

DESIGN AND VALIDATION OF A MEASUREMENT SCALE OF INTERGENERATIONAL FAMILY SOLIDARITY

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This paper aims to develop a multidimensional scale to measure intergenerational family solidarity (IFS) to assess its psychometric properties and to examine the invariance of the instrument across gender. In order to do that, we initially developed a scale with six dimensions. Using the theoretical framework of Bengtson and his colleagues (1991), we measured five out of the six conceptual dimensions of the IFS, together with a new one developed by us and called systematic solidarity. Furthermore, items about partner are introduced in the questionnaire. Using a sample of 201 valid questionnaires, different analyses were conducted to validate the new scale. The definitive scale proposed to measure IFS was composed by four dimensions: normative solidarity and three affectual solidarities (related to parents, partner, and children). Finally, we provide evidences of the consistency of this scale across gender differences.

Key words: Intergenerational family solidarity; Multidimensional scale; Validation; Gender; Systematic solidarity.

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Intergenerational family relationships have always existed. These family relations are crucial in promoting social cohesion or preventing social exclusion (Dykstra et al., 2006). However, recent demographic, social, and economic changes may affect these family relations. One of the most significant demographic changes in the last decades in western societies has been the decline of fertility rates (Van de Kaa, 1987) and the increase of life expectancy (Kinsella, 2005; Oeppen & Vaupel, 2002). Other significant demographic changes have been the rise of divorces and ruptures (Kennedy & Ruggles, 2014), the postponement of marriage and parenthood (Mills, Rindfuss, McDonald, & te Velde, 2011), and the number of old people living alone, especially women (Davidson, DiGiacomo, & McGrath, 2011). Moreover, recent socioeconomic changes may also affect family relations. Among others, the most important recent socioeconomic changes have been the entry of women in the (paid) labor market (Lewis, 2001), the rise of individualization (Meil, 2011), and the importance of the welfare state (Esping-Andersen, 1990; Lewis, 1992; Orloff, 1996) in the majority of postindustrial societies.

All these recent socioeconomic and demographic changes have reshaped forever the way people and families work. Nevertheless, these changes do not necessarily contribute to reducing the importance of family bonds. According to Bengtson (2001), all these changes may also lead to an increase in the importance of multigenerational bonds. Bengtson (2001) clearly stated four

major transitions that have partly reshaped the family: (1) the emergence of the “modern” nuclear family form, (2) the decline of the new “modern” nuclear family form, (3) the increasing heterogeneity of family forms, and finally (4) the importance of multigenerational bonds. There is an interesting debate about whether the family is simply changing (Coontz, 1992) or if the family is in decline and its functions are decreasing (Popenoe, 1988, 1993). At the same time, there is a similar academic debate about whether family solidarity is “lost” or “changed” solidarity (Daatland & Herlofson, 2003; Fokkema, Ter Bekke, & Dykstra, 2008).

Thus, all of these recent social changes have led a growing number of researchers to examine solidarity among family members, although the concept is not new in social sciences. In the seventies, Bengtson and his colleagues (Bengtson & Black, 1973; Bengtson, Olander, & Haddad, 1976) began to conceptualize a term or a construct that examined the relationships among family members, which focused on the beginning of parent-child relationships in adulthood (Mancini & Blieszner, 1989; Silverstein & Bengtson, 1997). The seminal works of Bengtson and his colleagues (Bengtson & Roberts, 1991; Roberts & Bengtson, 1990; Silverstein & Bengtson, 1997) were used as a basis for a growing number of empirical studies using the construct that measured the level of family solidarity and the interaction among the different dimensions defined by the authors, which will be reviewed in the next section. Many scholars have followed the dimensions of Bengtson and Roberts that were validated by Mangen, Bengtson, and Landry (1988). According to this tradition, the main goal of this study is to design and validate a scale that measures intergenerational family solidarity (IFS) and assess its psychometric properties. In addition, the second aim of this paper is to analyze the invariance of the instrument across gender.

In the following pages, after a literature review we present the five dimensions of Bengtson assumed by us, and we justify the reasons for developing a new dimension called “systematic solidarity.” We also discuss why we do not consider structural solidarity and explain why we include new questions regarding the solidarity between spouses/partners. Then we describe the method and present the results. Finally, in the discussion and conclusions some limitations and possible avenues for future research are given.

LITERATURE REVIEW: CONCEPTUALIZATION OF THE INTERGENERATIONAL SCALE

First Constructs of Family Solidarity

During the Forties and Fifties, we found the first academic attempts to measure family solidarity. As it is explained in Jansen (1952), Cavan and Ranck (1938) developed a scale used by Hill (1949), which included five different items to measure family solidarity: (1) degrees of affection, (2) amount of joint activity of family members, (3) willingness to sacrifice to attain family objectives, (4) degree of “esprit de corps,” and (5) degree to which solidarity is present. Jansen also developed a scale of family solidarity based on the eight items of marital unity by Mowrer (1948): (1) agreement with each other, (2) cooperation with each other, (3) concern for each other’s welfare, (4) enjoyment of association with each other, (5) affection for each other, (6) esteem or admiration for each other, (7) interest in each other, and (8) confidence or trust in each other. In 1970, Heller also attempted to measure family solidarity with a familism scale of 15 items, which, according to the author, can be used to study “such problems as the effects of

geographical and occupational mobility on generational relations and differences or similarities in rural and urban family solidarity” (p. 73).

Six Dimensions of Intergenerational Family Solidarity

However, as we stated before, the seminal works of Bengtson and his colleagues (Bengtson & Roberts, 1991; Bengtson, Giarrusso, Mabry, & Silverstein, 2002; Bengtson & Schrader, 1982; Roberts & Bengtson, 1990; Silverstein & Bengtson, 1997) have been the basis for a growing number of empirical studies about solidarity between family members. In their article, Bengtson and Roberts described family solidarity as a multifaceted and multidimensional construct, where the interaction among different family members can include up to six dimensions. These dimensions are the following: (1) affectual solidarity (reciprocal feelings of affection, understanding, recognition, trust and respect among family members); (2) associational solidarity (the frequency of intergenerational interactions, i.e., visits, calls and activities); (3) consensual solidarity (the sharing of opinions, values, and lifestyles among family members); (4) functional solidarity (the frequency of intergenerational exchanges of assistance solidarity, i.e., financial, physical, and emotional); (5) normative solidarity (the strength of commitment to meeting family obligations); and (6) structural solidarity (the factors that facilitate or discourage the interaction among family members, i.e., distance and health).

The first attempt by Bengtson and his colleagues to examine the interrelationships among family members was conducted in the Seventies (Bengtson et al., 1976), although there had been previous attempts by other scholars as showed before (Heller, 1970; Jansen, 1952). At that time, three constructs were used — affection, association, and consensus — based on the theories of interpersonal relationships by Homans (1950) and Heider (1958). However, empirical evidence (Atkinson, Kivett, & Campbell, 1986; Roberts & Bengtson, 1990) found that these three constructs could not be combined on a one-dimension scale. Based on these initial results, Bengtson and Roberts (1991) reformulated and added three new dimensions to their model: normative solidarity, based on Tönnies’ (1963) theory; structural solidarity; functional solidarity. In the same article, the authors empirically tested their proposals and, among other significant results, they found that although normative solidarity impacts affectual solidarity, it does not impact associational solidarity. These authors also showed that affectual solidarity was positively related to associational solidarity. This seminal work allowed other empirical studies to begin measuring family solidarity. A main criticism of this concept of family solidarity is that it is based only on the positive aspects of family relations, and it ignores the potential negative effects that solidarity may cause family members (Silverstein, Chen, & Heller, 1996).

Recently, Lüscher (2011) introduced the concept of ambivalence in the study of intergenerational solidarity. According to the author, ambivalence “refers to certain kinds of experiences. They occur while we search for the significance of persons, social relationships, and facts that are relevant for our identity and our agency, thereby oscillating between polar contradictions in feeling, thinking, wanting, or social structures, contradictions that appear temporarily or permanently insolvable. These oscillations can be asymmetrical, imbalanced, and reflect the impact of powers” (p.197).

A recent study (Hogerbrugge & Komter, 2012) proposed to consider the concept of intergenerational ambivalence as a relevant addition to Bengtson’s model. The authors suppose that ambivalence acts as a catalyst, and thus serves as an explanation for changes in family relations. The study tests both the viability of the intergenerational solidarity model and the hypothesized

effect of ambivalence employing longitudinal data. The authors conclude by confirming the viability of the intergenerational solidarity model and questioning the concept of intergenerational ambivalence for studying changes in family relations.

In order to validate a scale that measures intergenerational family solidarity (IFS) we initially developed a scale with six dimensions. Using the theoretical framework of Bengtson and his colleagues (Bengtson & Roberts, 1991; Mangen et al., 1988) we measure five out of the six conceptual dimensions of intergenerational family solidarity, together with a new one developed by us, called “systematic solidarity.” The five conceptual dimensions of IFS by Bengtson and his colleagues used in our survey were:

- 1) Affectual solidarity, the feeling that family members express about their relationship with other members.
- 2) Associational solidarity, the type and frequency of contact between family members.
- 3) Consensual solidarity, agreements in opinions, values and orientations between family members.
- 4) Functional solidarity, the giving and receiving support across generations, including exchange of both instrumental assets (e.g., money) as well as emotional support.
- 5) Normative solidarity, expectations regarding filial and parental obligations.

Furthermore, as we stated before, we consider a sixth dimension called systematic solidarity. We named it “systematic solidarity” with reference to the system of relationships that make up the family and also to the attitude of each member of contributing to its internal cohesion.

A family develops fully when its members exert themselves to maintain, build, treat, and restore harmony and communion among all of them. The greatest good of the family is its unity, which is achieved through unconditional love and solidarity.

According to Donati (2006), the family relationship is “a sui generis relationship made of four elements: gift, reciprocity, generativeness (biological and social), sexuality as conjugal love” (p. 58). The familiar gift is the free gift of excellence (the gift of oneself for the spouse and the gift of the life for the children), reciprocity is the form of family relationships, and generativeness is the emerging effect of the relationships.

There are various expressions of systematic solidarity: the capacity to organize one’s own life, always bearing in mind the necessities of other family members who are in need; the capacity to solve/to help to solve the problems among the members of the family; and the capacity to organize activities in order to strengthen family ties.

We decided not to use structural solidarity because we consider that this dimension does not depend on psychological and moral aspects of the family members, but it depends on external factors such as the geographical proximity/distance. From our perspective, structural solidarity might moderate the relationships between the different dimensions, but it is not a dimension itself. In other words, structural solidarity is not a dimension of family solidarity, but a set of factors that might increase or decrease the levels of family solidarity.

Finally, as a key implementation of the model, we introduced items related to the spouses/partners relation. Indeed, according to Donati (2012), the spousal relation holds a pivotal role in the intergenerational dynamic within family:

Intergenerational solidarity is defined as a complex of rules which define the relational rights and duties pertaining to people who have in common similar relations of family descent (. . .). The concept of generation refers to an age group in that individual members have similar family relations (given birth to/given birth by) mediated by society (that

is, they are seen as children, parents, grandparents, etc.). One generation would include the spousal couple, thus uniting a generation by blood to one by marriage, the horizontal as well as the vertical dimension. This provides enormous complexity, variation and interest to family mediations on behalf of one or other generations. (p. 114)

Empirical studies show as well the complexity of the intergenerational relationships and of the role played by the spouses. According to Kennedy (1992), the relationships between grandparent and grandchildren depend on several elements among which a sense of “an authentic or independent grandparent/grandchild relationship not dominated by, but supported by, the middle generation” (p. 84).

Moreover, the influence of the relationship between the parents (horizontal) on the quality of the relationships between grandparents and grandchildren (vertical) is particularly apparent in the case of divorce of parents. As an illustration, studies show that children from divorced parents are more likely to have a stronger relationship with the grandparents of the parent who has custody of the child.

Furthermore, the same dynamic, at the interception of horizontal and vertical dimensions, affects the relationship between divorced parents and children. A study conducted in Norway explored how divorce in the parent generation, and the shift from marriage to unmarried cohabitation among adult children, affects intergenerational solidarity. The findings suggested that divorce among parents is associated with lower solidarity with adult children on most solidarity dimensions. There is, on the other hand, no difference in solidarity between married and cohabiting children vis à vis the parent generation (Daatland, 2007).

Thus, according to these findings, from our point of view it is important to consider within the interpretative model also solidarity between parents (horizontal solidarity), because it gives shape to the solidarity with children and influences the solidarity among grandparents and grandchildren (vertical solidarity). Therefore, we assume that a high level of solidarity among partners may lead to a high level of solidarity between generations and vice versa.

METHOD

A survey was sent in July 2015. It was administered using Internet to the general public in Spain, so the final sample was in accordance with the target audience. We collected 201 valid questionnaires. No gender bias was detected in the sample and the majority (58.71%) of the respondents were under 45 years old. The educational level of the sample was high, with more than half of the respondents having a university degree (see Table 1 for the demographic record of the sample).

The questionnaire was divided into two sections. The first section gathers demographic data from respondents and other personal topics such as religion. The second section collects information about the intergenerational family solidarity behavior of respondents gathered in the six aforementioned dimensions. For each dimension, items are based on a 5-point Likert scale, ranging from *strongly disagree* (1) to *strongly agree* (5) or from *very low* (1) to *very high* (5), according to the nature of the item. Table 2 presents the second section of the questionnaire in detail.

Normative solidarity is composed of 11 items, six used in Longitudinal Study of Generations (LSOG, Silvester & Bengtson, 2016), which measures the expectations of filial obligations, three more used in National Survey of Midlife Development in the United States (MIDUS, Brim et al., 2016), which measures the expectation of parental obligations, and two more regarding the expectation of

spouse's obligation developed by the authors of this paper. Associational solidarity is based on a seven-item scale. These seven items were used in Bengtson and Roberts (1991) based on Mangen et al. (1988). Affectual solidarity contains 12 items. The novelty in this dimension was to consider not only the affection from parents to child and from child to parents, but also between spouses. Thus, the eight items regarding the affection from parents to child and vice versa were developed by Bengtson and Roberts (1991) based on Mangen et al. (1988), while the four remaining items regarding the affection between spouses were adapted by the authors of this paper. The next dimension refers to consensual solidarity and includes four items developed by us. The fifth dimension (functional solidarity) is composed by only two items, which were adapted from Netherlands Kinship Panel Study (Dykstra et al., 2004). The sixth and last dimension (systematic solidarity) is based on seven items developed by us. The total number of items in the second section is 43.

TABLE 1
 Demographic characteristics of the sample

	<i>N</i>	%
<i>Gender</i>		
Male	101	50.25%
Female	100	49.75%
Total	201	100.00%
<i>Age</i>		
Between 40 and 45 years	118	58.71%
Between 46 and 50 years	60	29.85%
Between 51 and 55 years	18	8.95%
Between 56 and 60 years	5	2.49%
Total	201	100.00%
<i>Working status</i>		
Working	162	80.60%
Unemployed	27	13.43%
Retired/pensioner	4	1.99%
School and work	2	1.00%
Homemaker	6	2.98%
Total	201	100.00%
<i>Annual income (in euros)</i>		
≤ 10,000 euros	15	7.46%
Between 10,001 and 20,000	36	17.91%
Between 20,001 and 30,000	40	19.90%
Between 30,001 and 40,000	29	14.43%
> 40,000 euros	23	11.44%
I prefer not to answer	58	28.86%
Total	201	100.00%
<i>Education</i>		
Basic studies	16	7.96%
High school diploma	37	18.41%
Vocational qualification	41	20.40%
University degree	107	53.23%
Total	201	100.00%



TABLE 2
 Questionnaire with its code items for IFS, gathered from the original dimensions, and references

Normative solidarity	SN1	Adult children should provide companionship or spend time with elderly parents who are in need	Adapted from LSOG
	SN2	Adult children help with household chores and repairs and/or provide transportation for elderly parents who are in need	
	SN3	Adult children should listen to the problems and concerns of elderly parents and to provide advice and guidance	
	SN4	Adult children should provide for personal and health care needs of the elderly parent (for example, bathing, grooming, medication, etc.)	
	SN5	Adult children should provide financial support and/or assist in financial and legal affairs of elderly parents who are in need	
	SN6	Adult children should provide housing for the elderly parents who are in need	
	SN7	Parents should drop their plans when their children seem very troubled	Adapted from MIDUS
	SN8	Parents should call, write, or visit their adult children on a regular basis	
	SN9	Spouses should share responsibility for the education and care of their children	Own developed
	SN10	Parents should take adult children back into home when adult children are in need	Adapted from MIDUS
	SN11	Spouses should respect and help each other	Own developed
Associational solidarity	SA1	Bengtson & Roberts (1991) based on Mangen et al. (1988)	
	SA2		
	SA3		
	SA4		
	SA5		
	SA6		
	SA7		

(table 2 continues)

Table 2 (continued)

Affectual solidarity	SAF1		
	SAF2		
	SAF3		
	SAF4		
	SAF5		Bengtson & Roberts (1991) based on Mangen et al. (1988)
	SAF6		
	SAF7		
	SAF8		
Affectual solidarity	SAF9	How much do you trust your spouse?	
	SAF10	How much respect for your spouse?	Adapted from Bengtson & Roberts (1991)
	SAF11	How much affection for your spouse?	
	SAF12	How close do you feel your spouse?	
Consensual solidarity	SC1	Do you identify yourself with the ethical principles that your parents have transmitted to you?	
	SC2	Do you transmit these same values to your children?	
	SC3	Have your children transmitted new values to you?	Own developed
	SC4	Have your children produced some profound changes in you?	
Functional solidarity	SF1	Have you received more than 1.000 euros from your parents in the past 12 months?	Adapted from KNPS
	SF2	Have you given more than 1.000 euros to your parents in the past 12 months?	
Systematic solidarity	SI1	When there are conflicts among family members, do you try to facilitate reconciliation?	
	SI2	Do you promote activities in order to strength family ties?	
	SI3	Do you organize your day thinking about the needs of your parents?	
	SI4	Do you organize your day thinking about the needs of your children?	
	SI5	Do you organize your holidays thinking about the needs of your parents?	Own developed
	SI6	Do you organize your holidays thinking about the needs of your children?	
	SI7	Do you normally call other family members who are not in need?	

Note. LSOG = Longitudinal Study of Generations, 1971, 1985, 1988, 1991, 1994, 1997, 2000, 2005 (Merril & Bengtson, 2016); MIDUS = National Survey of Midlife Development in the United States (MIDUS), 1995-1996 (Brim, et al., 2016); KNPS = Netherlands Kinship Panel Study (Wave 1 in 2002-2004).

Table 2 shows the items, gathered according to these six dimensions, in part borrowed from the literature and in part developed basing on our experience, as we stated before. However, the six dimensions had to be proven to be consistent. Therefore, to determine the dimensions or the latent constructs among these items, a factor analysis was conducted. First, the 43 intergenerational family solidarity items were analyzed using principal component analysis to explore the natural dimensions among them. The next section shows that this exploratory analysis yielded four dimensions instead of the six that were initially proposed. Consequently, the dimensionality of each of the four dimensions was analyzed. We then proceeded with a reliability analysis of these constructs to determine the internal consistency and the divergent validity. Once all of the dimensions showed the correct psychometric properties, a confirmatory factor analysis (CFA) was performed.

The scale was tested using structural equations modeling (SEM). The structural model was estimated by using the maximum likelihood (ML) method from the asymptotic variance-covariance matrix. EQS Version 6.2 was the software used to compute the empirical work.

RESULTS

The first step was to perform an exploratory factor analysis (EFA) through a principal components analysis of the 43 items from the previous six dimensions of intergenerational family solidarity. The Kaiser-Meier-Olkin (KMO) statistic index was .822 and Barlett test ($\chi^2 = 5.532, p = .000$) confirmed a linear dependence between the variables and supported the adequacy of this data. Eleven factors emerged with eigenvalues greater than one (Kaiser criterion), which accounted for 70.31% of the variance in the sample. Table 3 shows the suggested factors. Only loads above .10 are shown.

The scale was analyzed in accordance with very strict criteria in order to retain items, stricter even than those used by Ladhari (2010) and Wolfenbarger and Gilly (2003). The criteria are that the items (1) load at .70 or more on a factor, (2) do not load at more than .50 on other factor, and (3) have an item to total correlation of more than .40.

This exploratory analysis suggested only four factors (we decided to drop those factors consisting in only one or two items). The first factor includes eight items; all of them come from normative solidarity. Consequently, the label for this factor is the same. The second factor is composed by four items, all of them from the original affectual solidarity dimension. Particularly, all of these items refer to the relationship with parents; hence this factor is labeled affectual solidarity-parents. The third factor is analogous to the second one, but referred to the partner and labeled affectual solidarity-partner. The fourth and last factor that emerged is also analogous to these last couple, but referred to the relationship to children. In this case, one item that was included in the previous two dimensions is not included here. The item dropped is SAF3. It is due to the fact that this variable shows an extremely high value (4.925) and a very low standard deviation (0.299). A high consensus is reached in this item.

In order to balance the number of items in these four dimensions, some items from the first dimension were removed. Only items with loads higher than .80 were considered (we included SN9 because its load is just below this threshold). Five items remained: SN2, SN10, SN6, SN11, and SN9. After this consideration, another item of this scale was dropped, according to the criteria of maximizing its Cronbach's alpha: SN6 was removed.

Once the items for each dimension were proposed, the reliability and validity analysis for each factor was performed. Table 4 shows the reliability analysis for the four dimensions.



TABLE 3

Matrix of the 11 components extracted using principal components analysis and the varimax rotation of the intergenerational family solidarity items

	1	2	3	4	5	6	7	8	9	10	11
SN2	.850	.156									
SN10	.831			.154	-.116						.234
SN6	.809				.224	.111					
SN11	.805				-.276			.127			-.111
SN9	.796		.107	.137	-.243			.150			-.117
SN4	.774	.118			.176		.177			.174	-.103
SN1	.769	.178						.120	.155		.150
SN5	.762				.256	.131	.129				
SN3	.671				.344	.161			-.111		
SN7	.636		.126	.241							.541
SN8	.629			.130		.104					.539
SAF8		.817		.113	.187	.167	.157				
SAF7	.105	.779				.178	.157	.183	.105	.178	
SAF5	.103	.757	.103	.137	.175	.166	.118				
SAF6		.740	.143	.103		.187	.214		.162		.122
SA4	.161	.514		.506	.131			-.116			-.304
SA1	.146	.384	.162	.346	.307		-.106	-.350			.142
SAF12			.937								
SAF11			.917								
SAF9			.899			.148					
SAF10			.766		-.140	.275	.110				.101

(table 3 continues)

Table 3 (continued)

	1	2	3	4	5	6	7	8	9	10	11
SA7		.121	.533	.341							-.340
SI2				.718	.196		.162	.164	.193		.110
SI1				.663	.203		.303		.198		
SI7	.215	.311		.611	.108	.104	.112	.194			
SA3	.117	.196		.446	.288	.183		-.330		.283	-.136
SI5		.229		.174	.694	-.172	.114	.239			.180
SI3		.227		.322	.671	-.172		.188			.309
SA6				.185	.653		-.137		.216		
SA5					.582		.183				-.186
SAF2	.175	.127	.200			.773	.202				.126
SAF4		.210	.124			.767		.159	.137		
SAF1	.226	.201	.173	.155		.753					-.128
SAF3	.125	.247	.109			.493		.303	.119	.160	.176
SC1	.141	.283	.101	.178		.126	.854				
SC2		.288		.195		.152	.839				
SI4		.112		.206	.184	.145		.735		.132	
SI6	.227	.204		.191		.141		.688			
SA2		.316		.156	.140		-.155	-.482		.327	.178
SC4	.140	.119				.120	.101		.817		
SC3				.168	.129	.147			.777		
SF1				-.125					.134	-.757	-.118
SF2	-.149								-.215	-.703	.165

TABLE 4
Loads of the four CFAs and statistics for their reliability analyses

	1	2	3	4
	Normative solidarity	Affectual solidarity/parents	Affectual solidarity/partner	Affectual solidarity/children
SN11	.888	SAF8 .828	SAF12 .911	SAF1 .806
SN9	.885	SAF7 .804	SAF11 .899	SAF2 .784
SN10	.822	SAF5 .783	SAF9 .891	SAF4 .748
SN2	.795	SAF6 .777	SAF10 .803	
Cronbach's alpha	.906	.858	.930	.816
Composite reliability	.911	.875	.930	.823
Average variance extracted	.720	.637	.769	.608

Based on the results reported in Table 4, it can be concluded that the four constructs are reliable in terms of the classic thresholds of Cronbach's alpha ($> .70$), composite reliability ($> .70$), and average variance extracted ($> .50$) (Hair, Anderson, Tatham, & Black, 1998). Discriminant validation is also acceptable (Table 5).

TABLE 5
Correlation matrix of latent factors

	1	2	3	4
1 Normative solidarity	.848			
2 Affectual solidarity/parents	-.145	.798		
3 Affectual solidarity/partner	.127	-.200	.877	
4 Affectual solidarity/children	-.267	.447	-.339	.780

Note. Diagonal elements are the square roots of the average extracted (AVE).

The next step was to conduct a confirmatory factor analysis using structural equations modeling (SEM). The fit indices obtained in the measurement model estimation showed good general fitness. Satorra-Bentler scaled χ^2 was 191.44 with 84 degrees of freedom and a p -value of .000; χ^2/df was 2.28, which was under the acceptable limit of 5. RMSEA was .080, and the CFI was .900. The standardized solution is shown in Table 6.

An alternative model was also considered, in which the dimension normative solidarity is the same as in the previous model. Nevertheless, the three remaining dimensions are considered as subdimensions of a second order construct labeled affectual solidarity. In addition, the item SAF3 was incorporated in the subdimension affectual solidarity/children for the sake of homology with the other two affectual solidarity subdimensions. The fit of this competitive model was worse than the first model intended: Satorra-Bentler scaled χ^2 was 247.86 with 100 degrees of freedom and a p -value of .000; the RMSEA was .086; and the CFI was .863. Consequently, the first model consisting in four dimensions forming a construct of first order was chosen.

TABLE 6
 Confirmatory factor analysis for IFS

Dimension	Items	Load	<i>t</i> -value	<i>r</i> ²
Normative solidarity	SN2	.705	–	0.709
	SN9	.952	21.532	0.306
	SN10	.749	23.845	0.662
	SN11	.956	26.807	0.292
Affectual solidarity/parents	SAF5	.804	–	0.594
	SAF6	.745	7.535	0.668
	SAF7	.781	8.530	0.624
	SAF8	.863	17.352	0.506
Affectual solidarity/partner	SAF9	.875	–	0.484
	SAF10	.728	9.576	0.685
	SAF11	.934	8.942	0.358
	SAF12	.960	11.403	0.281
Affectual solidarity/children	SAF1	.857	–	0.515
	SAF2	.783	7.187	0.621
	SAF4	.705	7.638	0.709
Fit indices				
Satorra-Bentler scaled χ^2			191.44	
Degrees of freedom			84	
<i>p</i>			.00000	
χ^2/df			2.28	
Comparative fit index (CFI)			.900	
Root mean-square error of approximation (RMSEA)			.080	
90% confidence interval of RMSEA			(.065, .095)	

Note. *r*² = coefficient of determination.

The definitive scale proposed to measure IFS is composed by four dimensions: normative solidarity and the three affectual solidarities (related to parents, partner, and children). Note how analogous the three affectual dimensions are. It would be legitimate to introduce again SAF3 for the sake of symmetry, although it is known in advance that it will take a high score and a low standard deviation. Nevertheless, we kept our initial criterion and it was excluded from the scale.

Once the scale for IFS had been proposed, we proceeded to analyze differences between men and women. The size of the first subsample, corresponding to men is 101; the size for the second group, which corresponds to women, is 100. Figure 1 shows the scores of both subsamples. Only two items show a significant difference between both means: SAF8 (“How close do you feel to parent?”) and SAF4 (“How close do you feel to child?”) with an associated *p*-value of .019 and .014 respectively. In both cases, women score higher than men.

Next step was to analyze the consistency of the scale across gender differences. A multigroup analysis to test invariance between the two established categories concerning gender was

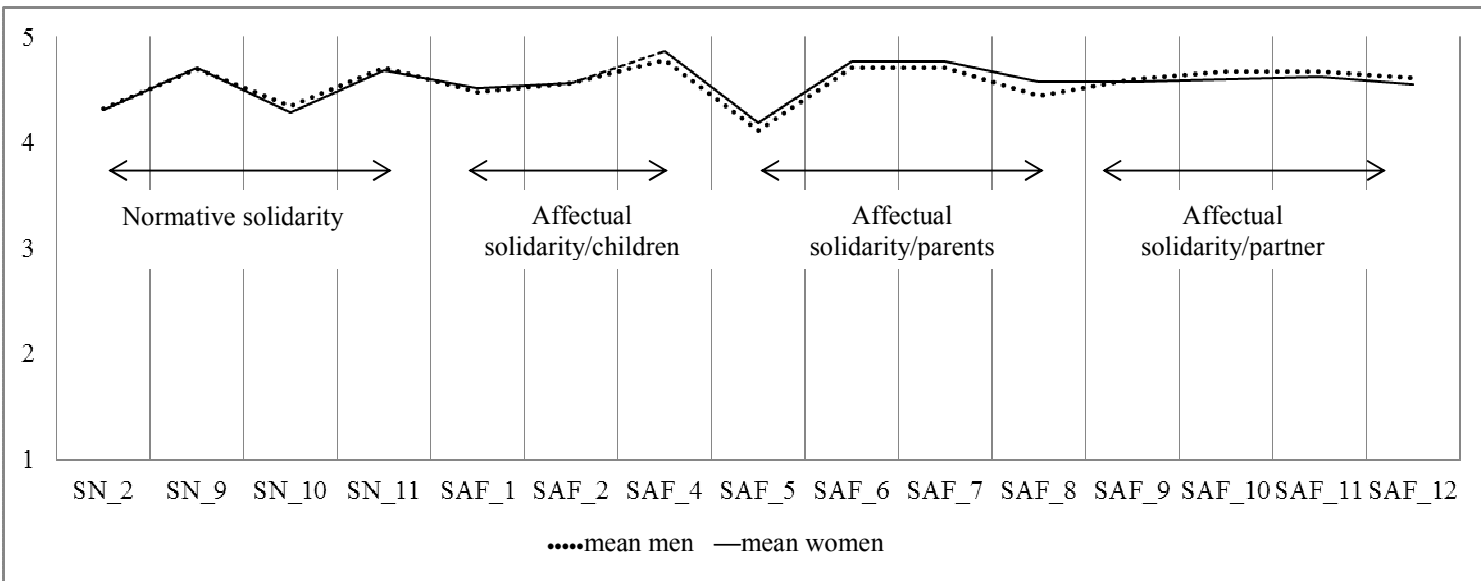


FIGURE 1
 Punctuations for the items of the IFS scale according to gender groups.

performed. As in previous analysis, the model was estimated using the robust maximum likelihood method from the asymptotic variance-covariance matrix. Eleven constraints were established, accounting for the invariance of the measurement model (the invariance of the loads). Restrictions cannot be imposed on the four parameters (loads) fixed to one in order to fix their scales. The fit indices are satisfactory: the Satorra-Bentler χ^2 was 322.54, with 179 degrees of freedom, χ^2/df was 1.80, which was below the acceptable limit of 5; RMSEA was .090; and the CFI was .846. This last index is below the accepted general criteria (Hair et al., 1998) and the results of the analysis should be taken cautiously. To locate parameters that are non-invariant across groups, we look for probability values associated with the incremental univariate χ^2 values that are $< .05$. Review of these values, as reported in Table 7, reveals that all parameters operate equivalently across gender groups, excepting the load of SAF2. Table 7 reports the standardized paths and also the non-standardized paths. The non-standardized paths have been constrained to be equal.

CONCLUSIONS

The main goal of this study was to design and validate a scale that measures intergenerational family solidarity (IFS). Using a sample of 201 valid questionnaires, different analyses were conducted to validate the new scale. The definitive scale proposed to measure IFS was composed by 15 items grouped in four dimensions: normative solidarity and the three affectual solidarities (related to parents, partner, and children). Taken as a whole, this study provides sufficient evidence that this new scale of intergenerational family solidarity can be used to measure intergenerational solidarity among family members. The novelty of this intergenerational family solidarity scale is to include the relationship between partners in different dimensions. Except for a few studies (Grzywacz & Marks, 1999), partners have not been included as a key element among intergenerational family solidarity. However, empirical evidences suggested that solidarity and equality between spouses is associated with improvements in multiple dimensions of marital quality (Amato, Johnson, Booth, & Rogers, 2003), and at the same time marital quality positively affects family cohesion (Silverstein & Bengtson, 1997). Thus, we consider that including solidarity between spouses is necessary to have a complete picture of intergenerational relationships among family members. On the other hand, we provide evidences of the consistency of this scale across gender differences.

This current scale has some limitations that should be highlighted. On the one hand, four dimensions were not incorporated into the final scale, including the new type of solidarity, which we called systematic solidarity. On the other, we included in functional solidarity the items relating to financial exchanges but not the physical and emotional ones. In this dimension, we only mentioned the items related with economic support because in Spain people do not usually speak about money. Specific questions were the only way to try to obtain information about economic needs and supports. We included physical and emotional needs and supports in the systematic solidarity.

However, as we have seen before, this scale has also several strengths. On one hand, it is a short validated scale which can measure family solidarity from different perspectives. On the other, this new scale includes the level of solidarity between spouses, which is an important novelty in this type of scale.

TABLE 7
Paths for each group in the multigroup analysis and univariate increment analysis

	Standardized paths		Non-standardized paths (<i>t</i> -value)	Univariate increment	
	Men subsample	Women subsample		Robust χ^2	Probability
Normative solidarity→SN2	0.563	0.709	1.000 (-)	-	-
Normative solidarity→SN9	0.890	0.979	1.165 (18.426)	0.460	0.498
Normative solidarity→SN10	0.637	0.731	1.055 (20.786)	0.717	0.397
Normative solidarity→SN11	0.921	0.958	1.143 (22.997)*	1.335	0.248
Affectual solidarity/parents → SAF5	0.775	0.735	1.000 (-)	-	-
Affectual solidarity/parents → SAF6	0.821	0.782	0.590 (8.480)	1.090	0.296
Affectual solidarity/parents → SAF7	0.834	0.847	0.677 (9.977)	0.105	0.746
Affectual solidarity/parents → SAF8	0.828	0.852	0.851 (18.600)	0.357	0.550
Affectual solidarity/partner → SAF9	0.852	0.876	1.000 (-)	-	-
Affectual solidarity/partner → SAF10	0.694	0.674	0.655 (7.977)	0.439	0.508
Affectual solidarity/partner → SAF11	0.944	0.926	1.073 (7.643)	0.172	0.678
Affectual solidarity/partner → SAF12	0.968	0.947	1.181 (8.999)	0.357	0.550
Affectual solidarity/children → SAF1	0.767	0.885	1.000 (-)	-	-
Affectual solidarity/children → SAF2	0.786	0.848	0.880 (10.919)	6.686	0.010
Affectual solidarity/children → SAF4	0.575	0.701	0.469 (6.423)	0.000	0.983

Note. (*) Significant at 5% level.

Finally, the findings of this study suggest that there is an interesting correlation between the dimensions of solidarity among parents, children, and spouses. Future research has the opportunity to measure the relationship between these factors and provide new empirical evidences and understanding of solidarity among family members. Further studies using this new scale might also examine the relationship between normative solidarity and affectual solidarity among parents, partner, and children.

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