Low Level of Equal Opportunities in Germany: Family Background Shapes Individual Economic Success

by Daniel D. Schnitzlein

For many years, securing equal life opportunities has been a normative goal shared by all democratic societies in the western world. Although, in principle, all citizens enjoy the same rights, in reality, individual life opportunities still vary according to family background which, in turn, shapes the prevailing pattern of social inequality. This is not a specifically German phenomenon.

Based on a new methodology, the present findings demonstrate that, in Germany, family background has a significant impact on individual earnings, family income, hourly wages, and also educational success: 40 percent of individual earnings inequality can be explained by family background. In the case of educational achievement, this figure even exceeds 50 percent.

By international standards, this places equality of opportunity in Germany at a similarly low level as in the US and significantly lower than in Denmark.

»We should not tolerate children being unable to develop their talents because of a lack of equal opportunities. We should not tolerate people having the impression that performance is no longer worthwhile for them, and that they will never advance even if they make every effort to do so,« said Joachim Gauck[1] concisely in his speech in front of the German Bundestag after being sworn in as Federal President of Germany, about achieving a goal which can be found in almost all westernized societies—the goal of equal opportunities.

The term »equal opportunities« does not mean advancement for all. Rather, it denotes a situation in which everybody has a fair opportunity for advancement—in terms of their abilities—during the course of their lives. Labor market success, educational achievement, or just the social status of a person should depend primarily on factors that can be attributed to individual talents and abilities and which are, therefore, under the control of the individuals. »Environmental factors,« that is, all the factors that an individual cannot influence should have no effect on their own success or failure. The economist and political scientist John E. Roemer calls this society preparing a level playing field.[2] However, the game should be played by each individual person.

According to this definition, equal opportunity is closely related to the degree of social mobility in a society: thus, the family background, for example, the social position of the family from which one originates is a factor that individuals cannot influence. If an individual's own

1 Joachim Gauck, March 23, 2012: Speech after the swearing-in ceremony of the Federal President of Germany. Deutscher Bundestag, Berlin, www.bundespraesident.de/SharedDocs/Reden/DE/Joachim-Gauck/Reden/2012/03/120323-Vereidigung-des-Bundespraesidenten.html.

2 J.E. Roemer, Equality of Opportunity (Cambridge/London: 1998). For an empirical application, see J.E. Roemer, R. Aaberge, U. Colombino, J. Fritzell, S.P. Jenkins, A. Lefranc, I. Marx, M. Page, E. Pommer, J. Ruiz-Castillo, M.J. San Segundo, T. Tranaes, A. Trannoy, G.G. Wagner, and I. Zubiri, »To what extent do fiscal regimes equalize opportunities for income acquisition among citizens?,« Journal of Public Economics 87 (3-4) (2003) 539-565.

success depends largely on this factor, the consequence for society is low social mobility, and the goal of equality of opportunity is inadequately achieved.

The present study examines the extent to which education and labor market success in Germany depend on the individual's family background.[3] In order to put the results more in context, the situation in Germany has been compared with the situations in Denmark and the US. These two countries were chosen because, compared internationally, they represent the extreme points on the scale of social mobility. Denmark is a typical representative of the Scandinavian countries, which have a high level of social mobility and, as a result, also of equal opportunities. The USA has—contrary to the popular »rags to riches« myth—in fact had a very low level of social mobility for decades.[4]

The present analysis uses the German Socio-Economic Panel Study (SOEP) as the data basis for Germany. As part of this longitudinal study, DIW Berlin, in cooperation with the fieldwork organization TNS Infratest Sozialforschung, has surveyed a representative sample of households in Germany every year since 1984. More than 20,000 people in more than 11,000 households currently participate in the survey. The data for the US comes from a study comparable in structure and content to SOEP,[5] the Panel Study of Income Dynamics (PSID).[6] The information for Denmark comes from a random sample of official Danish registry data (IDA), which is made available for scientific purposes.[7]

Sibling Correlations as a Measure of Equal Opportunities in a Society

The decisive factor in determining equal opportunities is estimating the extent to which family background influences the economic success of the individual. The majority of studies to date have attempted to estimate the effect of parental income or parental education (in most cases, the father's income or education) on the income or education of the children.[8]

In the conventional direct analysis of family backgrounds, only factors that can be incorporated in the models can be taken into account. As a result, the effect of the father's income on the income of the son or the correlation between the level of education of the mother and the daughter can be calculated. The influence of family background, however, encompasses much more than just easily measurable factors such as parental income or education.[9] A complete description of the entire family situation would require very extensive data on both the parents' and the child's generation that are not available in such detail anywhere in the world. In measuring equal opportunity, therefore, the direct analysis falls short.

In the present study, an alternative approach was chosen. Instead of comparing parents with their children, the study analyzes how similar the siblings are. The idea is that if a substantial intergenerational relationship is present, two siblings should be significantly more similar than two randomly selected individuals.[10] So the effect of family background is measured indirectly, thereby also taking into account the influence of the genetic dispositions of talents and abilities within a family (see box).

In modeling the similarity of siblings, all factors that are shared by the observed siblings during their joint socialization are taken into account statistically.[11] Besides the classical factors such as parents' education, parenting styles and parents' values passed on to their children as part of their upbringing are also included in the study. Consequently, the sibling correlation is a much broader measure of the statistical influence of family background on an individual's economic success than the

3 The full study is published as D.D. Schnitzlein, »How important is the family? Evidence from sibling correlations in permanent earnings in the United States, Germany, and Denmark,« Journal of Population Economics (2013, online first), DOI: 10.1007/s00148-013-0468-6.

4 An overview can be found in M. Corak, »Do poor children become poor adults? Lessons from a cross-country comparison of generational earnings mobility,« Research on Economic Inequality 13(1) (2006): 143-188.

5 See G.G. Wagner, J.R. Frick, and J. Schupp, »The German Socio-Economic Panel Study (SOEP) – Scope, Evolution and Enhancements,« Schmollers Jahrbuch 127(1) (2007): 161–191.

6 M.S. Hill, The panel study of income dynamics: a user's guide (Newbury Park, CA, 1992).

7 An overview of the IDA data can be found in B. Timmermans, »The Danish integrated database for labor market research: towards demystification for the English speaking audience,« DRUID Working Paper 10-16 (Danish Research Unit for Industrial Dynamics, 2010).

8 An overview can be found in S.E. Black and P. Devereux, »Recent developments in intergenerational mobility,« in: O. Ashenfelter, D. Card, (eds.), Handbook of labor economics, vol. 4B, (Amsterdam: 2010): 1487–1542.

9 Studies from the US and Sweden have shown that, for example, parental income accounts for less than 50 percent of the influence of family background. See B. Mazumder, »Sibling similarities and economic inequality in the U.S.,« Journal of Population Economics 21 (2008): 685-701 and A. Björklund, L. Lindahl, and M.J. Lindquist, »What more than parental income, education and occupation? An exploration of what Swedish siblings get from their parents,« The B.E. Journal of Economic Analysis & Policy 10(1), Article 102 (2010).

10 G. Solon, M. Corcoran, R. Gordon, and D. Laren, »A Longitudinal Analysis of Sibling Correlations in Economic Status,« The Journal of Human Resources 26 (3) (1991): 509–534.

11 The influence of divorce on siblings and of siblings being separated is not examined in detail in the following study. But when the divorce of the parents is a factor that all the siblings share in their socialization, the effect on the influence of family background is taken into account.

Sibling Correlations As a Measure of Social Mobility

Sibling correlations are used to statistically estimate the influence of family background on an individual's educational and labor market success. The starting point is a simple statistical model.[1] y_{ij} is a long-term income observation, adjusted for temporary fluctuations, for person j, belonging to family i. It is assumed that this income observation consists of two components—component a is determined by family background, or all factors the siblings share, and component b represents the single influence of the individual. This results in the following formula for the income observation:

$$y_{ij}=a_i + b_{ij} \qquad (1)$$

The individual components can be understood as an individual deviation from a family-specific mean. The correlation of the income of the two siblings, the sibling correlation, is as follows:

$$r = \frac{Var(a_i)}{Var(a_i) + Var(b_{ij})} = \frac{Var(a_i)}{Var(y_{ij})} \qquad (2)$$

A sibling correlation therefore indicates the proportion of variance in income that is attributable to the influence of family background. Since the variance in income is a measure of income inequality, the sibling correlation can also be interpreted as the proportion of inequality due to the influence of family background.

The variances required for calculating the sibling correlation are estimated using a multilevel model. Since there are no data on long-term income observations, annual observations y_{ijt} were used and the model was specified so as to adjust for short-term fluctuations. The estimation model chosen was:

$$y_{ijt} = x_{ijt}\beta + a_i + b_{ij} + v_{ijt} \qquad (3)$$

x_{ijt} are control variables which include age, age squared, and annual indicators to reflect age and year effects. a_i and b_{ij}, as defined above, are the family-specific and individual components. The last term in the model v_{ijt} models transitory fluctuations. As a result, short-term fluctuations are eliminated from the annual income observation.[2] The variances a_i und b_{ij} required to calculate sibling correlation were estimated on the basis of this model and then used to calculate sibling correlation.[3]

This model, shown here using income observation as an example, was also applied to the further measures listed in the report. In the case of sibling correlation of educational years and siblings correlation of height, only one—the most recent—observation per person was used since it was not necessary to adjust for short-term fluctuations here. For this reason, only a reduced model without the term v_{ijt} was statistically estimated in these cases.

This method identifies the influence of family background based on observations on the siblings. In order to make reliable statements, a sufficient share of children must have siblings in the countries being studied. This is not a problem here. In 2007, 72.3 percent of children under the age of 14 living in Germany had at least one sibling. In the US, it was 79.7 percent in the same year.[4] Statistics Denmark reported a proportion of 78 percent in Denmark. As the people surveyed in this report belong to older birth cohorts, the rates for these age groups may be even higher.

The component a_i in the above model is determined by all factors shared by the siblings observed.[5] Therefore, only factors that are identical or similar for both siblings are taken into account.[6] This means that sibling-specific factors of family background were not considered. In a recent review article on the method, economists Björklund and Jäntti argue that a sibling correlation still is a lower bound of the influence of family background despite its very broad definition.[7]

1 More details can be found in G. Solon, »Intergenerational mobility in the labor market,« in: O. Ashenfelter and D. Card (eds.), Handbook of Labor Economics, vol. 3A, (Amsterdam, 1999), 1761-1800.

2 A detailed discussion can be found, among others, in B. Mazumder, »Sibling similarities and economic inequality in the U.S.,« Journal of Population Economics 21, (2008): 685-701.

3 In detail, the model was estimated according to Restricted Maximum Likelihood and the standard errors of the sibling correlations were then calculated using the bivariate Delta method.

4 OECD Family database Table SF1.2.C.

5 See also the discussion in footnote 12 in the main text.

6 In addition to characteristics of family background, this may be the interaction of two siblings.

7 A. Björklund and M. Jäntti, »How important is family background for labour economic outcomes?« Labour Economics 19 (4), (2012): 465-474.

Table 1

Sibling Correlations[1] in Individual Earnings, Family Income, and Hourly Wages[2] in Germany

	Individual earnings	Family income	Hourly wages
Brothers			
Sibling correlation	**0.432**	**0.473**	**0.455**
Standard error	(0.078)	(0.067)	(0.074)
Number of observations	4,874	5,051	4,690
Number of individuals	1,014	1,036	983
Number of families	858	873	831
Sisters			
Sibling correlation	**0.391**	**0.323**	**0.463**
Standard error	(0.107)	(0.106)	(0.117)
Number of observations	2,945	3,693	2,902
Number of Individuals	704	792	692
Number of families	642	710	630

1 Sibling correlations are based on variance components and were estimated using multilevel models. The effects of age and years were taken into account in the models.
2 Only observed income from persons aged between 31 and 49 was included in the sample. Observed income of less than EUR 1,200 per year was excluded, as were hourly wages of less than two euros.
Source: SOEPv25 (2002-2008).

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For men, about 43 percent of the variation (inequality) in an individual's earned income can be explained by family background.

common models used previously that directly model the intergenerational relationship.[12]

Family Background Explains Almost Half of the Inequality in Individual Earnings in Germany

Table 1 lists the estimated sibling correlations for different types of income in Germany. The first column shows the results for yearly individual earnings. The estimated sibling correlation for men is 0.43 meaning that family background explains 43 percent of the variation—the inequality—of individual earnings of men.[13] For women, this figure was slightly lower at 39 percent, but the difference to the figure for men is not statistically significant.

This strong influence of family background can not only be found in yearly individual earnings, but also in hourly wages. Again, the results are very similar for men and women. The sibling correlations are both 0.46, meaning that 46 percent of the inequality in hourly wages can be explained by factors that are shared by the siblings. A rather more nuanced picture emerges when one examines the income situation of the current family of the individual in question instead of his or her individual income. This shows an increase in sibling correlation for men to 0.47, while the influence of family background in women is lower (0.32) than in the case of individual income.

Family Background Is More Important for Success in Education Than for Height–Which Is Largely Genetic

The strong influence of family background is not only reflected in the level of income, but also in other important economic factors. Table 2 first shows the sibling correlation in years of education.[14] For both men and women, the estimate here is significantly higher than 0.5 (0.66 for men and 0.55 for women), that is, about half of the variation in formal educational success can be explained by family background. To classify and evaluate these figures, the sibling correlation in height is shown in the second column. This is significantly lower than the corresponding value for education at 0.5 for brothers and 0.47 for sisters. Educational success in Germany depends more strongly on family background than mainly genetically determined characteristics such as height.[15]

The third column of Table 2 shows the sibling correlation of a measure of willingness to take risks.[16] The willingness to take risks is an important explanatory figure for economic decision-making.[17] Again, family background has a clear influence. This explains the varia-

12 In addition to the factors that are attributable to family background, other factors that are not strictly related to the family are also taken into account for sibling correlations, for example, the effects of the neighborhood where it affects both siblings. These factors may be related to their parents' economic situation. Consequently, parents with low incomes often live in neighborhoods where the income level is low. However, this distinction is not relevant in interpreting it as an indicator of equal opportunities. The neighborhood where a child grows up is one of the factors that he or she cannot influence, and should therefore have no influence on their success.

13 It should be noted that adjustments to the respective measurement have already been made to account for short-term fluctuations.

14 For Germany, school and vocational qualifications were converted into years and added together–as is usual in economic literature.

15 A similar result for the US can be found in B. Mazumder, »Sibling similarities and economic inequality in the US,« Journal of Population Economics 21 (2008): 685-701.

16 For the present study, the following question in the SOEP was asked about willingness to take risks in which respondents were asked to classify themselves on a scale of 0 to 10 (11 boxes): »How do you see yourself: Are you generally willing to take risks (risk-prone) or do you try to avoid risks (risk-averse)? Please answer on a scale from 0 to 10, where 0 means risk-averse and 10 means risk-prone. You can make your assessment using the values in between.«

17 T. Dohmen, A. Falk, D. Huffman, U. Sunde, J. Schupp, and G.G. Wagner, »Individual Risk Attitudes: Measurement, Determinants and Behavioral Consequences,« Journal of the European Economic Association 9 (3) (2011): 522-550.

tion in risk-taking in men of about 40 percent and in women of about 36 percent.

The level of Equal Opportunities in Germany and the US is Significantly lower Than in Denmark

The results to date have shown that the normative idea that individual economic success should only be determined by factors that can be influenced by individuals themselves, is not a reality in Germany. In order to better assess these results, in the following, Germany is compared internationally whereby Denmark and the US are each used as a comparison of extremes. Denmark and the US were chosen due to the positions of those countries on a scale of social mobility.[18] Many analyzes have shown that Denmark is a very socially mobile society. The influence of family background on the labor market and educational success of individuals shows that Denmark is characterized by a high degree of equal opportunities. Conversely, numerous studies show that the US is a very socially immobile country. The American dream of advancing from dishwasher to millionaire, or in the context of this study, the child of a dishwasher to millionaire is not excluded in spectacular individual cases. But the reality is rather different. In the majority of studies on intergenerational social mobility, the US is in or near last place.[19] The influence of family background on the success of individuals is, accordingly, very high. The US is a long way off the ideal of equal opportunity.

In an analysis of several countries, there is always the issue of comparability of data. This is, for example, of great importance in relation to education because these three countries have very different educational systems, making it difficult to compare results. Consequently, in this study, individual earnings are used as a comparative figure, since this can largely be measured consistently with the data sources at hand in all three countries.

For Denmark, the country with comparatively very high equal opportunities, there are sibling correlations of 0.20 for brothers and 0.19 for sisters. The difference between Germany and Denmark is significant (see Table 3) on the five-percent level for men and the ten-percent level for women. Hence, the degree of equal opportunities for men and women is significantly lower in Germany than in Denmark.

Table 2

Sibling Correlations[1] in Years of Education, Height, and Willingness to Take Risks[2] in Germany

	Years of education	Height	Willingness to take risks
Brothers			
Sibling correlation	**0.656**	**0.498**	**0.398**
Standard error	(0.035)	(0.061)	(0.089)
Number of observations	1,480	1,106	3,303
Number of individuals	1,480	1,106	1,437
Number of families	1,253	954	1,213
Sisters			
Sibling correlation	**0.551**	**0.466**	**0.357**
Standard error	(0.050)	(0.067)	(0.119)
Number of observations	1,245	981	2,785
Number of individuals	1,245	981	1,202
Number of families	1,086	870	1,045

1 Sibling correlations are based on variance components and were estimated using multilevel models. The effects of age and years were taken into account in the models.
2 The random sample included all persons of at least 25 years of age. Only the most recent information was used for years of education and body size. For this reason, the number of observations and the number of individuals are identical.
Source: SOEPv25 (2002-2008).

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For men, about 50 percent of the variation (inequality) in body size can be explained by family background.

A comparison with the US shows almost identical results for men, with an estimated value of 0.43 for Germany and a value of 0.45 for the US. A difference is found among women. Here, the estimate for Germany is 0.39 and the value for the US women is 0.29. This difference between Germany and the US is not statistically significant neither for men or women.

In summary, there is a significant difference between Germany and the US, on the one hand, with very low social mobility and Denmark, on the other, with a high degree of mobility.

Do the Reasons for the Differences Lie in the Respective Countries' Education Systems?

A clear causal statement of the reasons for these differences is not possible using the method of analysis applied here. However, existing literature provides evidence.

One important question is whether the observed differences are due to cultural factors or whether the insti-

18 Corak, »Do poor children become poor adults?«.

19 See A. Björklund, T. Eriksson, M. Jäntti, O. Raaum, and E. Österbacka, »Brother correlations in earnings in Denmark, Finland, Norway and Sweden Compared to the United States,« Journal of Population Economics 15 (4) (2002): 757-772 and Corak, »Do poor children become poor adults?«.

Table 3

Sibling Correlations[1] in Individual Earnings in Denmark, Germany, and the US[2]

	Denmark	Germany	US
Brothers			
Sibling correlation	0.202	0.432	0.450
Standard error	(0.008)	(0.078)	(0.043)
Number of observations	331,806	4,874	4,644
Number of individuals	73,554	1,014	1,435
Number of families	55,190	858	996
Sisters			
Sibling correlation	0.187	0.391	0.285
Standard error	(0.009)	(0.107)	(0.045)
Number of observations	311,897	2,945	4,906
Number of individuals	68,062	704	1,538
Number of families	52,222	642	1,067

1 Sibling correlations are based on variance components and were estimated using multilevel models. The effects of age and years were taken into account in the models.
2 The income observations come from Denmark for the years 2002-2007, 2002-2008 for Germany and from 1999 to 2007 for the US. Only income data about persons aged between 31 and 49 were included in the sample. Earnings of less than DKK 9,000 / EUR 1,200 / USD 1,200 per year were excluded.
Source: IDA (2002-2007); SOEPv25 (2002-2008); PSID (1999-2007).

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For men in Denmark, about 20 percent of the variation (inequality) in an individual's earnings can be explained by family background.

tutional framework is the main determinant. A recently published study,[20] based on Danish data also used in this report, addresses the question of equal opportunities among different groups of second-generation immigrants in Denmark. The results show very low sibling correlations for all groups, regardless of their cultural background, which are very similar to those for Danes with no immigrant background. This can be interpreted as evidence that social mobility and, therefore, equal opportunities are less determined by cultural background, and are primarily due to the institutional framework.

The results of a study from Sweden[21] confirm this result. The authors studied the change in influence of family background on the earned income of Swedish men during the expansion of the Swedish welfare state. The authors come to the conclusion that changes to the institutional framework, in particular to the education system, have led to a significant decrease in the influence of family background.

Conclusion

The results presented show that the objective of equal opportunities, that is, the independence of an individual's economic success from factors not in that individual's own sphere of influence, is not being achieved in Germany. Compared internationally, it is also clear that Germany's level of equal opportunities is as low as it is in the US and is significantly worse than Denmark.

Current results from the literature indicates that the education system can play an important role in helping to reduce the influence of family background on an individual's economic success. These findings suggest increasing the permeability of the education system and compensating for the lack of support for children in underprivileged families with early government services in order to achieve the goal of equal opportunities, or as Joachim Gauck put it recently and John F. Kennedy 50 years ago, »All of us do not have equal talent, but all of us should have an equal opportunity to develop those talents.«[22]

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20 D.D. Schnitzlein, »How important is cultural background for the level of intergenerational mobility,« Economics Letters 114 (3) (2012): 335-337.

21 A. Björklund, M. Jäntti, and M.J. Lindquist, »Family background and income during the rise of the welfare state: Brother correlations in income for Swedish men born 1932-1968,« Journal of Public Economics 93, (2009): 671-680.

22 John F. Kennedy, San Diego, June 6, 1963, www.presidency.ucsb.edu/ws/index.php?pid=9259.

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