CULTURAL CAPITAL SCALE: EVIDENCE OF VALIDITY BASED ON INTERNAL STRUCTURE

ESCALA DE CAPITAL CULTURAL: EVIDÊNCIAS DE VALIDADE BASEADAS NA ESTRUTURA INTERNA

ESCALA DE CAPITAL CULTURAL: EVIDENCIA DE VALIDEZ BASADA EN ESTRUTURA INTERNA

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ABSTRACT: This study aims to validate the Cultural Capital in Family Interactions Scale through validity evidence, focusing on the internal structure of the instrument. As outlined by the Bourdiesian theory, cultural capital is considered a set of cultural and social assets acquired in the domestic environment, and its direct relationship with students' academic performance is highlighted. In this analysis, we used a sample of 11,795 5th-grade students who answered a questionnaire. Data collection was done electronically. The Parallel Analysis indicated two factors: Static Cultural Capital and Relational Cultural Capital, with Guttman's lambda 2 assuming values of 0.702 and 0.845, respectively. We calculated UniCO = 0.787, ECV = 0.669 and MIREAL = 0.318 indices. We used Exploratory Factor Analysis and Partial Confirmatory Factor Analysis. The adjustment indices CFI = 0.946 and TLI = 0.935, and the residue index RMSEA = 0.053, the analysis of internal consistency, determinants, and replicability of the factorial scores gave us evidence of validity for the use of the Cultural Capital Scale in Family Interactions.

KEYWORDS: Cultural capital. Evidence of validity. Internal structure. Factor analysis.

RESUMO: *Este estudo visa validar a Escala de Capital Cultural nas Interações Familiares por meio de evidências de validade, centrando-se na estrutura interna do instrumento desenvolvido pelos autores. O capital cultural, conforme delineado pela teoria bourdiesiana, é considerado um conjunto de ativos culturais e sociais adquiridos no ambiente doméstico, e sua relação direta com o desempenho escolar dos alunos é destacada. Nessa análise, foi utilizado uma amostra de 11.795 alunos do 5° ano que responderam a um questionário. A coleta dos dados foi feita de forma eletrônica. A Análise Paralela indicou dois fatores: Capital Cultural Estático e Capital Cultural Relacional, com lambda 2 de Guttmam assumindo os valores de 0,702 e 0,845, respectivamente. Calcularam-se os índices UniCO = 0,787, ECV = 0,669 e MIREAL = 0,318. Foi realizado uma Análise Fatorial Exploratória e Análise Fatorial Confirmatória Parcial. Os índices de ajustes CFI = 0,946 e TLI = 0,935, e o índice de resíduo RMSEA = 0,053, as análises de consistência interna, de determinância e replicabilidade dos escores fatoriais nos indicaram evidências de validade para a utilização da Escala de Capital Cultural nas Interações Familiares.*

PALAVRAS-CHAVE: *Capital Cultural. Evidências de Validade. Estrutura Interna. Análise Fatorial.*

RESUMEN: *Este estudio tiene como objetivo validar la Escala de Capital Cultural en Interacciones Familiares a través de evidencia de validez, centrándose en la estructura interna del instrumento. El capital cultural, tal como lo plantea la teoría bourdiesiana, es considerado un conjunto de bienes culturales y sociales adquiridos en el entorno doméstico, y se destaca su relación directa con el rendimiento académico de los estudiantes. En este análisis, utilizamos una muestra de 11.795 estudiantes de 5º grado que respondieron un cuestionario. La recolección de datos se realizó electrónicamente. El Análisis Paralelo indicó dos factores: Capital Cultural Estático y Capital Cultural Relacional, con la lambda 2 de Guttman asumiendo valores de 0,702 y 0,845, respectivamente. Calculamos los índices UniCO = 0,787, ECV = 0,669 y MIREAL = 0,318. Utilizamos Análisis Factorial Exploratorio y Análisis Factorial Confirmatorio Parcial. Los índices de ajuste CFI = 0,946 y TLI = 0,935, y el índice de residuos RMSEA = 0,053, los análisis de consistencia interna, determinación y replicabilidad de las puntuaciones factoriales nos dieron evidencia de validez para el uso de la Escala de Capital Cultural en las Interacciones Familiares.*

PALABRAS CLAVE: *Capital cultural. Evidencia de validez. Estructura interna. Análisis factorial.*

Introduction

Cultural capital corresponds to a set of cultural assets, such as educational titles, diplomas, knowledge, skills, and competencies, which are acquired throughout life, and once combined, can result in other forms of capital, such as social and economic (Bourdieu, 1987). Jaeger and Karlson (2018) add that the transmission process of cultural capital can occur from parents to children or through investments and socialization.

According to Bourdieu (1998a), cultural capital is an educational variable that presents a differentiation power almost similar to economic capital regarding students' academic performance. According to this same author, "the reproduction of the structure of distribution of cultural capital occurs in the relationship between the strategies of families and the specific logic of the school institution" (Bourdieu, 2018, p. 34, our translation). Thus, researching cultural capital in family relationships can generate intervention strategies with the aim of reducing social inequality.

According to the sociologist Bourdieu (1998b), many of those recognized as "good students" in a classroom are the result of family action, mainly from a cultural perspective. According to this same author, students with a high level of cultural capital find more facilities in the school environment because teachers establish greater identification with them (Bourdieu, 1998a). Thus, with each generation of descendants of the high cultural level population, who are mostly people of high socioeconomic status, this capital will be reproduced in future generations, becoming a cycle, which Bourdieu calls Cultural Reproduction (Bourdieu, 1998a).

Contradicting the theory of Social Reproduction, DiMaggio (1982) suggests that, according to the situations and experiences lived in each family, cultural capital can be acquired and incremented, which he calls Cultural Mobility. The theory of Cultural Mobility breaks the rigidity of Cultural Reproduction and brings a new perspective for families of low socioeconomic status to reach other levels of cultural capital (Jaeger; Karlson, 2018). Consequently, students from lower socioeconomic backgrounds may achieve better academic results as long as families acquire more cultural capital.

Cultural capital can exist in three states: embodied, objectified, and institutionalized (Bourdieu, 1987). Cultural capital in the objectified state is present in the form of cultural goods such as paintings, art pieces, musical instruments, visits to museums, galleries, and musical performances. Just as economic capital requires investment for its growth, cultural capital also involves some form of investment for its development (Bourdieu, 1987). Cultural capital in the

embodied state is acquired throughout life through experiences and daily exchanges (Crossley, 2018). In the embodied state, cultural capital is the result of time investment, as it is not transferred instantly as with financial capital. It involves personal cost, dedication, and renunciation (Bourdieu, 1987).

In the family environment, this exchange of experience and, consequently, the formation of habits tend to be more significant precisely because of the greater interaction time among family members. Especially when considering that children observe and mimic the behavior of the adults they most identify with (Bandura, 1977). In the institutional state, cultural capital is associated with academic titles and achievements attained (Sieben; Lechner, 2019).

Tramonte and Willms (2010) divide cultural capital into two dimensions: static cultural capital (SCC) and relational cultural capital (RCC). SCC relates to objectified states since it includes possessing high culture goods, musical instruments, artworks, and visits to museums and theaters. On the other hand, RCC is related to the embodied state, as per the researchers' definition, this dimension includes discussions between children and their parents on political, cultural, and social issues, as well as topics arising from experiences in the school environment.

To capture the cultural capital transmitted from parents to children in the family environment, considering the two dimensions (RCC and SCC) proposed by Tramonte and Willms (2010), it is necessary to have an instrument with this approach that presents evidence of validity. These pieces of evidence will indicate how suitable the instrument is for the intended use (Aera; Apa; Ncme, 2014; Pacico; Hutz, 2015; Andrade; Valentini, 2018). However, it is important to understand that validity is not a characteristic that allows only two possibilities, such as valid or invalid, but rather a "continuous process, varying in terms of the quantity and quality of the evidence supporting a given interpretation for the scores of an instrument" (Ambiel; Carvalho, 2017, p. 87, our translation). Thus, as new findings are obtained about the test, more evidence is gathered regarding its suitability for the construct it aims to measure.

The literature points out five sources of valid evidence that can support the instrument: 1. Evidence based on content; 2. Based on the response process; 3. Based on internal structure; 4. Based on the relationship with other variables; and 5. Based on testing consequences (Aera; Apa; Ncme, 2014; Andrade; Valentini, 2018; Jesus; Rêgo; Souza, 2018). Although all five sources of evidence are essential in the process of constructing psychological and educational instruments, the focus of this article is on seeking evidence of validity based on the internal structure of the instrument.

The search for valid evidence based on the internal structure aims to establish the relationship between the test items and the construct to be measured and the relationships of these items with the possible dimensions derived from this construct. Among the psychometric techniques used for this purpose, we have Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) (Andrade; Valentini, 2018), as well as an intermediate technique known as Partial Confirmatory Factor Analysis (PCFA) (Rogers, 2022).

The general objective of this article was to obtain evidence of validity based on the internal structure of the Cultural Capital Scale in Family Interactions. The specific objectives of the present study were to verify the factorial structure of the cultural capital scale in family interactions and to obtain estimates of the reliability of the factors.

Method

Participants

The research was administered to 18,607 students out of a total of 19,649, all belonging to the same network of private schools. The network consists of 334 units located throughout Brazil and, annually, conducts a large-scale assessment to verify students' performance in the subjects of Portuguese Language (LP) and Mathematics (MT). Out of the 18,607 invited students, 12,835 agreed to participate voluntarily in the research with the proper authorization from their parents.

Students who did not fully complete the Cultural Capital questionnaire were excluded from the sample. Thus, the final sample consisted of 11,795 students from the 5th grade of Elementary School, with 49.6% being male and 50.3% female. Regarding age, at the time of the survey, 55.1% were 10 years old, 42.3% were 11 years old, 0.9% were younger than 10 years old, 1.6% were older than 11 years old, and 0.1% did not respond.

The research was conducted in 323 schools, with an average of 37 participating students per school (M = 36.5, SD = 21.6). The students were distributed across the five geographical macroregions of Brazil in the following proportions: 41.6% in the Southeast region; 21.6% in the South region; 14.1% in the North region; 13.1% in the Midwest region; and 9.6% in the Northeast region.

Instruments

The Cultural Capital in Family Interactions instrument was developed and administered alongside a Portuguese Language and Mathematics assessment. The knowledge assessment contained 22 Mathematics items and 22 Portuguese Language items. After students answered the knowledge questions, they had access to the instrument designed to measure cultural capital in family interactions. This instrument consists of 26 items depicting situations that may occur in the family environment, with 12 items from the CCE dimension and 14 items from the CCR dimension. The items were presented to students in a way that they responded using a Likert-type frequency scale, with the following points: 0 – Never happens; 1 – Rarely; 2 – Few times; 3 – Frequently; and 4 – Always. Table 1 presents the 26 items and the dimension to which each belongs.

Table 1 – Cultural capital items

Item	Description	Dimension
IT01	Someone in my household practices some form of painting (paper, canvases, fabric, walls, glass, etc.).	CCE
IT02	Someone in my household practices some form of handicrafts (sewing, carpentry, embroidery, crochet, or others).	CCE
IT03	Someone in my household sings in public settings (family gatherings, church, school, events, etc.).	CCE
IT04	Someone in my household plays a musical instrument.	CCE
IT05	Someone in my household participates in plays, performances, or dramatizations.	CCE
IT06	I talk with family members about what happens in my school.	CCR
IT07	I talk with family members about various subjects (soccer, religion, politics, friends, etc.).	CCR
IT08	I talk with family members about the news on TV.	CCR
IT09	I talk with family members about the Arts (music, literature, painting, sculpture, monuments, movies, etc.).	CCR
IT10	My parents/guardians recommend books for me to read.	CCR
IT11	Someone in my household speaks or studies other languages.	CCE
IT12	Someone in my household travels to other regions of the country.	CCE
IT13	Someone in my household travels to another country.	CCE
IT14	I discuss with my parents/guardians the subjects of the books I read.	CCR
IT15	My parents/guardians monitor my school assignments.	CCR
IT16	My parents/guardians talk to me about my future.	CCR
IT17	My parents/guardians talk to me about my school results.	CCR
IT18	Someone in my household collects something (stamps, old coins, stickers).	CCE
IT19	Someone in my household visits theaters.	CCE
IT20	Someone in my household visits museums.	CCE
IT21	Someone in my household attends musical performances (orchestras, bands, recitals).	CCE
IT22	My parents/guardians talk to me about how to treat people.	CCR
IT23	In my household, we exchange information about current topics.	CCR
IT24	My parents/guardians take what I say seriously (consider my opinion).	CCR
IT25	My parents/guardians guide me on how to make good use of time.	CCR
IT26	My parents dedicate some time to play/games with me.	CCR

Source: Authors' elaboration.

The elaboration of the items composing the instrument was based on various situations that occur in the family environment and are in line with the definition of CCR and CCE proposed by Tramonte and Willms (2010). These items, once developed, were subjected to judges' analysis and presented to the target audience with the aim of collecting content-based validity evidence. After going through this process, being improved at each new stage, the instrument consisted of the 26 items described in Table 1. The instrument was inserted into an assessment of the network composed, in total, of 87 items, distributed as follows: 44 items of knowledge in Portuguese Language and Mathematics, 17 items of Sociodemographic questions, and 26 items of Cultural Capital.

Data Collection Procedure

Data collection took place electronically through a system developed by the network itself. Through a personal login and password, students accessed the virtual environment and completed the assessment, responding to the questionnaire. The assessments were conducted at school, under the supervision of proctors. Students had a minimum of 30 minutes and a maximum of 240 minutes to complete the test. Along with the questionnaire, there was an assent form in which the student could choose whether or not to participate in the research.

Data Analysis

Two specific objectives were established to achieve the general objective, which is the search for evidence of validity based on internal structure. To establish the correct number of factors that the instrument possesses (specific objective 'a'), the Parallel Analysis (PA) method was used, considering its best performance in determining factors to be retained (Damásio, 2012). With PA, we performed *Closeness to Unidimensionality Assessment* procedures that aid in identifying the unidimensionality of the construct, avoiding the incorrect estimation of the model's factor count.

The *Closeness to Unidimensionality Assestment* indicator helps identify whether an instrument is multifactorial. "The idea behind the test is that, sometimes, multifactorial instruments present poorly defined factors that are difficult to reproduce, but that improve fit indices" (Damásio; Dutra, 2017, p. 255, our translation). Three indices help identify signs of unidimensionality: Unidimensional Congruence (UniCo) indicates the proximity to unidimensionality when its value is above 0.95, and Explained Common Variance (ECV)

indicates signs of unidimensionality when its values are greater than 0.85. The third index is the Mean of Item Residual Absolute Loadings (MIREAL), which is a residual measure. In this case, for the instrument to indicate unidimensionality, this index assumes values less than 0.30 (Damásio; Dutra, 2017).

Since the unidimensionality indicators reject the hypothesis of a single factor and parallel analysis confirmed the presence of two factors, we proceeded to other indices in our analysis that could explain how the data behave for the proposed model. In order to test how much the items were correlated with each other, determining each factor (specific objective 'b'), Exploratory Factor Analysis (EFA) was used, which also served to evaluate the quality of the items (Pasquali, 2012). Factor analysis is a statistical technique that works with multivariate analyses, assuming that a series of observed variables can be explained by unobserved variables called factors.

This occurs when these observed variables have something in common, generating intercorrelations among them (Pasquali, 2012). What causes these intercorrelations is the common, unobservable factor. When the aim is to explore a new instrument and how the items behave, Exploratory Factor Analysis (EFA) is used (Damásio; Dutra, 2017). However, before conducting the EFA, it was necessary to check the sample's suitability to the model. For this purpose, the Kaiser-Meyer-Olkin (KMO) test was used, which "measures the amount of shared variance among the items that can be explained by latent factors" (Damásio; Dutra, 2017, p. 254, our translation).

There are several methods for conducting EFA and estimating factorial parameters. The method adopted for conducting EFA in this article was Diagonally Weight Least Square (DWLS) for at least two reasons: 1. This method does not require data to be normally distributed; 2. It is a more recommended method when the data is considered ordinal (Damásio; Dutra, 2017).

Continuing our analysis, we performed a Confirmatory Factor Analysis that we used partially in the Exploratory Factor Analysis. This intermediate approach is known as Partial Confirmatory Factor Analysis (PCFA) (Rogers, 2022). This technique is interesting because it provides some indicators from Confirmatory Factor Analysis useful in model evaluation. We started with this intermediate approach with a residual measure: Root Mean Square Error of Approximation (RMSEA). Regarding residuals, the lower the value found, the better the fit to the model.

We used other indicators to measure how well the proposed model fits the data. The Tucker-Lewis Index (TLI), which can also be known as the Non-Normed Fit Index (NNFI), and the Comparative Fit Index (CFI) were used for this fit evaluation. In this case, since they are fit indicators, the higher the indicator value, the better the model fits the data (Damásio; Dutra, 2017).

We used some procedures to assess the quality of the factor scores generated by the instrument application. To calculate the instrument's reliability, Guttman's Lambda 2 calculation was used (Valentini; Laros; Mose, 2021), as Cronbach's alpha has been used less and less by researchers (Maroco; Garcia-Marques, 2006), receiving criticism for underestimating the reliability of a test score or overestimating reliability when errors are correlated (Bourque *et al*., 2019). We also used the ORION index (Overall Reliability of fully-Informative prior Oblique N-EAP) to calculate the reliability of the total score of all participants on each factor. We also calculated the score determinacy index and the replicability of factor scores through the H-observed index. The latter "indicates how well the set of items represents the common factor" (Rogers, 2022, p. 13, our translation), being the most suitable for ordinal variables.

The AP, EFA, PCFA indices, Closeness to Unidimensionality Assessment procedures, ORION indices, determinacy, and replicability of factor scores were conducted using Factor 12.03.01 software. The Guttman's Lambda 2 reliability coefficient calculation was performed using Statistical Data Analysis Software (SPSS) 28.0.1.0.

Results

Based on the theoretical model proposed by Tramonte and Willms (2010), for which the instrument was constructed, a structure with two factors was expected, namely: CCE and CCR. The AP method was used to estimate the number of factors. Unlike the Kaiser method, which suggests considering all factors with eigenvalues greater than 1.0 (Pasquali, 2012), AP estimates dimensions from a large number of randomly generated samples by comparing the eigenvalues of the real data with those of the sample (Timmerman; Lorenzo-Seva, 2011). The number of eigenvalues generated from the real data that are greater than the eigenvalues generated from random samples represents the number of factors to be retained (Hayton; Allen; Scarpello, 2004). The AP procedure indicated the presence of two factors.

Before proceeding with the EFA, it was necessary to check the sample adequacy index for the proposed model. The KMO value found was 0.88, 95% CI (0.85, 0.88). According to

Pasquali (2012), KMO values from 0.70 to 0.79 are considered fair, from 0.80 to 0.89, meritorious, and above 0.90, superb.

In conducting the EFA, it was decided to analyze the data matrix using polychoric correlation, as a Likert scale should be considered ordinal data (Damásio; Dutra, 2017). The factors showed a correlation of 0.370, 95% CI (0.309, 0.421). It was also chosen to use an oblique rotation, as it facilitates factor interpretation (Seva-Lorenzo; Ferrando, 2006), since with a non-orthogonal rotation, the relationship between the factors becomes more noticeable (Pasquali, 2012) due to the correlation between them (Devellis, 2017).

Table 2 shows the factor loadings with confidence intervals (95%) for each item on the two factors. These loadings are called factor loadings (Pasquali, 2012).

Table 2 – Factor loading with confidence interval (95%) of each item on the two factors

Item	F1		F2	
	Factor loading	**IC 95%**	**Factor loading**	**IC 95%**
IT01	-0,043	(-0,110 0,021)	0,440	(0,369 0,506)
IT02	0,005	(-0,061 0,071)	0,366	(0,292 0,425)
IT03	0,058	(-0,010 0,112)	0,293	(0,227 0,358)
IT04	-0,008	(-0,062 0,044)	0,480	(0,424 0,534)
IT05	0,008	(-0,043 0,076)	0,577	(0,509 0,637)
IT06	0,629	(0,579 0,677)	-0,143	(-0,199 -0,076)
IT07	0,579	(0,528 0,632)	0,053	(-0,009 0,119)
IT08	0,511	(0,457 0,562)	0,078	(0,019 0,143)
IT09	0,375	(0,321 0,427)	0,293	(0,235 0,349)
IT10	0,489	(0,435 0,535)	0,156	(0,096 0,212)
IT11	0,014	(-0,037 0,072)	0,476	(0,419 0,534)
IT12	-0,118	(-0,182 -0,060)	0,522	(0,450 0,577)
IT13	-0,204	(-0,276 -0,150)	0,612	(0,547 0,674)
IT14	0,557	(0,509 0,607)	0,123	(0,059 0,182)
IT15	0,560	(0,512 0,608)	-0,080	(-0,148 -0,021)
IT16	0,685	(0,638 0,724)	-0,074	(-0,128 -0,014)
IT17	0,734	(0,687 0,781)	-0,165	(-0,226 -0,104)
IT18	0,118	(0,054 0,175)	0,332	(0,260 0,386)
IT19	0,076	(0,020 0,127)	0,632	(0,569 0,683)
IT20	0,047	(-0,011 0,096)	0,563	(0,504 0,614)
IT21	0,082	(0,024 0,131)	0,569	(0,519 0,617)
IT22	0,683	(0,634 0,735)	-0,111	(-0,176 -0,054)
IT23	0,602	(0,552 0,655)	0,078	(0,007 0,136)
IT24	0,515	(0,457 0,565)	-0,099	(-0,162 -0,045)
IT25	0,673	(0,627 0,722)	-0,068	(-0,136 -0,019)
IT26	0,489	(0,439 0,540)	0,034	(-0,023 0,092)

Source: Authors' elaboration.

According Hair *et al.* (2009), factor loadings between |0.30| and |0.40| are minimally acceptable. However, the same author recommends that for samples larger than 350 participants, loadings of 0.30 can be considered significant. Thus, only IT03 was removed from the analysis for not meeting the minimum requirement.

Subsequently, IT09 was also removed from the analysis for showing factor loadings on both factors (0.375 and 0.293). Hair *et al.* (2009) recommend eliminating the item from the analysis. Although the loading on one of the factors is not significant, the difference between the loadings is very small (0.082). Therefore, a more parsimonious model was adopted (Pasquali, 2012).

With the elimination of the two items, a new EFA was conducted with 24 items. The KMO retained the same value, and the parallel analysis indicated two factors. The explained variance was 36.24%. Table 3 presents the items with their factor loadings, confidence intervals, and the corresponding factor in the new configuration.

Table 3 - Factor loading, confidence interval, and classification of each item on the factors after the removal of items IT03 and IT09 from the analysis

Item	F1			F2		
	Factor Loading	IC 95%		Factor Loading	IC 95%	
IT01	0,416	(0,349	0,476)			
IT02	0,354	(0,290	0,424)			
IT04	0,433	(0,374	0,492)			
IT05	0,537	(0,471	0,601)			
IT06				0,610	(0,555	0,656)
IT07				0,568	(0,512	0,620)
IT08				0,506	(0,450	0,557)
IT10				0,483	(0,430	0,533)
IT11	0,486	(0,430	0,545)			
IT12	0,557	(0,491	0,612)			
IT13	0,654	(0,581	0,713)			
IT14				0,546	(0,492	0,592)
IT15				0,557	(0,504	0,601)
IT16				0,684	(0,636	0,721)
IT17				0,734	(0,684	0,775)
IT18	0,338	(0,285	0,401)			
IT19	0,636	(0,589	0,689)			
IT20	0,568	(0,514	0,623)			
IT21	0,553	(0,494	0,606)			
IT22				0,678	(0,623	0,721)
IT23				0,598	(0,552	0,646)
IT24				0,508	(0,459	0,564)

IT25	0,666	(0,626	0,714)
IT26	0,478	(0,427	0,532)

Source: Authors' elaboration.
F1 = CCE: Static Cultural Capital; F2 = CCR: Relational Cultural Capital; Loadings below 0.3 were not presented.

Although the AP already indicated the presence of two factors, we conducted a new analysis aiming to verify the unidimensionality of the construct. The Cultural Capital Scale, the focus of this study, presented the following indices: UniCo = 0.787, 95% CI (0.738 - 0.825); ECV = 0.669, 95% CI (0.646 - 0.691); and MIREAL = 0.318, 95% CI (0.307 - 0.333). The reference values for unidimensionality are as follows: UniCo > 0.95, ECV > 0.85, and MIREAL < 0.30 (Damásio; Dutra, 2017).

The AFCP presented the following residual index: RMSEA was 0.053, 95% CI (0.0498 - 0.0534), therefore within the recommended parameters. The fit indices also showed good indicators: TLI = 0.935, 95% CI (0.926 - 0.927), and CFI = 0.946, 95% CI (0.940 - 0.956). The literature recommends that the fit indices should compute at least 0.90 or be above 0.95 (Hair *et al.,* 2009; Damásio; Dutra, 2017). In this case, the fit values are within acceptable limits.

To calculate the reliability of the instrument, we used Guttman's Lambda 2 calculation (Valentini; Laros; Mose, 2021). The 11 items from the CCE factor recorded a Lambda 2 value of 0.702, and the 13 items from the CCR factor recorded a Lambda 2 value of 0.845. We also used the ORION index to calculate the reliability of the total score of all participants in each factor. Again, the CCR factor presented a higher index (0.883) than the CCE factor (0.820). Another index that evaluates factor scores is the Factor Determinacy Index, "which estimates whether factor scores can be good indicators of the latent factor" (Damásio; Dutra, 2017, p. 258, our translation). The minimum expected value for each factor is above 0.80. The CCE factor obtained 0.906, and the CCR obtained 0.940.

We also calculated the factor replicability indicator using the H-observed index. The metric for interpreting the H-Observed is that values above 0.80 are considered acceptable (Damásio; Dutra, 2017). The CCE factor achieved a value of 0.791, 95% CI (0.779 - 0.810), slightly below the acceptable threshold, which, if reduced to one decimal place, would be within the acceptable range. On the other hand, the CCR factor, with a value of 0.864, 95% CI (0.856 - 0.875), is above the acceptable threshold.

Discussion

The general aim of this article was to obtain evidence of validity based on the internal structure for the Scale of Cultural Capital in Family Interactions developed by the author. We decomposed the general aim into two specific objectives, which were to verify the factorial structure of the scale of cultural capital in family interactions and to obtain estimates of factor reliability.

A version replaced the version with 26 items of the instrument with 24 items, as two items were eliminated. Item 3 was eliminated due to its low factor loading, while item 9 exhibited cross-loaded factor loadings. Even after eliminating these two items, the parallel analysis indicated the presence of two factors. The items are grouped into factors exactly according to the theory. To perform the Closeness to Unidimensionality Assessment procedure, we used three indicators, namely: UniCo, ECV, and MIREAL, which rejected the hypothesis of the instrument being unidimensional.

In addition to the EFA, we used adjustments of an AFCP model (Rogers, 2022), which contributed to verifying whether the internal structure of the instrument was adequate. We calculated the RMSEA, which indicated a low level of residual, as well as the TLI and CFI indices. All these indicators pointed to a good fit of the model.

The calculation of Guttman's Lambda 2 indicated that the factors exhibit adequate internal consistency. We also calculated the ORION index to measure the reliability of the total score of the participants and the factor determinacy index to verify if the factor scores are good estimators of the latent factor. In all cases, the results were acceptable, with the CCR factor showing better performance compared to the CCE factor.

Finally, we calculated the replicability index through the H-observed index of the factors. Once again, the CCR factor showed the best performance.

Conclusion

This study, aimed at finding evidence of validity based on the internal structure of the instrument developed to measure Cultural Capital in Family Interactions, succeeded in its purpose. Although two items were eliminated from the instrument, the remaining items exhibited satisfactory psychometric behavior. The 24 items were grouped according to the theoretical model proposed by Tramonte and Willms (2010) and presented indices that provide confidence for the use of the instrument in the research context. Thus, the final version comprised 13 items belonging to the CCR factor and 11 items belonging to the CCE factor.

Based on all the indicators mentioned in the Results section, we understand that we have sufficient evidence of validity for the use of the instrument in its purpose of measuring cultural capital acquired in interactions within the family environment in its two dimensions: CCR and CCE. The relational dimension (CCR) is directly linked to the state of cultural capital in the incorporated state, while the static dimension (CCE) is associated with cultural capital in the objectified state.

For future studies, we recommend that new items be added to the two factors to cover the spectrum of the construct more broadly, increasing the portion of explained variance. A review of the items in the CCE factor may improve the replicability of the instrument.

The next step in this sequence of studies is to verify if there is an impact of the cultural capital obtained from family interactions on students' academic performance. It will also be interesting to see if there are differences in cultural capital among schools and if this impacts students attending these educational institutions.

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