THE DECLINE OF THE FAMILY AND EDUCATIONAL RESEMBLANCE BETWEEN AUSTRALIAN SIBLINGS:
Birth Cohorts, Migration, Divorce and Working Mothers

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ABSTRACT
The possible decline of the importance of the family is analyzed using sibling data on educational levels from Australia. The resemblance between the educational levels of siblings is an indication of the importance of intergenerational transmission of educational attainment, which is a important function of the family. We find (1) that the educational resemblance between siblings did not change across cohorts born in the 20th century; (2) that the educational resemblance between siblings of migrants from most parts of the world is equal; (3) that there is no difference in the educational resemblance between siblings from divorced and non-divorced families; and (4) that educational resemblance is equal for siblings from families with and without working mothers.

Keywords: importance of family, migration, divorce, working mothers, Australia, siblings

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1. INTRODUCTION

Popenoe (1988:3) opens his book on family change and decline in modern societies with a citation from the sociologist Alex Inkeles: "Few popular ideas are more widespread than the belief that the importance of the family in human affairs has been weakening, that the family as an institution is under great strain...". Popenoe continues by remarking that the belief in the reality of family decline is by no means widespread among sociologists of the family. Given these conflicting views on the reality of family decline in modern societies among sociologists more empirical evidence is needed.

A possible empirical indication of the declining importance of the family is the decreasing effect of the family on the life chances of its offspring in successive birth cohorts. The intergenerational transmission of life chances is considered one of the important functions of the family. Educational attainment of children is one of the most important ways of intergenerational transmitting life chances in modern societies, even more important than the direct intergenerational transmission of money and wealth. If the family has become less successful in this transmission of educational attainment, this can be seen as an indication of a decline in the importance of the family. Families also impose restrictions on the development of their individual members, for instance by their poor financial or cultural resources or by high cultural or social boundaries between inside and outside families. If these restrictions are strong, the importance of the family is increased. A possible indication of the importance of the family is the resemblance of educational attainment by siblings. If this resemblance in educational attainment between siblings is smaller in younger birth cohorts compared with that of older birth cohorts, this indicates a decline in the importance of the family. This means that the within-family variance, controlled for measured parental characteristics like education and occupation, increases in younger cohorts. A decreased effect of parental characteristics like education and occupation on the educational attainment as has been found in stratification research and in the sociology of education is not an empirical test of a declining effect of the family. This effect of parental characteristics does not make a difference between within-family and between-family variance, which makes it impossible to distinguish between a decrease in differences between families and a change in differences between children from the same family. This distinction is important because a decline of the differences between families as a consequence of social policy, for instance, does not necessarily mean that the differences between children from the same family change. Therefor we control for the effects of measured parental characteristics on the resemblance between siblings' educational attainments. This results into two components of this resemblance or between-family variation: one part explained by these parental characteristics and another part which cannot be explained by the measured characteristics. The remaining degree of non-resemblance between siblings' educational attainment is the within-family variation, which cannot be explained by measured and unmeasured family characteristics.

In order to make this distinction between the within-family and between-family variance one needs special data, both on the education and occupation of the parents, as well as on adult children in their family. This type of data are quite rare. The first aim of this article is to test

whether these trends in within-family and between-family variance in educational and occupational attainment can be found in Australia, as these trends have already been identified for Germany, Hungary, the Netherlands, Poland and the USA. Australian society is an interesting and perhaps deviant case: it combines the characteristics of modern capitalist societies in Western Europe and North America with the characteristics of a relatively recently established society, populated mostly by forced or voluntary migrants.

Popenoe (1988:8-10) discusses various explanations of the declining importance of the family during the 20th century and thus implicitly of a higher within-family variance in educational attainment between siblings: the rise of divorce, the increasing number of mothers who work outside their families while they still have young children, the expansion of geographic mobility and migration. He argues that children in divorced families, children in families with a working mother and children of recent migrants have weaker bonds with their parents and siblings as a consequence of the break-up of their family, the diminished authority of their parents, the lower degree of parental monitoring of their children or the challenges of their new environment. If the rise of divorce, the increased number of working mothers and the expansion of migration are valid explanations of a possibly declining importance of the family during the 20th century (and thus of a higher within-family variance of educational attainment between siblings) the within-family variance should be significantly larger between siblings from divorced compared to those from non-divorced families, between siblings from families with a working mother compared to those from families without a working mother and between siblings from recently migrated families compared to those from not-recently migrated families. The second aim of this article is to test whether the expected differences in within-family and between-family variance in educational attainment can be found between divorced and non-divorced families, between families with and without a working mother and between recently and not so recently migrated families. The Australian data provide a unique opportunity to make these distinctions, an opportunity not provided by sibling data from other societies.

2. EARLIER SIBLING RESEARCH AND HYPOTHESES

As said above, a possible indication of the decreased importance of family is a lower resemblance of the educational attainment of siblings in younger birth cohorts compared with that in older birth cohorts. Although Van Eijck & De Graaf (1994) failed to find such birth cohort differences, probably due to their small number of siblings, a study for the Netherlands (Dronkers, 1992) showed a declining resemblance between the educational attainment of siblings in different Dutch birth cohorts. De Graaf & Huinink (1992) found that for German siblings resemblance in educational attainment decreased during the 20th century. Kuo and Hauser (1995) found that the resemblance between black brothers and between white brothers in the USA decreased in cohorts born between 1907 and 1946. In contrast to these other Western societies the resemblance between the educational and occupational levels of siblings did not decrease in Hungary during the 20th century (Toka & Dronkers, 1996). The authors explain this Hungarian deviance by the oppressive nature of the communist regime. They suggest that, as in Hungary after World War II, the importance of the family increases during difficult times. The declining sibling resemblance in Germany, the Netherlands and the USA only implies that the living conditions in these societies have improved to the extent that an important segment of the population in those societies no longer needs their family to improve their own individual life chances. This explanation of the difference between the western societies and Hungary is

supported by a study by Ruigrok, Dronkers & Mach (1996) who found a comparable unchanged resemblance between the occupational levels of Polish siblings. This resemblance remained equal for different cohorts of Polish siblings born before and during the communist regime.

An analysis of the resemblance in educational attainment of Australian siblings might add to this body of knowledge. Due to the decline of the importance of the family not being tempered by an oppressive regime or difficult living conditions, a decrease in sibling resemblance in Australia might be expected. But the large migration to Australia during the 20th century might counterbalance these trends, because one needs his or her family more in this difficult transition of migration. However, migrated parents can also help or hinder their children less in their new society than parents who are born and raised in Australia, because they lack knowledge about that new society.

Because we do not believe that the family strengthening effect is so strong that it counterbalances the family weakening effect of modernization and individualization, it can be hypothesized that *educational resemblance between Australian siblings decreases over birth cohorts, just like in the other capitalist, modern societies.*

The rise of divorce during the second half of the 20th century is often seen as one of the explanations of the decline in the importance of the family during the 20th century (Popenoe, 1988:9). This increased divorce rate also affected Australia and resulted in an increase in single parent families. The importance of the family might be less in single parent families caused by divorce as a consequence of the well documented psychological and social deprivation of children resulting from parental divorce (Amato & Keith, 1991; Borgers, Dronkers & van Praag, 1996; Dronkers, 1994), which can lead to a disintegration of the family (for instance early pregnancy). A lower resemblance between siblings from single parent families can also be explained by the lower degree of monitoring by only one parent, because the single parent misses the support of another adult. The same holds for siblings from families with a step-parent, because the children may not accept the authority of the step-parent. However, parental divorce or the death of a parent may also strengthen the bonds between siblings. They have to face together economic and social difficulties and will be more inclined to work together to overcome these. These processes can increase the importance of their families and thus counterbalance the negative consequences of parental divorce or the death of a parent.

The hypothesis put forward is that *the educational resemblance between siblings in mother headed single parent families*[1] *caused by divorce is lower than the resemblance in step-parent families and mother headed single parent families caused by death. The educational resemblance between siblings in two parent families is larger than in single parent families and step-parent families.*

The increase in the number of working mothers with dependent minor children during the 20th century is also sometimes seen as one of the explanations of the decline in the importance of the family (Popenoe, 1988:8), because the absent working mother is unable to monitor and correct the behavior of her children (fathers with a working wife do not work significantly less in order to assume the monitoring role of the mother). The increased number of working mothers also affected Australia and resulted in an increased number of families with working mothers. There has been much speculation about the negative effects of working mothers on the educational attainment of children, although the empirical evidence does not confirm this speculation

(Dronkers, 1989, 1995; Kalmijn, 1994). One might expect that the more hours or years a mother works, the less the parents can monitor their children. One might also expect that the age of the siblings influences the possibility of the mother monitoring her children. The younger the age of the sibling with a working mother, the less the mother could monitor her children at a very sensitive age.

It can be hypothesized that *educational resemblance between siblings is lower in families with a working mother than in families without working mothers. The lower the age of the respondent with a working mother or the longer the mother works full-time, the lower the educational resemblance between siblings.*

Increased mobility and migration during the 20th century is sometimes seen as one of the explanations of the decline in the importance of the family during the 20th century (Popenoe, 1988:9). Migration can weaken the importance of the family, because migrated parents can help or hinder their children less in the new society than the parents who are born and raised in Australia. This weakening of the family can differ among the several migrant groups, depending on the "cultural distance" between their former society and Australia. Families in agrarian societies are more important for their members while in more industrial societies individual achievement is valued more highly. This means that the importance of the family can differ among migrants. In countries in the Third World and around the Mediterranean the support of the family is seen as an more important factor, compared with western countries where individualism has always been more significant. On the other hand, migration might increase the importance of the family, because of the difficult transition period. Moreover, migration is often not a purely individual act but a family affair, which also might increase the importance of the family among migrants.

The hypotheses put forward are that *educational resemblance between siblings born in Australia is larger than the resemblance between migrated siblings and that educational resemblance between siblings who have migrated from western societies is smaller than the resemblance between siblings who have migrated from other societies.*

3. MODEL

A model to distinguish between the effects of parental background, common family factor and individual educational attainment was developed by Hauser & Wong (1989) and this model has been used by nearly all siblings studies. The model is a Multiple Indicators, Multiple Causes (MIMIC) model and is shown in Figure 1.

Place figure 1 about here

This model assumes no direct effects of the causes (parental characteristics) on the indicators (educational levels of the individual siblings). The MIMIC model specifies that exogenous background characteristics affect educational attainments of siblings through a single, unmeasured common family factor, which accounts for the resemblance in educational attainment. We use this model to make comparisons with the mentioned sibling analyses possible, because the majority of these studies applies this model.

A more technical explanation of this model can be found in Hauser & Wong (1989). We give here only a simple explanation to help the reader to understand our analyses. The common

family factor is a latent variable, of which the educational attainments of both siblings are the indicators (paths $\lambda_{1,1}$ and $\lambda_{2,1}$). This common family factor is affected by the educational levels of both parents, fathers' occupational status and the number of siblings, (the coefficients $\gamma_{1,1}$ to $\gamma_{1,4}$) which are also correlated (Φ-matrix). $\zeta_{1,1}$ indicates the variance of the unmeasured common family factor which measured parental characteristics are unable to explain. This coefficient is the indicator for the degree of between-family variance $\psi_{1,1}$. The error terms of the educational attainment of the oldest and the youngest sibling ($\varepsilon_{1,1}$ and $\varepsilon_{2,2}$) indicate the effect of factors unique to the educational attainment of each sibling and unrelated to the common family factor or parental characteristics. These error terms are the indicators of the within-family variance (Θ^{ε}) and the main indicator of differences in sibling resemblance between different groups. If these error terms can be set equal for different groups of siblings, the within-family variance is equal for these different groups. The coefficient $\lambda_{1,1}$ is fixed to 1.0 in order to identify the latent variable family factor. So the coefficients $\gamma_{1,1}$ to $\gamma_{1,4}$ give us the effect of parental characteristics on the educational level of the oldest sibling and the coefficient $\lambda_{2,1}$ is the proportional adjustment for the effect of parental characteristics on the educational level of the youngest sibling. All the models are estimated with LISREL VIII (Jöreskog & Sörbom, 1993).

This model requires data on parental characteristics and an indicator for the educational attainment of pairs of siblings in the family studied. The model of Hauser & Wong has been applied in a number of sibling studies, which compare different birth cohorts or other groups. De Graaf & Huinink (1992), Dronkers (1992), van Eijck & de Graaf (1994), Kuo & Hauser (1995), Toka & Dronkers (1996) and Ruigrok, Dronkers & Mach (1996) made comparisons between several birth cohorts. Comparisons between migrant groups, between two parent and single parent families and between families with or without working mothers have never been made in any sibling study.

3. DATA

Our data come from the National Social Science Survey of Australia of 1989-1990 (Kelley, Evans & Bean, 1992). In this national representative survey of the adult Australian population detailed information collected included educational attainment of respondents, social and economic background, such as parental education and occupational status of the father, parental family size and form and other relevant characteristics of 4513 men and women in Australia. The data were collected from a simple random sample of Australian citizens, chosen from the compulsory electoral roll. The completion rate was 67%, and the sample is representative of the nation in age, sex, education, labor-force participation and occupation (Bean, 1991; Evans, Kelley & Kolosi, 1992: 468).

The respondents gave information themselves and also about his or her parents and brothers or sisters. The respondents gave information about at most three siblings, even if there were more siblings in the family. As a consequence of this data selection procedure information is not available about all siblings, but only about the three selected by the respondent. For that reason a measurement of spacing between the given siblings was not included, as it would be misleading. We selected only those respondents who had one or more siblings born before 1972, who have more or less completed their education. This means that we only used information about respondents who were older than 18 years and who had at least one sibling older than 18 years (N=3677). We formed pairs of siblings. A respondent with only one sibling gives one pair; a

respondent with two siblings gives three pairs (the respondent and sibling A; the respondent and sibling B; sibling A and sibling B) and a respondent with three siblings gives six pairs. We added all the pairs of these respondents and their brothers and sisters together to a new data-set, which contains information about 14305 sibling pairs and their parents. We ordered the respondents and siblings in such a way that the oldest of each pair became the older sibling and the youngest the younger sibling. We deleted all pairs for which one of the siblings had no valid information on their educational level (leaving n=14158).

Our unit of analysis in this data-set is not the individual respondent but a pair of siblings. Because larger families as a consequence of the pair formation contribute more pairs than smaller families, one has to reweigh the sample of pairs in order to avoid a bias in the results. We have chosen the same weighing procedure as De Graaf & Huinink (1992), Dronkers (1992) and Toka & Dronkers (1996). This weighing procedure results in an equal representation of all families in the sibling pairs. If there were six possible sibling pairs, then their weight is 1/6, if there were three possible pairs their weight is 1/3, if there was just one possible pair then its weight is one. After the weighing procedure we ended up with 3486 weighted pairs for our analysis.

The first comparison (section 4.1) is between six birth cohorts based on the mean of the years of birth of both siblings: 1900-1919, 1920-1929, 1930-1939, 1940-1949, 1950-1959, 1960-1972.

The second comparison (section 4.2) is between sibling pairs in which the respondent lived at age 14 in a two-parent family, in a mother headed single parent family caused by divorce, in a mother headed single parent family caused by the death of the father or in a family with a step-parent.

The third comparison (section 4.3) is between siblings with and without working mothers, namely where the mother did not work when the respondent was aged 6 and 10 years, where the mother worked full-time when the respondent was aged 6 and 10 years, where the mother worked part-time when the respondent was aged 6 and 10 years, where the mother worked full-time where the respondent was aged 6 years and part-time when the respondent was aged 10 years, where the mother did not work when the respondent was aged 6 years but worked when the respondent was aged 10 years and where the mother worked when the respondent was aged 6 years but did not work when the respondent was aged 10 years.

The last comparison (section 4.4) is between sibling pairs in which the respondent was born in countries around the Mediterranean, in North-West Europe, in the Third World, in Eastern Europe, in English Speaking Countries or in Australia.

The operational definitions of all variables and their coding are given in appendix I. The groups in the last three comparisons could only be based on information about the respondent, not on information about the brothers or sisters. This might mean that the group doesn't fully apply to both siblings within a pair, for instance where the respondent was born outside Australia while the younger brother or sister was born in Australia. The same holds for the age of the brother or sister at which the mother worked or at which the parents divorced. Despite this limitation of our data, our groups are the best possible categorization.

4. RESULTS

We start with an analysis for the whole Australian population to compare our Australian outcomes with those from earlier studies of other societies. The model in Figure 1 only includes

the father's occupation, parental education and parental family size as parental characteristics and the educational attainment of both siblings. This model is estimated for the total population of 3486 sibling pairs. A basic model with no constraints on the unstandardized coefficients fits the data well (L^2 of 3.71 with 3 degrees of freedom; p=0.29)[2]. As a second step we estimate a model in which the oldest sibling and the youngest sibling would be influenced to the same degree by the common family factor. This model does not fit very well (L^2=15.86; df=5; p=0.01). It fits significantly less well than the first model, thus the unstandardized effect of the common family factor on the younger sibling is not equal to the unstandardized effect on the older sibling. A third model, in which the unstandardized effects of the educational levels of the father and the mother on the common family factor are equal, does fit (L^2=7.28; df=4; p=0.12) and does not fit significantly less well than the first model (the difference between the basic model and this third model is: L^2=3.57; df=1; p>0.05). But the most parsimonious model is the fourth model in which the unstandardized effects of the educational levels of the father and the mother on the common family factor are equal but also the error variance of the educational attainment of the older sibling is equal to the error variance of that of the younger sibling (L^2=7.32; df=5; p=.20). The unstandardized coefficients of this most parsimonious simple model for the whole Australian population are shown in the first column of Table 1.

Place table 1 about here

The coefficients of this simple model with Australian data do not deviate strongly from those for Europe and the USA. As we might expect for a society with a large influx of migrants who have to start all over again and whose parental background has less meaning in the new society, parental background explains less of the common family factor in Australia than in Europe (about 40% against about 50%). The smaller effect of parental background on the educational attainment of the younger sibling (.88) is also found in the sibling studies for Europe and the USA. On the whole one can conclude that the educational differences within and between families in Australia, despite its high level of migration, do not deviate strongly from those in Europe or the USA.

The possibility of differences between the results of different combinations of male and female siblings was one of the first topics analyzed in sibling analyses. It was argued that brothers and sisters within a family have less in common than brothers and brothers, or sisters and sisters. Earlier analyses in the USA and Europe with like-gender and cross-gender sibling pairs show small unsystematic differences in the parameters for the gender combinations. We also checked the possible differences between the coefficients for the different gender combinations. We could accept a model in which coefficients in all the different gender combinations were equal (L^2=40.4; df=31; p=.12). The results of this most parsimonious model are given in second to fifth columns of Table 1. Therefore, in the further analyses we do not distinguish between gender combinations.

4.1 Differences in sibling resemblance between birth cohorts

In order to test our hypothesis about the declining importance of the family during the 20th century (educational resemblance between Australian siblings decreases over birth cohorts) we divided 3397 sibling pairs into six birth cohorts based on their average birth years[3]. In the first panel of Appendix II we show our procedure to select the most parsimonious model. The basic

model is Model a, in which all unstandardized coefficients can be different between the birth cohorts. Models b to g equalize one or more unstandardized coefficients between the different birth cohorts. Models h and i add all acceptable equality constraints together. The degree of change in the L^2, given the gain in degrees of freedom, provides information regarding whether or not this equalizing is justified by the data. Only non-significant changes in the L^2 justify the equalization of the unstandardized coefficients. But we also used the BIC statistic, proposed by Raftery (1995) as a rule of thumb for these decisions[4]. A satisfactory fit is indicated by a negative BIC statistic, and in comparisons of fit between models, those with lower (more negative) BIC statistics are preferred. Sometimes, a conventional L^2 test yields a significant difference when BIC statistics suggest that the more parsimonious model is to be preferred. In those cases, we used BIC to guide our decisions because the probability of falsely rejecting a null hypothesis in a large set of contrasts is higher than the nominal probability level would suggest. On the basis of the L^2 and BIC values of Models b to g we estimate Models h and i. Although the BIC statistic of Model i is satisfactory, the L^2 of Model i deviates significantly from that of Model a. Inspection of the results revealed that the difference in L^2 between Models i and a can be explained by some deviant coefficients in cohorts 6 (1960-1972) and cohort 5 (1950-1959). We deleted the equality constraints for these coefficients in these two cohorts, which gives us an acceptable, final Model l. The unstandardized coefficients of this final Model l are given in table 2.

Place table 2 about here

The first panel of Appendix II and the coefficients of this final model clearly contradict our hypothesis about a decline in resemblance between the educational attainment of Australian siblings. The error terms of the educational attainments of the oldest and the youngest sibling ($\varepsilon_{1,1}$ and $\varepsilon_{2,2}$) are equal in all birth cohorts. The educational resemblance of the siblings born between 1900 and 1919 is not higher than the resemblance within the cohort born between 1960 and 1972. This outcome for Australia deviates from that for other modern societies like Germany, the Netherlands and the USA. An explanation of this Australian deviance might be that the large migration to Australia and the importance of the family for this difficult transition of migration counterbalances the decline in the importance of the family as a consequence of modernization and individualization. The effects of parental characteristics are equal between all birth cohorts, except for the two youngest. This might be explained by their still not fully completed education and by a decline in the importance of measured parental class in modern societies (see also: Jones, Kojima & Marks, 1994).

4.2 Sibling resemblance in two-parent and single parent families

We divided 3309 sibling pairs into four groups based on information[5] about parents in the family in which the respondent lived at 14 years of age to test our hypotheses, that the educational resemblance between siblings in mother headed single parent families caused by divorce is lower than the resemblance in step-parent families and mother headed single parent families caused by death and that the educational resemblance between siblings in two parent families is larger than in single parent families and step-parent families. The second panel of Appendix II shows the procedure to select the most parsimonious model. We apply the same rules as we did in section 4.1. On the basis of the L^2 and BIC statistics of Models b to g we

estimate our final, most parsimonious model h. The unstandardized coefficients for this final model (model h) are shown in Table 3.

Place table 3 about here

The second panel of Appendix II and Table 3 show that all the unstandardized coefficients are equal for all groups. The error terms of the educational attainments of the oldest and the youngest sibling ($\varepsilon_{1,1}$ and $\varepsilon_{2,2}$), which are our indicators for the within-family variance, are also equal in all family types. This does not confirm our hypothesis that the educational resemblance between siblings in mother-headed single parent families and in step-parent families is lower than the resemblance between siblings from two-parent families.

4.3 Sibling resemblance between families with and without a working mother

We divided the 3346 sibling pairs into six groups based on information[6] as to whether the mother worked, whether her work was part-time or full-time and on the age of the respondent (6 or 10 years) at which the mother worked, in order to test our hypotheses that the educational resemblance between siblings in families with a working mother is lower than in families without working mothers and that the lower the age of the respondent with a working mother or the longer the mother works full-time, the lower the educational resemblance between siblings. The third panel of Appendix II shows the procedure to select the most parsimonious model. We apply the same rules as we did in section 4.1. On the basis of the L^2 and BIC statistics of Models b to g we estimate Model h in which all effects were equal between the six types of family. Although the BIC statistic of model h is satisfactory, the L^2 of Model h deviates significantly from that of Model a. Inspection of the results revealed that the differences in L^2 between Models h and a can be explained by some deviant coefficients in family type 4 (mother did not work at the respondent's age of 6 but worked at the respondent's age of 10) and family type 6 (mother never worked). In Models i and j we set these effects free, which decreases the BIC statistics further and makes the differences in L^2 between Model a and Model j insignificant. The unstandardized coefficients of this final, most parsimonious Model j are shown in Table 4.

Place table 4 about here

The third panel of Appendix II and Table 4 show that all the unstandardized coefficients are equal for nearly all the groups. The error terms of the educational attainments of the oldest and the youngest sibling ($\varepsilon_{1,1}$ and $\varepsilon_{2,2}$), which are our indicators for the within-family variance, are also equal in all groups. This means that the resemblance between the siblings' educational attainment is equal in all groups. However for families in which the mother did not work when the respondent was six years old but worked when the respondent was ten years old the unstandardized effect of the common family factor on the younger sibling is smaller. Also in families in which the mother did not work at all the unstandardized effects of parental background on the common family factor differ: they are generally stronger, perhaps as a consequence of more traditional gender-roles in these families without a working mother. Being a never working mother with dependent children fits better into the traditional opinions on gender-roles and thus on inequality in society, as reflected by parental characteristics.

These results mean that we are not able to confirm our hypotheses that in families with a

working mother the educational resemblance of siblings is lower or that the degree of educational resemblance of siblings is influenced by the age of siblings at which the mother worked (6 years and 10 years) and by whether the mother worked full-time or part-time.

4.4 Sibling resemblance in different groups of migrants

In order to test our hypotheses that the educational resemblance between migrated siblings is lower than between siblings born in Australia and that the educational resemblance between migrated siblings from countries in the Third World and around the Mediterranean is higher that between migrated siblings from western societies, we divided the 3457 sibling pairs in to six groups based on information[7] as to which country the respondent was born in. The fourth panel of Appendix II shows the procedure to select the most parsimonious model. We apply the same rules as we did in section 4.1. On the basis of the L^2 and BIC statistics of Models b to g we estimate Models i and j. Although the BIC statistic of model j is satisfactory, the L^2 of Model j deviates significantly from that of Model a. Inspection of the results revealed that the differences in L^2 between Models j and a can only be explained by deviant error terms in group 4 (migrants from Third World countries). In Model l we set these error terms in this group free, which decreases the BIC statistic further. The unstandardized and standardized coefficients of our final Model l are shown in table 5.

Place table 5 about here

The fourth panel of Appendix II and the coefficients of Table 5 show that nearly all the coefficients in the different groups of migrated siblings are equal and that these coefficients do not deviate from the coefficients for the siblings born in Australia. Only the variances of the common family factor explained by the measured parental characteristics differ among migration groups. The error variances of the educational attainment of each sibling $\varepsilon_{1,1}$ and $\varepsilon_{2,2}$, which are our indicators for the within-family variance, are larger for migrants from countries in the Third World. But despite this interesting difference in error variances we must reject our hypotheses that the educational resemblance between siblings born in Australia is larger than the resemblance between migrated siblings and that the educational resemblance between siblings who have migrated from western societies is smaller than the resemblance between siblings who have migrated from other societies.

5. CONCLUSION AND DISCUSSION

Our results do not support our hypothesis that the resemblance between the educational attainment of siblings decreases in Australia in younger birth cohorts. Such a decrease could be expected as a consequence of the decline of the family due to a growing modernization and individualization of Australian society. An explanation of this Australian deviance might be that the large migration to Australia and the importance of the family for this difficult transition of migration counterbalances the decline in the importance of the family as a possible consequence of modernization and individualization.

One of the explanations of the decline in the importance of the family in modern societies is the increase in the number of children living in single parent families, caused by divorce. If the

educational resemblance between siblings from single parent families caused either by divorce or death or from step-families is lower than the resemblance between siblings living in two-parent families, the increasing number of children living in a single parent family would be a valid explanation of the decline in the importance of the family during the 20th century. However, the educational resemblance of siblings does not differ between different single-, two- or step-parent families. This might be explained by a neutralizing process. The difficulties faced by the siblings due to parental conflict, divorce or death or the introduction of a new adult into the family can also strengthen the bonds between siblings, because they have to rely on each other more to overcome these difficulties.

Another explanation of the decline of the family in modern society is the increase in the number of working mothers with dependent children. If the educational resemblance between siblings from families with working mothers is lower than the resemblance between siblings from families with mothers who stayed at home and if the educational resemblance between siblings from families with mothers who worked full-time or with children of a younger age is lower than the educational resemblance between siblings from families with mothers who worked part-time or with children of an older age, the increasing number of working mothers would be a valid explanation of the decline of the importance of the family during the 20th century. However, sibling resemblance in educational attainment does not differ between families with or without a working mother. However the effects of parental background on the common family factor are larger for families in which the mother did not work at all compared with other families, this is possibly due to more traditional gender-roles in these families. Being a never working mother with dependent children fits better into the traditional opinions on gender-roles and thus on inequality in society, as reflected by parental characteristics. The rejection of clear negative effects of working mothers on the educational resemblance between their children and thus on the bonds in their families does not contradict the research on the not-significant effect of working mothers on the educational attainment of their children, at least in those modern societies in which a mother's choice between work outside her home or being a full-time house-wive is more or less free, not forced by financial hardship or social policy. In such societies, a mother tends only to work outside her home if she can make sure that it will not harm her children, for instance by acquiring extra help in monitoring and caring for her dependent children.

The last explanation of the decline of the family in modern societies is an increased mobility of persons and families, which would weaken the family bonds. If the educational resemblance between migrated siblings is lower than the resemblance between siblings who are born in Australia and if the educational resemblance between siblings who have migrated from western societies is lower than the educational resemblance between siblings who have migrated from countries in Third World and around the Mediterranean, then increased migration would be a valid explanation of the decline in the importance of the family during the 20th century. However, the educational resemblance between siblings born in Australia is not larger than the resemblance between migrated siblings and the educational resemblance between siblings who have migrated from western societies is not smaller than the resemblance between siblings who have migrated from other societies. A possible explanation of this variation is that migration may increase the importance of the family, because one needs one's family more in this difficult transition of migration. Moreover, migration is often not a purely individual act but a family affair. Another possible explanation of the rejection of our hypothesis might be that a majority

of the migrants from countries in the Third World and around the Mediterranean to Australia were already oriented to the modern society, because of the former migration rules in Australia which restricted migration to people who could adopt themselves easily to an english-oriented, modern society (Evans, 1986).

These explanations for the unchanged educational resemblance between Australian siblings contradict the idea that a decrease in the importance of the family is a consequence of the break-down of the family. They suggest that the importance of the family is dependent on the degree of difficulties members of families have to face. In more difficult situations and times (parental death or divorce, migration or an oppressive regime) family members have to rely more on each other to survive. The living conditions in some modern societies like Germany, the Netherlands and the USA have improved so much that at least an important segment of the population in those societies no longer needs their family in order to improve their own individual life chances. Despite much improved living conditions during the 20th century, Australia is a deviant case because of its large proportion of recently migrated people, even compared to the USA. If this explanation is true a decrease in the importance of the family is not a sign of societal crisis but of improved living conditions.

Notes

1. We include only mother headed single parent families because of the small numbers of father headed single parent families as a consequence of different death rates between men and women and the different responsibilities for raising the children after divorce taken by men and women.

2. L^2 is the likelihood-ratio χ^2 statistic. The 3 degrees of freedom of the basic model come from the 4 non-assumed effects of the parental characteristics on the educational attainment of the younger sibling.

3. We deleted pairs with missing years of birth of both siblings.

4. BIC = L^2 - df x ln(N); df is the degree of freedom of the tested model or contrast, and N is the sample size.

5. We deleted pairs with no information about their parental families.

6. We deleted those pairs which had no information about the work of the mother.

7. We deleted all pairs with missing information regarding the country in which the respondent was born.

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Appendix I. Variables and their codings.

Father's educational attainment: Years of education, ranging from 0 (no education) to 15.70 (university).

Mother's educational attainment: Years of education, ranging from 0 to 15.70.

Father's occupational status: Kelley's Worldwide Status Scores, ranging from 0 to 100, which are conceptually similar to Duncan's SEI scores (Kelley, 1990:344-46).

Number of siblings in parental family: Ranging from 1 to 14.

Education of oldest and youngest siblings: Years of education, ranging from 0 to 15.70.

Birth cohorts: The mean of the years of birth of both siblings; 1900-1919 (N unweighted=1074; N weighted=234); 1920 - 1929 (N unweighted=1653; N weighted=382); 1930 - 1939 (N unweighted=1896; N weighted=457); 1940 - 1949 (N unweighted=2948; N weighted=737); 1950 - 1959 (N unweighted=3952; N weighted=917); 1960 - 1972 (N unweighted=2278; N weighted=670).

Family form at the age of 14: 1. Two-parent family (N unweighted=11813; N weighted=2910); 2. Mother-headed single parent family caused by divorce (N unweighted=356; N weighted=103); 3 Mother headed single parent family caused by the death of the father (N unweighted=490; N weighted=118); 4 Families with step-parents (N unweighted=731; N weighted=178).

Migrant Groups: Native country of respondent[8]; 1. Australia (N unweighted=10866; N weighted=2689); 2. English speaking countries (United Kingdom, New Zealand, etc.; N unweighted=1589; N weighted=409); 3. East Europe (Poland, Czechoslovakia, etc.; N unweighted=153; N weighted=42); 4. Third World (India, Philippines, Vietnam, Malaysia, Latin America, etc.; N unweighted=646; N weighted=141); 5. North-West Europe (Netherlands, Germany, etc.; N unweighted=287; N weighted=65); 6. Mediterranean (Yugoslavia, Italy, etc.; N unweighted=488; N weighted=111).

Mothers' work: 1. Mother worked full-time at six and ten years (N unweighted=1335; N weighted=364); 2. Mother worked part-time at six and ten years (N unweighted=976; N weighted=258); 3. Mother worked full-time at six years and part-time at ten years (N unweighted=126; N weighted=42); 4. Mother did not work at six years and worked at ten years (N unweighted=1696; N weighted=468); 5. Mother worked at six years and did not work at ten years (N unweighted=324; N weighted=88); 6. Mother worked neither at six years nor at ten years (N unweighted=9235; N weighted=2126).

Appendix II. Selection of the most parsimonious models.

MODELS	L^2	df	p	BIC	Contrasts	L^2	df	p
I. Birth cohorts								
a. Baseline model	12.74	18	.81	-51.02				
b. a & equality constraints on γ	45.95	38	.18	-88.65	a-b	33.21	20	.03
c. a & equality constraints on $\lambda_{1,2}$	15.40	23	.88	-66.01	a-c	2.66	5	n.s.
d. a & equality constraints on $\zeta_{1,1}$	15.24	23	.89	-66.23	a-d	2.50	5	n.s.
e. a & equality constraints on $\varepsilon_{1,1}$ & $\varepsilon_{2,2}$	23.01	28	.73	-76.12	a-e	10.27	10	n.s.
f. a & $\gamma_{1,1} = \gamma_{1,3}$	18.28	24	.79	-66.73	a-f	5.54	6	n.s.
g. a & $\lambda_{1,1} = \lambda_{1,2}$	20.41	24	.67	-64.60	a-g	7.67	6	n.s.
h. a & c & d & e & f & g	54.77	40	.06	-86.91	a-h	42.03	22	.01
i. h & b	108.24	60	.00	-104.60	a-h	95.50	42	.00
j. i & γ free for cohort 6	80.66	57	.02	-121.04	a-j	67.92	39	.01
k. j & $\lambda_{1,2}$ free for cohort 6	72.18	56	.07	-125.14	a-k	59.44	38	.02
l. k & γ free for cohort 5	57.34	53	.32	-130.40	a-l	44.60	35	n.s.
II Two-parent and single parent families.								
a. Baseline model	19.00	12	.09	-23.50				
b. a & equality constraints on γ	28.26	24	.25	-56.75	a-b	9.26	12	n.s.
c. a & equality constraints on $\lambda_{1,2}$	22.22	15	.10	-30.91	a-c	3.22	3	n.s.
d. a & equality constraints on $\zeta_{1,1}$	22.60	15	.09	-30.53	a-d	3.60	3	n.s.
e. a & equality constraints on $\varepsilon_{1,1}$ & $\varepsilon_{2,2}$	29.09	18	.05	-34.67	a-e	10.09	6	n.s.
f. a & equality constraints on $\gamma_{1,1} = \gamma_{1,3}$	27.13	19	.10	-40.17	a-f	8.13	7	n.s.
g. a & $\lambda_{1,1} = \lambda_{1,2}$	30.02	16	.02	-26.65	a-g	11.02	4	.02
h. a & b & c & d & e & f	50.41	37	.07	-80.64	a-h	31.41	25	n.s.
i. h & g	59.64	38	.01	-74.96	a-i	40.64	26	.03
III. Families with and without working mothers.								
a. Baseline model	6.82	18	.99	-56.94				
b. a & equality constraints on γ	29.59	38	.83	-105.01	a-b	22.77	20	n.s.
c. a & equality constraints on $\lambda_{1,2}$	10.55	23	.99	-70.92	a-c	3.73	5	n.s.
d. a & equality constraints on $\zeta_{1,1}$	14.50	23	.91	-66.97	a-d	7.68	5	n.s.
e. a & equality constraints on $\varepsilon_{1,1}$ & $\varepsilon_{2,2}$	13.95	28	.99	-85.23	a-e	7.13	10	n.s.
f. a & equality constraints on $\gamma_{1,1} = \gamma_{1,3}$	24.71	29	.69	-78.01	a-f	17.89	11	n.s.
g. a & $\lambda_{1,1} = \lambda_{1,2}$	18.54	24	.78	-66.47	a-g	11.72	6	n.s.
h. a & b & c & d & e & f & g	80.74	60	.04	-131.78	a-h	74.92	42	.00
i. h & $\lambda_{1,2}$ free for family 4	65.85	59	.25	-143.13	a-i	59.03	41	.02
j. i & γ free for family 6	49.35	56	.72	-149.00	a-j	42.53	38	n.s.
IV. Migrants.								
a. Basic model	10.80	18	.90	-52.96				
b. a & equality constraints on γ	46.06	38	.17	-88.54	a-b	35.26	20	.02
c. a & equality constraints on $\lambda_{1,2}$	13.03	23	.95	-68.44	a-c	2.23	5	n.s.
d. a & equality constraints on $\zeta_{1,1}$	25.01	23	.35	-56.46	a-d	14.21	5	.02
e. a & equality constraints on $\varepsilon_{1,1}$ & $\varepsilon_{2,2}$	39.78	28	.07	-59.40	a-e	28.98	10	.00
f. a & $\gamma_{1,1} = \gamma_{1,3}$	24.98	24	.40	-60.03	a-f	14.18	6	.03
g. a & $\lambda_{1,1} = \lambda_{1,2}$	21.65	24	.60	-63.36	a-g	10.85	6	n.s.
h. a & b & c & d & e & f & g	162.94	60	.00	-48.64	a-h	152.14	42	.00
i. h & no equality constraints on $\varepsilon_{1,1}$ & $\varepsilon_{2,2}$	88.73	50	.00	-87.57	a-i	77.93	32	.00
j. h & no equality constraints on $\zeta_{1,1}$	92.32	55	.00	-101.20	a-j	81.52	37	.00
k. i & j	63.78	45	.03	-94.89	a-k	52.98	27	.00
l. j & $\varepsilon_{1,1}$ & $\varepsilon_{2,2}$ free for group 4	74.87	53	.03	-112.68	a-l	64.07	35	.00

Table 1. The unstandardized coefficients of the most parsimonious model for the whole Australian population and for the diiferent gender combinations (t-values between brackets).

	Whole popul.	brother/ brother	brother/ sister	sister/ brother	sister/ sister
Effects on Common Family Factor (Γ)					
Education father ($\gamma_{1,1}$)	.17	.17	.17	.17	.17
	(21.10)	(19.80)	(19.80)	(19.80)	(19.80)
Education mother ($\gamma_{1,3}$)	.17	.17	.17	.17	.17
	(21.10)	(19.80)	(19.80)	(19.80)	(19.80)
Occupation father ($\gamma_{1,2}$)	.016	.016	.016	.016	.016
	(10.39)	(9.86)	(9.86)	(9.86)	(9.86)
Number of siblings ($\gamma_{1,4}$)	-.16	-.15	-.15	-.15	-.15
	(-8.12)	(7.74)	(7.74)	(7.74)	(7.74)
Global Effects (Λ)					
Education younger sibling ($\lambda_{2,1}$)	.88	.89	.89	.89	.89
Variances (ψ, Θ)					
Between-family ($\psi_{1,1}$)	2.58	2.58	2.58	2.58	2.58
	(17.04)	(14.64)	(14.64)	(14.64)	(14.64)
Oldest ($\Theta^{\varepsilon}_{1,1}$)	4.28	4.58	4.58	4.58	4.58
	(40.99)	(13.45)	(13.45)	(13.45)	(13.45)
Youngest ($\Theta^{\varepsilon}_{2,2}$)	4.28	4.48	4.48	4.48	4.48
	(40.99)	(14.73)	(14.73)	(14.73)	(14.73)

Table 2. The unstandardized coefficients of the most parsimonious model for the six birth cohorts (t-values between brackets).

	1900-1919	1920-1929	1930-1939	1940-1949	1950-1959	1960-1972
Effects on Common Family Factor (Γ)						
Education father ($\gamma_{1,1}$)	.15	.15	.15	.15	.10	.09
	(17.89)	(17.89)	(17.89)	(17.89)	(7.49)	(5.69)
Education mother ($\gamma_{1,3}$)	.13	.13	.13	.13	.10	.09
	(17.89)	(17.89)	(17.89)	(17.89)	(7.49)	(5.69)
Occupation father ($\gamma_{1,2}$)	.018	.018	.018	.018	.016	.012
	(9.31)	(9.31)	(9.31)	(9.31)	(5.69)	(3.69)
Number of siblings ($\gamma_{1,4}$)	-.11	-.11	-.11	-.11	-.12	-.08
	(-4.85)	(-4.85)	(-4.85)	(-4.85)	(-3.59)	(-1.35)
Global Effects (Λ)						
Education younger sibling ($\lambda_{2,1}$)	1.00	1.00	1.00	1.00	1.00	.78
Variances (ψ, Θ)						
Between-family ($\psi_{1,1}$)	2.02	2.02	2.02	2.02	2.02	2.02
	(17.02)	(17.02)	(17.02)	(17.02)	(17.02)	(17.02)
Oldest ($\Theta^{\varepsilon}_{1,1}$)	4.51	4.51	4.51	4.51	4.51	4.51
	(29.36)	(29.36)	(29.36)	(29.36)	(29.36)	(29.36)
Youngest ($\Theta^{\varepsilon}_{2,2}$)	4.25	4.25	4.25	4.25	4.25	4.25
	(29.63)	(29.63)	(29.63)	(29.63)	(29.63)	(29.63)

Table 3 The unstandardized coefficients of the most parsimonious model for the four groups of sibling pairs from two-parent and various single parent families (t-values between brackets).

	two parents family	mother family by divorce	mother family by death	step parent family
Effects on Common Family Factor (Γ)				
Education father ($\gamma_{1,1}$)	.17	.17	.17	.17
	(19.66)	(19.66)	(19.66)	(19.66)
Education mother ($\gamma_{1,3}$)	.17	.17	.17	.17
	(19.66)	(19.66)	(19.66)	(19.66)
Occupation father ($\gamma_{1,2}$)	.016	.016	.016	.016
	(9.79)	(9.79)	(9.79)	(9.79)
Number of siblings ($\gamma_{1,4}$)	-.16	-.16	-.16	-.16
	(-8.03)	(-8.03)	(-8.03)	(-8.03)
Global Effects (Λ)				
Education younger sibling ($\lambda_{2,1}$)	.88	.88	.88	.88
	(23.50)	(23.50)	(23.50)	(23.50)
Variances (ψ, Θ)				
Between-family ($\psi_{1,1}$)	2.50	2.50	2.50	2.50
	(14.22)	(14.22)	(14.22)	(14.22)
Oldest ($\Theta^{\varepsilon}_{1,1}$)	4.25	4.25	4.25	4.25
	(21.60)	(21.60)	(21.60)	(21.60)
Youngest ($\Theta^{\varepsilon}_{2,2}$)	4.21	4.21	4.21	4.21
	(25.34)	(25.34)	(25.34)	(25.34)

Table 4 The unstandardized coefficients of the most parsimonious model for sibling pairs from families with and without working mothers (t-values between brackets).

	1. always full-time working	2. always part-time working	3. first full-time later part-time	4. first not later working	5. first working later not	6. never working
Effects on Common Family Factor (Γ)						
Education father ($\gamma_{1,1}$)	.14	.14	.14	.14	.14	.18
	(11.25)	(11.25)	(11.25)	(11.25)	(11.25)	(18.66)
Education mother ($\gamma_{1,3}$)	.14	.14	.14	.14	.14	.18
	(11.25)	(11.25)	(11.25)	(11.25)	(11.25)	(18.66)
Occupation father ($\gamma_{1,2}$)	.013	.013	.013	.013	.013	.018
	(4.77)	(4.77)	(4.77)	(4.77)	(4.77)	(9.41)
Number of siblings ($\gamma_{1,4}$)	-.15	-.15	-.15	-.15	-.15	-.14
	(4.37)	(4.37)	(4.37)	(4.37)	(4.37)	(6.23)
Global Effects (Λ)						
Younger sibling ($\lambda_{2,1}$)	1.00	1.00	1.00	0.76	1.00	1.00
Variances (ψ, Θ)						
Between-family ($\psi_{1,1}$)	2.31	2.31	2.31	2.31	2.31	2.31
	(18.30)	(18.30)	(18.30)	(18.30)	(18.30)	(18.30)
Oldest ($\Theta^{\varepsilon}_{1,1}$)	4.47	4.47	4.49	4.49	4.49	4.49
	(28.21)	(28.21)	(28.21)	(28.21)	(28.21)	(28.21)
Oldest ($\Theta^{\varepsilon}_{1,1}$)	4.06	4.06	4.06	4.06	4.06	4.06
	(27.64)	(27.64)	(27.64)	(27.64)	(27.64)	(27.64)

Table 5. The unstandardized and standardized coefficients of the most parsimonious model for the six migrant groups (t-values between the brackets).

	1.Australia	2.Engl. Speak	3.East Europe	4.Third World	5.N-W Europe	6.Mediterranean
Effects on Common Family Factor (Γ)						
Education father ($\gamma_{1,1}$)	.15	.15	.15	.15	.15	.15
	(19.50)	(19.50)	(19.50)	(19.50)	(19.50)	(19.50)
Education mother ($\gamma_{1,3}$)	.15	.15	.15	.15	.15	.15
	(19.50)	(19.50)	(19.50)	(19.50)	(19.50)	(19.50)
Occupation father ($\gamma_{1,2}$)	.016	.016	.016	.016	.016	.016
	(10.80)	(10.80)	(10.80)	(10.80)	(10.80)	(10.80)
Number of siblings ($\gamma_{1,4}$)	-.16	-.16	-.16	-.16	-.16	-.16
	(-8.89)	(-8.89)	(-8.89)	(-8.89)	(-8.89)	(-8.89)
Global Effects (Λ)						
Education younger sib ($\lambda_{2,1}$)	1.00	1.00	1.00	1.00	1.00	1.00
Variances (ψ, Θ)						
Between-family ($\psi_{1,1}$)	1.99	1.99	3.88	4.67	1.25	6.01
	(15.89)	(6.64)	(2.51)	(3.86)	(2.18)	(6.30)
Oldest ($\Theta^{\varepsilon}_{1,1}$)	4.49	4.49	4.49	8.12	4.49	4.49
	(29.32)	(29.32)	(29.32)	(5.38)	(29.32)	(29.32)
Youngest ($\Theta^{\varepsilon}_{2,2}$)	3.93	3.93	3.93	6.12	3.93	3.93
	(27.46)	(27.46)	(27.46)	(4.62)	(27.46)	(27.46)

8. We made the same division of the different migrant groups as Evans (1986).

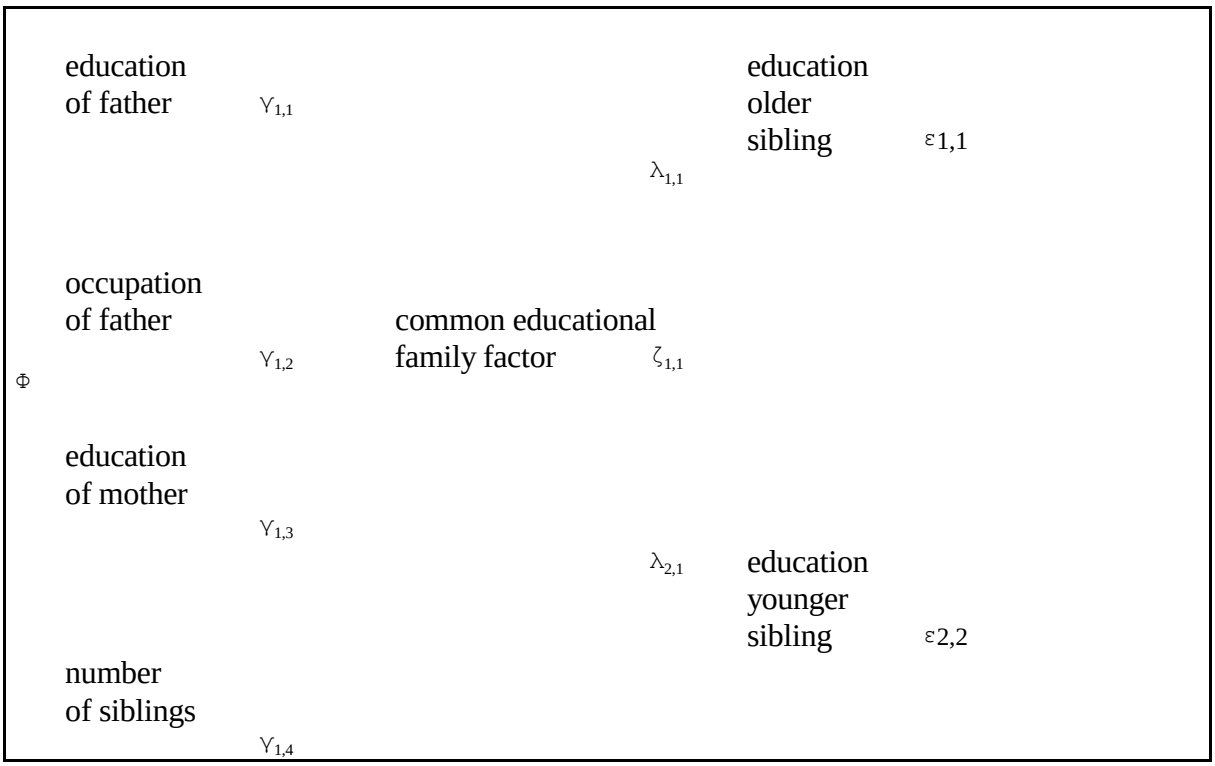

Figure 1: The causal model of the relationships between parental characteristics, the common educational family factor and the educational attainment of siblings