Psychometric properties of the Family Satisfaction Scale to Uruguayan families

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Título: Propiedades psicométricas de la Escala de Satisfacción Familiar en familias uruguayas.
Resumen: El objetivo del trabajo fue analizar las propiedades psicométricas de la Escala de Satisfacción Familiar de Olson (2010). La satisfacción familiar ha sido evaluada por clínicos e investigadores, en particular en vinculación con el Modelo Circumplejo de los Sistemas Maritales y Familiares. Sin embargo, son escasos los estudios de adaptación de la técnica en el idioma español. Partiendo del proceso de traducción y datos preliminares de fiabilidad, se realizó un estudio de tipo instrumental con una muestra de 385 familias de población general, con el objetivo de obtener evidencias de validez y fiabilidad de la escala. Los resultados del análisis factorial confirmatorio muestran ajuste razonable de los datos a una estructura unidimensional, con un índice de fiabilidad alto. Los análisis de validez externa se realizaron con el resto de las escalas FACES IV, con resultados esperables según el modelo teórico. Para obtener datos de validez de criterio, se comparó los resultados obtenidos por una muestra clínica ($N = 77$) con una submuestra equivalente de los participantes, hallando diferencias significativas entre los dos grupos. Se concluye que la Escala de Satisfacción Familiar es un instrumento válido y fiable para la evaluación de la satisfacción en familias uruguayas.
Palabras clave: Escala de Satisfacción Familiar. Propiedades psicométricas. Análisis factorial confirmatorio. Satisfacción familiar. Modelo Circumplejo.

Abstract: The aim of the present study was to analyze the psychometric properties of the Family Satisfaction Scale (Olson, 2010). Family satisfaction has been evaluated by clinicians and researchers, particularly in relation to the Circumplex Model of Marital and Family Systems. Despite its widespread use, there are few adaptations to Spanish. Based on the translation process and preliminary reliability data, an instrumental study was conducted with a sample of 385 families from the general population, with the aim of obtaining evidence supporting the validity and reliability of the scale. The results of the confirmatory factor analysis show a moderate fit of the data to a one-dimensional structure, with a high reliability index. The external validity analyzes were performed with the rest of the FACES IV scales, with expected results according to the theoretical model. To obtain criterion validity data, we compared the results obtained in a clinical sample ($N = 77$) with an equivalent subsample of the participants, finding significant differences between the two groups. It is concluded that the Family Satisfaction Scale is a valid and reliable instrument for the assessment of satisfaction in Uruguayan families.
Keywords: Family Satisfaction Scale. Psychometric properties. Confirmatory factor analysis. Family satisfaction. Circumplex Model.

Introduction

Family satisfaction has received, until a relatively short time ago, less attention than other family variables. The interest in the assessment of family satisfaction from a psychological point of view dates back to the 70s of the past century with the creation of the instrument Family Life Questionnaire (Barraca, López-Yarto & Olea, 2000; Zabriskie & Ward, 2013).

During the 80s, with the development of the Circumplex Model of Marital and Family Systems (Olson, Sprenkle & Russell, 1979), the idea of assessing family satisfaction emerges by asking the members of the family to evaluate the dimensions of cohesion and flexibility (FACES Scales) as they actually occurred in their families, and then, during a second administration, according to how they would like it to be. The difference between both measures would indicate the level of family satisfaction (Barraca et al., 2000; Zabriskie & Ward, 2013). This method did not receive enough empirical support and was rapidly replaced when, in 1982, Olson and Wilson elaborated the Family Satisfaction Scale (Olson & Wilson, 1989).

Family satisfaction is not included in the Circumplex Model, but it has been used in relation to its fundamental hypotheses. Two of the hypotheses of this model suggest that balanced families will report significantly higher levels of family satisfaction than those reported by unbalanced systems, and that families with high levels of family satisfaction will report significantly better family communication than families with low levels of satisfaction (Olson, 2000; 2010a).

To create the scale, Olson and Wilson (1989) started with a pilot questionnaire composed of 28 items, which they administered to 433 university students. Using this database, they carried out a series of factorial analyses and obtained a questionnaire with 14 items grouped into two dimensions: 8 items assessed the satisfaction with cohesion and 6 items assessed the satisfaction with family flexibility. The authors analyzed the internal structure of the scale and they arrived at the conclusion that it was a unidimensional scale, with a Cronbach coefficient of .92 for the total scale. The study of temporal stability with a 5-week interval test-retest application, revealed a correlation of .75 (Olson & Wilson, 1989).

Based on the original 14 items scale, Olson (2010a) reduced the scale to 10 items that assess satisfaction in relation to aspects of family functioning, such as flexibility, cohesion and communication. Family satisfaction is defined in terms of the degree to which family members feel happy and fulfilled with one other. Based on data collected from a North American sample $N = 2465$, a $M = 36.2$ and $SD = 9$ were obtained; Cronbach's α index of reliability for the scale was .92, and the test-retest correlation coefficient was .85 (Olson, 2010a).

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The Family Satisfaction Scale has gained wide acceptance (Barraca et al., 2000; Zabriskie & Ward, 2013) and has been used in studies of general population families and clinical families from different countries. In the Spanish language, Sanz (2008) carried out the adaptation of the 10-items scale with a sample of Spaniards addicted to opioids. In Peru, Villarreal-Zegarra, Paz-Jesús, Copez-Lonzoy, & Costa-Ball (2017) studied the validity and reliability of the 10-item scale with a sample of 607 university students. Both studies confirmed the unidimensional structure of the 10-item scale, with adequate indexes of validity and reliability. Also in Peru, Arias, Rivera, & Ceballos (2018) analyzed the psychometric properties of the 14-item scale with a sample of 274 workers, and reported results that showed the fit of the data to a two-factor structure.

In Uruguay, the initial phases of the process of adapting the Family Satisfaction Scale, as well as the rest of the scales of the FACES IV package, were conducted by the research team of the Catholic University of Uruguay, under the authorization of the author of the technique, David Olson. At the beginning of the adaptation process, a forward and backward translation was carried out following the guidelines recommended for the adaptation of scales (Balluerka, Gorostiaga, Alonso-Arbiol, & Haranburu, 2007; International Test Commission, 2017; Muñiz, Elousa, & Hambleton, 2013). A professional translator and two bilingual professors from the Psychology Department of the Universidad Católica del Uruguay carried out independent translations of the items. The three versions were compared and discussed until a single version was obtained. This first version was applied to a small group of volunteers from the Psychology Department; they were asked to give their opinion based on their understanding of the instructions and items. At this point, a few adjustments were made to the wording, and the backwards translation was carried out. A psychologist who is an English native speaker and who also speaks Spanish as a second language translated the version back to English. This last version of the FACES IV scales, Communication, and Satisfaction, was sent to Olson, who collated it with the original scale and endorsed the translated version (Costa-Ball et al., 2009).

The scales were administered in 4 pilot studies to a total sample of 584 subjects. In these first studies, new adjustments were made to some items, average scores and standard deviations were calculated, and the first exploratory factor analyses were carried out. According to the last pilot study applied, the reliability of the Escala de Satisfacción Familiar was of .94 (Costa-Ball et al., 2009).

The aim of this work is to complete the adaptation process of the scale by carrying out an analysis of dimensionality, validity, and reliability. Considering the reduced number of research works focused on the validation of the scale in the Ibero-American context and the special characteristics of the samples that were used for these studies, we aim at contributing with our effort to adapt the assessment technique

to this region by working with a large sample of families from the Uruguayan general population.

Method

Participants

In this study, 393 families from the general population residing in different cities in Uruguay participated. Those cases with missing data were eliminated, and a total sample of 385 families was selected. A convenience sample collected in private education institutions was used. 33 % of the families belong to high socioeconomic status groups, 61% to medium, and 6% to low (categories were grouped according to the scores of the Socioeconomic Level Index INSE; Perera & Cazulo, 2016). Following the criterion suggested by Olson et al. (1989), which involves taking the age of the oldest son in order to establish the stage of the family life-cycle, 69% of the families were at the young children stage (0-12 year-olds), 26% at the stage of adolescent children (13-18 year-olds), and 5% at the stage of emancipation (children at home older than 19 years).

Instruments

Sociodemographic questionnaire and Socioeconomic Index Level. A questionnaire was elaborated to obtain data concerning family configuration and socioeconomic level (items of the Index of Socioeconomic INSE, proposed by Perera & Cazulo, 2016).

Family Satisfaction Scale (Olson, 2010a). The scale consists of 10 items that assess the satisfaction of family members with various aspects of family functioning such as flexibility, cohesion and communication. The items should are answered according to a 5-point Likert scale in which 1 means *almost never* and 5 *almost always*. The minimum score of the scale is 10 points and the maximum 50 points. Higher points indicate higher family satisfaction.

Scales for Assessing Family Adaptability and Cohesion FACES IV (Olson, 2010b). FACES IV is composed of six scales: balanced cohesion and balanced flexibility; disengaged and enmeshed cohesion; rigid and chaotic flexibility. The validation studies carried out by Olson (2011) confirm the six-factor structure of the instrument (χ^2 = 2,058.76 (gl = 804, p < .001), IFI = .97, CFI = .97, RMSEA = .058). According to those studies, the cohesion scale shows a negative correlation with the disengaged (-.80) and the enmeshed (-.15) scales, and the flexibility scale shows a negative correlation with the chaotic (-.53) and the rigid (-.12) scales. The Cronbach's α reliability coefficients reported were: .89 for cohesion, .77 for enmeshed, .87 for disengaged, .84 for flexibility, .86 for chaotic, and .82 for rigid (Olson, 2011). In the present study, the version adapted for the Uruguayan population by Costa-Ball, González-Tornaría, Del Arca, Masjuan, & Olson (2013) was administered. In this version, each scale is composed of four items scored on a 5-point Likert scale

ranging from 1 = *strongly agree* to 5 = *strongly disagree*. Scores can range between 4 and 20 points. In both balanced scales, high scores indicate a healthy family functioning; in the four unbalanced scales, high scores indicate a more problematic family functioning. The abbreviated version showed good adjustment to the 6 factor model (x^2(237, N = 294) = 318.45, p < .000; x^2/gl = 1.34; RMSEA = .034; IFI = .92; CFI = .92; TLI = .91), with acceptable indexes of internal consistency (Cronbach α = .71 for cohesion, .60 for enmeshed, .56 for disengaged, .46 for flexibility, .65 for chaotic, and .57 for the rigid scale) (Costa-Ball et al., 2013). The Ordinal α reliability coefficients in the study's sample were: .66 for cohesion, .61 for enmeshed, .80 for disengaged, .49 for flexibility, .74 for chaotic, and .63 for the rigid scale.

Family Communication Scale (Olson & Barnes, 2010). The scale assesses the exchange of information, ideas, thoughts and feelings among family members, ranging from poor to very effective. The scale is composed of 10 items that should be answered according to a 5-point Likert scale in which 1 corresponds to *strongly disagree* and 5 to *strongly agree*, and which has a minimum score of 10 points and a maximum of 50 points. A higher score indicates a better level of family communication. The version adapted in Uruguay by Cracco & Costa-Ball (2019) was applied. The studies conducted to validate the instrument using a sample N = 518 confirmed its unidimensional structure (x^2(35, N = 518) = 157.45, p < .000; x^2/gl = 4.21; RMSEA = .082, 90% IC [.069, .095]; CFI = .97; TLI = .96), with a reliability index α ordinal of .92 (Cracco & Costa-Ball, 2019).

Procedure

To compose the sample, private educational institutions located in different cities of Uruguay were contacted. An institutional authorization to send a letter introducing the research project to the families and asking for their informed consent was requested. Each of the families that accepted to participate in the study received an envelope with the instruments to be completed by one of the responsible adults in the family and to be sent back to the educational institution anonymously. The procedure, the consent and the protocols received the approval of the Ethics Committee of the Catholic University of Uruguay, after having complied with the country's regulations concerning research involving human beings established by the Decree 001-4573/2007 issued by the Executive Power of Uruguay and by the Law No. 18331 concerning the writ of Habeas Data related to the privacy of personal data.

Design and data analysis

An instrumental study was conducted (Ato, López, & Benavente, 2013; Montero & León, 2007) with the aim of analyzing the psychometric properties of the Family Satisfaction Scale.

The descriptive data of the items was analyzed and the assumption of normality was tested using the Kolmogorov-Smirnov statistic. To study the dimensionality of the scale, a confirmatory factor analysis was performed Before conducting the analysis, the suitability of the correlation matrix was examined by using Barlett's test of sphericity and the measure introduced by Kaiser-Mayer-Olkin, and to determine the number of factors to retain both parallel analysis (Timmerman & Lorenzo-Seva, 2011) and Hull's method (Lorenzo-Seva, Timmerman, & Kiers, 2011) were used, all analyses were performed using the FACTOR software (Lorenzo-Seva & Ferrando, 2006).

Polychoric data matrices were used, as well as the robust weighted least squares estimation method, mean and variance adjusted (WLSMW) (Flora & Curran, 2004; Lloret-Segura, Ferreres-Traver, Hernández-Baeza, & Tomás-Marco, 2014). Taking into account Schreiber, Nora, Stage, Barlow, & King's (2006) recommendations, the following adjustment indexes were considered: the ratio of x^2 to its degrees of freedom, RMSEA (mean square error of approximation), CFI (comparative fit index), and TLI (Tucker-Lewis non-normed fit index). The cut-off points that indicate the fit of the data to the proposed model are: x^2/gl < a 3; RMSEA < a .08; CFI ≥ .95; TLI ≥ .95 (Schreiber et al., 2006).

The reliability of the scale was analyzed using the Ordinal α index (Elousa & Zumbo, 2008; Zumbo, Gadermann, & Zeisser, 2007), due to the ordinal nature of the items, considering a value of ≥ .70 as adequately reliable for research settings (Hair, Black, Babin, & Anderson, 2013) and a reliability of at least ≥ .80 for diagnosis (Carretero-Dios & Pérez, 2005).

Lastly, external validity studies were conducted to correlate (Spearman *rho*) the Family Satisfaction Scale results with the FACES IV and Family Communication scales. The Mann-Whitney *U* test was used to obtain information on the criterion of validity of the scale, by comparing the results obtained from a clinical sample (N = 77) of low and middle socioeconomic level, with the results from a subsample of participants from the general population of similar socioeconomic level and stage of the life cycle (n = 156). The effect size proposed by Cohen (1988) was calculated.

Statistical analyses were carried out with the programs FACTOR version 10.8.04 (Lorenzo-Seva & Ferrando, 2006), MPlus version 8.4 (Muthén & Muthén, 1998-2017), SPSS version 25, and G*Power (Erdfelder, Faul, & Buchner, 1996).

Results

The descriptive study of the items (see Table 1) showed values for skewness that exceed the range [-1, 1] or even the looser criterion of [-2, 2], which accounts for the need to use polychoric matrices and the robust weighted least squares estimation method (WLSMW) (Lloret-Segura et al., 2014). Kolmogorov-Smirnov test results were statistically signifi-

cant (p < .000) showing that the items do not fit a normal distribution.

Table 1. Descriptive statistics of the Family Satisfaction Scale items

	M	*SD*	Skewness	Kurtosis
Item 1	4.68	0.58	-2.54	11.84
Item 2	4.46	0.62	-0.85	0.36
Item 3	4.26	0.66	-0.49	0.02
Item 4	4.67	0.55	-1.48	1.23
Item 5	4.37	0.64	-0.64	0.01
Item 6	4.38	0.65	-0.75	0.30
Item 7	4.35	0.77	-1.17	1.32
Item 8	4.15	0.74	-0.60	0.27
Item 9	3.97	0.82	-0.84	1.22
Item 10	4.76	0.58	-2.97	10.76
Total	44.08	4.24	-0.83	0.86

Sampling adequacy was examined with Bartlett's sphericity test and the KMO measure of adequacy. Bartlett's sphericity test was significant (x^2 = 1090.9; *gl* = 45; *p* < .000), with a KMO = .88 adequacy index, which was considered to be satisfactory (Lloret-Segura et al., 2014). Results from both parallel analysis and Hull's method show a single-factor solution with an eigenvalue of 5.25, which explained 53% of the total variance.

A confirmatory factor analysis was conducted to assess data adequacy in relation to a unidimensional structure. The results of the goodness-of-fit indexes that were used (x^2(35, N = 385) = 132.532, *p* < .000; x^2/gl = 3.79; RMSEA = .085, 90% IC [.07, .10]; CFI = .96; TLI = .95) show that there is a moderate fit in relation to the unidimensional structure of the scale proposed by Olson (2010a).

Table 2 shows the values for factor loading and communality of the items. The reliability of the scale was estimated, and an ordinal α index of .91 was obtained.

Table 2. Factor loading and communality of the items.

	Loading	Communality
Item 1	.69	.48
Item 2	.69	.48
Item 3	.59	.35
Item 4	.63	.40
Item 5	.73	.53
Item 6	.82	.67
Item 7	.62	.38
Item 8	.78	.61
Item 9	.69	.48
Item 10	.68	.46

With the aim of obtaining evidence of the external validity, the correlations of the Family Satisfaction scores with the FACES IV and the Family Communication Scale scores were calculated. According to the hypothesis of the Circumplex Model, we expected a positive correlation with balanced cohesion and flexibility and a negative correlation with the following scales: enmeshed, disengaged, chaotic and rigid (unbalanced functioning). We also expected that family satisfaction would correlate positively with family communication (Olson, 2000; 2010a). The values reported in Table 3

show significant correlation indexes, as well as the sign that was expected according to the theoretical model, except for the rigid and enmeshed scales.

Table 3. Correlation between family satisfaction, FACES IV scales and family communication.

	Satisfaction	
	rho	*p*
Cohesion	.36	.000
Flexibility	.35	.000
Disengaged	-.31	.000
Enmeshed	.09	.067
Rigid	-.02	.730
Chaotic	-.35	.000
Communication	.65	.000

To obtain data concerning the validity criterion of the scale, the results obtained for a clinical sample (N = 77) were compared to an equivalent subsample of the participants in this study (n = 156) adjusted for socioeconomic level and family life cycle stage. The clinical sample was obtained in a university outreach center that offers free psychological counseling to families. When members of a family request psychological assistance, they are asked to fill out a consent form, and a battery of assessment tests is administered. The assessment is generally used as a guide for the psychological intervention, but it can also be used for learning purposes and for research, provided data anonymity is preserved. Based on the definition of family satisfaction, we assumed that in the families requesting psychological care tests would probably register low levels of satisfaction related to challenges experienced by the family system affecting some of the main dimension that account for their functioning (communication, cohesion, flexibility).

The clinical sample yielded M = 37.1 (SD = 7.24) while the subsample of the general population registered M = 43.7 (SD = 4.39). The results of the Mann-Withney U test (U = 2453.00; p < .000) allow us to assert that the difference between both groups is significant, taking into account that the effect size is d = 1.05, which is considered to be large (Coe & Merino, 2003).

Discussion and conclusions

The aim of this work was to complete the adaptation studies of Olson's (2010a) Family Satisfaction Scale to the Uruguayan population (Costa-Ball et al., 2009; 2013). This scale has been widely used, mainly in relation to the FACES scales for the assessment of family functioning. Despite this fact, studies for the adaptation of the scale to different populations are scarce. In the Latin American context in particular, the psychometric properties of the scale's latest version (Olson, 2010a) have been analyzed only in Peru by using a sample of university students (Villareal-Zegarra et al., 2017).

The use of measuring scales in clinical settings, as well as in research, entails making classifications or taking decisions that will, in a more or less direct way, have an impact on

people and families. Therefore, it is essential to consider that the instruments we use comply with strict rigor and quality criteria (Muñiz & Fonseca-Pedrero, 2019).

We acknowledge the importance of relying on instruments that have been put to test and adapted to this region. In Uruguay, the adaptation of FACES IV (Costa-Ball et al., 2013) and the Family Communication Scale (Cracco & Costa-Ball, 2019) have been carried out. The Family Satisfaction Scale (Olson, 2010a) completes the battery of techniques used in relation to the Circumplex Model of Marital and Family System (Olson et al., 1979). The model has integrated dimensions that are relevant for the understanding of family processes. It has also articulated knowledge emerging from theoretical, clinical and research areas, which is reflected in a considerable number of empirical works (Kounseki, 2000; Olson, DeFrain & Skogrand, 2014; White & Klein, 2008).

The results of this instrumental study allows us to claim that Olson's Family Satisfaction Scale (2010a) can be used as a valid and reliable instrument for the assessment of satisfaction according to what the individuals report in relation to aspects of their family life such as cohesion, flexibility and communication.

Concerning the internal validity of the instrument, the confirmatory factor analysis revealed there is a moderate fit to the unidimensional structure proposed by the author (Olson, 2010a). Other factor studies conducted with the 10-item scale (Aazami, Khadijah, & Akmal, 2015; Sanz, 2008; Villareal-Zegara et al., 2017) also indicated a good fit of the data to the single factor structure.

The factor loadings of the items are high (between .59 and .82) suggesting the convenience of keeping all the items present in the original version. On the other hand, the reliability index obtained in this study (.91) exceeds the minimal values established by Carretero-Dios & Pérez (2005; 2007) and Hair et al. (2013) for its application in clinical settings and in research (.80 and .70 respectively).

External validity studies were conducted taking into account the rest of the scales that compose the FACES IV package. These scales assess variables that are conceptually articulated with the fundamental hypothesis of the Circumplex Model of Marital and Family Systems. The results of the correlational analysis conducted show that, consistently with the theoretical model of reference, family satisfaction correlates positively with the scales of balanced family cohesion and flexibility. Family communication also correlates positively with the satisfaction levels reported by the families. This means that higher levels of cohesion, flexibility and communication, are associated with higher satisfaction levels reported by family members, which is consistent with the literature that indicates that cohesion, flexibility and communication are very important resources for family systems (Walsh, 2012). On the other hand, the model suggests that the satisfaction reported will be lower in families that reflect unbalanced levels of cohesion and flexibility. Data obtained from the correlations carried out confirm this idea in relation to chaotic and disengaged functioning scales. Nevertheless,

this is not the case for enmeshed and family rigidity scales, which do not correlate significantly with satisfaction. These results could be explained based on the increasing weakness that has been systematically reported for the enmeshed and rigid functioning scales by Olson (2011) himself, as well as by authors of other FACES IV scale validation studies (Baiocco, Cacioppo, Laghi, & Tafà, 2013; Costa-Ball et al., 2013; Koutra, Triliva, Roumeliotaki, Lionis, & Vgontzas, 2012; Martínez-Pampliega, Merino, Iriarte, & Olson, 2017; Mirnics, Vargha, Tóth, & Bagdy, 2010; Pereira & Teixeira, 2012).

In any case, it is important to bear in mind the relevance that the assessment of family satisfaction has as a measure that affords more flexibility to the Circumplex Model, since it acknowledges that families with unbalanced functioning are not necessarily dysfunctional families. Olson (2000) warns us that it would be a mistake to associate unbalanced values to family dysfunction, because it is crucial to take into consideration the particular circumstances of the phase that the family is going through, and also ethnical, cultural and religious aspects.

Concerning criterion validity, the comparative analyses conducted with two equivalent samples matched according to socioeconomic status and life cycle stage, showed that families seeking psychological assistance reported family satisfaction values that were significantly lower than general population family satisfaction values, which is to be expected if we consider that satisfaction refers to how satisfied family members feel in relation to areas of family functioning such as communication, cohesion and flexibility.

This study points to the limitations that should be focused on in future works related to the scale. On the first place, despite relying on a large sample of participants from different cities in the country, the sample was not sufficiently heterogeneous in what concerns socioeconomic level and life cycle stage. The fact of having chosen private educational institutions in order to contact the subjects might have induced some bias related to the socioeconomic level of the families. It will be necessary to count with random samples for future studies.

Also, concerning upcoming studies for the adaptation and standardization of the instrument, it will be important to revise some aspects concerning the validity of the contents of the items. Barraca et al. (2000) point out as a deficiency the fact that most researchers have dedicated their effort to measure the construct at the expense of delving into their conceptualization.

The results of the analyses conducted so far allow us to conclude that the Spanish version of Olson's (2010a) Family Satisfaction Scale has adequate psychometric properties that make of it a valid and reliable instrument for the assessment of satisfaction in Uruguayan families, both in clinical and in research settings. Taking into consideration the lack of psychometric studies related to the scale in the Ibero-American context, this work contributes to the creation of instruments and batteries for the assessment of family variables.

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