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The Web-based Executive Functioning Questionnaire (Webexec) is a brief scale developed to assess executive functions via online format. It has been used in different contexts, but its adaptation to other cultures is still restricted. This study aimed to perform a cross-cultural adaptation of the Webexec for a Brazilian sample considering the psychometric properties of the scale. This study used a sample of 295 Brazilian participants, with a mean age equal to 20.69 (SD = 6.030). This is a longitudinal study with reapplication of the scale six weeks after the test phase. Classical and contemporary methods were applied to analyze the psychometric properties of the Webexec. The results showed that the scale presented excellent psychometric properties for the Brazilian version, considering validity evidence based on the content and internal structure of Webexec, as well as reliability and precision. However, it is considered that other relational and experimental studies should be carried out with a larger sample size and for different population groups.

Keywords: Webexec; executive functions; cross-cultural adaptation.

1. Introduction

Executive functions (EFs) are defined as a complex process referring to the capability of self-control, behavioral self-regulation, focus and attentional sustaining, definition of action planning, goal orientation, and problem solving (Ahmed & Miller, 2011; Bagetta & Alexander, 2016; Barkley, 2012; Baumeister & Vohs, 2004; Blair & Ursache, 2011; Zurcher et al., 2020). Studying executive functions is fundamental to understanding daily functioning, learning, and personal development, as well as providing a check for potential impairments resulting from multidetermined neuropsychological disorders (Ahmed & Miller, 2011; Bakos et al., 2008; Garner, 2009; Williams et al., 2021). For this purpose, different printed self-report and observational tasks have been developed (Bagetta & Alexander, 2016).

The internet is becoming increasingly important for clinicians to reach clients/patients and as such using scales that are effectively assess certain functions, such as executive functions, are important to research. Currently, people have greater access to the internet and digital devices. It is estimated that more than 5 billion people have access to the internet now, which is equivalent to 63% of the world's population (Datareportal, 2022; The World Bank, 2022). More than 78% of Argentineans, Australians, Brazilians, Chileans, Europeans, British, Iranians, North Americans, New Zealanders, Russians, and Saudis access the Internet (The World Bank, 2022). People spend an average of 6h58m a day on the internet, an equivalent of 12.5 trillion hours spent online (Datareportal, 2022). Furthermore, the number of devices owned by individuals, including cell phones, is more than 100 per 100 inhabitants worldwide (International Telecommunication Union [ITU], 2021).

The COVID-19 pandemic has also contributed to the increasing flow of remote information. The amount of data transmitted during the years 2020 and 2021 increased

significantly compared to the pre-pandemic period (ITU, 2021). In this regard, more extensive use of screening measures in online format for neuropsychological assessment, such as the Web-based Executive Functioning Questionnaire ([Webexec]; Johnson et al., 2022), and verification of intervention effects for different groups became necessary (Williams et al., 2021).

The Webexec was developed by Buchanan (2016) and Buchanan et al. (2010) for brief, online assessment of EF. It features six items designed to evaluate ability in self-control, focus maintenance, task completion and accomplishment. The original Webexec studies demonstrated a unidimensional structure, with a satisfactory internal consistency (Buchanan, 2016; Buchanan et al. 2010).

Webexec has been used in different types of studies in which it was possible to verify association among EFs with several variables, namely: the functioning of prospective memory in the daily lives of those exposed to second-hand smoke (Heffernan & O'Neill, 2013); personality traits (Buchanan, 2016); changes in mood, distress tolerance, and sleep problems (Colleman & Cain, 2019; Cox, Ebesutani, & Olatunji, 2016; Rosen, Carrier, Miller et al., 2016); consumption of nearby food (Hunter et al., 2016); influence on alcohol consumption (Stautz et al., 2016); quality of life in people with Marfan syndrome (Ratiu et al., 2018); academic performance, anxiety, and technology use (Baert et al, 2019; Rosen, Carrier, Pedroza et al., 2018); self-control in relation to rewards (Magis-Wenberg & Dumontheil, 2019); emotional regulation and negative thoughts (Cox, Jessup, & Olatunji, 2019) and teachers' dedication to work during pandemic period (Johnsson et al., 2022).

Despite the results presented using Webexec, cross-cultural adaptation procedures of this scale are still scarce. There are only two studies of this sort found. One was conducted by Keen et al. (2020), formed by two samples of undergraduate

students from Historically Black College or University (HBCU) in the United States of America, and another was performed by Morea and Calvet (2020) for Spanish adolescents aged between 12-17 years. In the first research it was also evidenced associations between EFs and mood symptomatology. In the second, it was observed the difference in performance of EFs by age groups, positive association with internalizing and externalizing problems, and negative association with cognitive flexibility, attention, and inhibitory control scores. In Brazil, there are printed tasks for assessing EF for different age groups (Carvalho et al., 2018; Faria et al., 2015; Zimmerman et al., 2015), however, a search of the literature did not identify EF assessment tests in online format.

In accordance with the foregoing, this study aims to perform the cross-cultural adaptation of the Webexec for a Brazilian sample. Classical (Aiken's V and H indices, exploratory factor analysis [EFA], confirmatory factor analysis [CFA], factor invariance and composite realibility) and contemporary methods of analysis (Item Response Theory [IRT], exploratory graph analysis [EGA] and bootstrap exploratory graph analysis [BootEga]) will be adopted to verify the psychometric properties of the scale.

2. Materials and methods

2.1. Participants

Although this research was conducted using a non-probability sample, a minimum sample size was estimated using the software G*Power 3.1 for iOS (Faul et al., 2009), adopting the parameter t test for independent samples, two-tailed and 1:1 ratio among participants, significance level $\alpha = .05$; sample power $(1 - \text{ß}) = .95$, with beta representing the type II error. The sample should consist of at least 75 participants of each gender, female and male. People 14 years of age and older were included in this

study. We excluded: (a) incidental responses with a profile different from the proposed one, (b) participants who did not complete the Webexec, (c) participants who reported having had psychiatric, neurological, and/or neuropsychological diagnoses within the previous two months from the date of responding to the form, (d) participants who reported using alcohol (10,1fl oz) and other drugs up to one day (24h) before answering the questionnaire or who reported using these substances continuously, and (e) participants who reported not being natural from Brazil.

The sample used for the survey was composed of 295 people from different Brazilian states, aged between 14 and 53 years, with a mean age equal to 20.69 years (SD = 6.030). Most participants are female (N = 216, 73.2%), college students (25.8%) or have completed high school but not enrolled in college (19.3%), self-described as White (64.6%) or Pardo-Brazilian (24.2%), single (95.3%), and have a monthly family income of up to 4 minimum wages (71.9%)[1]. Two hundred and ninety-four people were retested with the Webexec six weeks after the initial application. The overall sample had a mean total questionnaire score of 12.29 (SD = 2.914) in the first application and 12.06 (SD = 2.653) in retest.

INSERT TABLE 1 PREFERENTIALLY HERE.

2.2. Study design

This is a cross-cultural adaptation research of Webexec, a scale of Anglo-Saxon linguistic origin, and of its psychometric properties for a Brazilian sample. This procedure involved seven steps, namely: 1) analysis of the scale and its conceptual foundation; 2) contextualized translation; 3) assessment by a committee of experts; 4)

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[1] the Brazilian salary (minimun wage) in the year 2020 was equal to 1,045 reais, equivalent to 296 dollars at the time.

adjustment of the items, 5) analysis of the intelligibility of the items and readjustments, if necessary, 6) back-translation into the original language and assessment by the author of the scale and 7) psychometric analyses grounded in classical and contemporary methods analysis (Golino & Epskamp, 2017; Mertens, 2014).

It is a longitudinal study of observational, descriptive, and relational type due to 1) collecting data at two different times without interference in the control and development of the observed variables, and 2) comprehending the relationships between variables, 3) and establishing parameters of comparison (Bairagi & Munot, 2019; Golino et al., 2020; Neuman, 2014).

2.3. Measures

A sociodemographic questionnaire was developed for the purpose of obtaining data on age, gender (female, male, intersex), school background (elementary school, high school, college, etc.), self-reported race (African-Brazilian, Asian-Brazilian, Pardo-Brazilian, Native-Brazilian and white), marital status (single, married, divorced, etc.) and family income.

Web-based Executive Function Questionnaire ([Webexec] Buchanan, 2016; Buchanan et al., 2010). Webexec is a one-dimensional brief self-report scale for online application to assess multiple aspects of executive functions. It is composed of six items ($\alpha = .758$) such as "Do you find it difficult to keep your attention on a particular task?" (Item 01), "Do you find it difficult carrying out more than one task at a time?" (Item 03) and "Do you find it difficult finishing something you have started?" (Item 05). The items are rated on a 4-point Likert scale ranging from "1" (no problems experienced) to "4" (a great many problems experienced).

2.4. Procedures

The first author of this article conducted a review of the available literature on brief online assessment instruments for EF, identifying the Webexec. Next, the original author was contacted with a request for authorization to adapt the scale for the Brazilian context. The authorization was granted via e-mail. Thus, the first part (translation) was conducted by two of the authors of this research. Each of them translated the scale independently, jointly analyzed the translated items and, by consensus, defined the first version of the items in Portuguese. Next, a committee of specialists composed of five researchers in the area was convened to analyze the preliminary translated version of the Webexec, considering the following criteria: 1) semantic equivalence (evaluate grammatical aspects and meaning of the item); 2) idiomatic equivalence (adjust the item without detriment to the original meaning), and 3) conceptual equivalence (assess whether the adapted item evaluates the same quality in different cultures). Each of these criteria was applied to all Webexec items using a Likert scale ranging from "1" (inadequate) to "4" (very adequate).

The items were adjusted after the experts' evaluation (N = 5) and submitted to intelligibility analysis by a group of respondents from the general population (N = 21), of both genders (61.9% were females), between 14 and 45 years old (M = 25.86, SD = 10.185). They were instructed to rate each of the items according to the following scale "1" (I don't agree), "2" (I have my doubts about this), or "3" (I agree), regarding age adequacy (the item can be understood by people of the same age), clarity (the item is grammatically correct and can be understood by people from the same culture), and language understanding (the meaning of the item can be understood). At the end of each question, respondents were asked to give suggestions in relation to that item and to consider whether or not it should be revised. The items adjusted at the end of the

intelligibility assessment were back translated into English by two other researchers who had no previous knowledge of Webexec. Then, they jointly analyzed the back translated items and, by consensus, defined the English language version of the items and sent it to the original author for evaluation. After the back-translated version from Brazilian Portuguese into English was approved by the original author of the Webexec, it was applied to the target group. The participants were asked to answer the questionnaire again (retest) six weeks after the first response provided in the testing phase avoiding losing the sample on retesting and developmental jumps that might occur especially among younger participants (Rossier & Duarte, 2019). Data were treated using analyses for evidence of validity based on the scale content, descriptive, and inferential validity grounded in classical psychometrics, network psychometrics, and IRT.

This research was approved by the Ethics and Research Committee involving human beings, under the registration CAAE 08550819.3.0000.5151, according to the resolutions CNS 466/2012 and 510/2016. It was completely made by web-based data collection due to the method of scale application, from August 2020 to July 2021. Emails were sent to the principals and the coordinators of the municipality's high schools and college institutions, with the potential respondent equaling 3000 participants. The research team forwarded an invitation to those institutions explaining the purposes of the study with an access link to the electronic form (Google Forms™) containing the informed consent, a sociodemographic questionnaire, and the Webexec. Participants could forward the form to other potential respondents (snowball strategy). Although the sample number was adequate, we could speculate the respondents' participation was small due to the large number of online tasks they were giving back in this period due to the COVID-19 pandemic.

2.5. Data analysis

2.5.1. Validity Evidence Based on Test Content

Aiken's V and H were employed, respectively, for the analysis of validity evidence based on the content of the scale and the homogeneity of an item rating among experts and respondents for the intelligibility of the scale (Aiken & Groth-Marnat, 2005). The results allow for agreement among raters on validity evidence content and breadth of item responses for five or more judges (Gwet, 2014; Lai & Chang, 2007; Poppins, 2019).

The V and H-index ranges from 0 to 1. A value close to 1 and a significant p-value ($p < .05$) for V indicate adequate content validity, and for H indicate high reliability and good internal consistency among observations. Results for Aiken's V and H that did not present significant values would indicate a qualitative analysis of the items for reformulations, considering, for each of these decisions, the theoretical framework (Lai & Chang, 2007) (for more information see supplemental material).

2.5.2. Validity Evidence Based on Test Internal Structure and Reliability/Precision

2.5.2.1 Descriptive analysis, internal consistency and correlation

Descriptive analyses were used to express the characteristics of the sample. Skewness and kurtosis tests were applied to continuous variables. Gender was used as a comparison factor. Internal consistency of Webexec was calculated from composite reliability because this analysis assumes the items contribute differently to their respective dimensions. Indices with values $\geq .70$ were considered adequate (Raykov, 1997, 2004). Spearman correlation was used between test-retest for each item and total score of the Webexec. When pertinent to the analyses, a p value $< .05$ was adopted (Field, 2017).

2.5.2.2. Exploratory graph analysis (EGA) and Bootstrap exploratory graph analysis (BootEGA)

EGA is a recently developed method to estimate the number of dimensions in multivariate data using undirected network models (Golino & Epskamp, 2017; Golino et al., 2020). EGA first applies a network estimation method followed by a community detection algorithm for weighted networks (Fortunato, 2010).

Bootstrap Exploratory Graph Analysis (BootEGA) is used to estimate and evaluate the dimensional structure of a model, when using the EGA (Christensen & Golino, 2019). The BootEga generates x number of bootstrap samples, and applies the EGA to each replicated sample, resulting in a sampling distribution of the EGA results. In the present study, we used a non-parametric procedure (resampling). This procedure works through a resampling of the original data with substitution (same amount of data as the original data). The resampling procedure allows cases to be represented more than once in a replicated sample, while others cannot be. The EGA is applied to the replicated data continuing iteratively until the desired number of samples is completed (Ex.: 1000) (for more information see supplemental material).

2.5.2.3. Factorial confirmatory analysis (CFA) and factorial invariance

CFA using the unweighted least squares estimator were conducted to test the internal structure of Webexec. An adequate fit was considered when comparative fit index (CFI) and Tucker-Lewis Index (TLI) values were > .90, while values of > .95 indicated good fit (Hu & Bentler, 1999). Root mean square error of approximation (RMSEA) values of .08 and .06 indicated acceptable fit, while values < .05 indicated good fit (Hu & Bentler, 1999). Factorial loadings were considered adequate if they ≥ .40.

Factor invariance of CFA for age group and gender was tested on Webexec unidimensional model for test-retest. The fit of the configural model data was measured using CFI, TLI and RMSEA. The configural model would be rejected if it displayed CFI < .90 or RMSEA ≥ .08. The equal thresholds, equal factor loadings and equal intercepts models would be rejected if they displayed ΔCFI > .005 and ΔTLI > .005.

2.5.2.4. Rasch analysis for polytomous items

Item response theory (IRT) analyses were conducted using the rating scale model (Andrich, 1978), suitable for polytomous items. The model estimates, independently, the item difficulty (δ) in log-odds units (logits). The fit of the items to the measurement model (infit and outfit), the dimensionality of the measurement residuals (main contrasts), and the local dependence of the items (residual correlations) were also estimated.

3. Results

The experts' assessment of the Webexec items showed evidence of validity based on the content of the scale and homogeneity among the responders for semantic, idiomatic and conceptual equivalence, with lower values for item 5 ("Do you find it difficult finishing something you have started?"). Something similar occurred in the assessment of item intelligibility made by 21 respondents for age appropriateness, item clarity and linguistic comprehension. Even though the values were significant, a qualitative analysis of the items was made based on the comments from both judges and respondents. For this reason, item 5 underwent a minor rewording. The quotation marks were removed from some words, since the emphasis given by them was not considered necessary, nor did they characterize figurative meaning according to the translation into

Brazilian context. The author of the original scale approved the back-translation, suggesting only that item 3 remain as "Do you find it difficult carrying out more than one task at a time?", instead of the first version, back-translated as "Do you have difficulty to carry out more than one task at a time?" (see Tables 2 and 3).

INSERT TABLE 2 AND 3 PREFERENTIALLY HERE.

The sample size was adequate, considering the initial calculation, with a sample greater than 75 individuals for each comparison group, namely age group and gender. Skewness and Kurtosis for total score of the Webexec had values between ± 2. The correlations between the scores (item and total) of the first application and retest were moderate to high, with statistically significant values (see Table 1). This suggests that the Webexec demonstrates good test-retest stability, both at the levels of individual items and the entire scale.

Table 4 presents the information from the EGA, CFA, and IRT analyses of Webexec. All items showed good stability and adequate network loadings for the EGA, suitable standardized estimates in the CFA, and difficulty values that ranged from -1.62 to -2.07 for IRT. Only item 6 showed low factor and network loadings, but good replicability on the EGA and adequate IRT fit values. The overall CFA scores were adequate indicating excellent CFI and TLI fits (> .95) and SRMR (0.072) and RMSEA (0.08[CI95: 0.04-0.10]) for the unidimensional model. Composite reliability proved satisfactory for both first application and retest, with values equal to 0.760 and 0.767, respectively.

INSERT TABLE 4 PREFERENTIALLY HERE.

Figure 1a shows the unidimensionality of Webexec estimated from the EGA for the first application. BootEGA analysis indicated three dimensions in the 1000 interactions, with a predominant unidimensional structure (617 times). The two-

dimensional structure appeared 370 times and the three-dimensional structure 13 times (Figure 1b). The EGA analysis also identified one-dimensional structure in the retest (Figure 1c). BootEGA for this phase of data collection indicated three dimensions in the 1000 interactions, with similar results to the first phase at 767 times for the unidimensional, 230 for the two structure and 3 for the three-dimensional structure, which means that the best replicability model has only one dimension.

INSERT FIGURE 1 PREFERENTIALLY HERE.

Age group invariance was calculated due to the fact the original version of the scale was developed for people 18 years of age and older and by gender (see Table 5). The Webexec proved to be factorial invariant between gender and age group, which means that we could assume that there is one same dimension (unidimensional model) for people at different ages and for the gender of the participants, both at the first application and at the retest.

4. Discussion

The main aim of this study was to perform the cross-cultural adaptation of the Webexec, for a Brazilian sample, by providing evidence of validity based on the content and internal structure, reliability and precision of the questionnaire. Regarding the content-based validity of the test, it was possible to verify the strong agreement among experts regarding a good fit of the scale for its Brazilian Portuguese version. Furthermore, respondents from a pilot study also admitted to understanding the items of the scale and their purposes. Regarding dimensional analysis, the results revealed adequate indices for unidimensional model for Brazilian version of Webexec. The composite reliability index showed satisfactory values for both times of data collection. There was a strong correlation between the same items and the total score from two collection phases,

which demonstrated that the results were reliable and had temporal stability. CFA demonstrated that this model presents excellent fit indices, individual and overall. The six items presented good fit measured by ITR infit and outfit. The unidimensional model of the Webexec was invariant between sex and age group. Thus, it demonstrated the applicability of the unidimensional score of the scale for a Brazilian sample.

The cross-cultural adaptation of a scale involves several steps in order to maintain the original meaning of the items for the new context (Arafat et al., 2016; Epstein et al., 2015). This procedure provides us with an understanding of three important aspects of a measure: the universality of the phenomena under observation, the variability, and the interpretability of the scores (Epstein et al., 2015). These are stated from the trends of the responses provided by the participants. We understand that the instrument adaptation was properly carried out when it features appropriate outcomes at the conclusion of the process (Kim, 2017). Thus, we provide evidence through content, internal structure, reliability, and accuracy that online measurement of EFs by Webexec for individuals with 14 years of age and older is feasible within the Brazilian population.

Validity is one singular concept which refers to evidence for the interpretability of results obtained by an instrument (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education; 2014; Eignor, 2013). Previously, there was a differentiation among the types of validity. However, today it is assumed that there is evidence to support the validity process. One of these would be evidence based on the content of a test. This evidence is highly important since it allows verifying how a set of items developed from theoretical presuppositions of a particular construct can be interpreted (Kim, 2017). Aiken's V and H were developed in a context well before this definition (see Aiken, 1985; Aiken &

Groth-Marnat, 2005). However, the analyses underpinning these indices can be employed to the present day, especially when referring to an evaluation of the items of a scale and their ability to provide inferences about a particular person's achievement regarding a psychological process. Furthermore, Aiken's indices enabled qualitative analysis of the items and their settings respecting symbolic idiosyncrasies from the Brazilian culture. Then, reformulated items were rated regarding their intelligibility by a group of respondents with the interest profile of this research. The results revealed that items were properly understood in relation to age adequacy, clarity and language understanding. Most respondents in this stage of the Webexec adaptation agreed the items did not need to be revised. Finally, the approval from the author of the original scale about the back-translation highlighted that the Portuguese version for Brazil preserved the meaning of the original version of the Webexec. In this sense, the evidence analysis based on the test content has indicated, initially, how appropriate the contextual adaptation of Webexec.

The other findings enabled, through classical analyses such as EFA and CFA, and contemporary ones such as network psychometrics through EGA and BootEGA, validity evidence based on internal structure of Webexec. Furthermore, the reliability of the scale showed adequate indexes in according to composite reliability, moderate to strong correlation between the first application and retest.

The Webexec, in its original version, was developed for responders 18 years of age and older (Buchanan et al., 2010). However, we know EF is a complex and evolving process (Baum et al., 2017; Koechlin, 2016; Müller & Kerns, 2015). For this reason, and by the fact teenagers are the group mostly use digital devices and the internet (ITU, 2021), we decided to include participants under the age of 18 in this investigation. A cross-cultural adaptation of the Webexec involving younger people had

already been done by Morea and Calvete (2020) for a sample formed by Spanish adolescents between 12 and 17 years old. The results evidenced appropriate psychometric properties for this group. However, no cross-cultural adaptation study of the Webexec involved different age groups as was done in this research. The two age groups divided by us (14-17 and $\geq$ 18 years old) were invariant regarding the Webexec dimensional structure. It demonstrates therefore that the scale would be adequate to assess the underlying construct in both groups.

There was also factor invariance for gender. There are some considerations about how executive functioning differs between male and female individuals. EFs display components of attention, self-control, decision-making, and working memory and those are measured within Webexec (Bagetta & Alexander, 2016; Buchanan et al., 2010). The current literature suggests women are less impulsive and avoid negative outcomes than men but perform as well as males regarding attention and working memory (Grissom & Reyes, 2019). However, such differences are reflected in performance, not in the dimensional structure of EF. Therefore, the fact that this comparison group was also invariant about the unidimensionality of the scale is also justified. In the present research, none of the participants claimed to be intersex or not to identify with any gender.

With all those promising results, it is believed that Webexec can be applied to people aged 14 years or older for Brazilian context. However, some reservations need to be made regarding the data from this research. First, the study did not propose associations among related constructs, such as personality (Buchanan, 2016), inhibitory control capacity, cognitive flexibility, and attention (Morea & Calvete, 2020), and changes in mood, anxiety, stress, and sleep problems (Cox, Ebesutani, & Olatunji, 2016; Cox, Jessup, & Olatunji, 2019; Keen et al., 2020). Self-report measures such as

this one can provide an insight into individuals' everyday experience of problems with executive functions. The extent to which scores on the measure would reflect performance on objective tests of cognitive function in the general population is open to question (Buchanan, 2016). Similarly, research design assessing changes in outcomes of scale by interventions was not conducted. It is a longitudinal study aimed at verifying the reliability and precision of the Webexec and, therefore, there was no interference on the development of EF between the first and the last application of the scale. Experimental interventions studies are recommended in order to check positive outcomes in executive skills in different contexts, such as educational, social/familiar, and clinical.

Such considerations provide future directions for association studies among EFs same/other constructs and outcomes from intervention processes. Thus, it would be possible to evidence the validity of Webexec through additional procedures.

Declaration of interest statement

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Figure 1

EGA and BootEGA for Webexec first application and retest

EGA

First application

BootEGA

a)

b)

Retest

c)
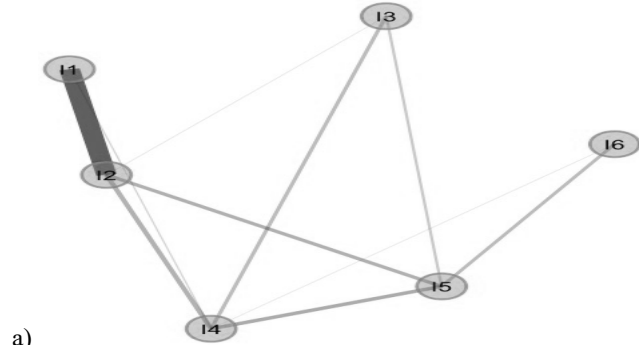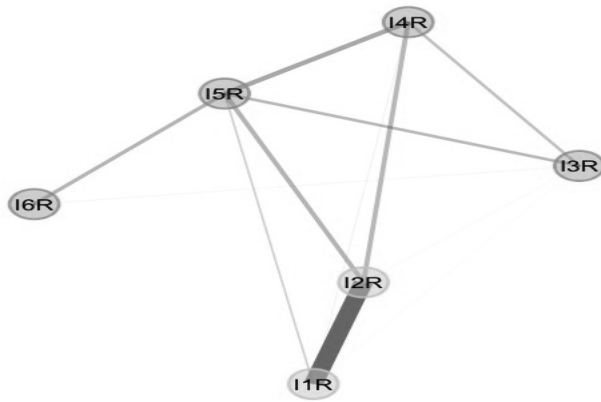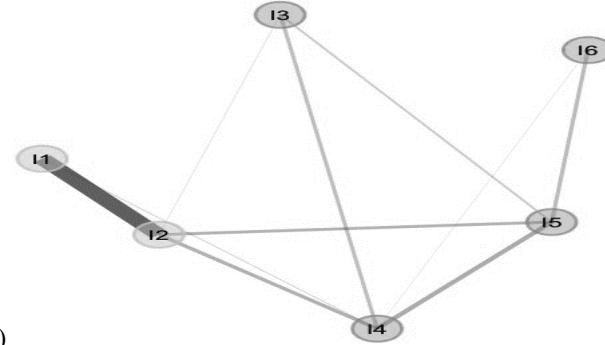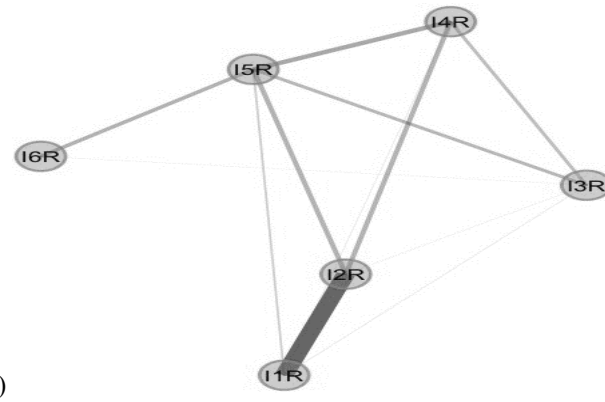
d)

Note. This figure presents the EGA and BootEGA network model, respectively for first application (a and b) and retest (c and d); I1(R). Do you find it difficult to keep your attention on a specific task?; I2(R). Do you have problems focusing on a task?; I3(R). Do you find it difficult carrying out more than one task at a time?; I4(R). Do you tend to lose your train of thought?; I5(R). Do you find it difficult finishing something you have started?, and I6(R). Do you find yourself acting on impulse?.

Table 1

Descriptive Analysis and Correlation between Webexec Test and Retest for Items and Total Score

	First application[#]						Retest[##]				Correlation
	n	%	M	SD	sk	kt	M	SD	sk	kt	ρ
Age			20.69	6.030							
Age group (years old)											
14 – 17	118	40									
18 – 53	177	60									
Gender											
Female	216	73.2									
Intersex or does not identify oneself with any gender	-	-									
Male	79	26.8									
Education											
High school	99	33.6									
Pre-college	57	19.3									
Bachelors	76	26.8									
Bachelor's degree	38	12.9									
Current post-graduate level	14	4.7									
Postgraduate degree/MBA	11	3.7									
Race (self-declared)											
African-Brazilian	26	8.8									
Asian-Brazilian	2	0.7									
Native-Brazilian	3	1.0									
Pardo-Brazilian	72	24.4									
White	192	65.1									
Marital status											
Single	281	95.3									
Married/Civil partnership	13	4.4									
Divorced	1	0.3									
Income											
Up to 2 minimum salaries	103	39.4									
From 03 up to 04 salaries	109	36.9									

	n	%	M	SD	sk	kt	M	SD	sk	kt	ρ
From 05 up to 6 salaries	32	10.8									
From 7 up to 10 salaries	30	10.2									
From 11 to 15 salaries	16	5.4									
Above 16 salaries	5	1.7									
Webexec											
1- Do you find it difficult to keep your attention on a particular task?			2.17	0.773			2.12	0.702			.609*
2 - Do you have problems focusing on a task?			2.10	0.756			2.09	0.651			.638*
3 - Do you find it difficult carrying out more than one task at a time?			1.92	0.815			1.89	0.723			.656*
4 - Do you tend to lose your train of thoughts?			2.06	0.723			2.03	0.649			.598*
5 - Do you find it difficult finishing something you have started?			1.97	0.832			1.96	0.779			.753*
6 - Do you find yourself acting on impulse?			2.07	0.775			1.99	0.709			.596*
Total			12.29	2.914	0.528	0.033	12.06	2.653	0.392	0.374	.772*

Note. This table presents descriptive analyses of the sociodemographic and Webexec items divided by first application and retest, and correlation between first application and retest of Webexec items and total score, [#]N = 295 (69,48%), [##]N = 294, n = sample, % = percentage, M = mean, SD = standard deviation, sk = skewness, kt = kurtosis, ρ = Spearman correlation (negligible correlation = .00 – .09; weak correlation = .10 – .39; moderate correlation = .40 – .69; strong correlation = .70 – .89, and very strong correlation = .90 – 1.00, Schober & Boer, 2018).

Table 2

Validity Evidence Based on Test Content for Webexec Portuguese Brazilian Translation

Item		Experts						Intelligibility						
		SE		IE		CE		AA		CI		LU		INR	
		V	H	V	H	V	H	V	H	V	H	V	H	V	H
1	Do you find it difficult to keep your attention on a specific task?	1.00*	1.00*	1.00*	1.00*	1.00*	1.00*	.93*	.75*	.86*	.52*	.93*	.75*	.95*	.82*
2	Do you have problems focusing on a task?	.93*	.78*	1.00*	1.00*	1.00*	1.00*	.90*	.69*	.81*	.39*	.90*	.69*	.81*	.38*
3	Do you find it difficult carrying out more than one task at a time?	1.00*	1.00*	1.00*	1.00*	1.00*	1.00*	.95*	.83*	.79*	.35*	.95*	.83*	.95*	.82*
4	Do you tend to lose your train of thought?	1.00*	1.00*	1.00*	1.00*	1.00*	1.00*	.95*	.83*	.93*	.75*	.95*	.83*	1.00*	1.00*
5	Do you find it difficult finishing something you have started?	.87*	.67	.93*	.78*	.87*	.67*	1.00*	1.00*	.79*	.35*	1.00*	1.00*	1.00*	1.00*
6	Do you find yourself acting on impulse?	1.00*	1.00*	1.00*	1.00*	1.00*	1.00*	.98*	.91*	.86*	.52*	.98*	.91*	.86*	.51*

Note. This table presents the content validity of Webexec considering the evaluation of experts (N = 5) regarding SE = Semantic equivalence, IE = Idiomatic equivalence, CE = Conceptual equivalence, and through the intelligibility of the items from a sample of respondents for the target population (N = 21) regarding AA = Age adequacy, CI = Clarity of the item, LU = Language understanding, and INR = Item no need reviews. V = content validity and H = homogeneity or range of answers provided by the experts, * p < .05.

Table 3

Translation and Backtranslation for Webexec Brazilian Portuguese Items

Item	Original version	First Translation	Translation with adjustments	Backtranslation
1	Do you find it difficult to keep your attention on a particular task?	Você acha difícil manter sua atenção em uma tarefa específica?	Você acha difícil manter sua atenção em uma tarefa específica?	Do you find it difficult to keep your attention on a specific task?
2	Do you find yourself having problems concentrating on a task?	Você tem problemas para se concentrar em uma tarefa?	Você tem problemas para se concentrar em uma tarefa?	Do you have problems focusing on a task?
3	Do you have difficulty carrying out more than one task at a time?	Você tem dificuldade em realizar mais de uma tarefa ao mesmo tempo?	Você tem dificuldade em realizar mais de uma tarefa ao mesmo tempo?	Do you find it difficult carrying out more than one task at a time?
4	Do you tend to "lose" your train of thoughts?	Você tende a "perder" sua linha de raciocínio?	Você tende a perder sua linha de raciocínio?	Do you tend to lose your train of thought?
5	Do you have difficulty seeing through something that you have started?	Você tem dificuldade para ver o desenvolvimento das coisas que começou?	Você tem dificuldade para terminar as coisas que começou?	Do you find it difficult finishing something you have started?
6	Do you find yourself acting on "impulse"?	Você se pega agindo por "impulso"?	Você se pega agindo por impulso?	Do you find yourself acting on impulse?

Note. This table presents the original items of Webexec, first translation, translation with adjustments after expert and respondents' analysis of Brazilian Portuguese version, and backtranslation with the approval of the original scale author.

Table 4

Validity Evidence Based on Internal Structure and Reliability of Webexec

Item	First application							Retest						
	EGA		CFA			IRT		EGA		CFA			IRT	
	E	L	ES	SE	δ	I	O	E	L	ES	SE	δ	I	O
1	0.75	0.39	0.83*	0.03	-2.07	0.84	0.85	0.99	0.51	0.75*	0.04	-1.71	1.26	1.27
2	0.75	0.57	0.95*	0.03	-1.92	0.77	0.78	0.99	0.43	0.83*	0.05	-2.06	0.84	0.84
3	0.99	0.14	0.31*	0.06	-1.52	1.36	1.30	0.99	0.39	0.42*	0.04	-2.00	0.73	0.74
4	0.99	0.33	0.57*	0.04	-1.85	0.81	0.81	0.99	0.29	0.60*	0.04	-1.42	1.23	1.23
5	0.99	0.34	0.54*	0.05	-1.62	1.12	1.12	0.77	0.18	0.67*	0.04	-1.83	0.85	0.85
6	0.99	0.09	0.20*	0.06	-1.87	1.18	1.18	0.77	0.10	0.23*	0.03	-1.62	1.14	1.14

Note. This table presents the psychometric analysis of Webexec Brazilian Portuguese scale; EGA: Exploratory Graph Analysis; CFA: Confirmatory Factor Analysis; IRT: Item Response Theory; E = stability; L = network loading; ES = standardized estimative; SE = Standard error; δ = Item difficulty; I = Infit and O = Outfit; * $p < .05$.

Table 5

Factorial Invariance of Webexec Considering Gender and Age Group

Model		Model fit						Model difference	
		χ^2	df	CFI	TLI	RMSEA	RMSEA (90% CI)	ΔCFI	ΔTLI
First Application	**Gender**								
	M1: Configural	48.894*	24	0.98	0.98	0.08	(0.05-0.09)	-	-
	M2: equal thresholds	48.544*	23	0.98	0.97	0.08	(0.05-0.10)	0.00	0.01
	M3: equal factor loadings	58.930*	23	0.94	0.94	0.09	(0.06-0.11)	0.04	0.03
	M4: equal intercepts	58.930*	23	0.94	0.94	0.09	(0.06-0.11)	0.00	0.00
	Age group								
	M1: Configural	50.043*	24	0.98	0.97	0.08	(0.05-0.12)	-	-
	M2: equal thresholds	44.948*	23	0.98	0.98	0.08	(0.04-0.11)	0.00	0.01
	M3: equal factor loadings	58.623*	34	0.98	0.98	0.07	(0.03-0.10)	0.00	0.00
	M4: equal intercepts	58.623*	34	0.98	0.98	0.07	(0.03-0.10)	0.00	0.00
Retest	**Gender**								
	M1: Configural	45.636*	24	0.96	0.95	0.07	(0.04-0.11)	-	-
	M2: equal thresholds	45.298*	23	0.96	0.95	0.08	(0.04-0.11)	0.00	0.00
	M3: equal factor loadings	80.075*	34	0.92	0.93	0.09	(0.06-0.12)	0.04	0.02
	M4: equal intercepts	80.075*	34	0.92	0.93	0.09	(0.06-0.12)	0.00	0.00
	Age group								
	M1: Configural	30.483*	9	0.98	0.97	0.09	(0.05-0.12)	-	-
	M2: equal thresholds	30.483*	9	0.98	0.97	0.09	(0.05-0.12)	0.00	0.00
	M3: equal factor loadings	32.213*	9	0.96	0.96	0.09	(0.06-0.13)	0.02	0.01
	M4: equal intercepts	32.213*	9	0.96	0.96	0.09	(0.06-0.13)	0.00	0.00

Note. Factorial invariance considering gender and age group by participants; χ^2 = chi-square; *p < .001; df = Degrees of freedom; CFI = Comparative fit index; TLI = Tucker-Lewis index; RMSEA = Root-mean-square error of approximation; CI RMSEA = Confidence interval of root-mean-square error of approximation; ΔCFI = Difference between comparative fit indices; ΔTLI = the difference between Tucker-Lewis indices.