Parental Risk Attitudes and Children's Secondary School Track Choice

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It is well-known that individuals' risk attitudes are related to behavioral outcomes such as smoking, portfolio decisions, and also educational attainment, but there is barely any evidence on whether parental risk attitudes affect the educational attainment of dependent children. We add to this literature and examine children's secondary school track choice in Germany where tracking occurs at age ten and has a strong binding character. Our results indicate no consistent patterns for paternal risk preferences but a strong negative impact of maternal risk aversion on children's enrollment in upper secondary school.

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1. Introduction

The decision about which educational path children should follow has far-reaching consequences into their future adult life, and in particular so in countries with early tracking such as Germany. If later revision of the decision is costly so that upward mobility between tracks is low, early secondary school tracking largely predetermines students' final secondary schooling achievement and their vocational or academic career. A child's future social and economic situation therefore strongly depends on an appropriate school track choice.

With respect to the determinants of this choice, one comes across a vast literature on the transmission of socio-economic status suggesting for high social selectivity in quite a few countries.[1] This means that parental education, as a compound measure for parents' cognitive skills and for investments into their children, is still the most important factor for children's educational attainment in Germany (e.g. Heineck & Riphahn, 2009) or the UK (Ermisch & Francesconi, 2001). In addition, there are studies that look at the influence of family income (Acemoglu & Pischke, 2001; Blanden & Gregg, 2004) or parental (un)employment (Bratberg et al., 2008; Coelli, 2011) on children's education. So far, however, there is barely any research in economics addressing whether parental attitudes towards education or other, possibly non-cognitive skills have an impact on their children's secondary schooling.[2]

Educational decisions might however be considered as investment with uncertain outcomes and would then be subject to individuals' risk preferences. Everything else constant, it is therefore plausible to assume that risk preferences will also matter if individuals have to decide on their children's educational paths. The direction of the effect, however, is unclear a priori. If future returns are uncertain, risk averse individuals may be more likely to choose a less risky schooling path either for themselves or for their children where "less risky" refers to both a shorter time spent in education and lower ability requirements. On the other hand, there is pervasive evidence on the positive effects of education on labor market success, so that education

[1] In economics, intergenerational mobility research has a focus mainly on income (see the work of Solon (1992) which has initiated a large body of research) whereas it is social class mobility that is of interest in the sociological literature (for example, Erikson & Goldthorpe, 2002)

[2] Yet, there is interest into this issue in sociology showing that, for example, parents' educational aspirations matter (Henz & Maas, 1995; Paulus & Blossfeld, 2007).

may also be used as a "safe haven", i.e. has an insurance character.

Given these two contradictory positions, it is no surprise that there are only few empirical studies that address the relationship between individuals' risk attitudes and their own educational outcomes and that these yield ambiguous findings (Belzil, 2007; Brown et al., 2006, see in more detail below). In addition, there to our knowledge is only one prior study by Leonardi (2007) who examines the relationship between parents' risk preferences and their children's secondary schooling track, but concludes that parental risk attitudes are no major determinant of school track choice.

We add to this scarce literature using data from Germany. Again, this is interesting and relevant, since 1) the German educational system streams children in different schooling tracks at age ten, i.e. very early in the life course and 2) mobility between tracks is low so that the initial choice has a strong predetermining character. In contrast to previous research, where risk attitudes are usually derived from hypothetical lottery scenarios, we employ the individuals' willingness to take risks in their career, which is a more appropriate indicator than the overall risk attitude.

In line with Leonardi (2007) our results imply that fathers' risk preferences exert no significant and consistent influence role for children's secondary schooling track choice. We however find a substantial negative effect of maternal risk aversion on the probability of choosing the upper secondary, i.e. the university qualifying school track.

2. The German school system

The federal government has no major liability for education in Germany but each of the 16 federal states is in charge for its educational system. The main features of the educational system, however, are nearly identical: Children between age three and six might, but most not attend pre-school kindergarten. Compulsory school attendance begins with entrance into elementary school at the age of six, and ends at the age of 16. Between age six and ten, i.e. from grade one to four,[3] in elementary school provides basic training in reading, writing, basic mathematical

[3] In two federal states, Berlin and Brandenburg, elementary schooling ends at age twelve, i.e. the end of grade six.

skills, as well as in creative and technical subjects such as music, sports, painting and practical work.

[Figure 1 about here]

After completing primary school and based on parents' preferred choices and teachers' recommendation, school tracking sets in and children are streamed into different secondary schooling tracks (Figure 1). This recommendation has a strong binding character in some but not all federal states,[4] and is to be based on students' abilities so that the recommended secondary school track should be the most suitable for the student.[5] The three dominant secondary school types are lower secondary school (*Hauptschule*), intermediate secondary school (*Realschule*), and upper secondary school (*Gymnasium*), covering about 80 percent of students.[6]

Lower secondary school as well as intermediate secondary school lasts for five to six years and provides the basis for further (blue and white collar) vocational apprenticeship training. Upper secondary school track lasts for nine years[7] and provides - with the *Abitur* as graduation certificate - the fastest and direct path to tertiary education on universities and universities of applied sciences (*Fachhochschulen*).

In general, although requirements differ across states, transition between secondary schooling tracks is possible. Individuals can for example 'upgrade' in a couple of federal states: After completion of lower secondary school students can achieve the intermediate schooling degree (*Mittlere Reife*) within one additional year. Transition to the upper secondary schooling track from both lower and intermediate secondary track is also possible but subject to entrance re-

[4] In 2004, it was binding in four (Bavaria, Baden-Württemberg, Saxony, Thuringia) out of sixteen federal states, but parents can challenge the recommendation for example via an assessment by specialized teachers or by entrance exams for the school track they want to have their child attend.

[5] Nonetheless there is strong empirical evidence, that the teacher's true recommendation is highly selective and strongly biased by parents' socioeconomic status (Bos et al., 2004).

[6] Other school types include comprehensive schools, special schools and some few other, mainly progressive education alternatives such as Waldorf or Montessori schools. Although privately organized, these schools are also subject to the curricula of the federal state's Ministry of Education.

[7] Reduction to eight years has been agreed upon, but the adjustment has not yet been realized in all federal states.

quirements such as having achieved a specific grade level and having a good command of an another foreign language in addition to English. Now, although transition between tracks after the initial track choice is possible, it is rare: in school year 2004-05, only 2.9 percent of the students in the seventh to ninth grade changed tracks and 60 percent of these changes were changes to lower qualifying tracks, i.e. from upper to intermediate secondary track or from intermediate to lower secondary schooling track. In contrast, only 0.6 percent of the students experienced an upwards track change. (Konsortium Bildungsberichterstattung, 2006). The initial choice therefore predetermines students' final educational attainment to a large extent.[8]

3. Risk preferences and educational outcomes

It is well-known that educational attainment correlates strongly with labor market success: No or lower educational attainment is associated to a higher risk of unemployment and to unstable and low-paid jobs. In contrast, higher education is a good predictor for access to well-paid and stable jobs with good career prospects. Why then should individuals not be willing to invest in education beyond compulsory basic education in order to minimize negative long-term consequences? In the context of our analysis, the question is why parents should not want their children to be streamed into the higher secondary school track?

One possible answer to this question is that, in terms of human capital, educational attainment is an investment into future payoffs and as such is a decision under risk: Since exact predictions of a child's future achievements are not possible it is not clear whether both monetary expenditures and non-monetary opportunity costs will pay off. Such unknown probabilities of the individual's achievement - including for example the risk of dropping out from higher secondary schooling - can discourage risk averse individuals to invest in human capital or education already at the outset.

Given a level of a child's abilities that would allow attending the higher secondary school track, we would in sum expect that educational decisions are subject to individuals' risk preferences. As noted above, there however are two possible, contradictory effects. On the one hand,

[8] Beyond that, there is evidence for social selectivity at both the initial and later transition stages (cf., for example, Jacob & Tieben, 2009; Glaesser & Cooper, 2010).

if future returns to education are uncertain, risk averse individuals will avoid such investments and we would therefore expect risk averse parents to be in favor of the lower secondary school track. On the other hand, higher education might be thought of as "safe haven", i.e. as type of insurance, since the positive correlation between educational attainment and labor market outcomes is well-known. Risk averse parents might then less likely want their children enrolled in the lower secondary school track.

While this ambiguity is not satisfactory from a theoretical point of view, we believe that it is the first notion - risk averse individuals shy away from investments with uncertain outcomes - that is the mechanism at work here, even more so since previous evidence yields results in line with this argument.

Previous research

While there is substantial evidence that risk attitudes are related to adult individuals' behavior and outcomes including labor market success (see c.f. Hartog et al., 2002; Bonin et al., 2007; Pfeifer, 2011), we concentrate on research on the relationship between individuals' risk attitudes and their own educational attainment. In an early study, Weiss (1972) uses data from the 1966 National Register of Scientific and Technical Personnel and provides evidence for a negative impact of risk aversion on human capital investments and on the returns to education. The results of Shaw (1996), which are based on data from the 1983 Survey of Consumer Finances, indicate a positive correlation between risk taking behavior and wage growth as well as higher returns to education for less risk averse persons. In contrast, Barsky et al. (1997) describe a u-shaped relationship between risk tolerance and years of education with the peak at 12 years which is in line with the findings of Brown et al. (2006) who use data from the U.S. Panel Study of Income Dynamcis (PSID). Belzil & Leonardi (2007) use the Italian Survey of Household Income and Wealth (SHIW) to explain differences in schooling by individual risk heterogeneity. Their results indicate only a small negative effect of risk attitudes on schooling attainment.

In addition, there so far is only one study by Leonardi (2007) who examines the role of parents' risk attitudes for the schooling track decision of their young adult (19-23 years) children. Using 1995 Italian SHIW data, he concludes that differences in risk attitudes are no important

determinant of secondary school choice. While this finding is at odds with our expectations, note that his analysis differs from ours inasmuch as he 1) examines the outcomes of individuals in the age range 19-23 whereas we look at younger children, and 2) he uses a risk aversion measures derived from a hypothetical lottery question while we base our analyses on parents' willingness to take risks in their occupational career.

4. Data and methods

Our analyses are based on data from the German Socio-economic Panel Study (SOEP). The SOEP is a representative, annual household panel study that started in 1984 in West Germany with more than 12,000 adult respondents in about 5,900 households. It was extended to former East Germany in 1990 and refreshed with additional samples later on, so that it now consists of more than 20,000 adults. The SOEP is a quite rich database including a wide range of information on the socioeconomic status of both private households and individuals (see Wagner et al., 2007).

As we are interested in the risk-education gradient for students' initial secondary school track choice we restrict our sample to adult respondents with children who are 10 to 15 years old.[9] We thus focus on children who have not yet acquired the first possible school leaving certificate and who could then for example be enrolled in further education in order to upgrade. Another reason for the upper age bound is that adolescents quite likely start to act stronger on their own behalf so that we could not be sure whether the track we observe at age 16 or older is the one that, we argue, was first dominated by the parents' expectations and preferences.

As for the child's secondary school track choice, we focus on the three major schooling tracks as outlined above: lower secondary (*Hauptschule*), intermediate secondary (*Realschule*) and upper secondary (*Gymnasium*). Therefore our dependent variable is a categorical variable with three outcomes:

[9] We cannot rule out that the observed school track is not the initial choice, but note again that less than one percent of all students changed to a higher qualifying track in school year 2004-05.

$$y_i = \begin{cases} 1, & \text{if the child attends the lower secondary schooling track } \textit{(Hauptschule)}. \\ 2, & \text{if the child attends the intermediate secondary schooling track } \textit{(Realschule)}. \\ 3, & \text{if the child attends the upper secondary schooling track } \textit{(Gymnasium)}. \end{cases}$$

Information on individuals' risk attitudes were first surveyed in 2004. In addition to a hypothetical lottery question, the questionnaire includes several items on the respondent's self-reported general and context-specific risk attitudes. General risk attitudes are surveyed asking *"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?"*, to which answers could be given on a 11-point Likert-type scale from 0 (*risk averse*) to 10 (*fully prepared to take risks*). Context-specific risk attitudes are measured as answers to *"People can behave differently in different situations. How would you rate your willingness to take risks in the following areas?"*, where areas mentioned are risk taking while driving, in financial matters, during leisure and sport, in the respondent's occupational career, with his or her health, and his or her faith in other people.

While previous research on the education-risk gradient is based on risk measures derived from lottery questions, Dohmen et al. (2005) clearly point out that context-specific risk attitudes are better predictors for context-specific behavioral outcomes than a lottery based measure. Individuals' risk attitude towards health, for example, is the best predictor for their health behavior. They furthermore show that self-employment propensity is best predicted by career risk attitudes. This is complemented by the findings of Pfeifer (2011) who shows that career risk attitudes are better predictors for sorting into public sector employment than the overall risk attitudes. We therefore employ individuals' risk taking willingness in his or her occupational career as the most appropriate measure with regard to the gradient between risk and human capital investments but we run additional analyses using both risk taking willingness in financial matters and the general risk taking attitudes as robustness checks.

Given the ordinal 11-point scale, we could generate up to eleven risk attitude dummies. For ease of interpretation we however calculate mean and standard deviation separately by mothers' and fathers' career risk attitudes and generate the following three risk categories:[10]

[10] Compared with other approaches, like a more or less arbitrary classification of four or five categories, we prefer using information from the observed distributions. See Table A.1 in

A parent is

- *risk averse*, if her response value X is smaller than the mean (μ) minus the standard deviation (σ): $X < \mu - \sigma$,
- *risk neutral*, if X is in a range between mean plus/minus one standard deviation: $\mu - \sigma <= X <= \mu + \sigma$,
- *risk loving*, if X is larger than the mean plus the standard deviation: $X > \mu + \sigma$.

Since there is evidence that 1) males and females differ in their willingness to take risks (Dohmen et al., 2005) and that 2) mothers are much more involved in their children's schooling activities (Enders-Dragässer et al., 2004; Oesterbacka et al., 2010) which might lead to a bigger influence of particularly mothers' risk attitudes in the tracking decision, we run separate analyses for mothers and fathers. Our final sample consists of 1,204 mother-child observations and of 997 father-child observations.

A first impression of the relationship is given in Figure 2 which provides the distribution of children's secondary school track choice by their parents' willingness to take risks in their occupational career. While the patterns are not clear-cut for fathers, it shows that children of risk loving mothers are much more likely enrolled in the upper secondary school track whereas children of risk averse mothers are more likely enrolled in the lower secondary school track.

[Figure 2 about here]

Since these descriptive findings can be confounded by other factors, we control for a large range of socio-demographic and -economic characteristics in our regression analyses. Parents' education clearly is a key determinant of children's secondary school track choice. In line with the structure of the educational system outlined above, the regression includes dummies on whether the parent has acquired a lower, intermediate or upper secondary schooling degree or whether the parent's education information is missing. Parents' current employment status is another relevant covariate since it relates to the household's budget constraint and might

the Appendix for descriptive statistics of the different risk measures.

also be related to the time, parents can invest in assisting their children, for example in doing homework. In addition, the parents' labor market experience is included by the three variables fulltime, part-time and unemployment experience.[11] The monetary budget constraint is further accounted for by the log of the monthly net equivalence household income. Further control variables are the child's age, whether the child is a boy, three dummies on the number of children in the family (one sibling, two siblings, three and more siblings), the parent's age at birth of the child, and whether the parent has Non-German nationality.[12] Moreover, the size of the respondents' residence is accounted for to capture possible differences between rural and non-rural areas in the supply of intermediate and particularly upper secondary schools.

As outlined above, the role of teachers' track recommendation after primary school differs between the federal states. Our baseline model includes a dummy for those four federal states (Bavaria, Baden-Württemberg, Saxony, Thuringia), where recommendation is more or less final and costs to circumvent the recommendation are high. We furthermore use this restriction as a kind of falsification test: The underlying correlation between parent's risk aversion and their preferences for their children's school track choice should be just as strong in these states as in all other federal states. Since the parent's preferences however are not taken into account, any association between parent's risk attitudes and school track choice must be due to omitted variables. Now, if there were no association in these four states but a strong association in the remaining states, the results will more likely point to causal effects rather than mere correlations. Thus, as a key competitor to our baseline model, we split our sample into two subsamples, where one sample includes observations from the four federal states where recommendation is binding and where the second sample contains observations from the federal states without rigorous binding recommendation.

Given the categorical character of our dependent variable, the multinomial logit estimator is used which allows for differences in each covariate's marginal effect across categories.[13] Our baseline model then describes the correlation between the child's secondary school track choice

[11] The different employment experience being highly correlated we run separate regression including only one of the three variables without substantial changes of the results.

[12] See Table A.2 for descriptive statistics.

[13] Both the Hausman-McFadden test and the Small-Hsiao test were applied to test the independence of irrelevant alternatives (IIA) assumption underlying the multinomial logit model and we found no evidence to the contrary (see also Long & Freese, 2006, p. 243ff.).

and a vector of covariates $Pr(Y_i = j|X_i)$, where X comprises the parent's risk attitude as well as the above noted controls.

Considering a possible relation between the parent's own education and his or her risk attitude, we extend our baseline specification by including terms interacting the respondent's risk attitude and his or her highest educational achievement. To avoid the issues that come along with the calculation of marginal effects in non-linear models that include interaction terms (Ai & Norton, 2003; Greene, 2010), we simulate changes in parents' risk preferences in order to calculate the corresponding conditional predicted probabilities of the child's secondary school track choice: $Pr(Y_i|$parent's risk attitude$)$, where parent's risk attitude could be averse or neutral or loving.

Since we are mainly interested in the effects of risk aversion vs. the willingness to take risks, we calculate the following differences:

$\Delta_L = Pr(\textit{lower track} \mid \textit{parent is risk averse}) - Pr(\textit{lower track} \mid \textit{parent is risk loving})$

$\Delta_I = Pr(\textit{intermediate track} \mid \textit{parent is risk averse}) - Pr(\textit{intermediate track} \mid \textit{parent is risk loving})$

$\Delta_U = Pr(\textit{upper track} \mid \textit{parent is risk averse}) - Pr(\textit{upper track} \mid \textit{parent is risk loving})$

In addition to our baseline specifications we run the following robustness tests: 1) we employ the individual's score on the risk willingness scale, i.e. we use a quasi-metric measure; 2) we employ the individual's general risk willingness attitude as well as her risk attitude in financial matters to check sensitivity of the risk measure used. As a further extension, we run separate analyses for mother/father-son/daughter subsamples to examine whether there are differences by child gender.

5. Results

Tables 1 and 2 report average marginal effects (Bartus, 2005) for the baseline model, separately for mothers and fathers. First, and unsurprising, the most influential control variables are parent's education and household income. Having a parent with an upper secondary schooling degree increases the probability of the child being enrolled in the upper secondary schooling

track by about 20 percentage points (Table 1 for mothers) or almost 16 percentage points (Table 2 for fathers), compared to a child of a parent with intermediate secondary schooling. A complementing picture is found for parents with lower secondary schooling degree, whose children are more likely enrolled in the lower secondary school track. That is, we find evidence for a strong education transmission from parents to children which is in line with previous research on intergenerational education mobility in Germany (Heineck & Riphahn, 2009). Children in higher income households also have greater chances for enrollment in the upper secondary school track. Moreover, living in a federal state where teachers' recommendation is strongly binding is associated with higher probabilities of enrollment in the lower secondary track and, complementary to this, with lower probabilities of enrollment in the upper secondary track.

Regarding our central interest, the estimates suggest for no impact of a high parental willingness to take risks on children's secondary school track choice, compared to an average risk taking attitude. Having a risk averse mother, however, is correlated with a 9 percentage point decrease in the probability of the child being enrolled in the upper secondary school track and about 5 percentage points increase for enrollment in the lower secondary school track (Table 1). This may seem a modest effect but it comes close to the association between living in a federal state with binding teachers' recommendation and children's secondary school enrollment. The overall pattern also indicates a substantial gradient: conditional on mothers' risk attitude, the predicted probabilities imply that the higher a mother's risk willingness, the more likely is enrollment in upper secondary school and the less likely is enrollment in the lower secondary school track (cf. the lower panel in Table 1).

[Table 1 about here]

While this finding is in line with the above mentioned notion that education is a risky investment from which risk averse individuals shy away, we find a somewhat different pattern for fathers. In particular, the estimates indicate a small negative and weakly statistically significant association between father's risk aversion and the child's enrollment in the lower secondary school track (Table 2, column 1). This is at odds with our preferred hypothesis but in line with

the “safe haven” notion. Yet, the negative sign of the average marginal effect of father’s risk aversion on the child’s enrollment in the upper schooling track may indicate that fathers opt for a middle way. In addition, calculating predicted probabilities conditional on fathers’ risk willingness (cf. the lower panel in Table 2), we find only little differences in children’s secondary school track choice as fathers’ career risk attitudes vary.

[Table 2 about here]

Sofar, we used a dummy variable to allow for between-states differences in the impact of teachers’ recommendation. However, as argued above, on might wonder whether there are factors other than parental risk attitudes driving the association with children’s school track enrollment. To falsify this, we split our sample: if there would be a gradient between parental risk attitudes and school track choice in federal states in which recommendation is final, we would have reason to distrust our results since such a gradient might be more likely caused by omitted confounding variables. However, the estimates do not raise concern. Without showing in detail, the simulations first indicate no statistical correlation between fathers’ risk attitude and their child’s school track for either the full sample or both subsamples. The findings for mothers then are convincing inasmuch as the risk attitude differences in conditional predicted probabilities are zero in the subsample of the federal states in which teachers’ recommendation is binding (Table 3, Panel B). In contrast, the findings for either the full sample that includes the binding recommendation state dummy or the subsample of observations from the states without binding teachers’ recommendation indicate substantial differences in both lower and upper secondary school enrollment probabilities, once mothers’ risk attitudes are varied from averse to loving (Table 3, Panel A and C). That is, having a risk loving rather than a risk averse mother significantly increases (decreases) the child’s probability of being enrolled in the upper (lower) secondary school track by roughly ten percentage points.

[Table 3 about here]

As a next step, we extend our baseline model and include interaction terms of parental risk attitudes and education in order to control for the relation between parent's own education and her or his risk attitude. Similar to the conditional predicted probabilities above, we calculate differences in the predicted school enrollment outcomes after varying parental risk attitudes, while all other covariates are kept at the observed values (see Table 4).

[Table 4 about here]

The results of these simulation exercises reinforce the findings of our baseline models inasmuch as there is no convincing evidence for fathers' risk attitudes but a striking gradient between mothers' risk attitude and their child's secondary school track enrollment. The difference in predicted probabilities of enrollment in the lower track amounts to almost 7 percentage points conditional on the mother being either risk averse or risk loving. The impact of maternal risk attitudes is even stronger looking at the upper secondary school track: There is a difference of 10 percentage points in predicted probabilities meaning that the child of a risk loving mother is much more likely enrolled in the directly university-qualifying schooling track.

6. Robustness

Using the quasi-metric scale

In our baseline models, we use categorical risk variables as derived from the underlying risk attitude distributions. In order to examine the stability of these first findings, we now employ the scores of the scale itself. The results in Table 5 mainly show similar patterns as compared to the estimations above. An increase in fathers' risk willingness by one unit is not statistically associated to children's secondary school track but the average marginal effects hint towards a kind of a u-shaped gradient. Moreover, there again is evidence for a monotonic relation between mother's occupational career risk attitudes and her child's secondary school track: a one unit increase in risk willingness decreases the predicted probabilities of enrollment in the lower track and increases enrollment in the upper track by one percentage point respectively.

[Table 5 about here]

Figure 3 depicts this result showing that irrespective of the mother having a lower or an upper secondary schooling degree, the child's probabilities of being enrolled in the upper secondary schooling track increases by roughly ten percentage points with changes in maternal risk taking willingness from 0 to 10. Complementing this, an increase in risk taking willingness over the whole range decreases lower secondary school enrollment also by about ten percentage points.

[Figure 3 about here]

General risk taking and risk attitudes towards financial matters

As outlined above, our analysis differs from the existing studies (e.g., Belzil & Leonardi, 2007; Leonardi, 2007) inasmuch as we do not employ individuals' risk aversion derived from hypothetical lottery questions. Instead, we use respondents' self-reported risk attitudes towards occupational career, arguing that this is better suited to capture the relation between risk taking attitudes and human capital investments. We however run further robustness checks to accommodate prior research by using 1) individuals' general risk taking attitudes, which still is a better overall risk behavior predictor than a lottery measure (Dohmen et al., 2005), and 2) using individuals' risk taking willingness in financial matters.

Compared to the findings from our preferred model, the results for individuals' general risk taking attitudes imply slightly different findings: while mothers' risk aversion estimates above suggest for a monotonic inverse gradient, the results now indicate no statistical association. There however is a 3.5 percentage points decrease for risk loving mothers in the probability of their child's enrollment in the lower secondary school track (Table 6, Panel A) which complements the prior finding. We also find an 1.8 percentage point decrease for risk averse fathers that the child is enrolled in the lower secondary track. This again hints towards the "safe haven" hypothesis, even more so since we further find a 9 percentage point increase in the predicted probability that the child is streamed into the intermediate secondary schooling track. The negative sign of the average marginal effect on the enrollment in the upper secondary track would

again suggest for shying away from this option, yet this is not statistically significant.

[Table 6 about here]

The results for risk taking in financial matters (Table 6, Panel B) are almost the same for mothers as the results for the general risk taking attitudes. There, first, is a 4 percentage point decrease in the predicted lower secondary track enrollment for children of risk loving mothers but no convincing statistical association otherwise. Again in line with the findings for fathers so far, there is no evidence for risk loving attitudes on children's secondary school track choice. The results however once more indicate that risk averse fathers opt for the average inasmuch as there is a 9 percentage point increase in the probability of the child being enrolled in the intermediate track and a 10 point decrease of enrollment in the upper secondary track.

For both robustness general risk attitudes and risk taking attitudes in financial matters, we also carried out simulation exercises, i.e. we calculated children's predicted secondary school track probabilities, conditional on varied parental risk willingness. We do not present these findings since the differences in the predicted probabilities are mainly not statistically different from zero. There is one exception: similar to the findings for mothers above, there is a 10.5 percentage points difference in the lower track enrollment probability for a mother being either risk averse or risk loving in financial matters with a higher probability found for the risk averse mother. Additionally, we repeat the simulations for the two subsamples that differ in terms of the binding character of teachers' recommendation and find similar patterns for mothers's risk attitude towards financial assets: there are no significant effects in federal states in which recommendation is final but, again, a 11 percentage points higher lower track enrollment probability for a child of a risk averse mother as compared to one of a risk loving mother in all other federal states.

Differences by child gender?

Recent research further suggests for gender-specific intergenerational education transmission, i.e. that fathers' education is more important for the educational achievement of sons and

that, similarly, mother's education is more relevant for daughters' educational outcomes (e.g. Dearden et al., 1997; Heineck & Riphahn, 2009; Kleinjans, 2010).

Given this evidence and the observation that risk taking willingness differs between males and females (Dohmen et al., 2005), we extend our analysis and separate the samples by the child's sex in order to examine whether parent's risk attitudes affect boys' or girls' secondary school enrollment differently (Table 7). Our results highlight two findings: First, parental risk attitudes play a larger role for daughters than for sons, inasmuch as none of the average marginal effects on the outcomes of boys is statistically different from zero. Second, we however find hints towards different underlying mechanisms for father and mothers. In line with the findings of our baseline model above, a daughter's probability of being enrolled in the lower secondary track is associated with an increase of about 10 percentage points when having a risk averse mother, but it in contrast decreases the daughter's probability of being enrolled in the upper secondary track by 8 percentage points. For fathers, we again find that risk aversion is negatively associated with enrollment in the lower secondary track, but that risk loving substantially decreases the daughter's chances of being enrolled in the intermediate secondary track and substantially increases her probability of being enrolled in the upper track, with changes of almost 10 and 14 percentage points respectively.

[Table 7 about here]

7. Summary and conclusions

There is growing research addressing the effects of individuals' cognitive and non-cognitive skills on different labor market outcomes (see Borghans et al., 2008, for an overview). The role of individuals' risk attitudes has also attracted scholarly effort within this strand of research (ibid., p. 1002 f.) but has largely concentrated on issues such as portfolio choice, occupational choice, or earnings. Yet, as future outcomes of individuals' educational choices are uncertain and might thus represent risky investments, it is plausible to assume that individual's risk taking willingness may have an impact on educational choices of the individual herself but also that

her risk attitude affects the educational path of her children.

Theoretically, it is however not that clear a priori whether risk averse individuals would try to avoid educational investments as education might also serve as "safe haven", i.e. would have an insurance type character. Our analysis sheds light on this issue and we examine whether parental risk attitudes are associated to the secondary school track choice of their children and which of the two mechanisms is at work.

We add to an almost non-existent literature, with the study of Leonardi (2007) as the only prior research on the parent-children gradient. We explore the German case which is as interesting and possibly even more relevant because of the institutional setting that streams children at age ten, i.e. very early, into different secondary school tracks. Upward mobility between tracks is low so that the initial choice has a strong predetermining character.

Our results imply the following: 1) everything else constant, risk averse mothers are more likely to have their child enrolled in the lower secondary schooling track, and particularly so if the child is a girl, and less likely enrolled in the upper secondary track. With substantial changes in the predicted probabilities (6 and 10 percentage points respectively), this supports the notion that education is looked at as risky investment. 2) In contrast, the findings for father are not as convincing and consistent as for mothers and are more in line with the "safe haven" argument inasmuch as the children of risk averse fathers are less likely enrolled in the lower secondary school track. We again find a stronger effect for daughters which is further complemented by the evidence that daughters of risk loving fathers are much more likely enrolled in the upper secondary track which directly qualifies for entrance in universities.

Given that our analysis is only the second attempt to explore this specific question it might be too early to deduce policy implications. Yet, in order to widen the scope for social mobility, it might either way be useful to consider relaxing the requirements for particularly upward track mobility so that a possibly wrong initial choice based on, amongst other things, parental risk taking attitudes could be more easily reversed.

Tables

Table 1: Baseline Specification - Children's educational attainment: Multinomial Logit Estimation.

	Pr(y=lower sec)	Pr(y=secondary)	Pr(y=upper sec)
Marginal Effects			
Mother: Risk averse (Career)	0.047^{**}	0.041	-0.088^{**}
	(0.021)	(0.044)	(0.044)
Mother: Risk loving (Career)	-0.011	0.009	0.001
	(0.016)	(0.041)	(0.042)
Mother's education: lower sec.	0.169^{***}	-0.043	-0.126^{***}
	(0.033)	(0.038)	(0.040)
Mother's education: upper sec.	-0.035^{**}	-0.160^{***}	0.195^{***}
	(0.014)	(0.034)	(0.036)
Mother's education: missing	0.104^{**}	-0.071	-0.033
	(0.041)	(0.059)	(0.066)
Mother's age (at birth)	-0.008^{**}	-0.007^{*}	0.015^{***}
	(0.003)	(0.004)	(0.003)
Mother: Migrant	-0.005	0.033	-0.028
	(0.018)	(0.059)	(0.060)
Mother's employment: Part-time	-0.012	0.031	-0.018
	(0.016)	(0.049)	(0.049)
Mother's employment: Not employed	-0.017	0.034	-0.017
	(0.016)	(0.054)	(0.055)
Male child	0.041^{**}	0.012	-0.053^{*}
	(0.016)	(0.030)	(0.031)
Child's age	-0.036^{***}	0.015	0.021^{**}
	(0.008)	(0.010)	(0.009)
Number of siblings: One	-0.009	-0.001	0.010
	(0.016)	(0.045)	(0.045)
Number of siblings: Two	-0.007	0.079	-0.072
	(0.019)	(0.055)	(0.054)
Number of siblings: Three or more	0.029	0.103	-0.132^{*}
	(0.032)	(0.071)	(0.069)
Net equiv-income (log)	-0.160^{***}	-0.072^{**}	0.232^{***}
	(0.030)	(0.035)	(0.032)
State with recommendation	0.058^{***}	0.021	-0.079^{**}
	(0.019)	(0.032)	(0.032)
Mother's emp. experience: full time	0.001	0.004	-0.005
	(0.003)	(0.003)	(0.003)
Mother's emp. experience: part time	-0.004	0.004	0.000
	(0.003)	(0.004)	(0.003)
Mother's emp. experience: unemployed	0.001	0.014^{*}	-0.015^{*}
	(0.006)	(0.007)	(0.008)
Regional fixed effects	*Yes*	*Yes*	*Yes*
Log-Likelihood	-1042.559		
Predicted Probabilities			
Pr(.../ mother's risk attitude = averse)	0.314^{***}	0.330^{***}	0.356^{***}
	(0.028)	(0.031)	(0.029)
Pr(.../ mother's risk attitude = neutral)	0.238^{***}	0.326^{***}	0.436^{***}
	(0.016)	(0.017)	(0.017)
Pr(.../ mother's risk attitude = loving)	0.217^{***}	0.342^{***}	0.441^{***}
	(0.031)	(0.033)	(0.031)

Note: Multinomial Logit estimation, average marginal effects. N=1204 mother-child observations. Predictions are generated as the average of all individual predicted probabilities (calculated with the individually observed values of the covariates), after mother's risk attitude is modified. Standard errors in parentheses. *** ** * significant at 1% 5% 10%.
Source: SOEP, 2004. Authors' own calculations.

Table 2: Baseline Specification - Children's educational attainment: Multinomial Logit Estimation.

	Pr(y=lower sec)	Pr(y=secondary)	Pr(y=upper sec)
Marginal Effects			
Father: Risk averse (Career)	-0.020^{**}	0.007	0.013
	(0.010)	(0.048)	(0.050)
Father: Risk loving (Career)	-0.014	-0.029	0.044
	(0.010)	(0.040)	(0.041)
Father's education: lower sec.	0.097^{***}	0.019	-0.116^{***}
	(0.029)	(0.042)	(0.044)
Father's education: upper sec.	-0.024^{**}	-0.134^{***}	0.158^{***}
	(0.012)	(0.040)	(0.041)
Father's education: missing	0.043	-0.162^{***}	0.119^{*}
	(0.032)	(0.052)	(0.064)
Father's age (at birth)	-0.006	-0.011^{**}	0.017^{***}
	(0.004)	(0.005)	(0.005)
Father: Migrant	0.032	0.120^{*}	-0.152^{**}
	(0.021)	(0.062)	(0.063)
Father's employment: Part-time	0.128	0.200	-0.328^{***}
	(0.081)	(0.125)	(0.109)
Father's employment: Not employed	0.061^{*}	0.033	-0.093
	(0.034)	(0.076)	(0.083)
Male child	0.021	-0.034	0.013
	(0.013)	(0.031)	(0.033)
Child's age	-0.038^{***}	0.014	0.024^{**}
	(0.009)	(0.011)	(0.011)
Number of siblings: One	0.011	0.041	-0.052
	(0.018)	(0.051)	(0.052)
Number of siblings: Two	0.016	0.109^{*}	-0.125^{**}
	(0.021)	(0.059)	(0.059)
Number of siblings: Three or more	0.045	0.153^{**}	-0.199^{***}
	(0.033)	(0.072)	(0.070)
Net equiv-income (log)	-0.063^{*}	-0.082^{*}	0.144^{***}
	(0.037)	(0.043)	(0.038)
State with recommendation	0.042^{***}	0.007	-0.049
	(0.016)	(0.034)	(0.036)
Father's emp. experience: full time	0.004	0.009^{*}	-0.012^{***}
	(0.004)	(0.005)	(0.004)
Father's emp. experience: part time	-0.008	-0.022	0.030^{**}
	(0.015)	(0.018)	(0.014)
Father's emp. experience: unemployed	0.021^{**}	0.032^{***}	-0.053^{***}
	(0.008)	(0.012)	(0.015)
Regional fixed effects	*Yes*	*Yes*	*Yes*
Log-Likelihood	-839.633		
Predicted Probabilities			
Pr(.../ father's risk attitude = averse)	0.185^{***}	0.352^{***}	0.463^{***}
	(0.029)	(0.038)	(0.038)
Pr(.../ father's risk attitude = neutral)	0.243^{***}	0.319^{***}	0.438^{***}
	(0.016)	(0.018)	(0.019)
Pr(.../ father's risk attitude = loving)	0.206^{***}	0.313^{***}	0.481^{***}
	(0.029)	(0.032)	(0.030)

Note: Multinomial Logit estimation, average marginal effects. N=997 father-child observations. Predictions are generated as the average of all individual predicted probabilities (calculated with the individually observed values of the covariates), after father's risk attitude is modified. Standard errors in parentheses. *** ** * significant at 1% 5% 10%.
Source: SOEP, 2004. Authors' own calculations.

Table 3: Predicted Probabilities, Simulation results for different samples: Baseline specification using career risk attitudes

(A) OBSERVATIONS FROM ALL FEDERAL STATES (N=1204)

	Pr(y=lower sec)	Pr(y=secondary)	Pr(y=upper sec)
	Predicted School Track		
P(...| mother = risk averse)	0.3138	0.3298	0.3564
P(...| mother = risk neutral)	0.2382	0.3262	0.4356
P(...| mother = risk loving)	0.2170	0.3415	0.4414
Δ averse-loving	0.0967^{**}	-0.0117	-0.0850^{**}
	(0.0398)	(0.0465)	(0.0427)

(B) OBSERVATIONS FROM FEDERAL STATES WITH BINDING RECOMMENDATION (N=528)

	Pr(y=lower sec)	Pr(y=secondary)	Pr(y=upper sec)
	Predicted School Track		
P(...| mother = risk averse)	0.3315	0.3495	0.3191
P(...| mother = risk neutral)	0.2907	0.3188	0.3905
P(...| mother = risk loving)	0.2774	0.3479	0.3746
Δ averse-loving	0.0540	0.0015	-0.0556
	(0.0691)	(0.0779)	(0.0721)

(C) OBSERVATIONS FROM FEDERAL STATES WITHOUT BINDING RECOMMENDATION (N=676)

	Pr(y=lower sec)	Pr(y=secondary)	Pr(y=upper sec)
	Predicted School Track		
P(...| mother = risk averse)	0.2896	0.3322	0.3782
P(...| mother = risk neutral)	0.1996	0.3372	0.4632
P(...| mother = risk loving)	0.1867	0.3240	0.4893
Δ averse-loving	0.1029^{**}	0.0082	-0.1111^{**}
	(0.0501)	(0.0600)	(0.0564)

Notes: Standard errors (in parentheses) are obtained via bootstrap with 500 repeated draws. *** ** * significant at 1% 5% 10%.
Source: SOEP, 2004. Authors' own calculations.

Table 4: Predicted Probabilities, Simulation results: Extended specification using career risk attitudes, interacted with parental education

(A) MOTHER-CHILD OBSERVATIONS (N=1204)

	Predicted school track		
Mother's risk attitude	**lower secondary**	**secondary**	**upper secondary**
P(...| mother = risk averse)	0.2764	0.3554	0.3682
P(...| mother = risk neutral)	0.2364	0.3286	0.4350
P(...| mother = risk loving)	0.2099	0.3230	0.4672
Δ Diff. averse-loving	0.0665^{*}	0.0324	-0.0990^{**}
	(0.0398)	(0.0478)	(0.0434)

(B) FATHER-CHILD OBSERVATIONS (N=997)

	Predicted school track		
Father's risk attitude	**lower secondary**	**secondary**	**upper secondary**
P(...| father = risk averse)	0.1824	0.3609	0.4567
P(...| father = risk neutral)	0.2425	0.3192	0.4383
P(...| father = risk loving)	0.2112	0.3145	0.4743
Δ Diff. averse-loving	-0.0288	0.0464	-0.0176
	(0.0403)	(0.0505)	(0.0468)

Notes: Standard errors (in parentheses) are obtained via bootstrap with 500 repeated draws. *** ** * significant at 1% 5% 10%.
Source: SOEP, 2004. Authors' own calculations.

Table 5: Children's secondary school track choice: Estimates using career risk attitudes as metric variable.

	Pr(y=lower sec.)	Pr(y=secondary)	Pr(y=upper sec.)
	Average Marginal Effects		
Mother: Risk willingness	-0.010^{**}	0.000	0.009^{*}
	(0.005)	(0.006)	(0.005)
Father: Risk willingness	0.002	-0.008	0.006
	(0.005)	(0.006)	(0.006)

Notes: Multinomial logit estimation, average marginal effects. N=1,204 (997) mother-(father-)child observations. The estimations are separately estimated for the mother-child and father-child sample and are based on the baseline specification including the same set of control variables. Risk willingness is used as a metric variable, where "0" indicates no willingness to take risk and "10" full willingness to take risks. Standard errors in parentheses. *** ** * significant at 1% 5% 10%.
Source: SOEP, 2004. Authors' own calculations.

Table 6: Children's secondary school track choice: Estimates using different risk attitudes

(A) GENERAL RISK TAKING ATTITUDES

	Pr(y=lower sec.)	Pr(y=secondary)	Pr(y=upper sec.)
Mother: Risk averse	−0.005	0.014	−0.009
	(0.019)	(0.045)	(0.047)
Mother: Risk loving	−0.035**	0.065	−0.030
	(0.017)	(0.045)	(0.045)
Father: Risk averse	−0.018*	0.086*	−0.068
	(0.010)	(0.052)	(0.053)
Father: Risk loving	−0.016	0.030	−0.015
	(0.011)	(0.052)	(0.054)

(B) RISK ATTITUDES IN FINANCIAL MATTERS

	Pr(y=lower sec.)	Pr(y=secondary)	Pr(y=upper sec.)
Mother: Risk averse	0.018	0.040	−0.059
	(0.017)	(0.036)	(0.037)
Mother: Risk loving	−0.041***	0.045	−0.005
	(0.013)	(0.041)	(0.042)
Father: Risk averse	0.010	0.093*	−0.102*
	(0.013)	(0.051)	(0.053)
Father: Risk loving	−0.006	−0.011	0.017
	(0.010)	(0.042)	(0.043)

Notes: Multinomial Logit estimation, average marginal effects. N=1,246 (1,005) mother-(father-)child observations. The estimation are separately estimated for the mother-child and father-child samples and are based on the baseline specification including the same set of control variables. Standard errors in parentheses. *** ** * significant at 1% 5% 10%.
Source: SOEP, 2004. Authors' own calculations.

Table 7: Child's secondary school track: Estimates using career risk attitudes by child's gender

	Average Marginal Effects		
Mother-daughter (N=567)	Pr(y=lower sec.)	Pr(y=secondary)	Pr(y=upper sec.)
Risk averse	0.101^{**}	-0.021	-0.080^{*}
	(0.045)	(0.049)	(0.046)
Risk loving	0.019	-0.025	0.007
	(0.048)	(0.052)	(0.049)
Mother-son (N=637)	Pr(y=lower sec.)	Pr(y=secondary)	Pr(y=upper sec.)
Risk averse	0.056	0.022	-0.078
	(0.045)	(0.053)	(0.048)
Risk loving	-0.048	0.044	0.004
	(0.044)	(0.052)	(0.045)
Father-daughter (N=475)	Pr(y=lower sec.)	Pr(y=secondary)	Pr(y=upper sec.)
Risk averse	-0.088^{**}	0.041	0.047
	(0.038)	(0.058)	(0.056)
Risk loving	-0.035	-0.104^{**}	0.139^{***}
	(0.042)	(0.050)	(0.050)
Father-son (N=522)	Pr(y=lower sec.)	Pr(y=secondary)	Pr(y=upper sec.)
Risk averse	-0.011	-0.012	0.024
	(0.047)	(0.057)	(0.056)
Risk loving	-0.032	0.066	-0.034
	(0.041)	(0.050)	(0.046)

Notes: Multinomial Logit estimation, average marginal effects. The estimations are separately estimated for the four samples and are based on the baseline specification including the same set of control variables. Standard errors in parentheses. *** ** * significant at 1% 5% 10%.
Source: SOEP, 2004. Authors' own calculations.

Figures

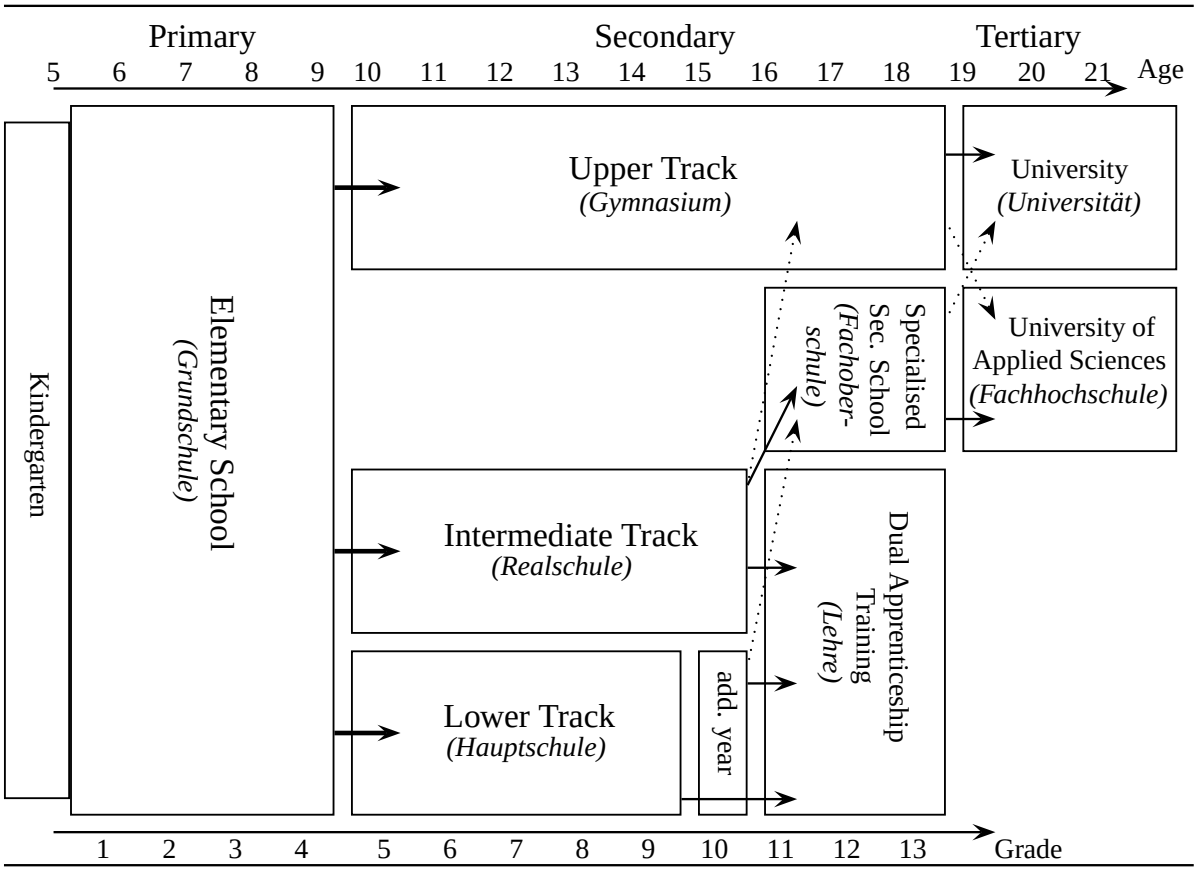

Figure 1: Simplified illustration of the German school system

Note: The German educational system is structured into three tracks (primary, secondary and tertiary). The bold arrows specify the typical paths. The dashed arrows represent less common transitions. Other school types (not shown) include comprehensive schools, special schools and some few other, mainly private progressive education alternatives such as Waldorf schools or Montessori schools. In some federal states, students with a lower secondary school degree can achieve the intermediate school degree (*Mittlere Reife*) within one additional year. Specialised secondary schools (*Fachoberschule*) offer an upper school degree that mainly qualifies for entrance in universities of applied sciences.

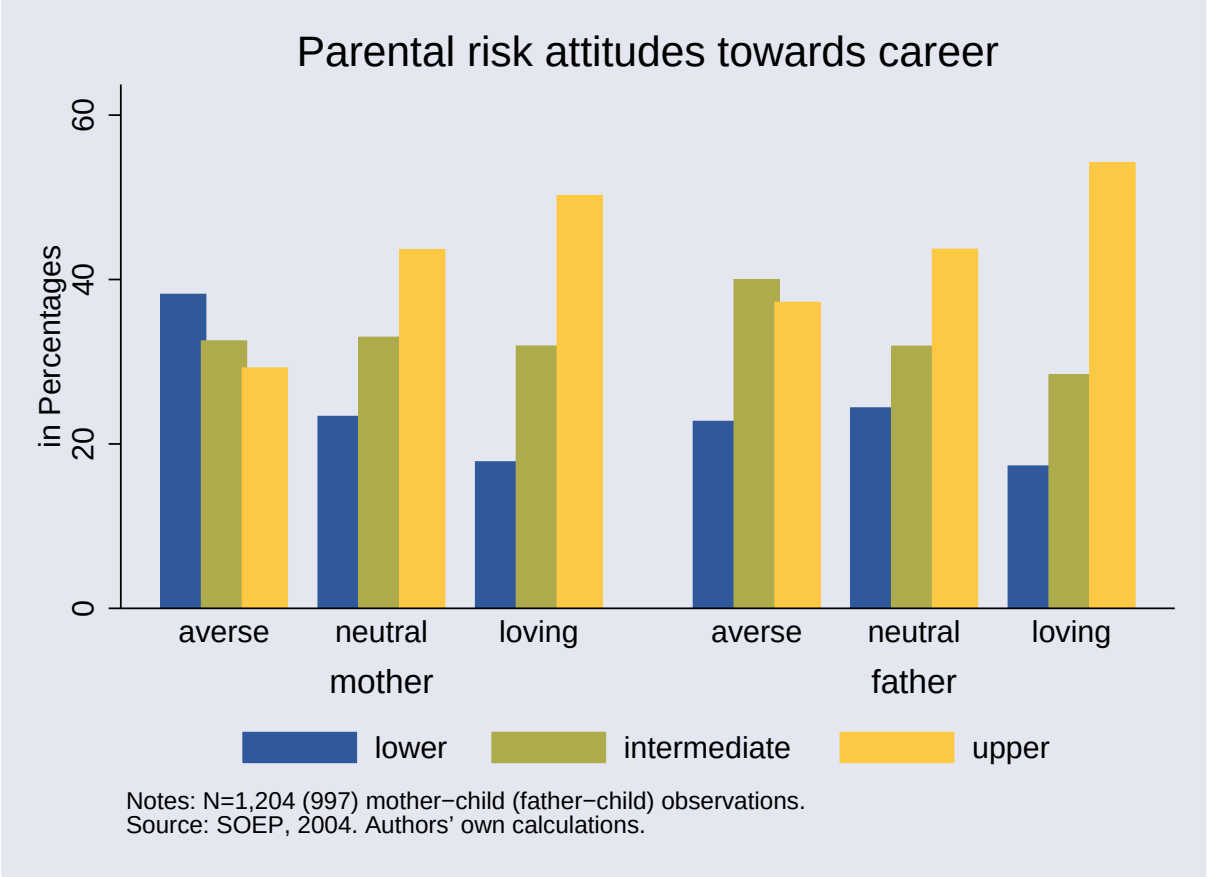

Figure 2: Children's school attendance by parental risk attitudes

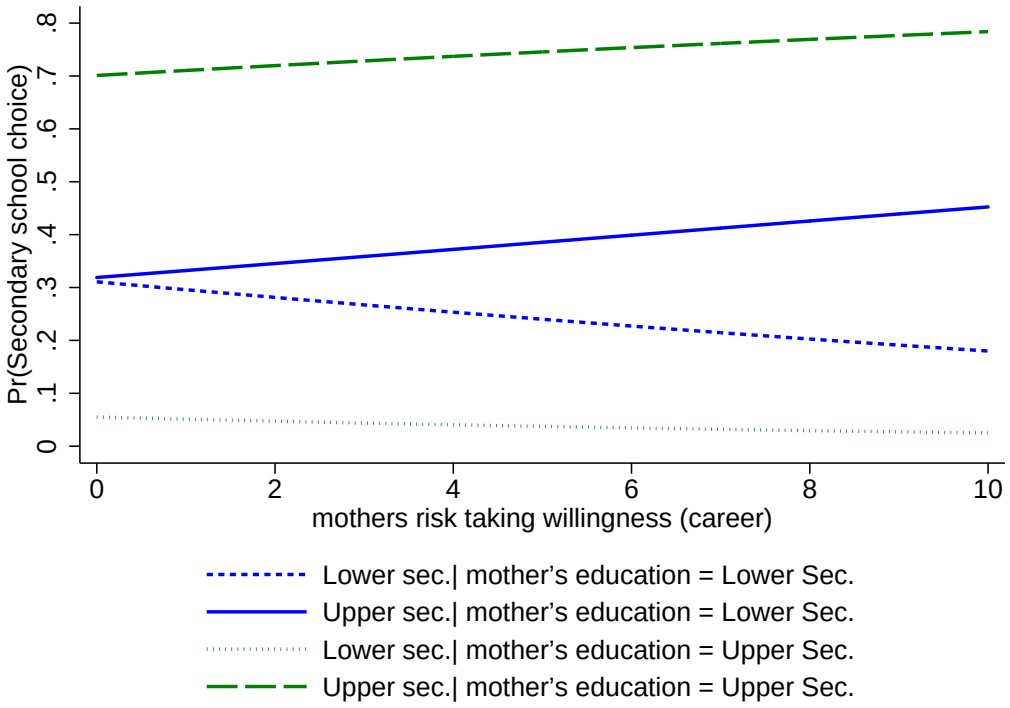

Figure 3: Predicted conditional school track choice probabilities

References

Acemoglu, D., & Pischke, J.-S. (2001). Changes in the Wage Structure, Family Income and Children's Education. *European Economic Review, 45*, 890–904.

Ai, C., & Norton, E. C. (2003). Interaction Terms in Logit and Probit Models. *Economics Letters, 80*, 123–129.

Barsky, R. B., Juster, F. T., Kimball, M. S., & Shapiro, M. D. (1997). Preference Parameters and Behavioral Heterogeneity: An experimental Approach in the Health and Retirement Study. *Quarterly Journal of Economics, 112*, 537–579.

Bartus, T. (2005). Estimation of marginal effects using margeff. *The Stata Journal, 5*, 309–329.

Belzil, C. (2007). Subjective Beliefs and Schooling Decisions. IZA Discussion Paper No 2820. Institute for the Study of Labor.

Belzil, C., & Leonardi, M. (2007). Can Risk Aversion Explain School Attainments? Evidence from Italy. *Labour Economics, 14*, 957–970.

Blanden, J., & Gregg, P. (2004). Family Income and Educational Attainment: A Review of Approaches and Evidence from Britain. *Oxford Review of Economic Policy, 20*, 245–263.

Bonin, H., Dohmen, T., Falk, A., Huffman, D., & Sunde, U. (2007). Cross-sectional Earnings Risk and Occupational Sorting: The Role of Risk Attitudes. *Labour Economics, 14*, 926–937.

Borghans, L., Duckworth, A. L., Heckman, J. J., & Ter Weel, B. (2008). The Economics and Psychology of Personality Traits. *Journal of Human Resources, 43*, 972–1059.

Bos, W., Voss, A., Lankes, E.-M., Schwippert, K., Thiel, O., & Valtin, R. (2004). Schullaufbahnempfehlungen von Lehrkräften für Kinder am Ende der vierten Jahrgangsstufe. In W. Bos, E.-M. Lankes, M. Prenzel, K. Schwippert, R. Valtin, & G. Walther (Eds.), *IGLU: Einige Länder der Bundesrepublik Deutschland im nationalen und internationalen Vergleich* (pp. 191–228). Münster, New York, München, Berlin: Waxmann.

Bratberg, E., Anti Nilsen, i., & Vaage, K. (2008). Job Losses and Child Outcomes. *Labour Economics, 15*, 591–603.

Brown, S., Ortiz, A., & Taylor, K. (2006). Educational Attainment and Risk Preference. Sheffield Economic Research Paper Series No 200602. University of Sheffield.

Coelli, M. B. (2011). Parental Job Loss and the Education Enrollment of Youth. *Labour Economics, 18*, 25 – 35.

Dearden, L., Machin, S., & Reed, H. (1997). Intergenerational Mobility in Britain. *The Economic Journal*, *440*, 47–66.

Dohmen, T., Falk, A., Huffman, D., Sunde, U., Schupp, J., & Wagner, G. G. (2005). Individual Risk Attitudes: New Evidence From a Large, Representative, Experimentally-validated Survey. IZA Discussion Paper No 1730. Institute for the Study of Labor. Forthcoming in Journal of European Economic Association.

Enders-Dragässer, U., Sellach, B., & Libuda-Köster, A. (2004). Zeitverwendung für Hausaufgabenbetreuung. In F. S. Office (Ed.), *Forum der Bundesstatistik* (pp. 149–159). Wiesbaden volume 43. (Alltag in Deutschland. Analysen zur Zeitverwendung ed.).

Erikson, R., & Goldthorpe, J. H. (2002). Intergenerational inequality: A sociological perspective. *Journal of Economic Perspectives*, *16*, 31–44.

Ermisch, J., & Francesconi, M. (2001). Family Matters: Impacts of Family Background on Educational Attainments. *Economica*, *68*, 137–156.

Glaesser, J., & Cooper, B. (2010). Selectivity and Flexibility in the German Secondary School System: A Configurational Analysis of Recent Data from the German Socio-Economic Panel. *European Sociological Review*, (pp. –).

Greene, W. (2010). Testing Hypotheses about Interaction Terms in Nonlinear Models. *Economics Letters*, *107*, 291–296.

Hartog, J., Ferrer-i Carbonell, A., & Jonker, N. (2002). Linking Measured Risk Aversion to Individual Characteristics. *Kyklos*, *55*, 3–26.

Heineck, G., & Riphahn, R. T. (2009). Intergenerational Transmission of Educational Attainment in Germany: The last five Decades. *Jahrbücher für Nationalökonomie & Statistik*, *229*, 36–60.

Henz, U., & Maas, I. (1995). Chancengleichheit durch die Bildungsexpansion? *Kölner Zeitschrift für Soziologie und Sozialpsychologie*, *47*, 605–633.

Jacob, M., & Tieben, N. (2009). Social Selectivity of Track Mobility in Secondary Schools. *European Societies*, *11*, 747–773.

Kleinjans, K. J. (2010). Family Background and Gender Differences in Education Expectations. *Economics Letters*, *107*, 125–127.

Konsortium Bildungsberichterstattung (2006). *Bildung in Deutschland. Ein indikatorengestützter Bericht mit einer Analyse zu Bildung und Migration*. Bielefeld: W. Bertelsmann Verlag.

Leonardi, M. (2007). Do Parents Risk Aversion and Wealth Explain Secondary School Choice? *Giornale degli Economisti*, *66*, 177–206.

Long, J. S., & Freese, J. (2006). *Regression Models for Categorical Dependent Variables using Stata*. (2nd ed.). College Station, Texas: Stata Press.

Oesterbacka, E., Merz, J., & Zick, C. D. (2010). Human capital investments in children: A comparative analysis of the role of parent-child shared time in selected countries. IZA Discussion Paper No 5084. Institute for the Study of Labor.

Paulus, W., & Blossfeld, H.-P. (2007). Schichtspezifische Präferenzen oder sozioökonomisches Entscheidungskalkül? *Zeitschrift für Pädagogik*, *53*, 491–508.

Pfeifer, C. (2011). Risk Aversion and Sorting into Public Sector Employment. *German Economic Review*, *12*, 85–99.

Shaw, K. L. (1996). An Empirical Analysis of Risk Aversion and Income Growth. *Journal of Labor Economics*, *14*, 626–653.

Solon, G. (1992). Intergenerational Income Mobility in the United States. *American Economic Review*, *82*, 393–408.

Wagner, G. G., Frick, J. R., & Schupp, J. (2007). The German Socio-Economic Panel Study (SOEP) - Scope, Evolution and Enhancements. *Schmollers Jahrbuch*, *127*, 139–169.

Weiss, Y. (1972). The Risk Element in Occupational and Educational Choices. *Journal of Political Economy*, *80*, 1203–1213.

A. Tables

Table A.1: Descriptive summary of risk measures

	Mother			Father		
	Career (N=1,204)	*Finance* (N=1,246)	*General* (N=1,246)	*Career* (N=997)	*Finance* (N=1,007)	*General* (N=1,005)
quasi-continuous						
0	17.61	28.01	7.95	8.22	16.19	3.08
1	8.06	17.09	5.38	6.32	10.43	2.39
2	12.87	21.75	12.52	10.33	16.09	7.66
3	14.45	15.09	14.45	12.44	15.89	13.53
4	10.30	5.78	12.28	9.33	9.04	10.35
5	19.02	8.27	23.52	19.96	12.51	20.50
6	6.40	2.17	9.87	10.83	9.33	14.53
7	6.40	1.12	7.62	12.14	6.36	15.52
8	3.57	.48	4.82	7.12	3.48	8.06
9	.66	.24	.96	1.60	.60	2.59
10	.66		.64	1.71	.10	1.69
Mean	3.38	1.97	4.07	4.40	3.24	5.04
Standard deviation	2.41	1.83	2.27	2.48	2.36	2.20
dummies						
risk averse	17.61	28.01	13.32	14.54	16.19	13.13
risk neutral	64.70	53.93	72.63	62.89	63.95	74.43
risk loving	17.69	18.06	14.04	22.57	19.86	12.44

Notes: A parent is *risk averse*, if her response value X is smaller than the mean (μ) minus the standard deviation (σ): $X < \mu - \sigma$; *risk neutral*, if X is in a range between mean plus/minus one standard deviation: $\mu - \sigma <= X <= \mu + \sigma$ and *risk loving*, if X is larger than the mean plus the standard deviation: $X > \mu + \sigma$.
Source: SOEP, 2004. Authors' own calculations.

Table A.2: Descriptive summary

Variable	Mother-child (N=1,204) Mean (Sda)	Father-child (N=997) Mean (Sda)
Child's age	13.26 (1.40)	13.22 (1.42)
Parent's age at birth	27.90 (4.97)	31.08 (5.69)
Number of siblings	1.27 (0.84)	1.33 (0.85)
Equiv. net household income (in €)	3173 (1830)	3378 (1896)
Male child	52.91	52.36
Child's secondary school track		
Lower track	25.00	22.57
Intermediate track	32.72	32.30
Upper track	42.28	45.14
Child's school recommendation		
None Particular	6.73	6.92
Lower Sec. School	8.72	7.82
Intermediate Sec. School	18.52	17.75
Upper Sec. School	28.41	29.79
Unknown/No answer	37.62	37.71
Parent's risk attitude (towards career)		
Risk averse	17.61	14.54
Risk neutral	64.70	62.89
Risk loving	17.69	22.57
Parent's school degree		
Lower track	25.25	30.99
Intermediate track	39.20	27.48
Upper track	24.42	28.59
Other	11.13	12.94
Parent's current employment status		
Fulltime	21.51	88.10
Part-time	49.83	2.70
Not employed	28.65	9.20
Parent's employment experience (in years)		
Fulltime	8.00 (6.35)	20.68 (6.67)
Part-time	4.75 (4.78)	0.46 (1.75)
Unemployment	0.93 (1.90)	0.68 (1.75)
Migration background	16.03	19.36
Federal state with binding recommendation	43.85	42.93
Community size of resident		
less than 2.000	14.12	13.94
2.000-5.000 (East:2.000-20.000)	12.96	12.14
5.000-20.000	25.25	27.98
20.000-50.000 (East:-100.000)	17.36	17.45
50.000-100.000	6.15	5.82
100.000-500.000	14.87	14.04
500.000 and more	9.30	8.63

Source: SOEP, 2004. Authors' own calculations.