Parental investment and the intergenerational transmission of economic preferences and attitudes

Maastricht University

Maria Zumbühl, Thomas Dohmen, Gerard Pfann

Parental investment and the intergenerational transmission of economic preferences and attitudes

RM/13/033

GSBE

Maastricht University School of Business and Economics
Graduate School of Business and Economics

P.O Box 616
NL- 6200 MD Maastricht
The Netherlands

Parental Investment and the Intergenerational Transmission of Economic Preferences and Attitudes

Maria Zumbuehl, Thomas Dohmen, Gerard Pfann

May 24, 2013

Abstract

We study empirically whether there is scope for parents to shape the economic preferences and attitudes of their children through purposeful investments. We exploit information on the risk and trust attitudes of parents and their children, as well as rich information about parental efforts in the upbringing of their children from the German Socio-Economic Panel Study. Our results show that parents who invest more in the upbringing of their children are more similar to them with respect to risk and trust attitudes and thus transmit their own attitudes more strongly. The results are robust to including variables on the relationship between children and parents, family size, and the parents' socioeconomic background.

1 Introduction

Mounting evidence in the economics, psychology and sociology literature indicates that preferences, attitudes and personality traits are transmitted from parents to children.[1] Dohmen et al. (2012) document an intergenerational correlation in risk and trust attitudes. The transmission of preferences, attitudes and other non-cognitive skills is expected to contribute to the intergenerational correlation in economic outcomes such as income and schooling that has been well documented in the literature (for recent reviews see Björklund and Salvanes, 2011; Black and Devereux, 2010; Holmlund et al., 2011).[2] As social mobility is of prime interest for society, social scientists need to better understand the channels through which non-cognitive skills are transmitted from parents to children. Of particular concern for policy makers is the role of nurture in the formation of preferences.[3] But very little is known about the channels through which socialization affects preference formation. An unanswered question is whether there is a technology for parents to shape children's preferences by purposeful investments.

This paper assesses empirically whether parental investments exist that strengthen preference transmission. We show that parents can engage in activities that make children more like them in terms of economic preferences, and thus demonstrate that a technology for shaping preferences exists. Therefore, there is scope to shape children's preferences by purposeful investments. Our focus is on providing evidence for the existence of a technology that parents can utilize to make investments to intentionally shape their children's preferences. We do not claim that parents in our data set exploit this technology by intentionally making certain investments. Instead we want to document that parents could purposefully shape the preferences of their child if they wanted to.[4]

Our key insight is that investment strategies exist that allow parents to shape the preferences of their offspring. This insight is also important for theoretical models of cultural transmission (e.g., Bisin and Verdier, 2001; Doepke and Zilibotti, 2008), since it empirically supports a central assumption in these models, namely, that parental investments

[1] Psychologists and sociologist have been studying the transmission of personality traits from parents to children since the 1930s (Loehlin, 2008).

[2] Bowles and Gintis (2002), for example, investigate how the transmission of personality traits, as well as IQ and race, influences intergenerational mobility in socioeconomic status.

[3] There is evidence that both nature and nurture play a role in preference transmission. Cesarini et al. (2009) show that there is a genetic effect on preferences, while Dohmen et al. (2012) point out the importance of socialization in the intergenerational transmission of preferences.

[4] There are two main reasons why abstain from answering the question whether parents deliberately follow an optimal investment strategy: First we lack data on parental intentions and their utility functions. Second, we do not observe investment costs and returns, i.e. we lack information that is essential for making judgments about optimal investment strategies according to theoretical predictions.

can affect the transmission of culture and preferences.[5]

The type of investment we consider relates to parental involvement, which we measure by combining proxies that measure how frequently parents have engaged in certain activities in direct interaction with their children, as in talking about the child's life and worries, and proxies that measure how much the parents were involved with their children's educational development. Our construct of activities thus captures a very general investment strategy. However, our measure of parental involvement as an investment variable is far from comprehensive, and many facets of investment are not captured. Thus our results should be considered a lower bound and an estimate of the importance of investments in the transmission mechanism.

Our empirical analysis focuses on risk and trust attitudes, which have been shown to play an important role in economic decision making. Risk attitudes have an impact not only on financial decision making but also on other realms of a person's life, such as choice of education or occupation or smoking (Dohmen et al., 2011). Guiso et al. (2008) show the importance of trust toward strangers for the development of impersonal markets and the well-functioning of political systems, while Butler et al. (2009) investigate the importance of trust attitudes for the individual, showing that trust and trustworthiness influence personal income. Using data from the German Socio-Economic Panel Study (SOEP) we find that parents who invested more effort in the upbringing of their children are more similar to their adult children with respect to risk and trust attitudes.

The remainder of this paper is structured as follows. Section 2 introduces our data and explains the choice of the main variables. Section 3 introduces the model, discusses the results, and applies robustness checks. Section 4 concludes the paper.

2 Data

Our analysis uses data from the German Socio-Economic Panel Study (SOEP),[6] which not only provides information about economic attitudes and parental investment, but also allows us to link grown up children to their parents. (We hereafter refer to these young adults who are our main observations as children, according to their position in the family.) The SOEP is a large representative household survey that has been conducted

[5]One example of a study that provides evidence on cultural transmission is by Fernandez and Fogli (2009), who trace the current labor force participation of female migrants in the United States to such preferences in their countries of origin. However, neither this study nor any other on cultural transmission (to our knowledge) empirically tests the assumption that it is possible for parents to invest in their children to increase their impact on their children's cultural traits and preferences.

[6]Socio-economic Panel (SOEP), Data for years 1984-2011, Version 28, SOEP, 2012, doi:10.5684/soep.v28.

yearly since 1984.[7] Once sampled in the SOEP, each individual is followed, even after leaving the initially sampled household. This feature is especially important for our study, since it allows us to observe also young adults and their parents who no longer live in the same household.

An important source of information for our paper is the youth biography questionnaire that is requested of every newly entering young individual since 2000. This questionnaire is administered to young people who live in a SOEP household and have just become old enough (turning 18 in the following year) to enter the regular personal survey in the next year. Aside from background questions, such as personal education history, the respondents to the youth survey are asked detailed questions about their upbringing and their interaction and relationship with their parents. Since the information from this youth questionnaire is crucial for our research, we restrict our sample to individuals who answered this questionnaire. Therefore our sample contains only children between the ages of 17 and 26.[8]

Further, measures for economic attitudes are not elicited in each wave of the SOEP. In particular, the two attitudes we focus on, risk and trust attitudes, were not always asked simultaneously. Therefore we construct two samples: one for trust and one for risk. These two samples largely contain the same observations, but since some individuals answered in one wave but not in another, not all individuals are part of both samples. If the individual answered the question to a certain attitude in several waves, we consider the first of those waves.[9] The information on the attitudes of the parents is taken from the same wave as the child's attitudes. Every observation thus consists of a child-mother-father triplet. For risk attitudes we have a sample of 2,187 observations. Since the trust questions were asked only twice (compared to six waves with the risk questions), the trust sample has somewhat fewer observations, with 1,466 parent-child triplets.

2.1 Similarity in preferences

This section describes how we construct our dependent variable and measure the underlying attitudes.

[7]Schupp and Wagner (2002) give detailed information on the construction and maintenance of the SOEP.

[8]With the exclusion of one 16-year-old who answered the regular survey and the youth questionnaire in the same year, which is not common practice.

[9]Since 2006 the risk question is also asked in the youth questionnaire. If a child answered the risk question in a subsequent regular SOEP survey we take the risk attitudes from this first regular answer. If the child answered the risk question only in the youth questionnaire, which is in particular the case for the SOEP participants who turned 17 in 2011, we take the risk attitude from the youth questionnaire. This increases our sample by 225 observations. However, our results change only marginally if we exclude those 225 observations.

2.1.1 Risk

Individuals' risk attitudes are assessed based on a survey question asking the parents and children in our sample how willing they are to take risks in general. The answer categories range from zero, which denotes not willing to take risks at all, to ten, which stands for very willing to take risks. Figure 1 shows the distribution of answers in our sample of young adults. The survey question is experimentally validated in the study by Dohmen et al. (2011), which also documents that the answer to the general risk question is a good predictor for a number of risky decisions. The general risk question was asked in six waves: in 2004, 2006, 2008, 2009, 2010, and 2011.

2.1.2 Trust

The measure of trust attitudes is slightly more complex as it combines three survey questions into an aggregated trust index. In 2003 and 2008 the respondents of the main SOEP survey were asked how strongly they agreed with the following three statements on a scale from one to four, where one means "Agree completely" and four means "Disagree completely": "On the whole one can trust people," "Nowadays one can't rely on anyone," and "If one is dealing with strangers, it is better to be careful before one can trust them." We use a simple average over the three trust measures as our trust index.[10] Figure 2 shows the distribution of the trust index for our sample of young adults. Fehr et al. (2003) validates this trust measure by showing that trust in strangers, measured by the three above-mentioned questions, indeed predicts first mover behavior in a trust game.

2.1.3 Similarity

We want to measure how strongly parents transmit their risk and trust attitudes. As such we are not interested in the absolute level of risk or trust attitudes of the child but, rather, in the relation between the child's and parents' attitudes. We therefore measure the impact of parents on the intergenerational transmission of preferences by the similarity of children to their parents in these preferences, and construct four different dependent variables: the difference in risk attitudes between mother and child (Δ_R^{MC}) and between father and child (Δ_R^{FC}) and the difference in trust attitudes between mother and child (Δ_T^{MC}) and between father and child (Δ_T^{FC}).

We calculate the difference measure as the absolute difference between the child's and parent's attitude. We then standardize the difference measure. In our main model we

[10] We reversed the answers of the first question so that a higher number on the trust index indicates a higher level of trust.

use current measures of attitudes without controlling for the effect of age on attitudes. We do this for two reasons. First, we assume that the parents want to transmit their current attitudes, rather than the attitudes they had when they were of the same age as their children are now. Second, if children use their parents as role models, they can only observe the parents' current attitudes. However, we show in the robustness checks that this age-induced difference in attitudes is not driving our results.

Figure 3 illustrates the distribution of the four dependent variables. The average difference in risk attitudes between mothers and their children is 2.44, with a standard deviation of 1.95, while that between fathers and their children is 2.16, with a standard deviation of 1.83. In trust attitudes, mothers and their children differ, on average, by 0.45 points on the trust index, with a standard deviation of 0.40, while fathers differ by 0.50 points from their children, with a standard deviation of 0.42.

2.2 Parental investment

We are interested in whether parental investments, broadly defined, influence the transmission of economic preferences and attitudes. We focus on parental effort in the upbringing of children as parental investments.[11] This includes, on the one hand, how much parents are involved in their children's school situation, which is an important part of a child's daily life, and, on the other hand, how strongly the parent participates in the child's life and how much the parent involves the child in family matters.[12]

We consider general parental investments for two reasons. First, we want to not only consider directed investments, but also investigate if general investments made by parents have an impact on the intergenerational transmission of preferences. Second, there is no very specific and easily observable parental investment we can link directly to the outcome, like it is possible for the research on the transmission of particular cultural traits or religion.[13]

[11]The importance of parental effort or involvement in intergenerational transmission has been demonstrated in the transmission of economic outcomes. In an investigation of the driving forces of sibling correlations in long-run income, Björklund et al. (2010) find that parental involvement and parenting practices have strong predictive power in explaining sibling correlations.

[12]The measures for parental participation in a child's life and how much the parent involves the child in decicion making are taken from a 9 item scale for supportive parenting (see Weinhardt and Schupp (2011) for more information on the supportive parenting scale and it's application in the GSOEP). We use 7 out of the 9 items, excluding two items which might be reversely related with our dependent variable. The two omitted items are: "The parent shows that she/he loves you", and "The parent gives you the impression that she/he really trusts you".

[13]For example Patacchini and Zenou (2011) investigate the transmission of religiousness by using the frequency of taking children to religious services as a measure of investment.

2.2.1 Investment proxies

The youth questionnaire of the SOEP provides proxies for the investment that we are interested in. We can measure how involved parents are in their children's school situation, how much parents participate in the life of their children, and how strongly they integrate their children in decision processes. Table 1 lists the proxies we use in our study, with means and standard deviations for both (risk and trust) samples. All the proxies are measured either as binary variables or on a four- or five-point scale, as described in Table 1 in the last two columns. Most of the school-related proxies are measured on an aggregate level for both parents together, while for other proxies we can distinguish between the efforts of mothers and fathers. Together, these 13 proxies provide insight into the general investments of parents in their children's upbringing. However, there are many more possible investments that we cannot address in this study, such as the choice of residential neighborhood or joint leisure activities. We assume that all the proxy variables measure parental investment, but none of them measures it perfectly. We combine the proxies in an index to measure the underlying true parental investment. Using principal component analysis on the respective 13 proxies allows us to construct such an investment index for mothers and fathers (we take the first factor to be the investment index).

Parents who invest much in their children, as measured by our investment proxy, differ from parents who invest little in the upbringing of their children. Table 2 displays the means and standard deviations of background characteristics for the groups of high and low investing mothers and fathers. We find that parents who invest more in the upbringing of their children are on average more educated, earn more and are older than parents who invest less.

3 Results

We now turn to the analysis of the effect of parental investment on the similarity in risk and trust attitudes between parents and their children. We investigate the relationship for every attitude (risk, trust) and parent group (mothers, fathers) seperately.

We start by regressing the standardized difference in risk attitudes between mothers and their children on the investments made by mothers. The results of this regression are displayed in Column (1) in Table 3. We find a negative relation between parental investment and the difference in risk attitudes, or in other words, that mothers who invest more in their children are more similar to them with respect to risk. One standard deviation increase in investment by the mother is related to a decrease in the absolute difference in risk attitudes between mother and child of 0.065 standard deviations.

Column (3) reports the relation between fathers' investments and the difference in risk attitudes between fathers and their children. We again find that higher levels of parental investment are associated with more similarity in attitudes.

Parents who invest much in their children also differ in many other aspects, as we show in Table 2. For our main analysis we thus have to control for an array of potentially important variables.

We control for the socio-economic background of the family by controlling for the level of education of both parents as well as for the level of houlsehold income per capita in the year when the child filled out the youth questionnaire (to make the income measure comparable across years we compute the vignitiles of per capita household income using the complete SOEP sample). Family size is another important variable in our analysis, since it can influence the formation of preferences and attitudes not only through available financial resources per child and potential environment effect of siblings, but also through the amount of time available to the parents for every single child in the family (Table 2 provides some evidence that parents with more children do on average invest less in every single child). We further control for age difference between the child and both parents. The literature on the intergenerational transmission of culture (e.g. Bisin and Verdier, 2001) shows that under certain assumptions minorities have larger incentives to invest in their children. We thus include a variable that captures whether the child has a migration background (both direct migration and migration of parents) to control for possible effects of being a member of an ethnic minority. We also include a measure of how heterogenous the parents are with respect to the attitude in question. Finally we also control for the age of the child at the time of the attitude elicitation, the gender of the child and the year in which the attitude was elicited.

Including the control variables in our analysis does not change the point estimates we obtain for parental investments however. Columns (2) and (4) of Table 3 report the regression results for the impact of maternal/paternal investment on the difference in risk attitudes between mother and child, or father and child respectively, when controlling for the above mentioned variables.

We now turn to investigate the relation between parental investment and the similarity between parent and child with respect to trust attitudes. Since trust attitudes were only measured in two waves of the SOEP our sample size is much smaller here than in the analysis regarding risk attitudes. The results, displayed in Table 4, however are qualitatively similar. We find a negative relation between the parent's investments and the difference in trust attitudes between the parent and the child, albeit statistically not significant at

conventional levels for the mother-child difference. While the effects of parental investment are rather small in size, they are very stable across specifications, which supports our hypothesis that there exists a possible investment technology to shape childrens attitudes.

We now challenge our research strategy by conducting a placebo analysis. We investigate the impact of parental investments on the similarity in a trait that should not be influenced by parental investment behavior. We use the difference in height between parent and child for this purpose. Using the same regression set up with the same control variables as we do for our main results we do not find any significant impact of parental investment on the difference in height between child and parent. The point estimates for the parent's investments are -0.014 (0.018) for mothers and 0.02 (0.025) for fathers.

3.1 Measurement error

We have so far shown that there is a relationship between parental investments and similarity in attitudes. However, our point estimates might strongly under-estimate the true effect, due to measurement error in the proxies. Aside from being rather noisy measures themselves, the proxy variables are all taken from the youth questionnaire, which means that they were measured at one point in time. The measurement error is thus very likely to be correlated across the proxy variables. The first principal component, which we used above as the investment index includes in this case also part of the measurement error, which leads to an attenuation bias in our analysis. We address this problem by constructing an alternative investment index, which combines the available proxy variables in an efficient way, so that the measurement error captured in the resulting index is minimized. The procedure we use has been introduced by Lubotsky and Wittenberg (2006).

To construct this new investment index we first regress the difference in attitudes between parents and children on all 13 proxy variables x_j and all K control variables z_k. In particular, for parent–child pair i,

$$\Delta^{PC}_{Pref_i} = \sum_{j=1}^{13} x_{ji} b_j + \sum_{k}^{K} z_{ki}\gamma_k + \varepsilon_i.$$

We then estimate

$$I_i = 1/\left(\sum_{j=1}^{13} \frac{cov(\Delta^{PC}_{Pref_i}, x_j)}{cov(\Delta^{PC}_{Pref_i}, x_1)} b_j\right) \sum_{j=1}^{13} x_{ji} b_j.$$

Finally, we standardize I and obtain our LW parental investment index. The assumptions made to generate the index are that the proxies and their measurement errors are not correlated with the error term and that all the proxies share this underlying trait. The weights that minimize the attenuation bias are endogenous to the system. The absolute size of the investment index is therefore not comparable across different samples or estimations with different dependent variables.

Table 5 reports the results of the regressions of the difference between a parent's and a child's attitude (risk and trust) on the investment the parent made in the upbringing of the child. All the investment indices used in the four displayed regressions are constructed using the Lubotsky-Wittenberg method. This also means that actual investment index is different for every column. We find point estimates for parental investment that are larger than the estimates for the PCA investment index and statistically highly significant in all four scenarios (risk/trust, mother/father). Apart from the change in the point estimates for the investment index the regression output stays largely similar to the output of our earlier analysis, the correlation coeficients of the control variables stay unchanged, while the total explained variance increases slightly. Given the noisy nature of the proxy variables and the fact that this is only a small selection of possible investments[14] the results of this analysis are likely to still underestimate the true effect.

Since all the dependent variables as well as the investment variables are standardized, it is hard to grasp the economic significance of our findings. In Table 6 we therefore present our main results in absolute points on the risk and trust scale. A change from the 5th to the 95th percentile in mother's investment, for example, relates to a decrease in difference in willingness to take risks of 0.596 points on the risk scale that ranges from 0 to 10. To get a better understanding for the economic meaning of this effect we compare it to the gender difference in willingness to take risks. The mentioned effect of a change from the 5th to the 95th percentile in mother's investment almost matches the difference in willingness to take risks between men and women in our sample, which amounts to 0.664.

3.2 Robustness checks

While the theory of cultural transmission by Bisin and Verdier (2001) assumes that parents invest in their children to enhance the probability that the children will become more similar to them, we can also imagine a reversed scenario where parents who are more similar to their children are (emotionally) closer to them and thus invest more. We address

[14]There are many other investment options, such as choice of place of residence or excursions with the children, just mention some.

this problem by adding information on the relationship between a child and parent in our model. If investment is indeed just a function of the relationship between parents and children, then the impact of investment on similarity should disappear (or at least drop significantly) once we include previously omitted variables on relationship. Adding two control variables on how often a child argues with a parent and how important the parent is in the child's life, we do not find that the impact of investments fades away. This finding (presented in detail in the Appendix in Tables 7 and 8) supports our hypothesis that parental investments influence the similarity between children and parents independently of the relationship between them.

Willingness to take risks decreases with age (Dohmen et al., 2011). Also trust attitudes depend on age: Older people have less trust in strangers (Alesina and La Ferrara, 2002). This may introduce a bias, since we use the absolute difference between the attitudes of parents and children and the distributions of the children's attitudes are shifted to the right due to the age effect (young people are more willing to take risks and to trust strangers). To be confident that our results are not driven by this age difference, we introduce a new set of dependent variables that are not dependent on age. We construct the age-independent difference in attitudes by regressing the individual attitude variables (of parents and children) on age dummies. For these regressions we use the complete SOEP sample, and not just our smaller sample of parents and children. We split this larger sample by gender and into a parent sample (age range of parents) and a children sample (age range of children) to allow for gender-specific age effects and to avoid introducing a bias by estimating a parent's and her child's age-independent attitude in the same regression. We then take the residual from these regressions as the age-adjusted attitude and use these new attitude measures to construct the new dependent variable. The resulting similarity variable measures the absolute difference of the age-adjusted attitudes between parent and child. The estimation with the new dependent variable leads to a very similar correlation coefficient for the investment index in particular for the more efficient LW-investment indices, thus supporting our previous results. We report the results in the Appendix in Tables 9 and 10. For both risk and trust attitudes, parental investment retains a strongly significant negative impact on the difference between parent and child.

4 Conclusion

We investigate whether parents are equipped with a technology that would allow them to deliberately shape the preferences of their children. In particular, we focus on the link between parental involvement and parent–child similarity in risk and trust attitudes

and find that parents who invest more effort by being more involved in the lives of their children have children who are more similar to them. This holds for mothers and fathers and for both risk and trust attitudes.

Our results are important for at least two reasons: First, answering the question whether parents can purposefully affect the economic preferences of their children generates new insights for social scientists and policy makers alike. Having shown that a mechanism exists which enables parents to affect the transmission of preferences by investments, such as parental involvement, indicates that preferences are malleable during childhood and can be targeted. As it is very likely that other investment opportunities, beyond the ones documented in this paper (e.g. the choice of neighborhood in which the child grows up), exist that allow parents to directly or indirectly affect their children's attitudes, beliefs, and preferences, we interpret our findings as a lower bound for the effect of parental investments on the intergenerational transmission of risk and trust attitudes. While the malleability of preferences suggests scope for policy intervention, we deliberately have not indicated whether policy makers should aim at affecting preference formation, and if so in what directions. In fact, it is not obvious what bundles of preferences are superior in different conditions, and we want to caution policy makers to jump to conclusions too quickly.

Second, we test a central assumption of several theoretical models on cultural transmission, namely, that parents can purposefully invest to shape the preferences of their children. Our findings support the assumption that investments made by parents have a significant positive impact on the intergenerational transmission of preferences and attitudes.

More generally, our findings provide evidence that socialization is crucial for the transmission of preferences from one generation to the next. This result is of great consequence for our understanding of intergenerational mobility and for the design and appraisal of policies that affect social mobility.

References

Alesina, A. and La Ferrara, E. (2002). Who trusts others? *Journal of Public Economics*, 85(2):207–234.

Bisin, A. and Verdier, T. (2001). The economics of cultural transmission and the dynamics of preferences. *Journal of Economic Theory*, 97(2):298 – 319.

Björklund, A., Lindahl, L., and Lindquist, M. (2010). What more than parental income, education and occupation? an exploration of what swedish siblings get from their parents. *The BE Journal of Economic Analysis & Policy*, 10(1):102.

Björklund, A. and Salvanes, K. G. (2011). Education and family background: Mechanisms and policies. volume 3 of *Handbook of the Economics of Education*, chapter 3, pages 201–247. Elsevier.

Black, S. and Devereux, P. (2010). Recent developments in intergenerational mobility. *IZA Discussion Paper*.

Bowles, S. and Gintis, H. (2002). The inheritance of inequality. *The Journal of Economic Perspectives*, 16(3):pp. 3–30.

Butler, J., Giuliano, P., and Guiso, L. (2009). The right amount of trust. *NBER Working Paper*.

Cesarini, D., Dawes, C., Johannesson, M., Lichtenstein, P., and Wallace, B. (2009). Genetic variation in preferences for giving and risk taking. *Quarterly Journal of Economics*, 124(2):809–842.

Doepke, M. and Zilibotti, F. (2008). Occupational choice and the spirit of capitalism. *The Quarterly Journal of Economics*, 123(2):747–793.

Dohmen, T., Falk, A., Huffman, D., and Sunde, U. (2012). The intergenerational transmission of risk and trust attitudes. *The Review of Economic Studies*, 79(2):645–677.

Dohmen, T., Falk, A., Huffman, D., Sunde, U., Schupp, J., and Wagner, G. G. (2011). Individual risk attitudes: Measurement, determinants, and behavioral consequences. *Journal of the European Economic Association*, 9(3):522–550.

Fehr, E., Fischbacher, U., von Rosenbladt, B., Schupp, J., and Wagner, G. (2003). A nation-wide laboratory. examining trust and trustworthiness by integrating behavioral experiments into representative survey. *CESifo Working Paper Series*.

Fernandez, R. and Fogli, A. (2009). Culture: An empirical investigation of beliefs, work, and fertility. *American Economic Journal: Macroeconomics*, 1(1):146–177.

Guiso, L., Sapienza, P., and Zingales, L. (2008). Alfred marshall lecture social capital as good culture. *Journal of the European Economic Association*, 6(2-3):295–320.

Holmlund, H., Lindahl, M., and Plug, E. (2011). The causal effect of parents' schooling on children's schooling: A comparison of estimation methods. *Journal of Economic Literature*, 49(3):615–651.

Loehlin, J. C. (2008). Resemblance in personality and attitudes between parents and their children. In Bowles, S., Gintis, H., and Groves, M., editors, *Unequal chances: Family background and economic success*. Princeton University Press.

Lubotsky, D. and Wittenberg, M. (2006). Interpretation of regressions with multiple proxies. *Review of Economics and Statistics*, 88(3):549 – 562.

Patacchini, E. and Zenou, Y. (2011). Social networks and parental behavior in the intergenerational transmission of religion. *CEPR Discussion Paper No. DP8443*.

Schupp, J. and Wagner, G. G. (2002). Maintenance of and innovation in long-term panel studies: The case of the german socio-economic panel (gsoep). *Allgemeines Statistisches Archiv/Journal of the German Statistical Society*, 86(2):163 – 175.

Weinhardt, M. and Schupp, J. (2011). Multi-itemskalen im soep jugendfragebogen. Technical report, DIW Berlin, German Institute for Economic Research.

5 Tables and figures

Table 1: Descriptive statistics: Investment variables by risk and trust sample

	Risk Sample		Trust Sample		no/not at all	yes/very much
VARIABLES	mean	sd	mean	sd	min	max
Parents show interest in performance	3.031	(0.727)	3.023	(0.732)	1	4
Parents take part in parents-evening	0.765	(0.424)	0.765	(0.424)	0	1
Parents come to teacher office hours	0.573	(0.495)	0.567	(0.496)	0	1
Parents visit teacher outside office hours	0.222	(0.416)	0.225	(0.418)	0	1
Parents involved in at least one school activity	0.923	(0.267)	0.925	(0.264)	0	1
Mother helps with studying	0.742	(0.438)	0.747	(0.435)	0	1
Mother talks about things you do	3.778	(0.910)	3.780	(0.893)	1	5
Mother talks about things that worry you	3.296	(0.993)	3.299	(0.980)	1	5
Mother asks you prior to making decision	3.728	(1.065)	3.733	(1.066)	1	5
Mother expresses opinion on something you do	4.027	(0.834)	4.028	(0.805)	1	5
Mother is able to solve problems with you	3.636	(0.991)	3.634	(0.988)	1	5
Mother asks your opinion on family matters	3.471	(1.033)	3.469	(1.010)	1	5
Mother gives reason for making decision	3.576	(1.026)	3.547	(1.006)	1	5
Father helps with studying	0.554	(0.497)	0.550	(0.498)	0	1
Father talks about things you do	3.328	(0.991)	3.323	(0.983)	1	5
Father talks about things that worry you	2.984	(1.001)	2.988	(0.989)	1	5
Father asks you prior to making decisions	3.578	(1.140)	3.574	(1.125)	1	5
Father expresses opinion on something you do	3.838	(0.938)	3.831	(0.915)	1	5
Father is able to solve problems with you	3.449	(1.056)	3.448	(1.046)	1	5
Father asks your opinion on family matter	3.325	(1.090)	3.314	(1.073)	1	5
Father gives reason for making decision	3.418	(1.083)	3.398	(1.058)	1	5
Observations	2,187		1,466			

Notes: Descriptive statistics of the proxy variables that we use to construct the investment index. The risk sample contains all observations we use for the analysis of the impact of investment on the similarity in risk attitudes between parents and children. This means it contains only observations for which we have information on both, mothers and fathers, in risk attitudes. The same holds for the trust sample respectively. The two groups do not contain exactly the same pool of observations, since we use data from different years for the attitude measures. The last two columns report the possible range of answers to each question.

Data source: SOEP, v28.

Table 2: Descriptive statistics on high and low investing parents

	Mother				Father			
	High investing		Low investing		High investing		Low investing	
No. of kids in family	2.461	(1.067)	2.657	(1.285)	2.491	(1.177)	2.634	(1.181)
Age	18.341	(1.209)	18.415	(1.283)	18.341	(1.223)	18.419	(1.271)
1 if female	0.509	(0.500)	0.470	(0.499)	0.492	(0.500)	0.488	(0.500)
Mother's years of education	12.687	(2.714)	11.833	(2.542)	12.617	(2.717)	11.864	(2.544)
Father's years of education	12.911	(2.838)	12.203	(2.763)	12.937	(2.843)	12.127	(2.737)
1 if no migration background	0.837	(0.369)	0.746	(0.436)	0.835	(0.372)	0.743	(0.437)
Age difference MC	27.942	(4.771)	27.511	(5.172)	27.995	(4.840)	27.420	(5.110)
Age difference FC	30.597	(5.670)	30.245	(5.983)	30.639	(5.617)	30.172	(6.058)
HH-income vigintile	11.749	(5.371)	10.619	(5.332)	11.793	(5.279)	10.495	(5.420)
1 if $\Delta_R^{MF} >$ median	0.355	(0.479)	0.358	(0.480)	0.348	(0.477)	0.366	(0.482)
Mother/Father important	4.803	(0.426)	4.619	(0.552)	4.729	(0.491)	4.375	(0.722)
Argue with mother/father	3.658	(0.889)	3.823	(0.945)	3.573	(0.895)	3.729	(0.984)
Observations	1136		1051		1198		989	

Notes: Descriptive statistics, means and standard deviations in parenthesis, of the control variables for high and low investing parents. We use the sample of our analysis on risk for this summary table.

Data source: SOEP, v28.

Table 3: PCA: The impact of parental investments on differences in risk attitudes

VARIABLES	Δ_R^{MC}		Δ_R^{FC}	
	(1)	(2)	(3)	(4)
Investment mother (PCA)	−0.065***	−0.050**		
	(0.023)	(0.023)		
Investment father (PCA)			−0.045*	−0.042*
			(0.024)	(0.025)
1 if Δ_R^{MF} > median		0.476***		0.222***
		(0.048)		(0.048)
No. of kids in family		0.003		−0.015
		(0.020)		(0.019)
Age		0.001		0.006
		(0.018)		(0.020)
1 if female		−0.201***		−0.077*
		(0.041)		(0.043)
Mother's years of education		−0.008		−0.002
		(0.011)		(0.011)
Father's years of education		0.001		−0.003
		(0.011)		(0.011)
1 if no migration background		−0.186***		−0.080
		(0.057)		(0.064)
Age difference MC		−0.001		−0.003
		(0.007)		(0.007)
Age difference FC		0.003		0.007
		(0.006)		(0.006)
HH-income vigintile		0.002		−0.002
		(0.005)		(0.005)
Constant	−0.016	0.051	−0.018	−0.049
	(0.023)	(0.376)	(0.023)	(0.399)
Observations	2,187	2,187	2,187	2,187
R-squared	0.004	0.078	0.002	0.022

Notes: The dependent variables are the standardized difference in risk attitudes between mother and child in Columns(1)/(2) and father and child in Columns(3)/(4). Risk attitudes are measured in survey questions, explained in Section 2.1. The variables of interest, "Investment mother (PCA)" and "Investment father (PCA)", are indices, each constructed through factor analysis on 13 investment proxies. We use the first factor as final investment index. The variable "1 if Δ_R^{MF} > median" is a binary variable that indicates parents that are heterogeneous in their risk attitudes. In addition to the listed variables we also control for the year of risk elicitation. Robust standard errors in parentheses allow for clustering at the parent level; * significant at 10%; **significant at 5%; ***significant at 1%.

Table 4: PCA: The impact of parental investments on differences in trust attitudes

VARIABLES	Δ_T^{MC}		Δ_T^{FC}	
	(1)	(2)	(3)	(4)
Investment mother (PCA)	−0.030	−0.040		
	(0.025)	(0.026)		
Investment father (PCA)			−0.064**	−0.062**
			(0.032)	(0.031)
1 if Δ_T^{MF} > median		0.267***		0.564***
		(0.057)		(0.058)
No. of kids in family		−0.015		−0.037*
		(0.025)		(0.020)
Age		0.000		0.002
		(0.019)		(0.019)
1 if female		0.024		0.071
		(0.052)		(0.051)
Mother's years of education		0.013		0.019
		(0.013)		(0.013)
Father's years of education		−0.014		−0.013
		(0.012)		(0.013)
1 if no migration background		0.073		−0.043
		(0.065)		(0.075)
Age difference MC		−0.002		0.010
		(0.007)		(0.008)
Age difference FC		0.003		−0.007
		(0.007)		(0.007)
HH-income vigintile		−0.002		−0.000
		(0.006)		(0.005)
Constant	−0.040	−0.150	0.002	−0.253
	(0.026)	(0.420)	(0.027)	(0.444)
Observations	1,466	1,466	1,466	1,466
R-squared	0.001	0.022	0.003	0.083

Notes: The dependent variables are the standardized difference in trust attitudes between mother and child in Columns(1)/(2) and father and child in Columns(3)/(4). Trust attitudes are measured as the average of 3 survey questions on trust in strangers, explained in Section 2.1. The variables of interest, "Investment mother (PCA)" and "Investment father (PCA)", are indices, each constructed through factor analysis on 13 investment proxies. We use the first factor as final investment index. The variable "1 if Δ_R^{MF} > median" is a binary variable that indicates parents that are heterogeneous in their risk attitudes. In addition to the listed variables we also control for the year of risk elicitation. Robust standard errors in parentheses allow for clustering at the parent level; * significant at 10%; **significant at 5%; ***significant at 1%.

Table 5: Measurement error correction: Lubotsky-Wittenberg. The impact of parental investments on differences in risk and trust attitudes

	Risk		Trust	
VARIABLES	Δ_R^{MC}	Δ_R^{FC}	Δ_T^{MC}	Δ_T^{FC}
	(1)	(2)	(3)	(4)
Investment Mother/Father (LW)	−0.091***	−0.096***	−0.085***	−0.093***
	(0.019)	(0.020)	(0.023)	(0.021)
1 if Δ_R^{MF} > median	0.485***	0.235***		
	(0.048)	(0.047)		
1 if Δ_T^{MF} > median			0.266***	0.561***
			(0.058)	(0.059)
No. of kids in family	0.005	−0.016	−0.014	−0.036*
	(0.021)	(0.019)	(0.025)	(0.021)
Age	0.002	0.011	−0.002	0.004
	(0.017)	(0.020)	(0.020)	(0.020)
1 if female	−0.201***	−0.067	0.034	0.075
	(0.041)	(0.043)	(0.050)	(0.052)
Mother's years of education	−0.005	−0.001	0.013	0.016
	(0.011)	(0.012)	(0.013)	(0.013)
Father's years of education	0.001	−0.002	−0.016	−0.012
	(0.011)	(0.011)	(0.012)	(0.013)
1 if no migration background	−0.168***	−0.072	0.069	−0.052
	(0.057)	(0.063)	(0.070)	(0.076)
Age difference MC	−0.001	−0.003	−0.002	0.010
	(0.007)	(0.007)	(0.008)	(0.008)
Age difference FC	0.003	0.006	0.003	−0.007
	(0.006)	(0.006)	(0.007)	(0.007)
HH-income vigintile	0.000	−0.003	−0.002	−0.001
	(0.005)	(0.005)	(0.006)	(0.005)
Constant	−10.179	−16.634	−11.031	−7.053
	(17.560)	(18.132)	(23.219)	(24.002)
Observations	2,187	2,187	1,466	1,466
R-squared	0.082	0.027	0.028	0.089

Notes: The dependent variables are the standardized difference in risk attitudes between mother and child in Column(1) and father and child in Column(2), and the standardized difference in trust attitudes between mother and child in Column(3) and father and child in Column(4). The measurment of risk and trust attitudes is discribed in Section 2.1. Our variable of interest, "Investment mother/father (LW)", is a constructed variable that differs between the four columns. It is constructed as a weighted average of 13 proxy variables of parental investment, using the method by Lubotsky and Wittenberg (2006) to estimate the attenuation bias minimizing weights. The variable "1 if Δ_R^{MF} > median" is a binary variable that indicates parents that are heterogeneous in their risk attitudes. We report robust standard error in parentheses, retrieved by bootstrapping the estimation procedure (1000 repetitions), * significant at 10%; **significant at 5%; ***significant at 1%.

Table 6: Impact of an increase in investment on the difference in attitude

Risk: Mother-Child (Δ_R^{MC})

	PCA investment index		LW investment index	
A change from the	std	abs	std	abs
25th - 75th percentile in investment	-0.064	-0.126	-0.125	-0.247
5th - 95th percentile in investment	-0.161	-0.319	-0.301	-0.596

Trust: Mother-Child (Δ_T^{MC})

	PCA investment index		LW investment index	
A change from the	std	abs	std	abs
25th - 75th percentile in investment	-0.050	-0.021	-0.111	-0.046
5th - 95th percentile in investment	-0.127	-0.053	-0.280	-0.116

Risk: Father-Child (Δ_R^{FC})

	PCA investment index		LW investment index	
A change from the	std	abs	std	abs
25th - 75th percentile in investment	-0.047	-0.087	-0.129	-0.237
5th - 95th percentile in investment	-0.120	-0.221	-0.318	-0.584

Trust: Father-Child (Δ_T^{FC})

	PCA investment index		LW investment index	
A change from the	std	abs	std	abs
25th - 75th percentile in investment	-0.069	-0.029	-0.124	-0.053
5th - 95th percentile in investment	-0.174	-0.074	-0.306	-0.130

Notes: We report the change in difference in attitude between parent and child, resulting from an increase in investment from the 25th to the 75th percentile (and 5th to 95th percentile respectively). For each of the four specifications (attitude and parent combination) we report standardized and attitude-point effects based on the results of the estimation with both investment indices.

Table 7: Robustness check: controlling for the relation between mother and child

VARIABLES	Δ_R^{MC}		Δ_T^{MC}	
	(1)	(2)	(3)	(4)
Investment mother (PCA)	−0.044∗		−0.027	
	(0.023)		(0.027)	
Investment mother (LW)		−0.088∗∗∗		−0.082∗∗∗
		(0.020)		(0.023)
Mother important	−0.031	−0.033	−0.066	−0.064
	(0.045)	(0.044)	(0.054)	(0.055)
Argue with mother	−0.001	−0.016	0.031	0.039
	(0.024)	(0.025)	(0.031)	(0.033)
Constant	0.209	−12.324	0.036	−10.547
	(0.461)	(17.946)	(0.512)	(23.642)
Observations	2,180	2,180	1,462	1,462
R-squared	0.079	0.082	0.024	0.030

Notes: The dependent variables are the standardized difference in risk attitudes between mother and child in Columns(1-2) and the standardized difference in trust attitudes between mother and child in Columns(3-4). The regressor "Investment mother (PCA)" is the first principal component of the investment proxies. The variable "Investment mother (LW)" is constructed as a weighted average of 13 proxy variables of mother's investments, using the Lubotsky-Wittenberg method to estimate the attenuation bias minimizing weights. Other controls include: No. of kids in family, year of birth, 1 if female, household income (vigintile), mother's years of education, father's years of education, 1 if no migration background, 1 if $\Delta_R^{MF} >$ median, age difference MC, age difference FC and year of the attitude elicitation. Clustered, robust standard error in parentheses, the standard errors for Column(2) and (4) are bootstrapped. * significant at 10%; **significant at 5%; ***significant at 1%.

Table 8: Robustness check: controlling for the relation between father and child

VARIABLES	Δ_R^{FC}		Δ_T^{FC}	
	(1)	(2)	(3)	(4)
Investment father (PCA)	−0.018		−0.059∗	
	(0.027)		(0.032)	
Investment father (LW)		−0.092∗∗∗		−0.102∗∗∗
		(0.020)		(0.023)
Father important	−0.081∗∗	−0.085∗∗	0.015	0.027
	(0.038)	(0.039)	(0.045)	(0.046)
Argue with father	0.002	0.007	0.052∗	0.070∗∗
	(0.024)	(0.024)	(0.027)	(0.030)
Constant	0.372	−15.797	−0.649	−0.428
	(0.447)	(18.117)	(0.489)	(22.414)
Observations	2,180	2,180	1,462	1,462
R-squared	0.024	0.029	0.084	0.092

Notes: The dependent variables are the standardized difference in risk attitudes between father and child in Columns(1-2) and the standardized difference in trust attitudes between father and child in Columns(3-4). The regressor "Investment father (PCA)" is the first principal component of the investment proxies. The variable "Investment father (LW)" is constructed as a weighted average of 13 proxy variables of father's investments, using the Lubotsky-Wittenberg method to estimate the attenuation bias minimizing weights. Other controls include: No. of kids in family, year of birth, 1 if female, household income (vigintile), mother's years of education, father's years of education, 1 if no migration background, 1 if $\Delta_R^{MF} >$ median, age difference MC, age difference FC and year of the attitude elicitation. Clustered, robust standard error in parentheses, the standard errors for Column(2) and (4) are bootstrapped. * significant at 10%; **significant at 5%; ***significant at 1%.

Table 9: Robustness check: using age adjusted preference differences mother and child

VARIABLES	$\Delta^{MC}_{R_{adj}}$		$\Delta^{MC}_{T_{adj}}$	
	(1)	(2)	(3)	(4)
Investment mother (PCA)	−0.014		−0.048*	
	(0.022)		(0.026)	
Investment mother (LW)		−0.060***		−0.088***
		(0.018)		(0.023)
Constant	0.280	−5.776	0.003	−15.760
	(0.395)	(16.989)	(0.422)	(23.291)
Observations	2,180	2,180	1,462	1,462
R-squared	0.035	0.034	0.022	0.028

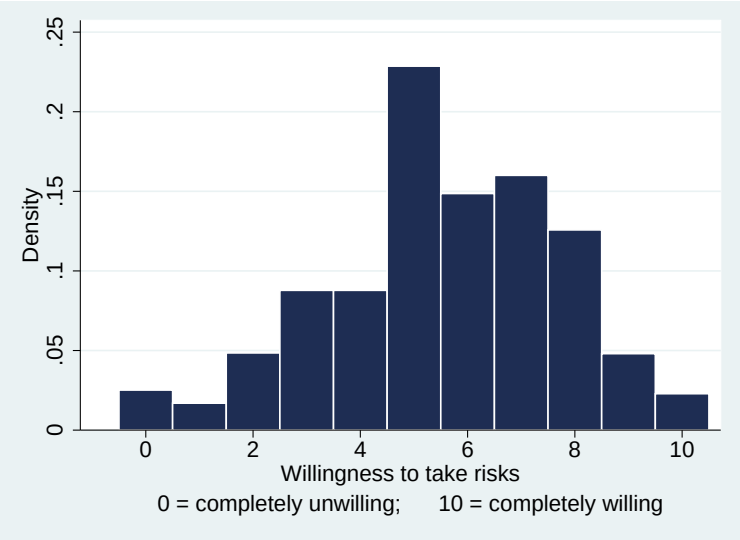
Notes: The dependent variables are the standardized age adjusted difference in risk attitudes between mother and child in Columns(1-2) and the standardized difference in trust attitudes between mother and child in Columns(3-4). The construction of age adjusted differences is discussed in Section 3.2. The regressor "Investment mother (PCA)" is the first principal component of the investment proxies. The variable "Investment mother (LW)" is constructed as a weighted average of 13 proxy variables of mother's investments, using the Lubotsky-Wittenberg method to estimate the attenuation bias minimizing weights. Other controls include: No. of kids in family, year of birth, 1 if female, household income (vigintile), mother's years of education, father's years of education, 1 if no migration background, 1 if $\Delta^{MF}_{R} >$ median, age difference MC, age difference FC and year of the attitude elicitation. Clustered, robust standard error in parentheses, the standard errors for Column(2) and (4) are bootstrapped. * significant at 10%; **significant at 5%; ***significant at 1%.

Table 10: Robustness check: using age adjusted preference differences father and child

VARIABLES	$\Delta^{FC}_{R_{adj}}$		$\Delta^{FC}_{T_{adj}}$	
	(1)	(2)	(3)	(4)
Investment father (PCA)	−0.039		−0.058∗	
	(0.024)		(0.031)	
Investment father (LW)		−0.113∗∗∗		−0.085∗∗∗
		(0.020)		(0.021)
Constant	−0.158	−12.311	−0.209	−3.530
	(0.396)	(18.006)	(0.442)	(24.058)
Observations	2,180	2,180	1,462	1,462
R-squared	0.031	0.038	0.081	0.086

Notes: The dependent variables are the standardized age adjusted difference in risk attitudes between father and child in Columns(1-2) and the standardized difference in trust attitudes between father and child in Columns(3-4). The construction of age adjusted differences is discussed in Section 3.2. The regressor "Investment father (PCA)" is the first principal component of the investment proxies. The variable "Investment father (LW)" is constructed as a weighted average of 13 proxy variables of father's investments, using the Lubotsky-Wittenberg method to estimate the attenuation bias minimizing weights. Other controls include: No. of kids in family, year of birth, 1 if female, household income (vigintile), mother's years of education, father's years of education, 1 if no migration background, 1 if $\Delta^{MF}_{R} >$ median, age difference MC, age difference FC and year of the attitude elicitation. Clustered, robust standard error in parentheses, the standard errors for Column(2) and (4) are bootstrapped. * significant at 10%; **significant at 5%; ***significant at 1%.

Figure 1: Risk attitudes

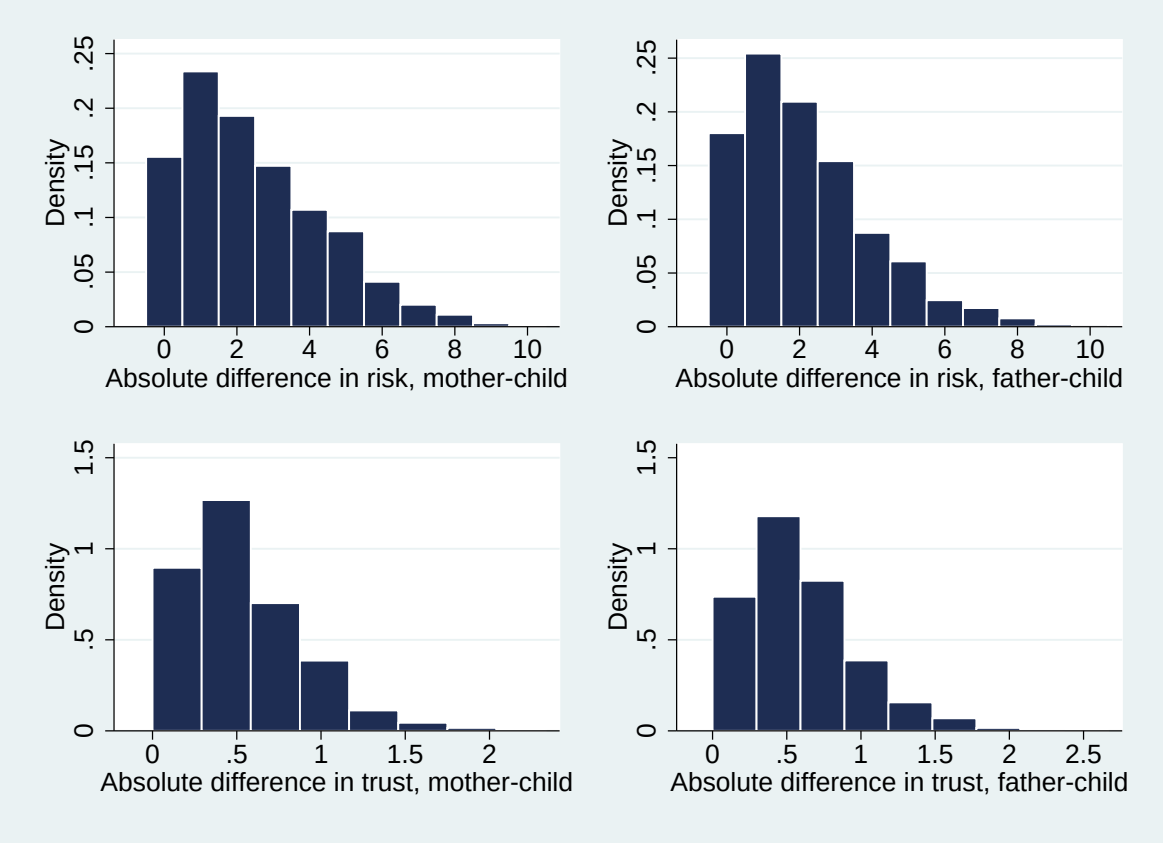


The histogram displays the distribution of answers to the general risk question of all children in our sample (at the time of their first encounter with the risk question). The wording of the risk question is: "How willing are you in general to take risks?"
Data source: SOEP, v28.

Figure 2: Trust in strangers

The histogram displays the distribution of trust attitudes among the children in our trust sample (when they first answer the trust questions). The trust attitudes are measured in an index, which is the simple average over the answers to the three trust questions: "On the whole one can trust people" (scale reversed), "Nowadays one can't rely on anyone" and "If one is dealing with strangers, it is better to be careful before one can trust them".
Data source: SOEP, v28.

Figure 3: Difference in attitudes between parent and child



Distribution of the dependent variable, the absolute difference in attitude between parent and child (Δ^{PC}_{Pref}).
Own calibration; data source: SOEP, v28.