MOTHERS' AND FATHERS' INFLUENCES ON EDUCATIONAL ATTAINMENT

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ABSTRACT

This paper reports on the relative influences of mother's education on sons' and daughters' educational attainment, relative to father's influences. Following the framework of Korupp et al. (2000, 2002), we explore to what extent parental influences are dominated by fathers or mothers, the highest status parent, and/or are specific to the gender of the child (sex-role model). The research questions concern the most appropriate operationalization of mothers' and fathers' influences on children's educational attainment as well as the historical trends of each parent's influence. We use data from the International Stratification and Mobility File (ISMF) that includes data from 1970-1999 from 29 countries and 151 studies. We find that (A) the influence of mother's education is larger than the father's when she is the highest educated parent, (B) her influence is larger on the daughter than on the son, and (C) *both* parents' educations are necessary to explain the largest amount of variance in children's educational attainment. We also find that the influence of mother's education is not only declining but is declining more rapidly over time than that of the father's.

INTRODUCTION

Comparative social mobility research has traditionally neglected women. Most cross-national studies, whether for theoretical reasons or for lack of data on women, limit their analyses to the inter-generational transmission of educational and occupational status between fathers and sons. Educational attainment research, however, has long incorporated women, and recent mobility studies have more frequently incorporated mothers and daughters into the analysis. Nevertheless, women remain conspicuously absent from comparative work. This paper attempts to correct this bias by analyzing the role of fathers *and* mothers in intergenerational mobility in 29 countries. More specifically, the paper analyzes the influence of both parents' educations on the educational attainment of the child utilizing data from 151 surveys that have been harmonized in the International Stratification and Mobility File (ISMF). Two theoretical questions are addressed:

(1) What is the most appropriate operationalization to model the influence of fathers' *and* mothers' educational levels on children's educational attainment?

(2) In linear status attainment models, cross-national mobility research has generally found that the influence of the father's education on his children's educational attainment is declining. Once mothers are included in the analysis, is educational reproduction still weakening? Do conclusions change significantly by including mothers?

In attending to these questions, the paper makes several contributions to the study of educational attainment and social mobility. First and foremost, the paper incorporates women into a cross-national analysis of educational reproduction. Second, it builds directly upon the work of Korupp et al. (2000, 2002) by testing the same models as well as a few additional models for 29 countries. Third, a unique dataset, the ISMF, is used to conduct the analyses.

THEORY AND HYPOTHESES

In the 1980s and 1990s scholars of social stratification debated the merits of including information on the work positions of both men *and* women for determining their positions in the class structure. The debate centered around two issues. The first concerned whether the family or the individual should be the unit of analysis. As the family generally shares the same position in the market as well as a similar lifestyle and standard of living, many argued for its primacy in class analysis. This led to the second issue in the debate. If the family is indeed the unit of analysis, how should one take the work positions of men and women from the same household into account in determining their shared market or class position? Various proposals emerged to answer this question, many of which are addressed below.

One should note, however, that this literature developed in response to fundamental questions concerning class analysis, not educational attainment. Nonetheless, the various proposals lend themselves nicely to the study of educational attainment and how one might use information on the educations of both parents. Furthermore, by calling upon this literature, the present paper builds directly upon the work of Korupp et al. (2000, 2002) and also allows for further elaboration in the future so that the present analysis can be extended to include the influences of

parents' class positions on children's educational and status attainment. For present purposes, however, the literature is used as a framework for analyzing only the influence of parental education on children's educational attainment. Namely, how should one operationalize parental education to best account for its influence on the child's educational attainment?

General Hypotheses

The Conventional Model:

So dubbed by Goldthorpe (1983) for its lengthy hegemony within the social mobility field, the conventional view postulates that precisely because of gender inequality in the labor market, men's occupations should remain the sole indicators of the household's class position. Applied to the field of educational attainment, this model would postulate that *only* the father aptly represents the influence of parental education. This view holds that status is transferred through the family but that the mother and father hold different positions within that context. Historically, fathers have assumed the role of breadwinner and have had a much stronger connection to the labor market than mothers, who have tended to care for children and the home. Because of the mother's traditionally more precarious connection to the labor market and her own dependence on her husband's earnings, this perspective argues that only the father's resources should be taken into account when researching inter-generational mobility (Goldthorpe, 1983; 1984). In short, the father's level of education (and not the mother's) exerts a direct influence on the child's educational attainment (Conventional Hypothesis). Critics of this theory in the realm of education, however, may argue that precisely because of the mother's traditional position as caretaker, only the mother's educational level influences the child's educational attainment (Unconventional Hypothesis). After all, as caretaker the mother spends much time with her children and is therefore in a position to influence the children's educational ambitions.

The Joint Model:

Sørensen (1994) discusses at length the possibility of creating a joint classification for the family's class position based upon the work positions of both mother and father. In particular, she notes "The joint classification approach to measuring a family's social class is still in its infancy, and it seems fair to say that little consensus exists on either the best way to combine information about both husband's and wife's occupational class into a joint measure of the family's class position, or on the wisdom of doing so" (Sørensen, 1994: 41). Her point remains, though, that women are increasingly entering the work force, and excluding them represents a bias. Although the precise measure may be unclear, the joint model theorizes that both parents' resources influence the child's outcome. The expectation here, then, is that mother's and father's combined educational resources accurately represent the family's influence on the child's educational outcome (Joint Hypothesis).

The Individual Model:

The Individual Model assumes that both the mother's and the father's resources influence the educational attainment and occupational status of the child. Unlike the Joint Model, however, this model assumes that each parent must be considered individually. In sum, the educational levels of both the mother and father influence the child's educational attainment, and each parent's influence must be considered independently (Individual Hypothesis). Adopting the reasoning of the conventional model, an additional expectation may be that the father's education remains more influential than the mother's.

The Dominance Model:

Participating in the debate surrounding the conventional view, Erikson (1984) tests various measures of class position and then makes the case for the dominance model. He argues that one should consider the resources of the parent with the highest (i.e., dominant) socioeconomic status, whether that be the father or the mother. While recognizing that in most cases attention remains with the father, this argument opens up the possibility that one should consider only the mother's resources instead of the father's, thereby separating class position from gender and re-centering it on the "dominant" parent. Surprised that the dominance model outperforms the joint model in his own tests, Erikson points out that it is indeed necessary to have information on the resources of both parents in order to determine which possesses the most resources but that the construction of a joint measure is unnecessary.

Applied to this paper, therefore, the Dominance Hypothesis states that *only* the education of the parent with the highest educational level influences the child's educational attainment. In a reformulation of this theory, one might expect that a child calibrates his educational ambitions not to the dominant parent but rather to the non-dominant parent. In this case, the child seeks to attain not the highest educational level of the two parents but the level that constitutes the common denominator between the two (Common Denominator Hypothesis). In a less radical and more pragmatic version of the dominance theory, a further hypothesis posits that the education of the dominant parent exerts the most influence on the child's educational attainment but that the education of the non-dominant parent nonetheless exerts an influence (Modified Dominance Hypothesis).

The Sex-Role Model:

The sex-role model assumes that the child views the same-sex parent as the person to emulate. The father's resources, therefore, are most important for the son's outcome while the mother's resources are most important for the daughter's. For the purposes of this paper, the expectation is that only the father's education influences the son's educational attainment and only the mother's education influences the daughter's educational attainment (Same-Sex Role Model Hypothesis). Or, placing such logic on its head, one might expect that the father's education influences only the daughter's education and the mother's education influences only the son's education (Different-Sex Role Model Hypothesis). The Same- and Different-Sex Role Model Hypothesis postulates that the same-sex parent's education exerts the most influence but that the different-sex parent's education nonetheless exerts an additional and independent (though more tempered) influence on the child's educational attainment.

Historical Trend Hypotheses

Based on previous research, the expectation is that the influence of both parents' educations on children's educational attainment has declined over time (Declining Trend Hypothesis). Relative to the influence of the father's education, however, the expectation is that the influence of the mother's education on the child's educational attainment has grown (Relative Trend Hypothesis). Or, to put it another way, the effect of mother's education is declining less quickly than the effect of the father's education. Throughout the twentieth century, the mother has gained authority in the household and has increasingly entered higher education and the labor market. These phenomena are likely to have boosted the role of the mother's education relative to the father's, even if the influence of both parents' educations has declined overall.

DATA AND METHODS

Data

This paper uses data harmonized in the ISMF for its analyses. We use 151 datasets from 29 countries, which delivers approximately 435,000 respondents aged 25 to 64. Age 25 has been chosen to ensure that respondents have completed most if not all of their educations. Table 1 displays the countries, studies, and the number of male and female respondents in each study. More information on the ISMF can be found online: < http://home.fsw.vu.nl/~ganzeboom/ismf/index.htm >. Table 2 displays the variables used in the analysis as well as their ranges. Note that birth year has been converted to a proportion, 0 to 1, with 0 representing the year 1900 and 1 the year 2000. As we have no data on persons born in 1900, we have re-centered birth year to 1950, where our data are plentiful. This produces a range of -0.5 to 0.5. This means that in regression analysis, the constant refers to the year 1950 and the historical trends refer to changes over any 100-year period. Multiple linear least squares regression is used to estimate the influence of parents' educations on the dependent variable: child's educational attainment in years.

TABLES 1 AND 2 ABOUT HERE

Models

The previous section introduced the theories and hypotheses regarding the influence of mothers' and fathers' resources on children's educational attainment. This section presents the precise models as operationalized by Korupp et al. (2000, 2002), displayed in Table 3. Three models – Models 8, 12, and 13 – have been added to test various combinations of the theories. In replicating the work of Korupp and her co-authors, this paper seeks to retest her findings concerning the preferred model and to expand the scope of the analysis to 29 countries. The large number of cases used here also facilitates the testing of the additional models that combine various theories. Such large numbers are often necessary to give us the power to explore the relationships between parental education and children's educational attainment, as will be seen.

TABLE 3 ABOUT HERE

The baseline model estimates the sex effect, the effect of year of birth (i.e. historical trend), and the historical trend of the sex effect (0).

The conventional model expands the baseline by introducing the first inheritance or transfer effect. It estimates the effect of father's education over time on the child's educational attainment (1). In contrast, the subsequent model reverses the conventional logic and postulates that the influence of mother's education over time (rather than the father's) is an adequate representation of social origin (2).

The joint model estimates the influence of the educations of both the father and the mother as well as the historical trend of that influence by introducing two constraints (3). Mother's and father's educations are constrained to be equal, as are their historical trends.

The individual model differs from the joint model by removing the constraints and estimating the influence of each parent's education over time (4).

Instead of estimating the influence of father's and/or mother's years of education over time, the dominance models estimate the influence of the educational level of the parent with the highest education (the "dominant" parent) and/or the parent with the lowest education (the "non-dominant" parent). To begin simply, model (5) estimates only the effect of the dominant parent's education and the historical trend. Playing the devil's advocate, the subsequent model estimates only the effect of the non-dominant parent and the historical trend (6). After all, one might suspect that a child adjusts his or her educational expectations to match the "common denominator," or the amount of education that both parents share. Model (7) then combines the effects of both parents and their respective historical trends. Model (8) goes a step further than the Korupp et al. models by combining the individual model with the dominance model. In this model, one estimates the influence of each parent but also the increased influence that the dominant parent exerts.

Moving on to sex role theory, the same-sex role model estimates the effect of only the same-sex parent's education on the child's educational attainment, in addition to the historical trend (9). The different-sex role model does the same for only the different-sex parent's education (10). The subsequent model incorporates the effects of both the same-sex parent and the different-sex parent along with their historical trends (11). It is important to note that the preceding three models do not include interaction effects for the respondent's sex and the effect of the same-sex parent or the different-sex parent. This means that one can speak of same-sex and different-sex effects but nothing of the precise parent-child configuration. Introducing the interaction with the respondent's sex essentially combines the individual model with the same- and different-sex model. This model (12) allows us to say something about four effects: father's influence on son's education, father's influence on daughter's education, mother's influence on daughter's education, and mother's influence on son's education. As stated earlier, this model is an addition to the work of Korupp et al.

The final model (13) is also a further contribution to the Korupp study. It is dubbed the full model because it expands the individual model to include a dominance effect as well as a same- and different-sex parent effect. It estimates (a) the effects of both parents' educations, (b) how these effects differ based on the sex of the child, and (c) the additional effect contributed by the dominant or highest educated parent.

RESULTS

Model Comparisons

Table 4 displays the degrees of freedom, adjusted R^2, parameter estimates, and t-values for the cross-national data. Country dummies have been included in the models but are not shown in the table (the reference category is Australia).

Comparing the conventional model (1) with the unconventional model (2), father's education provides only a slightly better indicator of children's educational attainment than mother's education. In fact, analyses not shown here reveal that in nine countries the mother's education is actually a better indicator of children's educational attainment: Canada, Chile, Finland, Hungary Israel, Latvia, Portugal, Quebec, and South Africa. Nonetheless, a more in-depth look at models (1) and (2) for each country illustrates that father's education is a stronger indicator of children's educational attainment than mother's education, and often considerably so (analyses not shown).

The joint model (3), which constrains both the main effects and the historical trends of the mother's education and the father's education to be equal, clearly provides a better fit to the data than the father's or mother's education alone. Only in Poland does the conventional model fare better than the joint model. This leads to a simple but nevertheless important point: mother's education should be incorporated into the analysis. The question remains, however, whether this is the best means by which to include her education.

The individual model (4) relaxes the constraints of the joint model and allows each parent's education to have an independent effect. The adjusted R^2 of these models are very similar, although the individual model (4) does fare slightly better. Examining how the two models perform for each country, however, reveals that the individual model is a better fit to the data in 21 of the 29 countries. (The eight exceptions are Finland, East Germany, Japan, Latvia, Malaysia, Portugal, Slovenia, and Switzerland.) Nevertheless, the improvement is really very slight.

Moving to dominance theory and its various operationalizations, the dominance model (5) is a better fit to the data than the common denominator model (6). The analysis here provides support for Erikson's (1984) suspicion that the dominant parent – the parent with the highest education in this case – is the most influential, no matter the parent's sex. As Table 4 illustrates, the dominance model's adjusted R^2 is not only noticeably better than the common denominator model, but also the conventional model. Country-specific analyses also reveal that the conventional model only fares better than the dominance model in the case of Malaysia. And only in the case of Chile does the unconventional model fare better than the dominance model. Nonetheless, the dominance model does not provide the best fit of all the models emerging from the theory. As was the case with the previous models, there is further evidence that it is always worthwhile to include both parents' educations. In this case, the modified dominance model (7), which includes the parent with the highest education as well as the parent with the lowest education, shows a small but clear improvement over the dominance model. The modified dominance model outperforms the individual model with only seven exceptions (Chile, Czech Republic, Denmark, Israel, Norway, Russia, and South Africa), making it the best model reviewed thus far. Model (8) goes a step further and combines the individual and dominance models, providing another slight improvement. This model

allows one to observe the effect of mother's education, father's education, and the additional influence of the dominant parent.

Sex role theory yields multiple models that produce new findings as well as further support for some of the findings reported above. When comparing the same-sex role model (9) with the different-sex role model (10), one finds support for the hypothesis that the same-sex parent does indeed exerts more influence on the child's educational attainment than the different-sex parent. The different-sex role model (10) only performs better in four countries: Chile, Finland, Russia, and Slovakia. However, model (11), which incorporates both the effect of the same-sex parent and that of the different-sex parent, offers an additional improvement and highlights yet again that the inclusion of both parents generates a significant improvement to the model. Model (12) combines the same- and different sex role model with the individual model, allowing one to speak not only of father's effect and mother's effect but also of their varying effects on sons and daughters. This model, too, claims a higher adjusted R^2 than its predecessor (country-specific exceptions: Chile, East Germany, Germany, Latvia, Malaysia, Portugal, and Switzerland). It is also intuitively appealing because it allows one to estimate four effects: father's influence on son, father's influence on daughter, mother's influence on daughter, and mother's influence on son.

Model (13) combines the individual model with the insights of dominance theory and sex role theory. It allows (a) for the main effects of mother's education and father's education, (b) for these effects to vary based on the sex of the child, and (c) for an additional effect of the dominant parent's education. This model fits the data the best (adjusted $R^2 = .5286$). It explains more of the variance in educational attainment than any other model. Admittedly, though, it is only a slight improvement over other models. One of the competing models sometimes offers a slightly better fit in some countries (Chile, Finland, East Germany, Latvia, Malaysia, Norway, Portugal, Russia, Slovenia, Sweden, and Switzerland), but overall this model fares the best. As such, its parameter estimates deserve some attention. Table 5 displays the estimated coefficients and t-values for the full model for each country. It reveals that many of the coefficients are not significant in the individual country analyses. Whether this is due to data limitations or theoretical reasons, we cannot yet say. Explaining this cross-national variation is beyond the scope of this paper, but we hope to address it in another paper.

TABLES 4 AND 5 ABOUT HERE

Educational Reproduction

The Full Model allows one to dissect father's and mother's influences on daughters and sons as well as the influence of the dominant parent. Using the cross-national data, Table 6 illustrates that for every year of father's education, the son receives 0.189 years of education and the daughter 0.131. For every year of mother's education, on the other hand, the daughter receives 0.171 and the son receives 0.112. The overall pattern is simple. Father's education contributes more to son's education than mother's to daughter's. Conversely, father's education contributes more to daughter's education than mother's to son's. These estimated parameters nicely illustrate the important role played by both parents, but particularly by the same-sex parent. The relationship of educational influence seems to be the same between mothers and daughters and fathers and sons as well as between mothers and sons and

fathers and daughters, with the influence of the mother's education a bit lower overall than the influence of the father's education.

Table 7 shows the estimated parameter for mother as the dominant parent. It illustrates that as the dominant parent the mother's education contributes the most to both children's education, relative to the father's education. As the dominant parent, the mother's influence on the daughter's education is particularly large. Table 8 shows the estimated parameter for father as the dominant parent and is largely the reverse image of Table 7. When father is the dominant parent, his influence on either child's education plays the largest role but is higher for sons.

Tables 6, 7, and 8 also reveal another point. The dominant parent's education effect contributes much more to the child's educational attainment than the same-sex parent effect. The same-sex effect for mother's education on daughter's education is 0.058 years of education for each year of the mother's education. The equivalent is 0.059 for father's education on son's education. The dominant parent effect, on the other hand, contributes 0.194 years of education when the mother is the dominant parent and 0.185 years when the father is the dominant parent. This is evidence that the dominance effect plays a larger role in educational reproduction than the same-sex effect.

TABLES 6, 7, AND 8 ABOUT HERE

Historical Trends

The data analyses here provide support for the Declining Trend Hypothesis but substantial evidence against the Relative Trend Hypothesis. The models in Table 4 clearly show that the influence of both mother's education and father's education is declining. All models with both historical trends illustrate this. The unexpected result, however, is how quickly the influence of mother's education seems to be declining. Because of women's growing level of education and participation in the labor market, we expected mother's influence to decrease less sharply than father's education. Frankly, there is no evidence to support this hypothesis. And, in retrospect, this may not be such a surprise. Perhaps stay-at-home mothers have traditionally contributed much to their children's educations by spending much time with them and thereby transmitting their own educations to their children. Perhaps it is women's increasing participation in and increasingly strong connection to the labor market that has sharply decreased the influence of their educations on their children's educational attainment.

CONCLUSIONS AND DISCUSSION

The first research question asks what the most appropriate operationalization is of the effect of parents' educations on children's educational attainment. The answer: it depends. Three points are in order.

First, if one is to take only one parent's education as an indicator of the child's educational attainment, the analyses here point to the parent with the highest education (i.e., the dominant parent). The data analyses of Korupp et al. (2000, 2002) produce the same result when looking at parental education alone. Furthermore, it is noteworthy that Erikson (1984) found the dominance model to be the most appropriate for class analysis. Although Sørensen (1994: 41) notes that "The dominance model has not gained wide usage in the research community," these

findings certainly suggest that more attention should be paid to dominance theory. Second, despite the good fit of the dominance model, if one wishes to explain as much of the variance as possible, one should select a model with both parents. Third, if one wishes to explain as much of the variance as possible *and* examine the various relationships by which parental education influences children's educational attainment, then the full model is the most appropriate operationalization. It is also the one we prefer. While its improvement over some of the other models may be slight, the substantive interpretation of its coefficients makes it particularly attractive. After all, in this analysis it demonstrates that the highest educated parent exerts the most influence, but that both parents' educations matter. Furthermore, it shows that there is a small but real effect of the same-sex parent's education.

The second research question can also be answered. Even after including mothers into the analysis of educational attainment, educational reproduction is still weakening. In fact, contrary to our own expectations, the influence of mother's education seems to be declining more quickly than that of the father's education. The mechanisms that produce this speedy decline deserve attention in future work. Taking further advantage of these cross-national data may offer a fruitful way to test some of these possible mechanisms.

This paper has made a contribution to the literature on educational attainment, particularly by operationalizing and testing various models using data on multiple countries. Nonetheless, there remain many areas for future work. First, this paper assumes that the relationship between parents' educations and children's educations is linear, meaning that the child's educational outcome increases the same amount for every additional year of the parent's education. It could very well be, though, that this relationship is nonlinear so that, for example, the first few years of the parent's education contribute little to the child's education but the last few years of the parent's university education contribute much. Further analyses are necessary to explore this possibility. Second, this paper has not yet taken full advantage of the cross-national data it uses. In the future, we hope to explain cross-national variation by including such macro-variables as economic development, communist regime, and female labor force participation. Third, it is possible that the various models specified here may fit the data better for certain cohorts than others, and there may be good theoretical reasons to believe so. This too deserves further attention. In all, this comparative paper has served to answer a few questions and has raised new ones for future research.

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TABLES

Table 1. Studies Harmonized in the ISMF

COUNTRY	STUDY	MEN	WOMEN	TOTAL
Australia	aus73	2928	1652	4580
	aus84	1051	1111	2162
	aus87	666	711	1377
	aus89	1650	1744	3394
	aus90	583	592	1175
	aus92i	870	789	1659
	aus99i	554	622	1176
Austria	aut74p	503	730	1233
	aut82	15220	16950	32170
	aut89	553	678	1231
	aut92i	297	412	709
Brazil	bra82	11836	12426	24262
	bra88	10265	10984	21249
	bra99i	685	705	1390
Canada	can73	12551	13139	25690
	can82w	1065	1013	2078
	can84	1025	1410	2435
	can86	2876	3336	6212
	can94	2953	3206	6159
	can99i	395	234	629
Chile	chl99i	439	597	1036
China	chn96	2646	2567	5213
Czech Republic	czr84	1095	1340	2435
	czr91e	597	799	1396
	czr93	2085	2395	4480
	czr99i	574	680	1254
Denmark	den72	408	395	803
	den76	2078	2082	4160
Finland	fin72	351	393	744
	fin75p	424	447	871
	fin94k	680	623	1303
France	fra99i	838	633	1471
East Germany	gdr91a	570	644	1214
	gdr92a	426	471	897
	gdr94a	402	425	827
	gdr96a	401	420	821
	gdr98a	351	409	760
	gdr99i	172	188	360
Germany	ger75p	752	877	1629
	ger80p	686	736	1422
	ger84a	1015	1060	2075
	ger86a	1048	1147	2195
	ger88a	925	1108	2033
	ger90a	1073	1097	2170
	ger91a	536	531	1067
	ger92a	801	919	1720

	ger94a	915	803	1718
	ger96a	930	858	1788
	ger98a	755	772	1527
	ger99i	340	334	674
Hungary	hun73	12440	13510	25950
	hun82	5265	5975	11240
	hun83	10434	11377	21811
	hun86	1998	2343	4341
	hun90e	338	415	753
	hun92i	411	458	869
	hun93	1645	1773	3418
Israel	isr91	3111	3486	6597
	isr99i	383	470	853
Japan	jap00	930	1097	2027
	jap75	2319	0	2319
	jap99i	445	464	909
Latvia	lat99i	392	446	838
Malaysia	mal76	1069	0	1069
	mal76l	0	1055	1055
Netherlands	net00s	426	427	853
	net02e	760	962	1722
	net03	2720	3744	6464
	net74p	383	393	776
	net77	1449	1354	2803
	net79p	601	572	1173
	net82n	1014	1062	2076
	net85o	1804	1734	3538
	net86l	1304	1471	2775
	net92f	846	837	1683
	net92t	1350	1271	2621
	net94e	659	654	1313
	net94h	401	529	930
	net95h	942	931	1873
	net95s	803	848	1651
	net95y	677	620	1297
	net96	328	293	621
	net96c	602	800	1402
	net96y	173	232	405
	net98	416	294	710
	net98e	746	802	1548
	net98f	893	906	1799
	net99	1123	812	1935
	net99a	3972	4215	8187
	net99i	598	566	1164
Norway	nor72	397	405	802
	nor99i	463	465	928
Poland	pol72	4155	3505	7660
	pol92g	584	689	1273
	pol93g	546	674	1220
	pol94	1393	1500	2893

	pol94g	556	620	1176
	pol94z	709	829	1538
	pol95g	533	601	1134
	pol97g	774	921	1695
	pol99g	706	851	1557
	pol99i	347	428	775
Portugal	por99i	385	457	842
Quebec	que73	3246	3385	6631
	que77	2440	773	3213
	que86	2260	2668	4928
	que94	804	958	1762
	que99i	95	27	122
Russia	rus92w	764	902	1666
	rus93	1576	2255	3831
	rus99i	546	620	1166
South Africa	saf91	3433	3067	6500
Slovenia	sln98	373	363	736
	sln99i	374	360	734
Slovakia	slo84	552	696	1248
	slo91e	354	389	743
	slo93	2042	2092	4134
	slo99i	354	431	785
Sweden	swe68	1993	1942	3935
	swe72	406	410	816
	swe74	1922	1922	3844
	swe81	1928	1888	3816
	swe91	1926	1870	3796
	swe99i	404	431	835
Switzerland	swi99i	463	540	1003
United States	usa72g	585	581	1166
	usa73g	482	587	1069
	usa74g	452	572	1024
	usa74p	506	625	1131
	usa75g	459	560	1019
	usa76g	452	571	1023
	usa77g	500	599	1099
	usa78g	468	599	1067
	usa80g	463	534	997
	usa82g	552	738	1290
	usa83g	501	660	1161
	usa84g	409	600	1009
	usa85g	513	572	1085
	usa86g	467	575	1042
	usa87g	554	718	1272
	usa88g	452	561	1013
	usa89g	468	601	1069
	usa90g	434	517	951
	usa90w	877	963	1840
	usa91g	459	605	1064
	usa93g	509	653	1162

usa94f	475	650	1125
usa94g	502	611	1113
usa96g	983	1184	2167
usa98g	942	1165	2107
usa99i	392	531	923

Table 2. Variables Included in the Data Analyses

VARIABLE NAME	CONTENTS	RANGE
FEMALE	Male/Female	0,1
BYR	Year of Birth (1904 ↔ 1979)	-0.5 ↔ 0.5
EDUCYR	Respondent's Level of Education in Years	0 ↔ 34
FEDUCYR	Father's Level of Education in Years	0 ↔ 30
MEDUCYR	Mother's Years of Education	0 ↔ 26
HI_ED	Dominant Parent's Level of Education in Years	0 ↔ 30
LO_ED	Non-Dominant Parent's Level of Education in Years	0 ↔ 26
SS_ED	Same-sex Parent's Level of Education in Years	0 ↔ 30
DS_ED	Different-sex Parent's Level of Education in Years	0 ↔ 30

Table 3. Models of Parents' Influences on Children's Educational Attainment

Definition	No.	Model
BASELINE MODEL		
Baseline	(0)	FEM + BYR + FEM*BYR
CONVENTIONAL MODEL		
Conventional	(1)	(0) + FEDUCYR + FEDUCYR*BYR
Reversal of Conventional	(2)	(0) + MEDUCYR + MEDUCYR*BYR
JOINT MODEL		
Joint – Equality Constraints on Main Effect and Historical Trend	(3)	(0) + (FEDUCYR = MEDUCYR) + (FEDUCYR*BYR = MEDUCYR*BYR)
INDIVIDUAL MODEL		
Individual	(4)	(0) + FEDUCYR + MEDUCYR + FEDUCYR*BYR + MEDUCYR*BYR
DOMINANCE MODEL		
Dominance	(5)	(0) + HI_ED + HI_ED*BYR
Reversal of Dominance	(6)	(0) + LO_ED + LO_ED*BYR
Modified Dominance	(7)	(0) + HI_ED + LO_ED + HI_ED*BYR + LO_ED*BYR
Individual + Modified Dominance	(8)	(0) + FEDUCYR + MEDUCYR + FEDUCYR*BYR + MEDUCYR*BYR + FEDUCYR*HI_FED + MEDUCYR*HI_MED
SEX ROLE MODEL		
Same-Sex	(9)	(0) + SS_ED + SS_ED*BYR
Different-Sex	(10)	(0) + DS_ED + DS_ED*BYR
Same- & Different-Sex	(11)	(0) + SS_ED + DS_ED + SS_ED*BYR + DS_ED*BYR
Individual + Same- & Different-Sex	(12)	(0) + FEDUCYR + MEDUCYR + FEDUCYR*BYR + MEDUCYR*BYR + FEDUCYR*MALE + MEDUCYR*FEMALE
FULL		
Individual + Modified Dominance + Same- & Different-Sex	(13)	(0) + FEDUCYR + MEDUCYR + FEDUCYR*BYR + MEDUCYR*BYR + FEDUCYR*HI_FED + MEDUCYR*HI_MED + FEDUCYR*MALE + MEDUCYR*FEMALE

Table 4. Models for Cross-National Data, Parameter Estimates and T-Values (country dummies not shown), N = 372,972

Model #	0	1	2	3	4	5	6	7	8	9	10	11	12	13
	Base	Conv	R.conv	Join	Ind	Dom	R.dom	M.dom	I.md	s.sex	d.sex	ss.ds	I.ss.ds	Full
d.f.	32	34	34	34	36	34	34	36	38	34	34	36	38	40
Adj. R^2	.3988	.5028	.4960	.5254	.5257	.5224	.4915	.5280	.5282	.5059	.4951	.5258	.5261	.5286
Constant	11.592	8.278	8.046	7.251	7.273	7.550	8.248	7.246	7.238	7.924	8.366	7.234	7.264	7.229
	(442.1)	(288.8)	(273.8)	(244.9)	(244.7)	(258.0)	(275.6)	(245.3)	(243.9)	(267.3)	(284.1)	(244.2)	(230.4)	(229.7)
Female	-0.333	-0.336	-0.354	-0.344	-0.343	-0.353	-0.339	-0.348	-0.348	-0.141	-0.541	-0.318	0.328	-0.332
	(-31.0)	(-32.4)	(-34.4)	(-33.5)	(-33.4)	(34.2)	(-31.9)	(-33.9)	(-33.9)	(-13.4)	(-50.9)	(-30.4)	(-14.5)	(-14.7)
Byc	7.174	7.231	8.251	8.005	8.078	7.481	8.246	7.832	7.900	7.881	8.003	7.999	8.058	7.881
	(142.4)	(90.6)	(100.9)	(94.8)	(95.5)	(89.6)	(99.5)	(92.8)	(93.5)	(93.9)	(98.3)	(94.5)	(94.7)	(92.8)
Byc*Female	0.884	1.140	1.161	1.207	1.213	1.179	1.163	1.199	1.204	1.342	0.984	1.220	1.253	1.244
	(13.2)	(17.6)	(17.9)	(18.7)	(18.8)	(18.3)	(17.5)	(18.7)	(18.8)	(20.4)	(14.8)	(18.7)	(18.9)	(18.8)
Feducyr		0.382		0.253	0.274				0.158				0.246	0.131
		(249.8)		(279.8)	(138.1)				(28.0)				(93.2)	(22.3)
Feducyr*byc		-0.354		-0.297	-0.136				-0.135				-0.133	-0.132
		(-42.2)		(-62.2)	(-10.9)				(-10.8)				(-10.7)	(-10.6)
Meducyr			0.422	0.253	0.229				.142				0.197	0.112
			(240.1)	(279.8)	(99.3)				(46.3)				(63.7)	(30.4)
Meducyr*byc			-0.572	-0.297	-0.476				-0.455				-0.479	-0.458
			(-61.3)	(-62.2)	(-34.5)				(-32.7)				(-34.7)	(-32.9)
Hi_ed						0.429		0.342						
						(273.9)		(146.4)						
Hi_ed*byp						-0.441		-0.269						
						(-51.9)		(-18.8)						
Lo_ed							.437	0.145						
							(229.7)	(52.8)						
Lo_ed*byp							-0.577	-0.303						
							(-57.1)	(-18.4)						
Ss_ed										0.415		0.280		
										(249.6)		(133.5)		
Ss_ed*byp										-0.503		-0.342		
										(-55.4)		(-26.3)		
Ds_ed											0.393	0.227		
											(234.0)	(108.3)		
Ds_ed*byp											-0.471	-0.251		
											(-51.5)	(-19.4)		
Meducyr*Hi_med									0.195					0.194
									(40.2)					(40.0)
Feducyr*Hi_fed									0.186					0.185
									(30.8)					(30.6)
Feducyr*male													0.059	0.058
													(16.5)	(16.0)
Meducyr*fem													0.061	0.059
													(15.6)	(15.2)

Table 5. Full Model for Each Country, Parameter Estimates and T-Values, DF=11

	AUS	AUT	BRA	CAN	CHL	CHN	CZR	DEN	FIN	FRA	GDR	GER	HUN	ISR	JAP	LAT	MAL	NET	NOR	POL	POR	QUE	RUS	SAF	SLN	SLO	SWE	SWI	USA
N	13164	30192	37158	32709	706	5137	9083	4666	2680	1427	4341	18252	64861	6540	4295	549	1268	44513	1593	18986	819	12684	5517	4576	1338	6498	16667	869	21884
Adj. R squared	0.2506	0.2785	0.3939	0.316	0.2167	0.2815	0.2416	0.371	0.4128	0.2224	0.1131	0.2606	0.3148	0.3013	0.3915	0.0294	0.375	0.2481	0.4745	0.3767	0.4375	0.315	0.1995	0.5596	0.3006	0.2308	0.4096	0.1798	0.2816
Intercept	8.607	1.823	2.461	9.261	6.750	6.065	6.079	3.346	6.960	7.205	6.309	3.840	5.987	9.966	8.587	9.373	6.369	7.003	8.004	7.066	7.240	9.155	9.564	4.771	4.825	7.453	6.207	8.103	9.126
	73.9	10.7	65.8	109.5	13.3	68.5	29.2	9.5	25.	17.4	15.3	21.8	110.4	103.8	52.9	10.2	22.9	100.5	20.6	84.0	34.3	72.0	67.0	43.6	10.9	31.6	45.0	17.1	90.1
Female	-0.487	1.498	0.005	-0.139	-0.354	-2.311	-1.713	0.532	0.101	0.767	0.080	-0.381	0.219	-0.171	0.635	0.803	-2.209	-0.517	-0.846	0.369	-0.991	-0.053	0.034	-0.715	-1.041	-1.353	0.250	-1.095	0.131
	-3.2	7.2	0.1	-1.4	-0.6	-18.5	-6.2	1.4	0.3	1.4	0.2	-1.6	3.2	-1.3	2.3	0.7	-6.3	-5.4	-1.6	3.2	-3.5	-0.3	0.2	-4.9	-1.8	-4.3	1.4	-1.6	1.0
Byr	10.072	3.953	7.539	9.742	19.396	10.769	0.283	5.994	14.221	-2.699	13.574	5.744	4.374	6.942	15.193	10.449	13.658	7.267	18.469	10.447	6.314	14.417	3.038	9.475	17.210	6.111	18.471	2.668	3.921
	18.2	4.2	29.4	30.3	5.9	14.4	0.2	4.1	13.2	-1.0	6.1	6.3	19.9	9.7	17.8	2.1	8.7	19.7	12.3	29.2	3.9	25.6	3.5	11.8	6.4	4.5	36.5	0.8	9.5
Female*byr	1.274	1.069	1.890	-0.525	0.644	2.700	1.875	1.308	0.395	6.577	4.614	1.838	3.432	3.407	-0.435	-1.331	4.434	2.817	1.441	3.848	4.297	0.757	4.405	2.224	1.473	3.394	0.786	3.130	1.022
	3.5	5.8	6.4	-2.1	0.2	2.8	4.1	2.4	0.5	4.8	7.6	6.5	18.8	5.1	-0.6	-0.6	1.9	13.2	1.6	14.5	2.6	1.7	5.6	2.5	1.2	5.6	3.0	2.0	3.8
Feducyr	0.152	0.652	0.445	0.042	0.363	0.256	0.138	0.543	0.279	0.470	0.274	0.403	0.316	0.162	0.044	0.183	0.564	0.167	0.230	0.115	0.184	0.034	0.195	0.341	0.411	0.411	0.216	0.001	0.131
	6.1	9.3	10.4	3.0	1.6	2.0	2.0	5.6	3.1	4.0	1.7	6.8	20.3	4.7	0.6	0.8	2.3	7.1	1.8	3.7	1.9	1.2	5.0	8.2	2.1	4.2	4.1	0.0	9.0
Feducyr*byr	-0.131	-0.394	-0.103	-0.153	-0.897	-0.725	-0.177	-0.115	-0.353	-0.298	-0.984	-0.094	0.223	-0.154	-0.390	-0.568	-0.166	-0.379	-0.686	-0.719	-0.120	-0.401	-0.359	-0.303	-0.776	-0.500	-0.667	-0.177	-0.079
	-2.0	-5.4	-1.3	-4.1	-1.4	-4.7	-1.5	-0.8	-1.7	-1.2	-4.0	-1.1	7.2	-1.6	-3.6	-1.0	-0.4	-9.3	-4.0	-12.4	-0.5	-5.8	-3.1	-2.1	-2.3	-3.3	-10.2	-0.5	-2.0
Meducyr	0.029	0.262	0.569	0.076	0.363	0.228	0.153	0.316	0.100	0.146	0.217	0.274	0.153	0.133	0.166	-0.003	0.42	0.144	0.158	0.011	0.222	0.153	0.155	0.367	0.309	0.088	0.185	0.107	0.150
	1.5	10.1	30.4	6.2	2.5	4.7	5.8	5.5	1.7	2.5	3.5	10.3	14.8	7.7	5.6	-0.0	3.4	12.8	2.9	0.8	4.7	7.0	6.9	11.8	4.5	2.4	7.6	2.0	11.3
Meducyr*byr	-0.559	0.043	-0.516	-0.438	-0.862	-0.683	0.202	-0.139	-0.411	0.376	-0.696	-0.277	-0.330	-0.706	-0.723	-0.31	0.124	-0.291	-0.544	-0.330	-0.324	-0.492	-0.184	-0.830	-0.795	0.035	-0.957	-0.329	-0.278
	-7.7	0.3	-5.6	-10.9	-1.2	-2.5	1.5	-0.6	-1.9	1.1	-2.2	-2.2	-8.3	-7.1	-5.4	-0.6	0.2	-5.4	-2.3	-5.5	-1.4	-6.2	-1.7	-5.5	-2.1	0.2	-11.8	-0.9	-6.0
Meducyr*hi_med	0.154	-0.032	-0.065	0.190	0.006	0.072	0.231	-0.050	0.170	-0.092	0.132	0.014	0.118	0.021	0.169	0.000	-0.356	0.173	0.036	0.249	-0.031	0.131	0.012	-0.030	-0.038	0.029	0.137	0.325	0.081
	6.9	-0.6	-2.5	15.3	0.0	0.9	3.9	-0.7	2.3	-1.0	1.0	0.3	9.7	0.7	3.4	0.0	-2.4	9.4	0.4	10.1	-0.5	5.7	0.4	-0.7	-0.3	0.4	3.5	3.0	5.6
Feducyr*hi_fed	0.128	-0.185	-0.032	0.206	0.048	0.068	0.274	-0.103	0.091	-0.190	0.081	-0.013	-0.010	-0.017	0.192	-0.075	-0.242	0.167	0.063	0.256	0.024	0.167	0.021	-0.049	-0.044	-0.025	0.148	0.283	0.088
	4.7	-2.6	-0.7	14.2	0.2	0.5	3.8	-1.1	1.0	-1.6	0.5	-0.2	-0.7	-0.5	2.8	-0.3	-1.0	7.0	0.5	8.2	0.2	5.8	0.5	-1.0	-0.2	-0.3	2.8	2.1	5.3
Feducyr*male	0.030	0.162	0.089	0.049	-0.153	-0.017	-0.008	0.103	-0.048	0.084	-0.008	0.127	0.051	0.088	0.050	0.098	0.062	0.039	0.049	0.056	0.019	0.078	-0.032	0.052	0.014	0.000	0.113	0.022	0.050
	1.7	9.9	4.8	4.7	-1.2	-0.5	-0.3	2.9	-0.8	1.4	-0.1	6.1	6.2	4.2	1.5	0.8	0.9	3.8	0.9	3.5	0.3	4.2	-1.3	1.6	0.2	-0.0	5.2	0.3	4.6
Meducyr*female	0.038	-0.039	-0.012	0.041	-0.116	0.129	0.106	0.007	0.006	0.013	-0.082	0.104	0.009	0.067	-0.064	0.078	0.073	0.024	0.112	0.043	0.080	0.020	-0.025	0.105	0.129	0.076	0.047	-0.022	0.015
	1.9	-1.3	-0.6	3.7	-0.8	2.7	3.3	0.1	0.1	0.2	-1.1	3.2	0.8	3.2	-1.5	0.7	0.7	1.8	1.7	2.7	1.5	0.9	-1.0	3.2	1.7	1.7	1.7	-0.3	1.2

Table 6. Estimated Parameters for Parent-Child Effects

	Son	**Daughter**
Father	0.189 = 0.131 + 0.058	0.131
Mother	0.112	0.171 = 0.112 + 0.059

Table 7. Estimated Parameters for Parent-Child Effects
Mother is the Dominant Parent

	Son	**Daughter**
Father	0.189 = 0.131 + 0.058	0.131
Mother	0.306 = 0.112 + 0.194	0.365 = 0.112 + 0.059 + 0.194

Table 8. Estimated Parameters for Parent-Child Effects
Father is the Dominant Parent

	Son	**Daughter**
Father	0.374 = 0.131 + 0.058 + 0.185	0.316 = 0.131 + 0.185
Mother	0.112	0.171 = 0.112 + 0.059