

THE ITALIAN VERSION OF THE VALUE OF CHILDREN QUESTIONNAIRE: FACTORIAL STRUCTURE AND MEASUREMENT INVARIANCE ACROSS GENDER AND GENERATIONS

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The Value of Children (VOC) questionnaire has been widely used to measure the value of children, that is, the reasons for wanting to have a child and expected benefits from becoming a parent. In this study we aim at analyzing the factorial structure of the Italian version of the VOC questionnaire. Data from 1,027 Italian participants were submitted to confirmatory factor analysis to test three models (a two-factor solution, a three-factor solution, and a four-factor solution), reflecting alternative representations of VOC dimensionality presented in the literature, and to investigate the measurement invariance of the best factor model across gender and family generations. The results indicated that the four-factor model (Economic-normative VOC, Emotional VOC, Family VOC, and Old-age security VOC) presented the best fit and parameters that were cross-group invariant. Implications for theory, assessment, and future research are discussed.

Key words: Value of Children (VOC) questionnaire; Factorial structure of VOC; VOC invariance across gender; VOC invariance across generations.

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The concept of value of children (VOC) was coined forty years ago within an interdisciplinary approach, which aimed to explain the variations in the fertility rates of affluent and developing countries. In particular, the VOC was initially defined by Hoffman and Hoffman (1973) as the whole of the functions that children serve or the needs that they fulfill for parents (e.g., economic utility, primary group ties, expansion of the self, “immortality”). It was measured by a series of open-ended and structured questions about the “reasons for wanting a child” (Arnold et al., 1975) and it was treated as the psychological variable which mediates the effects of individual resources and socioeconomic conditions on the decision to give birth to children (Bulatao, 1979).

Starting from this first conceptualization, several studies (called “VOC studies”) suggested that the VOC is a complex and multidimensional construct, whose dimensions are differently correlated to fertility (Arnold et al., 1975; Bulatao, 1979). Specifically, most of the VOC

studies focused on the distinction among an Economic-utilitarian VOC (i.e., contributions to the family economy from child labor, household help, and additional income), an Emotional VOC (i.e., emotional gratification that the relationship with one's own children brings), and a Social-normative VOC (i.e., improving standing and bettering reputation among one's own kin) (Kagitcibasi, 1982b), and reported significant differences in the VOC dimensions among sociocultural groups within and across countries. For example, significant gender-related differences were revealed: men tend to score higher on Economic-utilitarian and Social-normative VOC and lower on Emotional VOC than do women (e.g., Leavy & Hough, 1983). With respect to Economic-utilitarian and Social-normative VOC, also intergenerational differences emerged: grandmothers report higher values as compared to both mothers and adolescents (e.g., Trommsdorff, Mayer, & Albert, 2004). Furthermore, the values attributed by parents to their children were found to vary significantly based on the levels of the country's socioeconomic development and welfare system. Individuals who grew up in developing countries tend to stress more the economic benefits that children provide and to have more children. In contrast, the lower fertility in affluent countries is correlated to people's consideration of their offspring as a source of psychological benefits, such as love, joy, and companionship (Kagitcibasi, 1982b; Leavy & Hough, 1983).

Recently, the approach to the study of the VOC has been revised and extended in order to include the study of social changes and intergenerational relations. Two pathways, one more sociological and the other more psychological, were followed in the revision of the original VOC approach. Although both approaches are characterized by a certain conformity with the early VOC studies, and in particular with the notion of the multidimensionality of the benefits parents may get from their offspring, they are different from each other in their theoretical framework. On the one hand, Nauck (2005) integrated the concept of VOC with the Theory of the Social Production Functions (Lindenberg, 1996). According to this theory, "human beings strive for two major goods: physical well-being and social approval" (Lindenberg, 1996, p. 169). These two needs, however, cannot be reached directly, as they can be satisfied only recurring to intermediate goals: physical well-being can be met by producing comfort (i.e., insurance utility, economic help, and work utility) and stimulation, whereas social approval results from social status, behavioral confirmation, and affectionate relationships. Children, within this point of view, can be considered as intermediate goals in their parents' social production function, that is, they help parents to achieve comfort, social-esteem, and affect (Nauck & Klaus, 2007).

On the other hand, Trommsdorff (2001; Trommsdorff & Nauck, 2005) focused on the psychological issues related to the VOC, opening the VOC approach to intergenerational solidarity and development pathways of parent-child relations. A heuristic model of transmission of values and behavior preferences over three generations was developed (i.e., the culture-informed model of intergenerational relationships), integrating "person variables" (attachment, VOC, value of family) and "relationship variables" (relationship quality, parenting style, support), and taking also the cultural context into account (Trommsdorff, 2003, 2006). Person variables, among which the VOC, are assumed to influence the relationships between parents and children over the lifespan and over the generations. The predominant cultural values (e.g., independence or interdependence) affect the pathways for the development of parent-child relationships and the related processes of the cultural transmission.

In both these extensions of the VOC approach, Arnold and colleagues' (1975) questionnaire was revised using a selection of the original items and adding some newly developed items and some items from the Family and Fertility Survey (FFS; Pohl, 1995), for a final set of 27 items

(Schwarz, Chakkarath, Trommsdorff, Schwenk, & Nauck, 2001). In several studies (e.g., Nauck & Klaus, 2007), parents were asked to fill out the complete version, whereas grandparents (23 items) and adolescents (18 items) had to answer a smaller set of questions. This was due to the nonapplicability of some items to grandparents and children (e.g., "To have another girl").

Many studies, carried out in several countries, used this newly developed VOC questionnaire. However, the psychometric properties of this scale, which were studied only with regard to its dimensionality and generally by exploratory methods, remain uncertain. For example, the number of dimensions from exploratory factor analyses ranged from two (e.g., Traditional and Emotional VOC; Mishra, Mayer, Trommsdorff, Albert, & Schwarz, 2005) to four (e.g., Economic-normative, Emotional, Family, and Old-age security VOC; Mayer, Albert, Trommsdorff, & Schwarz, 2005). These configural variations make it very difficult to compare research results and to draw conclusions. Indeed, measurement invariance is required for comparisons among groups to insure that potential differences can be interpreted reliably (Vandenberg & Lance, 2000; Van de Vijver & Poortinga, 1997). In particular, configural invariance (which implies the same number of factors and the same pattern of parameters in each group) and metric invariance (which implies equal factor loadings across groups) are both strict prerequisites for inferring that the construct has the same meaning for the compared groups (Steinmetz, Schmidt, Booh, Wieczorek, & Schwartz, 2009). These two levels of invariance, also called "weak invariance," allow to compare groups in terms of associations (e.g., covariances and raw regression weights) between latent factors and external variables. To meaningfully compare test scores across groups, scalar invariance (i.e., "strong invariance") is additionally needed (Byrne & Watkins, 2003). Establishing scalar invariance indicates that observed scores are related to the latent scores, that is, the differences across groups in the means of the observed variables are due to the differences in the means of the respective factors.

Most of the studies using the newly developed VOC questionnaire focused on the comparison among groups (e.g., males and females; children and parents; groups coming from different countries; see Trommsdorff, 2001; Trommsdorff & Nauck, 2005), but surprisingly only a few of them examined the invariance of the scale and the existing evidence is quite mixed. To our knowledge, one of the first attempts to test configural and metric invariance of the scale was made by Mayer and colleagues (2005) in their three-generation study carried out in Germany. Based on a combination of exploratory principal components analysis (PCA) and multigroup confirmatory factor analysis (CFA), the scale was reduced to a 12-item version measuring four factors (Economic-normative VOC, Emotional VOC, Family VOC, and Old-age security/Long-term orientation VOC; Table 1), which resulted invariant across adolescents, mothers, and grandmothers.

More recently, Mayer and Trommsdorff (2010) involved adolescents from 12 countries¹ to test the cross-cultural equivalence of the 18-item scale. The authors conducted a PCA across all participants and countries (pooled solution), extracting two factors (Utilitarian-normative VOC and Emotional VOC) and removing three items which showed cross-loadings or no substantial loadings (Table 1). To test equivalence, a separate PCA was conducted for each country and target rotated to the pooled solution. The loadings of the target-rotated single solutions were then compared to the loadings of the pooled solution using the proportionality coefficient Tucker's phi (Chan, Ho, Leung, Chan, & Yung, 1999). With the exception of Israel and South Africa, the two dimensions of Utilitarian-normative and Emotional VOC proved cross-culturally equivalent. In the Israeli case, the country-specific solution yielded three factors (i.e., economic-utilitarian and social-normative reasons for wanting children formed two different dimensions in addition to Emotional VOC), while in South Africa a unifactorial structure resulted with all VOC items forming a single dimension.

TABLE 1
Models for the Value of Children (VOC) questionnaire

Item	Four-factor model	Two-factor model	Three-factor model ^a
1 Because a child helps around the house	–	Utilitarian-normative VOC	Comfort
2 Because any new family member makes your family more important	Family VOC	–	Social-esteem
3 Because having children increases your sense of responsibility and helps you to develop	Family VOC	Emotional VOC	Social-esteem
4 Because it is a joy to have a small baby	–	Emotional VOC	Affect
5 Because it is fun to have young children around the house	Emotional VOC	Emotional VOC	Affect
6 Because of the pleasure you get from watching your children grow	Emotional VOC	Emotional VOC	Affect
7 Because of the special feeling of love that develops between a parent and a child	Emotional VOC	Emotional VOC	Affect
8 Because parenthood improves your standing and betters your reputation among your kin	–	Utilitarian-normative VOC	–
9 Because people with children are less likely to be lonely in old age	Old-age security VOC	–	–
10 Because raising children helps you to learn about life and yourself	–	Emotional VOC	–
11 Because some of your older relatives feel that you should have more children	–	Utilitarian-normative VOC	–
12 Because your life will be continued through your children	–	–	–
13 To be sure that enough children will survive to adulthood	Economic-normative VOC	Utilitarian-normative VOC	–
14 To carry on the family name	Economic-normative VOC	Utilitarian-normative VOC	Comfort
15 To have one more person to help your family economically	Economic-normative VOC	Utilitarian-normative VOC	Comfort
16 To have someone to love and care for	Emotional VOC	Emotional VOC	–
17 When it is a duty to have children according to your belief	Economic-normative VOC	Utilitarian-normative VOC	–
18 Because your children can help you when you are old	Old-age security VOC	Utilitarian-normative VOC	Comfort

Note. – = items excluded because of cross-loadings or no substantial loading. ^a This model included two more items (“To bring parents closer together” and “More contacts with kin”) extracted from the 27-item version of the scale, both measures of Social-esteem.

Adopting the same exploratory procedure, Nauck and Klaus (2007) showed the cross-cultural equivalence of 12 items measuring three factors. According to the sociological extension of the original VOC approach, these factors were named Comfort (i.e., economic help and support in old age), Affect (i.e., affectionate intergenerational relationships), and Social-esteem (i.e., importance of the family and social approval within the kinship) (Table 1). The authors collected data from mothers, grandmothers, and adolescent children within 11 countries,² by administering the 27-item version of the scale to the mothers and the reduced versions to the grandmothers and adolescents. Firstly, exploratory factor analysis was performed on the total sample of mothers and problematic items (cross-loadings or no substantial loadings) were excluded until a satisfactory solution was established. Secondly, the remaining item pool of the final solution was factor analyzed for every single country and the results were compared to the pooled solution using the proportionality phi coefficient by Tucker. Equivalence was established for the majority of countries, but not to the same degree. In particular, Ghana and South Africa showed low proportionality coefficients for Comfort and Affect, whereas Social-esteem showed problematic results for Indonesia and India. Both steps (i.e., exploratory factor analysis and comparison to the pooled solution) were then repeated including the grandmothers and adolescents in the analysis.³ There was evidence that the three-factor structure was adequate for the grandmothers and adolescents too and turned out to be equivalent across most countries.

AIMS OF THE CURRENT STUDY

In light of this background, the general purpose of the current study was to extend previous work by examining alternative factor solutions of the newly developed VOC questionnaire administered, for the first time, to a large Italian sample. More specifically, two goals guided the study: a) to evaluate the prevailing factor models of the VOC questionnaire — proposed in the literature (Mayer et al., 2005; Mayer & Trommsdorff, 2010; Nauck & Klaus, 2007) and presented in Table 1 — in order to identify the solution that best fitted the data; b) to examine the configural, metric, and scalar invariance of the best factorial structure across gender (males vs. females) and family generations (adolescent and emerging adult children vs. parents). Gender and generation, in fact, were often investigated in relation to values in both cross-country and within-country studies and were found to influence the VOC (e.g., Leavy & Hough, 1983; Trommsdorff et al., 2004) and, more generally, value orientations (Barni, 2009; Barni, Ranieri, Scabini, & Rosnati, 2011). While there have been numerous attempts to explain gender and generational disparities in the VOC, it is not known whether these effects reflect true group differences or deficiencies in the way the VOC was measured. Thus, once measurement invariance was established, we aimed at analyzing gender and generation differences in the importance given to the VOC dimensions.

METHOD

Participants and Procedure

Participants (57% males and 43% females) were 528 adolescents and emerging adults (aged between 15 and 25; $M = 18.51$, $SD = 2.70$), and 499 adults (aged between 34 and 66; $M =$

49.84, $SD = 5.08$; the response rate was 81.8%). None of the adolescents and emerging adults had children, whereas all adults had one or more children ($M = 2.03$, $SD = 0.86$). All participants were Italians and lived in the North of Italy.

Data were collected across three studies. These studies were independently conducted in two urbanized regions of Northern Italy: Lombardy and Veneto. The first study involved parents of adolescents, who were contacted through their children's high schools, and was carried out in 2006. The second and the third studies, which were conducted in 2009 and in 2010 respectively, involved adolescents and emerging adults, who were recruited through the help of their high schools or universities.

Measures

The value of children was measured with the Italian translation of the newly developed VOC questionnaire (Schwarz et al., 2001).⁴ In this study we administered to the participants only the 18 items included in both parents' and children's versions of the scale because of our interest in finding a form of the scale which was invariant across family generations. Participants were asked to reply to the question "How important the following reasons for wanting to have children are to you personally?" and examples of items are: "Because of the pleasure you get from watching your children grow," "To have one more person to help your family economically." Items are rated on a 5-point scale (from 1 = *not important at all* to 5 = *very important*).

Data Analyses

The sample was randomly divided into two groups by using the odd-even split method. The first group (Group A) consisted of 514 participants ($M_{age} = 33.43$, $SD = 15.74$; 54.5% males) and the second group (Group B) consisted of 513 participants ($M_{age} = 31.71$, $SD = 16.60$; 59.5% males). Group A was used to analyze the factor structures under examination by confirmatory factor analysis (CFA). Group B was used to test the invariance of the best factorial structure across gender and generations by multigroup CFAs. The covariance matrices analyzed were produced using PRELIS and the various models were tested using LISREL 8.80 (Jöreskog & Sörbom, 2006).

Confirmatory Factor Analysis

The models were evaluated using maximum likelihood estimation. Each indicator loaded on only one factor and, because the measurement scale for each latent variable was indeterminate, one factor loading for each latent variable was arbitrarily set to one. All factors were allowed to correlate.

Model fit. Model fit was determined using the minimum fit function χ^2 . However, as this index is extremely sensitive to sample size (Hu & Bentler, 1995), it was supplemented with additional fit indices: the root mean square error of approximation (RMSEA), the comparative fit index (CFI), and the nonnormed fit index (NNFI). Values in the range of 0 to .08 for RMSEA re-

flect acceptable error and values equal or greater than .95 for CFI and .90 for NNFI suggest an acceptable fit to the data (Browne & Cudeck, 1993; Hu & Bentler, 1998, 1999).

Multigroup Confirmatory Factor Analysis

Multigroup CFAs were conducted on Group B to investigate whether the factor structure of best fit was invariant across gender: males ($N = 305$) versus females ($N = 208$), and generations: adolescent and emerging adult children ($N = 264$) versus parents ($N = 249$). Configural invariance, metric invariance, and scalar invariance across the multiple groups were examined.

Test of configural invariance. The preliminary step in the process of testing invariance is to evaluate whether the same general factor structure of the scale is supported in the groups (i.e., whether the same number of factors is relevant and whether the same items are salient to each factor). Thus, the factor solution was tested via separate CFAs for each group. This model (here, Model A) was then examined simultaneously for invariance across groups with no parameter constraints imposed, thus permitting different parameter values across groups. This model provided the basis for comparison with all subsequent models in the invariance hierarchy.

Test of metric invariance. Metric invariance tests the extent to which the relationships between the factors and the items are equivalent across groups. Thus, the factor pattern coefficients were constrained to be equal across, on the one hand, the two genders and, on the other, the two generations (here, Model B). The χ^2 difference test was then calculated to establish whether there was a significant difference between the constrained Model B and the unconstrained Model A. Whenever a nonsignificant difference between the two models is reported, this suggests that factor loadings are consistent across the groups (Byrne, 2001). However, since the χ^2 difference test suffers from the same well-known problems as the χ^2 test for evaluating overall model fit (Steenkamp & Baumgartner, 1998), the invariance hypothesis was further investigated by considering the differences in the CFI between Model A and Model B. Metric invariance can be retained when the change in CFI is not greater than .01 (Cheung & Rensvold, 2002).

Test of scalar invariance. If metric invariance is satisfied, scalar — or intercept — invariance can be tested by constraining the intercepts of items to be the same across groups (here, Model C). The χ^2 difference test and the change in CFI were used to compare Model C to Model B: whenever nonsignificant differences between the two models are found, the intercepts are consistent across groups (Byrne, 2001).

Cross-group mean comparisons. Once the scalar invariance was established, a 2 (Gender) \times 2 (Generation) analysis of variance was carried out to examine gender and generation differences in reported VOC dimensions. Scores of the VOC dimensions were generated by averaging across the respective items.

RESULTS

Factor Structures: Testing Alternative Models

A preliminary inspection of the item distribution was made. According to the guidelines of severe nonnormality proposed by West, Finch, and Curran (1995), the normality assumption of

all the variables was well met. Table 2 presents fit statistics (χ^2 and descriptive values) for the three models tested in this study.

TABLE 2
Fit indices for CFA tests for alternative models (Group A, $N = 514$)

Model	Total number of items	χ^2	df	RMSEA	CFI	NNFI
Four-factor model	12	154.83	48	.066	.93	.90
Two-factor model	15	420.52	89	.085	.85	.82
Three-factor model	10	181.22	32	.095	.88	.83

Note. RMSEA = root mean square error of approximation; CFI = comparative fit index; NNFI = nonnormed fit index.

Using the above-mentioned standard for fit, none of the solutions was completely satisfactory, but overall the four-factor model best fitted the data. Notably, its modification indices suggested an improved model fit by deleting the item #7 (“Because of the special feeling of love that develops between a parent and a child”), which cross-loaded on two factors (Economic-normative and Emotional VOC). This modification improved the model fit, with the χ^2 value decreasing to 97.64 ($df = 38$) and RMSEA to .055; CFI and NNFI increased to .96 and .92, respectively. All 11 items had an acceptable loading value, higher than the threshold value of .40 (Comrey & Lee, 1992), and factor and error variances were significant ($p < .05$) (Table 3). The factor intercorrelations ranged from .32 between Economic-normative and Emotional VOC to .79 between Emotional and Family VOC. The four factors showed a satisfactory internal consistency ($\alpha > .60$), despite the short length of the subscales (Table 4).

TABLE 3
Items, factors, standardized loadings, and error variances for the modified four-factor model of VOC questionnaire (Group A, $N = 514$)

	Item	Factor	Factor pattern coefficient	Error variance
13	To be sure that enough children will survive to adulthood	Economic-normative VOC	.65	.57
14	To carry on the family name	Economic-normative VOC	.65	.58
15	To have one more person to help your family economically	Economic-normative VOC	.72	.49
17	When it is a duty to have children according to your belief	Economic-normative VOC	.52	.73
5	Because it is fun to have young children around the house	Emotional VOC	.61	.63
6	Because of the pleasure you get from watching your children grow	Emotional VOC	.61	.62
16	To have someone to love and care for	Emotional VOC	.47	.78

(Table 3 continues)

Table 3 (continued)

	Item	Factor	Factor pattern coefficient	Error variance
2	Because any new family member makes your family more important	Family VOC	.58	.67
3	Because having children increases your sense of responsibility and helps you to develop	Family VOC	.48	.77
9	Because people with children are less likely to be lonely in old age	Old-age security VOC	.80	.35
18	Because your children can help you when you are old	Old-age security VOC	.83	.31

Note. VOC = Value of Children.

TABLE 4
Factor intercorrelations (Pearson coefficients) and reliability
for the modified four-factor model (Group A, $N = 514$)

Factor	Economic-normative VOC	Emotional VOC	Family VOC	Old-age security VOC
Economic-normative VOC	1.00			
Emotional VOC	.32	1.00		
Family VOC	.40	.79	1.00	
Old-age security VOC	.64	.33	.51	1.00
Number of items	4	3	2	2
Cronbach's alpha	.72	.61	.64 ^a	.80 ^b

Note. Spearman-Brown coefficients: ^a.65; ^b.80. VOC = Value of Children.

As far as the two-factor and three-factor models were concerned, it is worth noting the cross-loading of the item #7 and the correlated errors between several items.

Test of Invariance

Invariance tests were performed for the 11-item, four-factor model. Invariance was tested across gender and generations in the following hierarchical ordering of nested models: configural invariance, metric invariance, and scalar invariance.

Gender. The modified four-factor model showed an acceptable fit to the data both among males ($\chi^2 = 87.33$, $df = 38$; RMSEA = .065; CFI = .96; NNFI = .93) and females ($\chi^2 = 51.24$, $df = 38$; RMSEA = .041; CFI = .97; NNFI = .96). Table 5 displays how the unconstrained Model A fitted the empirical data adequately, supporting configural invariance. The equality constraints on

factor loadings (Model B) yielded neither a significant increase of the χ^2 nor change in CFI, indicating an invariant pattern of factor loadings between male and female participants. The scalar invariance model (Model C) also provided excellent fits to the data. In brief, the tests of differences in fit between adjacent models supported measurement invariance across gender.

TABLE 5
 Fit indices for invariance tests across gender and generations
 for the modified four-factor model (Group B, $N = 513$)

Model	χ^2	<i>df</i>	RMSEA	CFI	NNFI	$\Delta\chi^2$ (Δdf), <i>p</i>	Δ CFI
Gender (males, $n = 305$; females, $n = 208$)							
A. Configural invariance	138.57	76	.057	.96	.94		
B. Metric invariance	142.63	83	.053	.96	.95		
A-B comparison						4.06 (7), <i>ns</i>	.00
C. Scalar invariance	151.60	90	.048	.96	.96		
B-C comparison						8.97 (7), <i>ns</i>	.00
Generation (children, $n = 264$; parents, $n = 249$)							
A. Configural invariance	122.14	76	.049	.97	.95		
B. Metric invariance	128.69	83	.046	.97	.95		
A-B comparison						6.55 (7), <i>ns</i>	.00
C. Scalar invariance	134.70	90	.044	.97	.97		
B-C comparison						6.01 (7), <i>ns</i>	.00

Note. RMSEA = root mean square error of approximation; CFI = comparative fit index; NNFI = nonnormed fit index.

Generation. The modified four-factor model showed a good fit to the data among children ($\chi^2 = 46.89$, $df = 38$; RMSEA = .030; CFI = .98; NNFI = .94) and parents ($\chi^2 = 75.25$, $df = 38$; RMSEA = .053; CFI = .96; NNFI = .92). It was configurally and metrically invariant across the two groups and also the scalar invariance was supported (Table 5).

Cross-group comparisons. Based on the demonstration of measurement invariance across gender and generations, cross-group comparisons were conducted. As the VOC dimensions were significantly correlated, a multivariate analysis of variance (MANOVA) was performed.

Descriptive statistics of the four VOC dimensions are reported in Table 6, separately by gender and generation. On average, Emotional VOC and Family VOC scores were higher than Economic-normative and Old-age security VOC scores in all groups.

A Gender \times Generation interaction emerged for Family VOC, $F(1, 509) = 6.63$, $p < .01$, $\eta^2 = .02$. Among children, females attributed more importance to this VOC dimension than males did, whereas there were no differences between fathers and mothers. Also some main effects were significant. Gender differences were found for Economic-normative VOC, $F(1, 509) = 41.41$, $p < .001$, $\eta^2 = .07$, and Old-age security VOC, $F(1, 509) = 18.62$, $p < .001$, $\eta^2 = .03$, which were given more importance by males than by females. As far as generation was concerned, a slight difference emerged for Old-age security VOC, $F(1, 509) = 6.17$, $p < .05$, $\eta^2 = .01$, which was endorsed more strongly by children than by parents.

TABLE 6
 VOC dimensions: Means and standard deviations (Group B, $N = 513$)

	Males				Females			
	Children		Parents		Children		Parents	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Economic-normative VOC	2.28	0.82	1.98	0.91	1.62	0.69	1.65	0.66
Emotional VOC	3.85	0.69	3.87	0.81	3.95	0.63	3.76	0.78
Family VOC	3.57	0.91	3.76	0.81	4.04	0.87	3.79	0.97
Old-age security VOC	3.06	1.05	2.82	1.03	2.63	1.07	2.39	1.00

Note. VOC = Value of Children.

DISCUSSION

The purpose of this study was to investigate the factor structure of the Italian VOC questionnaire, by testing three alternative models proposed in the literature (Mayer et al., 2005; Mayer & Trommsdorff, 2010; Nauck & Klaus, 2007), and its measurement invariance across gender and generations. The traditional interest in the relationship between the VOC and fertility (e.g., Arnold et al., 1975; Bulatao, 1979) and the growing interest in group differences (e.g., Leavy & Hough, 1983; Trommsdorff et al., 2004), coupled with a lack of empirical evidence for the scale invariance, highlight the need for this type of investigation.

The results of the present study supported the use of Mayer and colleagues' four-factor model (Economic-normative VOC, Emotional VOC, Family VOC, and Old-age security VOC), but with 11 items rather than 12; by contrast, the two alternative models (i.e., the two-factor model and three-factor model; Mayer & Trommsdorff, 2010; Nauck & Klaus, 2007) did not demonstrate an adequate fit to the data. The item #7 "Because of the special feeling of love that develops between a parent and a child" was not included in the final model since it loaded highly on both Economic-normative and Emotional VOC. We could speculate that this reason for having children is too generic, so that it could be an expression of several dimensions; after all, the "feeling of love" is the basis of the parent-child relationship and it can comprise several aspects. However, it is not possible to exclude that the cross-loading of the item #7 is a sample peculiarity, since it has never been found in previous studies.

Overall, the four factors are substantively distinct and theoretically sound. Economic-normative VOC reflects economic reasons (e.g., to have one more person to help the family economically) and social advantages (e.g., to carry on the family name) for having a child; Emotional VOC refers to the happiness, joy, and companionship that parents experience with having a child; Family VOC includes social improvements for the family due to the birth of the child; Old-age security VOC connects children with parents' security in a long-term framework, particularly against loneliness in old age. The correlations between factors suggest that the subscales measure related but still separate reasons for parenthood. Notably, the highest correlations were found between, on the one hand, Emotional and Family VOC and, on the other, Economic-normative and Old-age security VOC. Although in the literature these four factors were sometimes collapsed into two factors

(Economic-utilitarian VOC and Emotional VOC; Mayer & Trommsdorff, 2010), our results support their distinctiveness. This is consistent with VOC theories (e.g., Nauck, 2005; Trommsdorff, 2001), stressing the multidimensionality of the VOC. In particular, the uniqueness and saliency of Old-age security dimension were already acknowledged by Kagitcibasi (1982a), who underlined that with economic development Old-age security VOC tends to decrease. This decrease appears to be a key process contributing to lower fertility as well as to the modification of values concerning the role of the child and the care of the aged in society.

The four factors showed a satisfactory reliability, measured in terms of internal consistency. However, it must be noted that both Family and Old-age security VOC were measured by only two items, and it is well known that, all other things being equal, more items usually lead to better construct representation (Eising, te Grotenhuis, & Pelzer, 2013). Interestingly, all the models we tested included fewer items than those of the original VOC questionnaire. Many items were discarded by the authors (Mayer et al., 2005; Mayer & Trommsdorff, 2010; Nauck & Klaus, 2007), because of cross-loadings or nonsignificant loadings on the well-known factors, which means that they might reflect some more reasons for becoming a parent. As recently asserted by Trommsdorff and Nauck (2010), it is uncertain whether the list of values is a complete value system.

The present study extends previous findings by examining the measurement invariance, an important but mostly neglected topic in the literature. The 11-item, four-factor model, which was the best solution we found, was invariant across gender and family generations. The four-factor structure fitted the data well for males and females, as well as for children and parents, supporting the idea that the pattern of parameters is identical across groups (i.e., configural invariance). Furthermore, factor loadings were equal across groups (i.e., metric invariance) and even the test of equal intercepts (i.e., scalar invariance) produced no significant differences. In other words, the groups interpreted the items in the same way and they used the response scale in a similar way. Thus, researchers can feel more confident when comparing mean levels of Economic-normative, Emotional, Family, and Old-age security VOC across gender and generations when they use the modified version of the VOC questionnaire emerged from and refined through our analysis.

In this study, means on Emotional and Family VOC competed for first place in ranking over gender and generations. Indeed, Italian participants tend to attribute a high value to the “psychological” benefits related to the quality of parent-child relationship and to the family. Consistently, in previous studies (e.g., Caprara, Scabini, & Barni, 2011), Italians were described as adhering to a Western European value model with the presence of individualistic values; however, the Italian culture has some collectivistic aspects as well, being strongly family-oriented, according to the Mediterranean model. Increasing emotional reasons for having a child were found to be related to a declining fertility rate (Trommsdorff & Nauck, 2005) and, in Italy, the birth rate is today among the lowest in the world (Istat, 2013).

However, gender and generation differences in the importance given to the various VOC dimensions emerged from our study. The largest size difference concerned gender: males attributed greater importance to Economic-normative VOC, which includes more “practical/instrumental” reasons for having a child, than females. This difference, which is in line with prior studies (e.g., Leavy & Hough, 1983; Mayer et al., 2005), is also consistent with research findings about men’s and women’s general value orientations (e.g., Barni, Ranieri, & Scabini, 2012). In general, men are more focused on self-promotional and materialistic values, while women are more oriented toward

self-transcendent, relational values. Both evolutionary psychology (Buss, 1995) and social structure or role theory (Eagly, 1995) provide grounds for expecting these gender differences.

As a limitation of our contribution, we have to acknowledge that the sample, although quite large, was a convenience sample and was recruited only in the northern part of Italy. Therefore our results are neither completely generalizable to the whole Italian population nor to other countries. Further confirmatory research with other cultural groups is strongly needed, also because cross-cultural differences in the VOC are of great interest for researchers. Indeed, the value of children approach was originally conceptualized in order to develop an instrument for cross-cultural comparisons of the influences on parents' fertility decisions (Trommsdorff & Nauck, 2005).

It is worthwhile noting that Mayer and colleagues' model, which received the strongest support in this study, was originally the result of a series of factor analyses, with a confirmative procedure similar to that adopted in our study (i.e., CFA and multigroup to test invariance). Differently, the alternative models (Mayer & Trommsdorff, 2010; Nauck & Klaus, 2007) were both obtained from exploratory factor analysis, but their equivalences were tested by Tucker's coefficient of agreement. Thus, one set of explanations of our results may be partially centered on the assessment procedure. Moreover, we were only able to test Nauck and Klaus's model partially, because of the lack of two items that the authors extracted from the 27-item version of the scale.

Finally, the examination of the other psychometric properties of the VOC questionnaire, especially its validity, is also needed to define whether this modified form might be eligible to be adopted in the VOC studies. If the short length of the scale may be advantageous in practical circumstances (i.e., application to participants), on the other hand, it may be problematic for reliability as well as for the construct validity.

The present study represents an attempt to systematically analyze the factorial structure of the Italian VOC questionnaire. We intended to provide a starting point for a comprehensive comparative research on the VOC, which has proven to be important in shedding light on parental goals and expectations regarding children. We finally propose a version of the VOC questionnaire including 11 items and four factors. This form permits a clear interpretation of the four dimensions and measurement invariance across gender and generations assists in the interpretation of group differences.

Inherent to the study is the notion of the multidimensionality of the benefits parents may obtain from their offspring. Further work on the scale is required and a global theoretical framework from which the meaning of these dimensions may systematically be derived is still missing. Efforts might be directed toward the integration of a coherent, interdisciplinary model of the latent structure of the VOC in both the psychological and sociological revisions of the original approach.

NOTES

1. China, France, Germany, India, Indonesia, Israel, Japan, Poland, Russia, South Africa, Turkey, and the United States.
2. China, Czech Republic, Germany, Ghana, India, Indonesia, Israel, Palestine, South Africa, South Korea, and Turkey.
3. The age-group specific items that were not surveyed for grandmothers and adolescents were imputed on the basis of the individual's response to those items of the same factor.
4. The scale was translated from the original English version into Italian and back-translated by a bilingual native speaker.

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