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The transition from School to Post-Secondary Education – What factors affect educational decisions?

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The transition from School to Post-Secondary Education – What factors affect educational decisions?[1]

Abstract:

This paper analyses the concrete post-school decision of school students whether to study or to enter the German VET system. It focuses on the investigation of individual risk preferences and the social background of individuals, and the effect on the ultimate decision to enrol in university or to start an apprenticeship, given the same level of qualification. For the empirical approach, the German SOEP is used, and information on individuals' educational decisions between 2007 and 2013 is considered. The results indicate that (i) individual risk preferences do not have an overall effect on the real transition and are not conditional on the academic background of parents; (ii) privileged individuals are more likely to take up higher education; and (iii) even when parents without an academic background support their children during school, they are less likely to guide their children into tertiary education.

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JEL classification: D81, I24, J24,
Keywords: Educational decision, risk preferences, uncertainty, social classes, family background

1 Introduction

In the past, the highly stratified German school system has often prevented those from the lower social classes obtaining the higher education entry qualification (*Abitur*, gained in school years 12–13).[2] However, structural school reforms have decreased social inequality by reducing existing barriers and easing access to upper secondary school for all students. As a result, access to higher education should be possible irrespective of social status. Nevertheless, students from lower social classes are still less likely to pursue university studies (see Middendorff, 2013).[3]

The educational decision to study at university is closely related to family background characteristics, such as income and parents' level of education, but depends also on individual risk preferences. Income prospects, as well as employment uncertainty, can lead to different educational decisions, depending on an individual's tolerance or aversion to risk and which social background they are from. To date, an extensive body of literature in sociology (e.g.

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[2] Abitur = Upper secondary school leaving qualification.
[3] Upper social class = parents have an academic degree; lower social class = parents have no academic degree

Becker and Hecken, 2007; Boudon, 1974; Breen et al. 2014; Breen and Goldthorpe, 1997; Esser, 1999; Jaeger and Holm, 2012) as well as in economics (e.g. Fossen and Glocker, 2014; Hartlaub and Schneider, 2012; Hartog, Ding and Liao, 2014; Hillmert and Jacob, 2003; Huebener, 2015; Levhari and Weiss, 1974) has focused on risk or risk preferences and their effect on educational decisions; however, some questions remain unanswered.

Firstly, in the economic literature, particularly that related to Germany, research focuses either on students in school and their hypothetical transition after school, neglecting the transition itself (e.g. Becker and Hecken, 2007; Hartlaub and Schneider, 2012) or fails to specify the transition possibilities (e.g. Fossen and Glockner, 2014). Secondly, it is suggested that family background and educational decisions are strongly related (e.g. Aakvik, Salvanes and Vaage, 2005; Blundell, 1997; Card, 2001; Carneiro and Heckman, 2002; Ermisch and Francesconi, 2001; Gregg and Machin, 2000). In particular, research on the time parents invest in their children and how this contributes to their children's cognitive and non-cognitive skill development has grown in importance recently (e.g. Carneiro and Ginja, 2016; Cunha, Heckman and Schennach, 2010; Del Boca, Monfardini and Nicoletti, 2012). However, to date, recent research in this context concentrates on skill development rather than on the effect on educational decisions and evidence specific to the German context is lacking. Hence, this research contributes by analysing (1) the transition after high school, as affected by individual risk preferences and (2) the extent to which a lack of parental support in schooling affects the decision of their children to enrol at university.

For the empirical part of this research, I use German Socio-Economic Panel information on individuals' educational decisions after secondary school. In contrast to the existing literature, I do not identify the overall impact of individuals' attitudes to risk on the probability that they will study at university, nor that of the academic background of parents. However, the academic background of parents seems to be most important when individuals are deciding between university study and apprenticeships. In particular, the support parents are able to offer during school life seems to be highly important. Of political importance is the fact that, even when trying to support their children in school, parents with no academic background are often not able to guide their children towards tertiary education.

This paper is organised as follows. Section 2 gives an overview of the relevant literature. Section 3 provides data and variable descriptions, as well as descriptive results. Section4

presents the empirical framework and discusses the results. Section 5 concludes the empirical analysis.

2 Literature

In general terms, family background and individual risk preferences have been suggested to be important in shaping the educational pathway of individuals. In particular, family background characteristics, such as family income and parents' level of education seem to affect educational achievement. Firstly, higher family income is associated with higher educational attainments of children. However, the research is not conclusive as to whether long-term or short-term family-income difficulties affect children's education. While, initially, the prevailing view among economists was that short-term family-income difficulties dominate (e.g. Blundell, 1997; Card, 2001; Ermisch and Francesconi, 2001; Gregg and Machin, 2000), the focus has moved to long-term income difficulties as well (e.g. Aakvik, Salvanes and Vaage, 2005; Carneiro and Heckman, 2002; Gregg and Machin, 2000). In the case of short-term income constraints, a lack of financial resources prevent children from entering higher education. Long-term income constraints, on the other hand, harm cognitive and non-cognitive development early in life, making access to higher education less likely. Ermisch and Francesconi, for example, examine information on British youth cohorts (1974–1981) and find lower educational attainment among adolescents from lower-income families (first income quartile measured at the age of 16–17, short-term constraints), when applying ordered probit and logit regressions. Furthermore, the higher the parents' level of education, the higher the educational attainment of their children. A mother's influence on her children, however, seems to increase with her own level of education and dominates over the father's influence at a certain level of education, due possibly to, firstly, a higher bargaining effect and, secondly, a higher productivity in human capital investment by mothers. Gregg and Machin (2010) investigate British individuals born in 1958 and their educational and economic outcomes at the ages of 16, 23 and 33. Financial constraints early in life as well as later are shown to affect educational and economic outcomes, with the experience of income difficulties in early childhood lowering school attendance and the likelihood of staying on at school. Lower school attendance, in turn, results in lower levels of education, lower hourly wages and lower employment probabilities later in life. Experiencing financial difficulties at the age of 11 or 16 (short-term constraints) also affects hourly wages and employment probabilities negatively. Aakvik, Salvanes and Vaage (2005) focus, in particular, on financial constraints at certain stages of life in Norway, suggesting that financial constraints early in childhood (0–6) and parents' level of education both lead to lower educational

attainment, but that parents' level of education dominates. According to the results, parents with a higher level of education are better at motivating or stimulating cognitive and non-cognitive skill development in their children, which is decisive in terms of performance and educational attainment later in life. Carneiro and Heckman (2002) find similar results for males in the US and claim that educated parents are better able to develop scholastic aptitude in their children, by assisting and directing them.

Besides family background characteristics, such as income and parents' level of education, the time parents invest in their children seems important (e.g. Carneiro and Ginja, 2016; Cunha, Heckman and Schennach, 2010; Del Boca, Flinn and Wisswall, 2016; Del Boca, Monfardini and Nicoletti, 2017; Del Bono et al., 2016; Gayle, Golan and Soytas, 2015). By applying multistage models of skill formation, Cunha, Heckman and Schennach (2010) suggest that parents' investment in non-cognitive skills early in childhood improves the later performance of their children; investment in cognitive skills, in contrast, is not long-lasting. Del Boca, Monfardini and Nicoletti (2017) and Del Boca, Flinn and Wisswall (2016) find similar results for the US and UK. In Del Boca, Monfardini and Nicoletti (2017), active time investment by US mothers is found to matter more in childhood than in adolescence. For the children's own time investment, however, the converse is true. The results, moreover, show a long-lasting effect, with mothers' active time investment during childhood being decisive in later school performance. Del Boca, Flinn and Wisswall's 2016 research focuses on how transfer-based interventions (unrestricted and restricted transfers) change the investment behaviour of parents. Similar to Del Boca, Monfardini and Nicoletti (2017), children's abilities improve with increasing time investment by mothers and fathers early in childhood, independent of the type of transfer-based intervention. Restricted transfers, which are linked to child-related criteria yet be fulfilled, however, are most effective, since parents are motivated to adapt their behaviour efficiently to meet the criteria in order to receive the cash transfers.

Since variations in income and employment prospects are associated with uncertainty, another important factor is the risk attitude of individuals and its effect on educational decisions. Levhari and Weiss (1974) first started to consider uncertainty with respect to educational decisions by adopting the expected utility theory. They show theoretical evidence for decreasing investment in human capital if risk, or risk aversion, increases. Eaton and Rosen (1980) extend the Levhari and Weiss model, including taxes, in order to measure the effect of taxes on human capital investment under conditions of uncertainty. Groot and Oosterbeek

(1992), furthermore, examine optimal investment in human capital under uncertain conditions, but assume risk-neutral decision-makers. They consider job-offer opportunities and income as well as unemployment prospects with respect to the optimal length of schooling.

Bilkic et al. (2011), in contrast, focus on the effect of continuous schooling costs on human capital investment. By assuming that educational decisions depend on schooling costs, earning streams, option values of staying in school and risk of change over time, they are able to develop a timing rule for leaving school. They conclude, firstly, that an individual's decision to invest in human capital is sequential in time and, secondly, that higher risks (e.g. a greater variation in income) have to be compensated with higher future income in order to continue schooling, even when assuming individuals are risk-neutral. Hence, as long as higher costs are compensated by higher future income, individuals postpone their decision to leave school.

Empirical evidence can be found in Belzil and Leonardi (2007), Brunello (2002), Fossen and Glocker (2014) or in Hartlaub and Schneider (2012). Brunello (2002) uses information on male Italian householders to investigate the effect of schooling on earnings. Addressing the problem of endogeneity, absolute risk aversion is taken as an instrument of schooling. The study showed lower levels of education in individuals with higher risk aversion; higher income levels are associated with higher levels of educational attainment. Belzil and Leonardi (2007) assume, firstly, that individual risk aversion has a time-invariant and a time-variable component and, secondly, that educational decisions follow a time-sequential process. They apply a hazard function model to measure the effect of risk aversion on schooling decisions in Italy. The results reveal lower school attainment as risk aversion increases. However, they conclude that educational background and ability appear to be more important in explaining differences in school attainment.

Fossen and Glocker (2014) and Hartlaub and Schneider (2012) focus, in particular, on university enrolment in Germany in relation to risk preferences. Fossen and Glocker (2014), on the one hand, concentrate primarily on whether stated risk preferences align with actual behaviour. According to their results, stated risk preferences are valid measures of risk behaviour. Using the German Socio-Economic Panel data (SOEP) from 2000 to 2010, and applying discrete hazard rate models, they find that risk-averse individuals are less likely to enrol in university. Hartlaub and Schneider (2012), on the other hand, combine sociological and economic theories on educational decisions. They analyse the intentions of 17–18-year-old

high-school students in Germany to continue education after secondary school. They consider risk aversion as a personal attitude, as assumed in economic theory, and rely also on the Relative Risk Aversion theory (RRA) of Boudon (1974) and Breen and Goldthorpe (1997), according to which, educational decisions are class-specific, as individuals opt to maintain their parents' social class in order to avoid downward mobility. Students from upper social classes, therefore, decide in favour of tertiary education to avoid loss of status and to maintain their parents' social class position. In contrast, individuals from lower social classes can choose between different pathways without downgrading. Hartlaub and Schneider (2012) conclude that risk-averse students and students with less-educated parents are, overall, more likely to favour vocational training over university. However, their decision varies with their level of risk aversion. While individuals from the higher social classes seem to have no choice but to opt for university, in order to remain their current social class, individuals from lower social classes, in contrast, are more likely to enrol in university if they are more risk tolerant.

Becker and Hecken (2007) and Davies et al. (2002) also investigate the theory of RRA and the consequences of social inequality. However, Becker and Hecken (2007) deny the hypotheses of status maintenance and of marginal return of schooling, using information on German students from Saxony. They conclude, similar to Esser (1999), Erikson and Jonsson (1996) and Jonsson and Erikson (2000), that educational costs are decisive in opting for or against university. Depending on social class, educational costs have different effects on financial wealth and lead to educational inequality. Davies et al. (2002), however, using information on young Danish individuals, support the RRA theory in its attempt to explain educational inequalities as motivated by status maintenance. Tieben and Wolbers (2010) find similar results for the Netherlands. Young people with more highly educated parents are more likely to continue education after secondary education. Even when the level of qualification obtained is taken into account, individuals from lower social classes tend to choose less ambitious educational pathways.

Overall, four principal determinants of educational decisions have been identified: (1) Family income; (2) parents' level of education; (3) parents' investment of time in their children throughout their children's school life and (4) an individual's risk preferences. Taking this into account, this paper contributes by its focus not only on individual risk preferences, but also on social class affiliation by accounting for heterogeneity across family background. Related to previous research on parental investment of time in the UK and the US, I consider parents'

support during school life, as affected by their own academic background. Moreover, and in contrast to the existing research on investment of time, I concentrate on educational attainment rather than on performance at school to contribute to the existing research.

3 Data

The empirical analysis relies on data from the German Socio-Economic Panel (SOEP). This representative longitudinal study has collected micro-data on individuals, households and families annually since 1984, and includes a constant set of core questions on employment, family, housing and income. More importantly, with respect to the research question, it provides information on the course of education, on the risk tolerance or aversion of individuals and on parents' involvement in their children's school life. See Wagner et al. (2007) for more information.

3.1 Sample and variables

The sample is restricted to the 'starters'. In *t-1* these individuals are reported neither as apprentices nor as students, but they change their employment status to one of these two states in *t*. Students from universities of applied science are excluded, since these provide courses which are less academic and more vocational. This enables a clear distinction between academic and non-academic pathways for individuals.

Since I am interested in analysing why some individuals opt for an apprenticeship and others start to study after high school, further limitations to the sample are necessary. The sample includes all individuals, subject to the following criteria: (1) they are aged 18 to 25; (2) they have no vocational degree; (3) they have a high school certificate[4]; (4) they have started an apprenticeship or university course. The adapted dependent variable takes on the value 0 (apprenticeship starter) or 1 (university starter).

The phrase

> *How do you see yourself: Are you generally a person who is fully prepared to take risks or do you try to avoid risks? Please tick a box on the scale, where the value 0 means 'not at all willing to take risks' and the value 10 means 'very willing to take risks'*

[4] Abitur = Upper secondary school leaving qualification

is used to capture individual risk aversion or tolerance. Risk tolerance/aversion was included in 2004 for the first time, but has been considered regularly since 2008. Although it is often criticised as too subjective, Dohmen et al. (2011) validate its use in performing a field experiment and relying on SOEP information. Although questions on risk attitudes in a specific context are more accurate (e.g. the relationship between the willingness to take risks in employment and the probability of being self-employed), the question on general risk tolerance is identified as the best all-round predictor.

The choice between starting an apprenticeship or being able to study further often depends on school grades. Therefore, school performance is considered, using information on individuals' school grades in mathematics, German and their first foreign language in their final school report.[5]

Social class position, furthermore, is taken into account by using parents' level of education. Parents with a higher level of education are often able to support their children, not only financially, but also by providing better support during school or by motivating their children (e.g. Carneiro and Heckman, 2002). A dummy variable defines parents as having higher education (1: academic background (upper social class)) if at least one parent has a university degree, and as having a lower educational level (0: no academic background (lower social class)) if both parents have a vocational degree, one parent has a vocational degree, or neither parents has a degree of any kind.

Parental investment of time in children is also considered. The respondents were asked whether their parents supported them 'not at all', 'not very much', 'pretty strongly 'greatly' during their school life. Note that, due to a low number of observations, the original indicator was aggregated from four to three categories. The adapted variable takes on the value 0 'not at all/not very much support', the value 1 'pretty strong support' and the value 2 'great support'.

Finally, information on age, gender, migration background, region (federal states, east/west, urban/rural) and year of observation are used as controls.

[5] Depending on the school type, the grading system in Germany can differ. Due to comparison reasons adjusted grades are used in the empirical part and range from 1 (very good) to 6 (failed).

Since SOEP started to include information on individual risk tolerance on a regular basis in 2008, the earliest possible observation of 'starters' is 2008. Based on this, the main analysis relies on a pooled cross-section sample, including 419 observed individuals in the waves 2007–2013, with no missing values in the variables used.

3.2 Descriptive statistics

Overall, approximately 80% of the sample decided to enrol at university instead of beginning an apprenticeship. With 50.6% of the starters being female and 49.4% being male, men and women are distributed equally overall and across the educational pathways (see Table 1). Of the total, 13.1% have a migration background and the average individual is 21 years old (see Table 10 in the Appendix).

Table 1 Characteristics by educational pathway

	Apprenticeship starter	University starter	Total
Gender			
Men	49.4%	49.4%	49.4%
Women	50.6%	50.6%	50.6%
N	87	332	419
Parents level of education			
No academic background	67.8%	38.9%	44.9%
Academic background	32.2%	61.1%	55.1%
N	87	332	419
Risk tolerance	5.03	4.85	4.89
N	87	332	419

Data source: Socio-Economic Panel, data 1984-2013, version 30, SOEP, 2015, doi:10.5684/soep.v30.

Table 1 shows the link between educational decisions and social background. Overall, 55.1% of all individuals have parents with a higher level of education. Moreover, almost 70.0% of the individuals who started an apprenticeship have parents with a lower level of education. In contrast, this only applies to 38.9% of the individuals who entered university.[6] Surprisingly, on average, apprenticeship starters are more risk-tolerant (5.03) than university starters (4.85). However, the t-test reveals no significant differences between the groups (see Table 2). For detailed information, see the summary statistics in Table 10 in the Appendix.

[6] See t-test in Table 13 in the Appendix

Table 2 T-test for risk tolerance differences between university and apprenticeship starters

	Mean	T-test	N
Risk tolerance			419
University starter	4.85	0.4413	332
Apprenticeship starter	5.03		87

Notes: T-test with equal variances. Risk tolerance (0: not at all willing to take risks; 10 very willing to take risks). Data source: Socio-Economic Panel, data 1984-2013,version 30, SOEP, 2015, doi:10.5684/soep.v30.

4 Empirical framework and results

4.1 Empirical method

I assume, in line with Levhari and Weiss (1974), that individuals compare the expected utilities of each educational opportunity by anticipating future income and employment prospects. Since income and employment prospects are associated with uncertainty, risk attitudes are considered as well as academic background, to account for a possible heterogeneity between social classes. Based on the literature, two hypotheses with respect to transition after secondary school are examined:

1) Educational decisions are affected by risk preferences.
2) Family background is more likely to affect educational decisions than individual risk preferences.

I apply standard probit regressions to estimate the probability of enrolling at university. *y* is the binary dependent variable which either takes on the value 1 (university starter) or 0 (apprenticeship starter):

$$\Pr(y = 1|X) = \Phi(X\beta) \tag{1}$$

Φ is the cdf of the standard normal distribution, *X* a matrix of explanatory variables and β the corresponding parameter values.

The underlying latent model is as follows:

$$y_i = \begin{cases} 0, & y_i^* \leq \tau \\ 1, & y_i^* > \tau \end{cases} \tag{2}$$

where

$$y_i^* = \beta_0 + \beta_1 x_{i1} + \cdots + \beta_k x_{ik} + \epsilon_i = x_i'\beta + \epsilon_i, \tag{3}$$

and represents the net benefit of entering university. ϵ_i is i.i.d and standard normal distributed:

$$\epsilon | \, x_i \sim N(0,1) \tag{4}.$$

x_i' is a vector of individual characteristics and β is the corresponding vector of parameters. According to equations 2 and 3, individual i chooses university if the net benefit of entering university is greater than 0, while the same individual chooses to begin an apprenticeship if the net benefit of entering university is lower than or equal to.

4.2 Results[7]

Table 3 displays five different probit regression specifications. Model I starts with a standard probit regression including only the risk attitude variable. From then on, a basic set of control variables, suggested by the literature, is introduced into Models II–V (gender, age, migration background, region, federal states and years). In addition, parents' level of education (Model III), performance in school (Model IV) and the support of parents in school (Model V) are considered in turn. The results shown contain no robust standard errors. Since the robustness checks with robust standard errors showed no differences in the significance levels, I rely on the estimations without robust standard errors. Overall, Table 3 displays average marginal effects and standard errors in parentheses.[8]

All five models reveal a negative relationship between the individual's risk attitude and enrolment in university. A higher tolerance of risk, thus, lowers the probability of entering university. Since the literature predicts that more risk-averse individuals decrease their investment in human capital (e.g. Levhari and Weiss, 1974; Belzil and Leornardi, 2007), this result is somewhat unexpected. However, the individual's risk attitude remains insignificant across all models, and further interpretations are, therefore, avoided for now.

[7] Statistical software: Stata Version 13.1

[8] For each observation, the marginal effect is computed for a discrete or partial change of a variable, while all other variables are held constant at their observed values. Finally, the average over all marginal effects is computed. Essentially, it is the average size of the effect across all observations (Long and Freese, 2014).

Table 3 Probability of enrolling at university

	I	II	III	IV	V	Relative effect (Model V)
Risk tolerance	-0.0076	-0.0088	-0.0062	-0.0020	-0.0033	-0.42%
	(0.0098)	(0.0101)	(0.0097)	(0.0096)	(0.0095)	
Parents with academic background			0.2028***	0.1894***	0.1886***	23.87%
			(0.0412)	(0.0405)	(0.0402)	
School grade: German				-0.0569**	-0.0554**	-7.01%
				(0.0277)	(0.0275)	
School grade: Mathematics				-0.0395**	-0.0438**	-5.55%
				(0.0181)	(0.0182)	
School grade: Foreign language				-0.0094	-0.0092	-1.16%
				(0.0255)	(0.0254)	
Support during school: Pretty strong					0.0868*	10.99%
					(0.0479)	
Support during school: Great					0.0610	7.72%
					(0.0535)	
Controls	No	Yes	Yes	Yes	Yes	-
Pseudo R^2	0.0014	0.0489	0.1060	0.1409	0.1489	-
N	419	419	419	419	419	-

Notes: Average marginal effects and standard errors in parentheses. Model II-V control for gender, age, migration background, region, federal states and year. Risk tolerance (0: not at all willing to take risks; 10 very willing to take risks). * p<0.10, ** p<0.05, *** p<0.01. Data source: Socio-Economic Panel, data 1984-2013,version 30, SOEP, 2015, doi:10.5684/soep.v30.

Performance at school and academic background of parents are, in contrast to the above, highly significant and increase the explanatory power of the models, if included. Having at least one parent with an academic degree increases the probability of studying by 18.86 percentage points at a 1%-level (Model V, full specification). This is in line with the literature, since the support and guidance gained through experience, as well as the financial wealth of more highly educated parents, ease children's enrolment at university (e.g. Carneiro and Heckman, 2002; Jonsson and Erikson, 2000).

Moreover, the poorer a student's performance in mathematics or German, the lower the probability of enrolling at university; performance in the first foreign language, however, seems to have no effect. School grades can affect educational decisions in several ways. Firstly, since many study programmes have restricted numbers and therefore impose entry requirements, poorer school performers are less likely to be accepted by a university. Secondly, poor performance at school reduces the own assessment of completing a university course successfully, in particular for individuals from lower social classes. Thirdly, lower grades might be the result of having no enjoyment in learning; hence, this type of student might prefer a mix of theory and practice-based learning and therefore favour an apprenticeship.

The support parents provide in school is also important. Supporting children 'pretty strongly' increases the probability of studying by 8.68 percentage points at a 10%-level, compared to children with less or no support. Surprisingly, supporting children 'greatly' does not significantly increase the probability of entering university. Too much support may be associated with performance pressure and could counteract the decision to study at university.

In summary, so far, the results suggest that parents have a significant impact on children's educational choices. Hence, in order to test Hypothesis 2, differences in the academic background of parents will be discussed in section 4.3.

4.3 Differences in the academic background of parents

The estimated contrast of margins in Table 4 shows no evidence for a motive of maintaining status, as was suggested by Hartlaub and Schneider (2012).[9] Instead, the analysis reveals no significant effect of risk preferences on the decision to enter university, either for individuals from higher social classes or for those from lower social classes.[10]

Table 4 Contrasts of predictive margins across risk preferences and academic background

	Probability to enter university
	b/se/ci95
(Risk tolerant vs. risk averse) Parents without academic background	-0.0675
	(0.0675)
	[-0.1998,0.0647]
(Risk tolerant vs. risk averse) Parents with academic background	-0.0021
	(0.0426)
	[-0.0857,0.0815]
Joint	1.00

Notes: Model contains contrast of margins and standard errors in parentheses. Controls: Gender, age, migration background, school grades, support by parents, region, federal states and year. Risk averse < median; risk tolerant ≥ median. * p<0.10, ** p<0.05, *** p<0.02. Data source: Socio-Economic Panel, data 1984-2013,version 30, SOEP, 2015, doi:10.5684/soep.v30.

Other determinants, however, appear more important. Following Esser's model in 1999, individuals from lower social classes have a lower expected probability of success, compared

[9] Contrast of margins: To test whether the probability of being risk-tolerant is the same across academic backgrounds.

[10] For easier interpretation, a dummy variable, measuring whether individuals are risk-tolerant or risk-averse, is used. Applied robustness checks confirm that the definition of risk tolerance or risk aversion has no effect on the results. See Table 8.

to those from upper social classes, which is why they differ in their educational attainment, even if their performance level in school is similar.

Table 5 Contrasts of predictive margins across school performance (mathematics) and academic background of parents

	Probability to enter university
	b/se/ci95
(w. academic background vs. wo. academic background) School grade mathematics 1	0.1226**
	(0.0528)
	[0.0191,0.2262]
(w. academic background vs. wo. academic background) School grade mathematics 2	0.1754***
	(0.0458)
	[0.0856,0.2651]
(w. academic background vs. wo. academic background) School grade mathematics 3	0.2090***
	(0.0447)
	[0.1215,0.2965]
(w. academic background vs. wo. academic background) School grade mathematics 4	0.2342***
	(0.0700)
	[0.0971,0.3714]
(w. academic background vs. wo. academic background) School grade mathematics 5	0.2422**
	(0.1051)
	[0.0363,0.4480]
Joint	23.04***

Notes: Model contains contrast of margins and standard errors in parentheses. Controls: Gender, age, migration background, support by parents, risk tolerance, region, federal states and year. No individual with a grade worse than 5. *p < 0.10, **p < 0.05, *** p < 0.01. Data source: Socio-Economic Panel, data 1984-2013, version 30, SOEP, 2015, doi:10.5684/soep.v30.

Table 5 and Table 6 support the stated assumptions. For instance, achieving a 2 in mathematics (German) is associated with a 17.53 (16.19) percentage-point higher probability of enrolling at university in individuals with more highly educated parents (at a 1%-level). Moreover, the lower the school grades, the greater the difference in probabilities between these groups.

Table 6 Contrasts of predictive margins across school performance (German) and academic background of parents

	Probability to enter university
	b/se/ci95
(w. academic background vs. wo. academic background) School grade German 1	0.1152*
	(0.0607)
	[-0.0038,0.2341]
(w. academic background vs. wo. academic background) School grade German 2	0.1619***
	(0.0454)
	.0729.2509]
(w. academic background vs. wo. academic background) School grade German 3	0.2128***
	(0.0484)
	[0.1180,0.3076]
(w. academic background vs. wo. academic background) School grade German 4	0.2419***
	(0.0931)
	[0.0595,0.4243]
(w. academic background vs. wo. academic background) School grade German 5	0.2453
	(0.1543)
	[-0.0572,0.5477]
Joint	23.40***

Notes: Model contains contrast of margins and standard errors in parentheses. Controls for gender, age, migration background, support by parents, risk tolerance, region, federal states and year. No individual with a grade worse than 5. *p < 0.10, ** p < 0.05, *** p < 0.01. Data source: Socio-Economic Panel, data 1984 2013, version 30, SOEP, 2015, doi:10.5684/soep.v30.

Additionally, the support that parents are able to offer during school life is another important aspect. The contrast of margins in Table 7 indicates that, given the same amount of support, parents with higher levels of educations are more successful in guiding their children towards the direction of tertiary education. The reasons are obvious. With the knowledge gained through own experience, highly educated parents are able to motivate and to give valuable advice. However, even if no or less support is provided in school, individuals from the higher social classes are in any case advantaged, being 14.63 percentage points more likely to study at university. In conclusion, Hypothesis 2 cannot be rejected.

Table 7 Contrasts of predictive margins across support during schooling and academic background

	Probability to enter university
	b/se/ci95
(w. academic background vs. wo. academic background) Not very much/no support	0.1463*
	(0.0821)
	[-0.0146,0.3073]
(w. academic background vs. wo. academic background) pretty strong	0.2104***
	(0.0561)
	[0.1004,0.3204]
(w. academic background vs. wo. academic background) great support	0.1912**
	(0.0745)
	[0.0452,0.3373]
Joint	22.90***

Notes: Model contains contrast of margins and standard errors in Parentheses. Controls: Gender, age, migration background, school grades, risk aversion region, federal states and year. * p<0.10, ** p<0.05, *** p<0.01. Data source: Socio-Economic Panel, data 1984-2013,version 30, SOEP, 2015, doi:10.5684/soep.v30.

4.3.1 Measures of risk aversion

To account for the heterogeneity of risk preferences across individuals, I checked three further risk preference indicators. Firstly, I considered the sample median of stated willingness to take risks. All individuals in the sample are defined as risk-averse (0) if their stated level of willingness to take risks lies below the median, while individuals with a stated level above or equal to the median are defined as risk-tolerant (1). There are, furthermore, inconclusive research results on the stability of risk preferences over time, which is why information on risk preferences in the period before individuals started to study or began an apprenticeship is used as well (e.g. Eckel et al., 2009; Harrison et al., 2005; Sahm, 2012). The third indicator is a dummy variable which defines individuals with a stated level of willingness to take risks of 7 and greater as risk-tolerant (1), and risk-averse (0) otherwise. The results, however, remain unaffected by the definition of risk tolerance (see Table 8).

Table 8 Probit Regression – Probability of enrolling at university with different measures of risk aversion

	Probability to enter university			
	I	II	III	IV
Risk tolerance	-0.0033			
	(0.0095)			
Dummy risk tolerant >= median		-0.0295		
		(0.0384)		
Dummy risk tolerant >= 7			-0.0046	
			(0.0455)	
Risk tolerance in the past				-0.0007
				(0.0109)
Pseudo R^2	0.1489	0.1500	0.1487	0.1794
N	419	419	419	334

Notes: Average marginal effects and standard errors in parentheses. Each model controls for gender, age, migration background, academic background of parents, grades in school, support by parents, region, federal states and years. Risk tolerance (0: not at all willing to take risks; 10 very willing to take risks). *p < 0.10, **p < 0.05, *** p < 0.01. Data source: Socio-Economic Panel, data 1984-2013, version 30, SOEP, 2015, doi:10.5684/soep.v30.

I furthermore tested whether high-risk behaviour in general, or high-risk behaviour in a specific context (occupational risk behaviour in 2009), affects the results differently. However, no differences are found (see Table 9). Since risk preferences do not affect educational decisions in general and are not conditional on parents' level of education, hypothesis 1 is rejected.

Table 9 Probit regression - Probability of enrolling at university in 2009 - Career risk preference vs. general risk preferences

	Probability to enter university	
	I	II
Risk tolerance in general	0.0522	
	(0.0655)	
Risk tolerance career		0.0502
		(0.0320)
Pseudo R^2	0.211	0.2413
N	45	45

Notes: Average marginal effects and standard errors in parentheses.
Each model controls for gender, age, migration background, school performance, support by parents, academic background of parents, region, federal states and year. Risk tolerance (0: not at all willing to take risks; 10 very willing to take risks). * p < 0.10, ** p < 0.05, *** p < 0.01. Data source: Socio-Economic Panel, data 1984-2013,version 30, SOEP, 2015, doi:10.5684/soep.v30.

4.3.2 Limitations

To validate my results, different model specifications are applied (see Table 3), different definitions of risk tolerance are chosen (see Table 8 and Table 9), and I checked for heterogeneity across the academic background of parents (see Table 4). Although existing research supports the indication that basic considerations as to whether to study or start an apprenticeship might be affected by an individual's risk preferences and the motivation of

maintaining status (see Hartlaub and Schneider, 2012), the results indicate that this transition might be affected by other determinants, such as performance at school, parental level of education and the support offered by parents during school.

To account for heterogeneity across subgroups, I estimated the effect of risk preferences, and the effect of parental involvement in schooling on the decision to study at university, separately for men and women, for individuals with parents educated to higher and lower levels, and for those with and without a migration background. No significant effect of risk preferences on the decision to enter university is revealed for any subgroup. Women, however, appear to be more sensitive to school performance and to the support provided by parents. Moreover, the probability of studying at university increases if highly educated parents (upper social classes) support their children during schooling, while support during schooling provided by parents educated to a lower level (lower social classes) has no significant effect.

Since I rely on pooled cross-sectional data, the results might be biased, in particular due to unobserved characteristics. One major concern is capturing the abilities of individuals correctly. Considering performance at school alone may lead to measurement error and biased results, which is why ability in a broader sense is captured by including cognitive skills (analogies, arithmetic operators, figures, summated index of all given answers). However, the results remain almost unaffected. School performance and parental support still influence the educational decision significantly, and risk preferences remain insignificant.[11] Another concern is that economic circumstances could alter the decision to study at university. Thus, a worse economic outlook (locally or throughout Germany) could force individuals to enter university in order to avoid unemployment. The inclusion of year and federal state dummies, however, should reduce potential bias. Unfortunately, there is no suitable instrument for individual risk preferences, nor is there panel data on individuals' school performance or detailed information on parents' involvement throughout childhood and youth. Nevertheless, considering an important set of control variables and applying robustness checks helps to reduce potential bias and supports the stated assumptions (see Table 11 in the Appendix).

[11] Note: Considering cognitive skills reduces the sample to 232 observations (Table 12 in the Appendix).

5 Conclusion

Using the German Socio-Economic Panel, I analysed whether individual risk preferences or family background characteristics affect educational decisions after high school. I concentrate on the decision between studying at university or starting an apprenticeship and, furthermore, consider parental investment in their children's school life, conditional on different family backgrounds and risk preferences. Since I rely only on pooled cross-sectional data, there is a risk of omitted variable bias. Controlling for an important set of control variables and performing several robustness checks, however, reduce potential bias. Compared to the literature reviewed about time investment, the variable of parental support during school life seems to scratch at the surface, but gives new insights for Germany. A suitable instrument for individual risk preferences as well as panel data on individuals' school performance or detailed information on parents' involvement throughout childhood and youth would help to further validate the results, but is not available.

This research was intended to test two hypotheses. Hypothesis 1, that risk preferences affect the educational decision of individuals, is rejected. The results indicate that individual risk preferences have no overall effect on the decision to study at university and are not conditional on social class as suggested by economic and sociological theory. On the contrary, the decision as to whether to continue with education is affected rather by performance in school and parents' support during school life and varies according to the educational level of parents. It seems that individuals with parents educated to a lower level (lower social class position) have lower educational goals than their peers with more highly educated parents (upper social class position). Even when students have similar school performance, those with parents educated to a lower level are less likely to study. Moreover, the poorer the performance in school, the greater the gap between individuals with and without highly educated parents in terms of likelihood to study at university. Hence, the expected probability of success or the relative costs of education seem more likely to affect the decision to enrol at university than the motive of maintaining status. This, in turn, is in line with Becker and Hecken (2007), Esser (1999) and Jonsson and Erikson (2000). It is politically interesting that, while highly educated parents increase their children's probability of enrolling at university if they support their children during their school life, less educated parents are not able to guide their children into tertiary education, even if they provide support during schooling. In conclusion, the second stated hypothesis, according to which educational decisions are affected by family background rather than by individual risk preferences, cannot be rejected.

Hence, using unexploited potential by supporting the decision-making process of students from lower social classes to achieve educational targets, such as increasing the rate of highly qualified individuals, could be a political recommendation.

Further research should focus on the support of parents during schooling and how this improves their children's performance and educational decisions later in life. Whether parents are able to guide their children into tertiary education seems to be related to their own academic background. Two important factors are worthy of investigation in this context. Firstly, is there a qualitative difference between the support provided by parents with and without an academic background and, secondly, if this difference exists, does it affect the level of performance and/or the educational decisions of their children. To support disadvantaged children systematically, further research should also concentrate on identifying in which phase of their educational life children are most greatly affected by a lack of support: childhood, adolescence or young adulthood.

References

Aakvik, A., Salvanes, K. G., and K. Vaage, 2005. Educational attainment and family background. *German Economic Review,* 6(3): 377–394.

Becker, R., and A. E. Hecken, 2007. Studium oder Berufsausbildung? Eine empirische überprüfung der Modelle zur Erklärung von Bildungsentscheidungen von Esser sowie von Breen und Goldthorpe/University or vocational training? An empirical test of the rational choice model of educational choices suggested by Esser as well as Breen and Goldthorpe. *Zeitschrift für Soziologie*, 36(2): 100–117.

Belzil, C., and M. Leonardi, 2013. Risk aversion and schooling decisions. *Annals of Economics and Statistics,* (111/112): 35–70.

Bilkic, N., Gries, T., and M. Pilichowski, 2012. Stay in school or start working? The human capital investment decision under uncertainty and irreversibility. *Labour Economics,* 19(5): 706 –717. Special Section on: Price, Wage and Employment Adjustments in 2007-2008 and Some Inferences for the Current European Crisis.

Blundell, R., Dearden, L., Goodman, A., and H. Reed, 2000. The returns to higher education in Britain: Evidence from a British cohort. *The Economic Journal,* 110(461): 82–99.

Boudon, R., 1997. *Education, opportunity, and social Inequality*. New York: Wiley.

Breen, R., and J. H. Goldthorpe, 1997. Explaining educational differentials: towards a formal rational action theory. *Rationality and Society,* 9(3): 275–305.

Breen, R., van de Werfhorst, H. G., and M. M. Jæger, 2014. Deciding under doubt: A theory of risk aversion, time discounting preferences, and educational decision-making. *European Sociological Review,* 30(2): 258-270.

Brunello, G., 2002. Absolute risk aversion and the returns to education. *Economics of Education Review*, 21(6): 635 – 640.

Card, D., 1999. *Chapter 30 - The Causal Effect of Education on Earnings*. Vol. 3 of Handbook of Labor Economics, Elsevier, 1801 – 1863.

Card, D., 2001. Estimating the return to schooling: Progress on some persistent econometric problems. *Econometrica,* 69(5): 1127–1160.

Carneiro, P., and R. Ginja, 2016. Partial insurance and investments in children. *The Economic Journal,* 126(596): F66–F95.

Carneiro, P., and J. J. Heckman, 2002). The evidence on credit constraints in post-secondary schooling. The Economic Journal, 112(482): 705–734.

Cunha, F., Heckman, J. J., and S. M. Schennach, 2010. Estimating the technology of cognitive and noncognitive skill formation. *Econometrica,* 78(3): 883–931.

Davies, R., Heinesen, E., and A. Holm, 2002. The relative risk aversion hypothesis of educational choice. *Journal of Population Economics,* 15(4): 683–713.

Del Boca, D., Flinn, C., and M. Wiswall, 2016. Transfers to households with children and child Development. *The Economic Journal,* 126(596): F136–F183.

Del Boca, D., Monfardini, C., and C. Nicoletti, 2017. Parental and child time investments and the cognitive development of adolescents. *Journal of Labor Economics,* 35(2): 565–608.

Del Bono, E., Francesconi, M., Kelly, Y., and A. Sacker, 2016. Early maternal time investment and early child outcomes. *The Economic Journal,* 126(596): F96–F135.

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

Eaton, J., and H. S. Rosen, 1980). Taxation, human capital, and uncertainty. *American Economic Review,* 70(4): 705–715.

Eckel, C. C., El-Gamal, M. A., and R. K. Wilson, 2009. Risk loving after the storm: a bayesiannetwork study of hurricane Katrina evacuees. *Journal of Economic Behavior and Organization,* 69(2): 110 – 124.

Erikson, R., and J. O. Jonsson, 1996. *Explaining class inequality in education: the Swedish test case.* In R. Erikson-J.O. Jonsson (eds.): Can Education be Equalised? The Swedish Case in Comparative Perspective', Boulder: Westview Press.

Ermisch, J., and M. Francesconi, 2001. Family matters: impacts of family background on educational attainments. *Economica,* 68(270): 137–156.

Esser, H., 1999. *Soziologie. Spezielle Grundlagen. Band 1: Situationslogik und Handeln,* Frankfurt am Main: Campus.

Fossen, F. M., and D. Glocker, 2014. Stated and revealed heterogeneous risk preferences in educational choice. IZA Discussion Paper 7950, Institute for the Study of Labor (IZA).

Gayle, G.-L., Golan, L., and M. A. Soytas, 2015. What accounts for the racial gap in time allocation and intergenerational transmission of human capital? FRB St. Louis Working Paper Series 2015-018, Federal Reserve Bank of St. Louis.

Gregg, P., and S. Machin, 2000. Child development and success or failure in the youth labor market. In: Blanchflower, D. G. & Freeman, R. B. [Hrsg.]: Youth employment and joblessness in advanced countries, 247-288. University of Chicago Press, Chicago and London.

Groot, W., and H. Oosterbeek, 1992. Optimal investment in human capital under uncertainty. *Economics of Education Review,* 11(1): 41–49.

Harrison, G. W., Igel Lau, M., Rutström, E. E., and M. B. Sullivan, 2005. *Eliciting risk and time preferences using field experiments: Some methodological issues*. In: Volume 10 - Field experiments in economics', Glenn W. Harrison, Jeffrey Carpenter, John A. List (eds.), 125–218. Emerald Group Publishing Limited.

Hartlaub, V., and T. Schneider, 2012. Educational choice and risk aversion: How important is structural vs. individual risk aversion?. SOEPpapers on Multidisciplinary Panel Data Research No. 433.

Hartog, J., Ding, X., and J. Liao, 2014. Is earnings uncertainty relevant for educational choice? An empirical analysis for China. *Education Economics,* 22(5): 471–483.

Hillmert, S., and M. Jacob, 2003. Social inequality in higher education. Is vocational training a pathway leading to or away from university? *European Sociological Review,* 19(3): 319–334.

Huebener, M., 2015. The role of paternal risk attitudes in long-run education outcomes and intergenerational mobility. *Economics of Education Review*, 47: 64 – 79.

Jæger, M. M., and A. Holm, 2012. Conformists or rebels? Relative risk aversion, educational decisions and social class reproduction. *Rationality and Society,* 24(2): 221–253.

Jonsson, J. O., and R. Erikson, 2000. Understanding educational inequality: the Swedish experience. *L'Année sociologique (1940/1948),* 50(2): 345–382.

Levhari, D., and Y. Weiss, 1974. The effect of risk on the investment in human capital. *American Economic Review,* 64(6): 950–963.

Long, J. S., and J. Freese. 2014. *Regression Models for Categorical Dependent Variables using Stata*. 3rd Edition, Stata Press.

Middendorff, E., Apolinarski, B., Poskowsky, J., Kandulla, M., and N. Nicolai, 2012. Die

wirtschaftliche Lage der Studierenden in Deutschland 2012, 20. Sozialerhebung des Deutschen Studentenwerks durchgeführt duch das HIS-Institut für Hochschulforschung, HIS-Institut für Hochschulforschung.

Sahm, C. R., 2012. How much does risk tolerance change? *Quarterly Journal of Finance,* 2(4): 1250020.

Tieben, N., and M. H. J. Wolbers, 2010. Transitions to post-secondary and tertiary education in the Netherlands: a trend analysis of unconditional and conditional socio-economic background effects. *Higher Education,* 60(1): 85–100.

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

Appendix

Table 10 Summary statistics

	MEAN	SD	MIN	MAX
Uni vs. VET	0.79		0	1
Risk tolerance	4.89	2.03	0	9
Risk tolerance median	5.00	0.00	5	5
Risk tolerance modus	5.00	0.00	5	5
Risk median past	5.09	2.02	0	10
Risk tolerance apprenticeship starter	4.85	1.99	5	5
Risk tolerance university starter	5.03	2.04	5	5
Parents with academic background	0.55		0	1
Women	0.51		0	1
Age	21.02	1.18	18	25
Migration background	0.13		0	1
Urban region	0.71		0	1
West Germany	0.79		0	1
School performance				
Grade: German	2.58	0.84	1	5
Grade: Mathematics	2.60	1.13	1	5
Grade: Foreign language	2.59	0.88	1	5
Support during school by parents				
No/not much support	0.27		0	1
Pretty strong support	0.46		0	1
Great support	0.27		0	1
N				**419**

Data source: Socio-Economic Panel, data 1984-2013, version 30, SOEP, 2015, doi:10.5684/soep.v30.

Table 11 Probability of enrolling at university in detail

	Probability to enter university	
	Without robust standard errors	With robust standard errors
Risk tolerance	-0.0033	-0.0033
	(0.0095)	(0.0091)
Women	-0.0003	-0.0003
	(0.0403)	(0.0399)
Age	0.0178	0.0178
	(0.0172)	(0.0167)
Migration background	0.0284	0.0284
	(0.0518)	(0.0508)
Parents with academic background	0.1886***	0.1886***
	(0.0402)	(0.0393)
Grade: German	-0.0554**	-0.0554**
	(0.0275)	(0.0266)
Grade: Mathematics	-0.0438**	-0.0438**
	(0.0182)	(0.0172)
Grade: Foreign language	-0.0092	-0.0092
	(0.0254)	(0.0266)
Pretty strong support	0.0868*	0.0868*
	(0.0479)	(0.0496)
Great support	0.0610	0.0610
	(0.0535)	(0.0539)
Urban	0.1024*	0.1024**
	(0.0542)	(0.0495)
Hamburg	-0.0831	-0.0831
	(0.1613)	(0.1434)
Lower Saxony	-0.0175	-0.0175
	(0.1136)	(0.1131)
North Rhine-Westphalia	-0.0670	-0.0670
	(0.1143)	(0.1097)
Hesse	-0.1218	-0.1218
	(0.1287)	(0.1243)
Rhinel.-Palatinate	-0.1287	-0.1287
	(0.1409)	(0.1475)
Baden-Wuerttemberg	-0.0220	-0.0220
	(0.1165)	(0.1115)
Bavaria	0.0705	0.0705
	(0.1066)	(0.1083)
Berlin	-0.1752	-0.1752
	(0.1537)	(0.1480)
Brandenburg	-0.1707	-0.1707
	(0.1595)	(0.1584)
Mecklenburg-West Pomerania	-0.0865	-0.0865
	(0.1598)	(0.1405)
Saxony	-0.0095	-0.0095
	(0.1214)	(0.1210)
Saxony-Anhalt	-0.0380	-0.0380
	(0.1429)	(0.1346)
2009	0.0651	0.0651
	(0.0727)	(0.0717)
2010	0.1064	0.1064
	(0.0663)	(0.0687)
2011	0.1184*	0.1184*
	(0.0681)	(0.0640)
2012	0.1026	0.1026
	(0.0710)	(0.0711)
2013	0.0723	0.0723
	(0.0663)	(0.0642)

Pseudo R^2	0.1489	0.1489
N	419	419

Notes: Average marginal effects and robust standard errors in parentheses.
* p<0.10, ** p<0.05, *** p<0.01. Data source: Socio-Economic Panel, data 1984-2013,version 30, SOEP, 2015, doi:10.5684/soep.v30.

Table 12 Probability of enrolling at university – Controls for cognitive skills

	Probability to enter university	
	I	II
Risk tolerance	0.0013	-0.0001
	(0.0119)	(.0117)
Parents with academic background	0.2157***	0.2100***
	(0.0525)	(0.0526)
School grade: German	-0.0636*	-0.0559
	(0.0362)	(0.0356)
School grade: Mathematics	-0.0970***	-0.0916***
	(0.0251)	(0.0251)
School grade: First foreign language	-0.0034	-0.0050
	(0.0343)	(0.0340)
Support during school (ref. category no /not much)		
Pretty much supported	0.1929***	0.1808***
	(0.0607)	(0.0610)
Greatly supported	0.1471**	0.1405**
	(0.0673)	(0.0673)
Sum index From all given Answers	0.0042	
	(0.0038)	
Sum index from Answers in Task group No. 2 – Analogies		0.0330**
		(0.0143)
Sum index from Answers in Task group No. 6 - Arithmetic Operator		-0.0001
		(0.0075)
Sum index from Answers in Task group No. 9 - Figures		-0.0039
		(0.0080)
Pseudo R^2	0.2937	0.3097
N	232	232

Notes: Average marginal effects and standard errors in parentheses. Controls: Gender, age, migration background, region, federal states and year. Risk tolerance (0: not at all willing to take risks; 10 very willing to take risks. * p<0.10, ** p<0.05, *** p<0.01. Data source: Socio-Economic Panel, data 1984-2013,version 30, SOEP, 2015, doi:10.5684/soep.v30.

Table 13 T-test: Probability of enrolling at university by academic background and gender

	Mean	T-test	N
Probability to enter university			419
Parents with academic background	0.6861702	0.000	231
Parents with no academic background	0.8787879		188
Men	0.7922705	0.9963	212
Women	0.7924528		207

Notes: T-test with equal variances.
Risk tolerance (0: not at all willing to take risks; 10 very willing to take risks).
Data source: Socio-Economic Panel, data 1984-2013,version 30, SOEP, 2015, doi:10.5684/soep.v30.

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