

Parental behavior as a risk factor for eating disorders: Development of a measurement instrument

El comportamiento de los padres como factor de riesgo de los trastornos alimentarios: Desarrollo de un instrumento de medida

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Abstract

Eating disorders (ED) are complex conditions influenced by psychological, biological, and sociocultural factors, with parental influence playing a key role in their onset and maintenance. However, no specific instruments assess how parental behaviors may act as risk factors for the development of ED. This study aimed to design and validate an instrument to measure these behaviors from the adolescents' perspective. An instrumental study was conducted with a sample of 300 high school students to whom the initial version of the instrument was administered. Content validity was evaluated using Aiken's V, which allowed the selection of 14 items with adequate coherence, representativeness, and clarity. Exploratory Factor Analysis (EFA) and Exploratory Graph Analysis (EGA) were performed to determine the structure of the instrument. The results indicated a unidimensional model with factor loadings greater than 0.50 for each item. Adequate reliability ($\alpha = .90$; $\omega = .90$) and 100% stability in network resampling were achieved. These findings confirm that the instrument is valid and reliable for assessing parental influence on EDs. Its application may contribute to the early detection of risk factors and facilitate the development of prevention and intervention strategies in clinical and educational contexts. As a limitation, a possible floor effect was identified in the responses, and the convergent validity of the instrument was not evaluated, suggesting the need for further studies.

Keywords: Eating disorders; Risk factor; Psychometric assessment; Body image; Teenagers.

Resumen

Los trastornos de la conducta alimentaria (TCA) son enfermedades complejas en las que influyen factores psicológicos, biológicos y socioculturales, y la influencia de los padres desempeña un papel clave en su aparición y mantenimiento. Sin embargo, no existen instrumentos específicos que evalúen cómo las conductas parentales pueden actuar como factores de riesgo para el desarrollo de los TCA. El objetivo de este estudio fue diseñar y validar un instrumento para medir estas conductas desde la perspectiva de los adolescentes. Se realizó un estudio instrumental con una muestra de 300 estudiantes de secundaria a los que se administró la versión inicial del instrumento. La validez de contenido se evaluó mediante la V de Aiken, que permitió seleccionar 14 ítems con adecuada coherencia, representatividad y claridad. Se realizaron análisis factoriales exploratorios (AFE) y análisis gráficos exploratorios (EGA) para determinar la estructura del instrumento. Los resultados indicaron un modelo unidimensional con cargas factoriales superiores a 0,50 para cada ítem. Se alcanzó una fiabilidad adecuada ($\alpha = .90$; $\omega = .90$) y una estabilidad del 100% en el remuestreo de redes. Estos resultados confirman que el instrumento es válido y fiable para evaluar la influencia de los padres en los TCA. Su aplicación puede contribuir a la detección precoz de factores de riesgo y facilitar el desarrollo de estrategias de prevención e intervención en contextos clínicos y educativos. Como limitación, se identificó un posible efecto suelo en las respuestas y no se evaluó la validez convergente del instrumento, lo que sugiere la necesidad de estudios complementarios.

Palabras clave: Trastornos alimentarios; Factor de riesgo; Evaluación psicométrica; Imagen corporal; Adolescentes.

INTRODUCTION

Eating disorders (EDs) are psychiatric illnesses whose incidence has increased significantly in recent decades, affecting populations in various regions of the world. EDs tend to manifest most frequently during adolescence, particularly in women, and are closely related to factors such as low self-esteem, depression, and anxiety. Studies have found that the prevalence of EDs in adolescents is significantly higher in women than in men and is associated with high levels of psychological distress and concerns about body image (D'Anna et al., 2022). In addition, recent research has documented a decrease in the age of onset of these disorders, reflecting a worrying trend of earlier onset and greater persistence into adulthood (Brown et al., 2020). This increase in prevalence has led some researchers to describe the phenomenon as an epidemic problem, especially in industrialized societies where sociocultural pressure surrounding body image and thinness continues to intensify (Signorelli, 2022).

At the global level, the prevalence of eating disorders (EDs) shows a heterogeneous distribution across regions. In Europe, anorexia nervosa (AN) affects between 1% and 4% of women and between 0.3% and 0.7% of men, while bulimia nervosa (BN) ranges from 1% to 2%, and binge eating disorder (BED) from 1% to 4%. In Asia, China reports rates of AN, BN, and BED of 1.05%, 2.98%, and 3.58%, respectively, while in Africa, AN is less than 0.1%, BN reaches 0.87%, and BED 4.45%. In Latin America, where studies predominantly focus on young women between the ages of 17 and 19, the prevalence of AN is 0.1%, BN 1.16%, and BED 3.53%. In the United States, the prevalence of EDs is higher, reaching 4.6%, while in Europe it is the lowest, at 2.2% (Arija Val et al., 2022). Furthermore, adolescence is a critical stage in the formation of identity and self-image, which increases concern about weight and body shape, key risk factors in the development of EDs. In this age group, it is estimated that 5.7% of adolescent girls and 1.2% of adolescent boys between the ages of 11 and 19 have an eating disorder, although only 20% receive treatment, highlighting a significant gap in access to specialized care (López-Gil et al., 2023). These figures reflect the magnitude of the problem and highlight the need to continue researching its sociocultural determinants, as

well as to strengthen prevention strategies and access to timely diagnosis and treatment, especially in vulnerable populations.

A multitude of triggering factors influence eating disorders, including sociocultural, family, and psychological factors. The role of social media and the media in spreading unrealistic beauty standards is particularly important, as it promotes a culture of continuous peer evaluation and causes dissatisfaction with one's physical appearance. Exposure to content that promotes standards of extreme thinness on digital platforms could increase the likelihood of eating disorders, particularly in adolescents and young adults (Arjona et al., 2024). In addition to the impact of the media, the family environment plays a decisive role in the origin and perpetuation of EDs. Derogatory comments about weight, pressure to change body shape, restrictive diets, and excessive monitoring of food intake can cause anxiety and reinforce disordered eating behaviors (Carvalho and Ferreira, 2020). Furthermore, a lack of emotional support and constant criticism from parents can lead to family conflicts, thereby increasing vulnerability to these disorders (Makki et al., 2023). Consequently, this situation contributes to the symptoms of EDs remaining hidden, hindering early detection and delaying access to appropriate treatment.

Parents play a fundamental role in shaping their children's eating habits, as patterns established at an early age can influence their relationship with food throughout their lives. During adolescence, a period of heightened emotional vulnerability and identity formation, parents' comments and behaviors can directly influence young people's body image and eating habits. Research has identified a link between parenting styles and the development of EDs, especially when adolescents are exposed to authoritarian or permissive parenting styles, they are more predisposed to developing EDs, either due to strict supervision of their eating or a lack of limits and structure in their eating habits (Hampshire et al., 2022). A family environment that places too much emphasis on body image as a measure of social success can contribute to the development of dysfunctional relationships with food. Derogatory comments about weight and pressure to change body shape or excessive control of diet can cause anxiety and promote body dissatisfaction, both of which are linked to the onset of EDs (Peleg et al., 2021). In this regard,

studies have shown that exposure to parental role models who practice restrictive diets or show excessive concern about food influences the adoption of unhealthy eating habits in adolescents, increasing the risk of developing disordered eating behaviors (Kontele et al., 2023). Furthermore, the relationship between parenting styles and adolescent mental health is a crucial aspect in understanding EDs. It has been shown that authoritarian parenting, characterized by strict control and low emotional sensitivity, may be associated with higher levels of anxiety, depression, and low self-esteem, factors that increase vulnerability to EDs (Kohli, 2023).

For all these reasons, it is essential to approach EDs from a psychological perspective in order to understand the associated risk factors, including the impact of the family environment. Negative comments about weight, aesthetic pressure, and excessive control of eating could increase adolescents' susceptibility to eating disorders. Several tools have been developed to assess EDs, such as the Eating Attitudes Test (EAT-40; Garner & Garfinkel, 1979), the Eating Disorders Inventory (EDI; Garner et al., 1983), the Questionnaire on Influences on Body Image (QIBI; Toro et al., 1994), the SCOFF test (Morgan, 2000), the Brief Questionnaire on Risky Eating Behaviors (Unikel-Santoncini et al., 2004), and the Binge Eating Disorder Scale (BEDS; Arauco-Lozada et al., 2024), all of which have been widely validated for the detection of symptoms and attitudes related to eating behavior. There are also instruments designed to assess parental perception, such as the Parent Eating Disorder Examination Questionnaire (Drury et al., 2023), which gathers caregivers' views on their children's eating habits and attitudes. However, these measures do not specifically and directly capture the frequency and impact of potentially harmful parenting behaviors from the adolescent's perspective, leaving a gap in the objective assessment of this risk factor. The absence of tools with this approach limits the early detection of dysfunctional family patterns and hinders the implementation of preventive interventions adapted to the family context. In this sense, the development of instruments focused on the objective measurement of risky parenting behaviors represents a significant incremental contribution, as it would allow for the design of more effective and culturally relevant prevention and intervention strategies, improving outcomes at both the individual and community levels.

The development and validation of these advanced measures must adhere to a rigorous process that employs effective methods supported by psychometric theories. Their validation requires the application of multiple methodological approaches to ensure accuracy and applicability across diverse studies. Exploratory Factor Analysis (EFA) and Exploratory Graph Analysis (EGA) are complementary techniques that allow the dimensional structure of an instrument to be evaluated from different perspectives. EFA is widely used to identify latent factors, ensuring that items are grouped consistently with the theoretical constructs they aim to measure (Lloret-Segura et al., 2014). The EGA is an emerging technique within network psychometrics that allows the number of dimensions to be determined and the interrelationships among items and their organization into factors to be visualized (Golino et al., 2018). Scientific evidence has indicated that the EGA is comparable to and even superior to traditional methods for identifying complex dimensions (Golino and Epskamp, 2017). The integration of EFA and EGA in the validation of an instrument not only strengthens its psychometric foundation but also improves its versatility for studies that employ methodologies specific to each approach, allowing for a more robust and comprehensive interpretation of the data.

In light of this problem, the present study set out to: (a) design an instrument to assess the role of parental behaviors as a possible factor involved in the onset of EDs; (b) explore the factorial structure of the instrument using Exploratory Factor Analysis (EFA) and Exploratory Graphical Analysis (EGA); and (c) report the reliability and stability of the network as measures to evaluate the consistency of the instrument.

MATERIAL AND METHOD

Design

The study was an instrumental design (Ato et al., 2013) because its purpose was to design an instrument to analyze parenting behaviors as a risk factor in the onset of eating disorders.

Participants

To obtain the sample size, Soper's free calculator (2021) was used, setting an effect size of 0.2, a statistical power of 0.8, and a significant-

ce level of 0.05. Considering the applied version of the instrument, three latent variables and 17 observed variables were included to determine the minimum sample size of 296 participants. All participants had to meet criteria to be included, such as (a) being enrolled in the educational institution, (b) being between 13 and 17 years of age, (c) being Peruvian nationals, and (d) having the informed consent and authorization of their parents or guardians. Those who (a) had a cognitive or sensory condition that hindered their understanding of the items, (b) did not complete the questionnaire in its entirety, and (c) did not have parental permission were excluded. On the other hand, the recruitment process was carried out using non-probabilistic convenience sampling. The authorities of the educational institution were contacted, who facilitated access to the institution and classrooms. The instrument was administered in person during school hours and in classrooms. Confidentiality and voluntary participation were guaranteed.

Three hundred secondary school students aged between 13 and 17 years old ($M = 14.8$, $SD = 1.01$) participated in the study (see Table 1). In terms of age distribution, 8.3% of participants were 13, 31.3% were 14, 35.3% were 15, 20.0% were 16, and 5.0% were 17 years old. In terms of school year, 10.3% were in the second year, 35.7% in the third year, 30.7% in the fourth year, and 23.3% in the fifth year. In terms of family context, 25.7% of participants indicated that their parents were separated, 29.7% that they lived together, 43.0% that they were married, and 1.7% that one parent was widowed. In terms of living arrangements, 70.3% of students lived with both parents and 29.7% with only one parent.

Table 1
Sociodemographic variables

Variables	Data
Age	14.8 $\pm$ 1.01
13 years old	25 (8.4%)
14 years old	94 (31.3%)
15 years old	106 (35.3%)
16 years old	60 (20.0%)
17 years old	15 (5.0%)
High school grade	
Second	31 (10.3%)
Third	107 (35.7%)

Fourth	92 (30.7%)
Fifth	70 (23.3%)
Parents' Marital status	
Separated	77 (25.7%)
Cohabitants	89 (29.7%)
Married	129 (43.0%)
Widow(er)	5 (1.6%)
Live with	
Both parents	211 (70.3%)
Only one parent	89 (29.7%)

Instruments

The Parental Risk Behaviors in Eating Disorders Scale (PRBEDS) was designed to assess parental behaviors that may influence the development of dysfunctional thinking patterns about body image and eating disorders in adolescents. The item generation process began with a comprehensive review of the scientific literature on family risk factors associated with EDs, identifying repeatedly reported behaviors such as sarcastic comments, insults, jokes, comparisons, negative reactions, and harassment related to body image and eating habits. Based on this evidence, an initial bank of statements was developed and discussed and refined through consensus among experts in clinical psychology, psychometrics, and nutrition, prioritizing semantic clarity, clinical relevance, and cultural appropriateness. The initial version of the instrument consisted of 17 items meticulously formulated to assess the frequency and impact of these behaviors from the adolescent's perspective. Responses are structured on a 5-point Likert scale, where 1 represents "totally disagree" and 5 represents "totally agree."

Data analysis

Initially, three expert judges, all psychologists with professional and academic experience in areas related to the subject of study: a specialist in cognitive-behavioral therapy, a specialist in eating disorders, and a specialist in health psychology. Each judge provided their assessment based on criteria of relevance, representativeness, and clarity, which allowed for the analysis of Aiken's V and its confidence intervals. This analysis was performed using the automated program developed by Ventura-León et al (2024), which allows for efficient evaluation of items based on three fundamental criteria:

relevance, representativeness, and clarity. Items with values above 0.70 were considered valid.

Subsequent analyses were performed in R Studio (version 4.4.2). First, descriptive analyses were performed to calculate the response rate, mean, standard deviation, skewness, and kurtosis for each item. Univariate normality was assessed using the criteria ± 3 for asymmetry and ± 7 for kurtosis (Finney & DiStefano, 2013). Since the responses were ordinal in nature, the polychoric correlation matrix was calculated. The correlation coefficients were interpreted according to Cohen's (1988) recommendations, considering values between 0.0 and 0.1 as null, between 0.1 and 0.3 as weak, between 0.3 and 0.5 as moderate, and greater than 0.5 as strong.

The Exploratory Factor Analysis (EFA) and the Exploratory Graph Analysis (EGA) were used to analyze the factorial structure. In EFA, data adequacy was assessed using the Kaiser-Meyer-Olkin (KMO) index, considering values above 0.70 as adequate (Lloret-Segura et al., 2014). Bartlett's sphericity test was also performed, and a p -value < 0.05 was expected. The number of factors to be extracted was determined using parallel analysis. Since the items were measured on an ordinal Likert scale, the weighted least squares (WLS) estimator was used, which is recommended for categorical data as it provides robust and unbiased estimates in the presence of ordinal scales, especially when the assumption of normality is not met, as in the case of floor and ceiling effects (Flora & Curran, 2004). The oblimin method (oblique rotation) was used for rotation. Items with factor loadings below 0.50 were eliminated due to their low representativeness in the structure of the instrument (Costello and Osborne, 2005). The reliability of the instrument was assessed using alpha and omega coefficients, with values above 0.70 indicating acceptable internal consistency.

The EGA was used as a complementary method to corroborate the structure of the instrument and provide a more detailed visualization of the interrelationships among the items. This technique, developed by Golino & Epskamp (2017), has proven effective in identifying factors and patterns of association. The GLASSO Gaussian model was used in conjunction with the Louvain algorithm, recognized for its effectiveness in community detection (Christensen, 2020). The bootEGA method was also used with resampling of 2,500 cases to assess the stability of the

factor structure. The structural consistency and stability of the items were analyzed considering a minimum threshold of 75%, ensuring that the identified dimensions were replicable across different samples (Christensen & Golino, 2021).

Ethical aspects

The research was approved by the Ethics Committee of the University of Sciences and Humanities (Acta N° 019; Código-040-24), including the review and approval of the informed consent forms for parents or guardians and informed assent forms for adolescents. For data collection, prior authorization was obtained from three educational institutions through a letter of introduction issued by the university. Once the study was authorized, informed consent was given to parents or guardians, and informed assent was subsequently requested from the students. The instrument was administered in the form of a physical survey, preceded by a detailed explanation of the study's purposes, the voluntary nature of participation, and the researchers' contact details. The confidentiality and anonymity of responses were guaranteed. Data collection took place in May 2024.

RESULTS

Content validity

The content validity analysis revealed that three of the initial 17 items did not achieve satisfactory Aiken V scores in at least two of the criteria evaluated: relevance, representativeness, and clarity (see supplementary materials). These items scored below 0.70, indicating insufficient content validity. Consequently, these items were removed from the instrument. The remaining 14 items demonstrated adequate content validity and met the established criteria for all aspects evaluated. The final instrument consisted of 14 items, ensuring consistency and accuracy in the measurement of risky parenting behaviors.

Descriptive analysis of the items

The results indicated a floor effect in most items, with a high concentration of responses in the lowest category (Table 2). On the other hand, univariate normality, assessed by the coefficients of asymmetry and kurtosis, was within the acceptable range for all items. Response percentages were grouped at the lower value, demons-

trating a floor effect (>25%), which suggests that many behaviors do not occur frequently in adolescents. The correlations among items showed variability, with associations ranging from none to strong (see supplementary material). These associations indicate that the instrument is sui-

table for structural analyses. Corrected homogeneity indices ranged from .16 to .74, with most items achieving values above .40. These results indicate adequate internal consistency of the scale, although some items with lower values may require revision.

Table 2
Descriptive statistics of items

Items	Response rate					M	SD	g ₁	g ₂	IHC
	1	2	3	4	5					
pb1	62.3%	19.7%	15.3%	2.0%	0.7%	1.59	.87	1.32	1.01	.64
pb2	62.0%	18.6%	13.7%	3.7%	2.0%	1.65	.98	1.48	1.52	.51
pb3	71.4%	17.0%	9.3%	2.0%	0.3%	1.43	.77	1.81	2.74	.71
pb4	64.0%	18.0%	12.3%	4.0%	1.7%	1.61	.96	1.55	1.70	.68
pb5	70.7%	13.0%	12.0%	2.6%	1.7%	1.52	.92	1.81	2.65	.69
pb6	72.3%	17.7%	7.7%	1.3%	1.0%	1.41	.77	2.14	4.83	.61
pb7	53.3%	28.0%	15.1%	3.3%	0.3%	1.69	.87	1.06	0.34	.36
pb8	39.0%	28.0%	24.6%	5.7%	2.7%	2.05	1.05	.74	-.12	.43
pb9	30.0%	47.0%	21.0%	1.7%	0.3%	1.95	.78	.46	-.07	.17
pb10	24.7%	36.3%	32.0%	5.0%	2.0%	2.23	.95	.44	-.08	.16
pb11	61.7%	19.7%	12.0%	5.0%	1.6%	1.65	.98	1.47	1.38	.74
pb12	61.0%	16.0%	17.7%	2.3%	3.0%	1.70	1.03	1.40	1.27	.66
pb13	58.0%	23.7%	13.0%	2.0%	3.3%	1.69	1.00	1.57	2.12	.43
pb14	73.0%	15.0%	7.4%	2.3%	2.3%	1.46	.90	2.21	4.62	.52

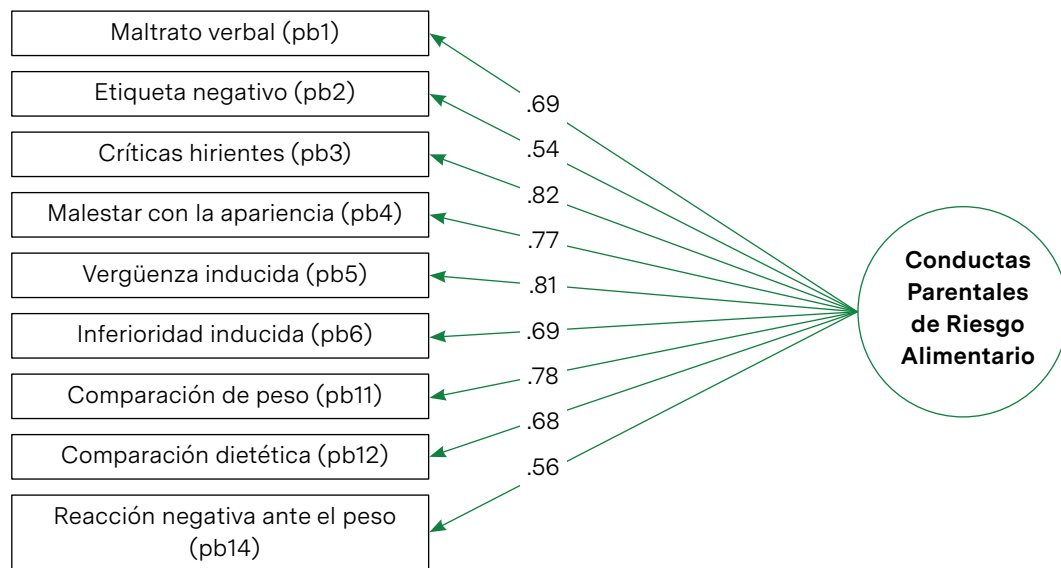
Note. M = mean, SD = standard deviation; g₁ = skewness; g₂ = kurtosis

Exploratory Factor Analysis

The initial analysis confirmed the suitability of the correlation matrix for Exploratory Factor Analysis (EFA) with a KMO index of 0.91 ($p < 0.05$). A two-factor model was identified when applying EFA to 14 items. However, when a cutoff point of 0.50 was established for factor loadings, the second factor included only one item, while four items did not have stable factor loadings. The variance explained by the initial model was 40.6%. Based on these results, a second analysis

was performed, excluding the problematic items. A unidimensional model with nine items was obtained, explaining 50.5% of the total variance. This model demonstrated adequate internal consistency, with coefficients of α (.90 [.87-.92]) and ω (.90 [.88-.92]). In addition, all factor loadings were greater than 0.50, indicating the representativeness of the items in relation to their latent factors (Figure 1). The final measure can be found in Appendix A.

Figure 1
Exploratory Factor Analysis

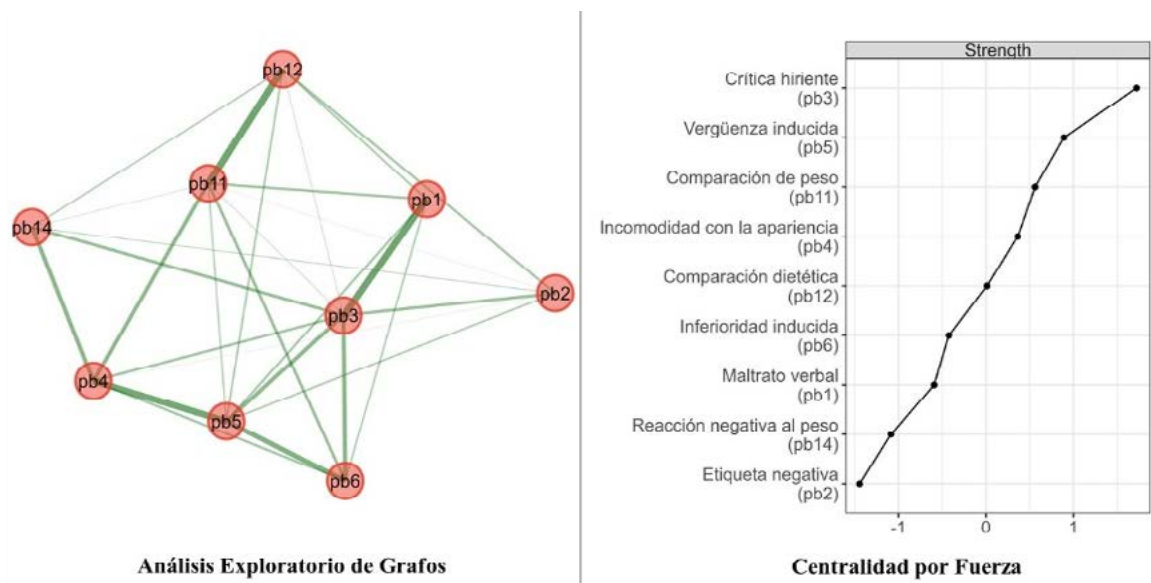


Exploratory Analysis of Graphs

As shown in Figure 2, the algorithm identified a single dimension related to parental risk behaviors in the development of unsafe eating behaviors. This finding was validated by bootstrapping analysis, which confirmed the reliability of the unidimensional model and aligned with the EFA results. Furthermore, in 100% of the resamples, the number of dimensions extracted was consistently one, and all items

were grouped within the same dimension in each simulation. These results indicate a high degree of structural consistency, demonstrating that the composition of the instrument remained stable across different resamples. The centrality analysis indicated that hurtful criticism (pb3) and induced shame (pb5) function as primary nodes within the network, suggesting that they play a key role in the perception of parental behaviors associated with eating difficulties.

Figure 2
Exploratory Analysis of Graphs and Centrality



DISCUSSION

The current psychological assessment models emphasize the importance of developing instruments that accurately measure risk factors for mental health and human behavior. The study of EDs is particularly important due to its implications for public health and the influence of multiple etiological factors, including the role of parents (Gruber et al., 2020). However, previous studies have addressed this issue mainly through self-report instruments to measure the presence of EDs in the person being assessed or through parents' perceptions of their children's eating habits (Drury et al., 2023). This approach is limited, as it does not allow for accurate determination of whether parental behaviors act as a risk factor in the onset of EDs. Therefore, this study aimed to design and validate an instrument that specifically assesses these behaviors. The instrument was developed using advanced factorial analysis and psychometric network methods to ensure its accuracy and applicability in future research.

The instrument was initially evaluated by a panel of judges with experience in eating disorders and human behavior. Content validity is a fundamental process that ensures that items meet the necessary criteria for accurate measurement of the construct (Almanasreh et al., 2019; Beck & Gable, 2001). In this regard, the PRBEDS demonstrated items with adequate values for Aiken's V, a statistical coefficient that determines the relevance, consistency, and clarity of each item with respect to the measured construct (Aiken, 1980). The results indicated that 14 items met the established criteria, ensuring their relevance within the scale. Previous studies have emphasized that content validation by expert judges is critical in the construction of psychometric instruments. This is because it allows for the refinement and optimization of items before their large-scale application, thus improving the validity and reliability of the measure (Fernández-Gómez et al., 2020).

The evidence of the structural validity of the PRBEDS was evaluated using two complementary approaches, with the aim of ensuring its applicability in psychological practice and in research using different assessment methodologies. First, Exploratory Factor Analysis (EFA) was used to identify a unidimensional structure, which was determined

to be more appropriate than a two-factor model, as it explained a higher percentage of the total variance. The unidimensional model demonstrated optimal factor loadings, supporting the representativeness of the items in measuring the constructs. In terms of reliability, the model obtained a coefficient greater than .90, indicating stability and consistency in measurement. These results indicate that the test items are capable of measuring the same construct and can be reliably applied to similar populations (Revicki, 2014).

On the other hand, the Exploratory Graph Analysis (EGA) allows the structure of the instrument to be examined from a psychometric network perspective, facilitating the analysis of item connectivity (Golino & Epskamp, 2017). As in the EFA, a unidimensional model was identified as the most appropriate. To assess the replicability of the network model, 2,500 iterations were resampled, resulting in a single dimension that grouped the nine items of the instrument in all cases. This process is critical in psychometric networks because it allows us to estimate the robustness of item centrality and model stability (Epskamp et al., 2018). These findings underscore the structural validity of the PRBEDS and its effectiveness as a reliable instrument for assessing risky parenting behaviors in the development of eating disorders.

The adoption of a unidimensional model offers notable methodological advantages, including greater interpretability of the construct and greater reliability of the instrument. Research has shown that unidimensional models are more replicable and robust in psychometric contexts, facilitating their application in future studies (Hair et al., 2019). Focusing on a single dimension avoids fragmentation of the construct and ensures a more accurate assessment of the relationship between the items and the underlying factor, thus improving measurement consistency.

Furthermore, the study findings indicated that the items with the highest factor loading and centrality were hurtful criticism (pb3), induced shame (pb4), weight comparison (pb5), and discomfort with appearance (pb11), suggesting that these parenting behaviors play a central role in the development of risk patterns for eating disorders. Research has shown that negative comments from families are associated with eating disorders in young

men and women, contributing to negative self-criticism that exacerbates problematic eating behaviors (Eisenberg et al., 2012; Londoño-Pérez & Moreno Ruge, 2017; Zelkowitz & Cole, 2020). Shame induced by parents has also been identified as a significant risk factor influencing the development of eating disorders caused by body dissatisfaction and impaired self-esteem (Cella et al., 2020; Iannaccone et al., 2016). Conversely, weight comparison has been shown to be a key predictor of EDs. Adolescents who are persistently concerned about their weight face a substantially higher risk of developing these disorders than those who do not share this concern (Killen et al., 1996). Parents' perceptions of their children's weight, especially when they consider them to be overweight, have also been identified as a stronger predictor of the development of EDs than the actual body weight of adolescents (Allen et al., 2009). Finally, parental dissatisfaction with their children's physical appearance is a relevant indicator. It has been found that families who emphasize physical attractiveness and social appearance increase the risk of children developing anxiety and dysfunctional eating behaviors (Dahill et al., 2021; Davis et al., 2004; Kluck, 2010). These findings underscore the importance of assessing the impact of parental attitudes and comments on body image and eating behaviors to prevent the development of EDs in vulnerable populations.

These results underscore the importance of incorporating family dynamics as a fundamental factor in the development and perpetuation of EDs, thus providing a reliable tool for their early identification. The results have implications for research and clinical and educational practices. This tool can be used in epidemiological studies, mental health environment assessments, and prevention programs for families and adolescents. However, future research should expand the sample and evaluate the tool's consistency in different cultural contexts, as well as its predictive capacity in relation to the onset of EDs. In this regard, the present study represents a significant advance in the assessment of family factors associated with EDs, underscoring the need to continue exploring prevention and early intervention strategies to address this pressing public health issue.

Although this study makes a significant contribution to this field, it is important to take into account the existing limitations when interpreting the results. To begin with, the number

of expert judges for content validation was small. Therefore, a larger number of evaluators would have strengthened the process. Another limitation was that although the sample included 300 high school students, increasing the sample size would allow for more accurate estimates and improve the generalizability of the results. Given the exclusive focus on adolescents, it is advisable to evaluate the applicability of the instrument to other populations. Likewise, the gender of the participants was not recorded due to an unintentional error in the distribution of the form, which prevented the analysis of possible differences between groups such as invariance. Another limitation was not exploring convergent and discriminant validity against existing instruments that measure related constructs. This omission limits the interpretation of the degree to which the PRBEDS captures a specific and distinct domain within the spectrum of risk factors for eating disorders. The lack of Item Response Theory (IRT) analysis prevents a more accurate understanding of how the items function, their discriminatory capacity across the construct continuum, and the location of response thresholds, which would be particularly useful for refining or eliminating items that contribute to the floor effect. Taken together, these limitations indicate that, although the instrument shows a solid factor structure and high reliability, its validity still requires a broader empirical consolidation process.

It is recommended that future research continue the study of the PRBEDS by: (a) collecting data on gender and other relevant sociodemographic variables to perform configural, metric, and scalar invariance tests; (b) analyzing convergent and discriminant validity with measures already established in the field, as well as evaluating predictive validity in longitudinal studies that allow for estimating the instrument's ability to anticipate the onset of risky eating behaviors; (c) applying IRT models to identify items with low discrimination or poorly distributed thresholds and reduce the floor effect; and (d) exploring cut-off points and norms that facilitate the clinical and educational interpretation of scores. This plan will strengthen the psychometric soundness of the PRBEDS and maximize its potential as a preventive and intervention tool in school, community, and clinical settings.

CONCLUSIONS

This study allowed for the creation and validation of a specialized instrument to assess risky parenting behaviors in the development of eating disorders (EDs). Through a rigorous process of content validation, exploratory factor analysis (EFA), and exploratory graph analysis (EGA), the unidimensional structure of the instrument was determined, as well as the stability and relevance of its items in measuring the construct. The adoption of a unidimensional model offers several advantages, such as greater interpretability of the phenomenon, avoidance of construct fragmentation, and a more accurate assessment of the relationship between items and underlying factors.

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LGT: Conceptualization, Data preservation, Research, Writing—original draft.

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DRC: Conceptualization, Data preservation, Research, Writing—original draft.

DYL: Research, Methodology, Formal analysis, Software, Supervision, Validation, Writing—original draft, Writing—review and editing.

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REFERENCES

- Aiken, L. R. (1980). Content Validity and Reliability of Single Items or Questionnaires. *Educational and Psychological Measurement*, 40(4), 955–959. <https://doi.org/10.1177/001316448004000419>
- Allen, K. L., Byrne, S. M., Forbes, D., & Oddy, W. H. (2009). Risk Factors for Full- and Partial-Syndrome Early Adolescent Eating Disorders: A Population-Based Pregnancy Cohort Study. *Journal of the American Academy of Child & Adolescent Psychiatry*, 48(8), 800–809. <https://doi.org/10.1097/CHI.0b013e3181a8136d>
- Almanasreh, E., Moles, R., & Chen, T. F. (2019). Evaluation of methods used for estimating content validity. *Research in Social and Administrative Pharmacy*, 15(2), 214–221. <https://doi.org/10.1016/j.sapharm.2018.03.066>
- Ato, M., López, J. J., & Benavente, A. (2013). Un sistema de clasificación de los diseños de investigación en psicología. *Anales de Psicología*, 29(3), 1038–1059. <https://doi.org/10.6018/analesps.29.3.178511>
- Arauco-Lozada, T., Yupanqui-Lorenzo, D. E., & Ottiniano-Malaga, T. (2024). Development and Validation of the Binge Eating Disorder Scale (BEDS). *Nutrición Clínica y Dietética Hospitalaria*, 44(2). <https://doi.org/10.12873/442arauco>
- Arija Val, V., Santi Cano, M. J., Novalbos Ruiz, J. P., Canals, J., & Rodríguez Martín, A. (2022). Characterization, epidemiology and trends of eating disorders. *Nutrición Hospitalaria*. <https://doi.org/10.20960/nh.04173>
- Arjona, Á., Monserrat, M., & Checa, J. C. (2024). Use of Social Media, Satisfaction with Body Image, and the Risk of Manifesting Eating Disorders. *Social Sciences*, 13(2), 105. <https://doi.org/10.3390/socsci13020105>
- Beck, C. T., & Gable, R. K. (2001). Ensuring Content Validity: An Illustration of the Process. *Journal of Nursing Measurement*, 9(2), 201–215. <https://doi.org/10.1891/1061-3749.9.2.201>
- Brown, T. A., Forney, K. J., Klein, K. M., Grillo, C., & Keel, P. K. (2020). A 30-year longitudinal study of body weight, dieting, and eating pathology across women and men from late adolescence to later midlife. *Journal of Abnormal Psychology*, 129(4), 376–386. <https://doi.org/10.1037/abn0000519>
- Carvalho, P. H. B. de, & Ferreira, M. E. C. (2020). Disordered eating and body change behaviours: support for the Tripartite Influence Model among Brazilian male university students. *Ciência & Saúde Coletiva*, 25(11), 4485–4495. <https://doi.org/10.1590/1413-812320202511.35572018>
- Cella, S., Iannaccone, M., & Cotrufo, P. (2020). Does body shame mediate the relationship between parental bonding, self-esteem, maladaptive perfectionism, body mass index and eating disorders? A structural equation model. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity*, 25(3), 667–678. <https://doi.org/10.1007/s40519-019-00670-3>

- Christensen, A. P. (2020). *Towards a Network Psychometrics Approach to Assessment: Simulations for Redundancy, Dimensionality, and Loadings*. <https://doi.org/10.31234/osf.io/84kgd>
- Christensen, A. P., & Golino, H. F. (2021). Estimating the Stability of Psychological Dimensions via Bootstrap Exploratory Graph Analysis: A Monte Carlo Simulation and Tutorial. *Psych*, 3(3), 479–500. <https://doi.org/10.3390/psych3030032>
- Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences*. Lawrence Erlbaum Associates. <http://utstat.toronto.edu/~brunner/oldclass/378f16/readings/CohenPower.pdf>
- Costello, A. B., & Osborne, J. W. (2005). Best Practices in Exploratory Factor Analysis: Four Recommendations for Getting the Most From Your Analysis. *Practical Assessment, Research, and Evaluation*, 10(1). <https://doi.org/10.7275/jyj1-4868>
- D'Anna, G., Lazzeretti, M., Castellini, G., Ricca, V., Cassioli, E., Rossi, E., Silvestri, C., & Voller, F. (2022). Risk of eating disorders in a representative sample of Italian adolescents: prevalence and association with self-reported interpersonal factors. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity*, 27(2), 701–708. <https://doi.org/10.1007/s40519-021-01214-4>
- Dahill, L. M., Touyz, S., Morrison, N. M. V., & Hay, P. (2021). Parental appearance teasing in adolescence and associations with eating problems: a systematic review. *BMC Public Health*, 21(1), 450. <https://doi.org/10.1186/s12889-021-10416-5>
- Davis, C., Shuster, B., Blackmore, E., & Fox, J. (2004). Looking good—family focus on appearance and the risk for eating disorders. *International Journal of Eating Disorders*, 35(2), 136–144. <https://doi.org/10.1002/eat.10250>
- Drury, C. R., Hail, L., Rienecke, R. D., Accurso, E. C., Coelho, J. S., Lock, J., Le Grange, D., & Loeb, K. L. (2023). Psychometric properties of the Parent Eating Disorder Examination Questionnaire. *International Journal of Eating Disorders*, 56(9), 1730–1742. <https://doi.org/10.1002/eat.23999>
- Eisenberg, M. E., Berge, J. M., Fulkerson, J. A., & Neumark-Sztainer, D. (2012). Associations between hurtful weight-related comments by family and significant other and the development of disordered eating behaviors in young adults. *Journal of Behavioral Medicine*, 35(5), 500–508. <https://doi.org/10.1007/s10865-011-9378-9>
- Epskamp, S., Borsboom, D., & Fried, E. I. (2018). Estimating psychological networks and their accuracy: A tutorial paper. *Behavior Research Methods*, 50(1), 195–212. <https://doi.org/10.3758/s13428-017-0862-1>
- Fernández-Gómez, E., Martín-Salvador, A., Luque-Vara, T., Sánchez-Ojeda, M. A., Navarro-Prado, S., & Enrique-Mirón, C. (2020). Content Validation through Expert Judgement of an Instrument on the Nutritional Knowledge, Beliefs, and Habits of Pregnant Women. *Nutrients*, 12(4), 1136. <https://doi.org/10.3390/nu12041136>
- Finney, S. J., & DiStefano, C. (2013). Nonnormal and categorical data in structural equation modeling. In G. R. Hancock & R. O. Mueller (Eds.), *Structural equation modeling: A second course* (2nd ed., pp. 439–492). IAP Information Age Publishing.
- Flora, D. B., & Curran, P. J. (2004). An empirical evaluation of alternative methods of estimation for confirmatory factor analysis with ordinal data. *Psychological Methods*, 9(4), 466–491. <https://doi.org/10.1037/1082-989X.9.4.466>
- Garner, D. M., & Garfinkel, P. E. (1979). The Eating Attitudes Test: an index of the symptoms of anorexia nervosa. *Psychological Medicine*, 9(2), 273–279. <https://doi.org/10.1017/S0033291700030762>
- Garner, D. M., Olmstead, M. P., & Polivy, J. (1983). Development and validation of a multidimensional eating disorder inventory for anorexia nervosa and bulimia. *International Journal of Eating Disorders*, 2(2), 15–34. [https://doi.org/10.1002/1098-108X\(198321\)2:2<15::AID-EAT2260020203>3.0.CO;2-6](https://doi.org/10.1002/1098-108X(198321)2:2<15::AID-EAT2260020203>3.0.CO;2-6)
- Golino, H. F., & Epskamp, S. (2017). Exploratory graph analysis: A new approach for estimating the number of dimensions in psychological research. *PLOS ONE*, 12(6), e0174035. <https://doi.org/10.1371/journal.pone.0174035>

- Golino, H. F., Shi, D., Garrido, L. E., Christensen, A. P., Nieto, M. D., Sadana, R., Thiagarajan, J. A., & Martinez-Molina, A. (2018). *Investigating the performance of Exploratory Graph Analysis and traditional techniques to identify the number of latent factors: A simulation and tutorial*. <https://doi.org/10.31234/osf.io/gzcre>
- Gruber, M., König, D., Holzhäuser, J., Castillo, D. M., Blüml, V., Jahn, R., Leser, C., Werneck-Rohrer, S., & Werneck, H. (2020). Parental feeding practices and the relationship with parents in female adolescents and young adults with eating disorders: A case control study. *PLOS ONE*, 15(11), e0242518. <https://doi.org/10.1371/journal.pone.0242518>
- Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2–24. <https://doi.org/10.1108/EBR-11-2018-0203>
- Hampshire, C., Mahoney, B., & Davis, S. K. (2022). Parenting Styles and Disordered Eating Among Youths: A Rapid Scoping Review. *Frontiers in Psychology*, 12. <https://doi.org/10.3389/fpsyg.2021.802567>
- Iannaccone, M., D'Olimpio, F., Cella, S., & Cotrufo, P. (2016). Self-esteem, body shame and eating disorder risk in obese and normal weight adolescents: A mediation model. *Eating Behaviors*, 21, 80–83. <https://doi.org/10.1016/j.eatbeh.2015.12.010>
- Killen, J. D., Taylor, C. B., Hayward, C., Haydel, K. F., Wilson, D. M., Hammer, L., Kraemer, H., Blair-Greiner, A., & Strachowski, D. (1996). Weight concerns influence the development of eating disorders: A 4-year prospective study. *Journal of Consulting and Clinical Psychology*, 64(5), 936–940. <https://doi.org/10.1037/0022-006X.64.5.936>
- Kluck, A. S. (2010). Family influence on disordered eating: The role of body image dissatisfaction. *Body Image*, 7(1), 8–14. <https://doi.org/10.1016/j.bodyim.2009.09.009>
- Kohli, T. (2023). Parenting Styles and its Impact on Eating Disorder. *International Journal of Social Science and Economic Research*, 08(06), 1458–1464. <https://doi.org/10.46609/IJSSER.2023.v08i06.020>
- Kontele, I., Saripanagiotou, S., Papadopoulou, A. M., Zoumbaneas, E., & Vassilakou, T. (2023). Parental Dieting and Correlation with Disordered Eating Behaviours in Adolescents: A Narrative Review. *Adolescents*, 3(3), 538–549. <https://doi.org/10.3390/adolescents3030038>
- Lloret-Segura, S., Ferreres-Traver, A., Hernández-Baeza, A., & Tomás-Marco, I. (2014). El análisis factorial exploratorio de los ítems: una guía práctica, revisada y actualizada. *Anales de Psicología*, 30(3). <https://doi.org/10.6018/analesps.30.3.199361>
- Londoño-Pérez, C., & Moreno Ruge, A. M. (2017). Factores Familiares y Personales Predictores de Trastornos de Conducta Alimentaria en Jóvenes. *Anales de Psicología*, 33(2), 235. <https://doi.org/10.6018/analesps.33.2.236781>
- López-Gil, J. F., García-Hermoso, A., Smith, L., Firth, J., Trott, M., Mesas, A. E., Jiménez-López, E., Gutiérrez-Espinoza, H., Tárraga-López, P. J., & Victoria-Montesinos, D. (2023). Global Proportion of Disordered Eating in Children and Adolescents. *JAMA Pediatrics*, 177(4), 363. <https://doi.org/10.1001/jamapediatrics.2022.5848>
- Makki, N., Althubayani, S. A., Mobarki, R. Q., Alsayed, J. A., Almohammadi, R. J., & Baabdullah, R. A. (2023). The Effect of Sociocultural Attitudes on Developing Eating Disorders Among Young Females in Almadinah Almunawarah, Saudi Arabia. *Cureus*. <https://doi.org/10.7759/cureus.50576>
- Morgan, J. F. (2000). The SCOFF questionnaire: a new screening tool for eating disorders. *Western Journal of Medicine*, 172(3), 164–165. <https://doi.org/10.1136/ewjm.172.3.164>
- Peleg, O., Tzischinsky, O., & Spivak-Lavi, Z. (2021). Depression and social anxiety mediate the relationship between parenting styles and risk of eating disorders: A study among Arab adolescents. *International Journal of Psychology*, 56(6), 853–864. <https://doi.org/10.1002/ijop.12787>
- Revicki, D. (2014). Internal Consistency Reliability. In *Encyclopedia of Quality of Life and Well-Being Research* (pp. 3305–3306). Springer Netherlands. https://doi.org/10.1007/978-94-007-0753-5_1494

Signorelli, A. (2022). Eating disorders and adolescence. From diagnosis to treatment. *RIVISTA SPERIMENTALE DI FRENIAITRIA*, 146(3), 81–103. <https://doi.org/10.3280/RSF2022-003005>

Soper, D. S. (2021). *A-priori sample size calculator for structural equiation models*. <https://www.danielsoper.com/statcalc/default.aspx>

Toro, J., Salamero, M., & Martinez, E. (1994). Assessment of sociocultural influences on the aesthetic body shape model in anorexia nervosa. *Acta Psychiatrica Scandinavica*, 89(3), 147–151. <https://doi.org/10.1111/j.1600-0447.1994.tb08084.x>

Unikel-Santoncini, C., Bojórquez-Chapela, I., & Carreño-García, S. (2004). Validation of a brief questionnaire to measure the risk of abnormal eating behaviors. *Salud Publica Mex*, 46, 509–515. <https://saludpublica.mx/index.php/spm/article/view/6572/8096>

Ventura-León, J., Lluncor-Vasquez, A., & Chuquillanqui-Silva, M. (2024). A computer tool for Aiken’s coefficients calculation: Applications in clinical and research settings. *Journal of Evaluation in Clinical Practice*. <https://doi.org/10.1111/jep.14134>

Zelkowitz, R. L., & Cole, D. A. (2020). Longitudinal relations of self-criticism with disordered eating behaviors and nonsuicidal self-injury. *International Journal of Eating Disorders*, 53(7), 1097–1107. <https://doi.org/10.1002/eat.23284>

Appendix A

Indicators	Items	Totally disagree	Disagree	Neither agree nor disagree	Agree	Totally agree
Verbal abuse	My parents often use offensive words about my physical appearance.					
Negative label	My parents have given me a nickname because of my physical appearance.					
Hurtful criticism	My parents often make sarcastic comments about my physical appearance.					
Discomfort due to appearance	My parents make me feel uncomfortable when I talk about my physical appearance.					
Induced shame	My parents often make me feel embarrassed about my physical appearance.					
Induced inferiority	My parents have made me feel inferior because of my physical build.					
Weight comparison	My parents often compare my weight to others.					
Dietary comparison	My parents compare my diet to that of others.					
Negative reaction to weight	My parents often react negatively to my weight gain.					

Table A
Validez de contenido

Ítems	Relevancia		Representatividad		Claridad	
	V	IC 95%	V	IC 95%	V	IC 95%
pb1	1.00	[.70, 1.00]	1.00	[.70, 1.00]	0.89	[.56, .98]
pb2	.67	[.35, .88]	.89	[.56, .98]	0.89	[.56, .98]
pb3	.78	[.45, .94]	.67	[.35, .88]	0.78	[.45, .94]
pb4	1.00	[.70, 1.00]	1.00	[.70, 1.00]	1.00	[.70, 1.00]
pb5	.67	[.35, .88]	.67	[.35, .88]	0.78	[.45, .94]
pb6	.78	[.45, .94]	.89	[.56, .98]	0.78	[.45, .94]
pb7	.89	[.56, .98]	.89	[.56, .98]	0.89	[.56, .98]
pb8	1.00	[.70, 1.00]	1.00	[.70, 1.00]	0.89	[.56, .98]
pb9	.89	[.56, .98]	.78	[.45, .94]	0.89	[.56, .98]
pb10	.78	[.45, .94]	.56	[.27, .81]	.78	[.45, .94]
pb11	.78	[.45, .94]	.67	[.35, .88]	.56	[.27, .81]
pb12	.89	[.56, .98]	.78	[.45, .94]	.89	[.56, .98]
pb13	.89	[.56, .98]	.89	[.56, .98]	.78	[.45, .94]
pb14	.78	[.45, .94]	.89	[.56, .98]	.78	[.45, .94]
pb15	.78	[.45, .94]	.67	[.35, .88]	.67	[.35, .88]
pb16	.67	[.35, .88]	.78	[.45, .94]	.78	[.45, .94]
pb17	.78	[.45, .94]	.67	[.35, .88]	.67	[.35, .88]

Table B
Matriz policórica de ítems

Ítems	pb1	pb2	pb3	pb4	pb5	pb6	pb7	pb8	pb9	pb10	pb11	pb12	pb13	pb14
pb1	1.00													
pb2	.46	1.00												
pb3	.78	.62	1.00											
pb4	.55	.48	.73	1.00										
pb5	.69	.54	.80	.81	1.00									
pb6	.65	.44	.74	.68	.76	1.00								
pb7	.37	.23	.35	.26	.29	.31	1.00							
pb8	.38	.39	.33	.39	.36	.33	.28	1.00						
pb9	.16	.09	.07	.07	.05	.04	.29	.18	1.00					
pb10	.02	.14	.04	.11	.11	.15	.28	.22	.29	1.00				
pb11	.65	.48	.70	.71	.70	.65	.30	.48	.22	.21	1.00			
pb12	.59	.49	.64	.61	.62	.54	.35	.44	.25	.19	.77	1.00		
pb13	.49	.30	.48	.47	.41	.53	.30	.19	.07	.04	.50	.39	1.00	
pb14	.47	.45	.63	.61	.55	.47	.20	.37	.13	.09	.55	.52	.43	1.00

Table C
Modelos exploratorios

	MODELOS EXPLORATORIOS		
	Primero		Segundo
	F1	F2	FG
pb1	.68	–	.69
pb2	.51	–	.54
pb3	.85	–	.82
pb4	.78	–	.77
pb5	.85	–	.81
pb6	.72	–	.69
pb7	–	–	–
pb8	–	–	–
pb9	–	.54	–
pb10	–	–	–
pb11	.71	–	.78
pb12	.60	–	.68
pb13	–	–	–
pb14	.55	–	.56
Autovalor	4.79	.89	4.54
Varianza explicada	.342	.064	.505
Omega	.90	.46	.90
Alfa	.89	.46	.90