

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 $(27 \times 26 / 2 =) 351$. 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:

^aNumbers 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)*

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

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.

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	35	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	-23	03	-04	02	18	08	01	06	02	00	38	40	-49	-21	-53	-44	-16	32	10	-02
Catholic	-65	-60	-13	-34	-23	13	-21	01	05	24	29	27	-41	-25	-42	-07	-61	-15	25	-20
Protestant	23	45	54	25	51	07	15	02	09	11	-09	-21	-02	-01	24	-13	18	12	34	33
Orthodox	24	20	-05	21	-16	-07	03	28	23	03	03	-03	62	56	69	37	49	-21	-32	06
Muslim	-	53	25	17	34	02	24	-08	-06	-15	-11	-15	46	30	41	36	34	-25	-25	12
Geograph	53	-	38	64	38	12	20	01	12	09	15	06	-01	11	29	-16	31	12	-03	22
Visits	25	38	-	-27	26	-16	-04	-13	-17	-28	08	-17	-28	-18	01	-24	-14	-07	28	15
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	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
Agreeable	-08	01	-13	26	55	40	34	-	86	70	44	41	15	56	45	14	34	-01	02	05
Personality traits	-06	12	-17	42	53	39	15	86	-	78	63	40	19	64	56	34	46	13	18	32
Consc.	-15	09	-28	48	44	52	12	70	78	-	54	56	03	41	33	30	19	16	22	31
Emot. stab.	-11	15	08	26	26	12	-12	44	63	54	-	71	-18	34	14	12	10	23	36	38
Extraversion	-15	06	-17	33	24	31	06	41	40	56	71	-	-30	00	-14	07	-03	31	38	32
Openness	46	-01	-28	10	03	10	22	15	19	03	-18	-30	-	75	78	62	56	-39	-42	07
Hierarchy	30	11	-18	32	32	27	36	56	64	41	34	00	75	-	86	48	57	-21	-27	18
Kin																				

Table 7.15 (cont.)

Values	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
	41	29	01	35	27	20	24	45	56	33	14	14	-14	78	86	-	57	69	-14	-20	33
Embedded	36	-16	-24	00	03	19	-06	14	34	30	12	07	62	48	57	-	50	00	01	49	
Hierarchy	34	31	-14	45	19	11	12	34	46	19	10	-03	56	57	69	50	-	38	-26	47	
Harmony	-25	12	-07	32	-03	00	-18	-01	13	16	23	31	-39	-21	-14	00	38	-	33	62	
Intel. aut.	-25	-03	28	-02	27	-06	-26	02	18	22	36	38	-42	-27	-20	01	-26	33	-	55	
Affect. aut.	12	22	15	29	26	15	-17	05	32	31	38	32	07	18	33	49	47	62	55	-	
Mastery																					

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