfaction with Life Scale. *European Journal of Developmental Psychology*, 1-9. doi: 10.1080/17405629.2017.1360179

Paluck, E. L., Shepherd, H., & Aronow, P. M. (2016). Changing climates of conflict: A social network experiment in 56 schools. *Proceedings of the National Academy of Sciences*, *113*(3), 566-571. doi:10.1073/pnas.1514483113

Pasquali, L. (1999). *Instrumentos psicológicos: Manual prático de elaboração*. Brasília: LabPAM/ IBAPP.

Pasquali, L. (2001). *Técnicas de exame psicológico (TPE): Manual - Fundamentos das técnicas psicológicas*. São Paulo, SP: Casa do Psicólogo.

Reschly, A. L., Huebner, E. S., Appleton, J. J, & Antaramian, S. (2008). Engagement as flourishing: The contribution of positive emotions and coping to adolescent's engagement at school and with learning. *Psychology in the Schools*, *45*(5), 419-431. doi: 10.1002/pits.20306

Roeser, R. W. (2001). To cultivate the positive: Introduction to the special issue on schooling and mental health issues. *Journal of School Psychology*, *39*, 99-110. doi: 10.1016/S0022-4405(01)00061-9

Sellstrom, E., & Bremberg, S. (2006). Is there a "school effect" on pupil outcomes? A review of multilevel studies. *Journal of Epidemiology & Community Health*, *60*(2), 149-155. doi:10.1136/jech.2005.036707

Soto, C. J., John, O. P., Gosling, S. D., & Potter, J. (2008). The developmental psychometrics of big five self-reports: Acquiescence, factor structure, coherence, and differentiation from ages 10 to 20. *Journal of Personality and Social Psychology*, *94*, 718-737. doi: 10.1037/0022-3514.94.4.718

Tian L., Wang D., & Huebner, E. S. (2014). Development and validation of the Brief Adolescent's Subjective Well-Being in School Scale (BASWBSS). *Social Indicators. Research*, *120*(2), 615-634. doi: 10.1007/s11205-014-0603-0

Van Vaerenbergh, Y., & Thomas, T. D. (2013). Response styles in survey research: A literature review of antecedents, consequences, and remedies. *International Journal of Public Opinion Research*, *25*(2), 195-217. doi: 10.1093/ijpor/eds021

Velicer, W. F. (1976). Determining the number of components from the matrix of partial correlations. *Psychometrika*, *41*(3), 321-327.

Vigil-Colet, A., Morales-Vives, A., & Lorenzo-Seva, U. (2013). How social desirability and acquiescence affect the age-personality relationship. *Psicothema*, *25*(3), 342-348. doi: 10.7334/psicothema2012.297

Vinha, T. P., Tognetta, L. R. P., Azzi, R. G., Moro, A., Aragão, A. M. F. D., & Morais, A. D. (2018). O clima escolar na perspectiva dos alunos de escolas públicas. *Revista Educação e Cultura Contemporânea*, *15*(40), 163-186. doi: DOI10.5935/2238-1279.20180052PDF

Wang, M., & Eccles, J. (2012). Social support matters: Longitudinal effects of social support on three dimensions of school engagement from middle to high school. *Child Development*, *83*(3), 877-895. doi: 10.1111/j.1467-8624.2012.01745.x

Whitley, A.M., Huebner, E.S., Hills, K.J., & Valois, R.F. (2012). Can students be too happy in school?. The optimal level of school satisfaction. *Applied Research in Quality of Life*, *7*(4), 337-350. doi: 10.1007/s11482-012-9167-9

Funding: This work was carried out with the support of *Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - CAPES* (Coordination for the Improvement of Higher Education Personnel) - Brazil - Funding Code 001.

Authors' participation: a) Conception and design of the work; b) Data acquisition; c) Analysis and interpretation of data; d) Writing of the manuscript; e) Critical review of the manuscript. J.L.D.V. has contributed in a,b,c,d,e; A.P.P.N. in a,c,e.

Scientific editor in charge**:** Dra. Cecilia Cracco