



Family Adaptability and Cohesion Evaluation Scale – Version IV (FACES IV): Validation study in the Portuguese population

Journal:	<i>Journal of Marital and Family Therapy</i>
Manuscript ID	Draft
Manuscript Type:	Original Article
Keywords:	Assessment/Diagnosis < Clinical, Families < Populations, Classical < Theory/Model

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5 **IV (FACES IV): VALIDATION STUDY IN THE PORTUGUESE POPULATION**
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10 **ABSTRACT**
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12 The present study addresses the psychometric properties of the Portuguese translation and
13 adaptation of the Family Adaptability and Cohesion Evaluation Scale – version IV (FACES
14 IV). The sample included 1089 individuals from 387 nuclear families, with an average age
15 of 36 years. Besides its sociodemographic heterogeneity, the sample also included
16 participants in various stages of the family life cycle and belonging to different family
17 subsystems. We found overall good to moderate psychometric properties, namely adequate
18 internal consistency, convergent validity, and discriminant ability. However, rigid and
19 enmeshed scales presented weaker results. Normative expectations and cultural bias are
20 discussed. FACES IV appears to be a valid and reliable measure of family dynamics, suitable
21 for research and clinical purposes within the Portuguese context. However, further studies
22 need to be carried out regarding the instruments' properties in tapping extremely high
23 cohesion (enmeshment) and low flexibility (rigidity) levels.
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42 **Key-words:** Family Adaptability and Cohesion Evaluation Scale, Validation, Family
43 Functioning Assessment, Family Life Cycle
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10 **INTRODUCTION**
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12 This article presents the translation and validation of the FACES IV (Family
13 Adaptability and Cohesion Evaluation Scale – version IV) for the Portuguese population, a
14 self-report measure of family functioning based on the Circumplex Model of Marital and
15 Family Systems (Olson, Sprenkle, & Russell, 1979; Olson, 1993). From 1977 through 1999,
16 approximately 450 empirical studies and 75 reviews and commentaries were published
17 involving different FACES versions, making it one of the most widely used and studied
18 family/marital assessment instruments (Kouneski, 2000). Ever since its inception, both the
19 model and the scale were submitted to extensive revisions and alterations, which we will
20 briefly address.
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33 The Circumplex Model integrates three dimensions of family behavior, which
34 emerged from a conceptual clustering of more than fifty concepts (Olson et al., 1989; Olson,
35 1993) developed in different social science fields (e.g., Psychiatry, Sociology, Small-group
36 studies, Anthropology) to describe marital/family dynamics: *cohesion*, *flexibility*
37 (adaptability in earlier versions of the model), and *communication*. Family *cohesion* was
38 defined as “the emotional bonding that family members have toward one another”. The
39 variables or concepts used to diagnose and measure cohesion were “emotional bonding,
40 boundaries, coalitions, time, space, friends, decision making, and interests and recreation.”
41 The second dimension, family *flexibility* or adaptability, was defined as “the ability of a
42 marital or family system to change its power structure, and relationship rules in response to
43 situational and developmental stress.” The concepts used to measure and describe this
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3 dimension were taken from social science disciplines, particularly family sociology, and
4 included “family power (assertiveness, control, discipline), negotiation styles, role
5 relationships, and relationship rules” (Olson et al., 1989, p. 48). Finally, *communication* was
6 considered a facilitating dimension, allowing couples and families to move on the other two
7 dimensions and its measurement focused “listening skills, speaking skills, self-disclosure,
8 clarity, continuity-tracking, and respect and regard” (Olson, 1993, p. 108).
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12 While attempting to bridge existing gaps between research, theory, and practice, the
13 Circumplex Model provided a systematic and integrative theoretical model for the myriad of
14 concepts used in the study of (ab)normal family processes, that allowed hypotheses to be
15 deduced and tested (Olson et al., 1989). The main hypothesis derived from the Circumplex
16 Model, also known as the curvilinear hypothesis, is that balanced or central levels of cohesion
17 and flexibility translate into optimal family functioning. At the same time, extreme or
18 unbalanced values on these dimensions are associated with families/couples experiencing
19 problems or with higher family vulnerability.
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Olson, Bell, and Portner in 1978 developed the original version of FACES, which consisted of a self-report instrument with 111 items that included three scales: cohesion, flexibility, and social desirability (Alexander et al., 1984; Kouneski, 2000). The scale underwent several modifications to improve its psychometric qualities, resulting in FACES II (Olson, Portner, & Bell, 1982) and FACES III versions (Olson, Portner, & Lavee, 1985; Olson, 1986). Empirical studies with these versions provided support to their ability for differentiating patterns of family functioning across a variety of clinical situations (e.g., Prange et al., 1992; Kashani et al., 1995; Place et al., 2005), and they have gained wide acceptance across the years, even though some authors argue that during the early 1990s,

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3 interest in the dimensional evaluation of family functioning waned with the increasing
4 popularity of family narratives (Place et al., 2005).
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8 The main challenge came from the fact that FACES II and III versions presented a
9 linear relation with (un)healthy family functioning and adjustment, whereas the Circumplex
10 Model predicted a curvilinear relation (Olson, 2011). High scores in the cohesion and
11 flexibility scales seemed to reflect balanced family functioning, and low levels were
12 associated with disengaged and rigid family functioning (Kouneski, 2000). This meant that
13 the scales were not able to classify enmeshed or chaotic families adequately. A new version
14 of FACES was developed to address these issues. FACES IV has a different organization
15 with six scales: two balanced scales (cohesion and flexibility) and four unbalanced scales
16 (disengaged, chaotic, enmeshed, and rigid). Family Satisfaction (FSS) and Family
17 Communication (FCS) were also included as companion scales (Olson & Gorall, 2003). In
18 2008, FACES IV was classified as an “approaching well-established” measure of general
19 family functioning (Alderfer et al., 2008), but since then, several studies concerning its
20 psychometric properties have surfaced. Results from the validation study by Olson (2011),
21 indicated that the six scales were valid and reliable, with high levels of concurrent, construct
22 and discriminant validity (although Enmeshed and Rigid scales had the lowest correlations
23 with the validity scales, warranting further work).
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44 Adaptation and validation studies of FACES IV have also been conducted in Italy
45 (Baiocco et al., 2013), Uruguay (Ball et al., 2009), Hungary (Mirnics et al., 2010), Spain
46 (Rivero et al., 2010), Greece (Koutra et al., 2012), Iran (Mazaheri et al., 2014), Poland
47 (Margasiński, 2015) and Portugal (Pereira & Teixeira, 2013; Gomes et al., 2019), showing
48 overall good psychometric properties and cross-cultural applicability. The first Portuguese
49 study was conducted with a sample of 214 adult caregivers (aged ≥ 18 years) of patients
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3 undergoing chemotherapy, limiting the generalization of results to more diverse families
4 (Pereira & Teixeira, 2013). As previous studies suggested, enmeshed and rigid scales were
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6 also found to be empirically weaker. The authors suggested additional validation studies with
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8 more diverse samples in order to improve the predictive validity and application in the
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10 clinical work of FACES IV (Pereira & Teixeira, 2013). Another study conducted in Portugal
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12 effectively focused on a different population of married couples with children where one
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14 parent had schizophrenia but did not analyze the psychometric properties of the instrument
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16 (Carvalho et al., 2014). The second validation study addressed the limitations found in the
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18 preceding one, presenting a significant leap forward with the employment of a systematic
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20 process of validation (Gomes et al., 2019). The factor analysis conducted led the authors to
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22 an item reduction process that resulted in a final 24 item solution, with four items per scale.
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28 Despite its groundbreaking nature and undeniable contribution to family research, this study
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30 also had its limitations. The instruments used to analyze convergent validity were not specific
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32 measures of family functioning, and discriminant analysis was also limited. The authors
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34 signaled that women's perceptions of family functioning were probably over-represented,
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36 but participants with university degrees were also over-represented, reaching almost two-
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38 thirds of the sample (64.5%). This last feature restricts the sample representativeness
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40 regarding the Portuguese population because, according to OECD (2019) data, only 25% of
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42 Portuguese adults (25-64 years old) completed tertiary education. Still regarding the sample's
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44 properties, certain stages of the individual life cycle were not contemplated, namely
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46 adolescence and old age (the age range was 19-57 years). Finally, while including
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48 participants in different family subsystems and family life cycle stages, it was not evaluated
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50 if their perceptions of family dynamics differed. This limitation not only impairs the Gomes
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52 et al. (2019) study but many other validations. Some studies account for differences between
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3 family members' perspectives (e.g., Margasiński, 2015), but none addresses developmental
4 influences on the scales scores. Bearing in mind that the Circumplex Model posits expectable
5 changes in cohesion and flexibility levels throughout family development (Olson et al.,
6 1989), it is puzzling how family life cycle stages are one of the least researched areas with
7 FACES (Kouneski, 2000). Therefore, the present study aims to complement preceding
8 validation efforts by providing further data regarding FACES IV psychometric properties
9 and addressing their limitations.
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21 **Objectives**

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24 Considering the promising relevance of FACES IV to assess family functioning, the
25 aims of the present study were its translation, cultural adaptation, and validation for the
26 Portuguese population. The specific goals included: i) analyze the psychometric properties
27 of FACES IV, focusing specifically its factor structure, reliability, and correlations between
28 scales; ii) analyze the instruments' convergent validity through the analysis of the
29 correlations between FACES IV scales and criterion scales; iii) examine the influence of
30 sociodemographic and family variables on the perception of family functioning; iv) analyze
31 the discriminating ability of the six FACES IV scales.
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45 **METHODS**

46 **Participants**

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49 Participants were recruited through convenience and snowball sampling procedures,
50 starting with a seed of 55 graduate and undergraduate students in Psychology and Clinical
51 Psychology of the Miguel Torga Institute of Higher Education, Coimbra, Portugal. Each of
52 these students underwent a brief course that addressed the instruments' objectives and
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3 guidelines for correct administration, and applied the protocol to a minimum of five different
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5 families.
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8 The sample was comprised of 1089 individuals from 387 nuclear families. The
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10 average age of participants was 36 years ($SD = 15.05$), with a 12-83 years range. There was
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12 a relatively even gender (male/female) and area of residence (urban/rural) proportion. One
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14 third had secondary education, and two-thirds were currently employed/working. All the
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16 occupations included in the Portuguese Classification of Occupations of 2010 (CPP/2010)
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18 were represented, and the average income was 1618€ ($SD = 961.59€$). Half of the participants
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20 were married (or cohabiting), and more than one third was single. About two-thirds were at
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22 the “Family with adult children” life cycle stage, but the remaining stages were also
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24 represented. Approximately half belonged to the parent subsystem; one third belonged to the
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26 child (and/or sibling) subsystem, and the remaining were only part of the couple subsystem
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28 (Table 1).
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(insert Table 1)

41 **Procedures**

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43 Permission was granted from the authors of the original FACES IV to translate and
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45 validate the scale for the Portuguese population. The translation process followed the
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47 guidelines recommended by Olson (n.d.) and those described by Beaton, Bombardier,
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49 Guillemin, and Ferraz (2000) for the translation and cultural adaptation of self-report
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51 measures, which aim to preserve the content validity of instruments across different cultural
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53 settings. This process included six independent translators with extensive knowledge in
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3 Psychology and awareness of the fundamental concepts of FACES IV (some of them family
4 therapists of the Portuguese Family Therapy Society).
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8 Participants were informed of the purposes of the study, the possibility of accessing
9 results (and of their withdrawal), and the confidentiality of responses. All signed an informed
10 consent form. Permission from the ethics committee of the Miguel Torga Institute of Higher
11 Education was also granted.
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19 **Measures**

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21 *Sociodemographic and Family Questionnaire.* This structured questionnaire
22 allowed the collection of sociodemographic information pertaining the respondent (e.g., sex,
23 age, marital status, education, employment status) and detailed information regarding their
24 family (nuclear/cohabiting family composition, the role of respondent in the family, number
25 of children, among others).
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33 *FACES IV Package.* The FACES IV Package includes the six scales from the Family
34 Adaptability and Cohesion Evaluation Scales IV (FACES IV), the Family Communication
35 Scale (FCS), and the Family Satisfaction Scale (FSS). This set of self-report measures can
36 be completed by all family members with a minimum of 12 years of age and comprises a
37 total of 62 items. FACES IV measures family functioning according to the Circumplex
38 Model and includes a total of 42 items that participants rate in a five-point Likert-type format.
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40 These are distributed among two balanced scales (Cohesion and Flexibility) and four
41 unbalanced scales (Enmeshed, Disengaged, Chaotic and Rigid) with seven items each. The
42 Family Communication Scale (FCS) is a 10-item measure (with a 7-point Likert-type format)
43 that assesses communication in family systems. Better family communication is usually an
44 asset of balanced systems (Olson, 1993; Olson & Gorall, 2003). The FCS was used to assess
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3 convergent validity in the Portuguese validation studies of the FACES IV (Pereira &
4 Teixeira, 2013; Gomes et al., 2019) and the Italian study (Baiocco et al., 2013). The Family
5 Satisfaction Scale (FSS) is a self-report measure designed to assess the level of satisfaction
6 that family members have regarding family functioning. It is a ten-item Likert-type scale,
7 with higher values indicating that family members are happy with their family system.
8 Internal consistency (alpha reliability) was .93 (Olson, 2011). The FSS was used as a criterion
9 validity scale in the original study of the FACES IV scales (Olson, 2011) and the Portuguese
10 and Italian studies (Baiocco et al., 2013; Pereira & Teixeira, 2013; Gomes et al., 2019).

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21 ***Self-Report Family Inventory - Version II (SFI-II)***. The SFI was developed by
22 Beavers, Hampson, and Hulgus (1985) as a self-report measure to address constructs
23 associated with the Beavers Systems Model of Family Functioning (Beavers, 1982; Beavers
24 & Hampson, 1993). The Self-Report Family Inventory: Version II (SFI-II) is a 36-item
25 measure of perceptions of family functioning in five areas: Health/Competence, Conflict,
26 Cohesion, Leadership, and Emotional Expressiveness (Beavers & Hampson, 1990).
27 Cronbach's alpha for the total scale was reported as between .84 and .93, and there is
28 evidence that supports test-retest reliability and construct validity (good discriminant abilities
29 and convergent validity with other self-report family measures) (Green & Bagarozzi, 1987;
30 Tutty, 1995; Grotevant & Carlson, 1989; Beavers & Hampson, 2000). For comparison and
31 validation, and following the original validation study by Olson (2011), only the
32 Health/Competence subscale was used, because it was found to be closely related to general
33 family functioning, namely to family cohesion and adaptability/flexibility (Beavers et al.,
34 1985; Tutty, 1995). The Portuguese translation of the SFI-II used in this study revealed good
35 psychometric properties, with Cronbach alpha values of .93 for the total scale and .91 for the
36 Health/Competence subscale.
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3 **Family APGAR.** Developed by Smilkstein (1978), the Family APGAR is a brief five-
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5 item screening instrument, based on family systems theory and coping theory, that provides
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7 an overview of the subjects' perception of family functioning (Grotevant & Carlson, 1989).
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9 The instrument possesses good internal consistency reliability, with Cronbach alphas ranging
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11 from .80 to .86 (Smilkstein et al., 1982), and discriminant ability (Good et al., 1979). It also
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13 presents construct-related validity, suggesting a reliable and valid measure of family
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15 function, suitable for clinical practice and research (Good et al., 1979). The Portuguese
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17 version was translated and validated by Agostinho and Rebelo (1988), and in the present
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19 study revealed good internal consistency reliability properties (Cronbach's alpha = .77).
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26 **Data Analysis**

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28 All statistical analysis was performed using SPSS v25 (IBM SPSS Statistics) and
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30 AMOS v18 (IBM SPSS Statistics) software. Descriptive statistics were calculated for both
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32 sociodemographic variables and FACES scales' scores. The instrument factor structure was
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34 studied using Principal Component Analysis (PCA) with Varimax Rotation. Kaiser-Meyer-
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36 Olkin (*KMO*) and Bartlett's sphericity tests were used to determine the adequacy of the data
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38 set to factor analysis. To further test the suitability of the six-factor model described in the
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40 literature, we removed items with poor factor loadings. Through additional Exploratory
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42 Factor Analysis (EFA), we reached a balanced instrument with four items per dimension,
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44 that was subjected to Confirmatory Factor Analysis (CFA). The maximum likelihood
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46 estimation method was used, considering four goodness-of-fit indicators: Tucker-Lewis
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48 Index (*TLI*), Comparative Fit Index (*CFI*), and Root Mean Square Error Approximation
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50 (*RMSEA*). Cronbach's alpha coefficient was used to measure internal consistency. Pearson
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52 correlation coefficient was employed to evaluate the association between FACES scales, and
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3 between these and validation scales. Differences in FACES scores according to
4 sociodemographic and family variables were assessed using Student *t*-tests (two groups) and
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between these and validation scales. Differences in FACES 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 posthoc tests. Finally, for assessing the instruments' predictive validity of problematic family functioning, a discriminant analysis was performed. P-values less than .05 were considered statistically significant.

RESULTS

Factor analysis

The 42 FACES IV items were subjected to factor analysis using PCA with Varimax Rotation. The Kaiser-Meyer-Olkin value was 0.91, and Bartlett's sphericity test was statistically significant ($p < .001$). Taking as guidelines the solutions described by Olson (2011), we forced the extraction of 6 and 4 factors. The results of these analyses were not always coincident with those of the original validation study (Olson, 2011). However, the first factor to emerge in all tested solutions emphasized the balanced scales items (cohesion and flexibility), all with positive factorial saturation above .30. This result points to a clear differentiation between balanced and unbalanced scales, representing healthy and unhealthy family functioning, which was one of the primary reasons behind the development of the instruments' fourth version.

Following the methodological procedures of Rivero et al. (2010) and Gomes et al. (2019), which presented reduced 4-item per scale solutions, we performed several EFAs, verifying which items to retain and excluding those with inferior factor loadings. The results emanating from these procedures similarly led to a refined model that represents a balanced instrument with four items per latent variable. Construct validity was supported by the quality

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3 of goodness-of-fit indices of the CFA ($\chi^2 / gl = 4.047$, $RMSEA = .053$, $NFI = .84$, $CFI = .902$,
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5 $GFI = .93$).

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8 However, considering that there were several discrepancies in the retained items
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10 between this study and Gomes et al. (2019) (of the 24 items in each solution, only 14 were
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12 coincident), and taking into account the panel of experts assessment of the items during
13
14 translation, that they were representative of the family dimensions purported to evaluate, we
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16 opted to retain all 42 items, conducting the ensuing statistical analysis with the full scale.
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19 20 21 **Internal consistency, average scale scores, and intercorrelations between scales**

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24 The results of the internal consistency assessment for the six scales were relatively
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26 modest when compared with previous studies that found very good or good alpha values
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28 (Olson, 2011; Pereira & Teixeira, 2013) but similar to other validations (Baiocco et al., 2013;
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30 Koutra et al., 2012). Cronbach's alpha values ranged from a maximum of .77 for balanced
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32 cohesion to a minimum of .58 in the enmeshed scale. Olson's initial validation (2011), the
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34 Greek and Portuguese studies (Koutra et al., 2012; Gomes et al., 2019) also found the lowest
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36 alpha values in the enmeshed scale (Table 2).
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40 Balanced cohesion and flexibility presented average mean scores considerably
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42 superior to the four unbalanced scales ($M = 28.03$ and $M = 26.06$, respectively). Regarding
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44 the unbalanced scales, disengaged and chaotic converged in the 15 points average, but
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46 enmeshed and rigid presented higher mean scores, around 20 points. This difference in the
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48 average mean scores of unbalanced scales was also found in the study of Pereira and Teixeira
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50 (2013), probably signifying that Portuguese families tend to perceive a higher degree of
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52 enmeshment and rigidity. The fact that this pattern does not emerge consistently in other
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54 countries provides further support for the cultural specificity hypothesis. For example, in the
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3 Greek and Italian validation studies, the enmeshed scale presented one of the lowest average
4 scores among the unbalanced scales (but Italians and Greeks also tended to characterize their
5 family functioning as rigid) (Baiocco et al., 2013; Koutra et al., 2012). However, it should be
6 noted that in the Portuguese Gomes et al. (2019) study, the highest average scores of
7 unbalanced scales were rigid and chaotic, but these stemmed from the analysis of a smaller
8 number of items.
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11 Correlation analyses were performed to assess the relationships between the six scales
12 (Table 2). As expected, the two balanced scales (cohesion and flexibility) were highly
13 correlated ($r = .72$). Olson (2011) and Pereira and Teixeira (2013) found similar results,
14 hypothesizing that these indicate that healthy family functioning is manifested through
15 concordance in balanced scales. High significant correlations between balanced scales were
16 also found in other validation studies (Koutra et al., 2012; Mirnics et al., 2010; Gomes et al.,
17 2019), being one of the most recurrent and therefore empirically supported results.
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20 There was a high and statistically significant negative correlation between balanced
21 cohesion and disengaged ($r = -.65$) and a low positive correlation between balanced cohesion
22 and enmeshed ($r = .19$). Balanced flexibility presented a moderate and statistically significant
23 correlation with chaotic ($r = -.39$) and a low positive correlation with rigid ($r = .14$).
24 Enmeshment and rigidity seemed to be positively connected to balanced functioning.
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27 Regarding relations between the two subsets of scales, it should be noted that the two
28 unbalanced scales of rigid and enmeshed showed a moderate and statistically significant
29 positive correlation ($r = .41$); the same applies to the disengaged and chaotic scales ($r = .51$).
30 Pereira and Teixeira (2013) found that families characterized by disengagement lean towards
31 chaotic functioning, and vice-versa. Our results add that rigidity and enmeshment tend to co-
32 occur, being in a significant relationship that also emerged in the Portuguese, Greek, and
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3 Hungarian validation studies (Koutra et al., 2012; Mirnics et al., 2010; Gomes et al., 2019).
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5 Balanced flexibility presented a negative correlation with disengaged ($r = -.52$), and balanced
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7 cohesion presents a negative correlation with chaotic ($r = -.44$). With low or very low
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9 correlation values, we found positive correlations between balanced flexibility and enmeshed
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11 ($r = .18$). Once again, enmeshment seemed to be positively associated with healthy family
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13 functioning.
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24 **Convergent validity**

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26 Correlations with three validation scales were conducted to assess the convergent
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28 validity of the six FACES IV scales: FSS, SFI-II Health/Competence subscale, and APGAR
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30 (Table 3). It should be noted that for the SFI-II Health/Competence subscale, higher scores
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32 are an indicator of greater problems within the family system.
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35 As expected, balanced cohesion and flexibility scales were strongly and negatively
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37 correlated with the SFI-II Health/Competence subscale ($r = -.71$ and $-.62$). The scales
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39 designed to assess disengaged and chaotic functioning presented positive correlations of
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41 large/moderate magnitude ($r = .64$ and $.48$). Rigidity did not reveal a significant relation,
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43 whereas the enmeshment scale presented a low negative, but still statistically significant,
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45 correlation ($r = -.18$).
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49 Similar results emerged with the FSS. High and positive correlations were found
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51 between balanced scales and the FSS ($r = .57$ and $.62$), indicating that healthy cohesion and
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53 flexibility are closely associated with increased family satisfaction. In the opposite direction,
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3 higher values in the disengaged and chaotic scales were connected with less satisfaction ($r =$
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5 $-.53$ and $-.37$).
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8 Several statistically significant correlations were found between the FACES scales
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10 and APGAR, but with lower values when compared to the first two validation scales.
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12 Regarding APGAR, all the FACES scales manifested the same general trends reported:
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14 balanced scales presented significant positive correlations ($r = .11$ and $.14$); disengaged and
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16 chaotic presented negative ones ($r = -.17$ and $-.15$).
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20 As with the original study by Olson (2011), the validity of the two balanced scales
21
22 and the disengaged and chaotic scales was highly supported. Enmeshed and rigid scales
23
24 presented weaker results. The convergent validity analysis of FACES IV by Pereira and
25
26 Teixeira (2013) also found non-significant correlations between the enmeshed and rigid
27
28 scales and the validation scales. Gomes et al. (2019) only found poor psychometric properties
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30 in the rigid scale.
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35 (insert Table 3)
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40 **Sociodemographic determinants of family functioning**

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42 Contrary to Pereira and Teixeira (2013), but aligned with other validations (Mirnics
43
44 et al., 2010; Gomes et al., 2019), significant associations with age and gender were found.
45
46 Women reported more balanced cohesion and less disengagement than men, and several
47
48 differences were found between age groups, except in the rigid scale (Table 4). Younger
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50 subjects (age ≤ 24) tended to perceive lower levels of balanced functioning (cohesion and
51
52 flexibility), and higher levels of unbalanced functioning (enmeshed, disengaged, and
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54 chaotic). Subjects in the age range of 35-44 presented the highest scores of balanced cohesion
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3 and flexibility, the lowest values of disengaged and chaotic functioning, but also perceived
4 the highest levels of enmeshed and chaotic functioning. Older subjects (age $45 \geq$) perceive
5 more disengagement in their families, with values similar to their younger counterparts.
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10 Regarding employment status, employed/working subjects tended to perceive higher
11 degrees of balanced cohesion and flexibility than those who were students. They also
12 perceived less disengagement than students and retired subjects (Table 4). Other studies did
13 not find significant differences between younger or older, employed, or unemployed
14 participants (Koutra et al., 2012).
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21 The sociodemographic variable that appears to hold a higher correlation with the
22 perception of family functioning was education (Table 4). All the FACES IV scales, except
23 chaotic, present the same pattern: higher echelons of educational attainment appear
24 connected to lower values in the unbalanced scales and higher levels of balanced functioning.
25 These differences were more pronounced than those found in the study by Pereira and
26 Teixeira (2013), where less education only showed a statically significant impact with higher
27 scores in the enmeshed and chaotic scales.
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44 **Family subsystems and life cycle stages**

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46 Several significant differences, according to family subsystem membership and life
47 cycle stage, were found (Table 5). Regarding family subsystems, one of the most striking
48 features is the lack of agreement between child and parent subsystems on all cohesion scales
49 and in the balanced flexibility scale. Members of parent subsystems tend to perceive more
50 balanced cohesion and flexibility, less disengagement, and more enmeshment, than members
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3 of child subsystems. Those that belong to the couple subsystem only differ significantly in
4 balanced flexibility in comparison to members of child subsystems. Their average scores
5 were similar to parent subsystems, except on chaotic functioning, where they registered the
6 highest average score of all three groups. These results point to a pronounced parent-child
7 discrepancy in family functioning perception, consistent with previous research (Olson et al.,
8 1989; Margasiński, 2015).
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12 As predicted by the Circumplex Model, people at various stages of the family life
13 cycle report different levels of cohesion and flexibility. The patterns found for both balanced
14 scales closely resemble the results obtained by Olson et al. (1989). Balanced cohesion is
15 higher in the early stages, reaching its apex in families with school-age children, and then
16 descending in the following stages. Balanced flexibility is at its maximum in the young
17 couple without children's stage but immediately decreases during the childbearing stage.
18 There is a statistically significant decline in flexibility between families with school-age
19 children and adolescents, and the average scores drop even further, reaching its minimum
20 value in families with adult children.
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38 These results are mostly congruent with individual and family development
39 theoretical perspectives. For example, cohesion reaches its ebb during the last stages, when
40 families are in the process of separation-individuation, and adult children are experiencing
41 even greater freedom and autonomy (Olson et al., 1989), often associated with higher
42 education academic pursuits outside the family's area of residence. Taking into account these
43 developmental tasks does not come as a surprise that families' sense of togetherness and
44 closeness changes and might be perceived as decreasing and even more disengaged (Olson
45 et al., 1989). Flexibility is highest among childless young couples. At this stage, couples are
46 negotiating roles, rules, and patterns and constructing their model of relationship. The major
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3 demand is related to their ability to be flexible so that an idiosyncratic way of being a couple
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5 can emerge.
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14 **Discriminant analysis**

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17 Since the entire sample was drawn from the general population and we had no specific
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19 criteria or clinical situation identified that allowed the definition of “problem group(s),” to
20
21 assess FACES’ discriminant ability we followed the procedure by Olson (2011) and created
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23 groups based on the scores obtained by each person on the validation scales. When subjects
24
25 scored above 50% (or 40%) on the Health/Competence subscale of SFI-II (where lower
26
27 values indicated poor family functioning) and below 50% (or 40%) in the FSS, they were
28
29 assigned to a “problem group.” Scores below 50% (or 40%) in the APGAR scale also
30
31 determined the subjects’ placement in a “problem group.”
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36 As expected, the greater discriminant ability was found in the top versus bottom 40%
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38 groupings (see columns 2 and 4 in Table 8). In these groups and both scales, the range of
39
40 correct placement ranged from 50.4% to 85.1%, with an average for the six FACES scales
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42 of 66.91%. The scales that presented greatest discriminant ability were balanced cohesion
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44 (85.1% correct placement on SFI-II/FSS and 72.3% on APGAR), disengaged (81.4% on SFI-
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46 II/FSS and 68.1% on APGAR) and balanced flexibility (80,2% on SFI-II/FSS and 72.8% on
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48 APGAR). The chaotic scale presented moderate values and the weakest results were found
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50 in the enmeshed and rigid scales,
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55 When the six scales were used together, predictive accuracy ranged from 72.4% to
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57 86.6%. The Cohesion Ratio score presented the greatest predictive accuracy when compared
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3 with the Flexibility Ratio, and the Circumplex Total Ratio discriminant ability ranged from
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5 a minimum of 72.3% to a maximum of 85.1%.
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14 **DISCUSSION**

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17 This study presents a major contribution to family systems research since it was the
18
19 first FACES IV validation study conducted in Portugal to include a large and heterogeneous
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21 sample drawn from the general population, complementing existing literature (Pereira &
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23 Teixeira, 2013; Gomes et al., 2019) on this important self-report family assessment
24
25 questionnaire. Besides the large sample size and the participants' heterogeneity, and like the
26
27 Greek validation endeavor (Koutra et al., 2012), one of the strengths of the present study was
28
29 also the use of standardized procedures for the translation and cross-cultural adaptation of
30
31 the original questionnaire. Another relevant and original contribution was the analysis of
32
33 family functioning according to family subsystem membership and in different stages of the
34
35 family life cycle. Besides providing further empirical support to the parent-children
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37 (particularly, adolescent children) disagreement in family functioning perception (Olson et
38
39 al., 1989; Margasiński, 2015), our results suggest that FACES IV detects changes in cohesion
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41 and flexibility across the family life cycle, consistent with normative developmental tasks
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43 and processes highlighted by family theorists, and with the developmental hypothesis derived
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45 from the Circumplex Model.
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51 We found overall good to moderate psychometric properties, meaning that FACES
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53 IV scales appear to measure, reliably and validly, the full-dimensional spectrum of cohesion
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55 and flexibility defined by the Circumplex Model (Olson, 2011), with adequate levels of
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3 construct, convergent and discriminant validity. As in the original validation study (Olson,
4 2011), content validity for the six scales was based on the scholarly opinion of senior family
5 therapists of the Portuguese Family Therapy Society involved in the translation procedures,
6 that described items as adequately representing evaluated dimensions.
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12 However, the Portuguese version of FACES IV presented an uneven balance between
13 scales regarding their psychometric properties, which warrants further discussion. Balanced,
14 disengaged, and chaotic scales present overall better properties; enmeshed and rigid scales
15 reveal weaker properties. Previous validation studies conducted in Portugal (Pereira &
16 Teixeira, 2013; Gomes et al., 2019) also revealed similar findings.
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24 These results might be due to Portuguese cultural specificities, namely its traditional
25 values and manifest ideological familism, that emphasizes affective closeness, frequent
26 contacts between family members, explicit solidarity norms and reliability on the availability
27 of family support, tending to the exclusion of other types of social relations (Portugal, 2011).
28 While working with Portuguese immigrants in the United States, Araújo-Lane (2005)
29 identified similar cultural traits, such as marked respect for authority and hierarchies, the
30 importance conceded to *honor*, that sometimes makes a family seem rigid and often induces
31 family members to stay together for its sake, and difficulty in sharing problems outside the
32 confines of the immediate family. Therefore, a certain degree of enmeshment and rigidity
33 seems to characterize “normal” family functioning in the Portuguese context and
34 occasionally approximates these dimensions to “healthy” family functioning. Olson et al.
35 (1989) also addressed this issue, cautioning that normative expectations and cultural bias
36 could compromise curvilinearity.
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53 However, the cultural background might not entirely account for these results. They
54 may also be due to the inherent limitations of self-report inventories in evaluating certain
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3 aspects of family functioning. This hypothesis might explain why other validation studies
4 also found the weakest psychometric properties in the unbalanced scales, particularly in the
5 enmeshed and/or rigid scales (Ball et al., 2009; Pereira & Teixeira, 2013; Margasiński, 2015;
6 Olson, 2011). Some authors caution that strong beliefs about how the family should interact,
7 as well as family loyalty and protection factors, could influence the subjects' responses to
8 paper-and-pencil scales in a socially desirable way, distorting and biasing collected data
9 (Fisher, 1982; Tutty, 1995). Therefore, we suggest the development of a FACES IV version
10 for therapists and professionals, to address both insiders' and outsiders' views, even though
11 we acknowledge that they might only provide another partial perspective, just as limited and
12 distanced from the elusive "true picture" as family members' perceptions (Tutty, 1995). This
13 new instrument would allow the development of a body of research theoretically grounded
14 on the Circumplex Model and focused on the perspectives that professionals hold about their
15 clients' family functioning across a wide variety of situations.
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33 Future studies with clearly identified clinical samples would be useful to provide an
34 adequate test of FACES IV discriminant ability. It would also be relevant to the development
35 of FACES IV to address different ethnic and cultural backgrounds, emerging family forms
36 and challenges, and other stages of the expanded family life cycle, such as late middle age,
37 retirement or later life families (Olson et al., 1989; McGoldrick et al., 2014).
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44 Snowball sampling procedures entail limitations, and might account for some
45 skewing in the representativeness of certain sociodemographic and family groups (e.g., some
46 occupations are underrepresented, and families with adult children are overrepresented), but
47 participants in virtually all the stages of the individual (from early adolescence onwards) and
48 family life cycle, and from different family subsystems, were included. As such, while it may
49 be premature to consider the average FACES IV scales scores obtained in the present study
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3 as national norms for the Portuguese population, they are nonetheless a stepping stone in this
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5 direction. As stated earlier, we found a distinctive pattern of mean scores that presented
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7 similarities with another validation study conducted in Portugal that kept the original 42 items
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9 (Pereira & Teixeira, 2013), but not with the results described by Gomes et al. (2019) that
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11 used a shorter version of FACES IV. This pattern is distinct from other countries' results,
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13 entailing discrepancies in the average values of the unbalanced scales, with disengaged and
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15 chaotic presenting lower scores than rigid and enmeshed. While more substantial normative
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17 data is not obtained, researchers and clinicians in the Portuguese national context should take
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19 into account that differences between these two subsets of unbalanced scales should not be
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21 immediately interpreted as clinically significant or as a deviation from the norm.
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59
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Table 1.
Sociodemographic and family characteristics of participants

	<i>n</i>	%		<i>n</i>	%
Gender			Residence		
Female	583	53.8	City (Urban)	488	45.1
Male	500	46.2	Town or Village (Rural)	595	55
Age			Employment status		
<= 14	55	5.1	Student	322	29.7
15 - 24	285	26.3	Unemployed	41	3.8
25 - 64	721	66.6	Retired	35	3.2
65+	21	1.9	Working/Employed	681	62.9
Education			Income (in Euros)		
Without formal education	6	0.6	<= 635**	78	10.5
1 st Cycle	66	6.1	636 - 1270	222	29.8
2 nd Cycle	118	10.9	1271 - 1905	218	29.2
3 rd Cycle	222	20.5	1906+	228	30.6
Secondary	388	35.8	Marital Status		
Higher Education	280	25.9	Single	408	37.7
Occupation*			Married (or Cohabiting)	577	53.3
Armed Forces Occupations	11	1.6	Divorced (or Separated)	73	6.8
Managers	74	10.9	Widowed	24	2.2
Professionals	161	23.6	Family Life Cycle Stage***		
Technicians and associate professionals	84	12.3	Young couple without children	60	5.5
Clerical support workers	78	11.5	Childbearing stage	52	4.8
Service and sales workers	76	11.2	Family with school-age children	83	7.7
Skilled agricultural, forestry and fishery workers	3	0.4	Family with adolescents	166	15.3
Craft and related trades workers	93	13.7	Family with adult children	722	66.7
Plant and machine operators and assemblers	22	3.2	Family Subsystem		
Elementary occupations	79	11.6	Parent subsystem**** (may also be part of a couple subsystem)	594	54.8
			Child subsystem (may also be part of a sibling subsystem)	390	36.0
			Couple subsystem (only)	99	9.1

* According to the Portuguese Classification of Occupations of 2010 (CPP/2010)

** Portuguese minimum wage

*** Following the stage subdivisions used by Relvas (1996) and Olson et al. (1989)

**** 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).

Table 2.
Descriptive statistics, correlation and reliability of FACES IV scales

	<i>M</i>	<i>SD</i>	<i>α</i>	Cohesion scales			Flexibility scales		
				Enmeshed	Balance Cohesion	Disengaged	Chaotic	Balanced Flexibility	Rigid
Cohesion scales									
Enmeshed	19.88	3.29	.58	—					
Balanced Cohesion	28.03	3.67	.77	.19**	—				
Disengaged	15.14	4.19	.74	-.10**	-.65*	—			
Flexibility scales									
Chaotic	15.10	4.21	.73	.08**	-.44**	.51**	—		
Balanced Flexibility	26.06	3.61	.64	.18**	.72**	-.52**	-.39**	—	
Rigid	20.39	3.99	.65	.41**	0.05	.13**	0.02	.14**	—

* $p < 0,05$; ** $p < 0,01$

Table 3.
Correlation of FACES IV scales with validation scales

FACES IV Scales	Validation Scales		
	SFI-II (Health/Competence subscale)	FSS	APGAR
Cohesion scales			
Enmeshed	-.175**	.089**	.002
Balanced cohesion	-.709**	.624**	.135**
Disengaged	.637**	-.527**	-.171**
Flexibility scales			
Chaotic	.477**	-.367**	-.148**
Balanced flexibility	-.622**	.565**	.109**
Rigid	-.045	-.060*	-.004

* $p < .05$; ** $p < .01$

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Table 4.
Sociodemographic differences (mean and standard deviation) for FACES IV scales

	FACES IV scales					
	Cohesion scales			Flexibility scales		
	Enmeshed	Balanced cohesion	Disengaged	Chaotic	Balanced flexibility	Rigid
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Gender						
Male	19.74 (3.27)	27.74 (3.60)	15.52 (4.15)	15.26 (4.28)	26.02 (3.62)	20.61 (4.08)
Female	29.00 (3.03)	28.28 (3.71)	14.82 (4.21)	14.96 (4.16)	26.09 (3.60)	20.21 (3.91)
<i>t</i> (sig.)	-1.325 (.186)	-2.445 (.015)*	2.728 (.006)**	.672 (.250)	-.290 (.772)	1.648 (.101)
Age						
≤ 24 ¹ (<i>n</i> = 340)	19.49 (3.28)	27.68 (3.93)	15.72 (4.43)	15.36 (4.36)	25.59 (3.82)	20.70 (4.01)
25 – 34 ² (<i>n</i> = 162)	19.67 (3.17)	28.26 (3.46)	14.40 (4.09)	15.08 (4.41)	26.20 (3.47)	19.75 (4.07)
35 – 44 ³ (<i>n</i> = 179)	20.45 (3.27)	28.82 (3.41)	13.94 (3.50)	14.35 (3.77)	26.91 (3.42)	20.72 (3.89)
45 ≥ ⁴ (<i>n</i> = 401)	20.06 (3.31)	27.89 (3.59)	15.50 (4.17)	15.21 (4.17)	26.02 (3.51)	20.24 (3.97)
<i>F</i> /Welch's <i>F</i> _(3, 1081)	4.07**	4.24**	17.14**	2.44	5.39**	2.68 ^{ns}
<i>Tukey HSD / Games-Howell</i>	1 vs. 3	1 vs. 3	1 vs. 2; 1 vs. 3; 2 vs. 3; 2 vs. 4; 3 vs. 4	1 vs. 3	1 vs. 3; 3 vs. 4	
Employment status						
Working/Employed ¹ (<i>n</i> = 681)	20.01 (3.25)	28.34 (3.48)	14.73 (3.97)	14.90 (4.19)	26.38 (3.51)	20.23 (3.99)
Student ² (<i>n</i> = 322)	19.49 (3.27)	27.58 (3.99)	15.77 (4.54)	15.39 (4.35)	25.55 (3.79)	20.61 (3.97)
Unemployed ³ (<i>n</i> = 41)	20.05 (3.50)	27.24 (3.61)	15.71 (3.70)	15.05 (3.58)	24.71 (3.41)	20.80 (3.55)
Retired ⁴ (<i>n</i> = 35)	20.89 (3.37)	27.46 (3.67)	16.74 (4.72)	16.20 (4.01)	26.11 (3.17)	21.03 (4.72)
<i>F</i> /Welch's <i>F</i> _(3, 1078)	3.07 ^{ns}	4.14**	6.63**	1.85 ^{ns}	5.93**	1.12 ^{ns}
<i>Tukey HSD / Games-Howell</i>		1 vs. 2	1 vs. 2; 1 vs. 4		1 vs. 2	
Education						
≤ 1 st Cycle ¹ (<i>n</i> = 72)	21.17 (3.81)	27.07 (3.60)	16.68 (4.91)	15.68 (4.35)	24.93 (3.57)	21.67 (4.87)
2 nd Cycle, 3 rd Cycle and Secondary ² (<i>n</i> = 728)	19.74 (3.25)	27.70 (3.60)	15.37 (4.12)	15.23 (4.26)	25.88 (3.61)	20.54 (3.94)
Higher Education ³ (<i>n</i> = 280)	19.93 (3.19)	29.13 (3.49)	14.17 (3.99)	14.63 (4.03)	26.79 (3.51)	19.66 (3.78)
<i>F</i> /Welch's <i>F</i> _(2, 1079)	6.23**	18.59**	13.72**	2.76 ^{ns}	18.59**	8.94**
<i>Tukey HSD / Games-Howell</i>	1 vs. 2; 1 vs. 3	1 vs. 3; 2 vs. 3	1 vs. 2; 1 vs. 3		1 vs. 3; 2 vs. 3	1 vs. 3; 2 vs. 3

* *p* < .05; ** *p* < .01

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

	FACES IV scales					
	Cohesion scales			Flexibility scales		
	Enmeshed	Balanced cohesion	Disengaged	Chaotic	Balanced flexibility	Rigid
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Family subsystem						
Parent ¹ (n = 594)	20.20 (3.34)	28.28 (3.49)	14.82 (4.02)	14.87 (4.09)	26.33 (3.54)	20.36 (4.06)
Child ² (n = 390)	19.34 (3.14)	27.60 (3.85)	15.67 (4.44)	15.31 (4.40)	25.52 (3.74)	20.47 (3.84)
Couple ³ (n = 99)	20.08 (3.34)	28.24 (3.82)	15.03 (3.96)	15.66 (4.15)	26.51 (3.29)	20.27 (4.20)
<i>F/Welch's F</i> _(2, 1080)	8.30**	4.30*	4.93**	2.24 ^{ns}	6.89**	0.14 ^{ns}
<i>Tukey HSD / Games-Howell</i>	1 vs. 2	1 vs. 2	1 vs. 2		1 vs. 2; 2 vs. 3	
Life cycle stage						
Young couple without children ¹ (n = 60)	19.38 (2.98)	28.78 (3.25)	14.58 (3.85)	15.57 (3.83)	26.93 (3.13)	20.53 (4.46)
Childbearing stage ² (n = 52)	20.08 (3.69)	28.88 (3.37)	14.31 (4.59)	14.62 (4.38)	26.35 (3.65)	19.12 (4.40)
Family with school-age children ³ (n = 83)	20.58 (3.41)	29.02 (3.68)	13.35 (3.40)	15.01 (3.81)	26.73 (3.30)	20.39 (3.89)
Family with adolescents ⁴ (n = 166)	20.39 (3.27)	27.78 (3.57)	15.04 (4.13)	14.55 (3.91)	26.66 (3.22)	21.17 (3.82)
Family with adult children ⁵ (n = 722)	19.71 (3.25)	27.85 (3.71)	15.48 (4.23)	15.23 (4.34)	25.75 (3.73)	20.30 (3.95)
<i>F/Welch's F</i> _(5, 1078)	2.83*	3.52*	5.89**	1.25 ^{ns}	4.23**	3.04*
<i>Tukey HSD / Games-Howell</i>		3 vs. 5	3 vs. 4; 3 vs. 5		3 vs. 4	2 vs. 4

* $p < .05$; ** $p < .01$

Table 6.

Discriminant analysis of “problem and non-problem” families (percent accuracy in discriminating groups)

FACES IV Scales	Top versus bottom 50% on SFI (HC) and FSS	Top versus bottom 40% on SFI (HC) and FSS	Top versus bottom 50% on APGAR	Top versus bottom 40% on APGAR
<i>n</i> for each group	Top = 370 Bottom = 391	Top = 289 Bottom = 293	Top = 533 Bottom = 357	Top = 286 Bottom = 357
Cohesion scales				
Enmeshed	53.7	52.4	53.8	51.8
Balanced cohesion	80.6	85.1	74.2	72.3
Disengaged	76.7	81.4	67.3	68.1
Flexibility scales				
Chaotic	67.3	71.6	64.7	64.2
Balanced flexibility	76.2	80.2	73.9	72.8
Rigid	52.0	52.1	50.4	50.9
Six scales together	84.4	86.6	72.4	74.6
Dimension ratios				
Cohesion ratio	80.0	84.5	69.3	70.0
Flexibility ratio	76.0	80.9	69.9	71.5
Total ratio	81.1	85.1	74.2	72.3
Validation scales				
SFI (SC)	NA	NA	78.8	79.3
SFF	NA	NA	78.6	81.5
APGAR	78.4	84.3	NA	NA

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