

THE INTERGENERATIONAL TRANSMISSION OF RISK AND TRUST ATTITUDES

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Abstract

Do parents pass on economically relevant attitudes to their children? We investigate whether there is intergenerational transmission of two crucial determinants of economic behavior: willingness to take risks and willingness to trust other people. We use survey questions that ask about these traits directly, and are successful measures in the sense that they reliably predict actual risk-taking and trusting behavior in large-scale field experiments. We find a strong, significant, and robust correlation between the responses of parents and their children. The behavioral validity of our measures implies that this correlation translates into an important impact on children's behavior. We also find that parental characteristics and family structure matter for transmission: mothers have a bigger impact on trust attitudes than fathers, and mothers have a bigger impact on the risk attitudes of only-children as opposed to children with siblings. Finally, we show that parents pass on a bundle of distinct attitudes to their children, rather than just a general propensity to take risks or trust. Using questions that ask about willingness to take risks in specific domains – financial matters, health, career, car driving, and leisure activities – we find that the best predictor of a child's attitude in a given domain is a parent's attitude in that same domain, rather than parental attitudes in other domains. Using three different trust questions, we find a similar result. Our results have potentially important implications for understanding social mobility, the impact of family structure on behavior later in life, the source of persistent differences in attitudes and behavior across countries, and more generally, where individual endowments of preferences, beliefs, and attitudes come from.

Keywords: Risk Preferences, Social Preferences, Intergenerational Transmission, GSOEP

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1 Introduction

Do parents pass on economically relevant attitudes to their children, thereby shaping the types of choices they make later in life? This question is fundamentally important, for several reasons. First, almost nothing is known about how an individual's endowment of preferences and beliefs about the world is formed. Establishing a role for parents in determining these endowments would be an important first step towards opening this black box. Second, transmission of preferences and beliefs from parents to children has implications for understanding social mobility. If children end up with similar socio-economic status to their parents partly because they have similar attitudes and thus make similar choices, this has important policy implications. Third, family structure and parental characteristics may matter in ways that are not typically included in economic theory. For example, the presence or absence of siblings might have an impact on the strength of attitude transmission from parents to children. Fourth, if different societies have different endowments of preferences and beliefs, and these are transmitted across generations, this could lead to persistent differences in behavior across countries and regions.

In this paper we assess whether two fundamentally important determinants of behavior – willingness to take risks and willingness to trust other people – are transmitted from parents to children. In order to detect intergenerational transmission of willingness to take risks and trust, it is desirable to have measures that elicit these attitudes directly, for both parents and children. If the measures are successful, and capture the relevant traits precisely, they should reliably predict actual risk-taking and trusting behavior. In fact, only if the measures are behaviorally relevant can a correlation between parents and children be taken to imply an impact on children's behavior. We take advantage of survey questions administered to a sample of roughly 10,500 parents and children (about 3,500 parents-child pairs), which ask directly about willingness to take risks and trust. The questions come from the 2003 and 2004 waves of the German Socio-Economic Panel (SOEP), a large representative survey of the adult population living in Germany. Importantly, these questions are unique in that they have been validated in large-scale field experiments, and shown to predict actual risk-taking and trust. Thus, we can be confident that an intergenerational correlation in these measures is behaviorally relevant, *i.e.*, has an important impact on children's economic decisions.

The transmission of risk attitudes is a potentially crucial determinant of children’s behavior in the realm of individual decision-making, given that almost every economic decision involves risk. For example, investment in education, occupational choice, and investment in risky assets are all believed to be powerfully influenced by risk attitudes. Trust is similarly important, but in the realm of social interactions, capturing something fundamental about the way that an individual approaches other people. Most interactions in life involve vulnerability to defection by others, and trust determines whether an individual cooperates in these situations, or is willing to enter them at all.¹ Trust may also be self-fulfilling if an individual interacts with reciprocal types who reward trust by being trustworthy but respond to distrust with defection (Falk and Kosfeld, 2006). In this paper we do not focus on distinguishing between different possible mechanisms for the transmission of risk and trust attitudes, which could include genetics, imitation, and deliberate inculcation by parents. Instead, we focus on a necessary first step, which is assessing whether transmission occurs at all. We do provide some evidence along the way, however, that suggests the transmission of these attitudes is not explained entirely by genetics.

The measures of risk attitudes include a question asking respondents “how willing they are to take risks in general,” on an 11-point scale. Dohmen *et al.* (2005) validate this question in a field experiment using a representative sample of 450 adults living in Germany. They find that responses to the question are significant predictors of decisions in real-stakes lottery choices. The survey also includes five additional questions, which use the same scale as the general risk question, but ask about risk taking in specific contexts: car driving, financial matters, sports and leisure, career, and health. Dohmen *et al.* (2005) show that these questions, and the general risk question, predict investment in stocks, participation in active sports, self-employment, migration from East to West Germany, traffic offenses, and smoking. In other research, the general risk question has been shown to predict geographic mobility (Bonin *et al.*, 2006a), willingness to work in a job that involves performance pay (Grund and Sliwka, 2006), and sorting into risky occupations, where riskiness is measured by cross-sectional earnings risk (Bonin *et al.*, 2006b).

Our measure of trust attitudes incorporates three different questions. These ask,

¹ Economic transactions are a prime example of the importance of trust, due to the prevalence of contractual incompleteness.

respectively, whether most people can be trusted, whether people are reliable, and whether it is wise to be cautious when trusting others. Fehr *et al.* (2003) study the behavioral validity of these questions using a representative sample of 450 adults living in Germany, and find that they are strong predictors of willingness to trust in a real-stakes trust game. Falk and Zehnder (2006) use a similar set of questions and show that these predict trusting behavior by first movers in a trust game, where first movers are 490 residents of different regions of a large city. The most prominent question used in the literature on trust, the so-called GSS trust question, is a combination of our first two questions. This GSS trust question has been shown to predict behavior at the aggregate level, for example explaining GDP growth and the efficiency of institutions across countries (La Porta *et al.*, 1997; Knack and Keefer, 1997; Zak and Knack, 2001).

The first portion of our analysis investigates whether risk and trust attitudes are correlated between parents and children. We find large, significant, and robust correlations: parents who are willing to take risks have children who are more risk taking, and trusting parents tend to have children who are trusting. These results are robust to controlling for exogenous characteristics that may affect risk and trust attitudes, such as gender, age and height, and also to a wide variety of demographic controls. Importantly, the impact of parents is long lasting, in the sense that it persists even after children leave the home. The five domain-specific risk measures allow us to investigate whether there is also an intergenerational correlation within specific domains. In fact, in each domain parents' and children's willingness to take risks is significantly correlated. This could indicate that the measures all capture the same underlying attitude, but it is also consistent with parents transmitting distinct attitudes in each separate domain. We return to this question later in the analysis.

The second portion of the analysis tests various hypotheses regarding the impact of family characteristics on the transmission process. We first assess whether mothers have a greater impact on daughters, and fathers on sons. This asymmetry could arise if children learn by imitation, and tend to choose a role model of their own gender. Although the point estimates are consistent with this story, for both risk and trust attitudes, the difference is not statistically significant. A second hypothesis is that mothers might have a stronger impact on children than fathers, regardless of gender. This would be in line with evidence from a meta-analysis of the psychology literature on personality transmission,

and could arise because mothers spend more time with children than fathers. We find that fathers and mothers are equally important for risk attitudes, but find that mothers do have a significantly larger impact than fathers for determining a child's willingness to trust. We also test the hypothesis that parents have a greater impact on only-children, *e.g.* because they do not have to divide their attention among multiple children. For trust attitudes, we find no effect, but for risk attitudes we do observe a strong difference: mothers are significantly more important for determining the risk attitudes of only-children than they are for determining risk attitudes of children with siblings. Given that women are significantly less willing to take risks than men, according to the general risk question, one might expect that only-children would be significantly less willing to take risks than children with siblings. This is in fact the case. Overall, the findings in this portion of the analysis are consistent with a role for imitative learning, or deliberate socialization by parents, and are hard to explain if transmission is *solely* genetic. On the other hand they certainly do not rule out that genetics play an important role as well.

The third portion of the analysis investigates whether there is a “coarse” or “fine” transmission of attitudes from parents to children. One might hypothesize that parents transmit only a general underlying tendency to take risks, or trust others, which is correlated with all of our different measures. In this case, asking about willingness to take risks in specific domains is unnecessary for measuring the transmission of risk attitudes. Instead, we find that the separate risk questions capture distinct attitudes that are transmitted across generations. For example, a child's willingness to take risks in career matters is predicted by parents' risk attitudes in this domain, but only weakly by parents' attitudes in other risk domains. Overall, each context-specific risk measure for parents is the best predictor of children's attitudes in that context. There is a similar result with the trust measures: each specific trust question is the best predictor of a child's response to that question. One message to take away from this analysis is that two children who have parents with the same general risk attitude may vary strongly in risk taking in a specific domain, such as health matters, if their parents differ in this domain. Another message is that there is an underlying coherence in the transmission process that is present even when we look at a finer degree of resolution. It appears that it is possible to measure the collection of attitudes transmitted from parents to children relatively precisely.

In summary, this paper shows that parents play an important role in determining an

individual's willingness to take risks and trust. These findings are important for several reasons. First, there is little previous evidence on how an individual's endowment of risk and trust attitudes is formed. Our data show that parents play an important role, which is an important first step in opening this black box. Previous evidence on intergenerational transmission of economically relevant attitudes includes Knowles and Postelwaite (2005), who report a correlation between parents' and children's responses to questions about propensity to save, and Charles and Hurst (2003) who report a correlation in answers to a hypothetical lottery. Relative to these studies, our measures have the advantage that they ask directly about the traits in question, and incorporate trust attitudes as well as a battery of risk measures. More importantly, our measures have been shown to predict actual risk-taking and trusting behavior. Thus we can conclude with more confidence that the intergenerational correlation we observe translates into an impact on the economic behavior of children.² Our findings are particularly relevant in light of an accumulating body of evidence showing that willingness to take risks and willingness to trust are heterogeneous across individuals (see Dohmen *et al.*, 2005; Fehr *et al.*, 2003 and Bellemare and Kroeger, 2004). Clearly, understanding the source of these individual differences is intimately linked to the goal of economics as a science for predicting behavior.

Second, our evidence has an important applications for understanding the persistence of socio-economic status, and inequality, across generations. Many studies have documented a strong correlation in the economic outcomes of parents and children, for example in terms of educational attainment (Mulligan, 1999; Black *et al.*, 2005), income (Mulligan, 1997; Solon, 1992), wealth (Charles and Hurst, 2003), and occupation (Kerkhoff *et al.*, 1985; Long and Ferrie, 2005). It is doubtless the case that this persistence is strongly influenced by the financial constraints facing parents. For instance, Charles and Hurst (2003) show that the level and variance of parental income is an important determinant of children's wealth, perhaps because these financial variables capture the ability of parents to lend money to their children. On the other hand, our findings suggest an additional mechanism, namely the transmission of attitudes from parents to children.

² There is also a large literature in psychology showing that parents and children give similar responses on scales designed to measure various aspects of personality and attitudes, including traits such as conscientiousness, sensation-seeking, neuroticism, and agreeableness, to name only a few (for a review, see Loehlin, 2005). We believe that this literature may eventually be informative for economists, but at this point the dimensions of personality studied by psychologists do not map directly into economic models. These measures are also typically not validated with respect to economic behavior.

Children may end up with similar outcomes to their parents partly because they inherit similar attitudes and thus make similar choices in life.³ This is consistent with evidence from Black *et al.* (2005), who show that an exogenous increase in the educational endowment of parents, due to a nationwide change in compulsory schooling laws, has no impact on the educational attainment of their children. This finding highlights the challenging policy implications raised by a role for transmission of attitudes. If the correlation in educational outcomes across generations partly reflects transmission of attitudes, changing this persistence may require more than changing the financial or educational endowment of parents. Notably, the intergenerational correlation in risk attitudes captured by our measures is relevant for children’s behavior in the domain of educational choice, and all of the other domains where intergenerational correlation in outcomes are typically observed.⁴

At the end of the paper we offer concluding remarks. We briefly return to the question of what specific mechanisms may underly the intergenerational transmission of attitudes. We also discuss evidence from our sample showing that additional types of attitudes, for example political ideology, are strongly transmitted from parents to children. We highlight evidence from a companion paper, showing that there is positive assortative mating of parents based on risk attitudes, and discuss the resulting reinforcing effect on the transmission of risk attitudes across generations. Finally, we discuss the implications of intergenerational transmission of risk and trust attitudes for explaining persistent differences in behavior across countries. The remainder of the paper is organized as follows: Section 2 describes the data, Section 3 presents the empirical results, and Section 4 concludes.

³ Others have hypothesized that the intergenerational transmission of attitudes, personality, or other personal traits plays a role in explaining the persistence of outcomes across generations (*e.g.*, Bowles and Gintis, 2002; Charles and Hurst, 2003; Loehlin, 2005; Osborne, 2005). The literature on non-cognitive skills has also advanced a closely related hypothesis, suggesting that parental inculcation of traits such as trustworthiness, tenacity and perseverance are important for explaining the economic success of children later in life (Heckman and Rubinstein, 2001; Heckman *et al.* (2006)). We contribute to this discussion by providing evidence that a behaviorally-relevant transmission of attitudes does indeed take place, for two important traits.

⁴ Dohmen *et al.* (2005) show that educational attainment is positively correlated with willingness to take risks, as measured by the general risk question. Children’s wealth, income, and the decision to invest in stocks are also positively correlated with willingness to take risks. General risk attitudes also predict sorting into different occupations (Bonin *et al.*, 2006b).

2 Data Description

Our data come from the German Socio-Economic Panel (SOEP), a representative panel survey of the resident German population (for a detailed description, see Wagner *et al.*, 1993, and Schupp and Wagner, 2002). The initial wave of the survey was conducted in 1984.⁵ For this study we focus mainly on the 2003 and 2004 waves, because these include key questions used in our analysis. Each wave includes roughly 22,000 individuals, from about 12,000 households.

The SOEP conducts a separate interview with each member of a household over the age of 17. A substantial fraction of the interviews, about one quarter, are computer-assisted personal interviews (CAPI), but in general the survey is filled in on paper forms during an oral interview, either by the interviewer or by the respondent. Importantly, given that we are interested in the correlation or lack of correlation in the responses of family members, interviewers are specifically instructed to administer the survey individually, and to take every precaution to ensure that different household members answer independently and are not influenced by each other's responses. If for some reason one household member wants to fill in the paper survey at the same time that the interviewer conducts a personal interview with another household member, the interviewer has to ensure that these two survey respondents are in different rooms. The large majority of interviews (roughly 80 percent in both 2003 and 2004) were completed while the interviewer was present in the household, but a small fraction of respondents returned the questionnaire by surface mail, due to severe difficulties in scheduling an appointment with the interviewer. In our analysis, we verify that our results are robust to excluding these mail-in interviews. As a more conservative robustness check, we also verify that our results are sustained when we restrict the sample to children who live in a separate household from their parents.

Respondents are asked for a wide range of personal and household information, and for their attitudes on assorted topics, including political and social issues. The 2004 wave of the SOEP contains a novel battery of questions about the risk attitudes of individuals. One question asks respondents to indicate their willingness to take risks on an eleven-point scale, with zero indicating complete unwillingness to take risks, and ten indicating complete willingness to take risks. The wording of the general risk question, translated

⁵ The panel was extended to include East Germany in 1990, after reunification. For more details on the SOEP, see www.diw.de/gsoep/.

from German, is as follows: “How do you see yourself: Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks? Please tick a box on the scale, where the value 0 means: ‘unwilling to take risks’ and the value 10 means: ‘fully prepared to take risks’.”⁶ The survey also includes five additional questions, which use the same 11-point scale, but ask about willingness to take risks in specific domains: car driving, financial matters, sports and leisure, career, and health. The 2003 wave of the SOEP contains three questions about individuals’ trust attitudes, similar to those that are asked in the General Social Survey in the U.S.. In particular, subjects were asked to indicate on a four-point scale to what extent they agree or disagree with the following statements: 1) In general, one can trust people. 2) These days you can’t rely on anybody else. 3) When dealing with strangers it is better to be careful before you trust them.⁷

Both the risk measure and the trust measure have been validated in field experiments with representative subject pools. Dohmen *et al.* (2005) conduct a field experiment with 450 adults living in Germany. The participants come from all regions of Germany, and were sampled according to the same random walk method used to construct the full SOEP sample (see Fowler, 1988). All subjects in the experiment first completed a detailed questionnaire, which included the exact same general risk question asked in the 2004 wave of the SOEP. Subjects then participated in a lottery experiment involving substantial monetary stakes. In the experiment, subjects had to decide between a lottery, in which they could either win 300 Euros with probability 1/2 or receive nothing with probability 1/2, and a series of different safe payment alternatives. The lottery option remained the same across choices, but the alternative safe payment option was increased in steps of 10 Euros up to a maximum of 190 Euros. Subjects were informed in advance that one of their choices would be randomly selected for payment, and that one out of nine participants would actually be paid according to the selected choice. The authors find that the questionnaire responses to the general risk question are reliable predictors of actual risk taking behavior in the lottery experiment. Dohmen *et al.* (2005) show in addition that survey responses to the general risk question in the 2004 wave of the SOEP predict risk-taking behavior in various domains of life, including investment in stocks, sports behavior, career choice, smoking behavior, and geographic mobility. There is also evidence that the

⁶ German versions of all risk questions are available online, at www.diw.de/deutsch/sop/service/fragen/personen/2004.pdf.

⁷ The four answer categories were labelled: strongly agree, agree somewhat, disagree somewhat, strongly disagree.

distribution of willingness to take risks among survey respondents, who are representative of the adult population living in Germany, maps into the distribution of risky behavior observed among the adult German population as a whole. For example, the distribution of willingness to take risks in car driving within gender-age-cells of the SOEP sample predicts the gender-age pattern of the traffic offence rate of the entire German population.

Fehr *et al.* (2003) validate the behavioral relevance of our trust measures in a field experiment with 429 subjects. These subjects were sampled by the same method as subjects in the study by Dohmen *et al.* (2005) and are representative of the adult population living in Germany. Subjects first completed a detailed questionnaire that contained the same three questions on trust attitudes that were asked in the 2003 wave of the SOEP. Subjects then played a sequential social dilemma game, a modified version of the trust game developed by Berg *et al.* (1995), which has become a standard tool for eliciting willingness to trust. In the design, two players, both endowed with 10 Euros, were randomly matched. Player A could then send any amount between 1 and 10 Euros to player B. The amount that A sent was doubled by the experimenter so that B received twice the amount that A had sent. B could then send money back to A, but this was not enforceable. The experimenter doubled any amount sent by B with the result that A received twice the amount that B had sent. So, if A sent x Euros and B sent y Euros back, the payoff for Player A was $10 - x + 2y$ Euros, while the payoff for B amounts to $10 + 2x - y$ Euros. The amount that player A sends in this game is a measure of trust.⁸ Fehr *et al.* (2003) estimate an econometric model that relates the survey responses of subjects in the role of Player A to the trusting behavior of these subjects in the social dilemma game, measured by the amount that they chose to send to Player B. Via factor analysis, Fehr *et al.* (2003) summarize the information that is contained in an individual's responses to the three survey questions about trust into one variable. They use this survey measure of trust as an explanatory variable in an ordered probit regression model with the amount invested by first movers (player A) in the experiment as the dependent variable. The significant coefficient that was found for the survey trust measure shows that subjects who report that they trust others in fact send more money to player B in the trust experiment.

Since we want to investigate whether and to what extent trust and risk attitudes are

⁸ A detailed description of the experiment, the empirical analysis and the results can be found in Fehr *et al.* (2003).

transmitted from parents to children, we focus our analysis on respondents whose parents also answered the same survey questions. For 3,171 children in the 2004 wave, we have complete information on their own answers to the trust questions and both of their parents' answers to these questions. We also have complete information about willingness to take risks for 3,331 children from the 2004 wave, and both their parents. These samples do not completely coincide because some of the children or their parents that were interviewed in 2003 did not answer the questions about risk attitudes in the 2004 wave. Likewise, in the 2004 wave we do not have information on some subjects' answers to the trust questions in 2003. These are mostly respondents who were not yet interviewed in 2003. In total, we have complete information on either trust or risk attitudes for 3,595 children and both their parents, *i.e.* for 10,785 individuals. We refer to a 3-person group consisting of two parents and their child as a parents-child pair in the remainder of the paper. The largest fraction of our 3,595 parents-child pairs (55.7 percent) live in the same household, but a substantial fraction (40.6 percent) of children in our sample live in different households than both of their parents. Only a small fraction lives in the same household with only one parent. We observe a large fraction of children who live in a separate household from their parents, because survey participants who move out of a household are followed by the SOEP and form a new household entity in the survey. An additional advantage of this sampling scheme is that half of our children are older than 23 years of age. The oldest child in our sample is 54 years old. The average age of children in our sample is 25.3 years (std. dev.= 6.96) while fathers are on average 54.6 years old (std. dev.= 8.70) and mothers are on average 51.7 years of age (std. dev. = 8.3). This variation in children's age means that our results are not based only on relatively young children.

Variation in parents' willingness to take risks and trust is a prerequisite for identifying an impact of parents' risk and trust attitudes on children's attitudes. The histograms in the lower part of Figure 1 show that there is substantial heterogeneity in willingness to take risks, for both mothers and fathers. The two diagrams in the upper part of Figure 1 provide a first look at the relationship between parents' and children's attitudes, as it appears in the raw data. The figures show children's average willingness to take risks, for given willingness to take risks of their mother (upper left diagram) or their father (upper right diagram) without controls for any observable characteristics. Children's willingness to take risks is clearly increasing in parents' willingness to take risks. This is illustrated

by the positively-sloped regression lines in the diagrams, which are based on a weighted regression of children’s average willingness to take risks on the respective parent’s willingness to take risks. The weighting takes into account the number of children with a parent who states a particular value on the risk scale (this weighting is reflected in the histograms in the lower part of the figure).

Turning again to the histograms at the bottom of the figure, it is clear that mothers are less willing to take risks than fathers. This is in line with the gender effect that Dohmen *et al.* (2005) find using the entire sample of the 2004 wave, which includes 22,000 individuals. The authors also find that two other plausibly exogenous individual characteristics, age and height, are significant determinants of individual willingness to take risks as well. Table 1 shows evidence of similar effects for our sub-sample of children. The table presents estimates from probit models, where the dependent variable is a binary measure of willingness to take risks that takes the value 1 if the individual reported a number larger than five on the eleven-point scale. In Column (1), the coefficients for gender, age, and height are all significant at the 1 percent level, and the effect of these determinants is quantitatively very similar to the estimated effects on willingness to take risks for the full sample used by Dohmen *et al.*. In particular, daughters, who represent 47.3 percent of all children in our sample, are 9.5 percent less likely than sons to report a willingness to take risks that exceeds 5 on the eleven-point scale. Moreover, the probability of reporting a number larger than 5 falls by about 0.8 percent with every year of age, and rises by 0.6 percent with every centimeter of body height. Column (2) shows that these results are robust to the inclusion of other, potentially endogenous controls. The importance of these exogenous factors for individual risk attitudes will motivate us to include them in the specifications used in our later analysis.

Columns (3) and (4) of Table 1 show how children’s trust is related to gender, age and height. The dependent variable in the OLS regression is a measure of trust that combines the information of all three questions on trust into a scalar via principal component analysis. Analogous to the approach taken in the validation study of Fehr *et al.* (2003), we compute the first principal component of the responses to the three trust questions.⁹ An individual’s principal component trust measure is then obtained by

⁹ For conceptual reasons, we prefer to use principle components analysis rather than factor analysis as is done by Fehr *et al.* (2003). We are interested in capturing the essential variation of the responses and using this in regression analysis across parents-child pairs, rather than for detailed analysis of covariance

multiplying the standardized answers to the respective trust questions with the loadings of the questions on the principal component. As can be seen from the table, gender and age have little impact on trust attitudes in the full specification. There is a marginally significant correlation with height.

Figure 2 shows how a child’s willingness to trust is related to the trust attitudes of mother and father, without conditioning on observable characteristics. The diagrams in the upper part of the figure plot children’s average values of the trust measure, constructed via principal component analysis, for given values of the same trust measure of mothers (left diagram) and fathers (right diagram). The regression lines are weighted by the number of observations of children whose parents’ trust measure takes a particular value. The distribution of these frequencies for mothers and fathers is reflected in the histograms below. The upward slopes of the weighted regression lines give an initial indication that children’s tendency to trust is increasing in their parents’ willingness to trust.

3 Results

3.1 Transmission of risk and trust attitudes

We begin our analysis by assessing whether there is an intergenerational correlation in willingness to take risks. In Table 2 we regress children’s answers to the general risk question on the answers of their respective mothers and fathers. We estimate binary probit models, where the dependent variable is equal to 1 if individuals are relatively willing to take risks, *i.e.*, choose a value greater than 5 on the risk scale. Likewise, a person is classified as relatively unwilling to take risks if he or she chooses a value of 5 or lower on the risk scale. We prefer this binary measure over using the full 11-point scale because it generates results that are intuitive and simple to interpret, and minimizes problems arising from individual differences in the use of response scales.¹⁰ To preclude that the observed correlation between parents’ and children’s attitudes is

(see also Tabachnick and Fidell, 2001). However, our results are unchanged if we instead use factor analysis for all regressions. We obtain the principal component without rotation. Analysis of eigenvalues suggests that only the principal component exhibits an eigenvalue larger than unity. The factor loadings, which are multiplying the standardized responses to the trust, reliance and caution questions are -0.8011, 0.8205 and 0.6419, respectively, for children, -0.7849, 0.8199, and 0.6603, respectively, for fathers, and -0.7772, 0.8082, and 0.6395, respectively, for mothers.

¹⁰ Note, however, that all results reported in the paper are essentially the same if we use the full scale instead. The respective regression tables are available on request.

driven by similarity in exogenous determinants, *e.g.* a tendency for tall parents to have tall children, we control for children’s gender as well as children’s and parents’ age and height. We report marginal effect estimates, evaluated at the mean of characteristics, from Probit regression models with the binary risk measure as dependent variable. All coefficients are marginal effects from the binary Probit estimations. We report robust standard errors, corrected for possible correlation of the error term across individuals from the same household.

Column (1) of Table 2 shows that children are increasingly likely to answer above five on the general risk scale as mother’s and father’s willingness to take risks increases. In addition to being highly statistically significant, the impact of parents’ risk attitudes is also sizable: the marginal effect is 0.029 for mothers, which implies that a child with a mother who is completely willing to take risks on the 11-point scale is about 30 percent more likely to be relatively willing to take risks than a child with a mother who is completely unwilling to take risks, assuming that the marginal effect at the mean applies to the entire range of admissible answers. This is larger than the impact of gender — women are about 10 percent less likely to be willing to take risks than men — and comparable to the impact of 40 additional years of age (compare to Column (1) in Table 1).

In Columns (2) and (3) of Table 2 we control for gender, age, and height, of both children and parents. In light of the results shown in Table 1 it is not surprising to find that daughters are less willing to take risks than sons, and that taller and younger children are more likely to report that they are willing to take risks. Age and height of the parents do not have a statistically significant direct effect on children’s willingness to take risks. Most importantly, the positive impact of parents’ willingness to take risks on their children’s risk attitudes remains strong, significant and virtually the same in size. This holds also in Column (3), where we control for permanent income of the child and his or her father, measured by occupational prestige.¹¹ Controlling for the permanent income of children and parents is particularly important since their incomes are likely to be correlated, and higher

¹¹ Following Ermisch *et al.* (2006), we use occupational prestige as a proxy for permanent income. The Treiman standard international occupational prestige score takes discrete values from 13 to 78, where higher scores indicate higher prestige (see Ganzeboom and Treiman (1996) for the methods used to construct the scale). As shown by Ermisch *et al.* (2006), this prestige measure exhibits a strong correlation with permanent income. This approach is useful mainly because it mitigates the problem of missing values on income and thus keeps the number of observations reasonably high. All results are qualitatively and quantitatively unchanged if we add controls for children’s and parents’ self-reported (log) household wealth in 2002, and (log) net monthly household income in 2004, as well as indicators for high school education of children and parents.

income may imply a higher willingness to take risks simply because it cushions the impact of bad outcomes. We also include indicator variables for residence of youth (big city, city, small town, countryside, missing) for both children and parents, and indicator variables for children’s and parents’ religions (catholic, protestant, other Christian, other religion, not a member of any church, missing information on religion). The two coefficients of main interest, mother’s and father’s willingness to take risks, remain basically unchanged, *i.e.*, the intergenerational transmission of risk attitudes is strong and robust even when controlling for socioeconomic and parental-background variables. Notably, in all three specifications the coefficient for mother is larger than the coefficient for father, a fact that we discuss in more detail below.

In the 2004 wave of the GSOEP respondents were not only asked about their general willingness to take risks but also about their willingness to take risks in the following domains: car driving, financial matters, sports and leisure, career and health. It is interesting to investigate whether we also observe intergenerational transmission of risk attitudes when we look at these domain-specific measures.¹² In Table 3 we show for each domain the marginal effect estimates of the mother’s and the fathers’s willingness to take risks, on the child’s willingness to take risks. The set of controls corresponds to those in our fullest specification, Column (3) of Table 2. To aid comparison, in Column (1) we once again report the coefficients for the general risk question. Columns (2) to (6) report the marginal effects for the specific domains. As is evident from Table 3 the transmission of specific risk attitudes is significant at the 1-percent level for all domains and for both mothers and fathers. The coefficient for mothers is larger than the coefficient for fathers, in every domain. In summary, Table 3 shows that the transmission of risk attitudes is not confined to a general risk attitude but extends to different domains. This could indicate that all measures are correlated with a single, general trait passed from parents to children. On the other hand it could indicate that parents’ transmit a bundle of specific attitudes. We return to the issue of domain-specific risk attitudes in Section 3.3.

We now turn to the analysis of trust. Recall from section 2 that respondents ex-

¹² In Dohmen *et al.* (2005) these questions are analyzed in detail. They report that the different measures are significantly correlated, suggesting the existence of a general disposition towards risk. On the other hand they show that the correlations are not perfect. In addition, they find that the measures predict risk-taking behavior in their corresponding domains. In fact, the domain-specific measures are the best predictor of behavior in a given domain, compared to measures from other domains. For example, the best predictor of smoking is willingness to take risks in health matters, and the best predictor of self-employment is risk attitude in career matters.

pressed their disagreement (on a scale from 1 to 4) to three different trust questions. The first asked whether “In general, one can trust people” (*general trust*), the second asked whether “In these days you can’t rely on anybody else” (*reliance*) while the third asked “When dealing with strangers it is better to be cautious before you trust them” (*caution*). Fehr *et al.* (2003) collapsed these three questions into a single factor and then showed that this measure is a significant predictor of first movers’ behavior in a paid trust experiment. First movers who are more trusting according to the survey measure transfer significantly more to the second mover. Since we are interested in behaviorally valid measures we also collapse the three trust questions into a single component.¹³ In Section 3.3, however, we also analyze answers to the three questions separately. The results, which are displayed in Table 7 show similar results to those obtained with the principal component trust measure.

In the presence of intergenerational transmission of trust attitudes, we should see a positive and significant relationship between parents’ willingness to trust and the trust attitudes of their children. To test this we ran three regressions analogous to the ones reported in Table 2. The dependent variable is the principal component (*trust*) of the children, which is regressed on the respective principal components of mothers and fathers, respectively. In the first column of Table 4 no further controls are added.¹⁴ The coefficients for mothers’ and fathers’ trust are positive and significant on any conventional level, supporting the transmission hypothesis. The coefficients remain basically unchanged and highly significant if we add further controls in Columns (2) and (3). Interestingly, the coefficients are quantitatively comparable to those obtained from the regressions on risk attitudes in Table 2. There, coefficients were marginal effects of parents’ attitudes measured on a scale from zero to ten on a binary outcome. The coefficients in the trust regressions are marginal effects of parents’ principal component trust measures on children’s principal component trust measure, all ranging from about -5 to 5. It is noteworthy that in Column (3) the attitudes of the parents are the *only* significant predictors of the children’s trust attitudes. Age, gender, permanent income or religious background of the children or their parents do not significantly explain trust attitudes. This reinforces the importance of the parents’ impact on the formation of children’s attitudes. Finally, it is notable that the coefficient for mother is substantially larger than the coefficient for father, in all specifications.

¹³ We collapse the measures using principal component analysis, as described in footnote ??.

¹⁴ Some observations are lost due to adjusting error terms for clustering at the household level.

As a robustness check, we estimate all of the regressions in Tables 2 and 4, excluding from the sample observations of parents-child pairs if one of the three individuals had sent in the questionnaire answers by surface mail, *i.e.*, answered the survey without the interviewer being present. In this case, we actually find a slightly stronger intergenerational correlation in risk and trust attitudes. We also estimate the same regressions using the 40 percent of children in the sample who have left the home and live in a separate household from the parents. In this case the the intergenerational correlation is still highly significant, for both trust and risk attitudes. This finding is important because it indicates that parents have a lasting impact on children, affecting their risk and trust attitudes even after they have left the home.¹⁵

As a final result for this section, we attach a monetary value to the intergenerational correlation in risk attitudes, using an alternative measure of willingness to take risks included in the SOEP. Respondents in the SOEP were asked how much of 100,000 Euros in lottery winnings they would choose to invest in a hypothetical asset promising, with equal probability, to either halve or double their investment in two years time. The question offered respondents six possible investment amounts: 0, 20,000, 40,000, 60,000, 80,000, or 100,000 Euros. The amount invested in this hypothetical asset is a measure of the respondent's risk preference. We do not focus on this question because it has not been validated like the general risk measure. Dohmen *et al.* (2005) also compare this measure to the general risk question, and show that it is a less reliable predictor of a variety of risky activities, including occupational choice, smoking, and geographic mobility. Nevertheless, the question is useful in that it makes it possible to discuss a concrete example, where the intergenerational correlation in risk preferences is valued in terms of monetary units. Regressing children's investment amounts in the hypothetical lottery on mother's and father's investment amounts, exogenous factors, and our standard controls included in Column (3) of Table 2, there is a highly significant, positive correlation between children's and parents' willingness to take risks.¹⁶ This correlation is also sizeable in monetary terms. For example, if a mother increases her investment amount from 0 to 100,000 Euros, this

¹⁵ We also restricted the sample to parents-child-pairs who all participated in CAPI interviews only, since this excludes that questionnaires were completed simultaneously. The results are qualitatively unchanged.

¹⁶ These results are robust regardless of whether we use OLS, or regression techniques that correct for the fact that the dependent variable is measured in intervals. The intergenerational correlation is highly significant and similar in magnitude if we control only for exogenous factors, as in Column (2) of Table 2. These regressions are available on request.

is associated with a 26,000 Euro increase in the child's investment amount.¹⁷ The impact of the father is almost identical in magnitude.

3.2 Asymmetric effects: gender, siblings and parents' preference alignment

In this section we explore how parental characteristics and family structure affect the transmission of risk and trust attitudes. We first consider the hypothesis that mothers may have a greater impact on daughters, and fathers on sons. Such an asymmetry could arise if, for example, children form their attitudes by imitating a role model. In this case, it is plausible that children might choose to model themselves after someone of the same gender. The first two columns of Table 5 address this hypothesis, presenting separate regression estimates for the sub-samples of sons and daughters. In these and all other regressions in the table, we include the full set of controls, as in the specification for Column (3) of Table 2. In Panels (A) and (B) we show results for the transmission of risk attitudes and trust attitudes, respectively. For both sons and daughters, the impact of mothers and fathers is positive and significant, for risk and trust attitudes. The point estimates for mothers and daughters are larger than for mothers and sons, and vice versa for fathers, consistent with a greater impact of parents on children of the same gender. However, these differences are not statistically significant, so we conclude that there is no clear support for this hypothesis in our data.

A second hypothesis is that mothers may have a larger impact on children than fathers, regardless of gender. This is consistent with evidence from a meta-analysis on intergenerational transmission of personality and attitudes, in which the correlation between mothers and children across studies is on average higher than the correlation between fathers and children (Loehlin, 2005). One explanation for a greater impact of mothers could simply be that mothers spend more time with children. Recall that in our baseline results for risk attitudes, presented in Table 2, and in our baseline results for trust attitudes, in Table 4, the point estimates for mothers were consistently higher than for fathers. It turns out that this difference is not statistically significant for risk attitudes, but is highly significant for trust. When it comes to determining a child's willingness to trust, mothers have

¹⁷ One Euro was worth approximately 1.2 US dollars on average during the period when interviews were taken.

a larger impact than fathers. This provides some support for the hypothesis that mothers are more important in the transmission of attitudes to children than fathers, although it is an open question why this is more pronounced for the case of trust attitudes than for willingness to take risks.

The presence of siblings could also be an important factor in the transmission of risk and trust attitudes. To the extent that an only-child receives more attention from parents than a child in a large family, transmission of attitudes might be stronger, and thus lead to differences in behavior. Columns (3) and (4) of Table 5 report separate regressions for the sub-samples of only-children and children with siblings. Panels (A) and (B) present results for willingness to take risks and willingness to trust, respectively. For trust attitudes, the table shows that parents have essentially the same impact, regardless of the number of children. For willingness to take risks, however, there is a substantial difference: mothers have a significantly stronger impact on only-children, as compared to their impact on children with siblings. For fathers, the point estimates make it seem that there is a weaker effect for only-children, but in fact this difference is not statistically significant. As a robustness check we investigate whether the impact of parents depends on the birth order of the child; if mothers have a stronger impact on first-born children, this could potentially explain our finding regarding only-children. However, we find that the impact of parents does depend on birth order. Given the importance of the mother for only-children, and given that mothers are significantly less willing to take risks than fathers, one might expect that only-children would be particularly unwilling to take risks, compared to children with siblings. This is in fact the case. Regressing our binary measure of children's willingness to take risks on a dummy variable for only-child and our standard set of other controls from Column (3) of Table 2, the coefficient on only-child is significant and negative.¹⁸

In summary, mothers have a stronger impact on the risk attitudes of only-children than on the risk attitudes of children with siblings. Consistent with the lower willingness to take risks among mothers, only-children are less willing to take risks than children with siblings. For trust attitudes, we find that mothers are more important than fathers. Overall, these asymmetries are hard to explain by genetics alone. This does not rule out

¹⁸ Only-children are defined as the children of a mother and a father who both report to be parent to only one child.

that genetics plays an important role, but suggests that some other mechanism, such as imitative learning or deliberate socialization, is likely to be at work as well.

3.3 Specificity of the transmission process

In this final results section we investigate the specificity of the transmission process. It might be the case that parents pass on a relatively general disposition towards risk-taking or trust, which is correlated with all of our different measures. Alternatively, it might be the case that parents pass on an entire bundle of distinct risk and trust attitudes to their children, which are precisely measured by our varied risk and trust measures. If the latter is true, this suggests that children are not just similar to their parents in a general sense, but are influenced by parents in a much more detailed and specific way.

We begin by considering our various measures of risk attitudes. In Columns (1) to (6) of Table 6 we regress the children's answers to the general risk question and each of the five domain-specific questions on mother's and father's responses to these questions, including parents' responses to all of the questions *simultaneously*. In addition, we control for exogenous factors and our standard controls used in Column (3) of Table 2. Thus, each domain-specific question is regressed on answers concerning this particular domain, but also on the answers in each of the other domains. We also control for children's answers to all domain-specific risk questions.

Dohmen *et al.* (2005) show that the domain-specific measures tend to be strongly and significantly correlated for an individual.¹⁹ Thus, if the transmission of attitudes is rather vague and unspecific, we would expect that a particular domain is explained equally well by answers to this domain and answers to all of the other domains. If, on the other hand, the domain-specific measures capture distinct attitudes towards risk, we should see that the measures of risk attitudes in the respective domain have the greatest explanatory power. This is indeed what we find. Table 6 reveals that the respective estimated coefficients which are found along the diagonal of the table are all positive and highly significant. Thus, controlling for all other domains, children's domain-specific attitudes are strongly and significantly associated with those of their parents. Moreover, most other coefficients off the diagonal are insignificant; if they are significant, they are typically smaller than those on the diagonal. In Column (3), *e.g.*, willingness to take risks

¹⁹ The correlations are in between 0.26 and 0.45 and are all significant on any conventional level.

in financial matters is highly correlated with mothers' and fathers' willingness to take risks in this domain, while not significantly correlated with parents' risk attitudes in any other domain. Likewise, Column (6) shows that willingness to take risks in health issues is correlated with the respective answers of parents. The only other significant correlation is mothers' willingness to take risks in general, but the coefficient is smaller. These results show a strikingly precise and content-specific transmission of attitudes.

In Table 7 we perform the same exercise as in Table 4, but use answers to three trust questions separately instead of the principal component. This time we are interested in the transmission of the context associated with the three sub-questions regarding trust. Again we regress children's answers to the trust questions on parents' answers, including parents' answers to all question in the regression simultaneously. We also control for children's answers to the sub-questions.

Note that the answers to these questions are significantly correlated but that this correlation is not perfect, *i.e.*, each sub-question contains some specific content.²⁰ It would therefore be a strong result in favor of a tight and robust transmission of trust attitudes if children's answers to a particular question would be best predicted by parents' answers to that specific question. As the results in Table 7 show, this is in fact the case. We find the same 'diagonal result' as with domain specific risk attitudes: controlling for the answers to the other trust questions, each particular answer to a trust-related question is positively and significantly correlated with mothers' and fathers' answers to this specific question. For the sub-question about caution displayed in Column (3) basically only the parents' answers regarding caution are significant. In case of general trust and reliability in Columns (1) and (2) other answers are also significant but quantitatively much weaker. For example, while in Column (1) the marginal effects for trust are 0.170 for mothers and 0.12 for fathers, marginal effects on reliability or caution are not above 0.05. It is also noteworthy that, as with risk, we control for children's responses in the respective alternative domain, which are correlated with the dependent variable. As with risk attitudes, the results for different domains of trust reveal a high degree of precision in the process of intergenerational transmission. Rather than just transmitting a general notion of trust and risk, the transmission appears accurate with respect to specific content.

²⁰ This is also the result of the principal component analysis. The first component explains a lot (around 57 percent) but not everything.

We conclude this section by investigating the extent to which willingness to take risks and willingness to trust are distinct attitudes. Trusting someone is a risky decision, and thus willingness to trust could partly reflect attitudes towards risks. On the other hand, there is an important component of trust that is likely to be independent of risk attitudes, namely beliefs about the trustworthiness of others. Trust could also capture a preference for trusting. Conceptually, there is no reason that these later components of trust should be related to risk attitudes. In the following we are thus interested in assessing whether our measure of trust attitudes in fact captures something distinct from risk attitudes.

To study this question we ran the regressions reported in Table 8. In Column (1) we regress children's willingness to take risks on parents' willingness to take risks and willingness to trust. We also control for the trust attitudes of children and include our standard controls as in Column (3) of Table 2. The marginal coefficients on mothers' and fathers' willingness to take risks are positive and significant and similar in size to those in Column (3) of Table 2. Moreover, the coefficients on trust are insignificant. This suggests that the disposition towards trust does not explain risk attitudes and confirms once more the precision of the transmission of risk attitudes. But what about the relation between trust and risk? In Column (2) we regress children's trust jointly on parents' willingness to take risks and their trust attitudes, together with the controls as in Column (1). We find that the coefficients on mothers' and fathers' trust are positive and highly significant. They are also very similar to those obtained in the regressions from Table 4, *i.e.*, without controlling for risk attitudes. This implies that trust attitudes do not simply measure attitudes towards risk and that the transmission of trust attitudes is not merely reflecting a transmission of risk attitudes. In contrast, mothers' willingness to take risks is insignificant and fathers' willingness to take risks, albeit significant, is only 0.035 compared to trust coefficients of 0.250 for mothers and 0.166 for fathers. Thus, parents' attitudes towards trust are much more important for children's trusting behavior than parents' risk attitudes.

In sum the results on the joint impact of parents' risk and trust attitudes on the respective attitudes of their children underline that risk and trust are two independent attitudes, which are independently transmitted. Having risk loving parents does not imply that children are trusting, just as having trusting parents does not imply that a child

is willing to take risks. The results also emphasize once more that the intergenerational transmission of attitudes seems to be quite fine-tuned, going clearly beyond the transmission of only vague and unspecific dispositions.

4 Concluding Remarks

We document a large, significant, and robust intergenerational correlation for two fundamentally important determinants of economic behavior: willingness to take risks and willingness to trust other people. Our findings are based on survey measures that elicit these attitudes directly, and have been shown to predict actual risk-taking and trusting behavior in large-scale field experiments involving real stakes. Thus, we can conclude that the transmission of risk and trust attitudes captured by our measures translates into an important impact on the economic behavior of children.

We find that parental characteristics and family structure matter for the transmission process. First, mothers tend to have a stronger impact than fathers, in particular for determining trust attitudes. Mothers also have a significantly stronger impact on the risk attitudes of an only-child, compared to a child who has siblings. Consistent with a greater influence of the mother, and with the fact that mothers are significantly less willing to take risks than fathers, only-children are significantly less willing to take risks than children with siblings.

There is also a strong intergenerational correlation when we look at each of our five domain-specific risk measures separately, and when we look at each trust question separately. The best predictors of a child's attitudes in a given context or question frame are the parents' responses for that same question. This shows that children are not similar to their parents just in terms of a general propensity to take risks or trust others, but in terms of a more detailed combination of attitudes, spanning different contexts of life and different framing of questions.

Our findings shed light on a fundamentally important question, namely where an individual's endowment of preferences and beliefs about the world comes from. An intriguing question that we have not addressed is which mechanism or combination of mechanisms is most important in the transmission process. We have been hesitant to address this question mainly because we believe that our data are not well-suited for generating compelling

new evidence. For example, in our view there are at least three potential transmission channels: genetics, child learning by imitation, and deliberate efforts by parents to shape the preferences and beliefs of their children. These may act in concert, and possibly interact. To have a hope of distinguishing transmission through genetics from transmission through these other channels would require, at the very least, observing children at much younger age, or observing a large sub-sample of children who were not raised by their biological parents, or observing attitudes of a large sample of fraternal and identical twins. We do have something to say on this subject, however, in the sense that we suspect that genetics cannot be the sole transmission mechanism, based on our findings regarding the importance of family structure. For example, we find that mothers have a greater impact on only-children than children with siblings. This is hard to explain with genetics alone, and suggests that socialization plays a role as well.

If socialization contributes to the intergenerational correlation in attitudes, this could partly be an unintentional effect of parenting that works, for example, through children observing and imitating their parents. It could also reflect deliberate efforts by parents to pass on their own preferences and beliefs. To the extent that influencing children is possible, parents do have incentives to “invest” in such activity. First, conflicts are arguably less likely if attitudes are aligned. Second, if parents’ utility depends on children’s decisions, for example in old age, children make better agents for the parents if they have similar attitudes.

Another important issue that we have not discussed is assortative mating of parents. Dohmen *et al.* (2006) find strong evidence of positive assortative mating on willingness to take risks using the SOEP data. Positive assortative mating implies that if a child has one parent with extreme risk attitudes she is likely to have a second parent with similarly extreme attitudes, so that the combined effect of both parents is large. Thus, positive assortative mating reinforces the strength and importance of the intergenerational transmission process that we observe.

Our findings may be just the tip of the iceberg in another way as well. Although risk and trust attitudes are important, there may be many other economically relevant traits that are shaped by parents, possibly including time preference or various other motivations and values. One example that we are able to study in our data is political ideology. The SOEP collects information on which political party a respondent “feels closest to.” We

categorize individuals as identifying with left-wing or conservative parties and regress an indicator for a child's political attitudes on parents' political attitudes. We observe a strong and significant positive relationship; children are substantially more likely to be leftist if their parents are leftist, and more likely to be conservative if their parents' are conservative. This is true controlling for risk and trust attitudes, exogenous determinants, and controls.

The transmission of preferences, beliefs, and ideology across generations also has important implications for behavior at the aggregate level. If different societies start with different endowments of these traits, intergenerational transmission may lead to persistent differences in behavior across regions and countries. One example is the difference in risk attitudes between the U.S. and Germany. In a cross-country survey, Fehr *et al.* (2006) report that average willingness to take risks, as measured by the general risk question, is 5.6 in their American sample and only 4.4 in the corresponding German sample. This difference is larger than the gender difference in their German sample. One explanation for this difference is that the ancestors of people living in the US today were more willing to take risks than the ancestors of those living presently in Germany. It is in fact very plausible that immigrants to the US were more willing to take risks than the average individual in their country of origin. At least, this is consistent with the findings of Bonin *et al.* (2006a), who show that greater willingness to take risks is associated with a greater likelihood of migrating between regions within Germany. The resulting difference in risk attitudes could play a role in explaining a variety of differences in behavior across the two countries, including the extent of within-country geographic and labor mobility, the pervasiveness of self-employment, and willingness of individuals to hold risky assets.

Finally, it is important to note there are large differences in willingness to trust across countries, judging from average responses to the GSS trust question (Knack and Keefer, 1997). There are also differences in trust between countries, as measured by questions asking how much individuals in one country trust citizens of various other countries.²¹ The intergenerational transmission of trust attitudes implies that these differences are more stable over time than if each generation's trust were formed anew. This inertia works against the effect of institutional or other changes in a country that might be expected

²¹ Guiso *et al.* (2005) show that trust towards citizens of another country predicts willingness to trade with and invest in that country.

to change willingness to trust, and contributes to cross country differences in behavior at the fundamental level of the efficiency of economic exchange.²² In the case of a major reorganization in government, for example, trust attitudes in a country might respond only mildly, because parents' attitudes still reflect the environment of distrust present under old institutions.

²² As noted by Arrow: "Virtually every commercial transaction has within itself an element of trust...It can be plausibly argued that much of the economic backwardness in the world can be explained by the lack of mutual confidence." (1972, p. 357).

References

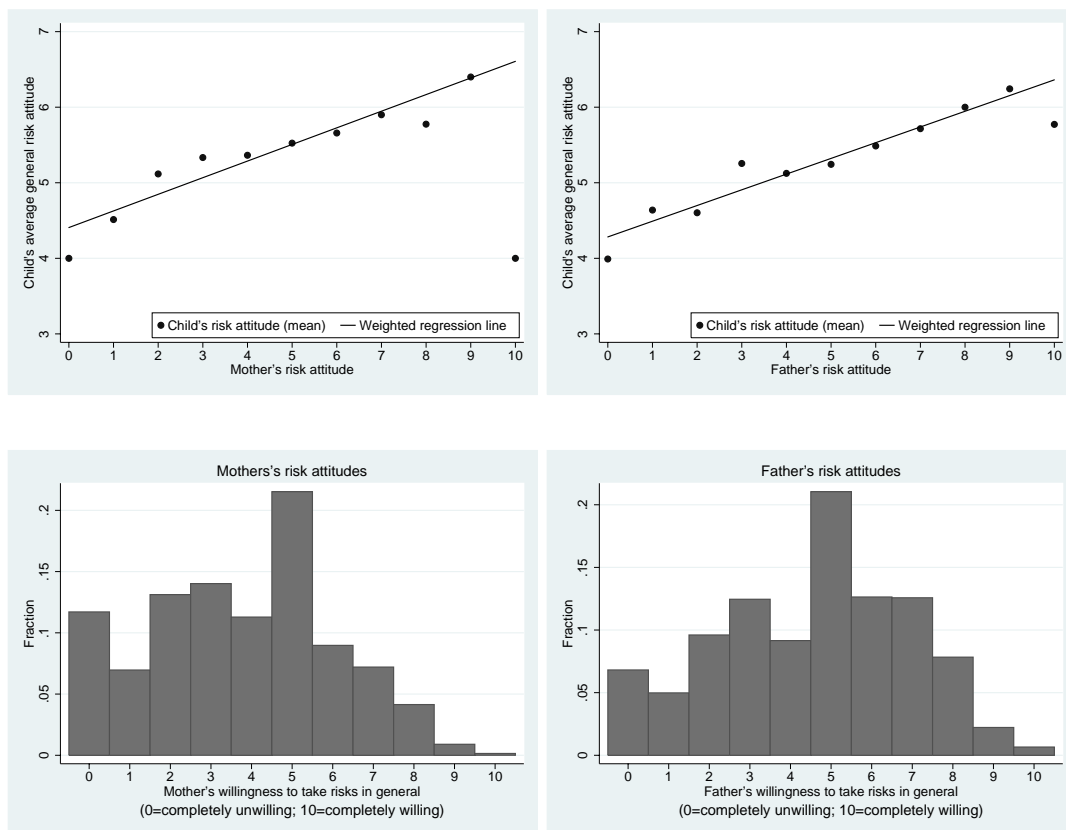
- BELLEMARE, C., AND S. KROEGER (2004): “On Representative Social Capital,” *IZA Discussion Paper*, 1145.
- BERG, J., J. DICKHAUT, AND K. MCCABE (1995): “Trust, Reciprocity and Social History,” *Games and Economic Behaviour*, 10, 122 – 142.
- BLACK, S. E., P. J. DEVEREUX, AND K. G. SALVANES (2005): “Why the Apple Doesn’t Fall Far: Understanding the Intergenerational Transmission of Human Capital,” *American Economic Review*, 95(1), 937–949.
- BONIN, H., T. DOHMEN, A. FALK, D. HUFFMAN, D. JAEGER, AND U. SUNDE (2006): “Direct Evidence on Risk Attitudes and Migration,” *IZA Working Paper*.
- BONIN, H., T. DOHMEN, A. FALK, D. HUFFMAN, AND U. SUNDE (2006): “Cross-Sectional Earnings Risk and Occupational Sorting: The Role of Risk Attitudes,” *IZA Discussion Paper*, 1930.
- BOWLES, S., AND H. GINTIS (2002): “The Inheritance of Inequality,” *Journal of Economic Perspectives*, 16(3), 3–30.
- CHARLES, K. K., AND E. HURST (2003): “The Correlation of Wealth Across Generations,” *Journal of Political Economy*, 111(6), 1155–1182.
- DOHMEN, T., A. FALK, D. HUFFMAN, AND U. SUNDE (2006): “Birds of a Feather Flock Together: Positive Assortative Mating in Risk Attitudes,” *IZA Working Paper*.
- DOHMEN, T., A. FALK, D. HUFFMAN, U. SUNDE, J. SCHUPP, AND W. WAGNER (2005): “Individual Risk Attitudes: New Evidence From a Large, Representative, Experimentally-Validated Survey,” *IZA Discussion Paper*, 1730.
- ERMISCH, J., M. FRANCESCONI, AND T. SIEDLER (2006): “Intergenerational Economic Mobility and Assortative Mating,” *Economic Journal*, *forthcoming*.
- FALK, A., AND M. KOSFELD (2006): “Distrust - The Hidden Cost of Control,” *American Economic Review*, *forthcoming*.
- FALK, A., AND C. ZEHNDER (2006): “Trust and Discrimination: A City-Wide Experiment,” *IZA, Bonn, mimeo*.
- FEHR, E., U. FISCHBACHER, M. NAEF, J. SCHUPP, AND G. G. WAGNER (2006): “A Comparison of Risk Attitudes in Germany and the U.S.,” *mimeo*, Institute for Empirical Research in Economics, University of Zurich.
- FEHR, E., U. FISCHBACHER, B. V. ROSENBLADT, J. SCHUPP, AND G. G. WAGNER (2003): “A Nation-Wide Laboratory: Examining Trust and Trustworthiness by Integrating Behavioral Experiments into Representative Surveys,” *mimeo*, Institute for Empirical Research in Economics, University of Zurich.
- FOWLER, F. (1988): *Survey Research Methods*. Newbury Park, London.

- GANZEBOOM, H.B.G., AND TREIMAN, D. (1996): “Internationally comparable measures of occupational status for the 1988 International Standard Classification of Occupations,” *Social Science Research*, 25(3), 201–239.
- GRUND, C., AND D. SLIWKA (2006): “Performance Pay and Risk Aversion,” *IZA Discussion Paper*, 2012.
- GUIISO, L., P. SAPIENZA, AND L. ZINGALES (2005): “Cultural Biases in Economic Exchange,” Working Paper, University of Chicago.
- HECKMAN, J. J., AND Y. RUBINSTEIN (2001): “The Importance of Noncognitive Skills: Lessons from the GED Testing Program,” *American Economic Review*, 91(2), 149–149.
- HECKMAN, J. J., J. STIXRUD, AND S. URZUA (2006): “The Effects of Cognitive and Noncognitive Abilities on Labor Market Outcomes and Social Behavior,” NBER Working Paper 12006.
- KERCKHOFF, A., R. CAMPBELL, AND I. WINFIELD-LAIRD (1985): “Social Mobility in Great Britain and the United States,” *The American Journal of Sociology*, 91(2), 281–308.
- KNACK, S., AND P. KEEFER (1997): “Does Social Capital Have an Economic Payoff? A Cross-Country Investigation,” *Quarterly Journal of Economics*, 112(4), 1251–1281.
- KNOWLES, J., AND A. POSTLEWAITE (2005): “Wealth Inequality and Parental Transmission of Savings Behavior,” *mimeo*, University of Pennsylvania.
- LA PORTA, R., F. L. DE SILANES, A. SCHLEIFER, AND R. VISHNY (1997): “Trust in Large Organizations,” *The American Economic Review Papers and Proceedings*, 87(2), 333–338.
- LOEHLIN, J. (2005): *Resemblance in Personality and Attitudes between Parents and Their Children: Genetic and Environmental Contributions*. Princeton University Press, Princeton.
- LONG, J., AND J. FERRIE (2005): “A Tale of Two Labor Markets: Intergenerational Occupational Mobility in Britain and the U.S. Since 1850,” *NBER Working Paper*, 11253.
- MULLIGAN, C. B. (1997): *Parental Priorities and Economic Inequality*. University of Chicago Press, Chicago.
- (1999): “Galton versus the Human Capital Approach to Inheritance,” *Journal of Political Economy*, 107(6), 184–224.
- OSBORNE, M. (2005): *Personality and the Intergenerational Transmission of Economic Status*. Princeton University Press, Princeton.
- SCHUPP, J., AND G. G. WAGNER (2002): “Maintenance of and Innovation in Long-Term Panel Studies The Case of the German Socio-Economic Panel (GSOEP),” *Allgemeines Statistisches Archiv*, 86(2), 163–175.
- SOLON, G. (1992): “Intergenerational Income Mobility in the United States,” *American Economic Review*, 82(3), 393–408.

- TABACHNICK, B. G., AND L. S. FIDELL (2001): *Using Multivariate Statistics*. Allyn and Bacon, Boston, 2 edn.
- WAGNER, G. G., R. V. BURKHAUSER, AND F. BEHRINGER (1993): “The English Language Public Use File of the German Socio-Economic Panel,” *The Journal of Human Resources*, 28(2), 429–433.
- ZAK, P. J., AND S. KNACK (2001): “Trust and Growth,” *Economic Journal*, 111(470), 295–321.

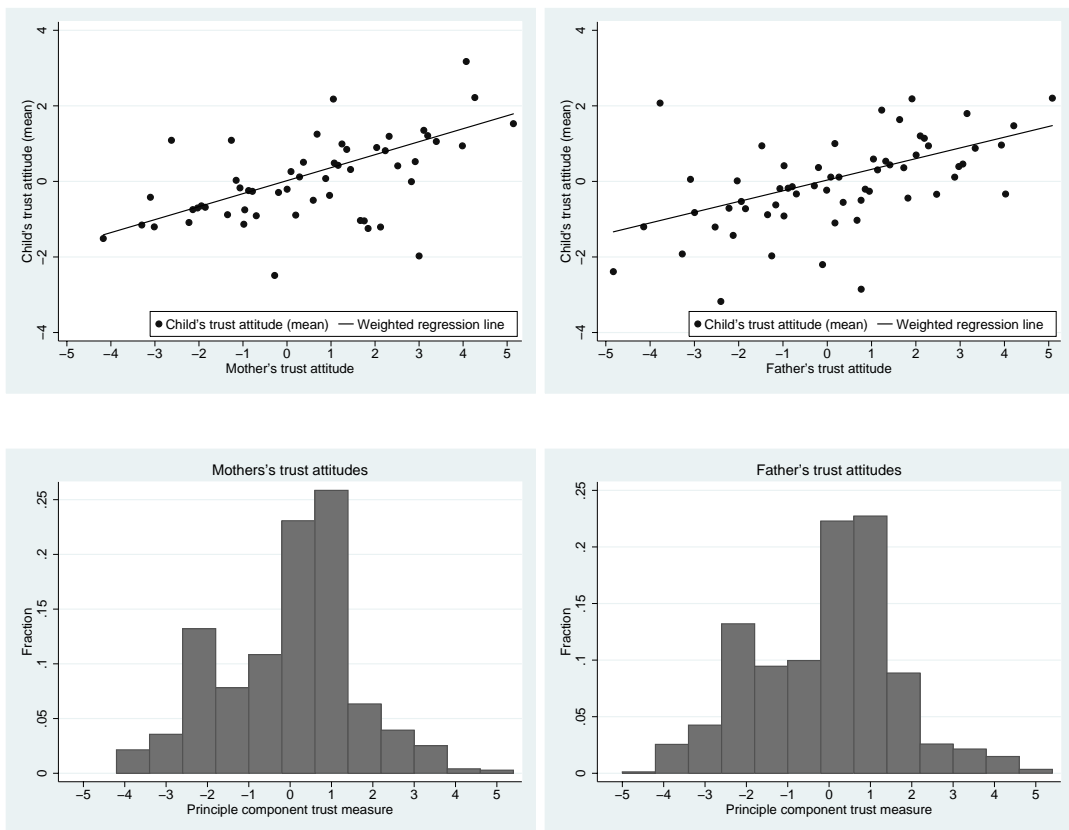
Figures

Figure 1: Risk Attitudes of Children and Parents



Notes: The upper panels of the figure show children's average self-reported willingness to take risks for a given willingness to take risks of mothers (left diagram) and fathers (right diagram). The histograms in the bottom panels of the figure show the distribution of responses to the question about general risk attitudes (measured on an eleven-point scale) by mothers (left histogram) and fathers (right histogram).

Figure 2: Trust of Children and Parents



Notes: The upper panels of the figure show childrens' average principal component "trust" for a given principal component "trust" of mothers (left diagram) and fathers (right diagram). The histograms in the bottom panels of the figure show the distribution of responses to the question about principal component "trust" by mothers (left histogram) and fathers (right histogram).

Tables

Table 1: The Influence of Exogenous Variables on Attitudes

Dependent variable:	Willingness to take risks		Trust	
	(1)	(2)	(3)	(4)
1 if female	-0.095*** [0.024]	-0.094*** [0.024]	0.066 [0.092]	0.007 [0.093]
Age of respondent (years)	-0.008*** [0.001]	-0.008*** [0.002]	-0.010** [0.005]	0.005 [0.006]
Height of respondent (cm)	0.006*** [0.001]	0.006*** [0.001]	0.013*** [0.005]	0.009* [0.005]
Additional controls	No	Yes	No	Yes
(Pseudo-)R-squared	0.033	0.037	0.01	0.03
Observations	3320	3320	2971	2971

The dependent variable in Columns (1) and (2) measures general risk attitudes as binary variable, coded as 1 if survey answer is six or larger on an eleven-point scale from zero to ten; estimation is by Probit, numbers are marginal effects evaluated at the mean of the respective explanatory variable. The dependent variable in Columns (3) and (4) is the principal component measure of individual answers on three questions on trust (general trust, reliance in others, need for caution in dealing with strangers); estimation is by OLS. Robust standard errors in brackets allow for clustering at the household level; ***, **, * indicate significance at 1-, 5-, and 10-percent level, respectively. Additional controls include occupational prestige of respondent, and respondent's mother and father, indicator variables for residence of youth before age of 14 of respondents (big city, city, small town, countryside, missing), indicator variables for respondents' religion (catholic, protestant, other Christian confession, other religion, not a member of a church, missing, all religion information obtained from the 2003 wave of the SOEP).

Table 2: The Influence of Parents' Risk Attitudes on Children's Risk Attitudes

Dependent variable:	Willingness to take risks in general		
	(1)	(2)	(3)
Willingness to take risks in general: Mother	0.029*** [0.004]	0.028*** [0.004]	0.029*** [0.005]
Willingness to take risks in general: Father	0.024*** [0.004]	0.022*** [0.004]	0.024*** [0.004]
1 if female		-0.104*** [0.026]	-0.101*** [0.027]
Age of respondent (years)		-0.009*** [0.002]	-0.009*** [0.003]
Height of respondent (cm)		0.006*** [0.002]	0.006*** [0.002]
Age of mother (years)		0.002 [0.003]	0.003 [0.003]
Age of father (years)		0.001 [0.002]	0.001 [0.002]
Height of mother (cm)		-0.001 [0.002]	-0.001 [0.002]
Height of father (cm)		-0.001 [0.002]	-0.001 [0.002]
Additional controls	No	No	Yes
Pseudo-R-squared	0.030	0.057	0.066
Observations	3331	3320	3320

Probit marginal effects estimates, marginal effects evaluated at the mean of the respective explanatory variable. The dependent variable in Columns (1) and (2) measures general risk attitudes as binary variable, coded as 1 if survey answer is six or larger on an eleven-point scale from zero to ten. Explanatory risk variables are coded on the eleven-point scale from zero to ten. Robust standard errors in brackets allow for clustering at the household level; ***, **, * indicate significance at 1-, 5-, and 10-percent level, respectively. Additional controls include occupational prestige of respondent, and respondent's mother and father, indicator variables for residence of youth (big city, city, small town, countryside, missing) before age of 14 of respondents, respondents' fathers and respondents' mothers, indicator variables for religion (catholic, protestant, other Christian confession, other religion, not a member of a church, missing, all religion information obtained from the 2003 wave of the SOEP), of respondents, respondents' fathers and respondents' mothers.

Table 3: The Influence of Parents' Risk Attitudes on Children's Risk Attitudes

	Dependent variable:					
	General	Car driving	Financial matters	Sports & leisure	Career	Health
	(1)	(2)	(3)	(4)	(5)	(6)
Willingness to take risks: Mother (in respective domain)	0.029*** [0.005]	0.023*** [0.004]	0.013*** [0.003]	0.039*** [0.005]	0.030*** [0.004]	0.022*** [0.003]
Willingness to take risks: Father (in respective domain)	0.024*** [0.004]	0.019*** [0.004]	0.012*** [0.003]	0.028*** [0.004]	0.020*** [0.004]	0.012*** [0.003]
Pseudo-R-squared	0.067	0.062	0.089	0.110	0.055	0.049
Observations	3320	2942	3221	3265	2845	3314

Probit marginal effects estimates, marginal effects evaluated at the mean of the respective explanatory variable. The specification in each column is identical to that in Column (3) of Table 2. The dependent variable measures general risk attitudes as binary variable, coded as 1 if survey answer is six or larger on an eleven-point scale from zero to ten; estimation is by Probit. Explanatory risk variables are coded on the eleven-point scale from zero to ten. Robust standard errors in brackets allow for clustering at the household level; ***, **, * indicate significance at 1-, 5-, and 10-percent level, respectively.

Table 4: The Influence of Parents' Willingness to Trust on Children's Trust Attitudes

Dependent variable:	Trust (Principal Component)		
	(1)	(2)	(3)
Trust: Mother	0.257*** [0.022]	0.252*** [0.022]	0.248*** [0.023]
Trust: Father	0.180*** [0.021]	0.176*** [0.021]	0.160*** [0.022]
1 if female		-0.002 [0.093]	-0.003 [0.095]
Age of respondent (years)		-0.024*** [0.007]	-0.011 [0.009]
Height of respondent (cm)		0.005 [0.005]	0.005 [0.005]
Age of mother (years)		0.012 [0.009]	0.011 [0.009]
Age of father (years)		0.009 [0.008]	0.005 [0.009]
Height of mother (cm)		0.002 [0.006]	-0.002 [0.006]
Height of father (cm)		0.003 [0.005]	0 [0.005]
Constant	0.043 [0.030]	-2.222** [1.133]	-0.722 [1.462]
Additional controls	No	No	Yes
R-squared	0.13	0.14	0.16
Observations	2979	2968	2916

OLS estimates. The trust variables measure trust as principal component obtained from answers to three questions on trust (general trust, reliance on others, need for caution in dealing with strangers) measured on a four-point scale. Robust standard errors in brackets allow for clustering at the household level; ***, **, * indicate significance at 1-, 5-, and 10-percent level, respectively. Additional controls include occupational prestige of respondent, and respondent's mother and father, indicator variables for residence of youth (big city, city, small town, countryside, missing) of respondents, respondents' fathers and respondents' mothers, indicator variables for religion (catholic, protestant, other Christian confession, other religion, not a member of a church, missing, all religion information obtained from the 2003 wave of the SOEP), of respondents, respondents' fathers and respondents' mothers.

Table 5: The Influence of Parents' Attitudes on Children's Attitudes**(A) Dependent variable: Willingness to take risks**

	Sons (1)	Daughters (2)	Only-Children (3)	Siblings (4)
Willingness to take risks	0.028***	0.030***	0.067***	0.030***
in general: Mother	[0.006]	[0.006]	[0.017]	[0.006]
Willingness to take risks	0.024***	0.022***	0.016	0.035***
in general: Father	[0.006]	[0.006]	[0.017]	[0.006]
Additional controls	Yes	Yes	Yes	Yes
Pseudo-R-squared	0.054	0.066	0.155	0.074
Observations	1749	1571	251	1955

(B) Dependent variable: Trust

	Sons (1)	Daughters (2)	Only-Children (3)	Siblings (4)
Trust: Mother	0.226***	0.276***	0.266***	0.275***
	[0.031]	[0.034]	[0.068]	[0.031]
Trust: Father	0.180***	0.154***	0.192***	0.176***
	[0.030]	[0.032]	[0.064]	[0.029]
Constant	-0.278	-1.861	0.623	-1.718
	[1.898]	[1.988]	[3.647]	[1.596]
Additional controls	Yes	Yes	Yes	Yes
R-squared	0.17	0.17	0.41	0.19
Observations	1547	1369	228	1643

The dependent variable in Panel (A) measures general risk attitudes as binary variable, coded as 1 if survey answer is six or larger on an eleven-point scale from zero to ten; estimation is by Probit, numbers are marginal effects evaluated at the mean of the respective explanatory variable. Explanatory risk variables are coded on the eleven-point scale from zero to ten. The trust variables in Panel (B) measure trust as principal component obtained from answers to three questions on trust (general trust, reliance on others, need for caution in dealing with strangers) measured on a four-point scale, numbers are OLS estimates. All specifications include controls for respondents' gender, age, height, residence of youth, occupational prestige and religion, and both parents' age, height, residence of youth, occupational prestige and religion as in specification (3) in Table 2. Robust standard errors in brackets allow for clustering at the household level; ***, **, * indicate significance at 1-, 5-, and 10-percent level, respectively.

Table 6: The Influence of Parents' Risk Attitudes on Children's Risk Attitudes

Dependent variable:	Willingness to take risks in the domain of:					
	General (1)	Car driving (2)	Financial matters (3)	Sports & leisure (4)	Career (5)	Health (6)
Willingness to take risks in domain of:						
General: Mother	0.026*** [0.007]	0.002 [0.005]	-0.002 [0.003]	0.006 [0.007]	0.006 [0.006]	-0.010** [0.005]
General: Father	0.020*** [0.007]	-0.004 [0.006]	-0.004 [0.003]	-0.009 [0.007]	0.003 [0.007]	0.002 [0.005]
Driving: Mother	-0.011 [0.007]	0.025*** [0.005]	0.001 [0.003]	-0.006 [0.007]	-0.002 [0.006]	0 [0.005]
Driving: Father	0.003 [0.006]	0.019*** [0.005]	0.000 [0.003]	0.001 [0.006]	-0.001 [0.006]	-0.006 [0.004]
Financial: Mother	0.006 [0.008]	-0.014** [0.007]	0.009*** [0.003]	-0.016* [0.008]	0.007 [0.007]	0.005 [0.005]
Financial: Father	0.01 [0.007]	-0.001 [0.005]	0.007** [0.003]	0.01 [0.007]	-0.013** [0.006]	-0.005 [0.005]
Sports: Mother	-0.007 [0.008]	0.004 [0.006]	-0.003 [0.003]	0.041*** [0.008]	-0.01 [0.007]	-0.006 [0.005]
Sports: Father	-0.015** [0.007]	-0.001 [0.005]	0.000 [0.003]	0.032*** [0.007]	0.003 [0.006]	-0.003 [0.004]
Career: Mother	0.005 [0.007]	-0.011** [0.006]	0.002 [0.003]	0.003 [0.007]	0.013** [0.007]	0.006 [0.005]
Career: Father	0.001 [0.006]	0.002 [0.005]	0.004 [0.003]	-0.005 [0.007]	0.019*** [0.006]	-0.007 [0.005]
Health: Mother	0.005 [0.007]	0.001 [0.005]	0 [0.003]	-0.001 [0.007]	0.003 [0.006]	0.013*** [0.005]
Health: Father	-0.014** [0.006]	-0.005 [0.005]	0 [0.003]	-0.014** [0.006]	0 [0.006]	0.018*** [0.004]
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo-R-squared	0.283	0.216	0.216	0.301	0.266	0.220
Observations	2585	2585	2585	2585	2585	2585

Probit marginal effects estimates, marginal effects evaluated at the mean of the respective explanatory variable. The dependent variables measure risk attitudes in the respective domain as binary variable, coded as 1 if survey answer is six or larger on an eleven-point scale from zero to ten. Explanatory risk variables are coded on the eleven-point scale from zero to ten. Robust standard errors in brackets allow for correlation of errors at the household level; ***, **, * indicate significance at 1-, 5-, and 10-percent level, respectively. Additional controls include individual risk attitudes in the alternative domains, measured as binary variable, occupational prestige of respondent, and respondent's mother and father, indicator variables for residence of youth of respondents (big city, city, small town, countryside, missing), indicator variables for respondents' religion (catholic, protestant, other Christian confession, other religion, not a member of a church, missing, all religion information obtained from the 2003 wave of the SOEP) as in Column (3) of Table 2. A substantial fraction, roughly 1/4, of the sample do not have complete answers to risk questions in all domains due to item non-response, in particular when the question does not apply (e.g. car driving for 17 year olds).

Table 7: The Influence of Parents' Willingness to Trust on Children's Trust Attitudes

Dependent variable:	General trust	Reliability	Need for caution
	(1)	(2)	(3)
General Trust: Mother	0.170*** [0.021]	0.056** [0.023]	-0.022 [0.023]
General Trust: Father	0.120*** [0.022]	0.055** [0.023]	0.035 [0.024]
Reliability: Mother	0.037** [0.018]	0.127*** [0.022]	0.042* [0.021]
Reliability: Father	0.050** [0.020]	0.149*** [0.022]	0.015 [0.021]
Need for caution: Mother	0.032* [0.017]	-0.002 [0.018]	0.153*** [0.021]
Need for caution: Father	0.02 [0.018]	-0.002 [0.019]	0.097*** [0.020]
General Trust: Child		-0.480*** [0.023]	-0.159*** [0.023]
Reliability: Child	-0.391*** [0.018]		0.184*** [0.020]
Need for caution: Child	-0.113*** [0.017]	0.160*** [0.017]	
1 if female	0.008 [0.033]	0.013 [0.036]	-0.006 [0.037]
Age of respondent in years	0.001 [0.003]	-0.007** [0.003]	0.005 [0.004]
Height of respondent in cm	-0.001 [0.002]	-0.001 [0.002]	0.003 [0.002]
Age of mother in years	0.004 [0.003]	0.010*** [0.004]	-0.003 [0.004]
Age of father in years	-0.004 [0.003]	-0.005 [0.003]	0.005 [0.003]
Height of mother in cm	0.002 [0.002]	0.002 [0.002]	0 [0.002]
Height of father in cm	-0.001 [0.002]	0.001 [0.002]	-0.003 [0.002]
Constant	2.197*** [0.498]	1.897*** [0.549]	0.807 [0.600]
Additional controls	Yes	Yes	Yes
R-squared	0.32	0.34	0.19
Observations	2916	2916	2916

OLS estimates. The measures for general trust, reliability and need for caution reflect disagreement to corresponding statements on a four-point scale. The statements are "In general, one can trust people.", "In these days you cannot rely on anybody else.", and "When dealing with strangers it is better to be cautious when dealing with them.", respectively. Robust standard errors in brackets allow for clustering at the household level; ***, **, * indicate significance at 1-, 5-, and 10-percent level, respectively. Additional controls include occupational prestige of respondent, and respondent's mother and father, indicator variables for residence of youth (big city, city, small town, countryside, missing) of respondents, respondents' fathers and respondents' mothers, indicator variables for religion (catholic, protestant, other Christian confession, other religion, not a member of a church, missing, all religion information obtained from the 2003 wave of the SOEP), of respondents, respondents' fathers and respondents' mothers as in Column (3) of Table 2.

Table 8: The Interaction Between Respondents' Attitudes and Their Parents' Attitudes

	Dependent variable:	
	Willingness to take risks (1)	Trust Principal Component (2)
Willingness to take risks in general: Mother	0.028*** [0.005]	0.250*** [0.023]
Willingness to take risks in general: Father	0.026*** [0.005]	0.166*** [0.022]
Trust: Mother	0.011 [0.007]	-0.007 [0.015]
Trust: Father	0.007 [0.007]	-0.035** [0.015]
Trust: Child	-0.008 [0.006]	
Willingness to take risks in general: Child		0.038** [0.016]
1 if female	-0.123*** [0.029]	0.037 [0.096]
Age of respondent in years	-0.010*** [0.003]	-0.01 [0.009]
Height of respondent in cm	0.005*** [0.002]	0.005 [0.005]
Age of mother in years	0.003 [0.003]	0.01 [0.009]
Age of father in years	-0.001 [0.003]	0.005 [0.009]
Height of mother in cm	-0.002 [0.002]	-0.002 [0.006]
Height of father in cm	0.0002 [0.002]	0 [0.005]
Constant		-1.03 [1.282]
Additional controls	Yes	Yes
(Pseudo-)R-squared	0.073	0.16
Observations	2900	2900

The dependent variable in Column (1) measures general risk attitudes as a binary variable, coded as 1 if survey answer is six or larger on an eleven-point scale from zero to ten. Explanatory risk variables are coded on the eleven-point scale from zero to ten. The trust variables measure trust as principal component obtained from answers to three questions on trust (general trust, reliance on others, need for caution in dealing with strangers) measured on a four-point scale. Estimation in Column (1) is by Probit, numbers are marginal effects evaluated at the mean of the respective explanatory variable, numbers in Column (2) are OLS estimates. Additional controls include occupational prestige of respondent, and respondent's mother and father, indicator variables for residence of youth (big city, city, small town, countryside, missing) of respondents, respondents' fathers and respondents' mothers, indicator variables for religion (catholic, protestant, other Christian confession, other religion, not a member of a church, missing, all religion information obtained from the 2003 wave of the SOEP), of respondents, respondents' fathers and respondents' mothers as in Column (3) of Table 2.