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ORIGINAL PAPER

Validation Study of the Portuguese Version of the Family Problem Solving Communication (FPSC) Index

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Abstract Within family stress theories, the way in which families communicate about their hardships and issues is crucial for the family's stress management and functioning. In the current study, we sought to validate the Portuguese version of the Family Problem Solving Communication (FPSC) Index and examine its psychometric properties. Developed within the context of the resiliency model of family stress, adjustment and adaptation, the FPSC is a ten-item self-report measure that assesses the family communication patterns that are likely to play a role in the family's coping with hardships and difficulties. The participants were 332 individuals between 18 and 76 years who completed the FPSC and self-report measures of family hardiness and family functioning. A confirmatory factor analysis supported the original FPSC bifactorial structure, indicating the presence of two dimensions, Affirmative Communication and Incendiary Communication. Correlations between the scale's total score and its dimensions with the measures of family hardiness and family functioning attested to its convergent validity. Furthermore, the index demonstrated respectable to very good internal consistency and temporal stability. In conclusion, the Portuguese version of the FPSC is a valid and reliable instrument that can support the development of future empirical studies focused on family problem solving communication, especially with regard to family adaptation in different contexts of adversity.

Keywords Family problem solving communication · Family resources · Family protective factors · Validation study · Psychometric properties.

Introduction

The way in which families communicate about problem solving is a key feature of family life. Over the course of the life cycle, families are confronted with various demands associated with the continuous presence of strains and with both normative and nonnormative stressors (Patterson 1988). According to the family adjustment and adaptation response (FAAR) model (McCubbin and Patterson 1983; Patterson 1988, 2002), families use their capabilities (resources and coping behaviors) to meet such demands. This allows them to maintain balanced functioning. However, there are times when the number or nature of family demands exceeds their capabilities, and families undergo a state of crisis and disorganization. To achieve post-crisis adaptation, families must overcome this imbalance by engaging in the following processes: reducing the demands they face, acquiring new resources and coping behaviors, and/or changing the meanings they ascribe to situations.

Understanding how families manage to adapt successfully to stressful situations as well as which processes are

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involved in this phenomenon are core questions for family scholars. Adding to the FAAR model, various theoretical frameworks have attempted to address these issues (Segrin and Flora 2011). In general, three conceptual components have been considered in these formulations: (a) the stressful event and its associated demands that interfere with a system's functioning; (b) the outcomes of stress comprising changes in the system's functioning that can be subsumed as good or bad adaptation; and (c) the intervening factors between these domains, which influence the stress experience and its outcomes (Lavee et al. 1985; Patterson 1988). If these factors lead to positive outcomes following risk situations, they correspond to family capabilities from the perspective of the FAAR model and parallel protective factors or processes from the perspective of family resilience approaches (Patterson 2002). One of the most well-established models of family resilience, the family resilience framework (Walsh 2006, 2016), defines resilience as the capacity of the family, as a functional system, to withstand and rebound from adversity and to emerge strengthened and resourceful. Within the scope of family stress theories, families demonstrate resilience as they manage to achieve post-crisis adaptation following significant risk situations (Patterson 2002). Regardless of the terminology used, the identification of the factors associated with positive family functioning after risk exposure prompts enormous interest from researchers involved in family stress and resilience and from clinicians who work with families.

Moreover, these potential protective influences are postulated to emerge from different levels of the ecosystem: individual family members, the family unit, and the community (Lavee et al. 1985; Patterson 2002; Tedeschi and Kilmer 2005). At the family level, family communication has been noted as one of the major facilitators of family functioning (e.g., Olson 2000) and resilience (e.g., Walsh 2006).

In the context of the circumplex model of marital and family systems (Olson 2000; Olson and Gorell 2003), family communication is conceptualized as a facilitator dimension that maintains the balance between family cohesion and family flexibility. From the perspective of the FAAR model, family communication patterns constitute a family resource because they allow for straightforward family efforts to manage demands (Patterson 1988), thereby facilitating the process of restoring balanced functioning. In defining what constitutes good or adaptive family communication patterns, Patterson (1988) drew attention to the importance of clear and direct messages, instrumental and affective communication capability, and verbal-nonverbal congruency. Within the family resilience framework, Walsh (2006, 2016) noted that clarity, open emotional expression, and collaborative problem solving represent the key family communication processes for family resilience. Furthermore, family communication involving clear, open emotional expression, and collaborative problem solving has been found to be one of the characteristics of resilient families (e.g., Black and Lobo 2008; Lietz 2007; McCubbin et al. 1997).

Given the significant role of family communication for family adaptation and resilience, instruments for assessing this variable are highly relevant. Recognizing the need for a measure that focuses specifically on family communication patterns when families are enduring stressful events, McCubbin et al. created the Family Problem Solving Communication Index (FPSC; 1988). This assessment instrument was developed within the resiliency model of family stress, adjustment and adaptation (McCubbin and McCubbin 2001), an extension of the FAAR model. The FPCS aims at capturing the family's problem solving and coping, one of the determinants of adaptation following a risk situation. This brief self-report instrument evaluates two dominant family communication patterns when families are dealing with stressors and strains: (a) affirmative, characterized by support and care and exerting a calming influence on family members (e.g., talking things through to reach a solution); and (b) incendiary, which tends to exacerbate the stressful situations families might endure (e.g., yelling and screaming) (McCubbin et al. 1988). In fact, creating a family environment or context of communication in which family hardships can be resolved is of great relevance for family stress management.

The original English version of the FPSC proved to be a reliable and valid measure across several studies of families under stress, including families of different ethnic groups. For instance, the FPSC was used in a study of 1399 families of investment executives and their spouses drawn from across 16 states in the U.S. (Thompson 1994) and families of Hawaiian ancestry (McCubbin and Thompson 1992). A separate study of Native Hawaiians established the FPSC's reliability and validity for single-parent ($N = 83$) and two-parent ($N = 114$) households. Studies were conducted with both the mothers ($N = 107$) and fathers ($N = 92$) of children with cardiac conditions and a separate group of mothers ($N = 72$) and fathers ($N = 62$) coping with childhood diabetes. Furthermore, a study with families struggling with a major economic downturn (McCubbin and Thompson 1989) resulted in the identification of two independent factors: Affirmative Communication and Incendiary Communication. Across these studies, reliabilities ranged from a low of .85 to a high of .89. This is in accordance to what was verified in the original validation studies (McCubbin et al. 1988), wherein internal consistency was .89 for the total score. Convergent validity for Affirmative Communication was established for the criterion measures of hardiness ($r = .41$) and coherence ($r = .15$); Incendiary Communication was validated with an

independent measure of maladaptation ($r = .23$) (McCubbin et al. 1988). Additional studies that involved the original version of the FPSC in their designs did not report on this instrument's psychometric properties (e.g., Hopkins et al. 2013). Moreover, the FPSC was translated and made available in Spanish (McCubbin et al. 1988), however, as far as we are aware, the psychometric properties of this version were never examined.

To the best of our knowledge, there are no assessment instruments in Portuguese that measure families' communication patterns when dealing with stressors and strains. This is likely to hamper the development of family-level stress research in Portuguese-speaking countries. Self-report measures focused on family resistance and resiliency resources, such as the FPSC, are vital for family researchers interested in the processes by which families manage to adapt to stressful situations. Given the growing number of demands and global changes that today's families are likely to experience (e.g., prevalence of chronic health conditions, living in uncertain macroeconomic conditions), family stress research has acquired renewed relevance. Validating the FPSC to a new cultural setting may allow empirical examinations of the role of family problem solving communication in stress management within different contexts of risk and adversity.

The goal of the present study was to develop a Portuguese version of the FPSC and to examine its psychometric properties in a sample of 332 adults. No barriers were identified regarding the cultural appropriateness of the item content of the FPSC in the Portuguese context. In fact, the FPSC was originally based on an etic conceptualization that specifically operationalizes incendiary and affirming communication. Accordingly, the items were not intended to be culture- or ethnicity-specific, especially because this allows the FPCS to be applied across ethnic groups and included in comparative studies focused on family problem solving communication. Our specific aims were to: (a) establish the Portuguese version of the FPSC; (b) provide evidence of its reliability, by assessing the scale internal consistency and temporal stability; and (c) provide evidence of its validity, by examining its factorial structure via confirmatory factor analysis (CFA), and by investigating associations with theoretically related constructs (family hardiness and family functioning). Considering the cultural appropriateness of the FPSC to our national setting and the results of previous studies confirming the reliability and validity of the original version of the measure, we expect to verify the psychometric adequacy of the Portuguese version of the FPSC in this study. Regarding the convergent validity analyses, we expect that in family problem solving communication, both the affirmative and non-incendiary patterns are positively associated with family functioning and family hardiness. Moreover, the strength of these correlations is expected to be medium to large (Cohen 1988) considering the values obtained in previous studies (McCubbin et al. 1998).

Method

Participants

The participants were 230 female (69.3%) and 102 male Portuguese adults (30.7%) ranging from 18 to 76 years, with a mean age of 28.93 ($SD = 12.67$). The majority of the sample was single ($n = 245$, 73.8%), lived in urban areas ($n = 149$, 44.9%) and had more than 12 years of education ($n = 158$, 47.5%). In addition to students ($n = 180$, 54.2%), 122 participants (36.7%) were employed at the time of the assessment. The delimitation of socioeconomic status was based on the participants' job and educational level following an accepted and widely known classification system for the Portuguese context (Simões 2000). Excluding participants who did not provide these data (e.g., students, unemployed persons), most of the participants came from a medium socioeconomic background ($n = 66$, 19.9%). Regarding family characteristics, the majority of the participants belonged to a two-parent family composed of four individual family members. In addition, in terms of the family life cycle, these families were in the stage corresponding to families with adult children. The overall sociodemographic and family data of the sample are shown in Table 1.

Procedures

Study procedures

Data were collected between February and May 2016 through a combination of two different procedures: the participants could complete the assessment protocol in person ($n = 178$) or online ($n = 154$). Inclusion criteria consisted of being 18 years or older, having Portuguese nationality and living in Portugal at the time of the study. The assessment protocol included information about the study's aims, the inclusion criteria, the voluntary nature of participation and compliance with confidentiality and anonymity, as well as the identification and contacts of the research team. Because the assessment protocol was not likely to create any type of distress or harm and given the guarantee of anonymity of the data, participants were not asked to sign informed consent (American Psychological Association [APA] 2010).

Participants who completed the assessment protocols in person were recruited with the assistance of graduate students from our institution. At the end of a class, students were informed about the study's goals and were invited to

participate. The majority (94%) agreed to collaborate in the study and were informed about the inclusion criteria and procedures. They were given copies of the assessment protocols to fill out and return in a sealed envelope to the research team one week later. The participants were also invited to complete the FPSC a second time one week later to assess the scale's temporal stability. Regarding the online data collection, potential respondents were invited via e-mail or social networks to participate in the online survey version. The participants who provided their e-mail address in the online survey were also contacted to complete the FPSC one week later.

Table 1 Sociodemographic and family characteristics of the participants

Characteristic	*n*	%
Sex		
Male	102	30.7
Female	230	69.3
Marital status		
Single	245	73.8
Married/cohabitating	77	23.2
Divorced	4	1.2
Widowed	6	1.8
Education		
4 years	7	2.1
6 years	4	1.2
9 years	21	6.3
12 years	142	42.8
>/12 years	158	47.5
Employment status		
Working	122	36.7
Not working	30	9.0
Students	180	54.2
Socioeconomic status		
Low	28	8.4
Medium	66	19.9
High	30	9.0
Students	180	54.2
Unemployed/retired	28	8.4
Residence		
Urban	149	44.9
Moderately urban	84	25.3
Rural	99	29.8
Religion		
Atheist	64	19.3
Agnostic	33	9.9
Catholic	221	66.6
Others	11	3.3
Unanswered	3	.9
Family structure		
Two-parent families	209	63.0
One-parent families	53	16.0
Step families	10	3.0
Extended/multigenerational families	35	10.5
Others	21	6.3
Unanswered	4	1.2
Family stage of life cycle		
Couple's formation	10	3.0
Families with young children	12	3.6
Families with children at school	9	2.7
Families with adolescents	6	1.8
Families with adult children		
18–30 years old	268	80.7
>30 years old	27	8.1
Number of family members		
2	54	16.3
3	94	28.3
4	133	40.1
5	23	6.9
>6	24	7.2
Unanswered	4	1.2

Development of the Portuguese version of the FPSC

To ensure proper translation of the original version of the FPSC into Portuguese, specific guidelines were followed (Gjersing et al. 2010). First, two translations of the original FPSC version were produced by two independent researchers and reconciled by a third one. Second, two back-translations of the prior version were created by two other independent persons and then reconciled by a third researcher. All the interveners in this process had a good understanding of both the English and Portuguese languages. Subsequently, both reconciled versions were analyzed by the research team, who did not detect significant inaccuracies in the translations and agreed on a final Portuguese version of the FPSC. This version was submitted to a pilot study with seven participants to verify the comprehensibility and adequacy of the items and response scales. Because the participants did not identify any difficulties, the final FPSC version was adopted for the Portuguese validation study.

Measures

In addition to the sociodemographic items, the assessment protocol included the FPSC and additional instruments measuring two constructs theoretically related to family problem solving communication, family hardiness and family functioning, for convergent validity purposes.

Family problem solving communication index (FPSC)

The FPSC is composed of ten items grouped into two subscales: Incendiary Communication (five items) and Affirmative Communication (five items). The participants indicated the degree to which each statement about their family's patterns of communication was characteristic of their family's typical functioning when facing problems or conflicts on a 4-point scale (0 = *False*, 1 = *Mostly False*, 2 = *Mostly True* and 3 = *True*). According to the original authors, the two subscales can be scored separately, with Incendiary Communication measuring negative attributes (after reversing items 3 and 9) and Affirmative Communication measuring positive forms of communication. In addition, the FPSC can be scored to create a total and positive (i.e., affirmative and non-incendiary) pattern for a communication score (after reversing items 1, 5 and 7). In this study, we opted to follow the former approach.

Family hardiness index (FHI)

The FHI (McCubbin et al. 1986; Portuguese version: (Cunha et al. 2017) was used to evaluate the internal strengths and durability of the family unit when facing stressful situations. Participants indicated the degree to which each one of the 20 items (e.g., "we have a sense of being strong even when we face big problems") described their families on a 4-point scale ranging from 0 (*false*) to 3 (*true*), with higher scores indicating greater family hardiness. The Portuguese validation studies indicated a three-factor solution involving the subscales Commitment (8 items), Control (6 items) and Challenge (6 items). The Cronbach's alpha for this scale's score was .76 in the Portuguese validation studies and .88 in the present study.

Systemic clinical outcome routine evaluation (SCORE-15)

This self-report instrument (Stratton et al. 2010; Portuguese version: Vilaça et al. 2015) assessed participants' family functioning across three dimensions, Family Strengths, Family Communication and Family Difficulties, each composed of five items. Participants indicated the degree to which each item (e.g., "we are good at finding new ways to deal with things") described their family on a 5-point scale ranging from 1 (*extremely well*) to 5 (*not at all*). In this study, this measure was combined in a total score, with higher levels indicating better family functioning. The Portuguese validation studies showed Cronbach's alphas ≥.78. In the present study, the Cronbach's alpha was .90.

Data Analyses

Statistical analyses were performed using Statistical Package for the Social Sciences (SPSS) and analyses of moments structures (AMOS) version 20.0 (IBM, SPSS, Chicago, IL). Missing data were found across the FPSC, FHI and SCORE-15, ranging from 0.3 to 1.2% of the cases. We used mean substitution to estimate the missing values because the percentage of missing values was fewer than 5% in all cases (Kline 2015). Independent-samples t-tests were conducted to compare the scores of the main study's variables (i.e., family problem solving communication, family hardiness and family functioning) for the personal and online administration groups. Supporting the literature that suggests that data from paper-based and online surveys tend to be similar (e.g., Shin et al. 2012), there were no significant differences between the two groups. Therefore, we found support for conducting all the statistical analyses in this study using the sample as a whole.

Both univariate and multivariate normality were checked in our sample. Because the absolute skewness and kurtosis values were not higher than two (George and Mallery 2010), the assumption of univariate normality was supported (Table 2). In contrast, we did not find evidence for multivariate normality in our data because Mardia's normalized estimate of multivariate kurtosis obtained was 13.17, which was higher than five (Bryne 2010). An identification of multivariate outliers was performed through the computation of the squared Mahalanobis distance (D^2) for each case. Twelve cases (corresponding to 3.6% of the overall sample) were removed from the dataset because their D^2 values differed from all the other values (Bryne 2010). After this procedure, Mardia's normalized estimate of multivariate kurtosis assumed the value of 4.58, which provided support for a multivariate normal distribution and for the use of the maximum likelihood (ML) estimation method in the confirmatory factor analyses (CFA) procedures. These analyses were then performed with a sample of 320 participants.

The tested model replicated the original FPSC factor structure involving two factors: Incendiary Communication and Affirmative Communication. Considering the parameters to be estimated in the model ($q = 21$), the sample size used in CFA analyses ($n = 320$) satisfactorily represented a sample-size-to-parameters ratio of 10:1 (Kline 2015). To assess model fit, we considered the chi-square as well as the comparative fit index (CFI) and the root mean square error of approximation (RMSEA). CFI values above

Table 2 Descriptive and item analyses of the FPSC

Total score, subscales, items	*M*	*SD*	Median	IQR	Skewness	Kurtosis	Corrected item total correlations
Total score	19.62	.30	20.00	7.00	−.47	−.06	
Incendiary Communication	9.22	.16	9.00	3.00	−.27	−.14	
InCom 1	1.80	.05	2.00	1.00	−.21	−.52	.56
InCom 3	2.03	.04	2.00	1.00	−.33	−.60	.76
InCom 5	1.86	.04	2.00	1.00	−.25	−.24	.51
InCom 7	1.66	.05	2.00	1.00	−.13	−.88	.40
InCom 9	1.88	.04	2.00	1.00	−.25	.70	.70
Affirmative Communication	10.40	.17	11.00	4.94	−.57	.21	
AffCom 2	2.26	.04	2.00	1.00	−.68	−.02	.70
AffCom 4	2.22	.04	2.00	1.00	−.73	−.23	.73
AffCom 6	2.05	.04	2.00	1.00	−.40	−.53	.68
AffCom 8	1.80	.04	2.00	1.00	−.23	−.51	.75
AffCom 10	2.06	.04	2.00	1.00	−.64	.70	.47

IncCom incendiary communication, *AffCom* affirmative communication

.90, .95, and .99 were considered acceptable, very good and outstanding fit, respectively (Little 2013). Considering a sample of more than 250 participants and a model with less than 12 observed variables, the RMSEA values should be lower than .07 (with CFI of .97 or higher) to indicate good model fit (Hair et al. 2010).

Internal consistency was measured with Cronbach's alpha coefficients. According to DeVellis (2012), values from .70 to .80 are considered respectable and from .80 to .90 are considered very good. The values of the item to total scale correlations are considered indicative of good discrimination when they are higher than .30 (Wilmut 1975). Pearson correlations were conducted to determine test-retest reliability in a subsample of 81 participants who completed the second assessment protocol one week later. According to Litwin (1995), values ≥.70 are considered adequate for test-retest Pearson correlation coefficients.

Concerning the convergent validity analyses, we conducted Pearson correlations between all FPSC, FHI and SCORE-15 total scores and subscales. The coefficients were interpreted as follows: small correlations ($r > \pm .10$), medium correlations ($r > \pm .30$) and large correlations ($r > \pm .50$), according to Cohen (1988).

Results

Item Analyses

Table 2 presents the means, standard deviations, medians, interquartile range, skewness and kurtosis for the FPSC total score, subscales and items. The skewness statistic was –0.47 for the total score, –0.27 for the Incendiary Communication subscale, and –0.57 for the Affirmative Communication subscale and ranged from –0.73 and –0.13 for the items. The kurtosis statistic was –0.06 for the total score, –0.14 for the Incendiary Communication subscale, and 0.21 for the Affirmative Communication subscale and ranged from –0.88 and 0.70 for the items. The item-total correlation coefficients indicated good discrimination of all items ($.40 > r > .76$).

Factor Analysis

The original bifactorial structure of the FPSC was examined through CFA. Indications of acceptable model fit were provided by chi-square statistic and CFI but not by RMSEA, χ^2 $(320) = 132.42$, $p < .001$, $CFI = .938$, $RMSEA = .095$, 90% CI [.08, .12]. Therefore, we engaged in post-hoc model fitting to detect model misspecification, conducting specification searches (MacCallum 1986). An examination of the standardized residuals did not suggest specific areas of model misfit because all the values fell below the cut-off point of 2.58 (Bryne 2010). Through the inspection of the modification indices (MI), we concluded that improved model fit would result from adding measurement error covariance between the following items: 1 and 6, 6 and 8, 5 and 7. These three respecifications were performed (Fig. 1) based not only on the MI values but also on a strong empirical rationale. In fact, items 1, 6 and 8 might present similar language (e.g., "we share with each other", "take time to hear what each other") and might address a shared smaller construct: ability to communicate in a calm and affirmative way (i.e., not yelling and screaming, taking time "to hear what each other has to say or feel"). The same applied to item 5 ("we walk away from conflicts…") and 7 ("…by fighting…"), which focused specifically on family conflicts. Therefore, we concluded

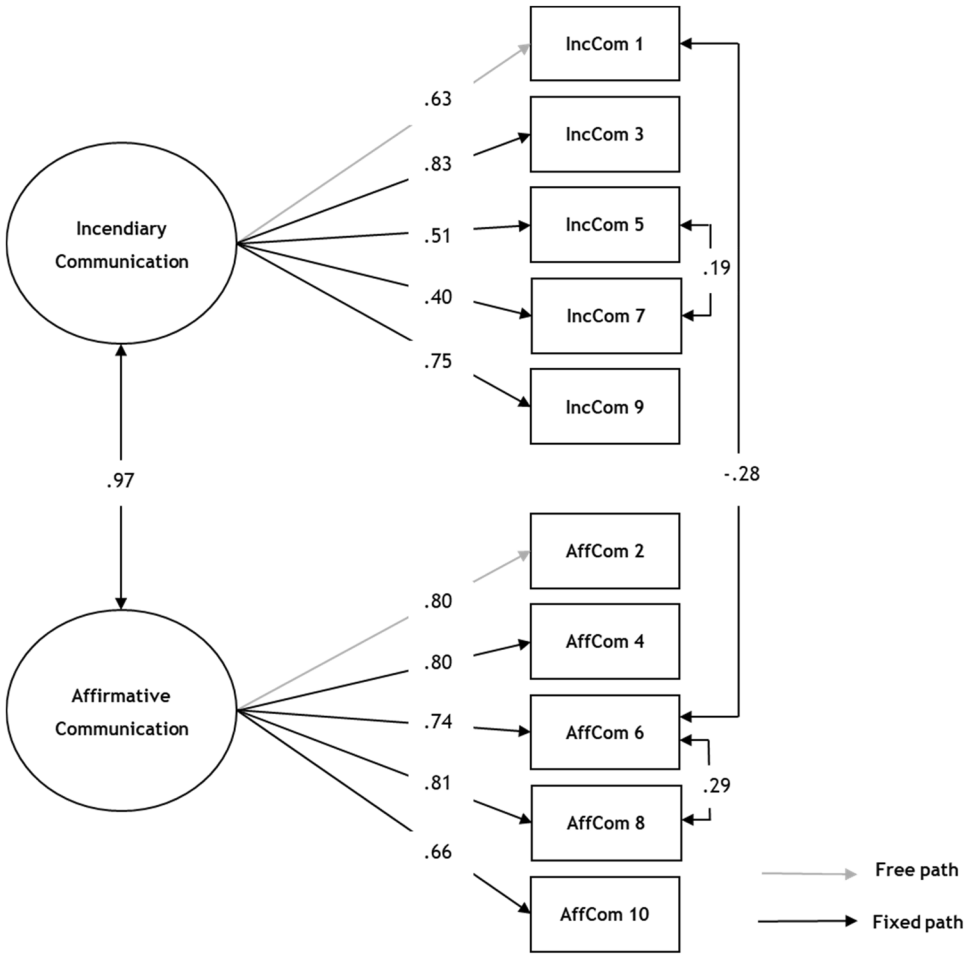

Fig. 1 Fit indexes for the reespecified model: χ^2 (320) = 74.390, $p < .001$; CFI = .973, RMSEA = .066 . Values shown in the figure represent standardized regression weights of the factor loadings. IncCom incendiary communication, AffCom affirmative communication

Table 3 CFA Results

Model	χ^2	p	CFI	RMSEA
Model 1	132.42	.001	.938	.095
Model 2	74.390	.001	.973	.066

χ^2 Chi-square, *CFI* comparative fit index, *RMSEA* root mean squared error of approximation

that the addition of error covariance was justified. The values for the respecified model suggested very good fit, χ^2 (320) = 74.390, $p < .001$, CFI = .973, RMSEA = .066, 90% CI [.05, .09]. Table 3 presents the fit statistics for the two models tested.

Reliability

The total score and the Affirmative Communication subscale presented Cronbach's alphas of .89 and .86, respectively, indicating very good internal consistency. The Incendiary Communication subscale had respectable internal consistency, with a Cronbach's alpha of .77. Regarding the test–retest reliability, the Pearson correlation coefficients were .84 for the FPCS total score and .80 and .79 for the Affirmative and Incendiary Communication subscales, respectively.

Convergent Validity

The FPSC, FHI and SCORE-15 total scores and subscales were positively and significantly ($p < .001$) correlated with each other, as presented in Table 4. All correlations were large except for the medium correlations found between the total score and subscales of the FPSC and the FHI subscale of Control.

Discussion

Despite the strong rationale supporting the relevance of family communication for overall family functioning (e.g., Olson 2000) and adaptation in times of stress (e.g., McCubbin and McCubbin 2001; Walsh 2006), no measures

Table 4 Correlations between the FPSC scores and the FHI and SCORE-15 scores

	Family Hardiness (FHI)				Family Functioning (SCORE-15)			
	Total score	Control	Commitment	Challenge	Total score	Family Strengths	Family Communication	Family Difficulties
Total score	.70**	.40**	.70**	.66**	.74**	.77**	.55**	.60**
Affirmative Communication	.65**	.34**	.67**	.63**	.69**	.73**	.53**	.53**
Non-incendiary Communication	.64**	.40**	.60**	.59**	.69**	.70**	.52**	.58**

**$p < .001$

have previously been developed to assess this construct in the Portuguese context. Aiming to contribute to the development of family stress research, in this study, we developed a Portuguese version of the FPSC and examined its psychometric properties. In accordance with the findings for the original version, the Portuguese version of the FPSC was found to be a valid and reliable measure.

Regarding the creation of the Portuguese version, the back-translation was found to be very similar to the original formulation of the measure, which made the process of adaptation rapid and straightforward. Moreover, the participants did not raise any issues related to the content of the items in the pilot study. We believe that this may reflect the soundness of the construct of family problem solving communication in contexts with a similar cultural background and familial values. Moreover, this is likely to be a result of the FPSC authors' original intent to create a measure not culture- or ethnicity-specific that, consequently, could be applied across diversified groups.

The bifactorial structure found in the Portuguese version replicated the one proposed by the original authors of the FPSC. Therefore, the results indicated the existence of two structurally related dominant patterns of family communication when dealing with problems or conflicts. The results concerning internal consistency and temporal stability ensure the reliability of the FPSC total score as well as the subscales. Thus, Affirmative Communication and Incendiary Communication were found to be valid and reliable measures, supporting their independent use in further studies.

The correlations between family problem solving communication as assessed with the FPSC and family hardiness and family functioning assessed with the FHI and the SCORE-15 attested to the FPSC's convergent validity. In the context of the resiliency model of family stress, adjustment and adaptation (McCubbin and McCubbin 2001), family hardiness is a buffer of the effects of stressors and demands and a facilitator of family resilience over time. In accordance with our hypothesis, family hardiness was positively associated with family problem solving communication; The medium to large correlations found between the total and subscale scores of the two instruments are in accordance with the results of previous studies (McCubbin et al. 1998). Correlation analyses also showed that, as expected, better family problem solving communication was positively associated with better family functioning. Moreover, it appears that larger correlations were verified between the FPSC scores with those of Commitment (FHI) (rs between .60 and .70) and Family Strengths (SCORE-15) (rs between .70 and .77), than between the scores of FPSC and those of Family Communication (SCORE-15) (rs between .52 and .55). Whereas Commitment (FHI) refers to family's sense of internal strengths, trust and ability to work together, Family Strengths concerns family resources and adaptability. This pattern of results might suggest that an affirmative and non-incendiary style of communication is more characteristic of families who perceive themselves as strong, resourceful, and capable of resolving their problems together. Also, these results indicate that the FPCS and the dimension Family Communication of the SCORE-15 do not tap into the same construct, which supports the specificity of family communication patterns in times of stress. Globally, the results supported theoretical assumptions regarding the role of family communication as a facilitator of both family functioning (Olson 2000) and resilience (Walsh 2006).

Limitations, Strengths and Future Directions

The current study presents limitations due to the non-probabilistic nature of the study sample, which was recruited through convenience methods, as well as the sample's homogeneity. In fact, the sample was substantially composed of young, single college students. Future studies should consider the psychometric properties of the FPSC with more heterogeneous samples. This will allow the application of tests of measurement invariance to determine whether the FPSC performs similarly across different groups (e.g., groups according to age, family structure and stage of the family life cycle). Nonetheless, testing the psychometric properties of the FPSC with young people can be regarded as a novel contribution given that the samples in previous studies comprised of parents and/or married individuals only (e.g., Thompson 1994).

Additionally, we engaged in model respecifications, adding three measurement error covariances to the initial model tested via CFA. Although these modifications were justifiable, the employment of this model generation strategy constitutes a limitation of the present study, especially because the modified model was not validated using new data (Bryne 2010; MacCallum 1995). Thus, these findings must be interpreted with caution until further studies have tested the modified model with a new sample. Accordingly, future studies performing a cross-validation are warranted.

Future studies should investigate the potential of the FPSC as a measure of therapeutic change in clinical settings. The majority of self-report family measures validated for clinical use typically evaluate overall family functioning, with family communication as one of its dimensions (Hamilton and Carr 2016). In line with the conceptualization of Olson (2000), we believe that the potential role of family communication as a facilitator of other dimensions of family life justifies a more detailed inspection of this construct through a more comprehensive assessment. Moreover, it could be expected that in a psychotherapeutic process, modifications of family problem solving communication patterns might be more easily or more rapidly achieved than changes to more general communication patterns. If this is the case, specifically assessing such patterns in the course of a clinical process would be valuable.

In addition, we consider one of the strengths of the FPSC to lie in the strong theoretical background in which the measure was developed. Expanding upon family stress theories, further investigations should examine the potential of family problem solving communication as a family resource for adaptation in different contexts of adversity (e.g., economic hardship, health chronic conditions, and refugee resettlement). The FPSC can thus contribute to the development of empirical studies in the family resilience field and may provide practitioners with a scientific basis for the potential relevance of working with family problem solving communication patterns with families facing specific risk situations. Additionally, researchers using the FPSC should consider collecting information from multiple family members and should use data analysis strategies that account for the relational nature of the data, such as multilevel modeling and social relations modeling (Card and Barnett 2015).

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Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no competing interests.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Name of the university that provided IRB approval for this study: Faculty of Psychology and Education Sciences, University of Coimbra

Informed Consent Informed consent was obtained from all individual participants included in the study. [However, participants were not asked to sign any declaration in accordance with the APA Ethical Principles of Psychologists and Code of Conduct (8.05 Dispensing with Informed Consent for Research)].

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