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Like Father, Like Misbehaving Son?
How externalising behaviour is associated to occupational
choice and occupational persistence across generations

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Contents

1	Introduction	1
2	Related Literature	3
3	Data and Summary Statistics	5
3.1	The SOEP	5
3.2	Relating externalising behaviour to the Big-5	7
3.3	Empirical sample, key and control variables	8
4	Regression Model	13
5	Empirical Results	15
6	Conclusion	24
A	Appendix Tables	29
B	Offspring-to-parents Matches	29
C	Design Weights	30
D	Supplementary Data Analysis	30
D.1	Controlling for cognition	30
D.2	High externalising behaviour	33
D.3	Logit model	37

Abstract

Using longitudinal data drawn from the SOEP from 1984 to 2017, I find that the intergenerational persistence in occupational choice among male offspring is 20 percent lower if the offspring is associated with externalising behaviour. There are no significant differences for females. These results suggest that, while misbehaviour is typically associated to negative economic outcomes, it is also associated to higher mobility across generations.

Unter Verwendung von Längsschnittdaten von 1984 bis 2017 aus dem SOEP stelle ich fest, dass die intergenerationale Transmission der Berufswahl unter männlichen Nachkommen um 20 Prozent geringer ist, wenn die Nachkommen mit Externalisierungsverhalten in Verbindung gebracht werden. Es gibt keine signifikanten Unterschiede für Frauen. Diese Ergebnisse legen nahe, dass obwohl Fehlverhalten in der Regel mit negativen wirtschaftlichen Ergebnissen verbunden ist, es auch mit einer höheren Mobilität zwischen Generationen einhergeht.

Keywords: Labor Market Outcomes, Occupational Choice, Intergenerational Persistence, Non-Cognitive Skills, Misbehaviour

1 Introduction

It is widely known that more educated parents have more educated children, that children whose parents earn more are more likely to be higher earners too and that the offspring's occupational choice is associated to the parents' occupational belonging. Genetic endowment, skill formation and environmental factors seem to be key determinants of this observed persistence.

While there has been an increasing recognition of the importance of non-cognitive skills in the economic literature, empirical studies on the effects of misbehaviour are still scarce. Sociologists have found that externalising behaviour, defined as disruptive, aggressive, hyperactive and acting-out behaviour, is negatively associated to life-cycle outcomes (Duncan and Magnuson, 2011; Duncan and Dunifon, 2012; Bertrand and Pan, 2013). However, more recently Papageorge et al. (2016) have argued that externalising behaviour is associated with underlying non-cognitive skills that are valuable in the labor market and, hence, is associated to positive outcomes.

Furthermore, intergenerational persistence in occupational choice can be sub-optimal if it drives mismatch between workers and jobs, reducing overall productivity (Mora, 2009; Lo Bello and Morchio, 2017). In order to be able to design policies that counteract the resulting market inefficiency, we would like to know which individuals are likely to show high or low occupational persistence and what the characteristics of these individuals are.

Hence, this thesis contributes to the literature by answering the following question: how is externalising behaviour associated to occupational choice and occupational persistence across generations? Using a longitudinal data set from Germany, the Socio-Economic Panel (SOEP), I estimate linear probability models relating misbehaviour to labor market outcomes and schooling. As the SOEP does not contain explicit measures of externalising behaviour, I measure it by using proxies following the approach suggested by DeYoung et al. (2008): I take the Big-5 personality traits¹ which are identified from self-reports to extract two higher-order factors called plasticity and stability by a principal component analysis. Then, following DeYoung et al. (2008), I define individuals as associated to externalising behaviour if they exhibit relatively low stability and relatively high plasticity. The key empirical fact I establish is that the intergenerational persistence in occupational choice among male offspring is 20 percent lower if the offspring is associated with externalising behaviour. There is no significant difference among females. This is in line with prevailing research suggesting that mostly males are associated with misbehaviour as their non-cognitive development responds considerably stronger to a decrease in parental investment and to problematic environments than females (Bertrand and Pan, 2013; Jacob, 2002).

Another important question is whether there is a wage premium in the labor market to misbehaviour. Given that I find that individuals of both gender who are associated with externalising behaviour are less likely to choose the lowest-paying sectors (skilled agricultural and fishery occupations, plant and machine and elementary occupations), the question arises whether they generally achieve higher earnings. This question is motivated by the findings in Papageorge et al. (2016), who show that misbehavior in childhood is associated with higher earnings in adulthood. However, I do not find a wage premium to externalising behaviour in my German sample. Furthermore, prevailing research argues that misbehaviour is negatively associated with schooling (Papageorge et al., 2016). Although males and females score roughly the same on cognitive ability tests, empirical studies show that boys generally receive lower grades and have more disciplinary problems (Bertrand and Pan, 2013; Jacob, 2002). Despite the presumed negative effect of misbehaviour on schooling, my findings suggest that on average individuals who are associated with externalising behaviour are not necessarily less educated. In particular, males are less likely to drop out of school and more likely to complete a vocational training if associated to externalising behaviour.

While my results do suggest that misbehaviour is related to some desirable labor market outcomes, my approach relies on proxies of externalising behaviour, which might be error-contaminated. By using proxies of externalising behaviour I characterise individuals by levels of plasticity and stability and es-

¹The most widely accepted taxonomy of personality traits is currently the Big Five or Five-Factor Model (Borghans et al., 2008).

timate potential differences in outcomes between individuals who are likely (or not) to be associated to this kind of misbehaviour. Furthermore, I use measures of personality that are assessed at the respondent's age of 24 and older, i.e. when the individual is already grown and has usually already chosen a particular occupation. This means that there could be feedback effects from jobs onto personality. To address this endogeneity problems related to age I regress each personality trait on age and age squared. The residuals from these regressions are then assumed to be free from age effects.

The remainder of the thesis is organized as follows: Section 2 discusses relevant literature and previous empirical findings regarding the questions I empirically test. Section 3 provides details on the nationally representative German Socio-Economic Panel (SOEP), my sample, key variables and the regression equations. Finally, section 5 presents the main findings and section 6 concludes.

2 Related Literature

While most empirical research has focused on studying the impact of cognitive ability on labor market outcomes, there has been an increasing interest in the role that non-cognitive skills play in the labor market. Recent findings have shown that our personality determines our choices and our success to a considerable degree (Heckman and Rubinstein, 2001; Heckman et al., 2006; Bertrand and Pan, 2013). Cunha et al. (2010) have reported that twelve percent of the variance in educational attainment is explained by personality measures, compared to 16 percent accounted for by cognitive ability.

On the one hand, the reason why for a long time the economic literature on skills almost exclusively focused on measures of cognitive ability and ignored non-cognitive skills in the analysis of earnings, education and other outcomes, might be due to the lack of reliable measures on personality (Heckman and Rubinstein, 2001). On the other hand, Borghans et al. (2008) argue that economists were simply not familiar with models on personality traits. Hence, with the increasing popularity and awareness of the Five Factor Model, also referred to as the Big-5 personality traits, researchers have focused more and more on the effects of non-cognitive skills on outcomes of interest. The Big-5 model encompasses the following five traits, that according to psychologists represent five different domains of personality: *Conscientiousness*, *Openness to Experience*, *Neuroticism*, *Extraversion* and *Agreeableness* (Goldberg, 1981; Borghans et al., 2008).

Personality traits are known to evolve throughout life and are more changeable than cognitive ability, even at later ages. In contrast, cognitive ability tends to rise sharply during childhood, peak in late adolescence, and then slowly decline (Borghans et al., 2008). Indeed, both are commonly known to predict a variety of individual's economic outcomes. Nevertheless, non-cognitive skills are

more sensitive to investment by parents and, hence, potentially a better policy-relevant target. For this, we need to know the channels of non-cognitive skills and how they affect individuals' choices and labor market outcomes.

Studies have shown² that personality traits are more important for individuals with lower levels of education and job complexity, such as, for unskilled workers. In contrast, cognitive ability is more important at higher levels of education and job complexity, for example, for professors, scientists, and managers (Schmidt and Hunter, 2004; Almlund et al., 2011). Likewise, Ham et al. (2009) show that based on personality, we can actually assess the probability of attaining a white collar occupation over a blue collar occupation. Recent evidence suggests that personality also affects wages (Heckman et al., 2006). Various studies find that high agreeableness predicts lower earnings, (Judge et al., 2012) as individuals with higher levels of agreeableness are worse negotiators, since they are susceptible to accepting early offers in the negotiation process (Barry and Friedman, 2011; Judge et al., 2012). In contrast, less agreeable individuals are more competitive in the workplace and strive for career advancement (Spurk and Abele, 2011). Furthermore, there is mixed evidence regarding gender with respect to extraversion. For men, there is a wage premium in increasing measures of extraversion, while there is a negative wage differential for women (Heineck and Anger, 2010).

In addition to personality, individuals' occupational choices and labor market outcomes are also known to be determined by family background, as they are passed on from generation to generation. The first important contribution in the literature on intergenerational persistence was asserted by Becker and Tomes (1979). He argues that the analysis of the distribution of income should include both the inequality in income between different families in the same generation, as well as the difference between different generations of the same family. This is referred to as intergenerational mobility³. Following this Solon (1992), Corak and Heisz (1999) and Solon (2002) have documented high persistence in income and Chevalier et al. (2005) have reported strong intergenerational effects of parental education on their offspring. Constant and Zimmermann (2004) and Knoll et al. (2013) have focused on occupational choices and found that the probability of choosing a particular occupation is significantly increased if one's father works in the occupation too. These results suggest that information frictions exist, or that parents might influence the offspring's occupational choice, for example to ensure that he/she takes over the family business. Parents may also bias their child towards certain occupations, sectors or companies, that parents consider a good choice since they are familiar with them. Furthermore, the offspring

²One of the first studies of personality in the field of occupational choice was that of Filer (1986). He used a sample from a recruiting firm and was able to show that individuals sort into occupations based on their personality.

³Up to this point, sociologists were the ones who emphasized the role of the individual's ancestors and background in the determination of one's socioeconomic status, while economists were mainly concerned with inequality within a generation (Becker and Tomes, 1979).

might be inclined to choose their parents' occupation because of the possibility to benefit from their social network, which increases their job-finding rate. However, this can lead to inferior matches of individual skills with occupational requirements, which negatively affects productivity, wages and subsequently, aggregate welfare (Mora, 2009; Bentolila et al., 2010; Guell et al., 2015; Lo Bello and Morchio, 2017).

Hence, we would like to know which subgroups of the population show the highest probability of high or low occupational mobility. Recent literature suggests that externalising behaviour might be a direct determinant of occupational belonging, earnings and educational attainment. While the psychology literature argues that misbehaviour is generally associated with lower life-cycle outcomes, Papageorge et al. (2016) have found that misbehaving individuals have a lower level of educational attainment, but achieve higher earnings than individuals who are not associated with externalising behaviour.

3 Data and Summary Statistics

First, I provide details on the nationally representative data from the German Socio-Economic Panel (SOEP). Second, I discuss how externalising behaviour can be related to the Big-5 personality traits by using the meta-traits stability (shared variance of neuroticism reversed, agreeableness, and consciousness) and plasticity (shared variance of extraversion and openness). Third, I describe how the empirical sample is constructed and report summary statistics on my key variables: occupational choice, personality traits, meta-traits and control variables. Finally, I present the linear probability models that I will estimate.

3.1 The SOEP

The results are based on data from the German Socio-Economic Panel (SOEP) which is a longitudinal study of individuals and private households which has been running since 1984. The SOEP questionnaires are designed to follow a large sample of households from birth through their lifetime. Moreover, the SOEP allows to match the offspring with their parents which is well-suited for my study.

In 2005, the Big-5 personality traits were surveyed for the first time and have become an integral part of all following questionnaires. The Big-5 approach is a psychological concept which is based on the assumption that five particular dimensions of personality reflect inter-individual differences in thoughts, feelings, and behaviour. The five dimensions are referred to as neuroticism, agreeableness, consciousness, extraversion and openness to experience. Each personality trait can be divided into six heterogeneous sub-dimensions or facets which are listed in table 1. These sub-dimensions result from differences in the attitudes

and motivations of individuals (Gerlitz and Schupp, 2005; Dehne and Schupp, 2007; Borghans et al., 2008).

Table 1: Facets of the Big-5

Neuroticism	Extraversion	Agreeableness
Anxiety	Warmth	Trust
Angry-Hostility	Gregariousness	Straightforwardness
Depression	Assertiveness	Altruism
Self-Consciousness	Activity	Compliance
Impulsivity	Excitement-Seeking	Modesty
Vulnerability	Positive Emotions	Tender-Mindedness
Openness to Experience	Consciousness	
Openness to Fantasy	Competence	
Openness to Aesthetics	Order	
Openness to Feelings	Dutifulness	
Openness to Actions	Achievement Striving	
Openness to Ideas	Self-Disciplin	
Openness to Values	Deliberation	

Furthermore, in the survey year 2006, cognitive ability tests were carried out for the first time on a sub-sample of the SOEP⁴. Since standard IQ tests cannot be implemented in a large-scale panel survey, two ultra-short tests of cognitive ability were developed for the SOEP: a symbol correspondence test (SCT) and a word fluency test (WFT). The former is conceptually related to the mechanics of cognition or fluid intelligence and refers to the performance and speed of solving tasks that are related to new material. The test was implemented by asking respondents to match as many numbers and symbols as possible within 90 seconds according to a given correspondence list. The second test, WFT, as implemented in the SOEP requires respondents to name as many different animals as possible within 90 seconds and thus, is conceptually related to the pragmatics of cognition or crystallized intelligence, such as verbal knowledge (Schupp et al., 2008; Lindenberger and Baltes, 2010).⁵

⁴The sub-sample for the cognitive ability tests comprises individuals who were interviewed in Computer-Assisted-Personal-Interviewing (CAPI) mode from waves A-H in 2006. The population was $N = 7440$ and a total of 5545 cognition tests were completed, i.e. with participation in both tests (Schupp et al., 2008).

⁵For more detailed information on the SOEP, see Wagner et al. (2007).

3.2 Relating externalising behaviour to the Big-5

Despite initial belief that the Big Five contain orthogonal dimensions, psychologists have found that there is a higher-order structure with two meta-traits that represent the shared variance among the identified five dimensions. These two higher order factors are called stability and plasticity. The latter represents the shared variance of extraversion and openness to experience (also called intellect) and relates to an individual's basic need to incorporate novel information from the environment. The meta-trait stability is composed of the shared variance of agreeableness, consciousness and reversed neuroticism (also referred to as emotional stability) and reflects stable functioning in emotional, motivational, and social domains. Externalising behaviour can be characterized by these two higher order factors (Digman, 1997; DeYoung et al., 2008). Indeed, Hirsh et al. (2009) show that several types of behaviour are actually predicted primarily by those two identified meta-traits and not directly by the Big-5 personality traits.

As there are no explicit measures of externalising behaviour reported in the SOEP, I follow the approach suggested by DeYoung et al. (2008) to relate this particular type of misbehaviour to the Big-5 personality traits which can be estimated from measures on personality that are provided by the existing data. Particularly, each respondent of the SOEP is asked 15 questions, also referred to as items, about his/her personality⁶. I obtain the Big-5 by reducing the 15 items to 5 components through principal component analysis. Furthermore, I run another principal component analysis to get the factor on cognition which loads on measures of SCT and WFT. To obtain the two meta-traits plasticity and stability, I then perform another principal component analysis: The factor stability is allowed to load on agreeableness, consciousness and reversed neuroticism and plasticity loads on extraversion, openness and cognition. DeYoung et al. (2008) argue that plasticity must load also on cognition to separate the variance in openness to experience associated with extraversion from variance in openness associated with cognitive ability, as the latter is negatively related to externalising behaviour, whereas I am interested in the positively correlated part of the variance. Being left with the resulting two factors of interest, stability and plasticity, I divide the former into 2 parts, i.e. higher and lower than the median and the latter into four quartiles. According to DeYoung et al. (2008) keeping stability constant, those individuals who have higher measures of plasticity are more likely to be associated with externalising behaviour. Therefore, as higher plasticity is the more important measure and indication of externalising behaviour than low stability I will characterise misbehaviour as being in the fourth quartile of plasticity and lower than the median of stability.

Furthermore, as suggested by Anger and Heineck (2010), each personality trait is regressed on age and age squared, to clean the measures from age effects. This way I also account for feedback effects from age on personality traits and thus avoid endogeneity problems related to age. For reasons of comparability, I

⁶See questionnaire in Dehne and Schupp (2007), p.66.

have standardized each trait and measures of cognitive ability of my sample to have zero mean and variance one. Notice further that Papageorge et al. (2016) used data on externalising behaviour where teachers assessed the students' behaviour. In contrast, I use self-reported data. This should not be a problem as DeYoung et al. (2008) argue that teacher reports describe behaviour only in a school setting, whereas self-reports assess behaviours that take place away from adult supervision. Thus, the self-reports and the teacher's reports assess behaviours in different contexts, and the teacher's reports are not necessarily preferable for the question at hand.

3.3 Empirical sample, key and control variables

The sample I constructed for my analysis is drawn from the SOEP-core that currently involves the waves 1-34 from the years 1984 to 2017. My final sample consists of a maximum of 31,219 observations for a total of 1874 individuals who could be matched either with one of the parents or with both. The sample is almost equally distributed between gender with 47 percent female offspring. In total, 1311 respondents could be matched with both parents - with a 45 percent female proportion. Most individuals, namely 1706, could be matched with their mothers, while 1479 individuals could only be matched with their fathers, with a female proportion of 47 and 46 percent, respectively.

The SOEP provides information on occupation for both offspring and parents according to the international standard classification of occupations (ISCO-88) which organises occupations in an hierarchical framework according to a strictly four-digit classification. Because of the limited sample size, in my analysis I restrict my attention to one-digit occupational groups. Notice that not all employed respondents are asked about their occupation on an annual basis. Only those who changed jobs and who are first-time respondents are annually asked to provide up-to-date information (SOEP Group, 2019; Hartmann and Rosenblatt, 2019). ISCO-88 defines 10 major groups of occupational sectors, as listed in table 2.

The information on the parents' occupation is provided by the SOEP in two ways. First, for each individual in the SOEP-core, there is biography data which reports contemporaneous information on the occupation. Second, there is retrospective information on the professional occupation of the father and the mother reported by the child when he/she was 15 years old. Table 3 shows the distribution of mothers, fathers and their offspring across the occupational sectors. If individuals rarely switch occupation over the life cycle, the two sources of information on parental occupation should be highly correlated. However, the number of observations seems to vary if we compare column (3) with (5), and column (4) with (6) which can be due to three reasons: first, subjective perception about the parents' occupation during the childhood might differ from the actual occupational belonging; second, parents have actually changed sectors and thus, the contemporaneous and the retrospective biography inform-

ation differ; third, it is possible that the biography information on the parents is more recent, hence, does not include self-reported retrospective information on the occupation.

Table 2: ISCO-88 major groups by classification number

classification number	occupational sector
0	Armed forces
1	Legislators, senior officials and managers
2	Professionals
3	Technicians and associate professionals
4	Clerks
5	Service and sales workers
6	Skill agricultural and fishery workers
7	Craft and related workers
8	Plant and machine operators and assemblers
9	Elementary occupations

Having a closer look at table 3 we can observe on the one hand that certain sectors have shrunk significantly in relative terms: while elementary occupations were by far more frequent among mothers than among fathers, sons and daughters are almost equally likely to belong to this occupational sector. Furthermore, while up to 20 percent of all parents' observations belong to elementary occupations only 7 and 9 percent of all daughters' and sons' observations, respectively, can be detected in this sector. The sectors of craft workers and plant and machine operators has seemingly shrunk too. On the other hand, we can observe that the higher paying occupations have grown in relative terms.

In a next step, I will compare individuals according to their behaviour. The questionnaires to evaluate the five dimensions of personality were conducted as part of the SOEP-core in five different years: 2005, 2009, 2012, 2013 and 2017. In total, my sample comprises 1729 offspring for which information on the Big-5 is available, with a female proportion of 47 percent. Individuals were surveyed up to four times on their personality: for 547 individuals there are one-time reports on measures for the Big-5, for 459 individuals there are two, for 302 individuals three and on 421 there are measures of four conducted surveys, with a female proportion of 49, 48, 40 and 49 percent, respectively.

Table 3: Distribution of offspring and parents across occupational sectors (relative frequencies); Source: SOEP 1984-2017

occ sector	offspring		when offspring was 15		self-reported	
	Daughters (1)	Sons (2)	Mothers (3)	Fathers (4)	Mothers (5)	Fathers (6)
0	0.08	1.30	0.03	0.19	0.00	0.60
1	1.95	2.48	2.68	6.84	1.59	4.17
2	12.08	11.88	9.11	15.07	6.83	12.23
3	27.97	15.23	21.50	12.29	21.16	10.42
4	14.22	8.61	15.79	6.27	14.64	5.84
5	27.27	8.06	20.61	2.68	19.53	4.28
6	0.97	2.20	1.74	2.64	2.11	3.12
7	5.49	33.90	4.49	30.42	10.43	37.57
8	3.07	7.71	4.85	13.78	4.64	10.07
9	6.89	8.63	19.20	9.83	19.07	11.68
	100.00	100.00	100.00	100.00	100.00	100.00
Total No. of observations	14,507	16,712	23,965	27,683	28,404	25,929

Table 4 reports the estimates of factor loadings mapping the measures of individual's latent skills to the Big-5 personality traits as well as cognition. Larger loadings signal a stronger relationship between the latent factors and the observed measure. Using the estimates of the distributions of underlying factors, I plot the gender-specific distributions of each latent trait in figure 1. The graphs show gender differences in personality traits, especially with respect to reversed neuroticism, agreeableness and extraversion. Therefore, the further resulting principal component factors, plasticity and stability, show differences in measures by gender too. Cognitive ability seems to be more similar across gender.

Following Papageorge et al. (2016) and DeYoung et al. (2008), I control for measures of cognitive skills using scores of two different tests: WFT and SCT. However, as reported in table 5, the number of observations available for the SCT and the WFT differ substantially. Whereas the SCT has been taken by 1729 individuals of my sample, only 724 respondents have participated in the WFT. As the factor cognition loads on both variables my sample is again reduced to a certain extent. Therefore, I estimate my main equations first without controlling for cognition and provide the results on equations where I include

Table 4: Factor loadings on stability, plasticity and cognition

	Stability
Neuroticism	-0.37
Agreeableness	0.64
Consciousness	0.67
	Plasticity
Openness to experience	0.71
Extraversion	0.71
	Cognition
SCT	0.67
WFT	0.66
Openness	0.35

Source: SOEP 1984-2017.

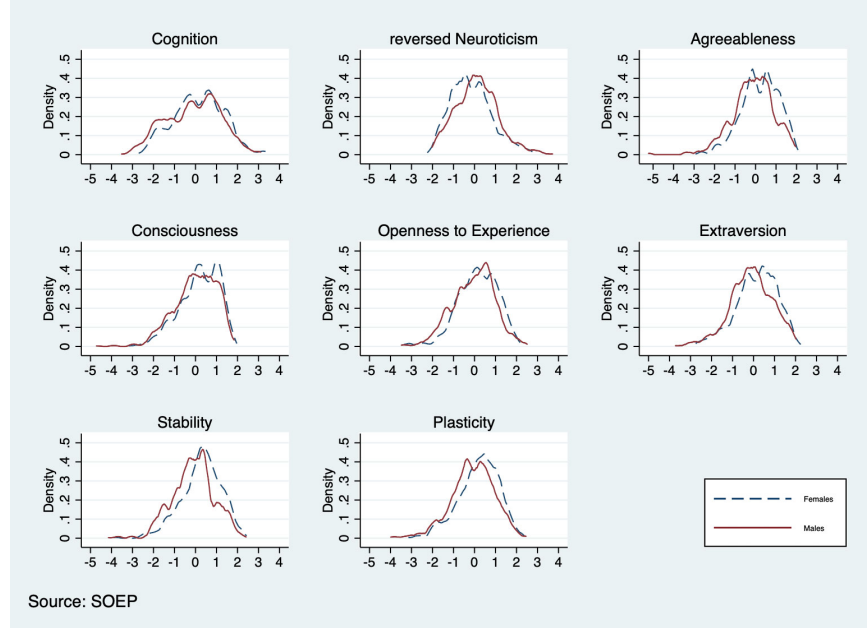
Note: author's calculations.

the variable cognition in the appendix. I show that my main results are robust to including the variable cognition which limits my sample substantially (see section D.1).

The two cognition tests in my sample from the SOEP-core were conducted in three distinct years: 2006, 2012 and 2016. The SCT was taken once by 1152 individuals, twice by 401 and three times by 176 individuals, with a female proportion of 48, 44 and 45 percent, respectively. The WFT was taken once by 540 individuals, twice by 66 and three times by 118 individuals, with a female proportion of 46, 47 and again 47 percent, respectively. Mean age of the test takers and their test score averages also by gender are reported in table 5. According to the results, women score on average marginally higher than men on tests of verbal as well as non-verbal ability. Interestingly, the largest scores are in both tests still scored by men.

Offspring's and parents' educational attainment is represented by the following educational levels: high school degree, vocational training and higher education degree. Table A13 reports the distribution of offspring by educational attainment and vocational training types by the level of plasticity and

Figure 1: Distribution of personality traits, meta-traits and cognitive ability by gender



stability. While the number of observations on drop-outs in the fourth quartile of plasticity is relatively low, the relative frequency in the first quartile of stability is comparably high. The relative frequency of a university degree is high in both the fourth quartile of plasticity as well as the first quartile of stability compared to any other quartile. In contrast, the relative frequencies of having a degree of a university of applied sciences shows the opposite. Apprenticeships are more common among respondents with lower measures of plasticity, while the frequencies remain unchanged across the quartiles of stability.

Table 5: Summary statistics of offspring's cognitive ability; Source: SOEP 1984-2017

	(1) both	(2) male	(3) female
Mean age			
in 2006	25.1	25.4	24.8
in 2012	28.7	28.9	28.4
in 2016	31.8	32.1	31.6
WFT			
mean score	26.24	25.42	27.18
largest score	66	66	64
No. of observations	15088	8094	6994
SCT			
mean score	32.07	31.67	32.53
largest score	92	92	91
No. of observations	31219	16712	14507

4 Regression Model

To examine the association of misbehaviour with labor market outcomes, I estimate the following linear equation:

$$sameocc_{i,t} = \alpha + \beta externalising_{i,t} + \gamma X_{i,t} + \epsilon_{i,t} \quad (1)$$

where i denotes the individual and t the year. The variable $sameocc_{i,t}$ is one if the offspring i chooses the same occupation as either parent, and zero otherwise. The variable $externalising_{i,t}$ is one if individual i is characterized by plasticity in the fourth quartile of the distribution and stability that is lower than the median, zero otherwise. The vector $X_{i,t}$ consists of various socioeconomic variables such as individual's age, age squared and education which are assumed to explain part of the intergenerational persistence in occupational choice (Knoll et al., 2013; Lo Bello and Morchio, 2017). I control also for mother's and father's education as it is arguable that the decision of choosing the same occupation as the parents also depends on the level of the parents' education. There are four mutually exclusive schooling levels: no finished school, high school degree, vocational training and higher education. The variable $noschool_{m,i,t}$ ($noschool_{f,i,t}$) is one if the mother (father) has not finished or attended school, zero otherwise. The variable $vocationaltraining_{m,i,t}$ ($vocationaltraining_{f,i,t}$) is one if the mother (father) has finished a vocational training, zero otherwise. The variable $highereducation_{m,i,t}$ ($highereducation_{f,i,t}$) is one if the mother (father)

has finished a higher education, zero otherwise. The reference group which I omit when estimating the equation is the variable which denotes whether the mother's (father's) highest educational attainment is a high school degree. There exist also four dummy variables on offspring's education: the variable $dropout_{i,t}$ is one if an individual has dropped out of school and zero if an individual has finished school. Notice that these individuals can finish afterwards some kind of education such as a vocational training. However, here they are still categorized as dropouts. The variable on vocational training is one if individual i 's highest educational achievement is an apprenticeship or any other kind of vocational school, zero otherwise. The variable on higher education is one if individual i has a higher education degree, such as a university degree, higher technical college, dual studies etc. The reference group which I omit are individuals whose highest educational attainment is a high school degree. Furthermore, I account for gender differences and estimate the equation separately for females and males as the latter exhibit larger differences by externalising behaviour in the literature (Jacob, 2002). In a next step, I estimate the equation for choosing the same occupation as the mother and separately for that of the father.

Second, I study how occupational choice is related to externalising behaviour. Thus, to assess whether externalising behaviour predicts sorting into certain occupations, I run the following regression:

$$occ_{s,i,t} = \alpha + \beta externalising_{i,t} + \gamma X_{i,t} + \epsilon_{i,t} \quad (2)$$

where i represents the individual, t the year and s the occupational sector from 0,...,9 presented in section 3.3, table 2. I control for individual's age, age squared and education as these variables are assumed to explain part of the variation in occupational choice (Schmidt and Strauss, 1975). The reference group which I omit are individuals whose highest educational attainment is a high school degree. All variables on the right-hand side are defined as in equation 1.

Motivated by previous findings which suggest that individuals who are associated with externalising behaviour have a lower educational attainment, though higher earnings (Papageorge et al., 2016), I estimate an equation where I regress educational outcomes of individuals on externalising behaviour:

$$educ_{i,t} = \alpha + \beta externalising_{i,t} + \gamma X_{i,t} + \epsilon_{i,t} \quad (3)$$

where i denotes the individual and t the year. The variable $educ_{i,t}$ represents three different outcomes which are indicated by the following dummy variables: first, I am interested whether individuals who are associated with externalising behaviour are more likely to drop out of school. Second, I want to assess whether misbehaving people are more or less likely to finish a vocational training. Lastly, I would like to know whether there is a significant difference between individuals who are and who are not associated with externalising behaviour on having a higher education degree. I control for cognitive abilities

and parents' education because both is well known to play a substantial role for offspring's educational achievement (Heckman and Vytlačil, 2001; Anger and Heineck, 2010). Here, I also account for heterogeneity in returns across gender.

Finally, I regress log hourly wages onto being associated with externalising behaviour of the following form:

$$\log(wage_{i,t}) = \alpha + \beta externalising_{i,t} + \gamma X_{i,t} + \epsilon_{i,t} \quad (4)$$

where i denotes the individual and t the year. The variable $\log(wage_{i,t})$ represents the log hourly wages. I include a time index and control for individual's years of experience, which is defined as the total length of full-time employment in the individual's career up to the point of the interview in a given year, and years of experience squared since it is well known that experience does not affect the wage linearly, but the effect wears off the more working experience an individual has. I also control for tenure, which reflects the length of time in years with the firm at the point in time of the interview for all employed individuals, and individual's education, defined as in equation 1, as well as industry and occupational sector the company is active for the most part.

In all regressions, I weigh observations using the recommended SOEP design weights.⁷

5 Empirical Results

The literature studying consequences of misbehaviour has mostly focused on educational outcomes. In contrast, I focus on labour market outcomes. Starting with the relationship between externalising behaviour and occupational persistence, I find a negative association between choosing the same occupation as either parent and misbehaviour if the offspring is male. Hence, we observe a higher intergenerational mobility. This result is robust to including the variable cognition which limits my sample significantly⁸.

Table 6 reports estimates of the linear probability model of the relationship between being associated with externalising behaviour and the intergenerational persistence in occupational choice.⁹ Column 1 provides the result of the baseline equation for male offspring. I find that males are 20 percent less likely to choose the same occupation as either the mother or the father. The coefficient remains substantially unchanged after including control variables as reported in columns 2 and 3. There is no significant difference regarding the occupational persistence

⁷For more information, see appendix section C.

⁸See section D.1.

⁹I use linear probability models to ease the interpretation of coefficients. I also run logistic regressions on my main equations and report the results in appendix section D.3. I find that my main results are unchanged if I use the non-linear logistic specification.

between male offspring who drop out of school, complete a vocational training or finish a higher education compared to males who have finished high school.

Table 6: Same occupation as either parent's occupation regressed on externalising behaviour

	same occ as either parent's occ (1) males	same occ as either parent's occ (2) males	same occ as either parent's occ (3) males	same occ as mother's occ (4) males	same occ as father's occ (5) males	same occ as either parent's occ (6) females	same occ as mother's occ (7) females	same occ as father's occ (8) females
externalising behaviour	-.201** (.066)	-.193* (.075)	-.181* (.073)	-.129*** (.021)	-.098 (.067)	.111 (.106)	.182 (.117)	.022 (.059)
age		.000 (.006)	.001 (.006)	.000 (.005)	.000 (.005)	-.007 (.008)	.003 (.005)	-.010 (.006)
age ²		-.000 (.000)	-.000 (.000)	-.000 (.000)	.000 (.000)	.000 (.000)	-.000 (.000)	.000 (.000)
dropped out of school		-.039 (.051)	-.027 (.053)	.021 (.044)	-.077 (.044)	-.090* (.041)	-.049 (.036)	-.048 (.026)
vocational training		-.049 (.043)	-.045 (.041)	-.036 (.038)	-.045 (.037)	.071 (.052)	.071 (.051)	.006 (.022)
higher education		.020 (.070)	.020 (.071)	-.010 (.045)	.017 (.064)	.091 (.070)	.020 (.070)	.057 (.034)
father no school			.013 (.101)		.149 (.107)	-.068 (.122)		-.065 (.052)
father vocational training			.012 (.051)		.038 (.044)	.014 (.064)		-.040 (.038)
father higher education			-.119 (.069)		-.031 (.064)	.038 (.075)		-.025 (.036)
mother no school			-.010 (.089)	-.076 (.047)		.154 (.211)	.168 (.187)	
mother vocational training			-.048 (.053)	-.036 (.041)		.067 (.063)	.091 (.054)	
mother higher education			.107 (.078)	.135 (.072)		.290** (.109)	.289* (.121)	
constant	.349*** (.020)	.416*** (.098)	.417*** (.116)	.174* (.081)	.266** (.097)	.344* (.134)	.099 (.092)	.285** (.093)
N	10349	10349	9914	10080	10096	8092	8350	8245
Adjusted R ²	.005	.013	.020	.024	.008	.035	.047	.013

* p < 0.05; ** p < 0.01; *** p < 0.001

Source: SOEP 1984-2017. Note: author's calculations. All models are linear probability models. Standard errors are clustered at the individual level. Columns (1)-(3): regression of male offspring choosing the same occupation as either parent's occupation on externalising behaviour (dummy variable, 1 if the offspring is associated with externalising behaviour, 0 otherwise); column (4): male offspring choosing the same occupation as the mother is regressed on externalising behaviour while controlling for mother's education; column (5): male offspring choosing the same occupation as the father is regressed on externalising behaviour while controlling for father's education; column (6): female offspring choosing the same occupation as either parent's occupation is regressed on externalising behaviour while controlling for parents' education; column (7): female offspring choosing the same occupation as the mother is regressed on externalising behaviour while controlling for mother's education; column (8): female offspring choosing the same occupation as the father is regressed on externalising behaviour while controlling for father's education. All estimated equations reported in columns (2)-(8) include a second-degree polynomial in age and dummies for the offspring's education

Estimating the equation only for mother's occupation, male offspring who is associated with externalising behaviour is 13 percent less likely to choose the same occupation as the mother. There is no significant difference between males who are and who are not associated with externalising behaviour when estimating separately for father's occupation. I find no significant differences for females as reported in columns (6)-(8).

Table 7: Same occupation as either parent's occupation regressed on externalising behaviour using retrospective information on parent's occupation

	same occ as either parent's occ (1) males	same occ as either parent's occ (2) males	same occ as either parent's occ (3) males	same occ as either parent's occ (4) females
<i>parents' occupation at offspring's age of 15</i>				
externalising behaviour	-.186** (.061)	-.180** (.064)	-.152* (.069)	-.029 (.094)
age		-.008 (.006)	-.008 (.006)	.006 (.006)
age ²		.000 (.000)	.000 (.000)	-.000* (.000)
dropped out of school		-.008 (.051)	-.002 (.053)	-.015 (.046)
vocational training		.030 (.042)	.035 (.041)	.048 (.058)
higher education		.044 (.061)	.059 (.065)	.163* (.072)
father no school			.155 (.128)	-.077 (.109)
father vocational training			.051 (.050)	-.092 (.121)
father higher education			-.048 (.065)	.081 (.081)
mother no school			.001 (.091)	-.258*** (.066)
mother vocational training			-.102 (.055)	.035 (.078)
mother higher education			.059 (.080)	.171 (.107)
constant	.345*** (.021)	.476*** (.103)	.501*** (.120)	.315** (.120)
N	10062	10062	9650	7728
Adjusted R^2	.004	.007	.020	.052

* p < 0.05; ** p < 0.01; *** p < 0.001

Source: SOEP 1984-2017. Note: author's calculations. All models are linear probability models. Standard errors are clustered at the individual level. The dependent variable $sameocc_{it}$ is 1 if individual i chooses the same occupation as the parent's occupation which the mother/father has belonged to when the offspring was 15 years old. The retrospective information on parent's occupation is provided by the offspring. Columns (1)-(3) display results from a regression of male offspring choosing the same occupation as either parent's occupation on externalising behaviour (dummy variable, 1 if the offspring is associated with externalising behaviour, 0 otherwise); column (4) reports results for the same model estimated for female offspring.

Running the same baseline regression but using the information on parents' occupational belonging at the offspring's age of 15 provided by the offspring, yields results reported in table 7. The coefficients are robust to the change of the source of information on parents' occupational belonging. Results indicate that we observe a higher intergenerational mobility among male offspring who is associated to externalising behaviour while there is no significant difference between females who are associated to externalising behaviour and the rest. As reported in tables 6 and 7, the adjusted R^2 is overall between 1 and 3 percent. This is common for linear probability models of complex outcomes which are determined by many unobserved phenomena and chance, and therefore exhibit substantial unexplained variation.

The next important question is now whether the higher intergenerational mobility applies to particular occupational choices. In fact, Papageorge et al. (2016) find no significant effect of externalising behaviour on occupational choice after controlling for education. In contrast, I find that both males and females are less likely to choose particular occupational sectors if they are associated to externalising behaviour. This is true for occupations with a relatively lower skill level and complexity of tasks. Individuals who choose these particular occupations are more likely to have a high school degree than a higher education. Table 8 reports results on estimated equations for those sectors where the coefficient on externalising behaviour is significant: columns 1 and 2 show that males who are associated with externalising behaviour are 2 percent less likely to become a professional soldier. Males are 6 percent less likely to choose a clerical or secretarial occupation if they are associated to externalising behaviour. I find a marginal effect for both gender of belonging to the occupational sector of skilled agricultural and fishery workers, as reported in columns (5) and (6). Males who are associated with externalising behaviour are 7-8 percent less likely to choose plant and machine occupations, as reported in columns 7 and 8, and misbehaving females are 5 percent less likely to belong to elementary occupations. Both males and females are less likely to choose the lowest level occupations if they have a higher education. Estimated results for all occupational sectors are reported in table 9. Except for the occupational sector of agricultural and fishery workers males and females who are associated to externalising behaviour do not show the same likelihood of (not) choosing a particular occupation. There seems to be a difference by gender where individuals who are associated to externalising behaviour end up regarding occupation.

While literature suggests that misbehaviour predicts lower educational attainment (Papageorge et al., 2016), I do not find a negative association between externalising behaviour and schooling for males, but a positive association between misbehaviour and completing a vocational training. Furthermore, my findings suggests that there is no association between externalising behaviour and educational outcomes for females. Table 10 reports results on regressing educational outcomes on externalising behaviour. Misbehaving males are less likely to drop out of school. They are more likely to have finished a vocational training if they are associated with externalising behaviour, especially if the father has finished a vocational training himself compared to a father who has finished a high school. In contrast, females are less likely to complete a vocational training if associated with externalising behaviour. I find no significant relationship between individuals having a higher education degree and their behaviour.

Table 8: Occupational choice by sector regressed on externalising behaviour

	occ. sector 0 (1) males	occ. sector 2 (2) males	occ. sector 4 (3) males	occ. sector 4 (4) males	occ. sector 6 (5) both	occ. sector 6 (6) both	occ. sector 7 (7) males	occ. sector 8 (8) males	occ. sector 9 (9) females	occ. sector 9 (10) females
externalising behaviour	-.020*** (.005)	-.018*** (.005)	-.064* (.026)	-.063* (.027)	-.018*** (.005)	-.017*** (.005)	-.075*** (.012)	-.069*** (.015)	-.050*** (.015)	-.045** (.015)
dropped out of school		.010 (.011)		.012 (.021)		-.006 (.007)		-.008 (.020)		-.014 (.022)
vocational training		.006 (.009)		.011 (.023)		.008 (.010)		.027 (.023)		-.020 (.020)
higher education		-.009 (.006)		-.009 (.029)		-.005 (.011)		-.040* (.019)		-.075*** (.019)
constant	.020*** (.005)	.006 (.006)	.090*** (.012)	.084*** (.020)	.018*** (.005)	.016* (.006)	.075*** (.012)	.066*** (.014)	.060*** (.013)	.079*** (.020)
N	10309	10309	10309	10309	18786	18786	10309	10309	8477	8477
Adjusted R^2	.000	.002	.001	.002	.001	.003	.002	.008	.002	.011

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Source: SOEP 1984-2017. Note: author's calculations. Regressions of occupational choice (dummy that takes value 1 if the individual is in a given occupation, 0 otherwise). All models are linear probability models and estimated separately for males and females. For greater clarity only the results of those sectors where the coefficient on externalising behaviour is significant are displayed, meaning that there is a significant difference in choosing a particular occupational sector between individuals who are and who are not associated with externalising behaviour. Standard errors are clustered at the individual level.

Columns (1)-(8) display results from a regression of males choosing a particular occupational sector on externalising behaviour (dummy variable, 1 if the offspring is associated with externalising behaviour, 0 otherwise). Columns (9)-(10) display results from a regression of females choosing a particular occupational sector on externalising behaviour.

Occupational sectors are as defined in table 2: (0) Armed Forces (1) Legislators, Senior Officials & Managers (2) Professional (3) Technical & Associate Professional (4) Clerical & Secretarial (5) Service & Sales (6) Skill Agricultural & Fishery Workers (7) Craft & Related (8) Plant & Machine (9) Elementary.

Table 9: Occupational choice regressed on externalising behaviour for each occupational sector

Panel A	occ. sector 0 (1) males	occ. sector 1 (2) males	occ. sector 2 (3) males	occ. sector 3 (4) males	occ. sector 4 (5) males	occ. sector 5 (6) males	occ. sector 6 (7) males	occ. sector 7 (8) males	occ. sector 8 (9) males	occ. sector 9 (10) males
externalising behaviour	-.017*** (.005)	.009 (.035)	-.001 (.070)	.045 (.087)	-.062* (.027)	-.019 (.029)	-.022* (.009)	.153 (.127)	-.072*** (.015)	-.015 (.057)
N	10309	10309	10309	10309	10309	10309	10309	10309	10309	10309
Adjusted R^2	.002	.009	.216	.010	.002	.018	.005	.060	.007	.004

Panel B	occ. sector 1 (1) females	occ. sector 2 (2) females	occ. sector 3 (3) females	occ. sector 4 (4) females	occ. sector 5 (5) females	occ. sector 6 (6) females	occ. sector 7 (7) females	occ. sector 8 (8) females	occ. sector 9 (9) females
externalising behaviour	-.003 (.013)	-.003 (.013)	.021 (.119)	-.079 (.046)	.066 (.097)	-.011* (.005)	.006 (.037)	.007 (.022)	-.047** (.015)
N	8477	8477	8477	8477	8477	8477	8477	8477	8477
Adjusted R^2	.004	.004	.015	.009	.023	.002	.006	.003	.007

* p < 0.05; ** p < 0.01; *** p < 0.001

Source: SOEP 1984-2017. Note: author's calculations. Regressions of occupational choice (dummy that takes value 1 if the individual is in a given occupation, 0 otherwise). Panel A and Panel B display results estimated for males and females, respectively. All models are linear probability models and include dummies on individual's educational attainment. Standard errors are clustered at the individual level. Occupational sectors are as defined in table 2: (0) Armed Forces (1) Legislators, Senior Officials & Managers (2) Professionals (3) Technical & Associate Professional (4) Clerical & Secretarial (5) Service & Sales (6) Skill Agricultural & Fishery Workers (7) Craft & Related (8) Plant & Machine (9) Elementary.

Furthermore, I estimate an ordered probit model and report the marginal effects in table 11. On the one hand, I find no significant differences for female offspring who is associated to externalising behaviour. Hence, my findings from estimating a linear probability model are not robust. On the other hand, males are less likely to drop out of school or have a high school degree if they are associated to externalising behaviour. Males are 6 percent more likely to complete a vocational training if they are associated to externalising behaviour. Since I do not find a strictly negative association between misbehaviour and educational attainment, my results may point to country-specific differences on how misbehaviour is treated in school.

Table 10: Educational outcomes regressed on externalising behaviour

	dropped out of school (1) males	dropped out of school (2) females	vocational training (3) males	vocational training (4) females	higher education (5) males	higher education (6) females
externalising behaviour	-.047* (.020)	.045 (.030)	.299* (.129)	-.268** (.092)	.007 (.135)	.138 (.092)
cognition	.006 (.008)	.002 (.011)	-.010 (.029)	.004 (.033)	.029 (.018)	.008 (.020)
father no school	-.028 (.075)	.120 (.102)	.101 (.169)	-.141 (.141)	-.097* (.040)	-.023 (.040)
father vocational training	-.079* (.036)	-.005 (.048)	.270*** (.077)	.103 (.097)	-.097 (.057)	-.021 (.046)
father higher education	.228 (.152)	.682*** (.145)	.012 (.154)	-.166 (.123)	-.103 (.121)	-.146* (.070)
mother no school	.043 (.050)	-.053 (.058)	.085 (.117)	-.063 (.095)	-.039 (.029)	.002 (.025)
mother vocational training	-.014 (.024)	-.013 (.061)	-.048 (.068)	-.277** (.089)	.070 (.046)	.136*** (.030)
mother higher education	.021 (.036)	-.012 (.059)	-.197* (.094)	-.535*** (.089)	.168* (.070)	.380*** (.068)
constant	.126** (.046)	.090 (.048)	.345*** (.080)	.631*** (.093)	.120** (.041)	.023 (.030)
N	2819	2525	2819	2525	2819	2525
Adjusted R^2	.028	.018	.067	.086	.047	.071

* p < 0.05; ** p < 0.01; *** p < 0.001

Source: SOEP 1984-2017. Note: author's calculations. The table displays results from a regression of educational outcomes on externalising behaviour (dummy variable, 1 if the offspring is associated with externalising behaviour, 0 otherwise). All models are linear probability models. They are estimated separately for males and females and include cognitive abilities and dummies on mother's and father's education. Standard errors are clustered at the individual level.

Lastly, Papageorge et al. (2016) finds a wage premium for individuals who have been reported to show misbehaviour in school. However, I find no significant difference in wages between individuals who are and who are not associated with externalising behaviour in my sample, as reported in table 12. Excluding the control variable cognition increases my sample, but does not change the fact that there is no significant relationship between misbehaviour and wages. Comparing columns (3), (4) and (5), we can observe that the coefficients on individual's education are higher in the smaller sample than in the bigger ones. Similarly, there are significant differences in wages for all occupational sectors in

the bigger sample, while in the smaller sample estimates show fewer differences indicating more diversity of the population in the bigger sample. As reported in column (3), tenure does not have a significant effect on wages in the smaller sample indicating that after including experience, tenure does not explain much further. When estimating with a bigger sample, tenure does have a significant effect, however the coefficient is very low. Individuals who drop out of school earn on average not less than individuals whose highest educational achievement is a high school degree, as reported in columns (2)-(5). This simply means that dropping out of school per se does not significantly affect wages since individuals who dropped out of school can for example finish afterwards some kind of vocational training and still achieve an average wage. Furthermore, as expected, females earn by up to 40 percent less than males.

Table 11: Estimated results of ordered probit models: marginal effects of being associated to externalising behaviour on educational achievement

	(1) males	(2) females
Marginal effect of being associated to externalising behaviour on dropping out of school	-.080** (.026)	.007 (.037)
Marginal effect of being associated to externalising behaviour on having a high school degree	-.110* (.054)	.005 (.027)
Marginal effect of being associated to externalising behaviour on completing a vocational training	.061*** (.012)	-.006 (.032)
Marginal effect of being associated to externalising behaviour on having a higher education degree	.129 (.080)	-.006 (.032)

* p < 0.05; ** p < 0.01; *** p < 0.001

Source: SOEP 1984-2017. Note: author's calculations. All models are ordered probit models estimated separately for males and females. The table displays marginal effects of being associated to externalising behaviour (dummy variable, 1 if the offspring is associated with externalising behaviour, 0 otherwise) on educational outcomes. The models include all dummies on mother's and father's educational attainment. Standard errors are clustered at the individual level.

I conduct a supplementary data analysis regressing the outcomes of interest on potentially high externalising individuals which are defined as being in the fourth quartile of plasticity and the first quartile of stability, i.e. very high plasticity and very low stability. Results remain substantially unchanged as reported in tables A16, A17 and A18, section D.2. Loosening up the specification of externalising behaviour, i.e. extending the definition to the third quartile of plasticity and lower than the median of stability, yields entirely insignificant results.

Table 12: Log hourly wages regressed on externalising behaviour

	log(wage) (1) both	log(wage) (2) both	log(wage) (3) both	log(wage) (4) both	log(wage) (5) both
externalising behaviour	-.002 (.147)	-.079 (.096)	-.155 (.096)	-.140 (.075)	
female	-.337*** (.069)	-.248*** (.057)	-.269*** (.052)	-.297*** (.050)	-.404*** (.010)
cognition	.055 (.038)	.032 (.034)	.027 (.034)		
experience		.054*** (.007)	.048*** (.007)	.041*** (.005)	.035*** (.001)
experience ²		-.001*** (.000)	-.001*** (.000)	-.001*** (.000)	-.001*** (.000)
dropped out of school		-.091 (.100)	-.167 (.137)	-.025 (.052)	-.027 (.020)
vocational training		.166** (.059)	.203*** (.054)	.123** (.040)	.125*** (.011)
higher education degree		.623*** (.074)	.408*** (.078)	.290*** (.051)	.338*** (.016)
tenure			.004 (.003)	.006 (.002)	.008** (.000)
occupational sector					
0			.476** (.151)	.603*** (.131)	.622*** (.036)
1			.228 (.157)	.347** (.117)	.824*** (.024)
2			.523*** (.107)	.728*** (.089)	.834*** (.022)
3			.322*** (.074)	.482*** (.067)	.645*** (.020)
4			.142 (.085)	.317** (.073)	.480*** (.021)
5			.189* (.077)	.209** (.078)	.337*** (.022)
6			.407** (.156)	.449*** (.107)	.303*** (.039)
7			.197** (.074)	.264*** (.073)	.370*** (.021)
8			.173* (.080)	.269** (.085)	.337*** (.022)
constant	7.683*** (.089)	7.488*** (.102)	7.013*** (.208)	7.056*** (.105)	6.483*** (.036)
N	5548	5530	4070	16104	434685
Adjusted R^2	.045	.330	.479	.387	.479

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Source: SOEP 1984-2017. Note: author's calculations. All models are linear probability models and include a time index. Columns (1)-(4) display results from a regression of the log of hourly wage on externalising behaviour (dummy variable, 1 if the offspring is associated with externalising behaviour, 0 otherwise); columns (3)-(5): The estimated equations include a variable denoting the industry in which the company or institution where the individual is employed is active for the most part and a variable on the occupational sector of the firm (occupational sector 9 is omitted); column (5) displays results of the wage regression without the variable externalising behaviour. Standard errors are clustered at the individual level.

6 Conclusion

While the effects of non-cognitive skills on education and labour market outcomes have received increasing attention in recent years, misbehaviour has gone largely untouched in the economic literature. Though misbehaviour is generally seen as largely unproductive, this thesis suggests that externalising behaviour is positively related to certain labour market outcomes and higher intergenerational mobility.

Given that I find a significant relationship between externalising behaviour and occupational decisions, it is likely that misbehaviour influences employment and a variety of other life-cycle outcomes as well. Both prior research and my findings may point to the potential of putting greater emphasis on misbehaviour in future research.

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A Appendix Tables

Table A13: Distribution of offspring by educational attainment and quartiles of plasticity and stability (relative frequencies); Source: SOEP 1984-2017

	quartiles of plasticity				quartiles of stability			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
school-leaving degree								
Secondary school degree	33.91	27.66	23.56	21.07	28.79	24.41	28.77	24.29
Intermediate school degree	25.31	30.82	29.53	32.40	22.29	27.59	30.84	36.84
Technical school degree	3.57	6.33	5.71	9.02	3.36	6.12	6.83	8.14
Upper secondary degree	18.24	20.88	27.49	24.63	24.63	26.71	20.36	19.74
Other degree	7.17	3.14	3.90	2.50	6.25	4.52	3.53	2.57
Dropout, no school degree	4.35	2.72	1.99	2.59	5.47	2.39	2.31	1.65
No school degree yet	7.46	8.44	7.82	7.79	9.21	8.26	7.34	6.78
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Total No. of observations	5,429	5,259	5,432	5,444	5,123	5,437	5,548	5,456
higher education degree								
University of applied sciences	45.03	33.27	36.59	29.33	28.43	43.99	31.49	34.84
University	53.91	59.63	57.64	61.33	69.57	52.34	57.45	56.78
University abroad	0	0.93	0.96	7.56	0.91	0	8.04	1.92
Upper school of engineering, Higher technical college (east Germany)	0	3.36	2.17	0	0	2.28	0	3.14
PhD, Habilitation	0.42	1.31	0.84	1.33	0.91	0.38	1.01	1.92
Dual studies, Professional academy	0.42	1.50	1.56	0.45	0.18	0.88	2.01	1.05
other types of university (since 2014)	0.22	0	0.24	0	0	0.13	0	0.35
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Total No. of observations	473	535	831	675	552	791	597	574
vocational degree								
Apprenticeship	74.93	74.65	72.61	65.46	72.51	73.57	72.75	69.32
Vocational school	13.35	12.51	14.04	15.53	14.49	13.94	15.47	11.73
Healthcare school (until 1999)	0.43	2.12	4.07	3.76	0.58	1.49	2.97	4.63
Technical school	5.38	8.13	4.56	8.09	6.93	7.70	4.85	6.75
Civil service training	3.17	0.04	2.29	3.26	3.22	1.42	1.15	3.16
Other degree	2.74	2.52	2.43	3.90	2.27	1.84	2.81	4.41
Completed vocational training	0	0.03	0	0	0	0.04	0	0
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Total No. of observations	3,027	2,781	2,800	2,820	2,423	2,819	3,031	3,155

B Offspring-to-parents Matches

Matching offspring with parents can be done in two ways: first, if both parents and their children participated in the SOEP survey, then information on parents is always self-reported, while information on the children is either reported by parents if the child is below age 12 at the time of the survey or is self-reported by children aged 12 and older. Adult offspring can also be matched

with their parents even if they do not live (anymore) in the same household. Second, if children participate in the SOEP survey, but one parent or both do not, then information on both the child and the parents is reported by the child.

Furthermore, the retrospective information on the professional occupation of the father and the mother when the respondent was 15 years old is provided by a survey called BIOPAREN which was developed as intergenerational aspects of individuals became more prevalent (Schnitzlein et al., 2018).

C Design Weights

The SOEP consists of several subsamples starting at different points in time. Because of the different sample sizes and the resulting implicit drawing probabilities, a weighting of the partial samples of the SOEP is necessary if one wants to evaluate all observations together. These differences are taken into account by so called design weights, which I use throughout the data analysis. For more information on the derivation of the design weights, see Spiess (2005).

D Supplementary Data Analysis

D.1 Controlling for cognition

Table A14 shows that my main results are robust to including the variable cognition which limits my sample substantially. Males who are associated with externalising behaviour are 16-22 percent less likely to choose the same occupation as either parent. Estimating separately for choosing the same as mother's occupational belonging yields insignificant results when the variable cognition is included. Using the retrospective information on parents' occupational belonging, I find that males are 17-21 percent less likely to choose the same occupation as either parent, as reported in columns 5-7. Males are 6 percent less likely to choose the same occupation as either parent if cognitive abilities increase by one unit.

Table A15 reports that individuals who are associated with externalising behaviour are less likely to choose any occupational sector but belonging to the armed forces, occupation of professionals, sales or craft. The latter being positively related to misbehaviour as reported in Panel B, columns 3 and 4. In particular, males are more likely to become a craftsmen if they have not finished a higher education. Males are more likely to belong to the occupational sector of technical and associate professionals if cognition increases by one unit or if they have finished a vocational training compared to males who have a high school degree. In contrast, individuals are less likely to belong to the two lowest paying sectors if cognition increases by one unit. They are 6 percent less

likely to choose an elementary occupation if they have a higher education degree compared to individuals who have finished a high school.

Table A14: Same occupation as either parents' occupation regressed on externalising behaviour

	at offspring's age of 15						
	same occ as either parent's occ	same occ as either parent's occ	same occ as either parent's occ	same occ as mother's occ	same occ as either parent's occ	same occ as either parent's occ	same occ as either parent's occ
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	males	males	males	males	males	males	males
externalising behaviour	-.215*** (.051)	-.194** (.066)	-.160* (.078)	-.054 (.029)	-.196*** (.048)	-.206** (.064)	-.174* (.070)
cognition	-.046 (.024)	-.045 (.024)	-.040 (.027)	-.013 (.019)	-.060** (.022)	-.065** (.022)	-.061* (.024)
age		.009 (.010)	.009 (.010)	.001 (.006)		.009 (.010)	.011 (.011)
age ²		-.000 (.000)	-.000 (.000)	-.000 (.000)		-.000 (.000)	-.000 (.000)
dropped out of school		-.069 (.089)	-.042 (.087)	-.026 (.094)		-.045 (.089)	.083 (.090)
vocational training		-.079 (.062)	-.050 (.055)	-.090 (.055)		.023 (.054)	.039 (.054)
higher education		.039 (.100)	.053 (.099)	-.060 (.062)		.166 (.094)	.178 (.102)
father no school			-.055 (.188)				.330* (.142)
father vocational training			-.086 (.075)				-.010 (.071)
father higher education			-.234 (.160)				.030 (.155)
mother no school			-.124 (.101)	-.127* (.058)			-.042 (.115)
mother vocational training			-.101 (.072)	-.074 (.058)			-.097 (.071)
mother higher education			-.004 (.090)	.132 (.086)			.043 (.093)
constant	.338*** (.029)	.284 (.173)	.403 (.051)	.233 (.135)	.327*** (.026)	.184 (.178)	.203 (.216)
N	3008	3008	2819	2896	2945	2945	2756
Adjusted R^2	.018	.032	.051	.055	.026	.036	.055

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Source: SOEP 1984-2017. Note: author's calculations. All models are linear probability models and include a variable on cognitive abilities. Standard errors are clustered at the individual level. Columns (1)-(3): regression of male offspring choosing the same occupation as either parent's occupation on externalising behaviour (dummy variable, 1 if the offspring is associated with externalising behaviour, 0 otherwise); column (4): male offspring choosing the same occupation as the mother is regressed on externalising behaviour while controlling for mother's education; columns (5)-(7): The dependent variable $sameocc_{i,t}$ is 1 if male i chooses the same occupation as the parent's occupation which the mother/father has belonged to when the offspring was 15 years old. The retrospective information on parent's occupation is provided by the offspring.

Table A15: Occupational choice by sector regressed on externalising behaviour

	occ. sector 0 (1) males	occ. sector 0 (2) males	occ. sector 1 (3) males	occ. sector 1 (4) males	occ. sector 3 (5) males	occ. sector 3 (6) males	occ. sector 4 (7) males	occ. sector 4 (8) males
Panel A								
externalising behaviour	-.024*	-.027	-.028**	-.034**	-.103	-.135*	-.082***	-.082***
	(.011)	(.014)	(.009)	(.011)	(.060)	(.063)	(.022)	(.023)
cognition	.004	.004	.006	.006	.035*	.034*	-.008	-.008
	(.005)	(.005)	(.006)	(.006)	(.017)	(.017)	(.016)	(.016)
dropped out of school		-.012		-.002		.033		-.013*
		(.009)		(.012)		(.059)		(.046)
vocational training		.009		.018		.119**		-.002
		(.014)		(.011)		(.040)		(.038)
higher education		-.019*		.001		.013		-.006
		(.008)		(.010)		(.045)		(.051)
constant	.021**	.019*	.023***	.014*	.189***	.124***	.093***	.096**
	(.007)	(.008)	(.006)	(.007)	(.023)	(.023)	(.016)	(.033)
N	3008	3008	3008	3008	3008	3008	3008	3008
Adjusted R^2	.001	.004	.002	.005	.010	.030	.003	.002
	occ. sector 6 (1) both	occ. sector 6 (2) both	occ. sector 7 (3) males	occ. sector 7 (4) males	occ. sector 8 (5) males	occ. sector 8 (6) males	occ. sector 9 (7) both	occ. sector 9 (8) both
Panel B								
externalising behaviour	-.014**	-.014**	.370*	.399***	-.052**	-.053*	-.045***	-.039***
	(.005)	(.005)	(.153)	(.108)	(.016)	(.023)	(.009)	(.009)
cognition	-.003	-.003	-.008	.005	-.028*	-.027*	-.035*	-.034*
	(.006)	(.007)	.027	(.025)	(.013)	(.013)	(.015)	(.015)
dropped out of school		-.014		-.113		-.014		.036
		(.006)		(.087)		(.033)		(.032)
vocational training		.006		-.086		.008		-.016
		(.011)		(.062)		(.030)		(.017)
higher education		-.003		-.449***		-.072***		-.061***
		(.011)		(.058)		(.021)		(.015)
constant	.016**	.014*	.359***	.452***	.078***	.082***	.063***	.075***
	(.006)	(.006)	(.031)	(.052)	(.016)	(.020)	(.010)	(.015)
N	5669	5669	3008	3008	3008	3008	5669	5669
Adjusted R^2	.001	.003	.014	.074	.014	.020	.025	.033

* p < 0.05; ** p < 0.01; *** p < 0.001

Source: SOEP 1984-2017. Note: author's calculations. Regressions of occupational choice (dummy that takes value 1 if the individual is in a given occupation, 0 otherwise). All models are linear probability models, include the variable cognition and are estimated separately for males, females or both together. For greater clarity only the results of those sectors where the coefficient on externalising behaviour is significant are displayed, meaning that there is a significant difference in choosing a particular occupational sector between individuals who are and who are not associated with externalising behaviour. Standard errors are clustered at the individual level.

Occupational sectors are as defined in table 2: (0) Armed Forces (1) Legislators, Senior Officials & Managers (2) Professional (3) Technical & Associate Professional (4) Clerical & Secretarial (5) Service & Sales (6) Skill Agricultural & Fishery Workers (7) Craft & Related (8) Plant & Machine (9) Elementary.

D.2 High externalising behaviour

In this subsection, I focus on individuals who are associated with high externalising behaviour which is defined as being in the fourth quartile of plasticity and first quartile of stability. Results reported in table A16 show that all coefficients are by a few percentage points lower than when regressing on the main and broader definition of externalising behaviour, i.e. being in the fourth quartile of plasticity and lower than the median of stability.

Table A16: Same occupation as either parent's occupation regressed on high externalising behaviour

	<i>at offspring's age of 15</i>						
	same occ as either parent's occ	same occ as either parent's occ	same occ as either parent's occ	same occ as mother's occ	same occ as either parent's occ	same occ as either parent's occ	same occ as either parent's occ
	(1) males	(2) males	(3) males	(4) males	(5) males	(6) males	(7) males
high externalising behaviour	-.191*** (.049)	-.148** (.054)	-.103 (.065)	-.043 (.031)	-.172*** (.044)	-.161*** (.052)	-.126* (.060)
cognition	-.047 (.024)	-.047 (.024)	-.041 (.026)	-.013 (.019)	-.062** (.022)	-.066** (.022)	-.062** (.024)
age		.009 (.010)	.009 (.010)	.001 (.006)		.008 (.010)	.011 (.011)
age ²		-.000 (.000)	-.000 (.000)	-.000 (.000)		-.000 (.000)	-.000 (.000)
dropped out of school		-.068 (.089)	-.042 (.086)	-.026 (.094)		.045 (.089)	.084 (.091)
vocational training		-.081 (.062)	-.052 (.055)	-.091 (.055)		.022 (.054)	.038 (.054)
higher education		.032 (.101)	.049 (.100)	-.061 (.062)		.159 (.095)	.173 (.104)
father no school			-.054 (.188)				.332 (.142)
father vocational training			-.184 (.076)				-.006 (.071)
father higher education			-.254 (.162)				.009 (.159)
mother no school			-.124 (.101)	-.127* (.058)			-.042 (.115)
mother vocational training			-.105 (.072)	-.075 (.058)			-.100 (.071)
mother higher education			-.003 (.090)	.132 (.086)			.043 (.093)
constant	.336*** (.029)	.286 (.174)	.407 (.218)	.234 (.135)	.326*** (.027)	.186 (.179)	.206 (.218)
N	3008	3008	2819	2896	2945	2945	2756
Adjusted R^2	.016	.030	.049	.055	.024	.033	.053

* p < 0.05; ** p < 0.01; *** p < 0.001

Source: SOEP 1984-2017. Note: author's calculations. All models are linear probability models and include a variable on cognitive abilities. Standard errors are clustered at the individual level. Columns (1)-(3): regression of male offspring choosing the same occupation as either parent's occupation on high externalising behaviour (dummy variable, 1 if the offspring is associated with high externalising behaviour, 0 otherwise); column (4): male offspring choosing the same occupation as the mother is regressed on high externalising behaviour while controlling for mother's education; columns (5)-(7): The dependent variable $sameocc_{i,t}$ is 1 if male i chooses the same occupation as the parent's occupation which the mother/father has belonged to when the offspring was 15 years old. The retrospective information on parent's occupation is provided by the offspring.

In particular, male offspring who is associated with high externalising behaviour is 15-19 percent less likely to choose the same occupation as either parents' occupation, as reported in columns (1) and (2). However, after including parents' education, the coefficient gets insignificant. There is no significant

difference in choosing the same as the mother's occupation between males who are and who are not associated with high externalising behaviour. Using the retrospective information on parents' occupational belonging, the estimated results remain substantially unchanged showing that males who are associated with high externalising behaviour are 13-17 percent less likely to choose the same occupation as either parent as reported in columns 5-7. Similar to results reported in table A14, males are 6-7 percent less likely to choose the same occupation as either parent if cognition increases by one unit.

Table A17 reports that individuals who are associated with high externalising behaviour are less likely to choose any occupational sector but armed forces, service and sales or craft and related occupations. Comparing with tables 8 and A15, we can observe that independent of the broadness of definition and included controls, all tables report that misbehaving males are less likely to choose to belong to clerical and secretarial and plant and machine occupations. Likewise, both gender are less likely to choose skill agricultural and fishery occupations. All other results vary to a certain extent when comparing coefficients.

Table A18 reports estimates on regressing educational outcomes on high externalising behaviour. Comparing with estimates reported in table 10, there are some differences between results estimated for individuals who are associated with externalising behaviour and high externalising behaviour. While males associated with externalising behaviour are less likely to drop out of school, males with very high measures are not significantly different than average males regarding the dropout rate. Males with high measures of externalising behaviour are way more likely to finish a vocational training than the rest. Furthermore, while males are 13 percent less likely to finish a higher education, females are 26 percent more likely to have a higher education degree if associated with externalising behaviour.

Table A17: Occupational choice by sector regressed on high externalising behaviour

Panel A	occ. sector 0 (1) males	occ. sector 0 (2) males	occ. sector 1 (3) both	occ. sector 1 (4) both	occ. sector 2 (5) males	occ. sector 2 (6) males	occ. sector 3 (7) males	occ. sector 3 (8) males	occ. sector 4 (9) both	occ. sector 4 (10) both
high externalising	-.024*	-.031	-.024**	-.031**	-.132***	-.051**	-.129**	-.180***	-.171***	-.146***
behaviour	(.011)	(.016)	(.007)	(.011)	(.026)	(.016)	(.045)	(.052)	(.028)	(.027)
cognition	.004	.004	.009	.008	.027	.009	.036	.034	-.014	-.014
	(.005)	(.005)	(.007)	(.007)	(.017)	(.011)	(.017)	(.017)	(.029)	(.028)
dropped out of school		-.012		.012		.021		.034		.043
		(.009)		(.012)		(.040)		(.059)		(.062)
vocational training		.009		.019		-.015		.120		.013
		(.014)		(.011)		(.015)		(.040)		(.048)
higher education		-.020		.038		.625		.007		-.078
		(.008)		(.022)		(.064)		(.046)		(.047)
constant	.021	.019	.023	.009	.109	.055	.189	.124	.173	.173
	(.007)	(.008)	(.007)	(.005)	(.017)	(.013)	(.023)	(.023)	(.029)	(.044)
N	3008	3008	2661	2661	3008	3008	3008	3008	2661	2661
Adjusted R^2	.000	.004	.003	.008	.011	.361	.010	.031	.004	.011
Panel B	occ. sector 6 (1) both	occ. sector 6 (2) both	occ. sector 7 (3) males	occ. sector 7 (4) males	occ. sector 7 (5) females	occ. sector 7 (6) females	occ. sector 8 (7) males	occ. sector 8 (8) males	occ. sector 9 (9) both	occ. sector 9 (10) both
high externalising	-.014**	-.014*	.528***	.511***	-.026**	-.018**	-.050**	-.063**	-.042***	-.035***
behaviour	(.005)	(.006)	(.054)	(.058)	(.008)	(.006)	(.016)	(.023)	(.011)	(.010)
cognition	-.003	-.003	-.010	.003	.013**	.013**	-.029*	-.027*	-.035*	-.034*
	(.006)	(.007)	(.027)	(.025)	(.005)	(.005)	(.013)	(.013)	(.015)	(.015)
dropped out of school		-.014*		-.114		-.003		-.014		.036
		(.006)		(.087)		(.018)		(.033)		(.032)
vocational training		.006		-.090		-.006		.008		-.016
		(.011)		(.062)		(.012)		(.030)		(.017)
higher education		-.004		-.434***		-.032**		-.074***		-.062***
		(.011)		(.056)		(.011)		(.021)		(.015)
constant	.016**	.014*	.358***	.453***	.025***	.032**	.078***	.081***	.062***	.074***
	(.006)	(.006)	(.031)	(.052)	(.007)	(.011)	(.016)	(.020)	(.010)	(.015)
N	5669	5669	3008	3008	2661	2661	3008	3008	5669	5669
Adjusted R^2	.001	.002	.024	.080	.007	.010	.014	.020	.024	.032

* p < 0.05; ** p < 0.01; *** p < 0.001

Source: SOEP 1984-2017. Note: author's calculations. Regressions of occupational choice (dummy that takes value 1 if the individual is in a given occupation, 0 otherwise). All models are linear probability models, include the variable cognition and are estimated separately for males, females or both together. For greater clarity only the results of those sectors where the coefficient on high externalising behaviour is significant are displayed, meaning that there is a significant difference in choosing a particular occupational sector between individuals who are and who are not associated with high externalising behaviour. Standard errors are clustered at the individual level.

Occupational sectors are as defined in table 2: (0) Armed Forces (1) Legislators, Senior Officials & Managers (2) Professional (3) Technical & Associate Professional (4) Clerical & Secretarial (5) Service & Sales (6) Skill Agricultural & Fishery Workers (7) Craft & Related (8) Plant & Machine (9) Elementary.

Table A18: Educational outcomes regressed on high externalising behaviour

	dropped out of school (1) males	dropped out of school (2) females	vocational training (3) males	vocational training (4) females	higher education (5) males	higher education (6) females
externalising behaviour	-.030 (.017)	.034 (.041)	.423*** (.054)	-.205 (.140)	-.126*** (.030)	.259* (.119)
cognition	.006 (.008)	.003 (.012)	-.011 (.029)	.000 (.033)	.032 (.018)	.009 (.020)
father no school	-.028 (.075)	.121 (.102)	.096 (.169)	-.148 (.140)	-.096* (.040)	-.016 (.043)
father vocational training	-.078 (.036)	-.006 (.047)	.262*** (.076)	.109 (.096)	-.096 (.057)	-.021 (.046)
father higher education	.223 (.154)	.687*** (.146)	.050 (.142)	-.196 (.122)	-.103 (.131)	-.148* (.071)
mother no school	.043 (.050)	-.053 (.058)	.085 (.117)	-.062 (.095)	-.039 (.029)	.001 (.026)
mother vocational training	-.015 (.024)	-.012 (.061)	-.048 (.068)	-.279** (.090)	.075 (.046)	.134*** (.031)
mother higher education	.021 (.046)	-.012 (.047)	-.198* (.080)	-.532*** (.093)	.168* (.041)	.375*** (.031)
constant	.125** (.046)	.092 (.048)	.349*** (.080)	.620*** (.093)	.120** (.041)	.026 (.030)
N	2819	2525	2819	2525	2819	2525
Adjusted R^2	.028	.018	.073	.077	.051	.075

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Source: SOEP 1984-2017. Note: author's calculations. The table displays results from a regression of educational outcomes on high externalising behaviour (dummy variable, 1 if the offspring is associated with high externalising behaviour, 0 otherwise). All models are linear probability models. They are estimated separately for males and females and include cognitive abilities and dummies on mother's and father's education. Standard errors are clustered at the individual level.

D.3 Logit model

In this subsection, I estimate logistic regressions and find that externalising behaviour is associated with lower intergenerational persistence in occupational choice. In particular, for a one-unit increase in externalising behaviour we expect a 1.572 decrease in the log-odds of choosing the same occupation as either parents' occupation, holding all controls constant. Furthermore, I find that individuals are less likely to choose being a clerk or belonging to an elementary occupation if they are associated to externalising behaviour. In contrast, I find a positive relationship between being associated with externalising behaviour and being a craft worker. This is in line with my findings reported in tables 8, A15 and A17.

Table A19: Same occupation as either parent's occupation regressed on externalising behaviour by estimating a logit model

	same occ as either parent's occ (1) males	same occ as either parent's occ (2) males	same occ as either parent's occ (3) males	same occ as mother's occ (4) males	same occ as father's occ (5) males
externalising behaviour	-1.572** (.484)	-1.490* (.582)	-1.332* (.653)	-2.904* (1.169)	-1.008 (.559)
cognition	-.206 (.109)	-.208 (.111)	-.194 (.119)	-.121 (.155)	-.262 (.142)
age		.064 (.054)	.070 (.055)	.022 (.062)	.061 (.063)
age ²		-.001 (.001)	-.001* (.001)	-.001 (.001)	-.001 (.001)
dropped out of school		-.291 (.407)	-.174 (.382)	-.190 (.606)	.169 (.435)
vocational training		-.373 (.276)	-.245 (.250)	-.750 (.398)	-.176 (.281)
higher education		.184 (.434)	.265 (.438)	-.390 (.479)	.271 (.492)
father no school			-.242 (.809)		.380 (.661)
father vocational training			-.379 (.319)		.056 (.336)
father higher education			-1.110 (.951)		
mother no school			-.579 (.471)	-1.405* (.643)	
mother vocational training			-.483 (.321)	-.656 (.431)	
mother higher education			-.059 (.381)	-.639*** (.485)	
constant	-.681*** (.132)	-1.267 (.901)	-.779 (1.043)	-1.286 (1.046)	-2.156 (1.165)
N	3008	3008	2819	2896	2879
R ²	.016	.030	.047	.072	.020

* p < 0.05; ** p < 0.01; *** p < 0.001

Source: SOEP 1984-2017. Note: author's calculations. All models are logistic regression models and include a variable on cognitive abilities. Standard errors are clustered at the individual level; columns (1)-(3): regression of male offspring choosing the same occupation as either parent's occupation on externalising behaviour (dummy variable, 1 if the offspring is associated with externalising behaviour, 0 otherwise); column (4): male offspring choosing the same occupation as the mother is regressed on externalising behaviour while controlling for mother's education; column (5): male offspring choosing the same occupation as the father is regressed on externalising behaviour while controlling for father's education.

Table A20: Occupational choice by sector regressed on externalising behaviour by estimating a logit model

	occ. sector 4 (1) males	occ. sector 4 (2) males	occ. sector 7 (3) males	occ. sector 7 (4) males	occ. sector 9 (5) both	occ. sector 9 (6) both
externalising behaviour	-3.125** (1.205)	-3.125** (1.216)	1.563* (.756)	2.048*** (.492)	-3.555*** (1.051)	-3.455** (1.050)
cognition	-.098 (.184)	-.096 (.185)	-.033 (.116)	.021 (.118)	-.585** (.201)	-.570** (.206)
dropped out of school		-.158 (.558)		-.476 (.380)		.465 (.374)
vocational training		-.023 (.440)		-.364 (.256)		-.260 (.281)
higher education		-.070 (.625)		-3.903*** (.888)		-2.558*** (.648)
constant	-2.277*** (.195)	-2.249*** (.379)	-.579*** (.135)	-.192 (.212)	-2.865*** (.162)	-2.668*** (.231)
N	3008	3008	3008	3008	5669	5669
R ²	.008	.009	.011	.074	.057	.083

* p < 0.05; ** p < 0.01; *** p < 0.001

Source: SOEP 1984-2017. Note: author's calculations. Regressions of occupational choice (dummy that takes value 1 if the individual is in a given occupation, 0 otherwise). All models are logistic regression models, include the variable cognition and are estimated separately for males, females or both together. For greater clarity only the results of those sectors where the coefficient on externalising behaviour is significant are displayed, meaning that there is a significant difference in choosing a particular occupational sector between individuals who are and who are not associated with externalising behaviour. Standard errors are clustered at the individual level.

Occupational sectors are as defined in table 2: (0) Armed Forces (1) Legislators, Senior Officials & Managers (2) Professional (3) Technical & Associate Professional (4) Clerical & Secretarial (5) Service & Sales (6) Skill Agricultural & Fishery Workers (7) Craft & Related (8) Plant & Machine (9) Elementary.