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ORIGINAL PAPER

Rethinking the Self-Report Family Inventory-Version II (SFI-II): Factor Structure and Psychometric Properties of the Portuguese Version

Henrique Testa Vicente[1,2] · Fernanda Daniel[1,3] · Joana Sequeira[1,2,4] · Robert Hampson[5]

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Abstract

This study addresses the factor structure and psychometric properties of the Self-Report Family Inventory-Version II (SFI-II) for a Portuguese sample. Based on the Beavers Systems Model, the SFI-II is a brief screening instrument, with 36 items that measure family competence, family style and other related domains. The SFI-II and several criterion scales were administered to a heterogeneous sample of 1083 individuals with ages ranging from 12 to 83 years old. In contrast with the original five-factor structure, but aligned with more recent findings, factor analysis showed that two factors could be meaningfully extracted. Additionally, analyses suggest that the SFI-II is a valid and reliable measure of family functioning. The authors propose a critical reading of the scale's bifactorial structure and its connection with the underlying theoretical model. The SFI-II appears to be a promising measure of family competence, with clinical and research applicability.

Keywords Self-Report Family Inventory · Family competence · Family assessment · Factor analysis · Validation

Introduction

Well-validated psychometric instruments designed to measure family functioning are essential in promoting quantitative family research and epidemiological studies, as well as providing practitioners and clinicians with tools to assess intervention outcomes (Pritchett et al., 2011). Family systems theory and practice have a long and rich history in Portugal, dating back to the inception of the Portuguese Family Therapy Society in the 1970s and to the development of training programs, courses and research projects, in universities throughout the country (Relvas et al., 2013). However, there is a scarcity of family focused self-report measures that persists well into the twenty-first century (Gomes et al., 2019; Relvas & Major, 2014). Several instruments have been developed and validated to assess family functioning (Relvas & Major, 2014), but most focus on one specific area of family dynamics, such as marital dyadic adjustment or parent–child relations (e.g. Gomez & Leal, 2008; Portugal & Alberto, 2014). Measures of global and complex family functioning which examine families as systemic wholes, are still lacking for Portuguese families. A Portuguese version of the Family APGAR (Smilkstein, 1978) has been available since the late 1980s (Agostinho & Rebelo, 1988) and, more recently, the Family Adaptability and Cohesion Evaluation Scale—version IV (FACES IV) (Gomes et al., 2019; Pereira & Teixeira, 2013; Sequeira et al., 2021), a multidimensional family functioning assessment instrument based on the Circumplex Model of Marital and Family Systems (Olson & Gorall, 2003; Olson et al., 1979), was also validated. These studies constitute a step forward in addressing the above-mentioned limitations, but the complexity of family functioning calls for a greater diversity of available measures. Despite its overall good psychometric properties, the Portuguese FACES IV has limitations in assessing unbalanced family functioning (namely enmeshed and rigid functioning), requiring additional studies with specific populations (Gomes et al., 2019; Pereira & Teixeira, 2013;

✉ Henrique Testa Vicente
henrique.t.vicente@gmail.com

1 Miguel Torga Institute of Higher Education, Largo da Cruz de Celas No 1, 3000-132 Coimbra, Portugal

2 Research Centre for the Study of Population, Economy and Society, Porto, Portugal

3 Centre for Health Studies and Research of the University of Coimbra, Coimbra, Portugal

4 Portuguese Society of Family Therapy, Lisbon, Portugal

5 Psychology Department, Southern Methodist University, Dallas, TX, USA

Sequeira et al., 2021). Therefore, Portuguese practitioners and researchers would benefit from the development of instruments that provide a reliable way to assess family dysfunction and/or changes in functioning. The availability of measures anchored on different theoretical models could also promote critical debate and contribute to the evolution of knowledge in the field of family psychology and systemic family therapies.

The Self-Report Family Inventory (SFI) (Beavers et al., 1985) is an instrument based on the Beavers Systems Model of Family Functioning (Beavers, 1982; Beavers & Hampson, 1993). Designed as a self-assessment measure of constructs associated with the model, it provides a brief screening device for potential family dysfunction and can be used independently or together with the Beavers clinical and observational rating scales (Beavers & Hampson, 1993; Tutty, 1995).

The Beavers Systems Model has two primary dimensions: family competence and family style. Family competence relates to behavioural functioning and adaptive flexibility of the system (Beavers & Hampson, 2000), theoretically ranging from severely dysfunctional to adaptive, competent systems. Family style relates to patterns of internalizing (Centripetal) or externalizing (Centrifugal) family behavioural and emotional themes. Extreme, rigid styles are present in the most dysfunctional families, while blended/mixed style is characteristic in more competent families (Beavers & Hampson, 1993).

The SFI accesses family members' perceptions of family competence, family style and other related domains, and is simple to complete, even by children aged 10 or 11 years (Beavers & Hampson, 1993). It includes a dedicated health/competence score, a cohesion score which is used as proxy measure of family style, and other clinically useful subscales of conflict resolution, leadership and emotional expressiveness (Beavers & Hampson, 1993). According to Beavers and Hampson (2000, p. 136), the health/competence subscale includes items pertaining "family affect, parental coalitions, problem-solving abilities, autonomy and individuality, optimistic versus pessimistic views, and acceptance of family members"; the cohesion subscale addresses themes related to style, including content items dealing with "family togetherness, satisfaction received from inside the family versus outside, and spending time together"; the conflict subscale addresses "overt and covert conflict, including arguing, blaming, fighting openly, acceptance of personal responsibility, unresolved conflict, and negative feeling tone"; the leadership subscale encompasses items that focus on "parental leadership, directiveness, and degree of rigidity of control"; the emotional expressiveness subscale items deal with "verbal and nonverbal expression of warmth, caring and closeness".

Cronbach's alpha for the SFI total score is reported as between 0.84 and 0.93 (Beavers & Hampson, 2000; Green & Bagarozzi, 1987; Grotevant & Carlson, 1989; Tutty, 1995). However, in a study that estimated criterion and construct validity of the SFI, Green (1989) identified several issues regarding the psychometric properties of its subscales. Internal consistencies for the subscales varied considerably, with leadership and communication presenting unacceptable alphas. The Cronbach alphas for the different subscales ranged between: 0.87 and 0.92 for health; 0.85 and 0.89 for conflict; 0.10 and 0.49 for communication; 0.44 and 0.66 for cohesion; 0.06 for leadership; 0.77 and 0.81 for expressiveness. According to Green (1989), the low internal consistency of the leadership and communication subscales could be related to the limited number of items on each of those scales.

Temporal stability of the SFI factors has been demonstrated for one and three month intervals (Beavers & Hampson, 1990). Convergent validity with other self-report instruments that focus conceptually similar domains is positive. These include FACES II and FACES III, Family Environment Scale (FES) and the Family Assessment Device (FAD) (Beavers & Hampson, 1990; Hampson et al., 1988, 1991). More recent studies show statistically significant associations between the SFI Health/Competence subscale and both FACES IV balanced scales (cohesion and flexibility) (Olson, 2011; Sequeira et al., 2021).

Discriminant validity of the SFI has been demonstrated in several studies (e.g. Green, 1989; Hampson et al., 1988). Green (1989) reported that the instrument was able to differentiate clinical from nonclinical groups (clinical families collected in an adolescent inpatient psychiatric unit; nonclinical families recruited randomly from the records of a school district). The statistically significant negative associations of the SFI total score with selected instruments from the Hudson Clinical Measurement Package (Generalized Contentment Scale, Index of Self-Esteem, Parent's Attitude toward Child and Child's Attitude toward Mother) (Hudson, 1982) were consistent with the theoretical proposition that members of optimal functioning families are less likely to experience problems in psychosocial functioning and parent–child relations. It should be noted that this study found FACES III to be less effective than the full-scale SFI and some of its subscales in discriminating clinical and nonclinical groups, but also that the SFI communication, cohesion and leadership subscales had inadequate discriminant abilities (Green, 1989).

The SFI has also been shown to predict outcomes in marital and family therapy (Hampson & Beavers, 1996; Hampson et al., 1999), attesting its usefulness in initial family and couple evaluations. Hampson and Beavers (1996) found that self-rated family competence by mothers and fathers at treatment outset was a significant predictor of goal attainment

rated by therapists at the completion of treatment (which, in turn, was highly correlated with family ratings of goal attainment and gains in observational ratings). Families that met some or most goals during therapy were the ones that scored at the most competent levels on the Health/Competence subscale during pre-therapy assessments. The same trend was found in a marital therapy setting (Hampson et al., 1999), where high levels of self-rated competence in couples presented the best results in therapy.

Even though there is ample support for the SFI as an adequate measure of family health/competence, it appears that family style, the other clinically significant dimension of the Beavers Model, is more difficult to measure by self-assessment (Hampson et al., 1988). If the cohesion score was effectively an accurate estimate of style, it would be expected a curvilinear relation of this subscale with healthy family functioning. But SFI cohesion and health/competence subscales appear to correlate in a highly directional and direct manner, leading the authors to question whether the first is actually assessing elements of family style, or just emotional and proximal closeness associated with general family functioning (Hampson et al., 1989).

In summary, the reliability and validity of the SFI as a measure of family competence has been demonstrated in multiple studies. However, support for its original subscales/dimensions and ability to tap family style is scant, underscoring the necessity of a more thorough consideration of its factor structure.

Factor analysis of the original 44-item scale yielded four factors: health (33 items), expressiveness (5 items), leadership (2 items) and style (3 items) (Beavers et al., 1985). With this larger version (Hampson & Beavers, 1987) and with the latter revised 36-item version (SFI-II), authors reported the extraction of a consistent six-factor solution through serial factor analysis (Hampson et al., 1989, 1991), but Beavers and Hampson (1990) suggested that the instrument taps five areas of family functioning: health/competence (19 items), conflict (12 items), cohesion (5 items), leadership (3 items), and emotional expressiveness (5 items).

More recent studies have questioned the multidimensionality and factor structure of the SFI (Goodrich et al., 2012; Shek, 1998, 2001), signalling inconsistencies on the number of factors reported. While working on the Chinese version of the Self-Report Family Inventory (C-SFI), Shek (1998) identified several issues in the literature concerning the instrument factor structure: (i) lack of technical details about the factor analysis performed; (ii) findings almost exclusively reported by researchers who developed the test; (iii) research on factor structure restricted to adults and college students; (iv) questionable empirical support for the multidimensionality of the instrument, with several items used to compute more than one subscale, some items not included in any subscale, and an extremely limited number of items in some subscales, that raise questions about the stability of underlying constructs. As previously mentioned, Green (1989) also reported the unacceptable reliability and questionable validity of some subscales, recommended that future use of the instrument should be restricted to full-scale scores and health/competence and conflict subscales, and suggested caution in interpreting the remainder subscales' results.

Through principal component analysis (PCA) with varimax rotation and inspection of the scree plot, Shek (1998) identified a bifactorial solution: family health and family pathology, subsequently renamed positive family behaviour and negative family behaviour (Shek, 2001). These findings were supported a decade later by Goodrich et al. (2012). The SFI-II factor structure was then studied by exploratory factor analysis (principal axis factoring) followed by an oblique rotation (Promax with Kaiser Normalization), visual inspection of the scree plot and of the item content for each factor. Results provided additional support for the two-factor solution advanced by Shek (1998, 2001), that the authors labelled "positive and negative aspects of family functioning" (Goodrich et al., 2012, p. 252). However, Goodrich et al. (2012) reckoned that a third factor should be carefully considered in future research, and highlighted the need to conduct additional analysis with different populations to assess the stability and consistency of the bifactorial solution, besides confirmatory factor analysis and convergent validity studies with other measures of family functioning.

Considering that the SFI-II fares well in accuracy and consistency when compared to other measures of family functioning (Green, 1989), and its potential utility for clinical and research purposes, this paper aims to present the results of its translation, cultural adaptation and validation for the Portuguese population. We will focus the instruments' factor structure, psychometric properties (internal consistency, convergent validity and discriminant ability) and relation with sociodemographic and family variables. Particular attention will be paid to family subsystem membership and life cycle stage, as there are evidences of differences in SFI-II scores between family members (e.g. parents and children) (Hampson et al., 1988) and the developmental period one is asked to rate (Hampson et al., 1994).

Methods

Participants

Snowball sampling procedures were used to recruit participants, starting from a seed of 55 graduate and undergraduate Psychology students. A total of 1083 individuals from 387 nuclear families submitted the questionnaires. These had an average age of 36.26 years ($SD = 15.045$; Min = 12 and

Max = 83). More details regarding sociodemographic and family variables are presented in Table 1.

Procedure

Permission was granted from the authors of the original SFI-II to translate and validate the scale for the Portuguese population. The translation process followed the guidelines for the process of cross-cultural adaptation recommended by Beaton et al. (2000) in order to preserve content validity. This process included six independent translators with extensive knowledge in Psychology and awareness of the concepts underlying the SFI-II (some of them senior family therapists of the Portuguese Family Therapy Society) that produced a unanimous translation (T1). At the same time, a naive translator who was unaware of the concepts, produced a second translation (T2). Both sets of translators met and compared their results, reaching consensus regarding one common translation (T-12). Two back-translations of this version were produced by two English-speaking lay persons (BT1 and BT2). Finally, an expert committee (methodologists, psychotherapists, and translators) analyzed the original questionnaire and each translation, discussed discrepancies in the back translations, and reached a final consensual version.

Data collectors underwent a brief course that addressed the instruments' objectives and guidelines for correct administration. Permission from the ethics committee of the Miguel Torga Institute of Higher Education was granted and all participants aged + 18 signed an informed consent form as did parents/legal guardians for underage participants. The paper-and-pencil protocol was handed to each family member individually and returned to the research team in an unidentified envelope, thus preventing that respondents from the same family unit influenced one another, and guaranteeing anonymity in data collection and analysis procedures.

Table 1 Sociodemographic and family characteristics of participants

	n	%		n	%
Gender			Income (in Euros)		
Female	583	53.8	≤ 635[a]	78	10.5
Male	500	46.2	636–1270	222	29.8
Age			1271–1905	218	29.2
≤ 14	55	5.1	1906 +	228	30.6
15–24	285	26.3	Marital status		
25–64	721	66.6	Single	408	37.7
65 +	21	1.9	Married (or Cohabiting)	577	53.3
Education			Divorced (or Separated)	73	6.8
Without formal education	6	0.6	Widowed	24	2.2
1st cycle	66	6.1	Family life cycle stage[b]		
2nd cycle	118	10.9	Young couple without children	60	5.5
3rd cycle	222	20.5	Childbearing stage	52	4.8
Secondary	388	35.8	Family with school-age children	83	7.7
Higher education	280	25.9	Family with adolescentes	166	15.3
Employment status			Family with adult children	722	66.7
Student	322	29.7	Family subsystem		
Unemployed	41	3.8	Parental subsystem[c] (may also be part of a conjugal subsystem)	594	54.8
Retired	35	3.2	Filial subsystem (may also be part of a fraternal subsystem)	390	36.0
Working/employed	681	62.9	Conjugal subsystem (only)	99	9.1
Residence					
City (Urban)	488	45.1			
Town or village (Rural)	595	55			

[a]Portuguese minimum wage

[b]Following the stage subdivisions used byRelvas (1996)

[c]The parental subsystem is usually made up of adults belonging to the conjugal subsystem, in charge with the task of educating and protecting younger generations. But this subsystem varies in composition and may include grandparents, uncles or godparents (Alarcão, 2000)

Measures

SFI-II

The SFI-II is a 36-item measure, modified from an earlier 44-item version (Tutty, 1995), of perceptions of family functioning in five areas: Health/Competence, Conflict, Cohesion, Leadership, and Emotional Expressiveness (Beavers & Hampson, 1990). Participants are requested to judge the extent to which the items accurately describe their family situation on a 5-point Likert scale—"fits our family very well" (1) to "does not fit our family" (5)—and total scores range from 36 to 180. Lower scores represent healthier family functioning.

The Portuguese translation of the SFI-II used in this study revealed a Cronbach alpha value of 0.94 for the total scale and for the remainder subscales produced the following results: Health/Competence = 0.91; Conflict = 0.86; Cohesion = 0.66; Leadership = 0.28; Emotional Expressiveness = 0.81.

FACES IV package

The Family Adaptability and Cohesion Evaluation Scale (FACES) IV (Olson, 2011) is the latest version of a self-report inventory designed to address the two central dimensions of the Circumplex Model of Marital and Family Systems: cohesion and flexibility. The FACES IV package includes six scales, two balanced and four unbalanced, the last designed specifically to address very low and high levels of cohesion (disengaged and enmeshed) and flexibility (rigid and chaotic). Each of these scales comprises seven items. This family assessment package also includes the companions Family Communication Scale (FCS) and Family Satisfaction Scale (FSS).

According to the original validation studies, reliability for the six scales (Cronbach's alpha) was very good: balanced cohesion = 0.89; balanced flexibility = 0.84; enmeshed = 0.77; disengaged = 0.87; chaotic = 0.86; rigid = 0.82. A confirmatory factor analysis was performed to assess FACES IV scales, and the resulting fit statistics indicated an acceptable model (Olson, 2011). Portuguese validations also indicate that FACES IV is a valid measure of family functioning (Gomes et al., 2019; Pereira & Teixeira, 2013; Sequeira et al., 2021). However, some psychometric issues were found in the unbalanced scales, particularly in the enmeshed and rigid scales, with alpha values bellow 0.70 (Pereira & Teixeira, 2013). Lower alpha values for these scales were also found in the Italian and Hungarian validation studies (Baiocco et al., 2013; Mirnics et al., 2010). Besides these issues concerning internal consistency, the four unbalanced scales of the Portuguese version also revealed less discriminant abilities than the two balanced scales (Pereira & Teixeira, 2013). For these reasons, we opted to use only the two balanced scales of FACES IV, that consistently reveal overall better psychometric properties, for the purposes of comparison and validation.

The FCS includes ten items that assesses communication in family systems, a facilitating dimension in the Circumplex Model that enables families and couples to move on the other two dimensions (flexibility and cohesion), with balanced systems having better communication (Olson, 1993; Olson & Gorall, 2003). Alpha reliability of the Portuguese version of the FCS is reported between 0.89 (Pereira & Teixeira, 2013) and 0.92 (Gomes et al., 2019).

The FSS is a ten item self-report measure designed to assess the level of satisfaction that family members have regarding family functioning. For this scale, Olson (2011) reports an alpha value of 0.93, and the Portuguese validation studies also revealed excellent internal consistency, with values ranging from 0.93 (Pereira & Teixeira, 2013) to 0.95 (Gomes et al., 2019).

APGAR

The Family APGAR is a very brief screening instrument developed by Smilkstein (1978), which provides a general overview of the respondent's perception of family functioning (Grotevant & Carlson, 1989). It includes five questions that measure five components of family functioning: Adaptation (family problem solving resources), Partnership (decision making and responsibility sharing), Growth (mutual support in maturational processes), Affection (family reactions to emotional expression) and Resolve (commitment to devote time to family members) (Smilkstein, 1978). The APGAR is not designed to measure whole-family functioning, so it is not appropriate to assess complex family functioning variables, such as enmeshment (Grotevant & Carlson, 1989). It is more appropriate to assess family affect, such as satisfaction (Andrade & Martins, 2011). Cronbach alphas range from 0.80 to 0.86 (Smilkstein et al., 1982), and the scale has adequate discriminant abilities (Good et al., 1979). Good et al. (1979) also found construct-related validity, suggesting that the APGAR is a reliable and valid measure of family function that can be used in both clinical and research contexts. The Portuguese version was translated and validated by Agostinho and Rebelo (1988). In the current study, we found good internal consistency reliability properties, with a Cronbach alpha value of 0.77.

Data Analysis

All data analyses were performed with the Statistical Package for the Social Sciences (SPSS), version 25. The instrument factor structure was studied using PCA with Varimax Rotation. Kaiser–Meyer–Olkin (KMO) and Bartlett's

sphericity tests were used to determine adequacy of the data set for factor analysis. Several criteria were used to determine the number of factors: visual inspection of the scree plot; analysis of factors with eigenvalues exceeding the unity; parallel analysis (using principal axis factoring) and Velicer's Minimum Average Partial test were conducted (O'Connor, 2000); visual inspection of item content to assess if the extracted factors were meaningful; comparison with other SFI-II factor solutions reported in the literature. Since factor analysis methods assume independence of responses across participants, and considering that in our sample some individuals share the same family milieu, only responses from mothers ($n = 322$) were used during this stage of data analysis. All the remaining statistical procedures involved the entire data set.

Internal consistency was evaluated with Cronbach's alpha. Descriptive statistics were calculated for both sociodemographic variables and SFI-II scores. Differences in SFI-II scores according to sociodemographic and family variables were assessed using Student *t* tests (two groups) and unidirectional ANOVAs/Welch (more than two groups) followed by Tukey HSD/Games-Howell post-hoc tests. Pearson correlation coefficients were calculated to evaluate statistically significant associations between the SFI-II and the criterion scales. Finally, for assessing the instruments' predictive validity in tapping problematic family functioning, a discriminant analysis was performed. Results with *p* values < 0.05 were considered statistically significant.

Results

Factor Analysis

An exploratory factor analysis was carried out to analyse the dimensional structure of the Portuguese version of the SFI-II. The KMO value was 0.94, indicating that data was suited for factor analysis (Marôco, 2011). Bartlett's test of sphericity has a value of $\chi 2 = 5078.89$ ($p < 0.001$). This indicates that our variables are significantly correlated and therefore suited for structure detection. PCA indicated six factors with eigenvalues superior to the unity (Kaiser criterion), which explained 54.10% of the variance. However, visual inspection of the scree plot and of the last substantial drop in the magnitude of eigenvalues suggested the extraction of two or three primary factors.

We tried several solutions (between three and six factors) with PCA followed by Varimax Rotation and analysed item content for each factor, comparing our findings with the five-factor solution reported by Beavers and Hampson (1990). Given the lack of correspondence between the extracted factors and the original subscales, and to avoid over-factoring, we opted for the two-factor solution that is increasingly gaining empirical support. Table 2 presents the varimax rotated factor structure of the SFI-II. Following the guidelines of Hair et al. (2010), and taking into account our sample size, factor loadings of ± 0.35 were considered significant. The primary or highest factor loading was considered in cross-loading cases. The decision to retain all items (including those with cross-loadings) stemmed from the fact that the resulting factor matrix had both empirical and conceptual support (Hair et al., 2010). The first factor includes 22 items, explaining 33.91% of the variance. The second

Table 2 Factor loadings for the bifactorial solution

	Factor			Factor			Factor	
	1	2		1	2		1	2
SFI 1	**0.62**	0.49	SFI 13	0.27	**0.38**	SFI 25	0.22	**0.65**
SFI 2	**0.37**	0.32	SFI 14	0.28	**0.72**	SFI 26	**0.65**	0.00
SFI 3	**0.61**	0.36	SFI 15	**0.35**	0.07	SFI 27	0.27	**0.52**
SFI 4	**0.53**	0.36	SFI 16	**0.55**	0.01	SFI 28	**0.69**	0.36
SFI 5	0.14	**0.58**	SFI 17	**0.60**	0.35	SFI 29	**0.59**	0.27
SFI 6	**0.60**	0.05	SFI 18	0.25	**0.63**	SFI 30	0.44	**0.51**
SFI 7	**0.53**	0.06	SFI 19	0.31	**0.60**	SFI 31	0.20	**0.68**
SFI 8	0.27	**0.52**	SFI 20	**0.64**	0.40	SFI 32	− 0.09	**0.42**
SFI 9	**0.67**	0.26	SFI 21	**0.61**	0.43	SFI 33	**0.64**	0.35
SFI 10	0.16	**0.74**	SFI 22	**0.63**	0.29	SFI 34	**0.58**	0.18
SFI 11	**0.42**	− 0.30	SFI 23	− 0.01	**0.61**	SFI 35	**0.53**	0.41
SFI 12	**0.61**	0.31	SFI 24	0.29	**0.40**	SFI 36	**0.35**	0.16

Bold values indicate primary or highest factor loadings

PCA with Varimax rotation and Kaiser normalization

factor comprises the remaining 14 items and accounts for 7.02% of the total variance.

Our solution coincides well with Shek's bifactorial structure (2001), with all the items loading on exactly the same factors, and also shows several similarities with Goodrich et al. (2012) factor matrix. All the items included in Factor 1 are scored in a linear positive direction, and the items in Factor 2 are scored in a linear negative direction. As such, lower scores on the complete SFI-II scale and both its subscales represent greater family competence.

The distribution of subscale items on the two factors follows a distinct pattern. Factor 1 includes 74% of the items that originally belonged to the Health/Competence subscale (optimism, closeness, happiness and family love, problem solving and listening skills, tolerance of individuality). Factor 2 includes 75% of the items attached to the Conflict subscale (overt conflict, blaming and arguing, favouritism and confusion, sadness and poor problem solving).

Items from the original Conflict subscale that loaded on Factor 1 focus on allowance for individuality and tolerant attitudes that minimize conflict, and on the assumption of personal responsibility for one's behaviour that might prevent blaming (*we accept each other's friends*; *each person takes responsibility for his/her behaviour*). Factor 1 items from the original Cohesion subscale point to a sense of group togetherness, closeness and proximity between family members associated with positive functioning, and to the satisfaction with the family as a supportive environment (*our family would rather do things together than with other people*; *our happiest times are at home*; *family members rely on each other*). The only Factor 1 item from the original Leadership subscale deals with shared, egalitarian leadership (*the grownups in this family are strong leaders*). Factor 1 items from the original Expressiveness scale involve feelings of closeness and a sense of effortlessness in the overt expression of caring and warmth (*family members pay attention to each other's feelings*; *our family members touch and hug each other; our family is proud of being close*; *family members easily express warmth and caring towards each other*).

Items of the Health/Competence and Cohesion subscales included in Factor 2 address blaming and scapegoating, individualism, and a manifest preference for seeking satisfaction from the outside world, to the detriment of the family environment (*we usually blame one person in our family when things aren't going right*; *family members go their own way most of the time*; *one of the adults in this family has a favourite child*; *when things go wrong we blame each other*; *our family members would rather do things with other people than together*). The Leadership subscale items in Factor 2 focus on the negative consequences of a leaderless family (power vacuum), and on the authoritarian/dictatorial exercise of power and control (*there is confusion in our family because there is no leader*; *one person controls and leads our family*). Lastly, the only item of the Expressiveness subscale assigned to Factor 2 addresses difficulties in emotional expression (*when we feel close, our family is embarrassed to admit it*).

Internal Consistency and Convergent Validity

Reliability analysis showed excellent to very good internal consistency, with Cronbach's alphas ranging from 0.94 for the full scale, 0.92 for the SFI-II Factor 1, and 0.88 for the SFI-II Factor 2. Correlations between the two factors and the SFI-II total score are very high (0.94 for Factor 1 and 0.88 for Factor 2). A moderate positive correlation was found between the two factors (0.65) (see Table 3).

As for the results of convergent validity analyses, both the SFI-II total score and the two factors correlated significantly with all the criterion scales. Higher correlation values were found for the SFI-II total score (range: − 0.73 with FSS to − 0.64 with APGAR), followed by Factor 1 (range: − 0.70 with FACES IV Balanced Cohesion scale and FSS, to − 0.61 with FACES IV Balanced Flexibility scale) and Factor 2 (range: − 0.61 with FSS to − 0.52 with APGAR) (see Table 3).

Sociodemographic Variables and Family Functioning Perception

No differences were found in the SFI-II results according to gender, even though women tend to report better family functioning. Regarding age, participants in the 35–44 years old range tend to perceive better family functioning than

Table 3 Descriptive statistics, reliability of SFI-II (sub)scales, and correlations with criterion scales

	M	*SD*	*α*	SFI Factor 1	SFI Factor 2	SFI total score	FACES IV balanced cohesion	FACES IV balanced flexibility	FCS	FSS	APGAR
SFI Factor 1	46.09	12.89	0.92	–	0.65*	0.94*	− 0.70*	− 0.61*	− 0.69*	− 0.70*	− 0.62*
SFI Factor 2	27.74	9.28	0.88		–	0.88*	− 0.60*	− 0.56*	− 0.55*	− 0.61*	− 0.52*
SFI total score	73.73	20.19	0.94			–	− 0.72*	− 0.65*	− 0.70*	− 0.73*	− 0.64*

*Correlation is significant at the 0.01 level (2-tailed)

younger and older counterparts (Factor 1 and SFI-II total score). Younger participants identify more family dysfunctionality than their older counterparts (Factor 2). Perception of family dysfunctionality is lowest among the 25–44 age range. Finally, those that are employed and have attained higher education degrees perceive better family functioning than those who are students and have less educational attainment (see Table 4).

Family Subsystems and Life Cycle Stages

Parents rated families as significantly better functioning than did children rating their families (note that these were not necessarily members of the same families). Families with school-aged children had more competent ratings than did families with adult-age offspring (Factor 1, Factor 2 and SFI-II total score). Adults with school-aged children had more competent ratings than adults with adolescent-aged children (Factor 2). However, it may be possible to identify an evolutive pattern: family functioning is lowest in the first stage (couples without children), increasing until reaching its peak in the family with school-age children, then progressively decreasing in the subsequent stages, reaching its lowest values in the family with adult children stage (see Table 5).

Discriminant Analysis

To assess the capacity of the SFI-II in discerning problem from non-problem families, a discriminant analysis was conducted with the results of the SFI-II factors and criterion scales. Since our sample was drawn from the general population and no specific criteria or symptoms were evaluated, we followed the procedure used by Olson (2011) in the FACES IV validation study. We created groups based on the scores that participants obtained in different family assessment measures. When participants scored in the top 50% or 40% (healthiest) on these scales, they were classified

Table 4 Sociodemographic differences for SFI-II (sub) scale(s)

	SFI		
	Factor 1	Factor 2	Total score
	M (*SD*)	*M* (*SD*)	*M* (*SD*)
Gender			
Male	46.83 (13.27)	28.30 (9.54)	75.05 (20.84)
Female	45.46 (12.53)	27.25 (9.04)	72.59 (19.57)
t (sig.)	1.73^{ns}	1.86^{ns}	1.99^{ns}(0.047)
Age			
≤ 24[1]	46.84 (12.95)	29.11 (9.55)	75.95 (20.72)
25–34[2]	46.16 (11.93)	26.72 (8.69)	72.83 (18.64)
35–44[3]	42.57 (12.80)	25.24 (8.39)	67.74 (19.46)
45 ≥ [4]	47.03 (13.04)	28.12 (9.44)	74.95 (20.21)
F/Welch	5.58**	7.79**	7.27**
Tukey HSD/Games-Howell	1 vs. 3; 2 vs. 3; 3 vs. 4	1 vs. 2; 1 vs. 3; 3 vs. 4	1 vs. 3; 3 vs. 4
Employment status			
Working/employed[1]	45.30 (12.73)	26.77 (9.09)	71.98 (19.77)
Student[2]	46.99 (12.94)	29.35 (9.43)	76.32 (20.64)
Unemployed[3]	48.98 (13.86)	29.17 (9.32)	78.15 (21.32)
Retired[4]	50.35 (13.36)	29.85 (8.83)	79.52 (19.65)
F	3.30*	6.74**	5.04**
Tukey HSD		1 vs. 2	1 vs. 2
Education			
≤ 1st Cycle[1]	48.59 (15.07)	30.49 (10.65)	78.82 (23.61)
2nd cycle, 3rd cycle and secondary[2]	46.68 (13.00)	28.23 (9.30)	74.80 (20.22)
Higher education[3]	44.04 (11.81)	25.84 (8.56)	69.88 (18.69)
F/Welch	5.64**	10.13**	8.36**
Tukey HSD/Games-Howell	1 vs. 3; 2 vs. 3	1 vs. 3; 2 vs. 3	1 vs. 3; 2 vs. 3

*$p < 0.05$

**$p < 0.01$

Superscript numbers refer to multiple comparison tests

Table 5 Perception of family functioning according to family subsystem membership and life cycle stage

	SFI		
	Factor 1	Factor 2	Total score
	M (*SD*)	*M* (*SD*)	*M* (*SD*)
Family subsystem			
Parent[1]	45.06 (12.55)	26.92 (9.02)	71.85 (19.51)
Child[2]	47.32 (12.87)	29.06 (9.48)	76.37 (20.41)
Couple[3]	47.38 (14.44)	27.38 (9.59)	74.47 (22.28)
F	4.16*	6.36**	5.98**
Tukey HSD/Games-Howell	1 vs. 2	1 vs. 2	1 vs. 2
Life cycle stage			
Young couple without children[1]	46.93 (13.75)	25.98 (8.28)	72.93 (20.88)
Childbearing stage[2]	44.04 (10.63)	26.78 (9.46)	70.61 (17.43)
Family with school-age children[3]	41.09 (12.82)	23.89 (7.97)	64.70 (18.68)
Family with adolescents[4]	44.96 (11.95)	26.51 (8.75)	71.48 (19.17)
Family with adult children[5]	47.00 (13.05)	28.68 (8.75)	75.57 (20.40)
F/Welch	4.72**	6.92**	6.50**
Tukey HSD/Games-Howell	3 vs. 5	3 vs. 5; 4 vs. 5	3 vs. 5

*$p < 0.05$

**$p < 0.01$

Superscript numbers refer to multiple comparison tests

as a "non-problem group"; those whose scores fell in the bottom 50% or 40% (most problematic) were included in a "problem group".

SFI-II (sub)scale(s) presented discriminant validity, with a range of correct placement between 71.9 and 84.4%. The best results were found in the top versus bottom 40% groupings. Discriminant ability was highest for the total score (average predictive accuracy of 79.0%), followed by Factor 1 (77.7%) and Factor 2 (74.8%) (see Table 6).

Discussion

One of the main purposes of this study concerned the assessment of the SFI-II factor structure. In line with previous studies (Goodrich et al., 2012; Shek, 1998, 2001), we found no empirical support to the instrument authors' five-factor solution (Beavers & Hampson, 1990).

Taking a closer look at the original definition of family competence proposed by Beavers and Hampson (1993), we find that it encompasses every dimension that the SFI-II purports to evaluate. The authors associate family competence with "how well the family, as an interactional unit, performs the necessary and nurturing tasks of organizing and managing itself" (Beavers & Hampson, 1993, p. 74). This overarching concept includes several dimensions, such as: family structure (e.g. egalitarian leadership, strong parental or adult coalitions, clear generational boundaries), autonomy development of its individual members (e.g. ability to resolve or accept differences), conflict/problem solving and communication skills, and spontaneity in emotional expression. If we take into consideration the different subscales' item content described previously, it is easy to find them closely associated with the Beavers Model central concept of family competence. In this sense, even though Beavers and Hampson (1993, p. 76) affirm that the SFI-II "is able

Table 6 Discriminant analysis of "problem" and "non-problem" families

Scale	*n* for each group		SFI		
	Top	Bottom	Factor1	Factor 2	Total score
FCS					
Top versus bottom 50%	478	514	77.2	74.6	77.9
Top versus bottom 40%	354	360	83.2	79.3	84.4
FSS					
Top versus bottom 50%	537	485	76.7	71.9	76.2
Top versus bottom 40%	423	428	79.9	75.6	80.6
APGAR					
Top versus bottom 50%	357	533	76.7	74.3	79.1
Top versus bottom 40%	357	286	76.7	75.6	79.3
FACES IV balanced cohesion					
Top versus bottom 50%	400	516	78.7	74.8	79.1
Top versus bottom 40%	400	387	80.3	76.0	81.1
FACES IV balanced flexibility					
Top versus bottom 50%	406	528	72.4	73.0	75.3
Top versus bottom 40%	406	383	75.5	72.6	77.2

Percent accuracy in discriminating groups

to access individual family members' perceptions of family competence, style, and several related domains", it's probable that this 36-item questionnaire mainly addresses family competence.

Consistent with previous findings (Goodrich et al., 2012; Shek, 1998, 2001), we found two factors comprising the SFI-II. This conclusion stemmed from the results of the PCA and visual inspection of the scree plot, as well as from the analysis of correlations between the factors. Both factors presented very high correlation values with the total score, but revealed a more modest correlation value between them, suggesting that they have a certain degree of independence from one another.

The question then emerges on how these factors should be labelled, and if the existence of two factors simply reflects the "general valence" of the items, rather than two genuine dimensions of family functioning (Shek, 2001). Hence, is the construct of family competence, measured by the SFI-II, truly a multidimensional one? Initially, Shek (1998) proposed that the two SFI-II factors/subscales could be labelled "family health" and "family pathology", because they referred respectively to competent and dysfunctional family phenomena or patterns. In his second study, Shek (2001, p. 381) effectively tackled the issue of the scale's multi- or unidimensional properties, and suggested that "the perceptions of the presence and the absence of family problems may be an important psychological distinction for some people". To reflect the role of positivity and negativity of the items of the Chinese version of the SFI-II, Shek (2001) then renamed the factors/subscales "positive family behavior" and "negative family behavior".

Goodrich et al., (2012, p. 252) found that the content of the bifactorial solution is "broad in scope and less specific than the content in the factor solution proposed by the authors of the scale, but the two factors are clear in meaning and evidence for more than three factors was not found." Consequently, he opted to label the factors/subscales as "positive and negative aspects of family functioning". This reading suggests that the double factor structure of the SFI-II is tapping the extremes of the health/competence dimension of the Beavers Systems Model. Consequently, we could recommend labels based on the wordings used by the original authors (Beavers & Hampson, 1993): effective/healthy family functioning (Factor 1) and dysfunctional patterns (Factor 2); or, more simply, functional strengths (Factor 1) and weaknesses (Factor 2).

While Factor 1 does tap the major affective and behavioral domains of positive family functioning, the family Competence dimension of the Beavers model, there may be an alternative, yet plausible, interpretation of the Factor 2. This factor consists of items originally written by Beavers and Hampson (1990) to constitute behavioral elements of the Family Style dimension. This theoretical dimension represents extremes of Centripetal (internalizing, inner-focused, over-controlling) and Centrifugal (externalizing, acting-out, and rejecting) stylistic behavioral patterns. In the Beavers model, competent families have a healthy balance of stylistic forces, whereas rigidly extreme styles (Centrifugal or Centripetal) are evident in more dysfunctional families. Family Competence and Style, then, are inter-related rather than theoretically orthogonal.

Upon examining the items isolated within Factor 2, there are several items which tap the Centrifugal extreme: 5, 8, 10, 13, 14, 19, 23, 25, 27, 31. These items collectively suggest overt conflict, negative feelings, denial of closeness, distancing, and loud dissent. Other items on Factor 2 suggest the Centripetal extreme: 18, 24, 30, 32. These items collectively identify scapegoating, parent–child coalitions, internalized emotions, and marked dominance.

As suggested in previous literature and this study, Factor 2 could represent a dysfunctional family pattern, or a "negative competence" dimension. If that is the case, this factor should be linearly related in a negative direction to Factor 1, which is positive family competence. However, if Factor 2 is detecting elements of family style, there may be a curvilinear, or quadratic, relationship with Factor 1. In this instance, middle ranges of style would be associated with high levels of family competence, and extremely high and low scores on the majority of items on Factor 2 would be associated with low levels of competence. Future research or analyses may be able to address this issue.

Our second objective entailed the analysis of the SFI-II psychometric properties. Results of the internal consistency, convergent validity and discriminatory ability analysis, for both the complete scale and its two factors, suggest that the SFI-II is a valid and reliable measure of family competence. Shek (2001, p. 383) also concluded that the Chinese version of the SFI-II "has very good reliability status". In summarizing our findings, the SFI-II and its factors show excellent or very good Cronbach alpha values and statistically significant associations with healthy family functioning (measured by FACES IV balanced scales and APGAR), satisfaction (measured by the FSS and APGAR) and communication (measured by the FCC). Our results indicate very favourable discriminant ability properties, aligned with previous research that found the SFI-II to successfully predict therapeutic process outcome (Hampson & Beavers, 1996; Hampson et al., 1999) and discriminate problem from non-problem groups (Green, 1989). Nevertheless, further studies with diagnosed clinical and nonclinical samples are recommended.

Our study found a more favourable perception of family functioning among those who have higher educational attainment and were in the 35–44 years age range. There were also discrepancies between those who identified as parents vs. those who were offspring. These differences in

self-report responses of parents vs. children, and younger vs. older participants have also been found with other instruments (Margasiński, 2015; Olson et al., 1989; Tutty, 1995). Hampson et al. (1988) suggest that to reach a "common picture of the family" it is necessary to associate self-rating profiles with observational scales' results. A more comprehensive picture could effectively surface through data gathering from several perspectives (Tutty, 1995), and further research that simultaneously encompasses different members' viewpoints to form a family composite could be a useful tool for therapists. The SFI-II also appears to detect subtle shifts in family perspective related to changes in the family life cycle. There were some interesting differences between children, adolescents, and adult offspring, as well as newly-married vs. parents with children. It should be noted that these results were not longitudinal nor were raters from within the same families. Hence, variances contingent with family life cycle stage need to be taken into account when considering norms (Tutty, 1995).

Study Limitations

The large and heterogeneous sample of the Portuguese population is undoubtedly one of the major strengths of this study, allowing for robust findings. However, some groups may have been under-represented (e.g. divorced/separated or aged 65 or more) or overrepresented (e.g. members of families with adult children). Consequently, there is the need to replicate these findings and assess their generalizability in different Portuguese samples.

As mentioned above, the discriminant validity of the scale was assessed on a nonclinical population, with groups created based on the scores obtained in other family functioning measures. Therefore, studies should be conducted with clearly identified clinical populations of individuals, couples and families, including different psychiatric diagnoses and types of problems (e.g. violence, substance abuse, delinquency). Besides shedding light on the role that family competence plays in the development of child and adult psychopathology, these would contribute to the development of national norms with diverse populations. We also agree with Shek's (1998) conclusion that a confirmatory factor analysis should be employed to give more insights into the dimensionality of the SFI-II.

Implications for Practice and Research

In conclusion, the SFI-II appears to be a very promising measure of family competence, with clinical and research applicability, which might significantly contribute to fill a gap in the availability of valid family assessment instruments in Portugal (Gomes et al., 2019; Relvas & Major, 2014).

The Portuguese version of the SFI-II provides an index of family members' perceptions concerning their family's competence that is reliable and clinically useful. When combined with other family self-report measures, observational instruments and collaborative family assessment tools (such as the genogram or the ecomap), it can contribute to a multimethod, multilevel family systems evaluation protocol (Beavers & Hampson, 1990). The literature reports that the SFI-II can also be used to screen high-risk families and to evaluate the results of clinical interventions (Beavers & Hampson, 2000). Further studies should be conducted to assess the instrument's sensitivity to change or responsiveness.

Considering the SFI-II potential use for tracking changes in therapeutic processes, and the fact that it focus core dimensions of family functioning, it could play a significant role in research on evidence-based systemic family therapy approaches. Evidence-based practice relies on the integration of relevant scientific evidence with clinical expertise and patient characteristics, culture and preferences (American Psychological Association, Presidential Task Force on Evidence-Based Practice, 2016; Shedler, 2018). But, as Stratton (2016) has noted, research on the efficacy of systems family and couples therapy depends on the availability of appropriate measures. In a systematic review of self-report family assessment instruments, focusing their psychometric properties, clinical utility and theoretical underpinnings, Hamilton and Carr (2016) concluded that only five of the measures they reviewed were suitable for clinical use in family therapy: McMaster Family Assessment Device (FAD); Circumplex Model Family Adaptability and Cohesion Evaluation Scales (FACES-IV); Family Assessment Measure III (FAM III); Systemic Clinical Outcome Routine Evaluation (SCORE) and Beavers Systems Model SFI. The validated Portuguese version of the SFI-II could thus be a valuable asset to process-outcome and efficacy/effectiveness studies of specific systemic intervention programs in Portugal.

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Data Availability Research data are not shared.

Declarations

Conflict of interest Authors declare that they have no conflict of interest.

Ethical Approval Permission from the ethics committee of the Miguel Torga Institute of Higher Education was granted.

Informed Consent All participants signed an informed consent form.

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