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ARTIGO

EVIDENCE OF VALIDITY OF THE BRAZILIAN VERSION OF THE MULTIPLE SCREEN ADDICTION SCALE (MSAS)

EVIDÊNCIAS DE VALIDADE DA VERSÃO BRASILEIRA DA MULTIPLE SCREEN ADDICTION SCALE (MSAS)

EVIDENCIAS DE VALIDEZ DE LA VERSIÓN BRASILEÑA DE LA MULTIPLE SCREEN ADDICTION SCALE (MSAS)

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Abstract:
With the increasing availability of digital screen devices, the impacts of technological addiction and its influence on the cognitive aspects of school-aged youth have been studied since 1998. In this scenario, there is a clear need to measure digital screen addiction within the Brazilian context. Therefore, this study performed a cross-cultural adaptation to validate the Multiple Screen Addiction Scale (MSAS), developed by Saritepeci in Turkey, for use in Brazil. After the translation and adaptation into Brazilian Portuguese, the questionnaire was administered online to 199 Brazilian high school students from private schools in the state of Pernambuco. Statistical analyses yielded the following results: McDonald's Omega of 0.873, KMO of 0.886, and factor loadings ranging from 0.39 to 0.96, with only one item presenting a value below 0.50. The Brazilian version retained three factors, consistent with the original scale.
Keywords: cross-cultural adaptation; digital addiction; adolescents; education; multiple screens.

Resumo:
Com a crescente disponibilidade de dispositivos com telas digitais, têm-se estudado, desde 1998, os impactos da dependência tecnológica e sua influência sobre aspectos cognitivos de jovens em idade escolar. Neste cenário, identifica-se a necessidade de medir a dependência de telas digitais no contexto brasileiro. Por esse motivo, este trabalho realizou a adaptação cultural para validar a escala *Multiple Screen Addiction Scale* (MSA), desenvolvida por Saritepeci, na Turquia, para ser utilizada no Brasil. Após o trabalho de tradução e adaptação para a língua portuguesa do Brasil, o questionário foi aplicado de forma on-line a 199 alunos brasileiros do Ensino Médio de escolas particulares no Estado de Pernambuco. As análises estatísticas

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trouxeram os seguintes resultados: 0.873 para o Ômega de McDonald, KMO (0,886) e cargas fatoriais variaram de 0.39 a 0.96, sendo que apenas 1 item apresentou valor abaixo de 0.50. A versão brasileira ficou com 3 fatores, como a escala original.
Palavras-chave: adaptação cultural; dependência digital; adolescentes; educação; múltiplas telas.

Resumen:
Con la creciente disponibilidad de dispositivos con pantallas digitales, se han estudiado, desde 1998, los impactos de la dependencia tecnológica y su influencia en los aspectos cognitivos de jóvenes en edad escolar. En este escenario, se identifica la necesidad de medir la dependencia de las pantallas digitales en el contexto brasileño. Por tal motivo, este trabajo realizó la adaptación cultural para validar la escala Multiple Screen Addiction Scale (MSAS), desarrollada por Saritepeci en Turquía, para su uso en Brasil. Tras el trabajo de traducción y adaptación al portugués de Brasil, el cuestionario se aplicó de forma online a 199 estudiantes brasileños de secundaria de escuelas privadas en el estado de Pernambuco. Los análisis estadísticos arrojaron los siguientes resultados: 0,873 para el Omega de McDonald, KMO de 0,886 y cargas factoriales que variaron de 0,39 a 0,96, donde solo un ítem presentó un valor inferior a 0,50. La versión brasileña mantuvo tres factores, al igual que la escala original.
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Introdução

The intensive use of electronic devices has become a defining characteristic of the current generation. Regardless of age, digital devices are present in a wide range of environments (Lin et al., 2025; Tsang et al., 2023; Wacks; Weinstein, 2021). With the ease of internet connectivity, connected screen time has increased and has significantly reshaped the ways individuals engage with information, entertainment, education, and interpersonal relationships. When there is a lack of regulation or control over device usage time, patterns of addiction, problematic use, or dependency may emerge (Kirolos, 2025; Taylor, 2024). Terms

related to digital dependence have become increasingly specific—such as social media addiction or internet addiction—making it necessary to present clear definitions to support a proper understanding of the present study (Haidt, 2024; Kang, 2021).

Recent research conducted by the Brazilian Internet Steering Committee indicates that 93% of Brazilian high school students accessed the internet at school in 2024 (NIC, 2025). However, only 47% of these students reported having received any guidance regarding the amount of time spent using the internet or mobile phones. Although screen use is not limited to moments of online connection, these findings strongly suggest the existence of a gap in awareness and guidance concerning the use of digital devices (NIC, 2025).

Digital addictions have not yet been formally recognized as mental disorders by health authorities; however, the growing demand for psychological and psychiatric care provides an important lens through which the issue can be examined. The term "problem" is commonly used to describe these dependencies, such as problematic internet use, gaming, or social media use. Thus, this phenomenon should be understood as a social problem that warrants attention and systematic investigation (Haidt, 2024; Park et al., 2019; Young; Abreu, 2019).

The term digital addiction is used as an umbrella concept to encompass various forms of dependency—such as gaming, internet, and social media addiction—and generally refers to the causes, symptoms, and outcomes associated with technology- and internet-related addictive behaviors. Although recent studies indicate an association between digital addiction and psychological problems, some scholars argue that definitions adopted by official institutions could be more explicit. Social awareness and the dissemination of reliable information are essential to promote psychosocial health and to ensure effective educational outcomes (Haidt, 2024; King et al., 2013; King; Nardi, 2023; Yildiz, 2021; Young; Abreu, 2019).

It is also important to emphasize that digital addiction directly affects learning processes, including human interactions and emotional aspects, attention and memory mechanisms, and sleep quality, which is closely linked to memory consolidation and learning (Chaudhury; Tripathy, 2018; Dehaene, 2022; Izquierdo, 2018; King; Nardi, 2023; Twenge, 2018).

For these reasons, the present study is particularly relevant to educational institutions, as identifying multiple screen addiction among students may enable school administrators to implement awareness initiatives and promote the responsible and purposeful use of technology. In this context, access to high-quality information is essential for those responsible for making informed decisions within family, educational, and social settings (Bickham, 2021; Andrade; Viñán-Ludeña, 2025).

Such information depends on research and assessment tools capable of measuring not only the presence of addiction but also its scope and impact. The relevance of this topic highlights the need for the development and validation of additional assessment instruments that address psychological and learning domains in children and adolescents. In Brazil, there are well-established research and assessment centers dedicated to this field—such as the Delete Institute, founded within the Institute of Psychiatry at the Federal University of Rio de Janeiro (King; Nardi, 2023). However, at the time of this study, no assessment instruments focused on digital addiction related to multiple screen use among children and adolescents were available.

In light of this gap, and with the aim of providing a research tool within the context of digital addiction, the objective of this study was to translate, adapt, and validate the Turkish Multiple Screen Addiction Scale (MSAS) for application among high school students in Brazil.

Metodologia

The cultural adaptation process of the instrument was conducted in two phases. The first phase involved a pretest with 29 students, and the second phase consisted of the full test application with 199 students. The scale included seven items aimed at identifying participant characteristics—such as age, gender, and type of internet connection typically used—and 15 closed-ended items. Participants were informed that they could interrupt the process at any time if they felt tired, uncomfortable, or no longer wished to participate. The risks associated with this study were considered minimal, as it did not involve public exposure of participants and consisted solely of responding to the scale. On average, participants took approximately seven minutes to complete the questionnaire.

This study was approved by the Ethics Committee of UNASP under CAAE number 73323123.0.0000.5377, Opinion number 6.267.961, with approval granted on August 29, 2023.

Caracterização dos participantes

The MSAS pretest was administered online via Google Forms to 29 invited students enrolled in the second and third years of high school. These students were registered and actively attending a private school located in the interior of the state of Pernambuco.

Following the pretest, the main test was administered to 199 students of both genders (Table 1), aged between 14 and 18 years (Table 2), using the same procedures adopted during

the pretest phase. In this stage, population identification questions were included, and the respondent group comprised students from another school within the same educational network, located in a different city in the state of Pernambuco.

Table 1 – Study population by gender

Gender	199 adolescents
Boys	48.24%
Girls	41.25%
Other	0.51%

Source: Prepared by the authors.

Table 2 – Study population by age group

Age	School A (98 students)	School B (101 students)
14	4.1%	19.8%
15	35.7%	31.7%
16	32.7%	21.8%
17	22.4%	26.7%
18+	5.1%	-

Source: Prepared by the authors.

More than 90% of the study population consists of high school students, while the remaining 10% are students from the final years of elementary education (Table 3). Of the 199 students, 101 were enrolled in the school where the pretest was conducted, hereafter referred to as School A. Among these 101 students, 58 were boarding students, meaning they both studied and lived at the school, and 43 were day students attending the same institution. The remaining 98 students belonged to another school that collaborated with the research, hereafter referred to as School B.

Table 3 – Study population by school year

School Year	199 adolescents
3rd year of High School	30.15%
2nd year of High School	22.12%
1st year of High School	38.70 %
9th grade of Lower Secondary Education (Fundamental II)	1.5%
6th to 8th grades of Lower Secondary Education (Fundamental II)	7.53%

Source: Prepared by the authors.

Instrument

The MSAS scale was developed by researcher Mustafa Saritepeci, from Necmettin Erbakan University in Konya, Turkey, with the objective of creating a reliable measurement tool to determine addiction and dependence related to multiscreen use among university students in

Turkey. In this context, an item pool was constructed based on studies in the literature addressing screen addiction and multiscreen addiction, including indicators of Internet Gaming Disorder from the DSM-5 of the American Psychiatric Association (2013), which are considered to be closely related to multiscreen addiction, as well as other scales and studies focused on issues such as internet addiction and dependence, mobile gaming addiction, and problematic use of social media. After several pretesting activities and the structuring of the research questionnaire, an initial scale form consisting of 16 items was developed and, following validation, finalized with 15 items (Saritepeci, 2021).

The original scale comprises three domains: (1) screen time, with four items (1 to 4); (2) compulsive behavior, with eight items (5, 6, 8 to 11, and 13[1]); and (3) loss of control, with three items (12, 14, and 16). For each item, respondents choose one of five options on a Likert scale: Never, Rarely, Sometimes, Often, and Always. The option "sometimes" was adopted in the original scale as the cutoff point for the analysis of monothetic and polythetic[2] criteria in identifying multiscreen addiction or dependence; therefore, the same parameters were applied in this study (Saritepeci, 2021).

Methodological Procedures

The methodology chosen for adapting the MSAS was Cosmin's Taxonomy due to the reliability of its process of analyzing and measuring information for the procedure of obtaining, analyzing, and obtaining results in its application, being used throughout the study process. The stages are described below.

Stage 1 – Translation of the Instrument into Portuguese

The process began with the translation of the instrument by two bilingual translators, one a native Brazilian and the other a native Mexican, both with university experience in the United States. They were contacted personally and, after agreeing to participate in the translation process, received the instruments for translation from English into Portuguese. Both

[1]We clarify that items 7 and 15 had already been excluded from the original version following statistical testing.
[2]Monothetic and polythetic are terms used to classify situations indicating the consistency of occurrence of the event. Monothetic, when all items without exception are included in the sample, and polythetic when the items are partially included: Hjørland (2017), and Pilati, Brito and Borges-Andrade (2011).

translators worked independently on the English version of the instrument, producing two versions referred to as T1 and T2 (translation 1 and translation 2).

Stage 2 – Synthesis of Translations T1 and T2 = T12

The synthesis of translations T1 and T2, referred to as T12, resulted from a discussion process between the translators, who analyzed discrepancies between the two produced versions. Based on this synthesis, the first version of the Equivalence Assessment document was developed and submitted to the expert committee.

Stage 3 – Back Translation

For the back-translation process, the T12 document derived from translations T1 and T2 was sent to two translators whose native language was English, residing in Brazil and fluent in Portuguese. The purpose of the back translation of these instruments—now in Portuguese—was to translate the scale back into the original English language in order to assess the quality of the initial translation, thus generating versions RT1 and RT2. Following this step, a synthesized version (RT12) was produced and forwarded to the expert evaluation committee.

Stage 4 – Expert Panel Review

The expert panel, composed of two methodologists, one linguist, and one technology specialist, was invited to evaluate the equivalence between the items in version T12 and those of the original scale. The panel assessed semantic and idiomatic equivalence, referring to the meaning of words and the use of expressions in the respective languages; conceptual equivalence, that is, the coherence of items in relation to their respective constructs and the target population, in this case adolescents; and cultural equivalence, which evaluates whether the situations presented in the instrument align with experiences typical of the Brazilian adolescent cultural context.

Stage 5 – Pretest

After validation of the document by the expert committee, a pretest was conducted with 29 students to assess comprehension of the inventory text. To participate in the pretest, students were required to complete the informed consent form (ICF) online via Google Forms. During questionnaire administration, the researcher remained available to address questions and

provide clarification as needed; this stage was conducted in person. At the conclusion of the application process and after receiving the completed questionnaires with no suggestions from participating students, the data underwent an initial qualitative analysis of the inventory at the translation stage, using JASP® software, version 0.17.1, with reliability assessed through McDonald's omega test. The instrument was subsequently resubmitted to the experts, even after confirming that no modification suggestions had been made by the students, and the same questionnaire applied in the pretest was thus established as the final version.

Stage 6 – Final Application of the Instrument

Following confirmation of the instrument by the members of the expert committee, the final stage began with the selection of participants for the final phase, totaling 199 high school students of both genders (see Table 1). For this process, students from the first, second, and third years of high school from two private-sector schools were selected, as well as students from the 6th to the 9th grades of lower secondary education who met the age range proposed in the study—between 14 and 18 years (see Table 3). All students completed the same questionnaire that had been validated by the experts during the pretest phase.

The application of the instrument followed the same procedures adopted in the pretest, taking into account criteria of reliability, quality, and validity of the information. After receiving the students' response data, the final stage included the performance of Confirmatory Factor Analysis to verify the model fit of the Brazilian version.

Data Analysis Methodology

Data were analyzed qualitatively during the translation phase, the expert committee review, and the pretest. After application to the final sample, the data were subjected to statistical analysis using JASP® software, version 0.17.1, including reliability analysis through McDonald's omega test and Confirmatory Factor Analysis.

Results

This section presents the results obtained throughout the study, which were divided into three parts: analyses conducted by the expert committee; results obtained from the pretest of the instrument; and results related to the final application of the MSAS-BR instrument. Each

stage was carefully analyzed to ensure the accuracy and relevance of the data presented, thereby contributing meaningfully to the objectives of this study.

Expert Committee Analysis of Version T12

Table 4 presents the observations and suggestions made by the expert panel. The first column of the table contains information related to the translators' work, while the second column presents the observations and suggestions.

To facilitate respondents' comprehension, the expert committee recommended that the descriptions of each "digital device" mentioned in the items be summarized using the term "screen(s)." Accordingly, the introductory statement already includes the following explanation: "This is a scale for assessing digital screen dependence. Whenever the word 'screen(s)' is mentioned, it includes: mobile phones, smartphones, television, computers, tablets, etc."

One item in particular (i04) posed comprehension difficulties for both the translators and the experts. The English text presented structural ambiguities in the sentence: "I keep without sleep deprived because I control any screen or watch something on that screen." The uncertainty concerned whether digital screen use caused sleep deprivation or whether the individual deprived themselves of sleep in order to use screens. To resolve this issue, the original author of the scale—who translated it from Turkish into English—was contacted and responded promptly. After clarifying the intended meaning to the committee, a version closer to the original Turkish scale was proposed, indicating that the individual recognizes that screen use leads to sleep deprivation. The final translation was formulated as follows: "It is harder for me to fall asleep when I interact with screens before going to bed."

Item 06 also required more extensive discussion in order to adapt it to the Brazilian target population while preserving semantic coherence. It was decided to use first-person phrasing—unlike the original text—and to reorganize negative expressions, such as "none," thereby facilitating alignment with the Likert-scale response options. The experts assessed that this choice would make clearer the relationship between time allocation and device use for respondents.

It was also noted that the scale included a device that is uncommon in the Brazilian context: the PDA (Personal Digital Assistant)—also known as pagers or small digital devices—which emit an audible alert upon receipt of text messages and function as portable devices for sending and receiving SMS messages. As this type of device is no longer in use in Brazil, it

was excluded from the list of devices mentioned in the original scale. In addition to this modification, minor adjustments were suggested to improve textual fluency for Brazilian readers, such as shortening sentences.

Item 14 drew the attention of the experts with regard to differences between Turkish and Brazilian family relationships. The issue of telling the truth or not lying to relatives and friends may be considered a culturally relevant aspect for future discussion. Analyses of this item warrant special attention in light of Brazilian cultural practices, often characterized by informal problem-solving strategies ("*jeitinhos*"), and their potential implications.

Table 4 – Evaluation by the Expert Committee

T12 Version	**Suggestions and Revisions**
Title: Multiscreen Addiction Scale (EVMT)	Title: Recommendation to retain the original acronym to facilitate identification of the scale in online searches; replace the term "addiction" with "dependence"; add the term "digital" to specify the type of screen; and include the suffix "PT" to indicate the language of the translation: Digital Multiscreen Dependence Test (MSAS-PT).
Initial instructions: Not included in the original scale	Suggestion: In the original version, each item contains detailed descriptions of digital devices. To shorten the items, the committee suggested beginning the test with an explanatory note to facilitate item readability and reduce the length of the statements. "This is a scale for assessing dependence on digital screens. Whenever the word 'screen(s)' is mentioned, it includes: mobile phones, smartphones, television, computers, tablets, etc."
Response scale: For each item, the following scale is provided: Never, Rarely, Sometimes, Often, Always	Revision: For each item, the following scale is provided: Never, Rarely, Sometimes, Often, Always.
Items: Excessive screen time, Compulsive behavior, and Loss of control	Observation and correction: Version T12 presented an error in terminology, which was promptly corrected. These are the domains of the scale, whereas the questions correspond to the items.
Excessive Screen Time	Excessive Screen Time
i01 "My mind is constantly occupied with one or more screens such as television, phone, tablet, computer, etc."	i01 The committee suggested replacing the term *"mind"* with *"attention"* to increase objectivity: "My attention is usually engaged with one or more screens."
i02 "I usually spend more time on a screen (TV, computer, tablet, phone, etc.) than I planned."	i02 "I usually spend more time than planned using screens."
i03 "I cannot control the time I spend in front of any screen."	i03 "I cannot control the time I spend in front of screens."
i04 "Interaction with an electronic device makes it difficult for me to fall asleep."	i04 "It is harder for me to fall asleep when I interact with screens before going to bed."
Compulsive Behavior	Compulsive Behavior
i05 "I cannot tolerate being without access to screens."	i05 "I cannot stand being without screens."

i06 – Two translations were initially proposed to determine the best fit for the Brazilian version: "I check television, phone, tablet screens, etc., even when I have no work or purpose (such as watching a TV program, writing a message on the phone, etc.)." "I constantly check the computer, television, or mobile phone screen even when I do not have a specific purpose or task (such as writing a message on the phone, doing academic work, etc.)."	i06 Final version after discussion: "I check a screen even when I do not have a specific task or purpose that justifies using this device."
i08 "Even though I do not receive any notification, I check my device screen (phone, tablet, etc.)."	i08 Revision: The exclusion of the term PDA was recommended, as it refers to a device no longer used in Brazil. "I check my device screen (~~phone, tablet, etc~~.) even when I have not received notifications."
i09 "I feel the need to constantly interact with a screen."	i09 "I feel the need to interact with a screen."
i10 "The most common thing I do during the day is to look at or check a screen."	i10 Final suggestion: "What I do most during the day is look at or check a screen."
i11 "I need to turn on a TV screen or similar device even when there is no program to watch or activity I need to do."	i11 Revised version combining suggestions: "I feel the need to turn on a screen even when there is no program to watch or activity to do on this device."
i13 "Being away from or unable to access the screens of one or more of my devices (mobile phone, computer, or TV, etc.) during the day makes me feel uncomfortable."	i13 "Being away from or unable to access the screen of one or more of my devices (~~mobile phone, computer, or TV, etc.~~) during the day causes me discomfort."
i15 "During the time I spend using screens, I feel that the negative emotions I experience decrease."	i15 "I feel that my negative emotions decrease when I am using a screen."
Loss of Control	Loss of Control
i12 "Although I have tried to control, limit, or reduce the amount of time I spent using screens, I have not succeeded."	i12 "Although I have tried to control, I have not been able to limit or reduce the amount of time I spend using screens."
i14 "I lie to my relatives (family members, friends, etc.) about the time I spend using screens."	i14 "I lie to family members and/or friends about the time I spend using screens on a device." Suggestion: *Discuss cultural aspects of family and friendship relationships with the author for future and comparative studies*.
i16 "I put several opportunities for my education (inability to prepare for an exam, etc.) or career at risk due to the time I spend in front of a screen."	i16 "I compromise several opportunities for my education or professional future due to the time I spend using a screen."

Source: author's personal notes from the meeting with the expert panel.

All observations were addressed, and the same instrument used in the pretest was applied in the final test, as no additional comments were made during the pretest evaluation phase. Both samples were analyzed, and the results are presented below.

Pretest Results

After administration of the test, the data were extracted from the pretest form into an Excel spreadsheet for analysis and verification of the statistical reliability of Cronbach's alpha and McDonald's omega values using JASP® software, version 0.17.1. The resulting values are presented in Table 5 below.

Table 5 – Cronbach's Alpha and McDonald's Omega Values from the Pretest

Bayesian Scale Reliability Statistics		
Estimate	**McDonald's ω**	**Cronbach's α**
Posterior mean	0.815	0.823
95% CI lower bound	0.715	0.731
95% CI upper bound	0.892	0.907

Source: research data obtained from JASP® software (version 17.1).

Based on the analysis of Cronbach's alpha and McDonald's omega derived from the data generated by the instrument in the pretest, the items demonstrated satisfactory reliability. This conclusion is supported by the fact that, according to the coefficients presented, data reliability should approach values close to 1 on a variance scale ranging from 0 to 1. In the pretest, the values obtained were 0.815 for McDonald's omega and 0.823 for Cronbach's alpha, thereby confirming the reliability of the data. As these values fall within the expected statistical parameters for this type of research, the reliability of the instrument is attested, considering the sample of 29 high school students who participated in the pretest.

Data Analysis

As no adjustments to the instrument applied in the pretest were necessary, some complementary general data questions were included in order to better identify the characteristics of the study population, while ensuring complete participant confidentiality. This final version was applied to 199 basic education students, all aged between 14 and 18 years and enrolled in the same educational network.

The results were also extracted into an Excel spreadsheet and analyzed using JASP® software, version 17.1, generating the reliability analysis presented in Table 5. For testing purposes, the Bayesian Unidimensional Reliability technique was employed, a statistical approach that combines prior information with observed data. Readers interested in further technical details of this statistical technique are referred to two scientific studies that explain

and apply the theorem in a practical manner: Droguett and Mosleh (2006) and Ramírez Pongo and Bueno Neto (1997).

In the application to the final sample, reliability was confirmed, as the values remained close to 1, indicating good internal consistency of the instrument (Auerswald; Moshagen, 2019; Damasio, 2012). For Cronbach's alpha analysis, a coefficient of $\alpha \geq .70$ was adopted, and for McDonald's omega, a coefficient of $\omega \geq .80$, as presented in Table 6 below.

Table 6 – Bayesian Unidimensional Reliability

Bayesian Scale Reliability Statistics		
Estimate	**McDonald's ω**	**Cronbach's α**
Posterior mean	0.873	0.872
95% CI lower bound	0.847	0.847
95% CI upper bound	0.897	0.898

Source: research data obtained from JASP® software (version 17.1).

When comparing the factor loading structure of the Brazilian MSAS-BR scale with the original version, a strong correlation between the scales is observed, with similar results. The internal consistency of the Turkish scale was 0.92, whereas the Brazilian version reached 0.88 (Saritepeci, 2021).

Confirmatory Factor Analysis

After confirming the reliability of the instrument, Confirmatory Factor Analysis (CFA) was conducted with the objective of evaluating the internal structure of the MSAS-BR instrument. The analysis was performed using the Robust Maximum Likelihood (RML) estimation method, which is appropriate for categorical data (DiStefano; Morgan, 2014; Li, 2016; Şimşek; Noyan, 2013).

The following fit indices were used: c^2; c^2/gl; *Comparative Fit Index* (CFI); *Tucker-Lewis Index* (TLI); *Standardized Root Mean Residual* (SRMR) and *Root Mean Square Error of Approximation* (RMSEA). These indices are presented in Tables 7 and 8. The c^2 values should not be significant; the c^2/gl ratio should be $\leq$ que 5 or, preferably, $\leq$ que 3; CFI and TLI values should be $\geq$ 0.90 and, preferably, above 0.95; RMSEA values should be $\leq$ 0,08 or, preferably, $\leq$ 0,06, with the confidence interval (upper bound) $\leq$ 0,10 (Brown, 2015).

Table 7 – Chi-square Values

Chi-square Values			
Model	**X^2**	**df**	**p**
Baseline model	1035.825	105	-
Factor model	171.409	87	< .001

Source: research data obtained from JASP® software (version 17.1).
Note: df = degrees of freedom.

After the first data rotation in JASP®, with the three factors predefined, factor loadings ranged from 0.39 to 0.96. Only one item presented a value below 0.50, although it was very close to that of the original scale. Therefore, all 15 items were retained in the Brazilian version of the MSAS-BR. Subsequently, Table 8 presents the structure and factor loadings of the items.

Tabela 8 – Factorial loadings of each item

Factor load								
							95% Confidence Interval (Upper)	
Factor	**Indicator**	**Symbol**	**Est.**	**Standard Error**	**Z-value**	**p**	**Lower**	**Upper**
Excessive Screen Time	i01 – My attention is usually engaged with one or more screens.	λ11	0.390	0.079	4.944	< .001	0.235	0.544
	i02 – I usually spend more time than planned using screens.	λ12	0.689	0.070	9.884	< .001	0.552	0.825
	i03 – I cannot control the time I spend in front of screens.	λ13	0.734	0.079	9.285	< .001	0.579	0.889
	i04 – It is harder for me to fall asleep when I interact with screens before going to bed.	λ14	0.533	0.086	6.224	< .001	0.365	0.701
Compulsive Behavior	i05 – I cannot stand being without screens.	λ21	0.788	0.070	11.234	< .001	0.650	0.925
	i06 – I check a screen even when I do not have a specific task or purpose that justifies using this device.	λ22	0.771	0.071	10.881	< .001	0.632	0.910
	i08 – I check my device screen even when I have not received notifications.	λ23	0.791	0.078	10.173	< .001	0.638	0.943

	i09 – I feel the need to interact with a screen.	λ24	0.836	0.059	14.224	< .001	0.720	0.951
	i10 – What I do most during the day is look at or check a screen.	λ25	0.670	0.080	8.334	< .001	0.512	0.827
	i11 – I feel the need to turn on a screen even when there is no program to watch or activity to do on this device.	λ26	0.697	0.085	8.248	< .001	0.532	0.863
	i13 – Being away from or unable to access the screen of one or more of my devices during the day causes me discomfort.	λ27	0.772	0.082	9.441	< .001	0.612	0.932
	i15 – I feel that my negative emotions decrease when I am using a screen.	λ28	0.579	0.096	6.029	< .001	0.391	0.767
Loss of Control	i12 – Although I have tried to control, limit, or reduce the amount of time I spend using screens, I have not succeeded.	λ31	0.961	0.075	12.799	< .001	0.814	1.108
	i14 – I lie to family members and/or friends about the time I spend using screens on a device.	λ32	0.573	0.093	6.152	< .001	0.390	0.755
	i16 – I compromise several opportunities for my education or professional future due to the time I spend using a screen.	λ33	0.763	0.080	9.475	< .001	0.605	0.920

Source: research data obtained from the JASP® software (version 17.1).

The Brazilian version of the MSAS-BR followed the structure of the original instrument, comprising three factors and a total of 15 items distributed as follows: Factor 1 = Excessive screen time, with four items (1–4); Factor 2 = Compulsive behavior, with eight items (5, 6, 8, 10, 11, 13, and 15); and Factor 3 = Loss of control, with three items (12, 14, and 16). In the original scale, items 7 and 9 were removed due to inconsistency (Saritepeci, 2021).

The consistency observed across the data—from both confirmatory and exploratory analyses as well as the collected dataset—underscores the relevance of the present study within the current landscape, in which research tools for assessing digital dependence are increasingly necessary for educational managers, families, and society at large. Accordingly, the primary expectation is that the MSAS-BR scale will be useful to researchers interested in further advancing studies in this field.

Discussion

An emerging issue in contemporary society is digital dependence and, more specifically, dependence on multiple digital screens. This is a sensitive topic for both families and schools. Social relationships, as well as the challenges related to personal and professional development, are directly implicated in this debate. Defining the limits and effects of digital dependence on children and adolescents—considering emotional and relational dimensions as well as interference in learning processes—requires the attention of families, educational institutions, and policymakers.

Within this context, the MSAS-BR scale was tested and evaluated in accordance with the guidelines of the COSMIN taxonomy (Mokkink; Elsman; Terwee, 2010). The methodological process involved initial translation, synthesis of versions, back-translation, expert committee review, and, finally, pre-testing and testing of the final version. The analysis of semantic, linguistic, cultural, and conceptual equivalence was conducted rigorously, with all committee members individually evaluating and discussing each item of the scale and proposing adjustments to ensure adequacy and clarity in Portuguese.

The review process conducted by the expert committee regarding translations T1 and T2—aimed at validating the T12 version of the inventory—resulted in adjustments to domain and item identifiers; refinements to item wording to facilitate participant comprehension; sentence reduction to improve readability and fluency; and direct consultation with the author of the original scale to clarify item i04, which addresses screen use and its relationship with sleep quality. These modifications enhanced the internal coherence of the scale items, ensuring that the adaptation was easily understandable for respondents and represented a reliable translation of the original instrument.

It is worth emphasizing that education plays a strategic role in an increasingly connected society. Awareness that today's learners are tomorrow's leaders, social actors, and educators should serve as a key driver for educators and administrators. Collecting robust evidence on

society's relationship with information media and understanding its influence on thinking and learning processes is critical to promoting healthy and responsible social behaviors. Rather than attempting to restrain technological progress, a more effective approach may be to foster a responsible society that uses technology intelligently. In this regard, the MSAS-BR scale has the potential to become a critical tool for educators and educational managers.

Final considerations

This study aimed to culturally adapt and validate the Multiple Screen Addiction Scale (MSAS-BR) for use in the Brazilian Portuguese context, based on a sample of basic education students—although the original scale targeted university students. To achieve this objective, the translation and adaptation process followed the COSMIN methodology.

Based on the collected data, the MSAS-BR scale was subjected to a comprehensive set of statistical measurement procedures. Validation was confirmed through multiple stages, including expert committee evaluation, internal consistency analysis, reliability assessment using Cronbach's alpha and McDonald's omega, and Confirmatory Factor Analysis as the final step in adapting the instrument to the Brazilian context.

With the confirmed adaptation of the MSAS-BR scale, its application in educational institutions is expected to generate more accurate data on multiple digital screen dependence within school environments, while also contributing to the development of educational strategies aimed at mitigating the effects of this phenomenon.

It is important to highlight that the data generated by the MSAS-BR scale provide a solid evidence base for researchers working in basic education settings in Brazil and other Portuguese-speaking countries. When used responsibly and rigorously—and combined with findings from complementary studies that address the limitations of the present research—these data can yield substantial societal benefits by ensuring that children and adolescents experience a healthy environment that leverages technological advances intelligently, promoting comprehensive development in interpersonal relationships as well as in engagement with knowledge and digital connectivity.

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