Parental Involvement and the Intergenerational Transmission of Economic Preferences and Attitudes

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June 2018

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May 15, 2018

Abstract

We empirically investigate the link between parental involvement and shaping of the economic preferences and attitudes of their children. 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 are more involved 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.

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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 and attitudes, beliefs, personality and character traits is expected to contribute to the intergenerational correlation in economic outcomes such as income, education or health that has been well documented in the literature (for reviews see e.g. Björklund and Salvanes, 2011; Black and Devereux, 2011; Holmlund et al., 2011; Lindahl et al., 2016).[2] As social mobility is of prime interest for society, social scientists need to better understand the channels through which these facets of human personality are transmitted from parents to children. How preferences are formed and whether they can be moulded by nurture is of particular concern for policy makers.[3] Despite some recent evidence (see e.g. Kosse et al., 2018, Deckers et al., 2017 or Heckman et al., 2017), little is known about the channels through which socialisation affects preference formation.

A central assumption in theoretical models of cultural transmission (e.g., Bisin and Verdier, 2001; Doepke and Zilibotti, 2008), is that the social environment affects transmission of culture and preferences. A recent theory by Doepke and Zilibotti (2017) highlights the role of parents as an important factor of the social environment. They assume that parents purposefully shape their children's preferences by choosing an optimal parenting style, in order to maximise the child's life time utility, given current and future conditions.

We assess empirically the role of parents in the transmission of preferences, by studying whether children's attitudes and personality traits are shaped by parental involvement. Our results indicate that increased parental involvement strengthens the preference transmission, and hence suggest that

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[1] Psychologists and sociologist have been studying the transmission of personality traits from parents to children since the 1930s (Loehlin, 2008), in economics the interest in the topic is more recent (e.g. Anger, 2012 and Grönqvist et al., 2016).

[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 socialisation in the intergenerational transmission of preferences.

there is a mechanism through which children's preferences can be moulded by parents.

Thereby we provide evidence that supports a key assumption of Doepke and Zilibotti (2017). However, our data do not allow us to test whether parents follow an optimal parenting strategy, because, firstly, we lack data on parental intentions and their utility functions, and secondly, we do not observe the costs and returns of moulding preferences.

We measure parental involvement by combining proxies about the frequency and intensity of parental engagement in their offspring's life during childhood and adolescence. These proxies capture aspects such as talking about the child's life and worries, but also the degree of parental involvement in their children's educational development.

Our empirical analysis focuses on risk and trust attitudes, which have been shown to play an important role in 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. (2016) show that trust and trustworthiness influence personal income.[4] Using data from the German Socio-Economic Panel Study (SOEP) we find that parents who are more involved in the upbringing of their children are more similar to their adult children in willingness to take risk and in trust towards strangers. Having established the existence of a significant correlation between parental involvement and formation of preferences, we exploit the panel structure of our data set, provide additional evidence from the TwinLife dataset, a SOEP related study, and extend our analysis to personality traits to shed light on the causal nature of this relationship.

The remainder of this paper is structured as follows. Section 2 introduces our data and explains the choice of the main variables. Section 3

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[4]We focus on risk and trust mainly because those two preferences are empirically validated, have been used in the literature on transmission in the past and since they are available in the SOEP in several waves. However, extending our analysis to other preferences that are available in the SOEP, namely positive and negative reciprocity, leads to similar results. For positive reciprocity we find a strong negative relation between distance in attitudes between the parent's and child's attitudes and parental involvement, for negative reciprocity the we also find a negative relation, however with lower statistical significance.

introduces the model, discusses the main results, measurement error and causality issues. Section 4 concludes the paper.

2   Data

Our analysis uses data from the German Socio-Economic Panel Study (SOEP),[5] which not only provides information about economic attitudes and parental involvement, 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 annually since 1984.[6] 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. In addition, a set of economic attitudes and personality traits are elicited subsequently in the regular SOEP questionnaires that are administered after age 17. If the individual answered the question to a certain attitude in several subsequent waves, we consider the first of those waves. 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 3,393 observations. Since the trust questions were asked only three times (compared to nine waves containing the risk questions), the trust sample has somewhat fewer observations, with 2,119 parent–child triplets.

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[5]Socio-Economic Panel (SOEP), data for years 1984-2015, version 32, SOEP, 2015, doi:10.5684/soep.v32.

[6]Schupp and Wagner (2002), Wagner et al. (2007) and Wagner et al. (2008) give detailed information on the construction and maintenance of the SOEP.

2.1 Similarity in preferences

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

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 10 waves: in 2004, 2006, and yearly since 2008.

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, 2008 and 2014 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.[7] Figure 2 shows the distribution of the trust index for our sample of young adults. Fehr et al. (2003) validate this trust measure by showing that trust in strangers, measured by the three above-mentioned questions, indeed predicts first mover behaviour 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 interested in the attitude of the child relative to their parents' rather than in absolute level of risk or trust attitudes of the

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

child. We therefore measure the impact of parents on the intergenerational transmission of preferences by the similarity of children to their parents in these preferences. We 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 standardise the difference measure. In our main model we 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 2.46 with a standard deviation of 1.95, while that between fathers and their children is 2.24, with a standard deviation of 1.84. In trust attitudes, mothers and their children differ, on average, by 0.46 points on the trust index, with a standard deviation of 0.40, while fathers differ by 0.49 points from their children, with a standard deviation of 0.42.

2.2 Parental involvement

We are interested in whether parental involvement, broadly defined, relate to the transmission of economic preferences and attitudes. We focus on measures on parental effort in the upbringing of children.[8] 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

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[8]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 investments and parenting practices have strong predictive power in explaining sibling correlations.

the parent involves the child in family matters.[9]

We consider general parental involvement for two reasons. First, parental involvement can be seen as a type of general investment, that parents could choose to engage in if they wanted.[10] Second, the growing literature on parenting style points out the importance and potential scope of parental behaviour on the formation of children's non-cognitive skills.[11]

2.2.1 Involvement proxies

The youth questionnaire of the SOEP provides proxies for the type of parental involvement 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 the last two columns of Table 1. Most of the school-related proxies are measured on an aggregate level for both parents together, while for the other proxies we can distinguish between the efforts of mothers and fathers. Together, these 13 proxies provide insight into the general involvement of parents in their children's upbringing. However, there are many more possible ways of parental involvement that we cannot address in this study, such as e.g. joint leisure activities. We assume that all the proxy variables measure parental involvement, but none of them measures it perfectly. We combine the proxies in an index to measure the underlying true parental involvement. Using principal component analysis

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[9]The measures for parental participation in a child's life and how much the parent involves the child in decision 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 SOEP). 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".

[10]Such investments would not be directed but rather general investments. There is no very specific and easily observable parental investment we can link directly to the transmission of both risk and trust attitudes, like it is possible for the research on the transmission of particular cultural traits or religion (for example Patacchini and Zenou (2016) investigate the transmission of religiousness by using the frequency of taking children to religious services as a measure of involvement).

[11]See (Heckman et al., 2013) for the importance of early childhood environment more generally.

on the respective 13 proxies allows us to construct such an involvement index for mothers and fathers (we take the first factor to be the involvement index, Table A1 in the appendix displays the factor loadings).

Parents who invest much in their children, as measured by our involvement 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 analyse the relationship between the effort parents put into the upbringing of their children and their influence on the formation of the children's preferences. We begin by establishing the link between parental involvement and the formation of the children's attitudes. The first part of the results section documents the correlation, without any claim to causality. In the second part of the section we then address the question of causality, also by extending the analysis to personality traits.

3.1   The correlation between parental involvement and the transmission of attitudes

Findings by Dohmen et al. (2012) and recent evidence by Kosse et al. (2018) highlight the role of the social environment for the development of economic preferences and prosociality. As parental behaviour is a key facet of the social environment during childhood and adolescence, it is natural to investigate the role of parents for preference formation. In a first step of our analysis we show that parental involvement is related to the transmission of own attitudes to children. We investigate the similarity of children to their parents, rather than independent attitudes of children. In a later step we will however consider the option, that parents have diverging aspirations for their children that are oriented at the level of the children's attitudes, rather than the closeness to the parents.

Table 3 reports the results of regressing the similarity in risk and trust attitudes on parental involvement and background characteristics, for mother

and child or father and child respectively. We find a negative relation between the involvement and the difference in attitude between parents and their children in all 4 cases, however in the second case (risk attitudes father–child) the relation is not statistically significant.[12] In other words, we find that parents who are more involved in the upbringing of their children have children who are more similar to them with respect to their willingness to take risks and with respect to trust in strangers. One standard deviation increase in the involvement by the mother, for example, is related to a decrease in the absolute difference in risk attitudes between mother and child of 0.061 standard deviations. These findings support the theoretical models on the transmission of attitudes (Bisin and Verdier, 2001; Doepke and Zilibotti, 2017) that assume that parents can influence the preferences and attitudes of their children.

Parents who are very involved in the upbringing of their children differ from less involved parents in many aspects, as we show in Table 2. For our main analysis we thus control for an array of potentially important background variables. We control for the socio-economic background of the family by including the level of education of both parents as well as the level of household 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 effects 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.[13] 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

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[12]If we take only parenting style type involvements into account we find very similar results. The involvement in schooling is largely insignificant on the transmission of attitudes. This is not unexpected however, since involvement in schooling is in part also driven by the child's needs.

[13]Table A2 in the Appendix shows the coefficients for parental involvement when the attitude variables are adjusted for the age of the respondent. The results stay qualitatively the same.

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 heterogeneous 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. Conditional on parents' involvement, we find little effects of family background on the transmission of attitudes, and also personal characteristics of the child are mostly insignificant. Having a migration background is related to weaker transmission of risk attitudes. Finally, the coefficient for the binary variable that indicates heterogeneous parents is both large and statistically highly significant. Since we investigate the similarity to both parents and heterogeneous parents pull from both sides, this result is expected.

One could conjecture that the relation between parental involvement and the transmission is not linear and homogeneous across different demographic groups. For example the transmission might be stronger for same-sex parent child couples (mother–daughter, or father–son). Likewise, the same level of parental involvement might have a stronger effect on transmission for more educated parents. Further the effect of involvement might be weaker the more dissimilar the preferences of the parents are, because each parent might want to influence the child in a different direction. Finally the returns to involvement might depend on the level of involvement, or on the direction of the intended change of preference (e.g. it might be easier to reduce risk aversion than to increase it). We therefore assess whether transmission depends on gender of parents and children, parental education, degree of diversity of parents' preferences, nonlinearities in returns to involvements.

In Table 4 we show that parental and child characteristics as well as nonlinearities and asymmetries of the effect of parental involvement do not play a major role. First, while we find similar coefficients on the relationship between parental involvement and similarity in attitudes and preferences to those reported in Table 3, this relationship does not depend on the gender-match of parents and children. This is evident from the insignificant coefficient on the interaction term between the gender of the child and parental involvement in each column of Panel 1, which are based on the same regression as reported in the respective column of Table 3, augmented with the

interaction term. Likewise, each of the following panels is based on the main regressions, reported in Table 3, augmented by different interaction terms.

The second panel, for example, does not indicate that the relationship between involvement and the transmission of attitudes is dependent on parental education. In 3 out of 4 cases, there is no significant interaction effect between involvement and parental education, and for the last case, the transmission of risk attitudes by mothers, we even find an effect that goes against the proposed positive effect of education. The interaction term is positive, which means that the relation between involvement and similarity in risk attitudes is stronger for lower educated mothers.

While having heterogeneous parents relates to a greater average distance from both parents generally, we do not find a significant interaction effect between the parents' heterogeneity in attitudes and parental involvement on the transmission of the attitudes, as can be seen in the third panel.

In Panel 4 we find weak support for decreasing marginal returns to parental involvement. For the transmission of trust by fathers we find a significant and positive coefficient for involvement squared, however, for the transmission of risk, and for the transmission of trust by mothers we find no such effects.

Finally, in Panel 5, we find some asymmetric effects with respect to the direction of the difference in attitudes. We add an interaction term with an indicator for the direction of the difference in attitudes and find that for fathers the transmission of attitudes is asymmetric and dependent on the direction of the change in attitudes. For the relation between involvement and the transmission of mothers' attitudes, however, we find no such asymmetries.

3.2   Measurement error

We have so far shown that there is a relationship between parental involvement and similarity in attitudes. However, our point estimates might strongly underestimate 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 includes in this case also part of the measurement error, which leads

11

to an attenuation bias in our analysis. We address this problem by constructing an alternative index of parental involvement, which combines the available proxy variables in an efficient way, so that the measurement error captured in the resulting index is minimised. The procedure we use has been introduced by Lubotsky and Wittenberg (2006).

To construct this new involvement 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,

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

We then use the estimates to construct the involvement index

$$I_i = -\sum_{j=1}^{13} x_{ji} b_j.$$

Finally, we standardise I and obtain our LW parental involvement 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 an underlying trait. The weights that minimise the attenuation bias are endogenous to the system. The absolute size of the involvement 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 level of parental involvement in the upbringing of the child. All the involvement indices used in the four displayed regressions are constructed using the Lubotsky–Wittenberg method. Since the weights that are used to construct the indices are endogenous, the indices are not directly comparable across the specifications. We find point estimates for parental involvement that are larger than the estimates for the PCA involvement index and statistically highly significant in all four scenarios (risk/trust, mother/father). Apart from the change in the point estimates for the involvement index the regression output stays largely similar to the output of our earlier analysis, the correlation coefficients 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 means of parental involvement the results of this analysis are likely to still underestimate the true effect.

Since all the dependent variables as well as the involvement variables are standardised, the economic significance of our findings is not straight forward. In Table 6 we therefore present our main results in terms of absolute points on the risk and trust scale. A change from the 5th to the 95th percentile in maternal involvement, for example, relates to a decrease in difference in willingness to take risks of 0.620 points on the risk scale that ranges from 0 to 10. Comparing the size of the effect to the gender difference in willingness to take risks, we see that the effect of a change from the 5th to the 95th percentile in maternal involvement exceeds the difference in willingness to take risks between men and women in our sample, which amounts to 0.531.

3.3 Causal nature of the relationship

In this subsection we address the issue of causality and try to mitigate some of the endogeneity concerns. In order to identify the causal nature we would need to be able to exogenously alter parental involvement (i.e. randomly assign the intensity of parental involvement to children), and at the same time we would need to be ascertained that the intervention that changes parental involvement does not directly affect children's preferences (Heckman, 2005).[14] Moreover we cannot easily observe the counterfactual, which would require to find a suitable comparison group. An additional complication for the measurement of effect sizes arises when the impact of parental involvement evolves over time.

There are, however, some avenues that we can pursue to at least address some of the most pressing concerns. There are three major ways in which reverse causality could be a problem: 1) It could be conjectured that parents' attitudes are changed by children and that the child's influence is stronger the more the parent is involved. 2) The observed correlation might be caused by biased responses. In particular, it might be conjectured that children who are more similar to their parents systematically state retrospectively that their parents were more involved. 3) It might be the case that parents are

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[14]Random assignments of parental involvement is not feasible due to legal and ethical constraints.

more involved with children who are more similar to them, for example because they enjoy interaction with more similar kids. In that case, the observed correlation is spurious. In order to address these three issues, we conduct additional analyses, using additional data. We focus on the transmission of risk attitudes since the information on the willingness to take risks satisfies the requirements needed for these additional analyses. Firstly risk attitudes are measured frequently enough to allow longitudinal analyses. Secondly an additional dataset on younger children, the pupils survey, also contains the risk question.

Further, we expand our analysis from risk and trust attitudes as outcome variables to personality traits (Big5, locus of control and patience). While for risk and trust attitudes it is objectively not clear what the optimal level of the attitude is — and neither is there a norm that more or less of this attitude should be preferable — this might not be the case for some of the personality traits. We thus investigate also the level of the children's traits in addition to the similarity to their parents.

3.3.1 Is there an impact of children's attitudes on parents' attitudes?

A causal interpretation of our results relies on the assumption, that parents' attitudes are well established and not dependent on their children's attitudes. While there is a growing body of evidence that suggests that risk attitudes are fairly stable in adults, there might still be the possibility that children can shape parents' preferences.[15] Even though the literature suggests that preferences and personality traits become much less malleable after adolescence, it cannot be fully precluded a priori that parents' preferences become more similar to those of their children if they are more involved with the children. We investigate the impact of changes in parents' stated risk attitudes on changes their children's stated risk attitudes and vice versa to test this alternative hypothesis. For this additional test we construct a panel of young adults (19-32) and their parents with repeated risk attitude measures. The results in Table 7 show a significant effect of lagged changes in attitudes of parents on the children's attitudes, but little to no effects in the opposite direction. Parents' attitudes appear to be independent of

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[15]See Josef et al. (2016) for a discussion of the stability of risk preferences.

their children's past developments in attitudes as well as changes in their partners' attitudes. The risk attitudes of young adults however seem to be still partially dependent on their parents'.

3.3.2 Are retrospective parental involvement measures endogenous?

The optimal timing and way to elicit parental involvement is not straightforward. It might be beneficial to measure the timing and intensity of parental involvement, particularly if the effect of parental involvement on the formation of preferences and attitudes varies over time. However, if parental involvement is stable over time — or at least rank-order stable — measuring parental involvement only once is less of a concern. The second issue is how the information on parenting is gathered. Since quality and quantity of parenting efforts are not easily observable, we mostly have to rely on self-reports from either the parents or the children. There is some evidence that the reports by young adults about their own upbringing are a better measure to predict achievement than reports about parenting by their parents (Aunola et al., 2000). This evidence supports our use of retrospective questions to the children to elicit parental involvement.

However, using children's self-reports to investigate the transmission of attitudes could potentially invite reverse causality issues. A suggested path is that children who are more similar to their parents remember the interaction with their parents more positively and answer the questions on parental involvement more favourably.

We address this problem by making use of a small subsample of the SOEP that provides parenting measures that are based on parents' answers. Starting with the cohort of children born to SOEP households in 2002 and 2003 the SOEP survey asks parents a battery of questions about their young children. Parents answer a battery of questions regarding the behaviour of their child and about their own role and expectations in the upbringing of the child at different stages of the childhood. The survey is administered to both parents when their child is seven or eight years old and it includes several measures of parenting style (see Richter et al., 2013, for information on the parenting style indices). These children were then interviewed personally for the first time in the pupil survey at the age of eleven or twelve. The first cohort of children completed this survey in 2014. The interviewed

15

children are 11 to 12 years old. In this survey the children answer the general risk question.[16] We use this information of children's self-reported risk attitudes of all children for whom we know the parenting style their parents reported four years earlier, i.e. when the children were aged 7 or 8, in order to asses the relation of parental efforts on the transmission of attitudes. We focus on the parenting style scale for emotional warmth, since the items to this scale are closest to our parental involvement measure.[17] We find a negative relation between the mother's reported emotional warmth and distance between mother and child in risk attitudes, however due to a small sample size and large standard errors the results are not statistically significant. Controlling for the child's gender and the parents' years of education we find that an increase of one point on the emotional warmth scale (1-5) relates to -.25 (.17) standard deviations in distance in risk attitudes between mothers and child. The relation between fathers emotional warmth and distance in risk attitudes is also negative, but closer to zero in this sample. These results indicate that more parental involvement is associated with a higher degree of similarity between parents' and children's preferences later in their children's life, casting severe doubt on the explanation that the observed correlation between parental involvement and similarity in preference is driven by biased retrospective reporting of parental involvement.

Ideally, we would like to present additional direct evidence that shows that our retrospective measure of parental involvement is not biased. This is, however, not possible, as we do not have an objective benchmark. Hence, we provide more indirect evidence on quality of the retrospective measure. For this, we focus on the correlation of answers of siblings about their parents' involvement. Of course, this could differ by sibling and circumstances, although this is not clear a priori. In order to limit this possibility we focus on twins, who arguably are affected by the same parental behaviour at the same time during their life. We use the correlation of answers of the two twins in order to gauge the degree of measurement error. We then compare the extent of potential measurement error in children's answers to the test-retest correlation of parent's answers to the parenting style questions that were collected when the children were eight and ten years of age.

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[16]The question is asked in exactly the same way as in the adult questionnaire.

[17]The emotional warmth index is based on the following 3 questions: 1) I show my child with words and gestures that I care about him/her. 2) I console child up when he/she is sad. 3) I praise my child.

Since the children cohort is still to young to have been part of the youth survey, we can not directly compare the parents' answers to the children's answers. We can however compare the quality of answers by parents to the quality of answers of siblings. The parents of the children cohort have answered the same parenting style questions twice, at age 8 and 10 of the child. In Figure 4 we compare the correlations between two answering waves of parents' answers to the correlation in answers to parenting style questions by twins. We use the TwinLife study for that purpose, to get a sufficiently large amount of data points. The test-retest correlations of the parents' answers are between 0.4 and 0.6 for all items, as the graph on the right hand side illustrates. The correlation of answers by twins are primarily between 0.2 and 0.7, with stronger correlations between monozygotic twins than between dizygotic twins. The similar range of correlations between siblings and between answers of a parent at different points in time, suggests that the data quality of the answers is comparable.

3.3.3 Does similarity lead to more involvement?

We have suggested that higher parental involvement leads to stronger similarity in risk and trust attitudes of parents and their children. One could, however, challenge such an interpretation of the observed correlation based on the argument that similarity between parents and children leads to higher involvement. Such an alternative explanation would entail, however, that similarity among other dimensions of personality, as measured for example by the Big5 personality traits, would also be associated with higher levels of parental involvement. If however, parents want to mould their children's personality, it is plausible to assume that they would like to equip their children with a personality that is conductive to life success. While it is less obvious whether a higher degree of risk attitudes is optimal, the literature (see e.g. Almlund et al. (2011), for an overview) indicates that higher levels of conscientiousness and openness are clearly linked to favourable outcomes. Likewise, impatience and an external locus of control are negatively related to success in life. We therefore extend our investigation to Big5 measures and measures of impatience and locus of control, available in the SOEP, in order to probe the conjecture that similarity in character leads to higher parental involvement.

We conjecture that benevolent parents, in the best interest of their

children, try to mould their children's character in order to increase their chances for success in life. Hence we expect that involvement in these cases affects the level of these traits rather than similarity to the parents' own traits. If we observe such a pattern in the data, it is hard to argue that similarity between parents and children drives parental involvement.

To allow for this different kind of influence we add a regression of the level of the child's personality trait on parental involvement and control variables. Alongside these results we provide the results of our previous estimation strategy, that is the regression of the distance in personality on involvement. While the transmission of own preferences follows the models of cultural transmission, e.g. in Bisin and Verdier, 2001, the absolute level of the attitude of the child is more in accordance with models of parenting style, as in e.g. Doepke and Zilibotti, 2017, that allow for shaping of the child's attitudes independent of the parents' own attitudes.

Table 8 provides the results of both types of regressions. Each row presents the coefficients of the respective parent's involvement on a personality trait, in levels of the child's trait and in the distance between the parent and the child in the respective trait. Since the attitudes and personality traits are gathered from different waves of the SOEP, the samples do not coincide between the different attitudes and traits.[18] Within attitude or trait the sample size is constant however. The same control variables as in our main analysis are included in every regression. For each attitude and parent we highlight the coefficients (on similarity or level of attitude) that are statistically significant at the 5% level.

We find that for almost every personality trait parental involvement is related stronger to the level of the child's trait than to the transmission of the parent's trait. As expected, openness to experience, conscientiousness, extraversion and agreeableness are positively related to parental involvement. The more the parents are involved in the upbringing of their children, the higher the children report in these success-bringing personality traits. We also find some evidence of transmission (significant effects for mothers in openness to experience and fathers in conscientiousness), but the effects are weaker than the level effects. For neuroticism we find a transmission effect

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[18]In the appendix we briefly introduce the attitudes and traits and how they are measured. We also report the sample size for analyses based on this variable as dependent variable.

for mothers and no effect for fathers. This means that mothers who rank high on the neuroticism scale have more neurotic children the more they are involved it their children's upbringing. We further find that fathers involvement has a negative impact on the external locus of control, which means that children of more involved fathers feel that they have more control over their own lives. Higher parental involvement of any of the parents relates to a lower level of impatience, for impulsiveness we find neither a level nor a transmission effect. Finally we find for risk and trust attitudes that the level effects are indeed insignificant.[19]

In general these results strongly support the hypothesis that parental involvement is related to the shaping of the children's preferences. We further see that for traits that have a more objective valuation (an optimal trait is either dictated by a societal rule or instrumental for future success) parental involvement is stronger related to the level of the trait. Finding that for personality traits the levels matter more also mitigates the concern of endogenous parental involvement, since the benefits of increased interaction with a more similar child are no longer an issue.

We can provide additional evidence that questions the conjecture that similarity drives parental involvement by investigating birth-order effects and differences between siblings.

Firstly we can observe that the first child is on average more similar to the parent in risk attitudes (the difference in similarity to the mother is 0.23, and 0.15 to the father, though only the difference for mothers is significant at the 5% level). If we assume that the attitudes dispositions are randomly distributed among children with the same parents, parents should be most involved with the most similar child. Thus there should be no birth order effect in the similarity to the parents. Instead we observe that the parents who have more than one child are on average more involved in the first child's upbringing (0.1 standard deviations difference between the first and the later child in parental involvement from mothers and fathers, both

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[19]In the appendix we also provide the results of the two types of regressions for the domain specific risks (Table A3). In case of the domain specific risk attitudes it is more difficult to predict whether the level or the transmission effect should be stronger. In the domains health and driving a level effect seems more likely, which coincides with our results. We also find a level effect for willingness to take risks in the domain of occupation, as well as a transmission effect in the risk attitude in financial matters for mothers. For risk attitudes in the domain of leisure and sport we find neither level nor transmission effects for either parent.

differences are statistically significant at the 5% level).

A different approach would be to investigate occurrences where the first child happens to be very similar to the parent's attitudes. If parents are more involved with children that are similar to them, and if there are no birth-order effects in the occurrence of attitudes, we should expect parents with a very similar first child to be less involved with the upbringing of the second child. Using the cases of siblings in our sample, we estimate the probability that the parents are more involved with the first child, based on the distance in risk attitudes between the parent and the child. We do not find support for any relation between the match in attitudes of the first child and the parent and the distribution of parental efforts between the children. The marginal effects of the similarity in risk attitudes between the mother and the first child on the probability that the mother is more involved with the first child than with the later child is small and statistically not different from zero, independent on whether we consider only same-sex siblings[20], or any constellation of siblings. For fathers the marginal effects are also statistically insignificant, while the sign is even inversed for same sex siblings.

4 Conclusion

Our analysis reveals that parents who are more involved in the lives of their children have children who are more similar to them in terms of economic preferences and attitudes. This holds for mothers and fathers. These results indicate that parents are equipped with a technology that enables them to shape the preferences of their children. While our data do not allow us to directly ascertain that parental involvement causally affects preferences, we provide ample evidence that preempt the most obvious reservations against a causal interpretation. First, there is no evidence of reverse causality. Statistical tests indicate that parental preferences and attitudes do not respond to children's attitudes over time. Second, we show that the involvement decision is not determined by similarities of parents and children. When it comes to personality traits, for example, parental involvement is not associated with similarity in personality of parents and their children, but is

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[20]We exclude mixed sibling couples because there could be differences in levels of involvement by gender of the child, see e.g. (Baker and Milligan, 2016)

rather related to the level of the child's traits. Moreover, we do not find evidence that parental involvement differs across same-sex siblings, even though parent–child similarity might differ between siblings. Third, the relationship between parental involvement and similarity in preferences is not a consequence of answering behaviour of the kind that children who are more similar to their parents answer the questions on parental involvement more favourably.

Our results have important implications. Evidence that a mechanism exists that enables parents to affect the transmission of preferences by investments, such as parental involvement, not only supports the view that preferences are malleable during childhood, but also that preferences can purposefully be shaped by parenting (Doepke and Zilibotti, 2017). Our findings thereby lend additional support to a central assumption of prominent theoretical models of cultural transmission, namely that parents can affect the intergenerational transmission of preferences and attitudes through nurture (Bisin and Verdier, 2001). As it is very likely that other investment opportunities, beyond the ones documented in this paper (e.g. the choice of neighbourhood in which the child grows up), exist that allow parents to directly or indirectly mould 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 preferences and attitudes.

This result is of great consequence for our understanding of intergenerational mobility and for the design and appraisal of policies that affect social mobility. While the malleability of preferences suggests scope for policy intervention during childhood, we deliberately have not indicated that policy makers should aim at influencing the formation of preferences formation. Too little is known about whether such changes are desirable. For example, 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.

References

Almlund, M., Duckworth, A. L., Heckman, J., and Kautz, T. (2011). Personality psychology and economics. *Handbook of the economics of education*, 4(1):1–181.

Anger, S. (2012). The intergenerational transmission of cognitive and noncognitive skills during adolescence and young adulthood. SOEPpapers 473.

Aunola, K., Stattin, H., and Nurmi, J.-E. (2000). Parenting styles and adolescents' achievement strategies. *Journal of Adolescence*, 23(2):205 – 222.

Baker, M. and Milligan, K. (2016). Boy-girl differences in parental time investments: Evidence from three countries. *Journal of Human Capital*, 10(4):399–441.

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. *Handbook of the Economics of Education*, 3:201–247.

Black, S. E. and Devereux, P. J. (2011). Recent developments in intergenerational mobility. In *Handbook of labor economics*, pages 1487–1541. Elsevier.

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

Butler, J. V., Giuliano, P., and Guiso, L. (2016). The right amount of trust. *Journal of the European Economic Association*, 14(5):1155–1180.

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.

Deckers, T., Falk, A., Kosse, F., Pinger, P., and Schildberg-Hörisch, H. (2017). Socio-economic status and inequalities in children's IQ and economic preferences. IZA Discussion Paper 11158.

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

Doepke, M. and Zilibotti, F. (2017). Parenting with style: Altruism and paternalism in intergenerational preference transmission. *Econometrica*, 85(5):1331–1371.

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. G. (2003). A nation-wide laboratory: examining trust and trustworthiness by integrating behavioral experiments into representative survey. IZA Discussion Paper 715.

Grönqvist, E., Öckert, B., and Vlachos, J. (2016). The intergenerational transmission of cognitive and non-cognitive abilities. *Journal of Human Resources*, pages 0115–6882.

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

Heckman, J., Pinto, R., and Savelyev, P. (2013). Understanding the mechanisms through which an influential early childhood program boosted adult outcomes. *The American Economic Review*, 103(6).

Heckman, J. J. (2005). 1. the scientific model of causality. *Sociological methodology*, 35(1):1–97.

Heckman, J. J., Holland, M. L., Makino, K. K., Pinto, R., and Rosales-Rueda, M. (2017). An analysis of the memphis nurse-family partnership program. Working Paper 23610, National Bureau of Economic Research.

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.

Josef, A. K., Richter, D., Samanez-Larkin, G. R., Wagner, G. G., Hertwig, R., and Mata, R. (2016). Stability and change in risk-taking propensity across the adult life span. *Journal of personality and social psychology*, 111(3):430.

Kosse, F., Deckers, T., Pinger, P., Schildberg-Hörisch, H., and Falk, A. (2018). The Formation of Prosociality: Causal Evidence on the Role of Social Environment. Working paper, University of Bonn.

Lindahl, M., Lundberg, E., Palme, M., and Simeonova, E. (2016). Parental influences on health and longevity: Lessons from a large sample of adoptees. NBER Working Paper 21946, National Bureau of Economic Research.

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. (2016). Social networks and parental behavior in the intergenerational transmission of religion. *Quantitative Economics*, 7(3):969–995.

Richter, D., Metzing, M., Weinhardt, M., and Schupp, J. (2013). Soep scales manual. SOEP Survey Papers 138, DIW/SOEP.

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.

Wagner, G. G., Frick, J. R., and Schupp, J. (2007). The German Socio-Economic Panel study (SOEP)–scope, evolution and enhancements. *Schmollers Jahrbuch*, 127(1):139–169.

Wagner, G. G., Göbel, J., Krause, P., Pischner, R., and Sieber, I. (2008). Das Sozio-oekonomische Panel (SOEP): Multidisziplinäres Haushaltspanel und Kohortenstudie für Deutschland–Eine Einführung (für neue Datennutzer) mit einem Ausblick (für erfahrene Anwender). *AStA Wirtschafts- und Sozialstatistisches Archiv*, 2(4):301–328.

Weinhardt, M. and Schupp, J. (2011). Multi-Itemskalen im SOEP Jugendfragebogen. Technical report, DIW Berlin, German Institute for Economic Research.

5   Tables

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

VARIABLES	Risk Sample mean	sd	Trust Sample mean	sd	no/not at all min	yes/very much max
Mother talks about things you do	3.783	(0.903)	3.779	(0.900)	5	1
Father talks about things you do	3.351	(0.996)	3.333	(0.993)	5	1
Mother talks about things that worry you	3.290	(0.986)	3.297	(0.981)	5	1
Father talks about things that worry you	2.981	(1.002)	2.990	(0.990)	5	1
Mother asks you prior to making decisions	3.714	(1.062)	3.733	(1.066)	5	1
Father asks you prior to making decisions	3.558	(1.147)	3.565	(1.141)	5	1
Mother expresses opinion on something you do	4.052	(0.827)	4.034	(0.819)	5	1
Father expresses opinion on something you do	3.857	(0.940)	3.840	(0.921)	5	1
Mother is able to solve problems with you	3.670	(0.984)	3.650	(0.989)	5	1
Father is able to solve problems with you	3.472	(1.050)	3.460	(1.048)	5	1
Mother asks your opinion on family matters	3.494	(1.020)	3.482	(1.016)	5	1
Father asks your opinion on family matters	3.312	(1.097)	3.313	(1.088)	5	1
Mother gives reason for making decision	3.613	(1.013)	3.590	(1.003)	5	1
Father gives reason for making decision	3.433	(1.084)	3.424	(1.071)	5	1
Parents show interest in performance	3.031	(0.731)	3.027	(0.734)	4	1
Mother helps with homework	0.746	(0.436)	0.750	(0.433)	1	0
Father helps with homework	0.559	(0.497)	0.566	(0.496)	1	0
Parents take part in parents-evening	0.763	(0.425)	0.772	(0.420)	1	0
Parents come to teacher office hours	0.585	(0.493)	0.581	(0.493)	1	0
Parents visit teacher outside office hours	0.230	(0.421)	0.230	(0.421)	1	0
Parents involved in at least one school activity	0.922	(0.268)	0.923	(0.266)	1	0
Observations	3,877		2,378			

Note: 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, v32.

Table 2: Descriptive statistics by parental involvement

| | Mother | | | | |
	High involvement		Low involvement		p-value $\triangle$
No. of kids in family	2.64	(1.16)	2.83	(1.34)	0.000
Age	18.17	(1.07)	18.22	(1.14)	0.210
1 if female	0.52	(0.50)	0.46	(0.50)	0.002
Mother years of education	12.61	(2.70)	11.94	(2.54)	0.000
Father years of education	12.82	(2.84)	12.29	(2.81)	0.000
1 if no migration background	0.79	(0.41)	0.74	(0.44)	0.000
HH-income vigintile	11.36	(5.43)	10.40	(5.34)	0.000
Age difference MC	28.24	(4.94)	27.95	(5.13)	0.037
Age difference FC	30.99	(5.76)	30.83	(5.94)	0.524
1 if $\Delta_R^{MF} >$ median	0.37	(0.48)	0.39	(0.49)	0.054
Observations	1,779		1,614		

| | Father | | | | |
	High involvement		Low involvement		p-value $\triangle$
No. of kids in family	2.62	(1.16)	2.82	(1.33)	0.000
Age	18.17	(1.07)	18.22	(1.14)	0.244
1 if female	0.52	(0.50)	0.47	(0.50)	0.722
Mother years of education	12.64	(2.71)	11.98	(2.55)	0.000
Father years of education	12.85	(2.84)	12.32	(2.82)	0.000
1 if no migration background	0.80	(0.40)	0.74	(0.44)	0.000
HH-income vigintile	11.45	(5.42)	10.43	(5.34)	0.000
Age difference MC	28.34	(4.94)	27.89	(5.10)	0.000
Age difference FC	31.05	(5.74)	30.79	(5.94)	0.022
1 if $\Delta_R^{MF} >$ median	0.37	(0.48)	0.38	(0.49)	0.002
Observations	1,574		1,819		

Note: Descriptive statistics, means and standard deviations in parenthesis, of the control variables for high and low parental involvement. We use the sample of our analysis on risk for this summary table. "p-value $\triangle$" reports the p-value of a mean-comparison test between high and low involvement parents.
Data source: SOEP, v32.

Table 3: PCA: The impact of parental involvement on differences in risk and trust

| VARIABLES | Risk | | Trust | |
	Mothers Δ_R^{MC}	Fathers Δ_R^{FC}	Mothers Δ_T^{MC}	Fathers Δ_T^{FC}
Maternal involvement (PCA)	−0.064***		−0.047**	
	(0.019)		(0.023)	
Paternal involvement (PCA)		−0.029		−0.062**
		(0.021)		(0.029)
No. of kids in family	−0.001	−0.001	−0.030*	−0.045***
	(0.017)	(0.015)	(0.018)	(0.016)
Age	0.012	0.006	−0.006	−0.002
	(0.016)	(0.018)	(0.015)	(0.016)
1 if female	−0.159***	−0.043	0.007	0.032
	(0.033)	(0.034)	(0.043)	(0.042)
Mother years of education	−0.007	0.002	0.005	0.016
	(0.009)	(0.008)	(0.011)	(0.011)
Father years of education	−0.004	−0.005	−0.007	−0.010
	(0.008)	(0.008)	(0.010)	(0.011)
1 if no migration background	−0.123***	−0.143***	0.068	−0.072
	(0.044)	(0.049)	(0.055)	(0.058)
HH-income vigintile	−0.001	−0.004	−0.005	−0.002
	(0.004)	(0.004)	(0.005)	(0.005)
Age difference MC	−0.008*	0.000	−0.000	0.005
	(0.005)	(0.005)	(0.006)	(0.007)
Age difference FC	0.007*	0.005	0.006	−0.000
	(0.004)	(0.005)	(0.006)	(0.006)
1 if $\Delta_R^{MF} >$ median	0.418***	0.192***		
	(0.038)	(0.038)		
1 if $\Delta_T^{MF} >$ median			0.326***	0.501***
			(0.047)	(0.049)
Constant	−0.072	−0.183	−0.140	−0.121
	(0.338)	(0.358)	(0.321)	(0.338)
Observations	3,393	3,393	2,119	2,119
R-squared	0.064	0.024	0.032	0.069

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

Table 4: Heterogeneous effects of parental involvement

VARIABLES	Risk		Trust	
	Mothers Δ_R^{MC}	Fathers Δ_R^{FC}	Mothers Δ_T^{MC}	Fathers Δ_T^{FC}
Involvement by parent	−0.095∗∗∗	−0.057∗	−0.053	−0.053
	(0.029)	(0.032)	(0.034)	(0.044)
1 if female	−0.151∗∗∗	−0.048	0.008	0.043
	(0.034)	(0.036)	(0.044)	(0.046)
Involvement # female	0.048	0.048	0.016	−0.038
	(0.038)	(0.042)	(0.045)	(0.059)
Involvement by parent	−0.066∗∗∗	−0.034	−0.047∗∗	−0.076∗∗
	(0.020)	(0.021)	(0.023)	(0.030)
Parental education (std)	−0.028	−0.009	0.020	−0.024
	(0.023)	(0.024)	(0.029)	(0.033)
Involvement # parental education	0.056∗∗∗	−0.021	−0.020	−0.031
	(0.019)	(0.021)	(0.021)	(0.029)
Involvement by parent	−0.060∗∗∗	−0.027	−0.058∗∗	−0.090∗∗∗
	(0.021)	(0.026)	(0.027)	(0.032)
1 if $\Delta_{Pref}^{MF} >$ median	0.418∗∗∗	0.193∗∗∗	0.325∗∗∗	0.489∗∗∗
	(0.038)	(0.039)	(0.048)	(0.050)
Involvement # $\Delta_{Pref}^{MF} >$ median	−0.010	−0.006	0.031	0.067
	(0.041)	(0.044)	(0.048)	(0.061)
Involvement by parent	−0.063∗∗∗	−0.031	−0.051∗∗	−0.070∗∗
	(0.020)	(0.022)	(0.024)	(0.029)
Involvement squared	0.017	0.004	−0.012	0.054∗∗
	(0.013)	(0.017)	(0.016)	(0.027)
Involvement by parent	−0.097∗∗∗	−0.112∗∗∗	−0.065∗∗	−0.170∗∗∗
	(0.033)	(0.030)	(0.032)	(0.038)
Involvement # $Pref^C > Pref^P$	0.041	0.159∗∗∗	0.047	0.225∗∗∗
	(0.040)	(0.042)	(0.045)	(0.057)

Note: Same controls as in main analysis, but allowing for different slopes in gender, parental education, heterogeneity between parents in attitudes, nonlinearities in parental involvement and direction of the difference in attitudes. All 5 regressions have the same number of observations as the respective regressions in the main analysis. Robust standard errors in parentheses allow for clustering at the parent level; ∗ significant at 10%; ∗∗significant at 5%; ∗∗∗significant at 1%.

Table 5: LW: The impact of parental involvement on differences in risk and trust

VARIABLES	Risk		Trust	
	Mothers Δ_R^{MC}	Fathers Δ_R^{FC}	Mothers Δ_T^{MC}	Fathers Δ_T^{FC}
Maternal involvement (LW)	−0.095∗∗∗		−0.063∗∗∗	
	(0.017)		(0.018)	
Paternal involvement (LW)		−0.078∗∗∗		−0.076∗∗∗
		(0.016)		(0.020)
No. of kids in family	−0.001	−0.001	−0.029	−0.045∗∗∗
	(0.016)	(0.015)	(0.018)	(0.016)
Age	0.013	0.008	−0.007	−0.002
	(0.016)	(0.017)	(0.015)	(0.016)
1 if female	−0.160∗∗∗	−0.036	0.005	0.035
	(0.033)	(0.034)	(0.046)	(0.044)
Mother years of education	−0.004	0.003	0.005	0.015
	(0.008)	(0.009)	(0.011)	(0.013)
Father years of education	−0.003	−0.003	−0.008	−0.010
	(0.008)	(0.008)	(0.010)	(0.011)
1 if no migration background	−0.110∗∗	−0.140∗∗∗	0.060	−0.074
	(0.045)	(0.048)	(0.053)	(0.056)
HH-income vigintile	−0.002	−0.005	−0.004	−0.002
	(0.004)	(0.004)	(0.005)	(0.005)
Age difference MC	−0.009∗	−0.000	0.000	0.004
	(0.005)	(0.005)	(0.006)	(0.007)
Age difference FC	0.007	0.005	0.007	−0.000
	(0.004)	(0.005)	(0.006)	(0.006)
1 if Δ_R^{MF} > median	0.421∗∗∗	0.197∗∗∗		
	(0.038)	(0.038)		
1 if Δ_T^{MF} > median			0.323∗∗∗	0.504∗∗∗
			(0.046)	(0.047)
Constant	−0.135	−0.126	−0.127	−0.128
	(0.336)	(0.339)	(0.336)	(0.336)
Observations	3,393	3,393	2,119	2,119
R-squared	0.069	0.029	0.034	0.072

Note: The dependent variables are the standardised difference in risk attitudes between mother/father and child in Columns(1)/(2) and in trust attitudes between mothers/father and child in Columns(3)/(4). Risk and trust attitudes are measured in survey questions, explained in Section 2.1. The variables of interest, "Maternal involvement (LW)" and "Paternal involvement (LW)", are indices, each constructed through the Lubotsky–Wittenberg method (see Section 3.2) using 13 involvement proxies. The variable "1 if Δ_R^{MF} > median" is a binary variable that indicates parents that are heterogeneous in their risk attitudes, and "1 if Δ_R^{MF} > median" analogously for trust. In addition to the listed variables we also control for the year of the attitudes elicitation. Bootstrapped standard errors (1000 reps); ∗ significant at 10%; ∗∗significant at 5%; ∗∗∗significant at 1%.

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

Risk: Mother-Child (Δ_R^{MC})

A change from the	PCA involvement index		LW involvement index	
	std	abs	std	abs
25th - 75th percentile in involvement	-0.079	-0.155	-0.129	-0.253
5th - 95th percentile in involvement	-0.199	-0.392	-0.315	-0.620

Trust: Mother-Child (Δ_T^{MC})

A change from the	PCA involvement index		LW involvement index	
	std	abs	std	abs
25th - 75th percentile in involvement	-0.058	-0.024	-0.083	-0.034
5th - 95th percentile in involvement	-0.146	-0.060	-0.207	-0.085

Risk: Father-Child (Δ_R^{FC})

A change from the	PCA involvement index		LW involvement index	
	std	abs	std	abs
25th - 75th percentile in involvement	-0.031	-0.058	-0.104	-0.193
5th - 95th percentile in involvement	-0.078	-0.145	-0.257	-0.478

Trust: Father-Child (Δ_T^{FC})

A change from the	PCA involvement index		LW involvement index	
	std	abs	std	abs
25th - 75th percentile in involvement	-0.064	-0.027	-0.099	-0.042
5th - 95th percentile in involvement	-0.163	-0.069	-0.259	-0.109

Note: We report the change in difference in attitude between parent and child, resulting from an increase in parental involvement 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 standardised and attitude-point effects based on the results of the estimation with both involvement indices.

Table 7: Changes in risk attitudes on changes of family members' attitudes

VARIABLES	All children Δ_t Risk Child	Δ_t Risk Mother	Δ_t Risk Father
Δ Risk Child = L,	-0.445***	-0.015	0.021*
	(0.011)	(0.011)	(0.012)
Δ Risk Mother = L,	0.037***	-0.462***	0.011
	(0.012)	(0.010)	(0.013)
Δ Risk Father = L,	-0.032***	-0.006	-0.489***
	(0.011)	(0.011)	(0.011)
Constant	-0.450***	-0.240***	-0.182**
	(0.086)	(0.081)	(0.077)
Observations	6,791	6,791	6,791
R-squared	0.235	0.262	0.274

Note: Robust standard errors in parentheses; * significant at 10%; **significant at 5%; ***significant at 1%.

Table 8: Level and distance in attitudes on parental involvement

| Dependent Variables | Mother | | Father | | N |
	Level	Distance	Level	Distance	
Big5: openness	**0.090**	**-0.079**	**0.112**	-0.010	1919
	(0.001)	**(0.002)**	**(0.000)**	(0.744)	
Big5: conscientiousness	**0.076**	-0.044	**0.090**	**-0.075**	1915
	(0.002)	(0.088)	**(0.002)**	**(0.012)**	
Big5: extraversion	**0.098**	-0.023	**0.120**	0.016	1918
	(0.000)	(0.348)	**(0.000)**	(0.588)	
Big5: agreeableness	**0.104**	-0.031	**0.096**	-0.010	1926
	(0.000)	(0.224)	**(0.001)**	(0.734)	
Big5: neuroticism	0.007	**-0.065**	0.013	-0.021	1924
	(0.777)	**(0.007)**	(0.668)	(0.495)	
external locus of control	**-0.049**	-0.001	**-0.068**	**-0.061**	2240
	(0.049)	(0.961)	**(0.015)**	**(0.039)**	
impatience	**-0.063**	-0.034	**-0.073**	-0.043	1542
	(0.030)	(0.241)	**(0.031)**	(0.178)	
impulsiveness	0.028	0.005	0.046	-0.036	1541
	(0.326)	(0.855)	(0.193)	(0.272)	
risk	-0.011	**-0.064**	-0.018	-0.029	3393
	(0.594)	**(0.001)**	(0.417)	(0.180)	
trust	0.029	**-0.047**	**0.074**	**-0.062**	2119
	(0.233)	**(0.041)**	**(0.010)**	**(0.031)**	

Note: This table lists the coefficients of the PCA involvement variables for mothers and fathers in regressions on different preference and attitude and personality measures. The control variables are the same as in the main specification, see Table 3. In Columns [1] and [3] the dependent variable is the child's level of the respective attitude. In Columns [2] and [4] the dependent is the distance in the attitude between the respective parent and the child. P-values in brackets.

Figure 1: Risk attitudes
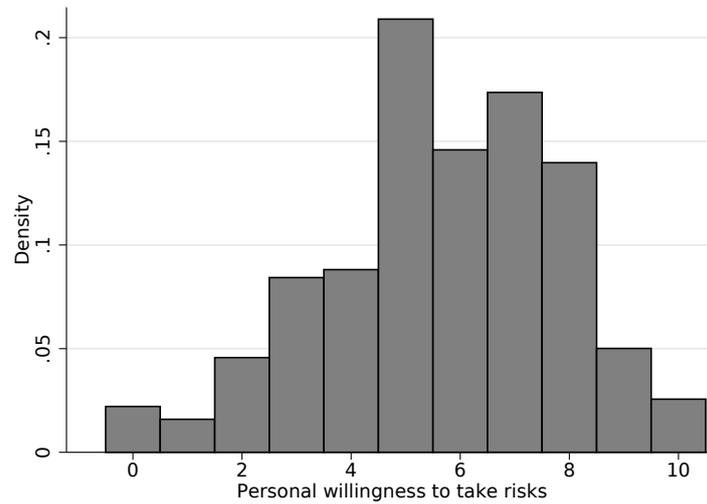
The histogram displays the distribution of answers to the general risk question of all children in our sample (at the time of their first encounter with the risk question). The wording of the risk question is: "How willing are you in general to take risks?"
Data source: SOEP, v32.

6 Figures

Figure 2: Trust in strangers
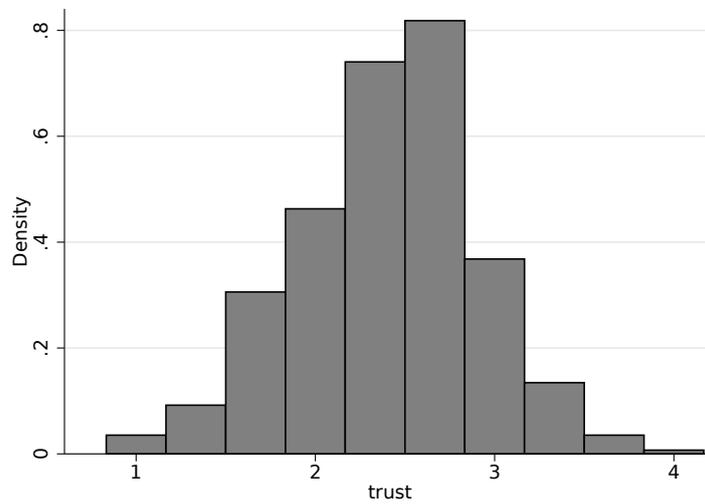
The histogram displays the distribution of trust attitudes among the children in our trust sample (when they first answer the trust questions). The trust attitudes are measured in an index, which is the simple average over the answers to the three trust questions: "On the whole one can trust people" (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, v32.

Figure 3: Difference in attitudes between parent and child
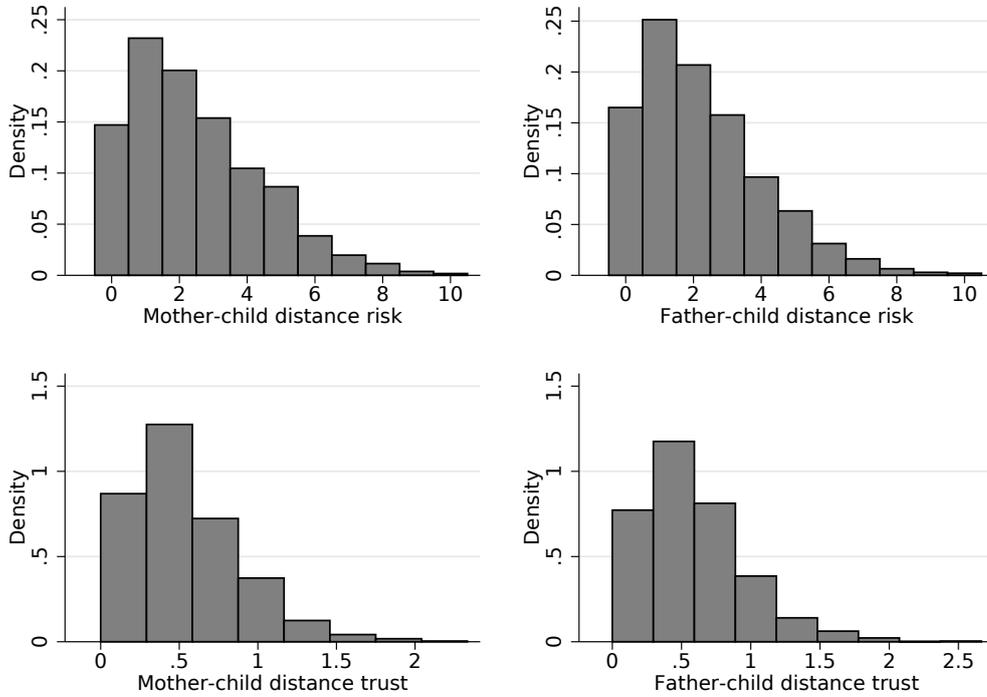
Distribution of the dependent variable, the absolute difference in attitude between parent and child (Δ_{Pref}^{PC}).
Own calibration; data source: SOEP, v32.

Figure 4: Correlations in reported parenting style
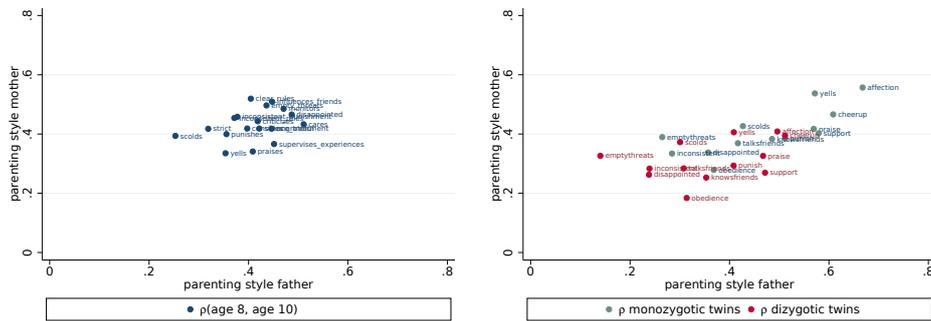
Note: Left panel: Test-retest correlations on parents answers to parenting style items, at the child's age 8 and 10. Own calibration; data source: SOEP, v32. Right panel: Correlation in answers to parenting style questions between twins. Own calibration; data source: TwinLife.

A1 Appendix

Table A1: Factor-loadings for PCA parental involvement measures

	Involvement mother	Involvement father
Parents show interest in performance	0.227	0.132
Parents take part in parents-evening	0.156	0.103
Parents come to teacher office hours	0.121	0.055
Parents visit teacher outside office hours	0.088	0.026
Parents involved in at least one school activity	0.174	0.107
Mother helps with studying	0.203	
Mother talks about things you do	0.328	
Mother talks about things that worry you	0.158	
Mother asks you prior to making decision	0.356	
Mother expresses opinion on something you do	0.384	
Mother is able to solve problems with you	0.363	
Mother asks your opinion on family matters	0.381	
Mother gives reason for making decision	0.383	
Father helps with studying		0.228
Father talks about things you do		0.364
Father talks about things that worry you		0.240
Father asks you prior to making decisions		0.368
Father expresses opinion on something you do		0.388
Father is able to solve problems with you		0.374
Father asks your opinion on family matter		0.376
Father gives reason for making decision		0.385

Table A2: Parental involvement on age adjusted differences in risk and trust attitudes

	Risk		Trust	
	Mothers	Fathers	Mothers	Fathers
VARIABLES	adj. Δ_R^{MC}	adj. Δ_R^{FC}	adj. Δ_T^{MC}	adj. Δ_T^{FC}
Maternal involvement (PCA)	-0.038**		-0.049**	
	(0.019)		(0.023)	
Paternal involvement (PCA)		-0.025		-0.052*
		(0.021)		(0.029)
Constant	0.118	-0.287	-0.049	-0.170
	(0.358)	(0.356)	(0.321)	(0.339)
Observations	3,393	3,393	2,119	2,119
R-squared	0.031	0.035	0.031	0.068

Note: All control variables from the main models are included. Robust standard errors in parentheses allow for clustering at the parent level; * significant at 10%; **significant at 5%; ***significant at 1%.

Table A3: Domainspecific risk attitudes: level and distance on parental involvement

| | Mother | | Father | | |
Dependent Variables	Level	Distance	Level	Distance	N
risk driving	**-0.065**	**-0.051**	**-0.070**	-0.021	2005
	(**0.007**)	(**0.040**)	(**0.013**)	(0.462)	
risk financial	**-0.049**	**-0.061**	-0.039	-0.027	2104
	(**0.041**)	(**0.017**)	(0.159)	(0.318)	
risk sport	-0.030	-0.031	-0.027	-0.011	2210
	(0.214)	(0.196)	(0.332)	(0.712)	
risk occupation	**-0.056**	-0.031	**-0.080**	0.019	2031
	(**0.038**)	(0.218)	(**0.009**)	(0.529)	
risk health	**-0.048**	**-0.046**	**-0.077**	0.025	2220
	(**0.043**)	(**0.050**)	(**0.005**)	(0.377)	

Note: This table lists the coefficients of the PCA involvement variables for mothers and fathers in regressions on different preference and attitude and personality measures. The control variables are the same as in the main specification, see Table 3. In Columns [1] and [3] the dependent variable is the child's level of the respective attitude. In Columns [2] and [4] the dependent is the distance in the attitude between the respective parent and the child. P-values in brackets.