Schooling or Social Origin?

The Bias in the Effect of Educational Attainment on Social Orientations

Inge Sieben and Paul M. de Graaf

The strong relationship between educational attainment and social attitudes and behaviour is often explained as an effect of schooling. However, educational attainment also reflects social origins. In order to obtain a view of the unbiased effect of educational attainment on social orientations, conventional research employs regression models that control for known characteristics of the family of origin. However, these controls do not represent the complete effects of social origins. In this study, we use sibling models to control completely for the family bias. We use data on primary respondents and one of their siblings from the Family Surveys Dutch Population of 1992 and 1998 (1198 sibling pairs). The results show that the effects of schooling on orthodox religious beliefs, church attendance, political party preference, left-wing or right-wing political orientation, conventional and unconventional political participation, post-materialism, economic and cultural conservatism and traditional male/female attitudes are much lower – on average 78 per cent – than suggested by conventional models.

Introduction

Research has shown that there is a close relationship between an individual's educational attainment and a broad range of social orientations (Hyman and Wright, 1979). The higher educated are less religious than the lower educated (Beit-Hallahmi and Argyle, 1997), they more often have left-wing political orientations (Lipset, 1981), participate more often in conventional and unconventional political activities (Barnes and Kaase, 1979), have post-materialist values as opposed to materialist values (Inglehart, 1977), are culturally less conservative (Felling and Peters, 1986), and have less traditional male/female attitudes (Wilcox, 1991). The differences between the higher and the lower educated are remarkably large. To give two examples for the Netherlands: of those who completed only elementary school, 26 per cent have participated in a petition, boycott, demonstration or strike in the past five years; of those

with a university degree, 45 per cent did so. The differences in post-materialism are striking too. If we score post-materialist values on a scale ranging from 1 to 6, Dutch women and men with primary schooling have an average of 2.96, whereas the Dutch with a university education have an average of 4.88.[1]

A well-known explanation of the relationship between educational attainment and social orientations is that it is due to the experience of schooling itself (Pallas, 2000). It is argued that schools generate attitudes and behaviour, in both direct and indirect ways. Through didactic and social learning processes, students are taught tolerant and liberal orientations so that they can take their place in society as good citizens. Schooling is also thought to affect social orientations in a more indirect way by helping students to grow both personally and cognitively (Phelan *et al.*, 1995; Vogt, 1997). It increases their knowledge of society and invokes a critical attitude. Moreover, students from different social backgrounds

meet at school. They have to cope and collaborate with each other and must be able to maintain relationships between and within groups. Another indirect way in which schooling affects social orientations is that educational attainment affects working life. Autonomy and work complexity are correlated both to educational attainment and to social orientations, and thus influence the effect of schooling on orientations (Kohn, 1969).

An alternative explanation for the well-established relationship between schooling and social orientations is that (part of) the relationship is spurious. Here, two mechanisms are relevant. First, some individual traits may affect both success at school and social orientations. Cognitive ability in particular has proven to be a major predictor variable of educational attainment, and if cognitive abilities affect social orientations as well a spurious relationship between schooling and orientations will be the result. Second, and the central topic of interest in this study, the family of origin can be a source of a spurious relationship between educational attainment and social orientations. Financial, cultural and social characteristics of the family affect children's educational attainment, and if the same family characteristics also have an impact on social attitudes and behaviour, the effect of educational attainment will be biased, to an unknown degree. Indeed, much research has shown that social orientations are – consciously or not – transmitted from one generation to the next (Acock and Bengtson, 1978; Nieuwbeerta and Wittebrood, 1995; Kelley and De Graaf, 1997). Figure 1 shows the simple causal structure of this argument. Effect A is the effect we are interested in: differences in educational attainment make individuals have different social orientations. The impact of the family of origin background on social orientations is represented by B, and its effect on educational attainment is represented by C. If there are family background characteristics that affect both educational attainment and social orientations, effect A will be overestimated, and it is the quality of the measurement of family background characteristics that decides whether effect
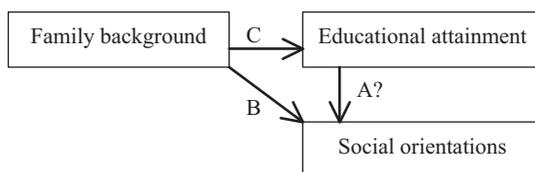
A represents the unbiased effect of educational attainment on social orientations.[2]

There are several strategies that aim to correct the family bias in the effect of education on social orientations. First, it is possible to include measures of family background such as socio-economic status and parents' educational attainment in the regression models of social orientations. These measures are often available in sociological research, but since it is not very likely that these crude variables are strongly correlated to social orientations in the family of origin, the effects of educational attainment will still be overestimated in such models. Second, direct measures of parental social orientations can be included in the models, such as cultural and religious practices in the parental home or parents' voting behaviour. This information is sometimes available, but we doubt whether the inclusion of these variables will produce effects on educational attainment that are no longer biased. The measurement of parents' social orientations may not be reliable, since it is usually done in a retrospective design, in which the respondent reports on attitudes and values of someone else (his or her parents). Proxy answers probably mean that the effect of educational attainment will still be underestimated. Moreover, parents' social orientations do not tell the whole story of orientation development in a family. To fully cover this process, one would need information on how important orientations were for the parents, and how important they thought it was to transmit these orientations to their children. This means that the involvement of parents with their children, the solidarity between parents and children, and other, not easily assessable, measures might be crucial factors in this respect. In this study, we will label designs in which measured family characteristics such as socio-economic background or parents' social orientations are included in regression models' conventional designs or conventional research.

The main goal of our study is to compare the results of conventional designs with the results of a sibling design. Sibling models (Hauser and Mossel, 1985; Hauser and Sewell, 1986) have been proved to produce unbiased effects of educational attainment on a dependent variable. In these models, the (lack of) resemblance between siblings in educational attainment and in the dependent variable of interest is used to estimate the total impact of the family of origin. If the within-family variation in educational attainment completely corresponds with the within-family variation in the dependent variable, there is no family bias. If, however, the within-family variation in educational attainment is not

Figure 1 *Relationships between family background, educational attainment and social orientations*

correlated with the within-family variation in the dependent variable, the bias is complete.

The importance of sibling models was first recognized by economists who set out to estimate the unbiased economic returns of schooling (Taubman, 1976; Griliches, 1979). They used data on brother pairs to correct the bias in the relationship between educational attainment and income. Later, sibling designs were applied in sociological status attainment research to estimate the unbiased effect of schooling on occupational status (Hauser and Mossel, 1985). This research showed that the effects of schooling on income and occupational status are largely unbiased. In our study, we employ the same sibling design to estimate the unbiased effect of educational attainment on a selection of cultural and social orientations.

In the Netherlands, sibling models have been applied both in social mobility studies (Van Eijck, 1996; Sieben and De Graaf, 2001) and in research that employs sibling models to study the effects of social origins on other dependent variables. Some of them focus on life styles (Van Eijck, 1996, 1997; Nagel and Ganzeboom, 2002), others study the effects of family background on social orientations. Van der Slik and Scheepers' (1997) study on Christian beliefs and church attendance concludes that most individual variation in religiosity originates in religious socialization in the family of origin. Need (1997) presents a sibling analysis on political party preference, and found that 29 per cent of all individual variance in political preferences can be attributed to the family, leaving 71 per cent to be explained by individual characteristics. These sibling studies concentrate on the impact of measured and unmeasured aspects of the family of origin, and not on the effect of educational attainment. In this study, we set out to use sibling models to estimate the unbiased effect of educational attainment on social orientations. We look at three central dimensions of social orientations:

1. Religion: religious orientations, as indicated by orthodox religious beliefs and church attendance.
2. Politics: political orientations, as indicated by political party preference, left-wing or right-wing political orientation, conventional political participation, unconventional political participation and post-materialism.
3. Values: value patterns, as indicated by economic conservatism, cultural conservatism and traditional male/female attitudes.

As shown above, individual educational attainment is a major predictor variable of these three dimensions of social orientation. Higher educated individuals are religiously less orthodox, and go to church less frequently than the lower educated. Higher educated have more liberal and left-wing political preferences, adhere more often to post-materialist values, and more frequently participate in political activities. They are less conservative with respect to sex role attitudes and in the cultural domain, and have more traditional values in the economic domain. To explain the finding that the higher educated are culturally progressive and economically traditional, Jackman and Muha (1984) argued that schooling leads to an individualistic ideology, which means that the higher educated are apt to defend their interests. Their preferences for non-conformity and a less traditional life-style are associated with a tolerance with respect to cultural values, and their economic interests are associated with conservative economic values.

In this study, we do not focus on explanations of the effects of educational attainment on social orientation. We have the more modest (but methodologically challenging) goal to find out to what extent conventional research, in which social origins are statistically controlled for by measured family characteristics, produce biased effects of educational attainment on the three dimensions of social orientation.

Data Description

To assess the unbiased effect of educational attainment on social orientations, we used sibling data from two Dutch surveys, the Family Survey Dutch Population 1992–1993 (Ultee and Ganzeboom, 1993) and the Family Survey Dutch Population 1998 (De Graaf *et al.*, 1999). The two surveys are highly comparable in their scope and measure, and are both based on a two-step stratified sample of the Dutch population. The response rates were 42 per cent (1992) and 50 per cent (1998). The 1992 survey contains information on attitudes and behaviour of 1000 primary respondents. Each respondent was asked to complete a sibling roster with information on all siblings. From this form, one sibling was randomly chosen and approached to fill in a write-in questionnaire, with a selection of the questions asked of the primary respondent. The importance of co-operating in this write-in questionnaire was stressed by mentioning the participation of the primary respondent to the sibling. After a reminder, 535 siblings participated. In the 1998 survey, 2029 respondents (primary respondents and their spouses) were interviewed. Analogously to the 1992 survey, one randomly chosen sibling of these respondents was approached to complete a write-in questionnaire. After two reminders, this resulted in data

on 788 pairs of siblings. The two surveys together have information on 1323 siblings pairs.[3]

There are several reasons why we do not have sibling information for all 3029 respondents. First, 278 respondents (9.2 per cent) reported not to have a brother or sister who was still alive. Second, 776 respondents (25.6 per cent) refused to give the address of the randomly chosen sibling or gave unusable address information. Third, 652 siblings (21.5 per cent) who were approached did not return the questionnaire. In the analysis, we only include respondents and siblings aged 25 years or older in order to prevent bias caused by incomplete educational careers. After this selection, we have information on 1198 pairs of a respondent and a sibling: 487 pairs from the 1992 survey and 711 pairs from the 1998 survey.

One possible bias in our data is that siblings who are close to the respondent may have a higher response rate. If this were the case, sibling pairs in our sample would be closer than the average sibling pair in the Netherlands, and the resemblance between siblings – and thus the total family impact – would be overestimated, which might also bias the effect of educational attainment. In order find out whether this bias is present, we employed additional data from the 1998 survey. First, we looked at the correlation between the educational attainments of sibling pairs. In the sibling roster, the primary respondent reported the highest educational attainment of all brothers and sisters, including the randomly chosen sibling who may or may not have been successfully surveyed. It turns out that siblings who did co-operate resemble the primary respondent less ($r=0.392$) than siblings who did not co-operate ($r=0.480$). The difference is statistically significant ($p=0.033$).[4] Thus, in this respect, the total impact of the family is not overestimated, but rather underestimated. Second, we looked at the timing of returning the write-in questionnaires. One could argue that a sibling who gets along well with the primary respondent and who resembles her or him will be motivated to return the questionnaire quickly. In contrast, siblings who are not that close will return the questionnaire much later, or perhaps never. We checked whether difference in educational attainment, church attendance, political party preference, post-materialism and traditional male/female attitudes affect the timing. The clear finding was that there was no systematic relationship between the timing of returning the questionnaires and the resemblance between respondents and siblings for the five variables mentioned.[5] We therefore conclude that (self-) selection of siblings cannot have led to major bias.

An important limitation of the sibling design is that respondents from one-child families cannot be included in the analysis. This refers to 4.5 per cent of the respondents. However, we do not think that this will bias the effects of family background on social orientations. A comparison of regression models showed that the effects of family size and parents' educational attainment, occupational status, church membership and political party preference on social orientations do not differ significantly between the complete sample and a sample without respondents from one-child families. Of course, we could only apply this test for conventional models (with measured aspects of the family), since information on more than one child per family is needed to estimate sibling models.

Table 1 gives an overview of the variables used in this paper. A list with measurements of all variables can be found in the Appendix. Educational attainment is measured in nine educational categories, ranging from 1 (primary school only) to 9 (post-university education). Sex, age and being the firstborn in a family are further individual control variables.[6] In addition, we will include parental occupational status and educational attainment as well as variables on parental social orientations as measured aspects of family background in the models. In both surveys, the primary respondents provide this parental information, referring to the period when they were 15 years of age. Parental educational attainment is measured by the highest of the educational attainments of the father and of the mother. Parental occupational status is measured in the same way. Parental church membership is set at 1 if at least one parent was a church member when the respondent was 15 years old. Parents' political party preference is measured on a five-point left–right scale (Gijsberts, 1999), by averaging the party preference of the father and the mother. We combined the information on the father and the mother because reported father's and mother's characteristics correlate highly, which could cause problems of multicollinearity. The correlation coefficients vary from $r=0.441$ for occupational status to $r=0.888$ for political party preference.

Whereas data on all individual and family predictors are available in both surveys, this is not the case for all dependent variables. Information on orthodox religious beliefs, left-wing or right-wing political orientation, conventional and unconventional political participation, and economic and cultural conservatism appears in the 1992 survey only, whereas questions on traditional male/female attitudes were only asked in the 1998 survey. Church attendance, political party preference and post-materialism appear in both surveys.

In the analysis, we treated all dependent variables as being measured at the interval level. On average,

Table 1 Description[a] of the variables

	Survey year	Primary respondent			Sibling		
		mean	s.d.	*n*	mean	s.d.	*n*
Individual characteristics							
Sex	1992 & 1998	0.482		1198	0.563		1198
Age	1992 & 1998	42.611	10.921	1198	43.678	11.819	1198
Firstborn	1992 & 1998	0.265		1198	0.272		1198
Educational attainment	1992 & 1998	4.816	2.283	1198	4.560	2.276	1180
Family characteristics							
Parents' educational attainment	1992 & 1998	3.190	2.312	1191			
Parents' occupational status	1992 & 1998	46.221	16.564	1193			
Number of siblings	1992 & 1998	4.627	2.590	1198	*as primary respondent*		
Parents' church membership	1992 & 1998	0.865		1169			
Parents' political party preference	1992 & 1998	2.808	0.785	1078			
Dependent variables (social orientations)							
Orthodox religious beliefs	1992	2.760	0.988	456	2.840	1.058	453
Church attendance	1992 & 1998	1.916	1.086	1191	1.919	1.076	1177
Political party preference	1992 & 1998	2.809	1.014	1049	2.849	1.055	993
Left-wing or right-wing political orientation	1992	5.399	1.882	454	5.448	1.788	441
Conventional political participation	1992	2.416	1.274	478	2.319	1.256	480
Unconventional political participation	1992	0.521	1.026	474	0.496	0.946	476
Post-materialism	1992 & 199	3.461	1.713	1142	3.382	1.694	1129
Economic conservatism	1992	2.767	0.649	477	2.754	0.646	467
Cultural conservatism	1992	2.558	0.870	479	2.660	0.929	468
Traditional male/female attitudes	1998	2.234	0.813	694	2.306	0.812	697

[a] *The descriptions displayed are survey year, mean score (mean), standard deviation (s.d.) and number of valid observations (n) for each variable.*

Table 2 Correlation coefficients between respondent's and sibling's social orientations and educational attainment

	r	*n*
Orthodox religious beliefs	0.447	423
Church attendance	0.559	1170
Political party preference	0.285	884
Left-wing or right-wing political orientation	0.248	412
Conventional political participation	0.161	471
Unconventional political participation	0.269	463
Post-materialism	0.191	1078
Economic conservatism	0.167	460
Cultural conservatism	0.356	457
Traditional male/female attitudes	0.364	681
Educational attainment	0.400	1178

primary respondents and their siblings do not differ from each other in social orientations, with the exception of cultural conservatism. Primary respondents turn out to be slightly less culturally conservative than their siblings. Table 2 gives the correlation coefficients between primary respondent and sibling social orientations. These correlation coefficients show to what extent siblings in a family resemble each other in social orientations. The more siblings resemble each other, the larger the total impact of the family is. It turns out that sibling resemblance in religious orientation is quite high. Respondents and siblings are less similar with respect to economic conservatism and conventional political participation. Sibling resemblance in educational attainment is rather high too ($r = 0.400$).

The Hauser–Mossel Sibling Model

The unbiased effect of educational attainment on social orientations can be estimated by employing data on more than one child in a family. The degree to which siblings with different levels of education have similar social orientations shows to what extent the correlation between educational attainment on social orientations is spurious. How often do siblings have different levels of education? Of the 1198 families analysed here, only 27 per cent have exactly the same level of education on a scale ranging from 1 to 9. In 20 per cent of the pairs, the difference is one educational category, in 22 per cent the difference is two categories, and in 31 per cent the difference is three or more categories. The correlation coefficient between the two levels of education is far from perfect ($r = 0.400$). The educational differences between children in a family are large enough to distinguish between a within-family and a between-family effect of individual schooling. Figure 2 depicts this distinction in the sibling model (cf. Hauser and Mossel, 1985). The upper half of the model shows the relations between the variables for the primary respondent. The same relations can be found in the bottom part of the model, this time for the respondent's sibling.

Important components of the sibling model are the two latent between-family factors. The first between-family factor (η_5) consists of the resemblance in educational attainment of the primary respondent and the sibling (η_1 and η_2, respectively). The second between-family factor (η_6) comprises the resemblance in social orientations of the primary respondent (η_3) and the sibling (η_4). The between-family factors cover the between-family variance in educational attainment and in social orientations. We include five measured characteristics of family background: parents' educational attainment (x_1), parents' occupational status (x_2), the number of siblings in a family (x_3), parents' church membership (x_4) and parents' political party preference (x_5). The effects of these measured family characteristics on educational attainment (γ_{51}–γ_{55}) and on social orientations (γ_{61}–γ_{65}) show to what extent measured aspects of family background determine the variance in the two between-family factors. The error terms ζ_5 and ζ_6 represent the size of the unmeasured parts of between-family variances. Note that the factor loadings of the measurement model of the between-family factors are constrained to
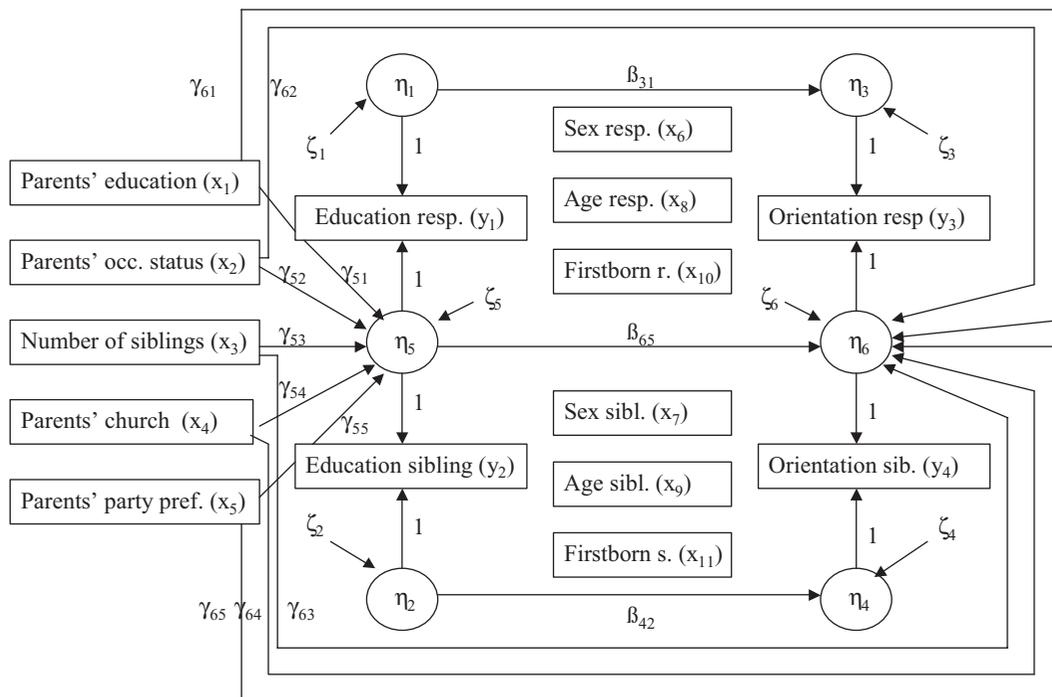

Figure 2 *Hauser–Mossel sibling model. The effects of sex, age and firstborn are not shown*

the value 1.0. Not only does this simplify the model, it also means that effects of family background will be the same for primary respondents and for siblings. This is plausible since the siblings in the model are randomly chosen out of the complete set of the respondent's siblings. Therefore, we also constrain the error terms of respondent's and sibling's educational attainments (ζ_1 and ζ_2) to be equal, just as the error terms of respondent's and sibling's social orientations (ζ_3 and ζ_4). These equality assumptions were tested and proven to be consistent with the data.

The unbiased effects of educational attainment on social attitudes and behaviour are represented by the within-family regression coefficients β_{31} (for the primary respondent) and β_{42} (for the sibling). Again, an additional test shows that these two effects can be constrained to be equal ($\beta_{31} = \beta_{42}$). The between-family regression coefficient β_{65} is the effect of the between-family factor of education on the between-family factor of social orientations. It shows whether the family level of education affects the family level of social orientations. The within-family regression coefficients represent the individual effects of educational attainment on orientations. These are the unbiased effects of educational attainment on social orientations, and are expected to be smaller than the between-family effect.

Finally, we include three individual characteristics in the model, namely sex, age and being the firstborn in a family. Research has shown that women often have different social orientations from men. Women appear to be more religious (Beit-Hallahmi and Argyle, 1997), more post-materialist (De Graaf and De Graaf, 1988) and politically more left-wing (De Vaus and McAllister, 1989) than men. Since women in the Netherlands, in general, reach lower educational levels than men, not including sex in the models may bias the effect of educational attainment on orientations. The same argument holds for age. Research has shown that older people are more traditional and more conservative than young people. The old are more religious (Beit-Hallahmi and Argyle, 1997), place themselves more to the right on a left–right scale (Lipset, 1981) and are less post-materialist (Inglehart, 1977) than the young. Since the educational attainment of older people, in general, is lower than that of younger people (cohort effects), it is important to control for age. Finally, being the firstborn in a family might also influence social orientations. Firstborns are supposed to have a stronger sense of responsibility and, therefore, show more conservative attitudes and behaviour than laterborns (Sulloway, 1996). Although previous research found no significant effects of birth order on

educational attainment in the Netherlands (Van Eijck, 1996), we test this interesting hypothesis again using a larger data set. The effects of the three individual characteristics on educational attainment and on social orientations are assumed to be the same for the primary respondent and the sibling (i.e. for sex: $\gamma_{16} = \gamma_{27}$ and $\gamma_{36} = \gamma_{47}$; for age: $\gamma_{18} = \gamma_{29}$ and $\gamma_{38} = \gamma_{49}$; for firstborn: $\gamma_{110} = \gamma_{211}$ and $\gamma_{310} = \gamma_{411}$). Tests of several models showed that these assumptions are justified for all social orientations studied in our analyses.[7] All siblings models are estimated using the software program LISREL 8.30 (Jöreskog and Sörbom, 1999).

Results of the Sibling Analysis

Table 3 shows the estimates of the sibling models. Before we turn to the primary goal of this study, that is the bias in the effects of educational attainment, we will first discuss our other findings. The effects of individual characteristics (sex, age and being the firstborn) on social orientations are as we expected them to be. Women are more religious than men, they attend church more often, prefer more left-wing political parties, participate less often in conventional and more often in unconventional political activities, are less economically conservative, and have less traditional male/female attitudes. Older people, in general, are more conservative than young people. They are more religious, attend church more often, have more right-wing political orientations, participate more often in conventional but less in unconventional political activities, are less post-materialist, are more culturally conservative, and have more traditional male/female attitudes. Firstborns prefer right-wing political parties, participate more often in unconventional political activities, and have more traditional male/female attitudes than laterborns. The effects of measured family characteristics are as expected too. It turns out that parents' church membership (for religious orientation) and parents' political party preference (for all orientations) have a relatively strong influence. Socio-economic indicators such as parents' educational attainment and occupational status correlate less strongly with social orientations, which indicates that such crude measures represent socialization practices poorly.

One important characteristic of sibling models is the decomposition of the individual variance in within-family and between-family components. The larger the between-family variance, the stronger the influence of family background on attitudes and behaviour. Table 3 shows that the family of origin influences orthodox religious beliefs

Table 3 Estimates of Hauser–Mossel sibling models for social orientations

Dependent variable	Unstandardized regression coefficients (standard errors in parentheses)										Variance components[a]				Fit of model	
	Within-family education	Between-family education	Sex	Age	Firstborn	Parents' education	Parents' occ. status	Number of siblings	Parents' church att.	Parents' party pref.	Between family	Between expl.	Within family	Within expl.	Chi² (df=32)	p
Religious beliefs (n=383)	0.004 (0.021)	-0.101 (0.081)	0.137** (0.064)	0.013** (0.004)	0.032 (0.074)	-0.002 (0.003)	-0.002 (0.031)	0.010 (0.016)	0.566** (0.121)	0.366** (0.053)	0.419 (41.8%)	0.172 (41.1%)	0.583 (58.2%)	0.023 (3.9%)	34.119	0.366
Church attendance (n=1025)	0.007 (0.013)	-0.060 (0.052)	0.082** (0.039)	0.017** (0.002)	0.035 (0.041)	-0.016 (0.022)	-0.010** (0.002)	0.036** (0.011)	0.495** (0.082)	0.349** (0.037)	0.622 (54.0%)	0.171 (28.3%)	0.530 (46.0%)	0.037 (7.0%)	41.054	0.131
Party preference (n=814)	-0.018 (0.017)	-0.125** (0.062)	-0.163** (0.048)	0.003 (0.003)	0.100* (0.053)	-0.001 (0.023)	-0.001 (0.002)	-0.039** (0.011)	0.126† (0.084)	0.460** (0.035)	0.327 (30.4%)	0.154 (47.1%)	0.748 (69.6%)	0.014 (1.9%)	29.922	0.572
Political orientation (n=373)	-0.064† (0.045)	-0.206† (0.165)	-0.114 (0.128)	0.017** (0.007)	0.048 (0.144)	0.049 (0.058)	-0.008† (0.006)	-0.030 (0.030)	0.586** (0.217)	0.606** (0.097)	0.770 (23.1%)	0.326 (42.4%)	2.561 (76.9%)	0.056 (2.2%)	35.252	0.317
Conv. participation (n=422)	0.101** (0.030)	0.097 (0.096)	-0.591** (0.083)	0.015** (0.004)	-0.030 (0.094)	-0.041 (0.036)	0.008** (0.004)	0.015 (0.018)	-0.291** (0.133)	0.058 (0.060)	0.152 (9.8%)	0.044 (29.1%)	1.397 (90.2%)	0.151 (10.8%)	43.956	0.078
Unconv. participation (n=415)	0.043* (0.023)	0.260** (0.083)	0.155** (0.065)	-0.011** (0.004)	0.094† (0.072)	-0.059* (0.031)	0.001 (0.003)	0.035** (0.016)	-0.098 (0.114)	-0.162** (0.053)	0.199 (21.7%)	0.079 (39.9%)	0.717 (78.3%)	0.033 (4.6%)	34.749	0.338
Post-materialism (n=962)	0.116** (0.029)	0.445** (0.084)	-0.068 (0.076)	-0.008** (0.004)	0.023 (0.083)	-0.058* (0.033)	0.008** (0.003)	0.023† (0.017)	-0.012 (0.125)	-0.204** (0.056)	0.529 (18.1%)	0.334 (63.2%)	2.400 (81.9%)	0.059 (2.5%)	30.226	0.557
Econ. conservatism (n=411)	0.013 (0.016)	0.041 (0.059)	-0.156** (0.045)	-0.001 (0.002)	0.010 (0.051)	0.005 (0.021)	-0.001 (0.002)	0.009 (0.011)	-0.036 (0.078)	0.127** (0.034)	0.061 (14.2%)	0.016 (26.8%)	0.362 (85.8%)	0.008 (2.1%)	26.381	0.747
Cult. conservatism (n=413)	-0.019 (0.019)	-0.010 (0.078)	-0.058 (0.058)	0.010** (0.003)	-0.031 (0.064)	-0.028 (0.029)	-0.006** (0.003)	0.024† (0.015)	0.091 (0.111)	0.253** (0.048)	0.284 (35.5%)	0.074 (26.1%)	0.516 (64.5%)	0.015 (2.9%)	36.669	0.261
Trad. m/f attitudes (n=600)	-0.093** (0.015)	-0.227** (0.044)	-0.169** (0.041)	0.017** (0.002)	0.077* (0.044)	0.025† (0.019)	-0.002 (0.002)	0.003 (0.010)	0.019 (0.073)	0.126** (0.032)	0.177 (27.8%)	0.078 (44.3%)	0.460 (72.2%)	0.080 (17.4%)	32.490	0.443

[a]The variance in the dependent variable is decomposed in a between-family variance and a within-family variance. In parentheses, these variance components are presented as percentages of the total variance. The column 'Between expl.' indicates how much of the between-family variance can be explained by the measured indicators included in the analysis. In parentheses, this variance explained is presented as a percentage of the total between-family variance. The same holds for the explained part in the within-family variance (column: 'Within expl.').
†$p < 0.10$; *$p < 0.05$; **$p < 0.01$.

and church attendance to a large degree. According to the estimates of the sibling model, 41.8 and 54.0 per cent, respectively, of all variance can be attributed to the family. For cultural conservatism, this percentage is also rather high (35.5 per cent), but it is fairly low for economic conservatism (14.2 per cent) and for conventional political participation (9.8 per cent). We find the same differences in Table 2, when we look at the correlation coefficients between respondent's and sibling's social orientations. Sibling analysis also makes it possible to estimate the extent to which measured family characteristics account for the total family impact. The five components of family background and the family effect of educational attainment together explain only 30 to 40 per cent of the between-family variance. One exception in this respect is post-materialism: the measured indicators explain no less than 63.2 per cent of total family impact. However, if we exclude the family effect of educational attainment, the percentage of variance in post-materialism explained is 27.6 per cent (not shown here). All this implies that it is unmeasured family factors that constitute most of the total family impact on social orientations, and that conventional research on attitudes and behaviour underestimates the influence of family background when including measured aspects of the family only.

The effects of educational attainment on social orientations, our primary research object, are reported in the second and third columns of Table 3. We differentiate between a regression coefficient of educational attainment between families (the family effect of education) and two regression coefficients of educational attainment within families (the individual effect of education). The family effects show to what extent the same (measured and unmeasured) family characteristics predict both variation in educational attainment and variation in social orientations. The individual effects of education on orientations are the unbiased individual effects of schooling on social orientations. The estimates show that, with the perfect control for family background provided by sibling models, educational attainment has no effect at all on religious beliefs, church attendance, political party preference, economic conservatism or cultural conservatism.

In addition, it is interesting to see that the family effect of educational attainment is significantly larger than the individual effect of education in three cases.[8] Brothers and sisters with different levels of educational attainment still highly resemble each other in unconventional political participation, post-materialism and traditional male/female attitudes, because they grew up in the same

family with a certain educational climate. Or, in other words, for these types of social orientation it is *between families* that large differences exist. Dutch women and men who grew up in families in which children had a high likelihood of attaining a high level of education participate more often in unconventional political activities, are more post-materialist and have less traditional male/female attitudes than Dutch women and men who grew up in a family with lower educational prospects. The differences within families are much smaller for these orientations, which means that siblings with different levels of educational attainment highly resemble each other in unconventional political participation, post-materialism and traditional male/female attitudes. Thus, it is the educational climate in the family that affects these social orientations. Within a family, less well-educated siblings are possibly pulled 'upwards' by their more highly educated brothers and sisters, and, therefore, have social orientations that, strictly speaking, are associated with the more highly educated. In the same way, more highly educated siblings may be influenced by their less well-educated brothers and sisters.

Table 4 gives more detailed results on the size of the bias in the effect of individual educational attainment. This table presents the standardized effects of educational attainment in four regression models: a bivariate model (A), a model with the demographic controls of sex, age and being firstborn (B), a model with measured effects of family background, including parents' church membership and political membership (C), and the unbiased effect from the sibling model (D). In all models it is assumed that the effects of educational attainment are equal for primary respondents and their sibling; this assumption is tested to be valid for all models. Comparing the results of models A, B and C shows that the effects of educational attainment on social orientations decrease when controls are included in the regression model: the effects are lower when individual demographic variables are included and decrease even more when family background variables are added.

A comparison of the results of models B and C shows to what extent the effects of individual educational attainment are biased in a model without controls for measured aspects of social background. We observe that the effects of educational attainment are, on average, overestimated by a factor of 1.46. For example, the effect of educational attainment on orthodox religious beliefs is overestimated by a factor of $(-0.063/-0.042 =)$ 1.50. In three cases, the effect of educational attainment decreases to below statistical significance. It seems very important indeed to control for the socializing impact of

Table 4 Standardized effects of educational attainment on social orientation

Dependent variable	Model A Bivariate effect	Model B Effect control I: regression analysis[a]	Model C Effect control II: regression analysis[b]	Over-estimation (B)/(C)	Model D Within-family effect sibling analysis	Over-estimation (C)/(D)
Orthodox religious beliefs	−0.107**	−0.063*	−0.042	1.50	0.011	4.82
Church attendance	−0.104**	−0.052**	−0.017	3.06	0.016	2.06
Political party preference	−0.073**	−0.073**	−0.087**	0.84	−0.039	2.23
Left-wing or right-wing political orientation	−0.115**	−0.091**	−0.117**	0.78	−0.075†	1.56
Conventional political participation	0.197**	0.223**	0.189**	1.18	0.158**	1.20
Unconventional political participation	0.250**	0.225**	0.224**	1.00	0.095*	2.36
Post-materialism	0.301**	0.295**	0.257**	1.15	0.133**	1.93
Economic conservatism	0.132**	0.128**	0.067*	1.91	0.039	1.72
Cultural conservatism	−0.106**	−0.073**	−0.035	2.09	−0.049	0.71
Traditional male/female attitudes	−0.400**	−0.358**	−0.344**	1.04	−0.237**	1.45
Average overestimation				1.46		2.00

[a]Controlled for the individual characteristics of sex, age and being the firstborn in a family or not.
[b]Controlled for the individual characteristics sex, age and being the firstborn in a family or not, and for the measured indicators of family background, i.e. parents' educational attainment, occupational status, church membership, political party membership and family size.
†$p < 0.10$; *$p < 0.05$; **$p < 0.01$.

the family. However, in the conventional regression Model C, we only eliminate biases in the effects of social origins that can be measured. This is evident when we compare the results of Model C with the results of the sibling model (D). Now we observe that, on average, the conventional design still overestimates the effect of educational attainment on social orientations by a factor of 2.0. This factor may give a false idea of the overestimation because in three cases the effect of education was already insignificant in Model C. When we compare the outcomes of models C and D only for the seven significant effects of educational attainment in the conventional model, the sibling models produce effects of education that are, on average, a factor of 1.78 lower than the conventional models. Apparently it is not enough to include only measured family characteristics in the analysis. The effect of education would be overestimated by about 78 per cent. Even more dramatic is that the bivariate associations between educational attainment and social orientations are, on average, 2.5 times higher than the effects of education on these orientations.

Conclusions and Discussion

Many studies have shown that educational attainment is often the strongest correlate of political, religious and normative orientations. This has prompted much research on the extracurricular impact of schooling on students. In this study, however, we show that a large part of the relationship between educational attainment and social orientations is not due to the effects of schooling but to the dependency of both educational attainment and social orientations on family background. Part of this family background bias can be corrected by including controls for socio-economic background characteristics and for social orientations in the family of origin in the model, but our sibling analysis shows that more than half of the bias is not covered by measured variables. Apparently, family background is more than what these conventional sociological variables measure, and other aspects of the home environment seem to affect both children's educational careers and social orientations. Question about the content of such unmeasured variables are hard to answer, simply because the variables are not measured, but we think that socializing practices, the intellectual climate and the resources within the family of origin are the most likely candidates.

For three of the ten social orientations investigated, we found that family effects of educational attainment

are considerably larger than individual effects. This finding tells us something about the impact of schooling, since one way to explain it is that skills and orientations that are learned at school are brought home and shared with brothers and sisters. There may, thus, be reciprocal effects between siblings, both with respect to educational decisions and with respect to social orientations. Such reciprocal effects are part of the between-family effects, and are part of the story of how going to school affects orientations. Nevertheless, this is only speculation. We think that the largest part of the between-family effects are not due to such sibling interactions but can be explained by unmeasured aspects of the parental home, which are not the consequence but the causes of both children's educational attainment and their social orientations.

Another point of potential criticism is that we followed the common practice in this research field by focusing on the level of education obtained as the major dimension of the impact of schooling. We think that progress could be made by analysing more dimensions of schooling that may affect social orientations. In the Netherlands, such dimensions of the educational system can be found in the distinction between private schools (*bijzonder onderwijs*) and public schools (*openbaar onderwijs*). Both types of schools are present on all levels of the educational system – primary, secondary and tertiary education. Public schools are run by the government, whereas private schools are run by special interest boards of governors, often of religious composition. Another important distinction in the Dutch system can be made between general and vocational education, and – within vocational education – between different types of vocational training. When these and other dimensions of an educational system are brought into the analysis, the extra-curricular effects of schooling can be established more precisely. A more balanced assessment of the relative influence of school and family would result from a double context design (Nagel and Ganzeboom, 2002), in which the resemblance between siblings represents total family impact and the resemblance between schoolmates represents total school impact.

In this study, we conclude that social origins have strong effects on social orientations, stronger than the effects of education. The sibling models show that only with regard to political participation, post-materialism, and traditional male/female values are there significant effects of schooling. Religious beliefs and church attendance, political party preference, and cultural and economic conservatism are not affected by educational attainment, in the sense that, within a family higher-educated siblings do not have other

social orientations than lower-educated siblings. It remains a puzzle to explain why some social orientations are affected by schooling and others are not, and we feel that the merit of our contribution is more that we have identified the different effects of schooling rather than that we have contributed to the solution of this puzzle.

To conclude, we would like to emphasize that our finding that social origins matter more than educational attainment may be surprising to some, especially to those who study the determinants of social stratification and the labour market. In the modern labour market diplomas have their own importance, and children with the same levels of education go to the same occupational destination whatever their social background. Sibling analysis has been an important tool to enable us to arrive at this firm conclusion: siblings with different levels of education attain different job levels. With regard to the cultural domain, however, we have to tell a different story: social origins do make a difference, and often more so than education. Siblings with different levels of schooling often have similar social orientations. For future research, this means that those who want to explain individual variation in social orientations should be cautious: the relationships between educational attainment and social orientations and values are often spurious. That this conclusion has important theoretical implications will be clear. The experience of schooling does not matter as much as the relationship between educational attainment and social orientations suggests.

Notes

1. These are our own calculations based on the data analysed in this study, that is the Family Surveys of the Dutch Population 1992 and 1998. The two examples pertain to Dutch women and men of 30–50 years of age. The age selection warrants that differences between the higher and the lower educated are not caused by cohort differences in educational attainment.

2. We use the term *unbiased* effect of schooling to indicate the net effect of educational attainment after completely controlling for family background. All effects of the family of origin have been removed from the effect of schooling. Only in this way can we be sure that the influence of educational attainment on social orientations really is an effect of schooling itself. Of course, other socialization agents than the family exist that exert an influence on orientations, such as clubs, media and peer groups. It would be interesting to investigate whether these socialization

agents influence both educational attainment and social orientations, and, in this way, cause a (further) decline in the effect of schooling.

3. Compared to primary respondents from the 1992 survey, primary respondents from the 1998 survey are somewhat more highly educated. This finding is not so surprising, since six years passed between the two points of data collection. The respondents from the 1998 survey also have more highly educated parents, grew up in smaller families, prefer more right-wing parties, and are less post-materialist than the respondents from the 1992 survey. These differences can be explained to a large degree by the six-year period between the surveys. Analyses not presented in this paper show that the estimated effects are statistically equal for both surveys.

4. To test the significance of the difference between two correlation coefficients obtained from two different random samples, we used Fisher's z transformations (Cohen and Cohen, 1983):

$$z = \frac{z_1 - z_2}{\sqrt{(1/n_1 - 3) + (1/n_2 - 3)}}$$

in which $z_1 = \frac{1}{2} \ln [(1 + r_1)/(1 - r_2)]$ and $z_2 = \frac{1}{2} \ln [(1 + r_2)/(1 - r_2)]$. In our case $r_1 = 0.392$; $n_1 = 708$; $r_2 = 0.480$; and $n_2 = 480$, yielding $z = -1.836$ with $p = 0.033$. We thus conclude that the difference between the two correlation coefficients is moderately significant.

5. We distinguished between three time frames of returning the questionnaire. In the first time frame, the sibling returned the questionnaire within 29 days, that is, before the first reminder was sent. In the second time frame, the questionnaire was returned between 29 and 42 days. This is the time period between the first and second reminder. In the third time frame, the sibling returned the questionnaire after 42 days, thus after the second reminder was sent. The correlation coefficients between respondent's and sibling's educational attainment, church attendance, political party preference, post-materialism and traditional male/female attitudes are shown in Table 5 below. In some cases, sibling resemblance turns out to decrease, in other cases it increases between time frames. Overall, no systematic pattern can be discerned.

6. Although very interesting in itself, we will not pay much attention to cohort differences. The Netherlands has experienced major cultural changes over the last decades, mainly in the direction of less

Table 5 Correlation coefficients between respondent's and sibling's educational attainment and social orientations for different time frames

	Correlation coefficients			
	Within 29 days (n = 491)	29–42 days (n = 92)	After 42 days (n = 127)	Total (n = 710)
Educational attainment	0.401	0.364	0.361	0.392
Church attendance	0.516	0.649	0.483	0.526
Political party preference	0.176	0.587	0.413	0.268
Post-materialism	0.208	0.217	0.142	0.199
Traditional male-female attitudes	0.312	0.480	0.426	0.364

Table 6 Chi^2-fit statistics for two sibling models

	$\beta_{31} = \beta_{42} = \beta_{65}$ (df = 33)	$\beta_{31} = \beta_{42} \neq \beta_{65}$ (df = 32)	Improvement in fit (df = 1)
Orthodox religious beliefs	35.444	34.119	1.325
Church attendance	42.381	41.055	1.326
Political party preference	32.168	29.222	2.946
Left-wing or right-wing political orientation	35.789	35.252	0.557
Conventional political participation	43.957	43.749	0.001
Unconventional political participation	40.711	34.749	5.962*
Post-materialism	41.726	30.226	11.500**
Economic conservatism	26.189	26.381	0.191
Cultural conservatism	36.770	36.669	0.101
Traditional male/female attitudes	39.295	32.490	6.805**

*$p < 0.05$; **$p < 0.01$.

traditional ways of life. An overview of recent developments can be found in a report by the Social and Cultural Planning Office (1998).

7. There is one exception: church membership. A model in which the effects of age on education and on church membership, and the effect of firstborn on education are allowed to vary between respondents and siblings ($\gamma_{18} \neq \gamma_{29}$; $\gamma_{38} \neq \gamma_{49}$; $\gamma_{310} \neq \gamma_{411}$) has a significantly better fit than a model with equality constraints ($\delta_{\chi2} = 15.45$; df = 6; p = 0.017).

8. We compared a model in which the regression coefficients within families are assumed to be equal to the regression coefficient between families ($\beta_{31} = \beta_{42} = \beta_{65}$) to a model in which these coefficients are not assumed to be equal ($\beta_{31} = \beta_{42} \neq \beta_{65}$). The Table 6 below shows the χ^2-fit measures and the improvement in fit for each social orientation.

References

Acock, A. C. and Bengtson, V. L. (1978). On the Relative Influence of Mothers and Fathers: A Covariance Analysis of Political and Religious Socialization, *Journal of Marriage and the Family*, **40**, 519–530.

Barnes, S. H. and Kaase, M. (1979). *Political Action: Mass Participation in Five Western Democracies*. Beverly Hills, CA: Sage.

Beit-Hallahmi, B. and Argyle, M. (1997). *The Psychology of Religious Behaviour, Belief and Experience*. London: Routledge.

Cohen, J. and Cohen, P. (1983). *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences*. Hillsdale, NJ: Lawrence Erlbaum Associates.

De Graaf, N. D. and De Graaf, P. M. (1988). Family Background, Postmaterialism and Life Style, *Netherlands' Journal of Sociology*, **24**, 50–64.

De Graaf, N. D., De Graaf, P. M., Kraaykamp, G. and Ultee, W.C. (1999). *Family Survey Dutch Population 1998* [machine-readable datafile; distributor Steinmetz archive P1583]. Nijmegen: Department of Sociology, University of Nijmegen.

De Vaus, D. and McAllister, I. (1989). The Changing Role of Women: Gender and Political Allignment in 11 Nations, *European Journal of Political Research*, **17**, 241–263.

Felling, B. and Peters, J. (1986) Conservatism: A Multi-dimensional Concept, *Netherlands' Journal of Sociology*, **22**, 36–60.

Ganzeboom, H. B. G., De Graaf, P. M. and Treiman, D.J. with an appendix by De Leeuw, J. (1992). A Standard International Socio-economic Index of Occupational Status, *Social Science Research*, **21**, 1–56.

Griliches, Z. (1979). Sibling Models and Data in Economics: Beginnings of a Survey, *Journal of Political Economy*, **87**, S37–S64.

Gijsberts, M. (1999). *The Legitimisation of Inequality in State-socialist and Market Societies. 1987–1996*. Amsterdam: Thela Thesis.

Hauser, R. M. and Mossel, P. A. (1985). Fraternal Resemblance in Educational Attainment and Occupational Status, *American Journal of Sociology*, **91**, 650–673.

Hauser, R. M. and Sewell, W. H. (1986). Family Effects in Simple Models of Education, Occupational Status and Earnings: Findings from the Wisconsin and Kalamazoo Studies, *Journal of Labor Economics*, **4**, S83–S120.

Hyman, H. H. and Wright, C. R. (1979). *Education's Lasting Influence on Values*. Chicago, IL: The University of Chicago Press.

Inglehart, R. (1977). *The Silent Revolution. Changing Values and Political Styles among Western Publics*, Princeton, NJ: Princeton University Press.

Jackman, M. R. and Muha, M. J. (1984). Education and Intergroup Attitudes: Moral Enlightenment, Superficial Democratic Commitment, or Ideological Refinement? *American Sociological Review*, **49**, 751–769.

Jöreskog, K. G. and Sörbom, D. (1999). *LISREL 8.30*. Chicago, IL: Scientific Software International.

Kelley, J. and De Graaf, N. D. (1997). National Context, Parental Socialization, and Religious Belief, Results from 15 Nations, *American Sociological Review*, **62**, 639–659.

Kohn, M. L. (1969). *Class and Conformity: a Study in Values*. Chicago, IL: University of Chicago Press.

Lipset, S. M. (1981). *Political Man. The Social Bases of Politics*. Baltimore, MA: Johns Hopkins University Press.

Nagel, I. and Ganzeboom, H. (2002). Participation in Legitimate Culture: the Effect of Family and School from Adolescence to Adulthood, *Netherlands' Journal of Social Sciences*, **38**, 102–120.

Need, A. (1997). *The Kindred Vote. Individual and Family Effects of Social Class and Religion on Electoral Change in the Netherlands, 1956–1994*. Nijmegen: ICS Dissertation.

Nieuwbeerta, P. and Wittebrood, K. (1995). Intergenerational Transmission of Political Party Preference in the Netherlands, *Social Science Research*, **24**, 243–261.

Pallas, A. M. (2000). The Effects of Schooling on Individual Lives. In Hallinan. M. T. (Ed.), *Handbook of the Sociology of Education*. New York: Kluwer Academic/Plenum Publishers, pp. 499–525.

Phelan, J., Link, B. C., Stueve, A. and Moore, R. E. (1995). Education, Social Liberalism, and Economic Conservatism: Attitudes towards Homeless People, *American Sociological Review*, **60**, 126–140.

Sieben, I. and De Graaf, P. M. (2001). Testing the Modernization Hypothesis and the Socialist Ideology Hypothesis: a Comparative Sibling Analysis of Educational Attainment and Occupational Status, *British Journal of Sociology*, **52**, 441–467.

Social and Cultural Planning Office (1998). *Social and Cultural Report 1998: 25 Years of Social Change*. The Hague: SCP.

Sulloway, F. (1996). *Born to Rebel: Birth Order, Family Dynamics, and Creative Lives*. New York: Pantheon.

Taubman, J. (1976). The Determinants of Earnings: Genetics, Family and Other Environments: a Study of White Male Twins, *American Economic Review*, **66**, 858–870.

Ultee, W. C. and Ganzeboom, H. B. G. (1993). *Family Survey Dutch Population 1992–1993* [machine-readable datafile; distributor Steinmetz archive P1245]. Nijmegen: Department of Sociology, University of Nijmegen.

Van der Slik, F. W. P. and Scheepers, P. (1997). Religieuze socialisatie in het ouderlijk gezin: een sibling-analyse [Religious Socialization in the Parental Family: a Sibling Analysis], *Sociale Wetenschappen*, **40**, 44–62.

Van Eijck, K. (1996). *Family and Opportunity. A Sibling Analysis of the Impact of Family Background on Education, Occupation, and Consumption*. Tilburg: Tilburg University Press.

Van Eijck, K. (1997). The impact of family background and educational attainment on cultural consumption: A sibling analysis, *Poetics*, **25**, 195–224.

Vogt, W. P. (1997). *Tolerance and Education: Learning to Live with Diversity and Difference*. Thousand Oaks, CA: Sage Publications.

Wilcox, C. (1991). Support for Gender Equality in West Europe, *European Journal of Political Research*, **20**, 127–147.

Authors' Addresses

Inge Sieben, Research Center for Education and the Labor Market (ROA), Maastricht University, PO Box 616, 6200 MD Maastricht, The Netherlands. E-mail: I.Sieben@roa.unimaas.nl

Paul M. de Graaf, Department of Sociology/ICS, University of Nijmegen, PO Box 9200, 6500 HE Nijmegen, The Netherlands. E-mail: pdegraaf@ mailbox.kun.nl

Appendix

Operationalization of variables used in this study

Sex respondent/sibling: 0 = man; 1 = woman.

Age respondent/sibling: in years.

Firstborn respondent/sibling: 0 = not first-born; 1 = first-born in family.

Educational attainment respondent/sibling/parents: 1 = primary education (lo); 2 = lower vocational training (lbo); 3 = lower general secondary education (mavo); 4 = higher general secondary education (havo); 5 = middle vocational training (mbo); 6 = pre-university education (vwo); 7 = higher vocational training (hbo); 8 = university (wo); 9 = post-university education (wo+).

Occupational status parents: International Socio-Economic Status (cf. Ganzeboom *et al.*, 1992).

Number of siblings: number of brothers and sisters of primary respondent added by one (i.e. the primary respondent).

Church membership parents: 0 = no; 1 = yes.

Political party preference respondent/sibling/parents: 1 = Groen Links, SP; 2 = PvdA; 3 = CDA, D'66, Unie 55+, AOV; 4 = VVD; 5 = SGP, GPV, RPF, CD (cf. Gijsberts, 1999).

Orthodox religious beliefs respondent/sibling: 1 = not orthodox religious; 5 = very orthodox religious; based on average score on 'I believe in the existence of a heaven', 'I believe in the existence of a hell', 'I believe in the existence of a devil', 'there is a God who is personally engaged in every human being', 'after death, everything is over according to me', '*I do not think there exists a God'; Cronbach's alpha = 0.87 (respondent) and 0.89 (sibling).

Church attendance respondent/sibling: 1 = never attend church; 2 = attend church once or a few times a year; 3 = attend church once a month; 4 = attend church once a week or more.

Left-wing or right-wing political orientations respondent/sibling: 1 = extreme left; 10 = extreme right.

Conventional political participation respondent/sibling: number of times one sometimes or often 'reads about politics in the newspaper', 'talks about politics with others', 'tries to persuade friends to vote like yourself', 'attends a political meeting', 'has personal contact with politicians', 'works for a political party or electoral candidate'; Cronbach's alpha = 0.65 (respondent) and 0.68 (sibling).

Unconventional political participation respondent/sibling: number of times one reports to have participated in a 'political petition', 'boycott', 'legal demonstration', 'rent or tax refusal', 'wild strikes', 'union strike', 'occupation of buildings or factories', 'traffic blockade' in the past five years; Cronbach's alpha = 0.62 (respondent) and 0.67 (sibling).

Post-materialism: 1 = materialist; 6 = post-materialist; based on the indicated sequence of importance of political goals (see table below). Materialist goals are 'maintain order in the nation', and 'fight rising prices'; post-materialist goals are 'give people more say in politics', and 'protect the freedom of speech'.

Post-materialism	Most important goal	Second important goal	Third important goal	Least important goal
1	Materialist	Materialist	Post-materialist	Post-materialist
2	Materialist	Post-materialist	Materialist	Post-materialist
3	Materialist	Post-materialist	Post-materialist	Materialist
4	Post-materialist	Materialist	Materialist	Post-materialist
5	Post-materialist	Materialist	Post-materialist	Materialist
6	Post-materialist	Post-materialist	Materialist	Materialist

Economic conservatism respondent/sibling: 1 = not economically conservative; 5 = very economically conservative; based on the average score on 'differences between high and low incomes should be larger than they are now', 'in the Netherlands, employment benefits are much too high at this moment', '*trade unions should conduct a much harder policy in order to serve interests of employees best', '*living off social security in the Netherlands is not very easy', '*the government should oblige businesses to let employees share in the profit as much as shareholders'; Cronbach's alpha = 0.60 (respondent) and 0.59 (sibling).

Cultural conservatism respondent/sibling: 1 = not culturally conservative; 5 = very culturally conservative; based on the average score on '*if someone really does not see the meaning of life anymore, he or she has the right to commit suicide', '*someone who is old and sick and who doesn't want to live anymore, should have the right to request of a doctor to die gently', '*it should be possible for a woman to have an abortion whenever she wants to', '*doctors should be allowed to put someone out of his misery by putting him to sleep'; Cronbach's alpha = 0.74 (respondent) and 0.80 (sibling).

Traditional male/female attitudes: 1 = not traditional; 5 = very traditional; based on the average score on 'a woman is more fit to raise little children than a man', 'if a husband doesn't want his wife to work, she should resign herself to that', 'it is unnatural for women to be in charge over men in a company', 'actually, women with children should only have a job when they are sure that they have enough time left for their children', 'a mother should see to it that she is at home when her children return from school', 'by nature, men are unsuitable for domestic work'; Cronbach's alpha = 0.80 (respondent) and 0.78 (sibling).

*All items with an asterisk are recoded in the opposite direction.