Families Across Cultures

A 30-Nation Psychological Study

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7   Results: cross-cultural analyses of the family

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This Chapter provides an overview of the cross-cultural data analyses. The Chapter is presented in seven parts. The first two involve the analyses of the psychometric properties of the instruments. "Equivalence and pooled factor Solutions" discusses the equivalence analyses, addressing the question of to what extent the instruments measure the same underlying constructs in each of the 27 countries. Having determined the equivalence (in a few cases leading to the elimination of a few items), we proceed with an analysis of the internal consistencies of the scales in each country in the section on "Internal consistency". The next two sections address the issue of sample differences in the various groups, namely gender (see p. 142) and educational level of the parents (see p. 145). The question is whether any country differences in education and gender need to be controlled prior to the cross-cultural data analyses. The next two sections of the Chapter involve these cross-cultural data analyses. On pp. 147–58 we present an analysis of the size of cross-cultural differences in the various instruments employed. The exploratory nature of the data analyzes changes for a hypothesis-testing perspective on pp. 158–72. The hypotheses of Chapter 5 are tested here. A final section (pp. 172–85) presents an integration of results that are relevant to the hypotheses.

EQUIVALENCE AND POOLED FACTOR SOLUTIONS

A first necessary step in cross-cultural data analyses involves the question of to what extent the same construct(s) has been measured by an instrument in all cultural groups involved. Technically this is known as testing for structural equivalence (van de Vijver and Leung, 1997). We employed exploratory factor analysis to assess the presence of structural equivalence.

The current study involved 27 countries. When only a few countries are compared, it is common to employ pairwise comparison of factors obtained in different groups. However, when 27 countries are compared,

the total number of comparisons is ($27^\star 26/2 =$) 351. Finding a patterning in such a large number of comparisons can be quite cumbersome. Problems of integrating pairwise solutions can be avoided by pooling the data. The procedure begins by computing the covariance matrix of the items of the scale to be analyzed per cultural group in the comparison (e.g., 27 covariance analyses in the case of comparison of the national groups). These covariance matrices are then averaged, with the sample size as weights. The overall covariance matrix provides us with a global average. It is our best estimate of the "averaged" covariance matrix. The core of the procedure consists of determining to what extent each country shows a factor structure that is similar to the factor structure in the pooled, global data matrix. The next step is to compare each sample with the global mean. If each group shows a sufficient level of agreement with the global solution, it is concluded that structural equivalence is supported and that a scale measures the same construct (s) in each group. If structural equivalence is not supported, additional analyses are required in order to explore the cause of the deviant factor structure (e.g., psychological constructs might not be identical, one or more items may not work in a particular cultural group, etc.).

The agreement between the factor loadings of items from two different groups can be expressed via several congruence indices (van de Vijver and Leung, 1997). The proportionality coefficient, also known as Tucker's phi (Tucker, 1951), is an often-used congruence index. This index measures the identity of two factors, up to a positive, multiplying constant. The latter allows for differences in factorial eigenvalues across cultural groups. Unfortunately, the index has an unknown sampling distribution, which makes it impossible to construct confidence intervals. Some rules of thumb have been proposed: values higher than .90 are taken to indicate factorial invariance, whereas values lower than .90 (van de Vijver and Leung, 1997) or .85 (Ten Berge, 1986) point to essential incongruities.

It may be noted that in order to compute the factorial agreement for a country, the data of the country were included in the pooled matrix; by including the country itself the value of the factorial agreement may be inflated somewhat. However, with 27 countries the contribution of each country was deemed to be limited.

Family networks

The family network variables were Proximity of Residence, Frequency of Meeting, and Frequency of Phone Calls (Georgas, Mylonas, Bafiti, et al., 2001). Each of the three scales showed a one-factorial solution

Table 7.1 *Factor loadings of geographical proximity, frequency of meeting, and frequency of telephone calls (pooled solution)*

Value and item	Loading
Living distance (47.57 percent)[a]	
Father	.75
Mother	.79
Siblings	.72
Grandfather	.68
Grandmother	.68
Uncles/aunts	.48
Meeting (49.16 percent)	
Father	.72
Mother	.76
Siblings	.70
Grandfather	.72
Grandmother	.73
Uncles/aunts	.55
Making phone calls (55.09 percent)	
Father	.77
Mother	.78
Siblings	.78
Grandfather	.76
Grandmother	.77
Uncles/aunts	.58

Note:
[a] Numbers behind variable names refer to the percentage of variance explained by the factor.

(explaining between 48 percent and 55 percent; see Table 7.1). The factorial agreement was very good, with a few exceptions, notably Hong Kong. Agreement indices of proximity of residence and frequency of meeting did not reach a value of .90. This could be due to the small physical size of Hong Kong, which makes it very unlikely that family members live far from one another and meet each other seldom.

It can be concluded that the analyses supported the structural equivalence of the scales in the 27 countries. The deviances (i.e., low values of Tucker's phi) did not show a particular patterning. It can be concluded that these analyses point to a sound basis for the cross-cultural comparisons of the next Chapter.

Family roles

The Family Roles Scale (Georgas, Giotsa, Mylonas, and Bafiti) was analyzed for the family positions: father, mother, grandfather, grandmother, aunts/uncles, 20-year-old male, 20-year-old female, 10-year-old boy, and 10-year-old girl.

Father

The first five eigenvalues found in the exploratory factor analyses of the 22 items describing the role of the father were as follows: 7.93, 1.49, 1.41, 1.12, and 0.94. A scree plot suggested the extraction of a single factor (or multiple correlated factors), while the extraction of three factors was also defensible. On the other hand, the literature suggests two factors (an expressive and an instrumental role; e.g., Parsons, 1943, 1949). Further analyses revealed that three factors yielded a meaningful clustering of the items (explaining 54.29 percent of the variance). The Varimax rotated loadings are presented in Table 7.2. The first factor corresponds to the expressive role, which is consistent with the literature. Items with high loadings dealt with emotional support provided to the wife, the children, and the grandparents, while items with protection of the family and preserving family relations also showed high loadings. The second factor described the financial role of the father with items such as "father contributes financially," "father manages finances," and "father gives pocket money to children." The third factor involved childcare; items with high loadings dealt with taking the children to school, doing housework, and helping children with homework. Two items had double loadings of about the same size: the item about protecting the family loaded on the first two factors and the item teaching manners to the children showed loadings on the first two factors.

The instrumental role that is usually found in the literature is split in two independent components in our study, namely a financial role and a childcare role. The equivalence of the first factor was fairly good (with a median factorial agreement of .95); the medians of the second and the third were .92 and .85, respectively. The latter values showed that the equivalence of the factors is not perfect. The relatively low values of the second and third factors may be due to the smaller number of items with high loadings on these factors.

Mother

The factor analysis of the roles of the mother yielded largely similar results. Three factors were extracted, explaining 41.10 percent of the

Table 7.2 *Factor loadings of roles of the father and the mother (Georgas et al.) (pooled solution)*

	Father			Mother		
Role	Expressive	Financial	Childcare	Expressive	Financial	Childcare
Emotional support to children	*.74*	.00	.06	*.68*	.02	.00
Emotional support to grandparents	*.68*	−.13	−.03	*.61*	.00	−.11
Emotional support to wife/husband	*.74*	.02	−.04	*.68*	−.05	−.05
Keeps the family united	*.74*	.19	−.08	*.77*	.07	−.09
Keeps a pleasant environment	*.76*	.11	−.02	*.75*	.05	−.02
Conveys traditions to children	*.59*	−.07	.22	*.42*	−.10	.37
Conveys religion to children	*.50*	−.02	.15	*.40*	−.19	.27
Preserves family relations	*.67*	.12	.04	*.62*	−.05	.17
Supports grandparents	*.51*	.22	−.06	*.53*	.15	−.03
Takes care of grandparents	*.33*	−.08	.32	.29	.01	.18
Protects the family	*.53*	*.44*	−.13	*.53*	.28	−.05
Resolves disputes	.26	*.44*	−.02	.21	*.36*	.08
Does housework	.02	−.06	*.65*	.16	.06	*.22*
Does the shopping	−.12	*.53*	.42	−.06	*.58*	.10
Takes children to school	−.05	.16	*.67*	−.22	.09	*.77*
Plays with children	.40	.06	*.44*	.14	.03	*.67*
Helps children with homework	.21	.12	*.55*	−.01	.13	*.70*
Teaches manners to children	*.44*	.39	.07	*.37*	.16	.30
Contributes financially	.11	*.73*	−.16	−.03	*.71*	−.08
Manages finances	−.08	*.77*	.07	−.02	*.74*	−.03
Gives pocket money to children	.02	*.64*	.16	.06	*.59*	.11
Supports career of children	.23	*.56*	.01	.20	*.48*	.12

The three factors explained 49.21 percent and 41.10 percent of the variance in the analysis of the roles of father and mother, respectively. Highest loading of each item is italicized.

variance (first five eigenvalues: 5.94, 1.79, 1.31, 1.16, and 1.01). Each of the three factors showed the patterning of high and low loadings as found in the analysis of the father's roles, with one remarkable exception (see Table 7.2). Whereas the item dealing with housework had a loading of .65 on the third factor in the analysis of the roles of the father, the loading was only .22 in the analysis of the roles of the mother. The mean of the mothers across all 5,482 participants was 5.47 ($S = .99$) on a seven-point scale compared to a mean of 2.61 ($S = 1.49$) for the fathers. It is very clear that mothers do most of the housework in all the countries studied. The scores of the mothers were very high in all countries and showed very little variation. Owing to the very small variation in the scores, the item showed small correlations with all other items, leading to low loadings on all factors. The two items with the double loadings in the analysis of the roles of the father went to the first factor in the analysis of the mother.

The cross-cultural stability was not optimal. The factorial agreement indices for the three factors were .95, .88, and .71. Greece, France, Cyprus, and Indonesia showed low values on the third factor. An inspection of the factor loadings in these countries did not suggest any specific patterning. The agreement indices of the factors of the father were slightly higher than those of the mother, presumably because of the slightly stronger factor loadings in the factor analysis of the father. The roles of the father seem to be more clearly defined than the roles of the mother.

A final analysis addressed the similarity of the three factors found for the father and the mother. The three factors showed agreement indices of .98, .97, and .87, respectively. So, it seems that the first two factors showed a high level of correspondence, while the somewhat lower value of the third factor can be explained by the differential loadings of the item about housework in the two analyses. In summary, the same sets of three factors can be used to describe the role of the father and the mother in all 27 countries, although the comparisons of scores on the childcare factor should be carried out with caution, as some countries showed slightly different factors.

Grandparents and uncles/aunts

As can be seen in Table 7.3, factor analyses of the roles of the grandfather showed the usual two-factorial structure (explaining 49.09 percent of the variance; first four eigenvalues: 9.34, 1.96, 1.06, and 0.95). The items about taking care of the grandchildren and playing with grandchildren showed loadings of about the same size on both factors.

Table 7.3 *Factor loadings of the roles of the grandfather, grandmother, and uncles/aunts (Georgas et al.) (pooled solution)*

Role	Grandfather		Grandmother		Uncles/aunts	
	Expressive	Instrumental	Expressive	Instrumental	Expressive	Instrumental
Emotional support to X^a	.71	.00	.72	−.01	.72	.00
Emotional support to parents	.76	−.08	.73	−.07	.76	−.10
Keeps the family united	.80	−.02	.78	−.02	.79	−.02
Keeps a pleasant environment	.83	−.03	.81	−.03	.83	−.05
Conveys traditions to X	.76	−.04	.74	−.02	.71	.00
Conveys religion to X	.65	−.03	.67	−.07	.60	.05
Preserves family relations	.76	.00	.75	−.01	.75	.02
Supports X	.66	.13	.65	.13	.68	.12
Takes care of X	.29	.44	.34	.40	.35	.41
Protects the family	.53	.30	.52	.29	.48	.33
Resolves disputes	.24	.48	.23	.48	.16	.54
Does housework	−.04	.57	.10	.54	−.00	.64
Does the shopping	−.05	.69	−.05	.67	−.04	.70
Takes X to school	−.07	.71	−.09	.69	−.11	.72
Plays with X	.41	.38	.38	.38	.33	.42
Helps X with homework	.00	.67	−.03	.66	.03	.68
Teaches manners to X	.58	.23	.60	.19	.46	.32
Contributes financially	−.02	.75	−.05	.74	−.06	.78
Manages finances	−.13	.79	−.14	.77	−.15	.81
Gives pocket money to X	.20	.56	.20	.55	.12	.62
Supports career of X	.23	.53	.24	.50	.22	.52
Babysits X	.24	.49	.30	.43	.21	.51
Helps parents with their work	.03	.61	.00	.64	.06	.60

Note:
The two factors explained 49.09 percent, 47.23 percent, and 49.16 percent of the variance in the analysis of the grandfather, grandmother, and uncles/aunts, respectively. Highest loading of each item is italicized.
[a] X involves grandchildren in the analysis of grandparents and nephews/nieces in the analysis of uncles/aunts.

The analysis of the grandmother also yielded a two-factorial structure, explaining 47.23 percent of the variance (Table 7.3). The same two items showed double loadings. A computation of the equivalence of the two factors found for both grandparents showed the similarity of both factors (agreement index = 1.00 for both factors).

The analysis of the roles of uncles and aunts also showed the two-dimensional structure (explaining 49.16 percent of the variance; see Table 7.3). All items showed the highest loading on the expected factor, although the differences were not large for some items. Interestingly, the same two items of the previous analysis (taking care of and playing with nephews and nieces) showed double loadings. For each of the three positions the structural equivalence was good (with median agreement indices well above .95).

Siblings

Factor analyses of the roles of the siblings (son of 10, daughter of 10, son of 20, and daughter of 20 years of age) also showed the two-factorial structure (Table 7.4). The percentages of variance explained were 42.72 percent, 42.59 percent, 42.86 percent, and 42.65 percent, respectively. Again, the items showed the loadings in line with expectations. Furthermore, with a few exceptions (e.g., the role of the 10-year-old son in the Ukraine) all factor agreement indices were well above .90. The median agreement coefficient across all the analyses of the siblings was .97. A final analysis addressed the equivalence of the factors as found for the four siblings of Table 7.4. Very high agreement indices were found (.99 and higher), which strongly suggests that the factors found were identical across the siblings.

Emotional distance

The scale measuring bonds or Emotional Distance (Georgas, Mylonas, Bafiti et al., 2001) with kin and non-kin showed a very good agreement in all countries, except for Germany (.40). The items constituted a single factor (see Table 7.5). In the hypothesis tests two scores derived from the scales are used, namely emotional distance to nuclear family members and extended family members. It may be noted that in keeping with the literature the concept is referred to as Emotional Distance, while the scale is scored in the opposite direction (of emotional closeness). On both scales high scores indicate strong emotional ties.

Table 7.4 *Factor loadings of roles of the siblings (Georgas et al.) (pooled solution)*

Role	Son 10 yrs		Daughter 10 yrs		Son 20 yrs		Daughter 20 yrs	
	Expressive	Instrumental	Expressive	Instrumental	Expressive	Instrumental	Expressive	Instrumental
Emotional support to grandparents	*.66*	−.13	*.66*	−.11	*.65*	−.12	*.59*	−.07
Emotional support to siblings	*.72*	−.07	*.72*	−.07	*.68*	−.01	*.68*	−.04
Keeps the family united	*.77*	−.08	*.77*	−.09	*.81*	−.08	*.80*	−.09
Keeps a pleasant environment	*.77*	−.06	*.77*	−.06	*.77*	−.01	*.78*	−.04
Conveys traditions to siblings	*.59*	.19	*.59*	.18	*.59*	.14	*.60*	.14
Conveys religion to siblings	*.53*	.24	*.53*	.22	*.53*	.15	*.55*	.12
Preserves family relations	*.65*	.11	*.64*	.12	*.65*	.08	*.68*	.06
Does housework	.14	*.57*	.19	*.56*	.10	*.45*	.19	*.47*
Does the shopping	.01	*.65*	.00	*.65*	.00	*.66*	−.03	*.67*
Takes siblings to school	.01	*.60*	.01	*.61*	.00	*.65*	.02	*.63*
Plays with siblings	*.34*	.08	*.35*	.07	*.31*	.31	*.33*	.29
Contributes financially	−.11	*.65*	−.11	*.63*	−.09	*.68*	−.10	*.69*
Babysits siblings	.07	*.62*	.07	*.63*	.11	*.58*	.15	*.53*
Helps parents with their work	−.02	*.69*	−.01	*.68*	−.06	*.70*	−.07	*.71*

The two factors explained 42.72 percent, 42.59 percent, 42.86 percent, and 42.65 percent of the variance in the analysis of the roles of the roles of son of 10, daughter of 10, son of 20, and daughter of 20 years of age, respectively. Highest loading of each item is italicized.

Table 7.5 *Factor loadings of emotional distance (Georgas et al.)* *(pooled solution)*

Emotional distance from	Loading
Mother	.38
Siblings	.44
Father	.41
Grandparents	.55
Cousins	.54
Uncles/aunts	.61

The first factor explained 25.35 percent of the variance. Loadings of positions not used in the computation of the emotional distance to nuclear and extended family (i.e., neighbors, friends, newspaper journalists, colleagues, acquaintances, priest, primary-school teachers, prime minister, shopkeepers, writers, spouse/date, fellow students, members of parliament, high-school teachers, newscasters) are not represented here.

Self-construal

In initial analyses, 20 items of the Self-construal Scale (Singelis, 1994; Singelis and Brown, 1995; Singelis and Sharkey, 1995) were analyzed, yielding the expected patterning of high and low loadings on both factors. However, the two-factorial solutions of about half of the countries did not reveal the same two factors. More specifically, agreement indices of less than .90 were obtained in more than half of the countries for the independence factor; the interdependence factor revealed low values in only two countries. The problems of the independence factor were not clearly patterned. Therefore, it was decided to adopt the strategy of splitting the scales as in the analysis of the personality and values scales. Initial analyses showed that items "I should take into consideration my parents' advice when making education/career plans" and "Even when I strongly disagree with group members, I avoid an argument" of the interdependence scale had to be eliminated as they challenged the equivalence in several countries. The final, nine-item scales showed unifactorial solutions with loadings between .35 and .65 (see Table 7.6). The independence scale showed a median agreement index of .96, but too low agreement values were found in four countries (France: .69; Indonesia: .81; Japan: .82; United Kingdom: .89). In each case different items (with either low or negative loadings) were responsible for the low values. The agreement was excellent for the interdependence scale, with a median of .98 and all values well above .90.

Table 7.6 *Factor loadings of independence and interdependence (Singelis et al.) (pooled solution)*

Scale/item	
Independence	Loading
Enjoy being unique	.43
Act as independent person	.44
Direct and forthright	.49
Comfortable when praised	.43
Speaking up not a problem	.53
Act the same way	.62
Do the best for me	.41
Take care of myself	.44
Act the same way	.51
Interdependence	
Respect modest people	.36
Sacrifice self-interest	.58
Cooperate	.52
Relationships are important	.50
Happiness depends on others	.53
Stay in the group	.57
Respect group decisions	.65
Maintain harmony	.65
Go along with others	.44

The two factors explained 23.09 percent and 29.24 percent of the variance in the analysis of the independence and interdependence scale, respectively.

Personality

In initial analyses all personality variables from the Williams, Satterwhite, and Saiz (1998) Personality Traits Scale were analyzed jointly. In line with the underlying theoretical model, which is the currently popular five-factor model of personality (e.g., Allik and McCrae, 2004), five factors were extracted. Subsequent analyses showed that this five-factorial structure was not at all stable across cultures. This finding is not consistent with the literature. The evidence for the structural equivalence of the model is impressive, sometimes with the exception of Openness (e.g., De Raad, 1994). One of the possible reasons for the poor support of the structural equivalence could be that we used an instrument to measure the five factors of personality for which the structural equivalence has never been tested. Another problem could be the considerable reduction of items needed in the current study; there

were 30 items in our instrument while the original instrument has 240 items, so our factor solution cannot be expected to be as stable as a solution based on the full instrument. Therefore, we adopted another strategy and analyzed the measure as consisting of five independent scales. For each of the five scales the same factor equivalence procedure was followed. The pooled solution, which represents the factor loadings in the "average country" (Table 7.7), showed the expected unifactorial bipolar arrangement of items. The absolute values of the loadings ranged between .40 and .70, with one exception. The negative pole of Openness was not well defined. The item about rigidity showed a loading of $-.03$ and the items about inhibition and conservatism $-.26$.

The factorial agreement of the Agreement, Conscientiousness, Extraversion, and Neuroticism scales were very good; the median agreement index is well over .95. Yet, that does not mean that the agreement is perfect. For example, even for Conscientiousness, the scale with the highest median agreement, there was a single country (South Korea) that did not reach the lower threshold of .90. An inspection of the factor loadings showed that the value of .89 was due to the weak loading $(-.01)$ of "organized." It was not clear to what extent this problem is due to sample particulars, translation problems, or a relationship between the item and the construct that differs from other countries.

The most problematic scale was Openness, with a median value of .89. Particularly for Algeria (.24), Saudi Arabia (.31), and Nigeria (.32) the scale did not show the unifactorial, bipolar structure as expected and found in the global solution. The countries with these low values did not show similar deviances of the global pattern among themselves. Therefore, it was assumed that particulars of the sample or administration caused the problems. As noted before, this is not the first study to observe problems with the equivalence of the Openness Scale. A comparison of the median agreement indices per country showed that some countries such as Pakistan and Nigeria had average values well below .90. A further inspection of the factor loadings did not suggest a patterning behind the deviant loadings.

It is clear that any comparison involving data in which one or more countries did not show the desired structural equivalence has to be interpreted with caution. The question had to be addressed of how to proceed with using the scales in the countries with low values. From a statistical perspective different approaches can be adopted. The first is to eliminate the problematic items so as to end up with a set of equivalent items. This approach was not adopted, as it would reduce our already short scales even further; moreover, in most countries all items performed well. The second would be to eliminate the whole country. For

Table 7.7 *Factor loadings of personality (Williams et al., 1998)*
(pooled solution)

Scale/item	Loading
Agreeableness (32.76 percent)[a]	
Understanding	.61
Sympathetic	.55
Considerate	.56
Quarrelsome	−.52
Deceitful	−.57
Rude	−.62
Conscientiousness (40.07 percent)	
Organized	.69
Reliable	.49
Responsible	.66
Careless	−.60
Lazy	−.63
Disorderly	−.70
Emotional stability (31.76 percent)	
Stable	.54
Optimistic	.50
Calm	.47
Moody	−.53
Irritable	−.67
Anxious	−.64
Extraversion (39.61 percent)	
Outgoing	.62
Sociable	.69
Active	.57
Withdrawn	−.60
Shy	−.65
Quiet	−.64
Openness (25.28 percent)	
Imaginative	.65
Adventurous	.72
Spontaneous	.67
Rigid	−.03
Inhibited	−.26
Conservative	−.26

Note:
The scales were analyzed in separate factor analyses.
[a] Numbers after scale names refer to the proportion of variance accounted for by the factor.

obvious reasons, it is not attractive to remove every country that shows a value lower than the threshold level in any of the equivalence analyses. The third approach adopted here (as well as in the subsequent analyses) was to inspect any patterning in the deviances and to compare the equivalence problems across scales so as to identify problematic samples.

Family values

The Family Values Scale (Georgas, 1989, 1991, 1993, 1999) was intended to measure two factors, Hierarchical roles of father and mother and Relationships within family and with kin. Initial analyses showed that four items ("Parents shouldn't get involved in the private lives of their married children," "Parents should help their children financially," "The children should work in order to help the family," "The parents shouldn't argue in front of the children") did not show loadings in various cultural groups and were eliminated. As can be seen in Table 7.8, the remaining items in the pooled solution revealed the expected patterning across the two orthogonal factors. All countries showed agreement indices well above the threshold level of .90 (with overall

Table 7.8 *Varimax-rotated factor loadings of family values (Georgas et al.) (pooled solution)*

Item	Hierarchy	Relationships
Father head of family	*.69*	.23
Good relationships with relatives	.16	*.56*
Mother's place is at home	*.69*	.02
Mother go-between	*.59*	.14
Parents teach behavior	.09	*.60*
Father should handle money	*.75*	.06
Children take care of old parents	.11	*.58*
Children should help	−.09	*.60*
Problems are solved within the family	.08	*.60*
Children should obey parents	.32	*.62*
Honor family's reputation	.28	*.63*
Children should respect grandparents	.08	*.69*
Mother should accept father's decisions	*.70*	.13
Father is breadwinner	*.72*	.12

The two factors explained 44.36 percent of the variance. Highest loading of each item is italicized.

medians of .96 for Hierarchy and .98 for Relationships) except for the loadings on the hierarchy factor in Pakistan (.83) and the loadings on the kin relationships factor in Ghana (.89). The low values were due to some low loadings in these countries as compared to the pooled solution.

Values

The 24 items from Schwartz (1992, 1994a) measuring six values (Embeddedness, Hierarchy, Harmony, Intellectual autonomy, Affective autonomy, and Mastery[1]) were first analyzed in a single analysis. The expected two-factorial structure was not stable across countries. As in the previous analysis, the relatively small number of items (Embeddedness was measured with six items, the others by three items each) could also challenge the equivalence. The same procedure of splitting up the instrument into separate unifactorial scales was also followed here. The procedure was effective in that with the exception of Mastery in Algeria (with an agreement coefficient of .68), all scales in all countries showed values above .90; across all comparisons the median agreement was 1.00, which points to excellent structural equivalence. The pooled solutions are given in Table 7.9; all items showed positive and in most cases high loadings.

INTERNAL CONSISTENCY

In the next step of the analyses the Cronbach alpha internal consistencies were computed for the scales. Each factor found in the structural equivalence analyses was taken as a scale. In most analyses this meant that all items were assumed to constitute a single scale. Reliability analyses at both individual and country level are reported. The former is based on the individual responses ($N = 5,482$) to scale items. The latter deals with the reliability at country level. Each country makes up one observation ($N = 27$). The latter analysis is carried out because many analyses (and most hypotheses) deal with differences at country level, and the reliability of the constructs at country level cannot be assumed but has to be demonstrated.

For the Self-Construal, Personality, and Values scales the individual-level reliabilities were fairly similar, with an average of .62 (range of α:.45–.75). The values at country level were slightly higher ($M = .69$,

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[1] As noted in Chapter 6, *Egalitarian Commitment* was omitted in a number of countries, and rather than not employing the questionnaire, we proceeded with six scales instead of seven.

Table 7.9 *Factor loadings of values (Schwartz) (pooled solution)*

Value and item	Loading
Embeddedness (35.59 percent)[a]	
Family security	.54
Respect for tradition	.64
Honoring elders	.70
Social order	.63
National security	.66
Reciprocation of favors	.34
Hierarchy (59.55 percent)	
Authority	.81
Wealth	.69
Social power	.81
Harmony (60.66 percent)	
World of beauty	.71
Unity with nature	.83
Protecting environment	.79
Intellectual autonomy (51.31 percent)	
Broadminded	.61
Creativity	.78
Curious	.75
Affective autonomy (56.05 percent)	
Pleasure	.78
Exciting life	.68
Enjoying life	.78
Mastery (50.34 percent)	
Independent	.80
Daring	.67
Choosing own goals	.65

Note:
[a] Numbers behind value names refer to the percentage of variance explained by the factor.

range of α: .27–.90). The low value of .27 is due to a small, negative correlation between "daring" and "choosing own goals" (the other correlations were positive). Internal consistencies at country level also tended to be higher for the other scales (presumably owing to aggregation effects in these data). Family Networks, Emotional Distance, and Family Values showed higher values, both at individual and country level (the latter had an average of .81 and the former of .79). It can be concluded that although the internal consistencies of particularly the scales related to values, self and personality were only moderate, the values are acceptable given the relatively small number of items of most of the scales.

The expressive role had high reliabilities both at individual level (overall mean $\alpha = .84$, $S = .04$) and country level (overall $M = .91$, $S = .04$). The Instrumental roles (for father and mother this was split into finances and childcare) showed lower values. The overall mean was $\alpha = .68$ ($S = .08$) at individual level and .62 ($S = .22$) at country level. Higher reliabilities of the expressive roles (presumably because of their slightly larger number of items) were found in every country. The lowest country average was found for Algeria (.69) and the highest for Hong Kong (.83). The distribution of internal consistencies did not show clear outliers. Furthermore, an inspection of the patterning of these values did not suggest any country-level characteristic (such as temperature, affluence, or religion) with which these values would be related.

It can be concluded that the averages of the internal consistencies of the various scales ranged from acceptable to good, that the differences across countries were not large, and that the expressive roles tended to have higher internal consistencies than the instrumental roles.

GENDER DIFFERENCES

The next analysis addresses the differences in responses given by female and male participants (no data on gender were available for Indonesia). Because the sample size in this study is large, relatively small differences in average scores between females and males can result in statistical significance but, in fact, these differences may be very small from a psychological perspective. Thus, interest was more in the size and "psychological significance" rather than the statistical significance of the differences, that is, effect sizes. Two kinds of effect sizes are reported in this section. The first is used in reporting results of an analysis of variance with gender and country as independent variables and psychological measures as dependent variables. The effect size we report is the proportion of explained variance (η^2) resulting from the independent variables. This number refers to the proportion of variance resulting from the total score variation (i.e., across individuals and countries) that is due to gender differences. The total score variation consists of both (random) unsystematic sources of variance resulting from unreliability of the measures as well as systematic differences across individuals, gender, and countries. Cohen (1988) proposed values of η^2 of .01, .06, and .14 to distinguish small, medium, and large effects. An advantage of this measure of effect size is that it can be used for independent variables with any number of levels; it can be used to compute effect sizes for both countries and genders. A disadvantage of this measure is that is not directional. An effect size of .14 is large; yet, it does not indicate which

level (country or gender) showed larger or smaller values relative to the others. Therefore, we also employed another effect measure which is directional (although it can be used only for independent variables with two levels, such as gender). Cohen's d is defined as the difference of the averages of the male and female students, divided by their pooled standard deviation. The numbers can be interpreted as z scores: values above zero refer to higher average scores of males; values below zero refer to higher average scores of females. Cohen's d is said to be small, medium, or large if its absolute values are larger than .20, .50, or .80, respectively.

The multivariate effect size of gender for the Self-Construal Scales (Singelis et al. 1995) was zero and not significant. The interaction was significant ($p < .01$), though very small ($\eta^2 = .01$). More specifically, the value of Cohen's d of the Independence Scale was $\eta^2 = .03$ and for the Interdependence Scale $\eta^2 = .01$.

The multivariate effect size of the scores on personality (Williams, Satterwhite, and Saiz, 1998) was statistically significant ($p < .01$) but small; the proportion of variance accounted by gender, η^2, was .03, while the interaction of gender and country also showed a small effect size of .01 (interactions effects of all analyses reported here are discussed at the end of this section). More specifically, female participants scored higher on Agreeableness when averaged across countries ($d = -.23$), Conscientiousness ($d = -.20$), Extraversion ($d = -.15$), and Openness ($d = -.09$), while males scored higher on Emotional Stability ($d = .15$).

For the Family Values Scale (Georgas, 1989; Georgas et al. 2004c), the multivariate main effect of gender and interaction of gender and country were highly significant ($p < .01$); their effect sizes were ($\eta^2 = .04$ and .01, respectively). An inspection of the univariate results showed that the significance was entirely due to the Hierarchy Scale. Males showed much higher scores on the scale than females ($d = .42$; $p < .01$), while the differences on the Kin Relationship Scale were nonsignificant and very small ($d = -.02$). Most differences we find are in line with the gender literature (Brannon, 2002; Maccoby and Jacklin, 1975; Williams and Best, 1982, 1990).

The multivariate effect sizes of gender and the country by gender interaction on Schwartz's values questionnaires were significant ($p < .01$) and small ($\eta^2 = .02$ and .01, respectively). Females showed higher scores on Embeddedness ($d = -.14$) and Harmony ($d = -.13$), while males scored higher on Hierarchy ($d = .19$). The differences on the other scales were so small that even with the current sample sizes the gender differences were not significant (Intellectual Autonomy: $d = .01$; Affective Autonomy: $d = .03$; Mastery: $d = .03$; all ps $> .05$).

The three family network variables (geographical proximity, frequency of visits, frequency of telephone calls) and Emotional Distance from nuclear and extended family (Georgas et al., 2004a) showed a similar patterning of small, but consistent gender differences. The family network variables were statistically significant ($p < .01$), although the multivariate effect size was small ($\eta^2 = .01$), as was the effect size of the interaction ($\eta^2 = .01$). The d values of the gender differences were $-.01$ (geographical proximity), $-.10$ (females visit relatives more), and $-.18$ (females telephone relatives more). The multivariate effect sizes of Emotional Distance (to the nuclear and extended family) were .003 for the main effect of gender and .01 for interaction of gender and country. The average emotional distance (Cohen's d) was $-.11$ for the nuclear and $-.18$ for the extended family. The consistency of d values of all variables tested is remarkable and suggests that daughters have a somewhat closer emotional relationship with the members of the nuclear family and close kin. The effect is probably not due to acquiescence as similar effects were not found for the other psychological variables.

The last set of variables involved the Family roles (Georgas et al., 2004b). The meaning of gender differences is different from the previous analyses. In the previous analyses the cross-cultural stability of gender differences in psychological functioning was examined; in the analysis of the family roles the participants did not report about their personal preferences or practices but about patterns in their own family. Systematic differences of male and female participants are more problematic than in the previous analyses as they point to systematic differences in males and females as observers of family patterns. Large interactions of gender and country would exacerbate this problem, as they would mean that these systematic observer effects vary across countries.

All family roles were examined in a single multivariate analysis of variance. The multivariate effect sizes of both the main effect of gender and the interaction of country and gender were significant ($p < .01$); the first explained 7 percent and the second 1 percent of the variance. The former effect, a medium size, is due to the global gender difference across all positions and roles; Cohen's d of the difference of the global means of male and female students was $-.12$. The negative sign is in line with the findings on the network variables and emotional distance, despite the difference in psychological meaning of both kinds of variables. That is, females tend to be more in agreement with each of the three roles.

In most of the previous analyses the interaction component was significant but small. In analyses we conducted (but not reported here), the nature of the deviations was explored by using factor analysis of

their correlations and cluster analysis of their distances. No particular patterning was found in either analysis. Therefore, it seems likely that at least some of the effects may be due to sampling particulars, small sample sizes of either gender in some of the countries, and other presumably less relevant sources of variation.

The analyses to be reported further in this Chapter, exploration of country differences and tests of hypotheses, could have been carried out on the data after correction for differences in gender composition of the samples (by applying weights to individual-level data so as to make the gender ration identical across countries). This was not done for three reasons. First, it would have meant that Indonesian data could no longer be used as no gender data were available for Indonesia. Second, the proportion of females in the sample, which ranged from .22 in Ghana to .89 in France ($M = .62$, $SD = .16$), was not systematically related to the scores on the family roles. The latter finding suggests that a correction for differential gender composition does not lead to a systematic change in the patterning of findings. Third, the overall correction would affect the mean score of a country to only a limited extent, as most of the gender differences were relatively small.

In conclusion, although gender differences were found with some variables, the effect sizes indicate they do not appear to be very large across countries. The largest differences appear to be in the direction of females having somewhat higher average scores. This was found in a number of family roles, particularly the expressive roles of mother, grandmother, daughters, but even with father, grandfather, and sons. Females visit and telephone relatives more frequently. Females are somewhat more Agreeable, Conscientious, and Extroverted on the personality scales, and they have higher scores on Embeddedness values. Males have somewhat higher scores on Emotional Stability, Schwartz's Hierarchy values, and Hierarchical family values (Georgas et al., 2004b). However, it is important to emphasize again that the effect size of these differences, the percentage of variance explained, was relatively small and does not allow us to conclude that there are large gender differences in most of the findings.

EDUCATIONAL LEVEL OF PARENTS

A potentially important source of individual and country differences in family-related measurement instruments is the educational level of the parents. It could well be that parental educational level is associated with particular parenting styles and family practices. The relationship of family-related scales and parental education was investigated at

individual and country level separately. Parental educational level was measured as the number of years of schooling averaged for both parents and coded into four categories. No attempt was made to further examine the nature of the differences of schooling in the various countries so as to provide a more fine-grain scoring system.

No data were available for Indonesia and South Korea, which reduced the sample size to 4,981 participants in 25 countries. Some data on educational level were missing in some countries.

The variation in parental education was large. The global average was about 10 years of schooling. An analysis of variance was computed in order to estimate the effect size of the country differences. The country differences were highly significant ($F(24, 4980) = 73.16$, $p < .01$) and explained not less than 26 percent of the variation in parental education, which points to large cross-cultural differences. A closer inspection of the country means (not further reported here) did not suggest that students living in more affluent countries tended to have better educated parents. The correlation was .27, which is not significant in a small sample of 25 observations.

The correlations between parental education and the family variables (Family Networks, Family Roles, and Emotional Distance) at *individual* level were very low. Most of the means of the correlations were close to zero while the standard deviations were sizeable. This pattern suggests that within counties the correlations were not strong. Although not further documented here, the same pattern was found when the educational level of father and mother were correlated separately with the family variables. Furthermore, a cluster analysis of the correlations of the parental educational level and family variables per country (25 countries $\times$ 25 family variables) did not suggest any patterning of the correlations. Therefore, it seems fair to conclude that there are no salient correlations between parental educational level and family variables that generalize across countries.

At *country* level the Family Network and Emotional Distance scales did not show any significant correlations. For the family roles some significant correlations were found; more specifically, the financial and care roles of the mother ($r = .57$ and $.40$) as well as the instrumental–material/economic role of the grandfather and grandmother ($r = .40$ and $.54$) were all significantly related to parental education ($p < .05$). A similar pattern of positive (though nonsignificant) correlations was found for the other positions. If we focus on the patterning rather than on the significance of the correlations (and disregard the significance levels), the correlations point to the presence of very weak negative correlations between parental education and expressive roles and a

somewhat stronger (though still modest) positive correlation between parental education and instrumental–material/economic roles.

In summary, we did not find correlations between parental education and family-related variables at individual level in the 25 countries. Some correlations were significant in some countries; however, their significance was sample- or country-specific and did not generalize across the 25 countries of our study. At the country level we found a pattern of weak negative correlations between parental education and expressive roles and a pattern of slightly stronger positive correlations between parental education and instrumental–material/economic role roles. Particularly at the individual level we can safely ignore the influence of parental education on the family variables studied here. This observation implies that parental education does not need to be involved as a covariate in the analyses reported in the remainder of the Chapter.

SIZE OF CROSS-CULTURAL DIFFERENCES

The current section describes the size of cross-cultural differences in all psychological variables (i.e., family networks, family roles, emotional distance, personality, self-construal, family values, and values) at country-level and also at the individual level. The current section describes different kinds of analyses. First, some analyses consider the data at individual level ($N = 5,482$) and treat individuals as replications within countries. Second, some analyses consider the data at country level ($N = 27$); each country is represented by its mean, which is derived from aggregating individual scores. Third, some analyses deal with sets of countries clustered on the basis of Affluence, Relatedness or Religion. Table 7.10 gives the clustering of the countries in terms of affluence and relatedness.

The last religion cluster comprises of a mixture of Buddhism, Hinduism, and Traditional Beliefs. As the first four clusters are more homogeneous and are based on a substantial variation in the percentages, it was decided to omit the last cluster from the hypothesis tests.

Psychological and family variables

Table 7.11 gives an overview of the averages and standard deviations of the psychological scales at country level ($N = 27$; a more detailed table can be found in the next Chapter). It is remarkable that for all psychological variables the mean scores are much above the scale midpoints of 4 (score range: 1 to 7), possibly because most items dealt with positive, desirable attitudes. The standard deviation of the family value

Table 7.10 *Country clusters in terms of affluence, relatedness, and religion*

	Low	Medium	High
Affluence	Algeria, Ghana, India, Indonesia, Nigeria, Pakistan	Brazil, Bulgaria, Chile, Cyprus, Georgia, Greece, Iran, Mexico, Saudi Arabia, Turkey, Ukraine	Canada, France, Germany, Hong Kong, Japan, South Korea, Spain, The Netherlands, UK, USA
Relatedness	Algeria, Ghana, India, Indonesia, Nigeria, Pakistan	Brazil, Bulgaria, Chile, Cyprus, Georgia, Greece, Hong Kong, Iran, Japan, Mexico, Saudi Arabia, South Korea, Spain, Turkey, Ukraine	Canada, France, Germany, The Netherlands, UK, USA

Religion	
Roman Catholic	Brazil, Canada, Chile, France, Mexico, Spain
Protestant	The Netherlands
Christian	Germany, UK, USA
Orthodox	Bulgaria, Cyprus, Georgia, Greece, Ukraine
Islamic	Algeria, Indonesia, Iran, Nigeria, Pakistan, Saudi Arabia, Turkey
Buddhist/ Hindu/ Traditional	Ghana, Hong Kong, India, Japan, South Korea

Hierarchy is larger than the others. The means and standard deviations of emotional distance are striking; the global mean of the scale measuring distance to the nuclear family is 6.16, which is very high, while its standard deviation is only 0.18. The emotional distance is smaller ($M = 4.68$) and its standard deviation is much larger ($SD = .43$). Clearly, a close emotional tie with the nuclear family and a weaker relationship with the extended family is universal in our data.

Means and standard deviations of Family Networks and Family Roles are given in Table 7.12. It is interesting to compare the means of the male and female positions. Consistently higher scores were reported for female positions; for instance the mean of mother across the three scales (i.e., expressive role, finances, and childcare) is 4.62, while this value for the father is 4.12. Similarly, the mean score is 3.50 for grandmother and 3.25 for grandfather, 3.58 for the 20-year-old daughter and 3.40 for the 20-year-old son, and 2.72 for the 10-year-old daughter and 2.64 for the 10-year-old son. The importance of the various family positions

Table 7.11 *Means, standard deviations across countries, and proportion of variance (η^2) accounted for in psychological variables by country and clusters of countries based on affluence, religion, and relatedness*

| | | | | Proportion of variance accounted for | | |
| | | | | Affluence | Religious | Relatedness |
Scale	M	SD	Country	cluster	cluster	cluster
Emotional Distance						
Nuclear	6.16	.18	.04	.01	.01	.01
Extended	4.68	.43	*.09*	.02	.04	.00
Self-Construal						
Independent	4.78	.34	**.17**	.02	.01	.01
Interdependent	4.85	.49	**.29**	.04	.02	.05
Personality						
Agreeableness	5.60	.32	**.14**	.04	.05	.02
Conscientiousness	5.16	.42	**.17**	.05	*.06*	.03
Emotional stability	4.56	.28	*.09*	.01	.02	.02
Extraversion	4.72	.28	*.07*	.00	.03	.01
Openness	4.56	.31	*.13*	.01	.05	.01
Family values						
Hierarchy	4.46	1.06	**.54**	**.33**	**.32**	**.37**
Kin	5.99	.45	**.29**	**.18**	*.12*	**.15**
Values						
Embeddedness	5.71	.49	**.29**	**.20**	**.20**	**.14**
Hierarchy	4.51	.53	**.16**	.05	*.06*	.06
Harmony	5.45	.37	*.11*	*.09*	.06	.07
Intel. autonomy	5.60	.31	*.09*	.01	.01	.00
Affect. autonomy	5.75	.36	*.13*	.01	.05	.02
Mastery	5.74	.25	*.07*	.02	.02	.00

All scales have a minimum score of 1 and a maximum score of 7. Nonsignificant and small effect sizes ($\eta^2 < .06$) are printed in regular font, medium effect sizes ($.06 < \eta^2 < .14$) in italics, and large effect sizes ($\eta^2 > .14$) in bold.

for the Family Roles showed an interesting pattern. As could be expected, parents showed the highest scores ($M = 4.37$), indicating that they play the most central role in vital family functions, both expressive and instrumental. They are followed by the 20-year-old children ($M = 3.49$), who are followed by the grandparents ($M = 3.37$). Uncles and aunts showed a mean of 2.89, while the lowest scores were obtained for 10-year-old children ($M = 2.68$). Finally, means of expressive roles were larger than means of instrumental–material/economic roles, with the

Table 7.12 *Means and standard deviations across countries, and proportion of variance (η^2) in family variables accounted for by country and clusters of countries based on affluence, religion, and relatedness*

Scale	*M*	*SD*	Proportion of variance accounted for			
			Country	Affluence clusters	Religious clusters	Relatedness clusters
Family networks						
Geographic proximity	3.42	.51	**.17**	.02	*.08*	*.07*
Visits	4.22	.37	*.11*	*.06*	.05	*.07*
Telephone calls	3.22	.58	**.17**	*.07*	.05	*.06*
Family roles						
Father expressive	4.40	.42	**.19**	**.14**	*.13*	*.10*
Father finances	4.70	.41	**.19**	*.11*	*.10*	*.06*
Father care	3.25	.30	*.08*	.01	.02	.02
Mother expressive	4.89	.32	**.20**	*.13*	*.11*	.07
Mother finances	4.61	.33	*.13*	.00	.02	.00
Mother care	4.37	.40	**.15**	.01	*.09*	.02
Grandfather expressive	3.91	.45	**.17**	*.11*	*.07*	*.06*
Grandfather instrumental	2.58	.33	*.12*	.03	.01	.03

Grandmother expressive	4.15	.40	**.17**	*.08*	.06	.04
Grandmother instrumental	2.85	.29	*.09*	.00	.03	.01
Uncles/aunts expressive	3.37	.43	**.16**	.04	.04	.02
Uncles/aunts instrumental	2.41	.31	*.12*	.04	.01	.05
Son (20) expressive	3.72	.31	*.11*	*.06*	.04	.02
Son (20) instrumental	3.08	.25	*.09*	*.07*	.03	*.06*
Daughter (20) expressive	3.89	.35	**.15**	*.07*	*.06*	.03
Daughter (20) instrumental	3.26	.26	*.09*	.05	.03	.03
Son (10) expressive	3.33	.30	*.12*	.03	.01	.01
Son (10) instrumental	1.95	.23	*.08*	.02	.02	.03
Daughter (10) expressive	3.41	.31	*.13*	.03	.02	.01
Daughter (10) instrumental	2.03	.24	*.08*	.02	.02	.02

All scales have a minimum score of 1 and a maximum score of 6 (except for geographic proximity which has a maximum score of 7). Nonsignificant and small effect sizes ($\eta^2 < .06$) are printed in regular font, medium effect sizes ($.06 < \eta^2 < .14$) in italics, and large effect sizes ($\eta^2 > .14$) in bold.

exception of the financial role of the father, which was globally the most important role of the father.

Proportion of variance (η^2) accounted for in psychological and family variables

The nature and size of the cluster differences were further explored in series of analyses of variance with either country or cluster membership as the independent variable and the scale scores as dependent variables. These analyses are at the individual level. Four kinds of analyses are reported. The first is based on an analysis of variance with country as the independent variable (27 levels) and a psychological measure as the dependent variable. The second analysis is at the individual level ($N = 5,482$) and is based on a clustering of the countries in three Affluence clusters (see Table 7.10). It may be noted that the three levels of Affluence are used as a nominal classification in the analysis. The third analysis addresses Religion and examines the effectiveness of a split in religious clusters (five levels; see Table 7.10) to address country differences in psychological variables. The final analysis addresses the country clustering in terms of Relatedness (three levels; see Table 7.10). All main effects of country were found to be significant ($p < .01$), which is not surprising for our large sample size. Therefore, we were more interested in the size of the cross-cultural differences, as measured by the proportion of variance accounted for by cluster membership (η^2) and in the nature of the cluster differences, which were explored in post hoc analyses. The latter analyses are given for referential purposes and are not discussed here in detail (the next section examines to what extent their pattern follows expectations).

The first set of analyses of variance can be seen as defining an upper limit of the effect sizes that can be found in the clustering of the countries. By definition the effect size of a clustering cannot be larger than the effect size found in the first analysis. However, the question to be addressed is to what extent the two ways of clustering countries (which use very few levels compared to the 27 levels of the first analysis) yield effect sizes comparable to the country variation. If a particular clustering captures much country variation, an effect size will be found for the clustering that is similar in size to the effect size of the first analysis. On the other hand, a country clustering that yields very small effect sizes does not provide an explanation of the country differences observed.

The effect sizes of the psychological variables can be found in Table 7.11, and the effect sizes of the family variables can be found

in Table 7.12. The effect sizes of the country differences of the first analysis pointed to large differences. All effect sizes were medium or large, with the exception of Emotional Distance to the nuclear family for which a value of $\eta^2 = .04$ was found. The average effect size was $\eta^2 = .18$ for the psychological variables and $\eta^2 = .16$ for the family variables. These values are very large if one takes into account that the scores are derived from scores of individuals and that even for fairly reliable instruments a sizeable proportion of the variance is random error, which reduces the effect size of countries. Particularly high effect sizes were found for the values Embeddedness (Schwartz, 1992) and Hierarchy (Georgas, 1989; Georgas et al., 2004c). Both point to large cross-cultural differences in more traditional and more modern countries. We return to this issue in the next section on hypothesis tests. Furthermore, the expressive roles of family members showed somewhat larger cross-cultural differences than did the instrumental–material/economic roles (with average effect sizes of $\eta^2 = .26$ and $\eta^2 = .11$, respectively).

The cluster means of family network variables and family roles are presented in Table 7.13. This table also indicates which mean scores differed at least .50 SD (a medium or large effect size) from each other. An inspection of the Family Network variables shows that the countries in the medium level of both Affluence and Relatedness tended to show the highest scores on geographic proximity, frequency of visits, and telephone calls. As for Religion, the Christian Orthodox showed the highest means. Curvilinear effects (in which the medium level of Affluence or Relatedness showed much higher or lower means than the other levels) were not found for any family role. Rather, these showed either linear effects or no effects at all. The most common pattern was a decrease of scores across the levels of Affluence (with in some cases medium or large effect sizes in the comparison of the countries in the low and high affluence clusters). The opposite pattern was found for Relatedness; scores on the family roles tended to increase with Relatedness. The comparisons of the Religious clusters showed medium or large effect sizes only in some comparisons of Protestant and Islamic countries. The expressive roles of both the father and the mother were more salient in Islamic countries. The other family positions showed the same pattern of higher scores in Islamic countries than in Protestant countries, although the effect sizes tended to be small. The financial role of the father was also more salient in Islamic countries than in Protestant countries; the same was found for the instrumental role of the 20-year-old son. The parental instrumental roles (finances and childcare) showed an interesting pattern. The financial role of the father decreased with Affluence and increased with Relatedness, while the financial role

Table 7.13 *Mean scores on family network variables and family roles per country clustering (affluence, religion, and relatedness)*

	Affluence			Religion					Relatedness		
	Low	Medium	High	Cath.	Prot.	Orth.	Muslim	Buddh.	Low	Medium	High
Family networks											
Geography	3.60	3.66	3.25	3.28	$2.68_{O,M}$	3.73_P	3.56_P	3.84	$2.80_{M,H}$	3.71_L	3.60_L
Visits	3.98	4.50	3.95	4.24_P	$3.66_{C,O}$	4.60_P	4.17	3.98	3.84_M	4.48_L	3.98
Telephone	2.72_M	3.61_L	3.29	3.18_O	3.37	$3.88_{C,M}$	3.09_O	3.05	3.23	3.53_H	2.72_M
Father											
Expressive	$4.98_{M,H}$	4.48_L	4.01_L	4.08_M	4.08_M	4.53	$4.93_{C,P}$	4.17	4.09_H	4.31_H	$4.98_{L,M}$
Finances	5.16_H	4.85_H	$4.32_{L,M}$	4.51_M	4.52_M	4.94	$5.12_{C,P}$	4.34	4.49_H	4.63_H	$5.16_{L,M}$
Childcare	3.44	3.22	3.20	3.42	3.39	3.32	3.27	3.00	3.47	3.13	3.44
Mother											
Expressive	5.25_H	5.00_H	$4.54_{L,M}$	4.75_M	4.76_M	5.01	$5.22_{C,P}$	4.54	4.73_H	4.80_H	$5.25_{L,M}$
Finances	4.61	4.61	4.58	4.70	4.69	4.81	4.50	4.43	4.64	4.58	4.61
Childcare	4.32	4.48	4.29	4.56	4.63	4.78_M	4.19_O	3.97	4.62	4.31	4.32
Grandfather											
Expressive	4.41_H	4.00_H	$3.43_{L,M}$	3.68_M	3.66_M	4.04	$4.31_{C,P}$	3.52	3.63_H	3.76_H	$4.41_{L,M}$
Instrumental	2.87	2.56	2.41	2.40	2.68	2.77	2.62	2.55	2.55	2.47	2.87
Grandmother											
Expressive	4.53_H	4.24	3.71_L	4.03	4.06	4.20	4.47	3.68	4.01	3.98	4.53

Instrumental	2.88	2.86	2.74	2.76	3.07	3.13	2.74	2.64	2.95	2.76	2.88
Uncle/aunt											
Expressive	3.61	3.47	3.08	3.48	3.28	3.29	3.60	2.99	3.32	3.27	3.61
Instrumental	2.78_H	2.35	2.29_L	2.44	2.46	2.30	2.58	2.34	2.45	2.28_H	2.78_M
Son 20											
Expressive	3.95_H	3.83	3.44_L	3.69	3.54	3.79	3.94	3.43	3.57	3.67	3.95
Instrumental	3.47_H	3.08	2.86_L	3.02	2.85_M	3.09	3.31_P	3.01	2.91_H	3.00_H	$3.47_{L,M}$
Daughter 20											
Expressive	4.15_H	3.99	3.58_L	3.85	3.77	3.91	4.16	3.53	3.79	3.80	4.15
Instrumental	3.51_H	3.32	3.01_L	3.21	3.00	3.42	3.39	3.10	3.08_H	3.21	3.51_L
Son 10											
Expressive	3.19	3.48	3.10	3.40	3.12	3.38	3.27	3.12	3.16	3.35	3.19
Instrumental	2.15	1.89	1.88	1.86	1.79	1.87	2.02	2.09	1.79	1.91	2.15
Daughter 10											
Expressive	3.25	3.57	3.18	3.50	3.23	3.44	3.36	3.16	3.27	3.42	3.25
Instrumental	2.21	1.98	1.94	1.93	1.85	1.97	2.10	2.15	1.86	2.00	2.21

Cath. = Roman Catholic cluster. Prot. = Protestant cluster. Orth. = Christian Orthodox cluster. Buddh. = Buddhist/Hindu/traditional beliefs cluster. Subscripts following denote indicate medium and large effect sizes. For Affluence and Relatedness the subscripts L, M, and H indicate that the cell mean differs at least .50 SD (a medium effect size) from the score in the low, medium, and high level, respectively. For example, the letter M in the first cell of telephone calls (2.72_M) indicates that this mean of 2.72 differs at least .50 SD from the mean of 3.61 of the medium-affluence cluster. The subscripts C, P, O, M in the means of the religions indicate that the means differ from the Catholic, Protestant, Orthodox, and Muslim mean, respectively. The last cluster (Buddhist/Hindu/Traditional Beliefs) is not considered because of its heterogeneity.

of the mother was unrelated to both Affluence and Relatedness. In Roman Catholic and Protestant countries the financial role of the father was less important than in Islamic countries. Childcare shows even fewer cluster differences. Apart from the scores of the mothers, which were higher in the Orthodox than in the Islamic countries, no cluster comparison yielded a large effect size, strongly suggesting the childcare is a domain with small cluster differences.

The psychological variables showed a pronounced pattern of cross-cluster similarities and differences (see Table 7.14). The Emotional Distance, Self-construal, and Personality Scales showed very few medium and large effect sizes. The same was true for Intellectual Autonomy, Affective Autonomy, and Mastery. However, the other values, Embeddedness, Hierarchy, and Harmony, showed much more cluster variation. These three values decreased with Affluence and increased with Relatedness. The religious clustering also showed various substantial effect sizes for the same values. The Roman Catholic and Protestant clusters often showed much lower means than did the Orthodox clusters. Family Values largely replicated this pattern of cluster differences. These values increased with Relatedness and decreased with Affluence; the Islamic and (to a somewhat lesser extent) Orthodox Cluster showed high scores while the Roman Catholic and Protestant clusters showed lower scores.

The analyses of the three different country clustering methods yielded largely similar results. The patterning of the relatively large and small effect sizes across the scales was similar across the four analyses; for example, Georgas' Hierarchy and Schwartz's Embeddedness showed large values in each analysis, while emotional distance to the nuclear family yielded relatively small effects in all analyses. Moreover, the effect sizes of the psychological variables of the three types of clustering are largely identical ($\eta^2 = .07$ for Religion and $\eta^2 = .06$ for the other clusters). This value means that the three affluence and the five religious clusters can capture on average 35 percent ($= 100 \times (.06 + .07 + .06)/(3 \times .18)$) of the country variation. Affluence and Relatedness are more effective than Religion despite their slightly lower effect sizes, because the latter uses five categories while the former two need only three categories to arrive at the same effect size. The three kinds of clustering can explain on average 36 percent ($= 100 \times (.05 + .05 + .04)/(3 \times .13)$) of the country variation in the family variables. Affluence and Relatedness are also slightly more powerful here for the same reason as in the first analysis. Moreover, Affluence, Religion, and Relatedness explain 49 percent, 39 percent, and 26 percent in the expressive roles, respectively. These numbers are lower for the instrumental–material/

Table 7.14 *Mean scores on emotional distance, self-construal, personality, family values, and values per country clustering (affluence, religion, and relatedness)[a]*

Domain/scale	Affluence			Religion					Relatedness		
	Low	Medium	High	Cath.	Prot.	Orth.	Muslim	Buddh.	Low	Medium	High
Emotional distance											
Nuclear	6.24	6.22	6.00	6.17	5.90	6.28	6.19	6.05	6.02	6.14	6.23
Extended	4.68	4.85	4.45	4.82	4.35_O	5.10_P	4.59	4.39	4.57	4.69	4.68
Self-construal											
Independent	4.91	4.86	4.68	4.93	4.79	4.82	4.81	4.67	4.77	4.77	4.91
Interdependent	5.17_H	4.83	4.72_L	4.84	4.57_O	4.98_P	4.95	4.87	4.60_H	4.84	5.17_L
Personality											
Agreeableness	5.72	5.62	5.35	5.60	5.53	5.57	5.73	5.22	5.59	5.46	5.72
Conscientiousness	5.38_H	5.23	4.83_L	5.18	5.15	5.19	5.35	4.66	5.19	4.99	5.38
Emotional stability	4.57	4.59	4.42	4.60	4.61	4.60	4.56	4.29	4.64	4.47	4.57
Extraversion	4.67	4.76	4.63	4.86	4.95	4.65	4.72	4.38	4.89	4.64	4.67
Openness	4.50	4.60	4.47	4.75	4.75	4.45	4.54	4.24	4.73	4.48	4.50
Family values											
Hierarchy	$5.86_{M,H}$	$4.52_{L,H}$	$3.75_{L,M}$	$3.62_{O,M}$	$3.47_{O,M}$	$4.43_{C,P,M}$	$5.61_{C,P,O}$	4.74	$3.27_{M,H}$	$4.45_{L,H}$	$5.86_{L,M}$
Relationships with kin	$6.51_{M,H}$	6.01_L	5.63_L	5.84_M	5.70_M	5.93_M	$6.41_{C,P,O}$	5.76	$5.70_{M,H}$	5.87_H	6.51_L
Values											
Embeddedness	6.17_H	5.89_H	$5.28_{L,M}$	$5.36_{O,M}$	$5.30_{O,M}$	$5.94_{C,P}$	$6.20_{C,P}$	5.51	$5.26_{M,H}$	$5.71_{L,H}$	$6.17_{L,M}$
Hierarchy	5.06_H	4.54	4.33_L	4.23_M	4.31_M	4.37_M	$5.00_{C,P,O}$	4.73	4.19_H	4.53	5.06_L
Harmony	5.78_H	5.63_H	$5.07_{L,M}$	5.34	$4.97_{O,M}$	5.57_P	5.77_P	5.30	4.96_H	5.49_L	$5.78_{L,M}$
Intellectual autonomy	5.54	5.68	5.50	5.73	5.51,	5.68	5.54	5.45	5.54	5.62	5.54
Affective autonomy	5.62	5.80	5.74	5.83	5.92	6.04	5.64	5.42	6.02	5.69	5.62
Mastery	5.81	5.86	5.60	5.76	5.64	5.91	5.81	5.59	5.64	5.77	5.81

Note:
[a] See footnote to Table 7.13 for an explanation.

economic role (Affluence: 30 percent; Religion: 31 percent; Relatedness: 27 percent).

It can be concluded that large cross-cultural differences were found in nearly all scales examined, especially in Schwartz's Embeddedness and Georgas' Hierarchy values. Moreover, the clustering of countries in terms of Affluence, Religion, and Relatedness was effective in that about 35 percent of the country variation could be accounted for by differences in affluence, religion, or relatedness. More specifically, the effectiveness of Affluence in explaining country differences in expressive roles was remarkable.

HYPOTHESIS TESTS

This section focuses on relationships between country-level indicators (such as the ecological and sociopolitical variables) and psychological variables, such as the family-related variables. It consists of two parts. The first discusses the correlations between country indicators and the psychological variables. The hypotheses that were formulated in Chapter 5 for some of these correlations are tested here. The second part examines the country-level indicators in more detail; it integrates these variables, and examines the relationship of the integrated variables with the psychological variables.

In order to be consistent with the previous analyses, the presentation of the correlations deals more with effect sizes than with significance of correlations (Cohen's proposed cutoff values of .10, .30, and .50 for small, medium, and large effect sizes in (absolute values of) correlations). For our current sample sizes ($N = 27$) correlations are significant at 5 percent level if their absolute values are larger than .38 and at 1 percent level if these are larger than .48.

Ecocultural Framework, ecological and sociopolitical variables, psychological variables and family variables

According to the Ecocultural Framework, the three ecological indicators (i.e., Affluence, Temperature, and Percentage of Population Working in Agriculture) are expected to show a similar pattern of correlations. Affluence is expected to have a positive correlation with Education and an inverse relationship with Agriculture. We hypothesized that the Percentage of the Population Working in Agriculture and Temperature would be positively related to family network variables (i.e., Geographic Proximity and Frequency of Visits), while Affluence would show the opposite pattern. As can be seen in Table 7.15, the correlations of the

Table 7.15 *Correlations across all family positions with affluence, religion, family networks, and psychological variables (N = 27 countries)*

		Family networks			Emotional distance (Georgas et al.)		Self-construal (Singelis et al.)		Personality traits (Williams et al.)				Family values (Georgas et al.)				Values (Schwartz)				
		Geogr	Visits	Telep	Nucl	Ext.	Indep	Inter	Agree	Consc	Emot	Extra	Open	Hiera	Kin	Embed	Hier	Harm	Intel	Affect	Mast
Affluence		−48	−27	26	−39	−29	−23	−28	−43	−43	−28	01	−02	−68	−64	−70	−49	−82	−11	25	−32
% working in agriculture		31	−10	−44	33	26	26	24	44	54	35	06	06	69	64	63	73	70	09	−09	35
Highest temperature		18	−09	−05	−08	−34	−16	−08	−05	02	−15	−07	−18	39	29	32	40	21	−07	−14	09
Education		−24	−15	35	−29	−05	−29	−18	−42	−48	−30	−07	−05	−59	−60	−64	−55	−79	−22	33	−32
Religion	Catholic	−23	03	−04	02	18	08	01	06	02	00	38	40	−49	−21	−53	−44	−16	32	10	−02
	Protestant	−65	−60	−13	−34	−23	13	−21	01	05	24	29	27	−41	−25	−42	−07	−61	−15	25	−20
	Orthodox	23	45	54	25	51	07	15	02	09	11	−09	−21	−02	−01	24	−13	18	12	34	33
	Muslim	24	20	−05	21	−16	−07	03	28	23	03	03	−03	62	56	69	37	49	−21	−32	06
Family networks	Geograph	–	53	25	17	34	02	24	−08	−06	−15	−11	−15	46	30	41	36	34	−25	−25	12
	Visits	53	–	38	64	38	12	20	01	12	09	15	06	−01	11	29	−16	31	12	−03	22
	Telephone	25	38	–	−27	26	−16	−04	−13	−17	−28	08	−17	−28	−18	01	−24	−14	−07	28	15
Emotional distance	Nuclear	17	64	−27	–	34	31	26	26	42	48	26	33	10	32	35	00	45	32	−02	29
	Extended	34	38	26	34	–	53	52	55	53	44	26	24	03	32	27	03	19	−03	27	26
Self-construal	Independ.	02	12	−16	31	53	–	64	40	39	52	12	31	10	27	20	19	11	00	−06	15
	Interdep.	24	20	−04	26	52	64	–	34	15	12	−12	06	22	36	24	−06	12	−18	−26	−17
Personality traits	Agreeable	−08	01	−13	26	55	40	34	–	86	70	44	41	15	56	45	14	34	−01	02	05
	Consc.	−06	12	−17	42	53	39	15	86	–	78	63	40	19	64	56	34	46	13	18	32
	Emot. stab.	−15	09	−28	48	44	52	12	70	78	–	54	56	03	41	33	30	19	16	22	31
	Extraversion	−11	15	08	26	26	12	−12	44	63	54	–	71	−30	34	14	12	10	23	36	38
	Openness	−15	06	−17	33	24	31	06	41	40	56	71	–	−30	00	−14	07	−03	31	38	32
Family values	Hierarchy	46	−01	−28	10	03	10	22	15	19	03	−18	−30	–	75	78	62	56	−39	−42	07
	Kin	30	11	−18	32	32	27	36	56	64	41	34	00	75	–	86	48	57	−21	−27	18

Table 7.15 (*cont.*)

		Family networks			Emotional distance (Georgas et al.)		Self-construal (Singelis et al.)		Personality traits (Williams et al.)				Family values (Georgas et al.)				Values (Schwartz)				
		Geogr	Visits	Telep	Nucl	Ext.	Indep	Inter	Agree	Consc	Emot	Extra	Open	Hiera	Kin	Embed	Hier	Harm	Intel	Affect	Mast
Values	Embedded	*41*	29	01	*35*	27	20	24	*45*	**56**	*33*	14	−14	**78**	**86**	–	**57**	**69**	−14	−20	*33*
	Hierarchy	*36*	−16	−24	00	03	19	−06	14	*34*	*30*	12	07	**62**	48	**57**	–	**50**	00	01	*49*
	Harmony	*34*	*31*	−14	*45*	19	11	12	*34*	*46*	19	10	−03	**56**	**57**	**69**	**50**	–	*38*	−26	*47*
	Intel. aut.	−25	12	−07	*32*	−03	00	−18	−01	13	16	23	*31*	*−39*	−21	−14	00	*38*	–	*33*	**62**
	Affect. aut.	−25	−03	28	−02	27	−06	−26	02	18	22	*36*	*38*	*−42*	−27	−20	01	−26	*33*	–	**55**
	Mastery	12	22	15	29	26	15	−17	05	*32*	*31*	*38*	*32*	07	18	*33*	*49*	*47*	**62**	**55**	–

Correlations are significant at 5 percent level if their absolute value is at least .38 and at 1 percent level if their absolute value is at least .49 ($N = 27$). Decimal points omitted. Zero and small effect sizes (absolute value of correlation, r, < .30) are printed in regular font, medium effect sizes (.30 < r < .50) in italics, and large effect sizes (r > .50) in bold.

Percentage of the Population in Agriculture and Temperature with Proximity of Residence were in the expected direction, but the correlations were not strong ($r = .31$ and $.18$). The correlation with Affluence was stronger ($r = -.48$). Frequency of Visits showed small negative correlations for all three indicators. Frequency of Phone Calls showed a correlation of $-.44$ with the Percentage of the Population Working in Agriculture and of $-.05$ with Temperature. Affluence showed a correlation of $.26$ with Frequency of Phone Calls. The analyses provided incomplete support for the hypotheses. Although the sign of most correlations was in the expected direction, the strength of the association tended to be weak, in particular for Temperature.

Ecological variables and psychological variables

A second set of predictions involved the association of the ecological variables and psychological variables. It was expected that the Percentage of the Population in Agriculture and Temperature would be associated with close Emotional Distance and an Interdependent Self-construal, high Hierarchy and Kin Family values; an opposite pattern was expected for Affluence. As in the previous analysis, the correlations of Temperature tended to be weak and to have the expected sign. The correlations of the Percentage in the Agriculture and Affluence were stronger and in the expected direction. The correlations (absolute values) with Emotional Distance were around $.30$ and with both Self-construals around $.25$. Strong effect sizes were found for both family values ($r = .66$) and three personal values (Embeddedness, Hierarchy, and Harmony; $r = .68$). It can be concluded that our predictions were confirmed for all three indicators in most cases, although the relationships of the psychological variables tended to be weaker for Temperature than for the other two indicators.

Fairly strong correlations of $.45$ were found with Agreeableness and Conscientiousness. Emotional Stability showed a medium effect size of $r = .33$, while Extraversion and Openness were unrelated to the ecological variables. Mastery showed a medium effect size ($r = .34$); both intellectual and affective autonomy did not show any relationship with the ecological variables.

Sociopolitical variables and psychological variables

Two kinds of sociopolitical variables were studied, namely Education and Religion. As predicted, the patterning of Education was strikingly similar to the pattern for Affluence; the correlation of the rows for

Affluence and Education in Tables 7.15 and 7.16 was .95. The direction of these relationships was always correctly predicted. Correlations with an absolute value of at least .30 were found for Making Phone Calls ($r = .35$), Agreeableness ($r = -.42$), Conscientiousness ($r = -.48$), Emotional Stability ($r = -.30$), Hierarchy in the Family ($r = -.59$), Relationships with Kin ($r = -.60$). Furthermore, strong correlations were also found for Embeddedness ($r = -.64$), Hierarchy as a personal value ($r = -.55$), and Harmony ($r = -.79$).

The correlations of Religion (based on percentage of adherents in each country) showed an interesting pattern. Catholicism showed positive medium effect sizes for Extraversion ($r = .38$) and Openness ($r = .40$), and Intellectual Autonomy ($r = .32$), and negative medium and large effects for Embeddedness ($r = -.53$), and Hierarchy as a family value ($r = -.49$) and as a personal value ($r = -.44$). Family network variables were not associated with Catholicism ($r < .25$). The percentage of Protestants in a country showed a large, negative effect size for Proximity of Residence ($r = -.65$), Frequency of Visits ($r = -.60$), and Harmony ($r = -.61$). Negative effects of medium size were found for Emotional Distance to Nuclear Family ($r = -.34$), Hierarchy in the Family ($r = -.41$), and Embeddedness ($r = -.42$). Although the variables with sizeable effect sizes were quite different for Catholicism and Protestantism, the overall patterning was fairly similar, as expected (the two rows of correlations showed a correlation of .56). The two religions had a negative relationship with interpersonal features; the relationships with intrapersonal features tended to be positive, but were often very weak.

The percentage of Orthodox adherents showed an entirely different pattern of correlations. Positive correlations above .50, pointing to large effects, were found for Making Phone Calls ($r = .54$) and Emotional Closeness to Extended Family ($r = .51$), while a medium effect was found for Visits to the Family ($r = .45$). Affective Autonomy ($r = .34$), and Mastery ($r = .33$) also showed medium-size effects. As expected, the correlations for the percentage of Muslim adherents were the opposite of those found for Catholicism and Protestantism; the correlations of the rows of Tables 7.15 and 7.16 for Islam, on the one hand, and Catholicism and Protestantism, on the other hand, were $-.74$ and $-.76$, respectively. The strongest relationship between the percentage of Muslims and the psychological variables was positive and involved both Family Values (Hierarchy: $r = .62$, Kinship Relationships: .56). Medium-size correlations were found for two individual values, being Hierarchy ($r = .37$) and Harmony ($r = .49$). Affective Autonomy showed a negative correlation of $-.32$.

Table 7.16 *Correlations of the family roles for each family position with affluence, religion, family networks, and psychological variables (N = 27 countries)*

| | | Father | | | Mother | | | Grandfather | | Grandmother | | Aunt/Uncle | | Male 20 yrs | | Female 20 yrs | | Male 10 yrs | | Female 10 yrs | |
		Exp.	Fin.	Care	Exp.	Fin.	Care	Exp.	Instr.	Exp.	Instr.	Exp.	Instr.	Exp.	Instr.	Exp.	Instr.	Exp.	Instr.	Exp.	Instr.
Affluence		−65	−58	11	−61	11	16	−61	−19	−48	05	−37	−28	−55	−66	−51	−69	−33	−38	−29	−41
% working in agriculture		71	67	14	71	03	01	64	42	55	19	39	66	46	82	44	73	05	59	04	59
Highest temperature		50	31	−05	37	−25	−44	35	−04	33	−40	30	19	29	30	31	−03	15	28	16	23
Education		−55	−45	03	−54	15	22	−52	−04	−44	21	−43	−29	−52	−56	−50	−49	−39	−44	−37	−46
Religion	Catholic	−56	−34	22	−32	24	32	−33	−28	−17	−03	−13	01	−13	−13	−17	−10	12	−17	12	−19
	Protestant	−31	−21	32	−19	17	25	−34	−13	−23	06	−07	12	−28	−36	−19	−35	−38	−23	−33	−25
	Orthodox	13	24	15	16	34	49	15	34	06	53	−14	−20	07	01	00	27	10	−15	05	−10
	Muslim	73	53	−25	58	−47	−51	57	−01	53	−33	35	06	56	39	61	21	23	05	26	06
Family networks	Geograph	37	41	−20	24	−32	−17	34	37	21	−03	12	13	23	38	17	24	12	01	08	00
	Visits	17	39	03	17	−15	18	23	08	21	04	16	−18	26	13	24	20	32	−34	29	−31
	Telephone	−09	03	01	−10	05	18	−15	00	−17	06	−24	−45	−15	−39	−14	−32	−07	−65	−07	−63
Emotional distance	Nuclear	35	51	26	47	07	29	48	27	53	29	40	26	47	52	45	58	40	11	37	14
	Extended	15	43	34	31	17	54	27	28	23	36	25	33	28	30	24	48	20	−12	16	−09
Self-construal	Independ	14	31	47	25	21	33	11	−01	11	−04	33	42	25	21	24	25	12	06	09	03
	Interdep	21	23	24	21	07	05	17	07	12	−08	12	15	17	25	14	16	−04	00	−10	−04
Personality traits	Agreeable	37	54	22	56	−11	20	40	02	40	05	30	27	44	41	49	49	22	01	23	06
	Conscient.	47	67	40	68	−05	42	53	18	54	22	52	50	57	52	62	66	28	06	31	12
	Emot. stab.	24	46	36	45	15	41	33	05	33	21	43	39	44	30	44	46	29	05	30	11
	Extraversion	11	34	44	38	10	51	25	10	38	24	49	33	41	20	44	35	18	−39	22	−33
	Openness	−09	17	23	18	12	34	07	−01	22	14	39	36	17	08	18	21	06	−26	09	−22
Family values	Hierarchy	79	49	−17	60	−27	−38	70	33	58	−04	44	37	65	62	62	47	34	51	31	50
	Kin	80	65	22	79	−16	−05	78	28	72	01	63	43	85	69	84	62	44	21	43	23

Table 7.16 (*cont.*)

		Father			Mother			Grandfather		Grandmother		Aunt/Uncle		Male 20 yrs		Female 20 yrs		Male 10 yrs		Female 10 yrs	
		Exp.	Fin.	Care	Exp.	Fin.	Care	Exp.	Instr.	Exp.	Instr.	Exp.	Instr.	Exp.	Instr.	Exp.	Instr.	Exp.	Instr.	Exp.	Instr.
Values	Embedded	**88**	**72**	05	**82**	−21	−12	**79**	*30*	**68**	03	**54**	*30*	**79**	**59**	**79**	**60**	*44*	22	*43*	26
	Hierarchy	**56**	*47*	01	**50**	−03	−11	*44*	*30*	*35*	06	*42*	**60**	*36*	*47*	*33*	*42*	04	*46*	04	*47*
	Harmony	**55**	**54**	−10	**58**	−02	−05	**52**	21	*46*	11	28	20	*48*	**65**	*45*	**68**	*32*	*44*	*30*	*48*
	Intel. aut.	−25	−14	19	−05	**58**	*36*	−19	−12	−12	21	−07	01	−13	05	−20	27	00	16	−01	19
	Affect. aut.	−11	02	*42*	04	*44*	**60**	00	17	04	*45*	17	27	−08	−18	−09	09	−14	−27	−12	−22
	Mastery	26	*32*	*33*	*36*	*48*	*43*	29	25	29	*35*	*40*	*39*	*34*	28	25	*46*	19	10	17	14

Correlations are significant at 5 percent level if their absolute value is at least .38 and at 1 percent level if their absolute value is at least .49 ($N = 27$).

Decimal points omitted. Zero and small effect sizes (absolute value of correlation, r, < .30) are printed in regular font, medium effect sizes ($.30 < r < .50$) in italics, and large effect sizes ($r > .50$) in bold. Exp. = expressive role. Fin. = financial role. Care = childcare role. Instr. = instrumental role.

Table 7.17 *Spearman's rank order of the correlations of the four main religions, across all scales*

Religion	Catholic	Protestant	Orthodox
Catholic	–		
Protestant	.53**	–	
Orthodox	.06	−.08	–
Islamic	−.72**	−.62**	−.35*

Note:
$^{t*}p < .05.$ $^{**}p < .01.$

In order to identify the overall patterning of these correlations across the four types of religions, Spearman's rank order correlations were computed across the various scales of the of Tables 7.15 and 7.16; results are reported in Table 7.17. This analysis was aimed at comparing correlations of the four religions with personality, values and family values, self-construals, and family networks and family roles. We found the expected patterning. The correlations between Catholicism and Protestantism were positive and significant ($\rho = .53$, $p < .01$). Islam showed significant, negative correlations with the three Christian churches (Roman Catholic: $\rho = -.72$; Protestant: $\rho = -.62$; Orthodox: $\rho = -.35$; all ps $< .05$). The correlations between the Christian Orthodox percentages on the one hand and Catholic and Protestant Christianity on the other hand were very small. It appears, in summary, that we found some evidence for the two expected clusters of correlations. The first cluster is based on a juxtaposition of Catholicism and Protestantism on the one hand and Islam on the other. Catholic and Protestant countries showed negative associations with expressive and instrumental roles, while Islamic countries showed the opposite pattern (with a strong positive correlation of .56 for expressive roles and a median of only .05 for the instrumental role). Orthodox countries constitute the second cluster. The instrumental role showed a median correlation of .24 in the Orthodox countries; the other correlations of Orthodox countries were close to zero. As for the other scales, the major source of differences of the first cluster is correlations with hierarchy-related variables (which are positive for Catholicism and Protestantism and negative for Islam). The Christian Orthodox Church has its own independent pattern of correlations with the psychological variables (which did not confirm our hypothesis).

Table 7.15 contains several correlations with large effect sizes, for which no hypothesis was formulated. A first example involves the strong positive intercorrelations of .60 of the personality scales (at country level). A much lower value of .21 was found at individual level (the latter figure is based on scores that were standardized per country in order to eliminate confounding country differences in scale scores). The positive correlations of the scales were also found by Williams et al. (1998), possibly owing to the role of response sets such as social desirability (Poortinga and van de Vijver, 2000). The two family values (Hierarchy and Kinship Relations) showed large effect sizes ($r = .75$). The patterning of Schwartz's six values pointed to the existence of two larger value clusters (with high within-cluster and low between-cluster correlations). The first one is formed by the more interpersonal values of Embeddedness, Hierarchy, and Harmony, and the second by the more intrapersonal values of Intellectual Autonomy, Affective Autonomy, and Mastery. Relatively strong, positive correlations were also found between Emotional Distance and all personality scales and between Georgas et al.'s Family Values and Schwartz's Embeddedness, Hierarchy, and Harmony.

Ecological and sociopolitical variables and family roles

As the hypotheses about the relationships of roles only involved a distinction between expressive and instrumental roles, another table was composed, containing the median correlations across the nine family positions (father, mother, etc.) (see Table 7.18). The Percentage of the Population Working in Agriculture and Temperature were assumed to be positively associated with both family roles, while Affluence was assumed to have a negative relationship. The median correlations of the Percentage of the Population Working in Agriculture were .46 and .59 with the expressive and instrumental roles, respectively. The correlations were (again) lower for Temperature, namely .31 and −.03 (the latter relationship is clearly at odds with the hypothesis). The median correlations of Affluence were −.51 and −.28, as expected. Highly similar values of −.50 and −.29 were found for Education. These correlations confirmed our expectation.

In summary, the ecological variables and sociopolitical variable of Education showed a pattern of negative relationships with the expressive role and weaker associations with the instrumental role. For Religion, the expected opposite pattern of correlations of Muslim and Orthodox countries on the one hand and Catholic and Protestant

Table 7.18 *Median correlations between country-level indicators and expressive and instrumental roles (N = 27 countries)*

Country-level indicator		Expressive	Instrumental
Affluence		−.51	−.28
Percentage of population working in agriculture		.46	.59
Highest temperature		.31	−.03
Education		−.50	−.29
Religion	Catholic	−.17	−.10
	Protestant	−.28	−.13
	Orthodox	.07	.24
	Muslim	.56	.05
	Buddhism/Hinduism/Other	−.09	.01
Family networks	Geographical	.21	.01
	Visits	.23	.04
	Telephone	−.14	.00
Emotional distance	Nuclear	.45	.27
	Extended	.24	.33
Self-construal	Independence	.14	.21
	Interdependence	.14	.07
Personality traits	Agreeable	.40	.20
	Conscientious	.53	.40
	Emotional stability	.33	.30
	Extraversion	.38	.24
	Openness	.17	.14
Family values	Hierarchy	.60	.37
	Kin	.78	.23
Values	Embedded	.79	.26
	Hierarchy	.36	.42
	Harmony	.46	.21
	Intellectual autonomy	−.12	.19
	Affective autonomy	−.08	.17
	Mastery	.29	.33

countries on the other hand replicated our findings in the analysis of the other psychological variables.

Psychological variables and family variables

A final analysis concerned the relationships between the psychological variables (at country level) and the family variables. As can be seen in Table 7.16, personality factors were unrelated to the family network variables. Embeddedness, Hierarchy, and Harmony were positively

related to proximity of residence, while the two autonomy values showed (weaker) negative correlations. Frequency of visits and telephone calls were less systematically related to values. Self-construal scores were not strongly related to the family network variables related either. Emotional Distance showed positive relationships with proximity of residence and frequency of visits (closer emotional ties are associated with more proximity and more frequent visits). Frequency of phone calls did not show strong relationships with Emotional Distance. The two family values, Hierarchy and Kin Relationships, showed positive relationships with proximity of residence, while the relationships with frequency of visits and phone calls were weak.

The relationships between psychological variables and family roles tended to be stronger. Most of the correlations were positive, although slightly stronger for the expressive role (median $r = .36$) than for the instrumental role ($r = .24$). All personality factors had a median correlation of well above .30 with both Family Roles, except for Openness, which was unrelated to roles. Embeddedness was the value with the strongest median correlation (of $r = .79$) with the expressive role, its relationship with the instrumental role was much weaker (median $r = .26$). Positive correlations were also found for Hierarchy, Harmony, and Mastery. Zero correlations were found for both autonomy values. The median of both self-construal scores were just above zero, which suggests that Family Roles are unrelated to independent and interdependent self-construals at country level. Emotional Distance to both the nuclear and extended family were positively related to Family Roles (median $r = .30$ across roles and positions, indicating that countries with stronger family emotional ties report on average higher scores on both Family Roles. Finally, both Family Values showed strong, positive relationships with both roles (median $r = .45$ across all roles and positions); countries with stronger family values showed higher scores on both expressive and instrumental roles across all positions.

It can be concluded that psychological country characteristics were more strongly related to Family Roles than to Family Network Variables and that the relationships were somewhat stronger for the expressive role than for the instrumental role. Proximity of Residence is the only Family Network variable that shows relationships with "relational and hierarchical" psychological characteristics, such as Embeddedness and Harmony. For the Family Roles a related and more pronounced pattern was found; strong relationships with these psychological characteristics were found, while country features that deal with independence (such as Intellectual and Affective Autonomy) were unrelated to Family Roles.

Family Change Model

On the basis of Kağıtçıbaşı's Family Change Model (see Chapter 3) two kinds of hypotheses were formulated (see Chapter 5). The first deals with living conditions including urban–rural, SES, and level of affluence, reflecting socioeconomic development. The second deals with culture, reflecting culture of relatedness–separateness.

Living conditions and family patterns

To deal with the first kind of prediction of the Family Change Model, changes in family patterns with increased Affluence are examined. It was predicted that both expressive roles and instrumental roles would decrease in importance with growing affluence. The current study is not longitudinal, which precludes a direct test of the second hypothesis. However, by comparing the relationship of both roles with Affluence, an indirect test can be carried out of the adequacy of the model. Therefore, the hypothesis is tested that both the emotional role and the material role decrease across the Affluence range. This hypothesis is tested at country level ($N = 27$).

A set of regression analyses (at country level) was carried out with Affluence as the independent variable and the Family Roles as dependent variables. The regression coefficients of Affluence are hypothesized to be below zero for both the expressive role and the instrumental role. The regression coefficients are given in Table 7.19. Most regression

Table 7.19 *Raw regression coefficients predicting the emotional (Expressive) and economic (Instrumental) roles of the family members at country level on the basis of affluence*

Position	Expressive	Instrumental
Father	$-.27^{**}$	$-.24^{**}$ (Finances) and .03 (Care)
Mother	$-.19^{**}$	.04 (Finances) and .06 (Care)
Grandfather	$-.28^{**}$	$-.06$
Grandmother	$-.20^{**}$	.02
Uncle/aunt	$-.16$	$-.09$
20-year-old male	$-.17^{**}$	$-.16^{**}$
20-year-old female	$-.18^{**}$	$-.18^{**}$
10-year-old male	$-.10$	$-.09^{*}$
10-year-old female	$-.09$	$-.10^{*}$

Note:
$^{*}p < .05.$ $^{**}p < .01.$

coefficients are below zero, as expected. The global median is $-.13$. The median regression coefficient is $-.18$ for the expressive role and $-.09$ for the instrumental role. These differences are small and confirm the earlier observation that cluster differences are smaller for the instrumental role than for the expressive role. Even without a statistical test of the significance of these dependent regression coefficients, it is clear that the pattern of findings is in line with the prediction according to which both the material/instrumental role and the emotional/expressive role should decrease across the Affluence range.

The Family Change Model recognizes the parallel associations of Affluence and Education and the inverse association of Percentage of Population Working in Agriculture (indicating rural living conditions) with family patterns (see Chapters 3 and 5). Regarding these associations, similar predictions are made with the Ecocultural Framework. Therefore, the relevant results reported previously for Ecocultural Framework also hold for the Family Change Model. To avoid repetition, the predictions of the Model presented in Chapter 5 will be mentioned here in general terms.

Increased Affluence and Education and decreased Percentage of Population in Agriculture were predicted to be associated with greater distance of residence and reduced frequency of family contacts; decreased emotional roles and emotional closeness; decreased material/instrumental family roles; less material/instrumental role of the child; decreased prevalence of interdependent self; less hierarchy and decreased kin relationships; and less personal embeddedness. These associations are borne out by the above findings and those presented previously with regard to the Ecocultural Framework. They refer to systematic relationships between living conditions and family/self patterns that are in line with a contextual sociocultural approach to the (changing) family.

In conclusion, various hypotheses derived from the Family Model were supported. First, the emotional/expressiveness role of the family was important in all relatedness clusters. Even in the independence cluster, which showed the lowest expressiveness scores, the global means were still relatively high and they are higher than the means of the instrumental role for each position. Secondly, both the expressive and the instrumental role decreased in importance with increased Affluence (although the decrease in the former was more pronounced than in the latter). Thirdly, the instrumental role of children decreased more (than others') with increased affluence. If we do not take the financial role of the father and the mother into account, the current results suggest that the instrumental role of children is more influenced (decreased) by Affluence than is the instrumental role of any other family member. This

is in line with the predictions of the Family Change Model regarding decreased material/economic value of the child with economic development.

Culture of relatedness–separateness clusters

To deal with the second kind of prediction deriving from the Family Change Model, country clusters were formed predicting a specific patterning of high and low scores on emotional/expressive and material/instrumental roles/Interdependencies across the three clusters of Relatedness (see Chapter 6). The Family Model of Interdependence was proposed to be prevalent in agrarian, collectivistic contexts (culture of relatedness; see Table 7.10 for a listing of the countries in the first relatedness cluster). Countries in this cluster should have high values in both roles. The Model of Emotional Interdependence was proposed to be prevalent in urban and relatively more affluent contexts but with a culture of relatedness (the second cluster). It should have high values in expressive roles but lower values in Instrumental Roles. The Family Model of Independence is proposed to be prevalent in industrial individualistic contexts (culture of separateness; third cluster of Table 7.10). Countries in this cluster are expected to show low values of both the emotional and material roles/interdependencies. This hypothesis is tested at individual level ($N = 5,482$).

In order to test the hypothesis, analyses of variance were carried out, with cluster membership (three levels) as the independent variable and the Family Roles as dependent variables. The results are given in Table 7.12. The Family Network scales showed medium-size cross-cluster differences (with effect sizes between .062 and .074). Proximity of residence of parents and children was smallest in the (high-relatedness) interdependence cluster and lowest in the (low-relatedness) independence cluster. Participants in countries of the middle cluster reported the most visits ($M = 4.48$) and participants in the independence cluster the smallest number ($M = 3.84$). Frequency of telephone calls was also highest in the middle cluster ($M = 3.53$ vs. 3.23 for the independence cluster and 2.72 for the interdependence cluster). Emotional Distance showed remarkably small differences across the three clusters. Emotional Closeness (low Distance) to the Nuclear Family varied slightly across the clusters, but the scores were high for all clusters (the lowest average, found in the independence cluster, was 6.02 on a seven-point scale). The effect size was .005, which indicates that across the three clusters of relatedness the emotional closeness to the nuclear family was invariably high. Emotional Closeness to the Extended Family was greater, but

again, the range of the scores was small (4.57 to 4.69) and the effect size was only .001. These findings support the hypothesis that Emotional Distance is only marginally related to (affected by) Relatedness.

The Family Change Model predicts a specific patterning of high and low scores on both roles across the three clusters. Emotional/expressive roles should be higher in the interdependence cluster than in the independence cluster; also, scores on emotional/expressive roles should be higher than scores on material/instrumental roles in all three clusters. As can be seen in Table 7.13, the averages of the emotional/expressive role increased with Relatedness for most positions. The effect sizes tended to decrease from the top to the bottom of the table (from the parents to the 10-year-old children). Although sizeable, even the most substantial decrease in scores was less than one unit on the six-point response scale. Thus, the emotional/expressive role remains important in the family. The average score of the emotional/expressive role was larger than the average score of the material/instrumental role for all family positions (except for the financial role of the father, which was the highest score of the father in each cluster). This finding provides strong evidence for the vital importance of the emotional/expressive role of the family.

As predicted by the Family Change Model, scores on instrumental roles tended to decrease with Relatedness, even though the effect sizes were small for most positions. This was not always the case. For example, very small cluster differences, which did not show a decrease, were found for the childcare role of the father and the financial and childcare role of the mother. Indeed, the main prediction of the Family Change Model is with regard to the decreased material value (instrumental role) of the (grown-up) child.

AN INTEGRATION OF COUNTRY CHARACTERISTICS

The hypotheses specified relationships between country characteristics (e.g., relatedness and religion) and psychological variables (e.g., family roles). We assumed in our hypotheses that the ecological variables, Affluence and two religions (Catholicism and Protestantism) would show identical patterns of correlations with the psychological variables. These hypotheses may incorrectly convey the impression that all context variables in the ecocultural variables are interchangeable. The four sets of variables are based on a conceptual classification. However, conceptual distinctness does not necessarily imply statistical independence. An important issue not yet considered involves the unique contribution of a defined country characteristic to the observed effects. For example, a

Table 7.20 *Factor loadings of country-level affluence indicators*

Variable	Loading
Affluence[a]	.95
Education[b]	.88
Relatedness[c]	−.93
Percentage of population working in agriculture	−.87

Notes:
Country scores can be found in Table 6.4.
[a] Indicators: Gross National Product per capita in US$, energy use per capita (in kg of oil equivalent), electricity consumption per capita in kilowatt hours, unemployment rate, percentage of population employed in industry, percentage of population employed in services, imports (in US$), exports (in US$).
[b] Indicators: total adult illiteracy, pupil/teacher ratio education at first level, enrollment ratios at first, second, and third level of education (see Chapter 6).
[c] Three levels (higher scores refer to higher levels of relatedness).

hypothesis test dealing with religious differences should ideally control for all country differences other than religion (often indicated in the literature as "all other things being equal"). This argument, which is the cornerstone of experimental designs, does not necessarily hold when comparing naturally occurring entities, such as countries. This section first examines relationships between the sets of country characteristics we have used (ecocultural variables, sociopolitical variables, religion, and relatedness).

It turned out that some country characteristics showed strong intercorrelations. A factor analysis of the economic indicator Affluence (Gross National Product, energy use, electricity consumption, unemployment rate, percentage of population employed in industry, percentage of population employed in services, and imports), the Education indicator (adult illiteracy rate, pupil/teacher ratio education at first level, enrollment ratios at first, second, and third level of education), percentage of the population working in agriculture, and relatedness constituted a very strong factor, which explained 82.3 percent of the variance; loadings are presented in Table 7.20. As could be expected, Relatedness and Percentage of the Population Working in Agriculture (which in developing and developed economies is also a measure of industrialization) showed negative loadings, while Affluence and Education showed positive loadings. Both Temperature and Religion constituted separate clusters. The correlations of the clusters can be found in Table 7.21. The Protestant countries in the study were the more affluent countries ($r = .53$, $p < .01$) and the Muslim countries were the less affluent

Table 7.21 *Correlations between the combined affluence indicator, average maximum temperature in the hottest month, and the four main religions of the current study (N = 27)*

Variable	Affl.	Temp.	Cath.	Prot.	Orth.
Affluence (combined)					
Temperature	−.31				
Percentage of Roman Catholics	.30	−.24			
Percentage of Protestants	.53[**]	−.17	.11		
Percentage of Christian Orthodox	.01	−.32	−.30	−.29	
Percentage of Muslims	−.52[**]	.49[**]	−.44[**]	−.31	−.21

Note:
[**]$p < .01.$

countries ($r = -.52$, $p < .01$). The correlations of Temperature and Affluence had opposite signs. Islamic countries tended to be warmer ($r = .49$, $p < .01$). Finally, in their correlations with Affluence and Temperature, Islamic countries and Christian countries showed correlations with opposite signs (although not all correlations were significant). The latter confirms our findings of multidimensional scaling.

In summary, for the current set of countries the conceptual classification of the contextual variables into ecological variables (Percentage of population engaged in agriculture, Highest monthly temperature, Affluence) and sociopolitical variables (Education and Religion) was found not to be two separate classes of variables, since several of their constituent elements showed strong relationships. Empirically, these contextual variables can be rearranged into three groups of variables: (1) Affluence, as measured by indicators of the level of economic development of a country (including Education); (2) Ecology, as measured by temperature; (3) Religion, as measured by the percentage of adherents to the four denominations of the current sample: Roman Catholic, Protestant, Christian Orthodox, and Muslim. This classification of variables is more or less in line with Georgas, van de Vijver, and Berry's (2004) classification, with one adjustment. Whereas Georgas et al. (2004c) found that the economic factor was also related to temperature (i.e., average daily maximum temperature in the hottest month), the current set (which is based on a much smaller set of countries) found a weaker correlation.

These three new indicators were used in regression analyses in order to detect their association with the psychological and family variables. The analyses were carried out at country level, because the hypotheses involve mechanisms at this level. However, an analysis at country level

has a sample size of "only" 27 cases. The number of predictors (affluence, temperature, and religion) would be large relative to the number of observations, which would make it difficult to find any significant coefficients. Therefore, it was decided to split up the analyses and to examine the association of each religion in separate regression analysis. For example, the association with Agreeableness was studied in four regression analyses. In the first affluence, temperature and the percentage of Roman Catholics were used as the predictors, in the second the latter was replaced by the percentage of Protestants, in the third by the percentage of Christian Orthodox, and in the fourth by the percentage of Muslims. So, for each dependent variable of interest four regression analyses were carried out, each time with a different religion as independent variable. In addition to significance, consistency of associations between predictors and dependent variables was examined.

The results of the regression analyses of the psychological variables are presented in Table 7.22. The prediction of personality traits at country level was not very successful. Agreeableness and Conscientiousness were negatively predicted by Affluence, while the contribution of Affluence to the explanation of the other traits was limited. The regression coefficients of Temperature were small, nonsignificant, and negative in most cases (median $\beta = -.11$). Mostly positive, though nonsignificant associations were found for religion (.11). Only one of the 20 squared multiple correlations was significant. It is fair to conclude that relationships between the country characteristics studied here and personality ranged from absent to weak. These results largely confirm findings that positive personality aspects such as agreeableness and conscientiousness are negatively related to Affluence (Allik and McCrae, 2004; van de Vijver, 2006; van Hemert, van de Vijver, Poortinga and Georgas, 2002).

Schwartz's values questionnaire yielded high squared multiple correlations for Embeddedness, Hierarchy, and Harmony (median $R^2 = .58$, .43, and .66, respectively, all ps $< .01$). The largest contribution came from Affluence, which showed a negative association in all analyses. Roman Catholicism was negative related to Embeddedness ($\beta = -.34$), while Christian Orthodoxy and Islam were positively related ($\beta = .28$ and .45, all ps $< .01$). The analysis of the individualistically oriented values (Intellectual Autonomy, Affective Autonomy, and Mastery) showed nonsignificant multiple correlations. It can be concluded that the collectivistic values are strongly and negatively influenced by Affluence, while the individualist values are not influenced by Affluence; the same pattern was reported by Georgas et al. (2004). Temperature and Religion did not show strong associations with values. The lack of an association between religion and personal values may seem unexpected.

Table 7.22 *Regression analysis with affluence (combined score), temperature, and religion as independent variables and psychological variables as the dependent variable*

Dependent Variable	Religious Denomination	Affluence (combined)	Temperature	Religion	Adj. R^2
Emotional distance					
Nuclear family	Roman Catholic	−.54[*]	−.23	.01	.17
	Protestant	−.56[*]	−.23	.03	.17
	Christian Orthodox	−.48[*]	−.15	.22	.21[*]
	Muslim	−.51[*]	−.25	.06	.17
Extended family	Roman Catholic	−.38	−.41	.18	.14
	Protestant	−.35	−.44[*]	.04	.11
	Christian Orthodox	−.22	−.29	.44[*]	.31[**]
	Muslim	−.40	−.37	−.19	.13
Self-construal					
Independent	Roman Catholic	−.38	−.25	.12	.04
	Protestant	−.64[*]	−.29	.46	.17
	Christian Orthodox	−.34	−.25	.05	.02
	Muslim	−.43	−.20	−.20	.05
Interdependent	Roman Catholic	−.40	−.18	.09	.03
	Protestant	−.38	−.19	−.00	.02
	Christian Orthodox	−.35	−.16	.11	.03
	Muslim	−.42	−.16	−.11	.03
Personality					
Agreeableness	Roman Catholic	−.49[*]	−.17	.14	.10
	Protestant	−.67[*]	−.21	.34	.16
	Christian Orthodox	−.44[*]	−.18	.04	.08
	Muslim	−.36	−.27	.23	.12
Conscientiousness	Roman Catholic	−.50[*]	−.11	.11	.11
	Protestant	−.78[**]	−.15	.48[*]	.25[*]
	Christian Orthodox	−.44[*]	−.08	.15	.12
	Muslim	−.44	−.16	.08	.10
Emotional stability	Roman Catholic	−.32	−.25	−.01	.00
	Protestant	−.64[*]	−.27	.49[*]	.17
	Christian Orthodox	−.29	−.20	.15	.02
	Muslim	−.34	.06	.01	.00
Extraversion	Roman Catholic	−.07	.01	.40	.03
	Protestant	−.19	−.07	.36	−.03
	Christian Orthodox	.02	−.09	−.11	−.11
	Muslim	.10	−.10	.01	−.11
Openness	Roman Catholic	−.11	−.11	.40	.06
	Protestant	−.24	−.19	.39	.01
	Christian Orthodox	−.07	−.28	−.30	−.00
	Muslim	.04	−.21	.10	−.09
Family values					
Hierarchy	Roman Catholic	−.64[**]	.12	−.26	.63[**]
	Protestant	−.73[**]	.16	.02	.56[**]

Table 7.22 (*cont.*)

Dependent Variable	Religious Denomination	Affluence (combined)	Temperature	Religion	Adj. R^2
	Christian Orthodox	−.71**	.17	.01	.56**
	Muslim	−.60**	.07	.27	.61**
Values Embeddedness	Roman Catholic	−.60**	.05	−.34*	.59**
	Protestant	−.76**	.10	.10	.49**
	Christian Orthodox	−.63**	.20	.28*	.56**
	Muslim	−.51**	−.06	.45**	.62**
Hierarchy	Roman Catholic	−.50**	.18	−.26	.46**
	Protestant	−.78**	.21	.32	.46**
	Christian Orthodox	−.58**	.22	−.01	.39**
	Muslim	−.60**	.25	−.06	.39**
Harmony	Roman Catholic	−.87**	−.04	.10	.66**
	Protestant	−.91**	−.06	.10	.66**
	Christian Orthodox	−.81**	.00	.17	.68**
	Muslim	−.80**	−.09	.12	.66**
Intellect. autonomy	Roman Catholic	−.24	−.05	.38	.03
	Protestant	−.17	−.12	.06	−.10
	Christian Orthodox	−.11	−.08	.12	−.09
	Muslim	−.29	.02	−.37	−.01
Affect. autonomy	Roman Catholic	.33	−.04	−.02	−.00
	Protestant	.29	−.04	.05	.00
	Christian Orthodox	.41*	.09	.38	.14
	Muslim	.24	.04	−.21	.03
Mastery	Roman Catholic	−.35	.00	.09	−.01
	Protestant	−.46	−.02	.22	.02
	Christian Orthodox	−.24	.10	.33	.09
	Muslim	−.39	.05	−.17	.00
Relationships with kin	Roman Catholic	−.68**	.08	.01	.43**
	Protestant	−.84**	.06	.25	.47**
	Christian Orthodox	−.67**	.08	.02	.43**
	Muslim	−.56**	−.03	.29	.48**

Note:
Values in cells denote standardized regression coefficients.
*$p < .05$. **$p < .01$.

However, there are at least two explanations for this finding. Firstly, some important religious values such as submission to a Supreme Being may be either universal or not covered well by the questionnaire. Secondly, the relationship between religion and values may be strongly influenced by Affluence. For example, Harmony showed a correlation of $r = .49$ with the percentage of Muslims and of $r = −.54$ with the percentage of Protestants (both ps $< .01$). However, the very strong

correlation between Affluence and Harmony of $r = -.83$ ($p < .01$) rendered correlations of the religions nonsignificant.

The regression analyses of the two self-construal measures showed similar results. No squared multiple correlation reached significance, although it is remarkable that the regression coefficients of Affluence and Temperature were negative in each analysis. This similarity may seem unexpected, as independence and interdependence are often supposed to be negatively correlated. However, the scores at country level showed a very strong positive correlation between both of $r = .64$ ($p < .01$), which can explain the similarity in sign of the regression coefficients.

Both family values, Hierarchy and Relationships with Kin, were strongly influenced by the country characteristics (median $R^2 = .59$ and .45, respectively, both ps $< .01$). These effects were due to the negative association with Affluence (median $\beta = -.41$ and $-.39$). Religion and Affluence had small regression coefficients, which were positive in almost all cases.

Compared to family values, Emotional Distance showed weaker associations with country characteristics. Affluence and Temperature invariably showed negative regression coefficients (median $\beta = -.44$ and $-.27$), which reached significance in some cases. The proportions of variance accounted for by the predictors were modest (median $R^2 = .17$).

It seems fair to conclude that the psychological variables that were examined showed substantial variations in their associations with country characteristics. The most strongly affected were Personal and Family Values (notably Embeddedness, Hierarchy, Harmony, Family Hierarchy, and Relationships with Kin). It is noteworthy that all these aspects are strongly relational. Affluence had a negative influence on all these values. The impact of Temperature was very limited (with only one significant coefficient in 68 analyses). The influence of religion (which had six significant coefficients) was slightly higher. Clearly, Affluence was the most salient predictor and it was more effective in explaining interpersonal aspects than intrapersonal aspects. These findings support a model in which increasing Affluence is assumed to affect social aspects much more than individual aspects of psychological functioning. The findings regarding Self-construals were not in line with this conclusion, possibly owing to the measurement problems with these scales found in the equivalence analyses (see the first section of this Chapter).

Family Network Variables (proximity of residence of parents and children, frequency of visits, and frequency of telephone calls) showed some relationships with the predictors (see Table 7.23). Not surprisingly, Affluence was positively related to Telephone Calls). Temperature

Table 7.23 *Regression analysis with affluence (combined score), temperature, and religion as independent variables and family networks and family roles as the dependent variable*

Dependent variable	Religious denomination	Affluence (combined)	Temperature	Religion	Adj. R^2
Family networks					
Geographic proximity	Roman Catholic	−.40	.04	−.06	.09
	Protestant	−.02	.09	−.60**	.33**
	Christian Orthodox	−.38	.12	.19	.12
	Muslim	−.42	.06	−.01	.08
Visits	Roman Catholic	−.13	−.10	−.08	−.12
	Protestant	.39	−.06	−.80**	.31**
	Christian Orthodox	−.04	.02	.39	.04
	Muslim	−.04	−.19	.22	−.08
Telephone calls	Roman Catholic	.42	.05	−.11	.04
	Protestant	.67*	.09	−.42	.14
	Christian Orthodox	.52**	.24	.55**	.33**
	Muslim	.49*	−.02	.23	.06
Father					
Expressive	Roman Catholic	−.50**	.26	−.34*	.62**
	Protestant	−.68**	.31*	.13	.52**
	Christian Orthodox	−.54**	.39*	.22	.56**
	Muslim	−.42**	.16	.43**	.64**
Finances	Roman Catholic	−.48*	.11	−.17	.29*
	Protestant	−.67**	.13	.22	.29*
	Christian Orthodox	−.45*	.25	.33	.37**
	Muslim	−.41*	.03	.30	.32**
Childcare	Roman Catholic	−.01	.00	.20	−.09
	Protestant	−.21	−.05	.41	−.01
	Christian Orthodox	.10	.04	.21	−.08
	Muslim	−.09	.10	−.34	−.04
Mother					
Expressive	Roman Catholic	−.54**	.17	−.12	.38**
	Protestant	−.75**	.18	.28	.42**
	Christian Orthodox	−.52**	.27	.24	.42**
	Muslim	−.45*	.08	.31	.43**
Finances	Roman Catholic	−.04	−.21	.18	−.03
	Protestant	−.05	−.25	.10	−.05
	Christian Orthodox	.10	−.12	.36	.07
	Muslim	−.22	−.04	−.57*	.16
Childcare	Roman Catholic	.04	−.38	.20	.14
	Protestant	−.05	−.42*	.22	.13
	Christian Orthodox	.20	−.25	.47*	.32**
	Muslim	−.08	−.26	−.43	.22*

Table 7.23 (*cont.*)

Dependent variable	Religious denomination	Affluence (combined)	Temperature	Religion	Adj. R^2
Grandfather					
Expressive	Roman Catholic	−.53**	.15	.12	.35**
	Protestant	−.68**	.17	.18	.36**
	Christian Orthodox	−.53**	.23	.17	.36**
	Muslim	−.44*	.06	.32	.40**
Instrumental	Roman Catholic	−.20	−.16	−.25	.00
	Protestant	−.38	−.13	.17	−.04
	Christian Orthodox	−.20	−.03	.27	.02
	Muslim	−.32	−.07	−.14	−.04
Grandmother					
Expressive	Roman Catholic	−.44*	.20	.02	.18
	Protestant	−.62*	.18	.29	.24*
	Christian Orthodox	−.41*	.22	.07	.18
	Muslim	−.29	.07	.35	.26*
Instrumental	Roman Catholic	−.01	−.44*	−.14	.07
	Protestant	−.20	−.43*	.23	.09
	Christian Orthodox	.06	−.26	.46*	.26*
	Muslim	−.15	−.33	−.25	.10
Uncles/aunts					
Expressive	Roman Catholic	−.39	.23	.22	.12
	Protestant	−.56*	.18	.37	.17
	Christian Orthodox	−.35	.16	−.11	.09
	Muslim	−.27	.15	.14	.09
Instrumental	Roman Catholic	−.43*	.10	.14	.09
	Protestant	−.74**	.05	.54*	.27*
	Christian Orthodox	−.42*	.03	−.14	.08
	Muslim	−.51*	.18	−.28	.12
Son 20 years					
Expressive	Roman Catholic	−.52*	.15	.06	.22*
	Protestant	−.67**	.12	.27	.27*
	Christian Orthodox	−.48*	.16	.08	.22*
	Muslim	−.34	.00	.38	.32**
Instrumental	Roman Catholic	−.73**	.10	.11	.49**
	Protestant	−.88**	.07	.28	.53**
	Christian Orthodox	−.69**	.10	.06	.48**
	Muslim	−.71**	.09	−.03	.48**
Daughter 20 years					
Expressive	Roman Catholic	−.45*	.17	.02	.18
	Protestant	−.66**	.15	.34	.26*
	Christian Orthodox	−.44*	.18	.02	.18
	Muslim	−.24	−.01	.49*	.34**
Instrumental	Roman Catholic	−.76**	−.25	.06	.43**
	Protestant	−.85**	−.26	.17	.45**
	Christian Orthodox	−.68**	−.17	.26	.50**
	Muslim	−.77**	−.23	−.08	.44**

Table 7.23 (*cont.*)

Dependent variable	Religious denomination	Affluence (combined)	Temperature	Religion	Adj. R^2
Son 10 years					
Expressive	Roman Catholic	−.30	.12	.25	.01
	Protestant	−.23	.08	−.01	−.05
	Christian Orthodox	−.22	.10	.07	−.05
	Muslim	−.19	.03	.12	−.04
Instrumental	Roman Catholic	−.50[*]	.12	−.03	.23[*]
	Protestant	−.67[**]	.11	.24	.27[*]
	Christian Orthodox	−.52[**]	.11	−.04	.23[*]
	Muslim	−.70[**]	.29	−.46[*]	.37[**]
Daughter 10 years					
Expressive	Roman Catholic	−.26	.14	.24	−.01
	Protestant	−.22	.10	.05	−.06
	Christian Orthodox	−.18	.11	.03	−.06
	Muslim	−.12	.04	.18	−.04
Instrumental	Roman Catholic	−.52[*]	.05	−.06	.23[*]
	Protestant	−.68[**]	.05	.22	.26[*]
	Christian Orthodox	−.54[**]	.06	.00	.22[*]
	Muslim	−.71[**]	.21	−.42	.34[**]

Note:
Values in cells denote standardized regression coefficients.
[*]$p < .05.$ [**]$p < .01.$

was unrelated to the Family Network Variables. It is interesting to note that Protestant and Orthodox countries showed different relationships. The percentage of Protestants showed negative and in some cases very strong associations with each of the three dependent variables (the value of β was −.80 for frequency of visits and −.60 for geographic proximity, both ps < .01), while the opposite was found for the percentage of Christian Orthodox. The two other religions did not show a strong patterning. The effects of the percentage of Christian Orthodox adherents and Affluence are both positive and go in the same (positive) direction, which is remarkable as in most analyses Affluence and Religion showed regression coefficients with opposite signs.

The expressive roles of the father and the mother were both negatively associated with Affluence (median β = −.52 and −.53, coefficients of all tests were significant). The patterning of the other variables was also similar for both parents, although more pronounced and more often significant for the father than for the mother. Temperature showed low, positive regression coefficients in all analyses, which were significant

(only) for percentages of Protestant ($\beta = 31$, $p < .05$) and Orthodox adherents ($\beta = 39$, $p < .05$). Furthermore, the data suggested that the four Religions did not affect the expressive role in the same way. Negative regression coefficients were found for Catholicism, although only the value of the father was significant ($\beta = -.34$, $p < .05$), while the other religions showed positive regression coefficients. Yet, it should be acknowledged that the relationships were weak and only one of these was significant: the positive regression coefficient of Islam in the prediction of the father's expressive role ($\beta = .43$, $p < .01$).

The instrumental role of the parents, split up into finances and childcare, yielded squared multiple correlations that were lower than found in the analyses of the expressive role. Apart from this agreement, the findings were quite different for both parents. The financial role of the father diminishes with Affluence (median $\beta = -.47$; all four coefficients were significant, $p < .05$), but this was not the case for the mother (median $\beta = -.05$, the coefficient was not significant in any analysis). The childcare role of the father was unrelated to any country characteristic. For the mother negative coefficients were found for Temperature (median $\beta = -.32$, while Religion yielded heterogeneous results (significant only for Christian Orthodox, $\beta = .47$, $p < .05$). It is interesting to note that Affluence was unrelated to the childcare role; we found no evidence for the view that with modernization (i.e., increase of Affluence) the father assumes a more active role in childcare. A final observation concerns the comparison of the size of the squared multiple correlations for both parents. The median value of the father was .31, while the value of the mother was .19. This finding suggests that the roles of the father are more affected by changes in Affluence than are the roles of the mother; however, it should be realized that this interpretation is tentative (for the current limited sample size tests of differences of dependent multiple correlations require much larger differences in observed values in order to be significant).

Hierarchical power   A prediction based on the family literature in Chapter 1 was that Hierarchical power of the mother has increased in higher affluent countries, as compared to father. The two family roles are: "*Father–mother* is the protector of the family," and "When there are arguments or disputes, *father–mother* makes the decision regarding the manner of solution."

The simple correlation between level of affluence and paternal power was very high and indicated a negative relationship between power and affluence, ($r = -.70$, $p < .01$, as also with maternal power ($r = -.60$, $p < .01$). However, at the individual level, means of the three affluence

clusters of countries indicated an interaction between level of maternal and paternal power. Paternal power in low-affluence countries was higher than maternal power, while no differences in means of father and mother were found in medium-level affluent countries, but maternal power was higher than paternal power in high-affluence countries.

A second hypothesis was that fathers in all societies do less housework (cleaning, cooking, washing) than mothers. The simple correlation between level of affluence and housework was very high for fathers ($r = .60$, $p < .01$), but no significant correlation was found for mothers ($r = -.08$, ns). However, at the individual level, means of the three affluence clusters of countries indicated an interaction between housework and mother and father. The means of housework for fathers increased according to level of affluence of the countries, but there were no differences for mothers across the three affluence levels.

Further evidence for the interpretation that Affluence influences the role of the mother more than the role of the father was found in the analysis of the grandparents. Higher values were found for the grandfather (median $R^2 = .22$) than for the grandmother (median $R^2 = .22$). The Expressive Roles of both grandparents were negatively related to Affluence (median $\beta = .53$ for grandfather and .43 for grandmother). The regression coefficients of Temperature and Religion were positive in almost all analyses, though no coefficient reached significance. The absence of any influence of Affluence on Instrumental, found for the parents, was replicated for the grandparents. It can be concluded that the expressive role of both grandparents becomes less salient with increases in Affluence, in particular for the grandfather, and that cross-cultural differences in their instrumental role (which were large according to Table 7.23) are affected by other country characteristics than those studied here.

For the uncles and aunts only one of the eight squared multiple correlations was significant. Affluence invariably yielded negative regression coefficients, which were significant for the instrumental role (median $\beta = -.47$), the regression coefficients of Temperature all have a positive sign, but did not reach significance. The coefficients of the religions were both positive and negative; one of these was significant: the percentage of Protestants was positively associated with the instrumental role of the uncles and aunts ($\beta = .54$, $p < .05$).

The final analyses involved the children. In all 32 analyses (4 children $\times$ 2 roles $\times$ 4 religions) Affluence had a negative sign. This consistency points to a decrease in both expressive and instrumental roles with an increasing Affluence, although the effect seems slightly more pronounced for the 20-year-old children (median $\beta = -.61$) than for

Table 7.24 *Regression analysis with affluence (combined score), temperature, and religion as independent variables and aggregated family roles as the dependent variable*

Dependent variable	Religious denomination	Affluence (combined)	Temperature	Religion	Adj. R^2
Expressive	Roman Catholic	−.50[*]	.21	.01	.27[*]
	Protestant	−.66[**]	.19	.25	.32[**]
	Christian Orthodox	−.48[*]	.24	.10	.28[*]
	Muslim	−.36	.08	.35	.35[**]
Instrumental	Roman Catholic	−.49[*]	−.16	.04	.10
	Protestant	−.74[**]	−.18	.41	.22[*]
	Christian Orthodox	−.39[*]	−.04	.36	.32[*]
	Muslim	−.63[**]	−.03	−.37	.20[*]

Note:
Values in cells denote standardized regression coefficients.
[*]$p < .05$. [**]$p < .01$.

10-year-old children (median $\beta = -.41$). Furthermore, Temperature showed a positive sign in most analyses, but never reached significance, while the regression coefficients of Religion tended to be small and have different signs across roles and positions, except for Islam, which showed small negative coefficients for the instrumental role and small positive coefficients for the expressive role. Finally, the values of the squared multiple correlations were higher for the instrumental role than for the expressive role (with median values of .10 and .40, respectively). This is a reversal of the pattern found for all adult rules.

Across positions means of emotional roles tended to differ across countries in the same way, which suggests the existence of positive correlations across the positions. If the expressive roles of the eight positions are considered as items of a scale, an internal consistency of .96 is found. Similarly, if the instrumental roles are taken to constitute a single scale, an internal consistency of .83 is found. Both values point to consistent country differences in both roles. Regression analyses were then carried out with the same predictors as before (Affluence, Temperature, and the four Religions) and the scale scores on the expressive role and instrumental role as dependent variables (see Table 7.24). The same pattern of findings emerged as reported before: Affluence yielded negative and significant predictors in all analyses, while the influence of Temperature and Religion was much weaker. Furthermore,

the expressive role revealed slightly larger squared multiple correlations than did the instrumental role.

It is remarkable that in most analyses Affluence had a negative sign (the mean beta across all analyses was $-.38$), indicating that higher levels of Affluence are associated with lower levels of most psychological scales and family roles. Aggregated across the regression analyses, Temperature had a negligible impact (average beta of $-.01$). The pattern of Religion showed more variation. The percentage of Christian Orthodox and Protestants had an average beta of .15, which indicates that these religions were associated with psychological variables and that Affluence and these religions seem to have an opposite influence. The average beta was .02 for Islam and .04 for Roman Catholicism.

It can be concluded that the regression analyses of the family roles were fairly consistent in that Affluence was the main predictor and that the influence of Temperature and Religion were much weaker. Affluence and Religion often showed opposite relationships with the psychological variables and family roles. The influence of the various religions was not the same; the percentage of Christian Orthodox and Protestant adherents often showed stronger relationships than did the percentages of Muslim and Roman Catholic adherents. Furthermore, the country variables we studied were slightly more effective in predicting the Expressive Role than the Instrumental Role for adults (parents, grandparents, and uncles/aunts), while the opposite was found for children (20-year-old son and daughter, 10-year-old son and daughter).