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Conference Paper

It's not all about parents' education, it also matters what they do. Parents' employment and children's school success in Germany

Beiträge zur Jahrestagung des Vereins für Socialpolitik 2015: Ökonomische Entwicklung - Theorie und Politik - Session: Men and Women in the Workplace, No. G18-V2

Provided in Cooperation with:

Verein für Socialpolitik / German Economic Association

Suggested Citation: Hoffmann, Malte; Boll, Christina (2015) : It's not all about parents' education, it also matters what they do. Parents' employment and children's school success in Germany, Beiträge zur Jahrestagung des Vereins für Socialpolitik 2015: Ökonomische Entwicklung - Theorie und Politik - Session: Men and Women in the Workplace, No. G18-V2, ZBW - Deutsche Zentralbibliothek für Wirtschaftswissenschaften, Leibniz-Informationszentrum Wirtschaft

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Parents' employment and children's school success in Germany

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In this paper, we explore whether parents' time use, especially for employment, is significantly associated to their offspring's school success, beyond the well-established effects of education, income and demography. Our results indicate an employment channel from mothers to their kids. A nine year spell of maternal full-time work compared to an equivalent unemployment spell corresponds to an improved school performance that equals 19.9 % of its total range. Moreover, paternal job prestige and maternal secondary disparities are substantially linked to the outcome. Some results are sensitive to the partner context and the child's gender. We find income effects to depend on the partner specification and a negative effect of mothers' housework for daughters, pointing to a negative role model.

Keywords: school achievement, parental time-use, parental employment, role models

JEL Classification: D13, I24, J13, J16

Partial funding from the German Federal Ministry of Labour and Social Affairs (BMAS) for a research project whereof this study is part of is gratefully acknowledged. The full content of the study, any omissions and views expressed therein are in the sole responsibility of the authors.

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1 | Introduction

Recent literature recognizes that for Germany family background still features not only success in school but also later income in life (Schnitzlein 2013). Children whose parents have low educational attainment less often achieve tertiary education than children from different backgrounds (OECD 2012: 107-109). The educational divide begins before entering school and manifests in different school tracks. 61.0 % of students attending an upper secondary school, but only 12.2 % of students enrolled in a lower secondary school or an intermediate school have a parent that holds a high school certificate at home (Destatis and WZB 2013). Assuming the distribution of inborn talents being independent from the parental socioeconomic status, potential is wasted. Apart from normative concerns that arise here, negative long-term consequences for the economy are likely to occur. These refer to a lower economic growth path (Wößmann and Piopiunik 2009; Wößmann and Hanushek 2015), higher fiscal expenditures and lower revenues (Allmendinger et al. 2012). Higher expenditures do not only arise from higher transfer payments but also from a higher exposure of the more lowly educated to crime (Lochner and Moretti 2004; Machin et al. 2011). Tapping each child's potential is compelling also from an individual perspective. There are manifold individual benefits of schooling like a higher socioeconomic status later in life (Deckers et al. 2015), a larger set of opportunities or better decision making (Oreopoulos and Salvanes 2011), and higher life satisfaction (Cuñado and de Gracia 2012). Hence, the issue of parental background and child outcomes has evoked a large body of literature. The question arises if it is all about parents' education or which other factors influence children's educational pathway.

Indeed, when refining the term family background, parental education evolves as a strong predictor of a child's school success. Theoretically, the positive correlation can have two explanations: One is pure selection, i.e. better parents choose higher education, the other causal. In obtaining more education one becomes a better parent. Empirical evidence from the literature with respect to the causal effect is not unequivocal. Björklund and Salvanes (2010) find that parental education plays a minor role in explaining variation in children's school achievement. Also Black et al. (2005) provide evidence that, with one exception, parental education causally affects the child's education only to a low degree. The exceptions are mother-son pairs, where increased maternal educational attainment leads to increased attainment of their sons, too. Plug (2004), who uses a sample of adoptees, suggests only positive effects from father's education. Behrman and Rosenzweig (2002), who utilize data on pairs of identical twins, even find a negative, almost significant relationship between maternal education and the outcome.¹ To sum up and in accordance with Teachman (1987), there is evidence that parental education alone does not cover all relevant aspects of family background. The cited findings rather suggest that other attributes, which are more or less closely related to parental education, play a role.

¹ In adoptee samples, if children are randomly assigned to adoptive parents, genetic factors can be excluded in the transmission. In twin samples, differences due to genetics can be differenced out between twins.

Resuming to the selection argument, both parental education and other observables like parents' behavior, interests and attitudes could be driven by latent parental traits which also influence the child's school achievement. Parental education alone might, however, not be sufficient to capture these traits. In this case, other observables can complement parental education as input factors in the household production function, where child quality in terms of school success is the outcome. The idea of relevant parental traits for the 'production' of child quality is supported by the fact that unlike genetic information that may be transmitted by inheritance, social learning takes time. A large body of psychological research documents that personality traits of children are malleable and do not stabilize until late adolescence (Borghans et al. 2008). For example, the importance of a low time preference rate as a precondition of school success is highlighted by Becker and Mulligan (1997) who find that future orientation has to be learnt. In fact, time preference is more malleable than intelligence (Golsteyn et al. 2013). According to Deckers et al. (2015), time preference by itself has been found to be related with parental socioeconomic status (SES) which points to the importance of parental traits triggering both parental and child outcomes.

Relying on the above cited literature, it is likely that part of parents' heterogeneity beyond SES is captured by their time use decisions, particularly with respect to employment. Parental employment should notably relate to children's school outcomes. In fact, also this hypothesis is all too familiar. The literature on the effect of parental employment on children's outcomes is manifold (Goldberg et al. 2008). Most studies refer to maternal employment due to lacking variation for fathers in most data. Still, the findings are not unequivocal for mothers' employment either. A notable amount of studies refers to mothers' employment in pre-school years and its association to cognitive skills during elementary school measured e. g. by reading and math scores. Most of those studies find small negative effects of working moms (Ruhm 2004, Baker et al. 2008, Waldfogel et al. 2002) whereas others find no or only limited effects (Blau and Grossberg 1992, Baker and Milligan 2010).

Seminal work from Cunha and Heckman (2007) shows that early investments in children may exert long lasting influences. There are also indications that even earlier points in time matter: Currie (2009) mentions the potential significance of prenatal environment conditions. Typically, however, research focusses on the postnatal period. Hence, a strand of literature addresses the question whether early maternal employment during the child's age 0-5 significantly relates to the child's adult outcomes. The underlying assumption is that staying at home and caring for the children serves as an input in the child production function, paying off later in life, e. g. in higher earnings of the offspring. However, Gottschalk and Stinson (2012) find few significant differences between children's earnings at age 30 of working and stay-at-home-mothers. The question arises whether some of the effects fade over time. Addressing the performance of adolescents in various aspects, the evidence is once again mixed. Some studies report positive effects (Muller 1995, Ruhm 2008), negative effects (Bogensneider and Steinberg 1994) or no effects (Paulson 1996, Gottschalk and Stinson 2014). For example, Ruhm (2008) gives evidence for a small negative overall effect of maternal employment in the first ten years of a child's life on cognitive development and body weight of children aged 10/11. However, the findings heavily differ by parental home – the disadvantaged children benefiting from the mother's foot in the labour market whereas the more ad-

vantaged are more likely to be harmed. Also the negative effects found by Bogenschneider and Steinberg (1994) refer to two-parent households only. Muller (1995) shows that the test scores of eight graders on high schools are positively associated to maternal part-time employment and also, albeit to a lower extent, to full-time employment once children's time spent unsupervised after school is controlled for.

The cited literature clearly emphasizes the moderating effect of certain parental home variables on the relationship between maternal employment and children's school outcomes. Furthermore, many studies refer to a large time distance between the input and the output variables. With the study at hand, we fill these gaps. In a comprehensive methodological setting, we focus on the association of parental employment behavior during the child's compulsory school age and the child's school performance at the end of this phase, measured by the (expected) school leave degree. To this end, we use SOEP data from about 800-1,500 households. To account for different family structures, we split the analyses into two specifications: One of which does not consider any partner data and so includes data from all parents, either if they are (temporarily) lone or not. The other one considers stable couples. To account for sample selection effects we estimate different specifications which are also checked for robustness, amongst others by using grade point average as another indicator of achievement.

This paper contributes to the existing literature in mainly three aspects.

First, we employ a very fine-grained specification of parental employment. This (a) applies to the incorporated longitudinal information: Instead of referring to a parent's labour market status in a distinct year we employ his or her employment biography during the child's whole compulsory school time between age 7 and age 15. We (b) differentiate by parents' work volume. This holds for the retrospective information regarding experience (years of full-time vs. part-time experience) and for the current labour market status. With occupational prestige and by disentangling unemployment from other out-of-labour market spells we consider some qualitative aspects of work and non-work, respectively. By differentiating between both parents' and children's gender in our analyses we are able to establish gender role effects.

Secondly, we comprehensively document further characteristics of the parents and the family that are likely to be associated with the children's school outcome. For example, by taking parents' education and income into account, we address parents' heterogeneity in employment decisions *within* education and income groups, respectively. Thus, as soon as parents' unobserved ability correlates with formal education, variation in parental employment within educational groups may be treated as exogenous. Furthermore, reverse causation is excluded since the measurement of parents' employment refers to the time prior to the child's outcome measure in the age range 15-17. We show that the employment associations to the child outcome are of importance even when a wide range of demographics, partner context, family disruptions, parents' habits, interests and milieu factors are taken into account. A novelty of the study at hand is that we incorporate an index measuring certain parental leisure time uses, habits and attitudes. This index is created to capture heterogeneity of the social context as well as family life aspects. We show that it is the mother's features which are particularly relevant for the school outcome..

Thirdly, we examine the different associations of the named potential influences in different partner contexts. To this end, we stratify samples by the use of partner information. In more detail, we compare effects for children living in stable couples with those in households where partner information is disregarded (comprising single parents as well). This setting reveals that some characteristics of mothers and fathers are highly intriguing if partner information is disregarded but lose relevance otherwise, once again i. a. pointing to gender roles.

The results of our study notably confirm our expectations. Despite the leverage effect of parental education exerting a strong influence also in our study, parental employment behavior proves statistical significance even when parental education, income, demographics and secondary disparities in habits are controlled for. In more detail, our results indicate an employment channel from mothers to their kids. A nine years maternal full-time spell compared to an unemployment spell of equivalent time corresponds to an improved school performance amounting to 19.9 % of its total range. So does a maximum increase of the secondary disparities' index value, with a performance increase amounting to 26.7 % of its total range. Mothers' time use and interests are more decisive than fathers' in all models which points to the importance of joint time with the children as a transmission channel. By contrast, an 11 hours' increase of a mother's daily housework during primary school is related to a child performance decrease of 12.3 % of total performance range. The effect is triggered by girls only. We take this as a negative role model effect from mothers to their daughters. Admittedly, high maternal working hours during primary school are contra-productive as well, but the negative association is restricted to couple households and even here, the effects are weak and of mixed significance. As expected, associations between income and the output variable are diminished when employment behavior is controlled for. Particularly, labour income does not carry an extra positive effect. We conclude that employment effects are rather transmitted via role models than via pecuniary advantages. Moreover, the fathers' job prestige is substantial in all samples. The results are robust against various model modifications. Some further results beyond maternal housework are sensitive to the gender of the child.

The paper is organized as follows. Section 2 discusses the theoretical considerations and the derived hypotheses thereof. Section 3 describes the data, the variables and the samples used. Section 4 presents the econometric specification. Section 5 discusses the main results and Section 6 portrays results from split analyses by the child's gender and various robustness checks. Section 7 concludes.

2 | Hypotheses and related literature

In this section, we introduce the hypotheses that motivate our empirical analyses and thereby refer to the relevant literature. We first argue that beyond standard SES related vari-

ables like income and education, there is parental heterogeneity that is decisive for the child's performance in school.

Hypothesis H1

We hypothesize that parental habits which signal openness, social activeness and aspirations are positively associated to the child's school success. We expect the effect to be diminished when parents' human capital and employment behavior is controlled for.

There is evidence that parental aspirations are substantially heterogeneous across similar levels of formal education (Ehmke 2009; Paulus and Blossfeld 2007). As the measurement of aspirations is typically rather complicated or subject to data limitations, we use a different approach. It attempts to shed more light on family life and parental aspirations by regarding indicators of parental interests and activities. Certain characteristics relate to personal aspirations and also to milieus in which certain norms for activities, attitudes and aspirations are hold up. Because the question of whether the milieu shapes personal characteristics or the milieu is chosen according to personal preferences is difficult to answer, we simply refer to the observed characteristics and argue through an indirect channel. We thus construe aspirations from family life, expressed by personal interests and behavior.

Hypothesis H2

There is a positive income association to children's school performance. However, we expect that the association is weakened when parents' employment behavior is controlled for. This particularly applies to labour income.

Income has been found both positively associated (as in Dahl and Lochner 2012 or Duncan et al. 2011) and non-significantly associated (as in Løken 2010 or Tamm 2008) with the child's success in school. Several possible transmission channels were suggested in the literature: Direct effects include enhanced possibilities to purchase inputs favorable for the school achievement (Becker 1965), e.g. by affording private tuition, moving to a better neighborhood, a reduced risk of stigmatization or even less parental stress (McLoyd 1990). Schneider 2004 shows for West Germany that a higher maternal education does not prevent the household from purchasing private tutoring and homework help. Others pointed out that low household income can increase the risk of separation and divorce (D'Addio 2007: 31f). The latter occurrences are negatively related to the child's school achievement (Björklund and Sundström 2006).

Hypothesis H3

In comparison to unemployment spells, parental employment experience in terms of full-time or part-time years and even voluntary out-of-labor force spells are more advantageous with respect to the child's school achievement.

Indirect effects arising from income refer to parents' underlying behavior. The behavioral channel predicts that effects on the child's outcome differ between different kinds of household income. In this context, parental employment plays a key role. As discussed in Section 1, empirical evidence on the linkage of maternal employment to children's educational success is manifold but inconsistent. This is not surprising given the time-, extent- and effect-

variant nature of this characteristic. It can, for instance, be important at which age of the child parental employment is measured and how it is measured.

From a theoretic perspective, parental employment can affect the child's development through at least four interrelated channels, which are: (1) Time spent together with or in the presence of the child, (2) the household's monetary endowment, (3) the transmission of values through role modeling, and (4) the family stress level. Hence, employment can carry far more than monetary benefits. Each of the following hypotheses H3-H6 addresses one or more of the named transmission channels in a way that is suitable for empirical testing.

With regard to the effect of parental unemployment there is evidence for a negative association between paternal job loss and school achievements (Gregg 2012). Bratberg et al. (2008) on the other hand find no long term effect on children's earnings for Norwegian data. Rege et al. (2011) find a negative effect on school performance only for a father's job loss, but the effect could not be confirmed for maternal job losses. Apart from the scars that arise through the lay-off, unemployment leads to the opposite effects of the previously described benefits of employment and is also associated with arising psychological problems and low self-esteem (Ström 2003, Sheeran et al. 1995). Low self-esteem, in particular, is considered to change parental expectations for their children to the negative (Kaplan et al. 2001). This implies a need to differentiate between (involuntary) unemployment and (voluntary) OLF time.

Hypothesis H4

Maternal employment, for girls in particular, is positively associated with the outcome through role modeling.

A fourth channel arises when the idea of a parental role model is applied. Employment can signal the child commitment, social participation and in the case of maternal employment also a modern view of a woman's role in society (Röhr-Sendlmeier 2009; 2011). Often, the role model is interpreted as an intergenerational transmitter of attitudes. Fernandez, Fogli, and Olivetti (2004) as well as Morrill and Morrill (2013) find that women are more likely to participate in the labor force if their mother had already worked. This correlation also remains stable between mother-in-law/daughter-in-law pairs. With regards to other positive effects, Alessandri (1992) find that children with employed single-parent mothers have greater self-esteem than children with non-employed mothers and girls whose mothers are full-time employed had higher academic achievement. Finally, Anger (2012) notes that the older children get the more similar their personality becomes to the parental one. In terms of maternal autonomy and employment, this might have a positive influence on a child's, in particular a girl's, achievement.

Hypothesis H5

We expect negative effects by high working hours, particularly of mothers.

A fundamental issue underlying all effects arising through employment is its extent. Depending on the working hours and conditions, employment might affect the family stress level and thus the environment where a child grows up. An effect can be positive if sorrows due to low income and social stigmatization are mitigated by higher income. Negative effects

are also conceivable if, for instance, the job requires frequent unexpected overtime or leaves too little time for remaining activities. This time trade-off holds particularly true for the more highly educated who work more overtime hours than others (Zapf 2012). Moreover, it applies especially to mothers who are traditionally more in charge with the care of their offspring than fathers. Findings of Felfe and Hsin (2012) show that maternal work-related hazards and stress negatively affect the child's development. Their results also portend that compensating maternal time investments are indeed significant but have a small effect.² Because overtime is positively related to the number of working hours (Institut der deutschen Wirtschaft 2014, Zapf 2012) we hypothesize not only that high working hours tighten up parental time budgets but are also linked to the stress level within the family and that this particularly applies to mothers.³ Whether the relationship is linear or not is not clear a priori.

Hypothesis H6

Beyond education and income, parents' occupational prestige impacts positively on the child's schooling outcome.

In spite of the high correlation of occupational prestige with income and education, it can be argued that parental social status is also shaped by occupation (Currie 2009). Moreover, occupational prestige might reflect parental aspirations concerning human capital formation as well as higher levels of social capital.

3 | Data

We make use of the German Socio Economic Panel Study (SOEP, v29, see Wagner et al. 2007), where we link parental data to child's data from the youth questionnaire of the years 2000-2012. As the outcome is available for only one point in time, our analysis is a cross-section analysis. Owing to the restrictions in the number of observations, we consider retrospective parental data only from the time onwards when the child was enrolled in school, that is, from age 6 to 15. In the full sample, the number of observations amounts to 3,934 for the main target variable. The full sample is diminished due to diverse sample restrictions (see below: samples).

Dependent Variables

As our main dependent variable we use the (expected) school leave degree (E)SLD. The reason for focusing on the tracking information lies in the strong association between parental home and children's highest education attained that is empirically documented for Ger-

² The linkage between mothers' time devoted to their children and the offspring's outcomes later in life depends also on the quality. The findings of Datcher-Lourey (1988) show that extended time use on child care of highly educated, but not of less educated mothers, significantly increases children's years of schooling. Recent evidence from Kalil et al. (2012) demonstrates that more educated mothers spend more time on child-related activities that promote the child's development than less educated mothers do. Thus the amount and the quality of parental care time must both be regarded; often, however, only quantitative information is accessible as in the case for the used SOEP data.

³ The study shows that almost 80% of full-time employed workers, but only 65% of the part-time employed work long hours. The data are from 2011.

many (see Section 1). In this context, school leave degree matters more than grades since access to universities is regularly⁴ restricted to High School graduates.⁵ The dependent variable is measured at about the age of 15 to 17 which is close to or already the end of a school career.

We base ESLD on either a finished school graduation or, if the child is still in school, on the usual (and therefore expected) graduation for the current school it is on. The latter typically applies to pupils on the Gymnasium whereas those graduating from other school types typically leave school before the age of 17. If possible, we double-check the school graduation with SOEP-data obtained from later questionnaires. This procedure also allows including students from comprehensive schools where the type of graduation can be unclear. Differences in the graduation rates between the German states imply that the requirements to be on a certain school type vary. To remove such differences, we standardize the measure on state level, so the variable becomes metric. The ordering follows the level of requirement. Students enrolled in a “Hauptschule” (“Realschule”; “Gymnasium”) are assigned a 1 (2; 3). We then compute statewise the mean and standard deviation of the expected school degree. We thereby assume that the difference in performance between Hauptschule and Realschule equals that between Realschule and Gymnasium. The standardized individual performance is then derived from the difference between the individual performance and the state-specific mean, divided by the state-specific standard deviation.

For computing the state wise mean performance, we refer to the full sample before the restrictions are set. By contrast, the individual performance refers to the respective estimation sample. We observe that the mean of the dependent variable, the standardized individual performance, is higher for students in East than in West Germany. We argue that the East German samples have been more heavily affected by positive selection arising from sample attrition than the West German ones. We suggest that the lower number of observations for East Germany exacerbates the selection issue. To control for these differences, we generate an “East Germany” dummy that comprises of East German states with West German states as a reference. The dummy ensures that the other covariates’ estimates are comparable on the state level.

As an alternative measure of school success, we use a Grade Point Average, GPA (see Section 6). This variable is more fine-grained than our main dependent variable as it considers subject-specific individual heterogeneity within school tracks. It uses information from the last grades in the main subjects German, Mathematics and the first foreign language. The answers were given once for all by the adolescent when he or she turned 17. Some individuals reported finer information in terms of half point grading which is incorporated. Because

⁴ Although in principal, a lower secondary school degree does not make tertiary education impossible, de facto only few persons graduating from lower secondary school enter college later in life (Statistisches Bundesamt 2013).

⁵ There are three main secondary school types in Germany. They differ in requirements to attain a certain grade. The highest standards are found at the upper secondary school (“Gymnasium”), the lowest at the lower secondary school (“Hauptschule”). In between is the intermediate school (“Realschule”). The grades on each school range from 1 (the best grade) to 6 (the worst grade). The different requirements and outcomes can be used for evaluation of school achievement. More but less often visited school types in Germany are assigned to the scheme above. Students at technical secondary schools were assigned to the Gymnasium. Pupils currently at an occupational school were assigned to the type of school they were visiting before. This is done because there is a plethora of different occupational schools in Germany which cannot be sensibly ordered. The assumption is that pupils would self-select into further education that meets their standards, neither higher nor lower.

grades are differently hard to achieve across different school types, the calculation of the GPA requires a scheme to convert grades between school types. Such a scheme does not exist in general. We use the “Hamburger Stadtteilschule” transformation scheme. More concrete, a 1 (3) in a Hauptschule (Realschule) is transformed in a 4 on the most difficult school, the Gymnasium. The worst grade on the Hauptschule, a 6, corresponds to a 9 on the new harmonized GPA scale. Table 6 in Appendix A 1 provides an illustrative example. The transformation is done subject wise. For convenience of interpretation in the regressions, the new scale is reversed such that favorable grades are larger than unfavorable ones. In a second step, we standardize the grades for each subject state wise. In so doing, we account for both general and subject specific differences in level and variance between federal states. To have a large enough number of observations when standardizing, all grades over the years acquired in a certain federal state were pooled. It is hereby assumed that the relative requirements in each federal state remained stable over the decade.⁶ The final step is to apply the arithmetic mean to the standardized grades on the three subjects.

Explanatory variables

According to our hypotheses, our set of explanatory variables contains three categories, socio-demographic variables (to test H1 and H4), human capital related variables (to test H2), and employment-related variables (to test H3-H6).

Socio-demographic variables

In the literature, there is manifold evidence that socio-demographic attributes have a bearing on the child’s development. The first model includes socio-demographic variables only . We incorporate the gender of the child, the number of siblings at age 15 and birth order. From an intra-family resources view, many siblings decrease the parental resources left per child, being the first-born has the advantage that the previous effect will eventuate later. The number of siblings is also related to the mother’s age at first birth since production-technological restrictions might stipulate births at the end of the fertile life span of women. Maternal age, education and the number of siblings are likely to be interrelated but their effect on the outcome variable is a priori ambiguous.⁷ Hence, we include each factor separately. We further control for the number of moves during compulsory school, because children’s struggles to cope with the new environmental situation could influence their school performance. Parental separation or divorce could cause distress for some children, and, as Rodgers and Pryor (1998) show, this leads to bad outcomes for some of them. However, we do not explicitly account for divorces and separations in our study for two reasons. First, these variables would reduce the number of observations drastically. Second, we do not ex-

⁶ Saarland and Rhineland-Palatinate were treated as one federal state for data reasons.

⁷ As Nechyba et al. (1999), based on evidence by Geronimus et al. (1992), point out, the correlation between a mother’s age and the child’s school achievement is likely to be non-causal as underlying characteristics influence both the time of birth and the child’s development. Particularly, a mother’s age at first birth is positively associated to the mother’s education (Boll et al. 2013). Highly educated mothers face higher opportunity costs of child bearing and rearing, whereas the care time investment for each child is assumed not to be lower than a certain threshold (Oreopoulos and Salvanes 2011). Moreover, according to Becker’s quantity-quality model, the demand for child quality increases with parents’ education (and henceforth age at first birth), resulting in fewer children (Becker and Lewis 1973).

pect to find a significant effect as we control for many factors that might capture to a certain extent parental unobservables related to their propensity of separation. Such variables are, for instance, the number of years living together with a single parent, whereby the category living together with both parents serves as a reference. Our argumentation follows here Björklund and Sundström (2006) whose findings based on a sibling-difference approach suggest that the negative association between separation and children's development is rather due to selection than to causality (see also Francesconi et al. 2010).

We further incorporate dummies for rural agglomeration⁸ and migration background. We thereby differentiate between indirect and direct migration background. Our dataset does not provide suitable information on peers (Lohmann et al. 2009). However, some peer group effects might be captured by milieu indicators which are included in the robustness checks (Section 6). As discussed above, we further incorporate a dummy for living in East Germany at age 15.

In so doing, we control for the data construction effect that resulted in a higher mean performance for children from the Eastern part of Germany compared to the Western part. However, the dummy itself may not be interpreted in a meaningful way.

As pointed out in theoretical part, there are good reasons to include 'softer factors' to capture parental heterogeneity within educational groups. We therefore consider proxy-variables indicating aspirations, interests, and behavior. More precisely, we first make use of revealed interest in politics as we expect that it reflects self-efficacy and personal control (Shani 2009). Secondly, we use parental statements as to how often they take part in local political activities. The social connectedness of the second component can also be related to Coleman's (1990) term of social capital (Shah 1998). Thirdly, an exercise-oriented indicator is used, which can be related to knowledge on what is important to preserve well-being in the future and the wish and self-confidence to attain it, thereby pointing to an internal locus of control. Individuals with an internal locus of control are more likely to exercise regularly (Cobb-Clark et al. 2014). These variables are standardized and summed up. Fourthly, we regard general interest in further education, as this can be connected to occupational or personal prospering and thus aspirations (Harney et al. 2003). We construct a dummy variable indicating whether a parent is generally interested or participated (=1) in further education or not (=0). This dummy is added to the sum of the former three standardized variables. We condense the information from the named four sources and construct an index variable. The index is composed of variables measured at the time when the child is 13 to 15 years old. In our view, a high index value indicates a rather open minded, societally active parent with high educational aspirations, self-esteem and self-efficacy.⁹

⁸ Initially, we distinguished between four degrees ranging from large cities to rural areas. Ideally, no systematic differences with regard to grades or proportion of school leave degrees should exist; however, the degree of agglomeration is different across states and so are mean grades and relative shares of types of graduation. Thus, we expected to find effects. However, only rural areas turned out to be different from the other areas.

⁹ In an alternative specification, we replace the index variable by the four index components as separate regressors. Three out of four components show a similar pattern as the index variable, results being robust throughout models and samples (the exercise variable slightly loses significance from model II to model III). Only the local political activities' effect turns out to be less significant. We take this as an additional information but stick to our index variable concept to shorten down the variable list.

To check once more for the parental soft factors' explanatory power, we conduct robustness checks by including Milieu indicators. One fundamental difference to the 'soft factors'-variable is that if a milieu effect is assumed, the underlying individuals within their group must be relatively homogenous in relevant characteristics. The soft factors, however, leave more room for within-group individual heterogeneity.

Indicator variables for MOSAIC-milieus are a projection of Sinus-milieus created by Sinus Sociovision GmbH.¹⁰ A milieu is determined according to a two-dimensional system consisting of social status and personal basic values. The milieus are, however, subject to societal change and also not necessarily distinct. To make sure which milieus are used, we mark the labels with the respective codes provided in the SOEP: Established (B1), Postmaterials (B12), Modern Performers (C12), Conservatives (A12), Traditionals (A23), Middle Class (B2), GDR-Nostalgic (AB2), Fun-Driven (BC3), Experimentalists (C2) and Consumer-Materialists (B3) (Goebel et al. 2007: 28ff for details). For a qualitative classification how these milieus relate to a family's educational practice we refer to Bremer & Kleemann-Göhring (2012).

Finally, given the time-use argument above, we include a variable measuring the average daily hours of housework. We argue that growing up children need less and less exclusive parental time. Instead, parents' availability in the household to be used on children's request gains importance, i. e. for help with homework. Due to a lack of variation for fathers, we restrict the household variable to mothers. The idea behind focusing on the child's age 7 to 9 is that parental availability of the mother at home most likely matters at primary school age paving the streaming decision at age 10.¹¹

Human capital related variables

As to the human capital related variables, we refer to parental education and income. For the parental *education* we use years of attained education. They range between 7 and 18 years. We further incorporate the quadratic term to control for nonlinear effects.

In our final estimations, we use four different income variables measured as averages in the child's age corridor 7 to 15. We use net household income, net public transfers received by the household, income stemming from private transfers and individual gross labor earnings.¹² Public transfers contain earnings replacement benefits like unemployment benefit, unemployment assistance, social assistance and housing allowance. Labor earnings comprise wages and salary from all employment forms including training, primary and secondary jobs, and self-employment, plus income from bonuses, over-time, and profit-sharing. Net household income as an aggregate income controls for further income accruing to the house-

¹⁰ In the SOEP, the exact milieus are not known. Only probabilities for a household to be in a certain milieu are estimated. Then for each household the milieu with the highest probability is chosen as the dominant milieu. We use the latter variable to create a set of dummy variables measured at the child's age 15.

¹¹ We initially generated three averages over the time spans where the child was between 7 and 9, 10 and 12, 13 and 15, respectively. However, the spell-specific variables proved to be highly correlated in test analyses thus we skipped the two most recent ones and kept the household workload when the child was aged 7 to 9. Moreover, we initially constructed a childcare variable that focused on time that is exclusively devoted to children. This variable proved to be insignificant throughout analyses, therefore we skipped it.

¹² The effect of income stemming from assets plus fictive rent was found to be mostly insignificant and erratic and therefore dropped.

hold. Income variables are measured on a monthly basis in 1,000 Euros (for example, a household income of 3.8 equals 45,600 €/Year).¹³

Employment related variables

For the parental employment biography variables, we employ the Artkalen spell data. We divided the data into the categories full-time, part-time, OLF time, further education and unemployment according to Geyer and Steiner (2009). As the employment biography variables add up to 9, a reference group is needed. We define years spent in unemployment as the reference.¹⁴ Individuals with statuses deviating from the ones mentioned above are excluded from the analysis.

The occupational prestige, measured by the Wegener-Scale, is one indicator for the socioeconomic status of a person. The scale assigns a prestige value to different kind of jobs, depending on their standing in society. Its scale is adjusted specifically for Germany (Boll 2011a; 2011b). However, it can only take values if a person is employed. As described above, using the occupational prestige as an explanatory variable implies sample selection, as the never-employed individuals cannot be regarded. Another problem is the potential time-variation of the variable. Measuring it at all relevant times removes all individuals who were at least once not employed and so reduces observations markedly. Since we hypothesize that occupational prestige - beyond its associations to income and education - additionally transmits latent skills and aspirations as hardly time-varying traits, we chose the maximum value in the period 7-15 as a representative. This proxy holds for all but those individuals who were never employed during the observation period. Although this applies only to a small number of observations, we check the selection arising from this specification (see Section 6: Robustness checks).

We also include mothers' average factual weekly working hours. Owing to the changing and edged definition of what constitutes full-time, part-time and marginal employment, we decided to use the number of working hours as metrically scaled information on the employment extent. An additional advantage of factual working hours is that also self-employed parents who do not have a formal working contract can be included in this way. If no factual working hours are stated, we impute contract working hours if available. The aforementioned path-dependency of time use does not only apply to unpaid but also to paid work. To narrow down the variable list we choose the time-span 7 to 9 analogous to the housework variable, mothers' trade-off between care and work is considered most crucial

¹³ In separate analyses, we controlled for the household size as an extra variable. The persons in the household were weighted by equivalence weights (First adult's weight: 1, Person's weight if older than 14: 0.5, Person's weight if younger or as old as 14: 0.3). This changed the results only marginally; only the birth order variable's effect was weakened in some specifications.

¹⁴ The data exhibited certain ambiguities, which we removed at two stages. Related entries that added up to inadmissible values were corrected to admissible values. An example: If in a certain year, an individual has two spells, housewife and OLF time, which both last 12 months, this is categorized to a one-year OLF time-spell. Consistency between the five categories was ensured as follows: If sum of the durations of the five spells for a certain year summed up to more than 1, they were multiplied by an individual factor that ensures their sum to be 1. The relative duration of the categories served as a weight in this correction. This corresponds to the assumption that we don't know which spell is true and our best guess is the relative length. The last step is the summation of each of the categories over the period when the child was between 7 and 15, such that the sum of the five variables' values equals 9.

during primary school.¹⁵ However, we only find effects emanating from the number of factual working hours but not from contract working hours, so contract working hours were omitted as a separate regressor in the final estimations.

Samples

Within the scope of nine years of compulsory school duration, the household composition is likely to change in some cases, household members leaving the household or being replaced by other persons. Restricting the observation sample to stable couples would hence lead to an immense loss of information. We therefore estimate two different sample specifications. In the first specification, a child's data is linked separately to only the mother's and only the father's characteristics, respectively, disregarding possibly available partner data. The link is established by the information about the respective parent's personal number in the youth questionnaire. If we merge the child's data with parental data via the mother's (fathers) personal number, the mother (father) is termed as reference parent or as the chair of the household/couple. One more restriction is set up: The reference parent has to be in the SOEP at all considered times, i.e. from the child's age of 7 to 15. This first specification leaves us with two samples – one with the mother as the reference parent, one with the father in this position.¹⁶ The samples may comprise of lone parenthood households, households with changing partner and stable couples (for the latter one, the partner would be disregarded).

The second specification focuses on stable couples only, the two derived samples are therefore subsamples of the mother (father) chaired samples with disregarded partner information. For stable couples, some additional restrictions are imposed: Also the partner must have participated in the SOEP in the considered time range, the reference parent and his/her partner must have lived together in the same household during the whole period from the child's age 7 to 15. Those who were at least once in this period without a partner or switched the partner are hence excluded. We treat cohabitation, marriage and switching between the two states as the same. The two partner data samples with one time the mother being the reference parent, the other time the father, have many observations in common (just in "opposite positions") but they are not completely the same: if, for instance, both biological parents live separated and one or both have new partners, who are also in the SOEP, the information differs. Note that the "stable partner"-restriction when the child is aged 6 to 15 does not address biological parents but the "living together variables" (that focuses on the child's age 0-15) does.¹⁷

¹⁵ Furthermore, we initially included information about the father's/male partner's factual work hours, too; after controlling for related variables like education and income, all of them turned out to be insignificant though. Thus, we removed fathers' factual working hours from our final specifications. In further analyses, we examined the influence of overtime in several specifications which were mostly insignificant. Anyway, the overtime coefficient would be difficult to interpret due to reduced number of observations that result from the construction of the variable. It requires information on contract working hours that lacks for amongst others the self-employed. We therefore skipped the overtime variable. We also tested the hypothesis of a quadratic increase in effect of factual working hours, but this could neither be confirmed and was also skipped.

¹⁶ One might criticize that some children grow up with only one parent, say the mother, but supply both parents' personal numbers. Linking the child with father's data in this case might then be somewhat misleading. But although the child lives officially with the mother, we cannot exclude that the child spends much time with its father. Hence, we use the data if available, although the influence is most certainly heterogeneous across the children.

¹⁷ One critique by Björklund and Chadwick (2003) points at caveats by treating biological and non-biological fathers the same: regarding intergenerational income mobility, the association between the biological father and the child is

Note that the fact that at least one parent has to be in the SOEP at all considered times is likely to threaten sample representativeness. Evidence is provided by Spiess and Kroh (2008) who predicted the probability of re-interviewing versus refusal in the year 2006. Amongst others, non-German households and households experiencing separation and unemployment were associated with an increased risk of attrition. As argued, these factors are also related to the child's school achievement. The restriction of stable couples is likely to cause even a double selection with respect to the outcome variable as stable partnerships are expected to positively impact on the child's development. We therefore check the effects of partnership survival on the main endogenous variable, the expected school leave degree. We perform t-tests on the equality of the mean value. We do not find significant mean-value differences for samples without partner data. For the expected school leave degree in the mother's sample with partner, we run a one-sided t-test (with unequal variances). The test results indicate differences in the mean value at the 10%-level. The same t-test result applies to father chaired samples with partner. Moreover, the average expected school leave degree is somewhat higher in our stable partnership-samples than on average.¹⁸ That is, indeed, the results hint at a slightly positive selection of stable couples that requires to carefully interpret results arising from sample comparisons. However, as we are more interested in the structural information within samples this finding does not cause us to modify our specification strategy.

The third restriction applied to all four samples refers to a minimum of one employment observation of the respective parent, and in stable couples additionally the partner, during the child's compulsory school age 7 to 15. This restriction is necessary to avoid missing values on the occupational prestige variable.¹⁹

4 | Econometric specification

In creating the two dependent variables with the described method, we transformed two variables initially containing ordered categories to two more or less metric ones. While the GPA appears metric, the (expected) school leave degree kept some of its categorical character, which is illustrated in Figure 1 in the appendix A1. Yet it consists of sufficiently many

much stronger, presumably due to inherited ability. This indicates potential differences also for other outcomes. We ignore the issue for two reasons: Firstly, we restrict the sample to partners that were there at all considered times, the difference might therefore not be expected too strong. Secondly, the low number of cases would make separate analyses difficult.

¹⁸ Please find detailed information on the descriptive comparison of endogenous variables in Table 6 of A 1 in the appendix.

¹⁹ To test the selection effect caused by the third restriction, we compared regression results from the full sample with the sample for which the restriction "at least once employed during the regarded period" binds. This was done for the mother chaired samples. It turned out that the restriction was almost exclusively binding for mothers, as almost all fathers or male partners were once employed. In the samples without partner data, we find only slight changes, for instance weaker effects by net household income and the employment biography; our results seem to be robust. When partner data is included, the changes are even smaller. Detailed results from these analyses may be provided from the authors on request.

distinct values to consider it as metric. For both dependent variables, we therefore apply ordinary least squares.²⁰

According to the established hypotheses, we partition the set of explanatory variables into three groups which are successively added in the estimation process. The first model, OLS1 (O1), contains socio-demographic variables only, hence the equation is defined as

$$Y_i = \alpha + \beta_1 SD_i + u_i \quad (1)$$

where Y_i denotes the standardized individual school performance, α the constant term, SD a vector of socio-demographic variables, and u the error term. The index i shows that the data is individual-level. As we hypothesize that parental human capital characteristics have a bearing on the child's performance beyond demographics, we additionally control for parents' human capital in model O2:

$$Y_i = \alpha + \beta_1 SD_i + \beta_2 HC_i + u_i \quad (2)$$

HC depicts a vector of human capital related parental characteristics. Finally, we suggest that parental employment related factors exert an extra effect on children's school performance. Thus, we control for them as the core variables of our study in the third specification, O3:

$$Y_i = \alpha + \beta_1 SD_i + \beta_2 HC + \beta_3 EMPL_i + u_i \quad (3)$$

Model O3 is our preferred specification.

Table 1 and Table 2 depict the descriptive statistics for the dependent variables used in our main results and the robustness check, respectively, as well as for all independent variables. Table 1 provides the statistics for samples with disregarded partner context and Table 2 for stable couples. The maximum range of (E)SLD (GPA) amounts to 4.378 (5,035). The means are slightly higher in stable couples. The latter are marked by few cases unequal to zero in some of the "number of years living together with"-variables. The stability in family life reflects the positive selection effect described above and is related to more favorable child outcomes.

Table 1 Summary statistics for Samples 1, 2 without partner data

Sample 1: Mother sample	Mean	SD	min.	max.	Sample 2: Father sample			
					Mean	SD	min.	max.
(E)SLD	0.01	0.95	-3.102	1.276	(E)SLD	0.03	0.96	-3.102
GPA	0.01	0.87	-2.767	1.897	GPA	0.02	0.87	-3.189
Yrs with both parents	13.19	4.18	0	15	Yrs with both parents	14.17	2.90	0
Yrs w. single mother	1.05	3.09	0	15	Yrs w. single mother	0.38	1.81	0
Yrs w. mother & partner	0.66	2.43	0	15	Yrs w. mother & partner	0.31	1.78	0
Yrs w. single father	0.02	0.36	0	9	Yrs w. single father	0.06	0.63	0
Yrs w. father & partner	0.03	0.51	0	13	Yrs w. father & partner	0.03	0.53	0
Yrs w. others	0.04	0.58	0	15	Yrs w. others	0.04	0.56	0
Gender of child (Ref.: boy) *	0.49	0.5	0	1	Gender of child *	0.49	0.5	0
Birth Order (Ref.: First born)	1.65	1.08	0	8	Birth Order	1.67	1.13	0
Number of Siblings	1.49	1.2	0	11	Number of Siblings	1.52	1.27	0
East Germany *	0.3	0.46	0	1	East Germany *	0.29	0.46	0

²⁰ We abstain from using robust standard errors as the differences to ordinary standard errors turned out to be small.

Rural Area *	0.35	0.48	0	1	Rural Area *	0.37	0.48	0	1
Number of Moves	0.56	0.82	0	5	Number of Moves	0.49	0.72	0	5
Soft Factors (Index)	-0.49	2.15	-4.15	11.53	Soft Factors	-0.49	2.12	-4.53	8.43
Mother's age (years)	44.28	5.02	33	65	Father's age	46.97	5.67	27	71
Migration background*	0.22	0.41	0	1	Migration background	0.23	0.42	0	1
Maternal Housework (daily hours)	3.56	1.61	0	11					
Labor Income (1,000 Euro)	1.07	1.14	0	10.55	Labor Income	3.32	1.96	0	17.72
Post. Gov. Income (1,000 Euro)	3.54	1.42	0.7	12.56	Post. Gov. Income	3.64	1.4	0.93	12.56
Public Transfers (1,000 Euro)	0.07	0.14	0	0.98	Public Transfers	0.06	0.15	0	1.32
Private Transfers (1,000 Euro)	0.02	0.09	0	0.78	Private Transfers	0.01	0.03	0	0.46
Parent's Years of Education	11.84	2.49	7	18	P's Years of Education	12.1	2.62	7	18
Parent's Years of Education ²	146.4	65.45	49	324	P's Years of Education ²	153.4	71.02	49	324
Maternal Paid Work (weekly hours)	16.9	15.62	0	70					
Parent's Years Fulltime	2.27	3.17	0	9	Parent's Years Fulltime	8.23	1.74	0	9
Parent's Years Parttime	2.93	2.91	0	9	Parent's Years Parttime	0.15	0.69	0	8.5
Parent's Years Fur. Educ.	0.09	0.26	0	1.96	P's Years Fur. Educ.	0.12	0.79	0	9
Parent's Years OLF	3.12	3.15	0	9	Parent's Years OLF	0.07	0.22	0	2.14
Parent's Years Unemployment	0.59	1.37	0	9	P's Years Unemployment	0.44	1.2	0	9
Parent's Occ. Prestige	71.7	31.65	30.2	216	Parent's Occ. prestige	63.52	29.21	30.1	216
N=1457					N=1338				

*Dummy. (E)SLD: (Expected) School Leave Degree. GPA: Grade Point Average.

Table 2 Summary statistics for Samples 1, 2 with partner data

Sample 3: Mother sample	Mean	SD	min.	max.	Sample 4: Father sample	Mean	SD	min.	max.
(E)SLD	0.05	0.96	-3.102	1.276	(E)SLD	0.07	0.94	-2.972	1.276
GPA	0.04	0.87	-2.766	1.846	GPA	0.06	0.87	-2.766	1.846
Yrs with both parents	14.66	2.03	0	15	Yrs with both parents	14.7	1.89	0	15
Yrs w. single mother	0.04	0.39	0	7	Yrs w. single mother	0.07	0.74	0	15
Yrs w. mother & partner	0.27	1.74	0	15	Yrs w. mother & partner	0.16	1.38	0	15
Yrs w. father & partner	0.01	0.41	0	13	Yrs w. father & partner	0.02	0.44	0	13
Yrs w. others	0.02	0.31	0	9	Yrs w. others	0.04	0.63	0	15
Gender of child (Ref.: boy) *	0.48	0.5	0	1	Gender of child *	0.49	0.5	0	1
Birth Order (Ref.: First born)	1.75	0.92	1	8	Birth Order	1.6	1	0	6
Number of Siblings	1.47	1.17	0	11	Number of Siblings	1.37	1	0	6
East Germany *	0.3	0.46	0	1	East Germany *	0.31	0.46	0	1
Rural Area *	0.37	0.48	0	1	Rural Area *	0.38	0.49	0	1
Number of Moves	0.41	0.62	0	4	Number of Moves	0.4	0.62	0	4
Soft Factors (Index)	-0.48	2.11	-4.15	10.09	Soft Factors	-0.38	2.1	-4.53	7.37
Partner: Soft Factors (Index)	-0.42	2.08	-4.52	7.51	Partner: Soft Factors	-0.44	2.04	-4.17	9.33
Mother's age (years)	44.36	4.87	33	65	Father's age	46.96	5.29	34	65
Migration background *	0.21	0.41	0	1	Migration background *	0.19	0.39	0	1
Maternal Housework (daily hours)	3.71	1.63	0.14	11	Partner: Housework	3.48	1.55	0	11
Labor Income (1,000 Euro)	0.99	1.08	0	10.55	Labor Income	3.34	1.93	0	17.02
Post. Gov. Income (1,000 Euro)	3.75	1.42	1.25	12.56	Post. Gov. Income	3.75	1.37	1.47	11.95
HH:Public Transfers (1,000 Euro)	0.1	0.23	0	2.24	HH:Public Transfers	0.09	0.23	0	2.24
Private Transfers (1,000 Euro)	0	0.02	0	0.36	Private Transfers	0	0.02	0	0.36
Parent's years of Education	11.86	2.44	7	18	Parent's years of Education	12.13	2.64	7	18
Parent's years of Education ²	146.54	64.41	49	324	Parent's years of Education ²	154.07	71.71	49	324
Partner: Years of Education	12.12	2.62	7	18	Partner: Years of Education	12.03	2.46	7	18
Partner: Years of Education ²	153.76	71.43	49	324	Partner: Years of Education ²	150.68	65.44	49	324
Maternal Paid Work (weekly hours)	15.59	15.66	0	70	Partner: Maternal Paid Work	18.39	15.61	0	70
Parent's Years Fulltime	2.03	3.08	0	9	Parent's Years Fulltime	8.31	1.66	0	9
Parent's Years Parttime	3	2.94	0	9	Parent's Years Parttime	0.13	0.62	0	8

Parent's Years Fur. Educ.	3.37	3.25	0	9	Parent's Years Fur. Educ.	0.14	0.9	0	9
Parent's Years OLF	0.07	0.23	0	1.95	Parent's Years OLF	0.06	0.21	0	2.14
Parent's Years Unemployment	0.53	1.35	0	9	Parent's Years Unemployment	.36	1.07	0	9
Partner: Years Fulltime	8.47	1.33	0	9	Partner: Years Fulltime	2.41	3.27	0	9
Partner: Years Parttime	0.11	0.51	0	7.33	Partner: Years Parttime	3.48	2.9	0	9
Partner: Fur. Educ.	0.04	0.15	0	2.14	Partner: Fur. Educ.	0.06	0.19	0	1.38
Partner: OLF	0.04	0.37	0	9	Partner: OLF	2.6	2.68	0	9
Partner: Unemployment	0.33	1.00	0	7.91	Partner: Unemployment	.45	1.15	0	6.24
Partner: Occ. prestige	63.18	28.68	30.1	191.3	Partner: Occ. prestige	64.46	29.03	30.1	216
Parent's Occ. Prestige	71.55	31.22	30.2	216	Parent's Occ. Prestige	63.46	27.81	30.1	191.3
N=1018					N=876				

*Dummy. (E)SLD: (Expected) School Leave Degree. GPA: Grade Point Average.

Throughout samples, boys and girls are roughly equally represented. Most adolescents spent their lives together with both parents. One third of adolescents lived in the Eastern part of Germany at age 15. The number of moves is negligible. Parents exhibit 12-13 years of education on average, with fathers' values slightly exceeding mothers' by 0.5-1 year. However, parental education does not differ between samples with and without partner data. Parents hardly differ in secondary disparities with respect to mean values (roughly 0.5), the sole exception being the father chaired stable couple where the father's mean is a bit lower (0.4). However, fathers achieve lower maxima in father samples. Mothers with children aged 7 to 9 dedicate on average 3 1/2 hours per day to housework and 16-18 hours per week to market work. On average, mothers (fathers) exhibit 2 (8-9) years of full-time experience during the 9 years-observation period of compulsory school. Moreover, mothers experience 3 years in part-time work and 3 years out of the labour force (OLF). For both parents, years in unemployment or further education and training are negligible. Mothers' occupational prestige is slightly higher on average than that of fathers in most samples.

5 | Main results

The main results are reported in Table 3 and Table 4. We refer to them according to our hypotheses H1-H6.

Table 3 Main results – Samples without partner data

	Mother without partner				Father without partner		
	Model O1	Model O2	Model O3		Model O1	Model O2	Model O3
<i>Socio-demographic characteristics</i>							
Yrs w single mother	-0.02*** (0.007)	-0.01 (0.008)	-0.009 (0.008)	Yrs w single mother	-0.016 (0.013)	-0.013 (0.013)	-0.017 (0.014)
Yrs w mother & partner	-0.024*** (0.009)	-0.029*** (0.01)	-0.03*** (0.01)	Yrs w mother & partner	-0.013 (0.013)	-0.022* (0.013)	-0.023* (0.014)
Yrs w single father	0.009 (0.048)	0.011 (0.051)	-0.056 (0.063)	Yrs w single father	-0.025 (0.031)	-0.022 (0.031)	-0.022 (0.037)
Yrs w father & partner	0.029 (0.045)	0.024 (0.043)	0.032 (0.042)	Yrs w father & partner	0.001 (0.046)	-0.019 (0.044)	-0.022 (0.044)
Yrs w others	-0.036 (0.038)	-0.027 (0.037)	-0.018 (0.038)	Yrs w others	-0.032 (0.043)	-0.026 (0.042)	-0.021 (0.042)
Gender of child	0.257***	0.254***	0.272***	Gender of child	0.277***	0.274***	0.293***

	(0.043)	(0.042)	(0.043)		(0.046)	(0.046)	(0.047)
Birth Order	-0.17***	-0.124***	-0.126***	Birth Order	-0.162***	-0.132***	-0.137***
	(0.032)	(0.031)	(0.033)		(0.031)	(0.032)	(0.033)
Number of Siblings	0.049*	0.033	0.047	Number of Siblings	0.027	0.02	0.021
	(0.027)	(0.027)	(0.029)		(0.024)	(0.027)	(0.028)
East Germany	0.144***	0.144**	0.213***	East Germany	0.138**	0.135**	0.159***
	(0.052)	(0.058)	(0.068)		(0.054)	(0.059)	(0.061)
Rural Area	-0.127***	-0.11**	-0.091*	Rural Area	-0.138***	-0.103**	-0.113**
	(0.046)	(0.045)	(0.047)		(0.049)	(0.049)	(0.05)
Number of Moves	-0.05*	-0.03	-0.029	Number of Moves	-0.049	-0.027	-0.041
	(0.029)	(0.029)	(0.03)		(0.034)	(0.034)	(0.036)
Soft Factors	0.14***	0.087***	0.085***	Soft Factors	0.124***	0.067***	0.064***
	(0.011)	(0.012)	(0.012)		(0.011)	(0.012)	(0.012)
Mother's age	0.037***	0.025***	0.023***	Father's age	0.025***	0.016***	0.016***
	(0.005)	(0.005)	(0.005)		(0.005)	(0.005)	(0.005)
Migration	-0.034	0.093	0.134**	Migration	-0.198***	-0.064	-0.026
	(0.058)	(0.059)	(0.061)		(0.06)	(0.063)	(0.064)
Maternal Housework	-0.035**	-0.025*	-0.031*				
	(0.014)	(0.015)	(0.017)				
<i>Human-capital related characteristics</i>							
Labor Income		-0.044*	-0.045	Labor Income		0.017	0.003
		(0.024)	(0.035)			(0.021)	(0.024)
Post Gov Income		0.076***	0.057***	Post Gov Income		0.057**	0.045
		(0.019)	(0.02)			(0.027)	(0.029)
Public Transfers		-0.562***	-0.248	Public Transfers		-0.281*	0.127
		(0.181)	(0.256)			(0.166)	(0.353)
Private Transfers		0.514*	0.361	Private Transfers		0.923	1.253
		(0.286)	(0.289)			(0.825)	(0.84)
Years of Education		0.267***	0.255***	Years of Education		0.27***	0.265***
		(0.072)	(0.074)			(0.082)	(0.085)
Years of Education ²		-0.007***	-0.007***	Years of Education ²		-0.007**	-0.008***
		(0.003)	(0.003)			(0.003)	(0.003)
<i>Employment biography characteristics</i>							
Maternal Paid Work			-0.004				
			(0.003)				
Years Fulltime			0.062**	Years Fulltime			0.058
			(0.029)				(0.045)
Years Parttime			0.065**	Years Parttime			0.098*
			(0.026)				(0.056)
Years OLF			0.052**	Years OLF			0.032
			(0.025)				(0.053)
Years Fur. Educ.			0.095	Years Fur. Educ.			-0.029
			(0.097)				(0.125)
Occ. prestige			0.003***	Occ. prestige			0.005***
			(0.001)				(0.001)
Constant	-1.258***	-3.216***	-3.674***	Constant	-0.875***	-3.025***	-3.572***
	(0.235)	(0.53)	(0.587)		(0.221)	(0.598)	(0.683)
A-R ²	0.19	0.25	0.27	A-R ²	0.15	0.22	0.23
N=	1600	1555	1457	N=	1464	1398	1338

Table 4 Main results – Samples with partner data

Mother with partner

Father with partner

	Model O1	Model O2	Model O3		Model O1	Model O2	Model O3
<i>Socio-demographic characteristics</i>							
Yrs w single mother	0.002 (0.033)	0.041 (0.04)	0.063 (0.076)	Yrs w single mother	-0.025 (0.034)	-0.02 (0.033)	0.011 (0.04)
Yrs w mother & partner	-0.044*** (0.014)	-0.044*** (0.015)	-0.048*** (0.018)	Yrs w mother & partner	-0.039** (0.018)	-0.039** (0.017)	-0.035* (0.02)
Yrs w father & partner	0.022 (0.066)	0.01 (0.064)	0.011 (0.063)	Yrs w father & partner	0.032 (0.051)	-0.017 (0.061)	-0.019 (0.061)
Yrs w others	-0.055 (0.044)	-0.022 (0.044)	-0.097 (0.086)	Yrs w others	-0.034 (0.042)	-0.01 (0.041)	-0.004 (0.043)
Gender of child	0.266*** (0.05)	0.277*** (0.049)	0.299*** (0.052)	Gender of child	0.24*** (0.053)	0.258*** (0.051)	0.304*** (0.055)
Birth Order	-0.181*** (0.036)	-0.113*** (0.036)	-0.124*** (0.04)	Birth Order	-0.171*** (0.04)	-0.12*** (0.039)	-0.122*** (0.042)
Number of Siblings	0.069** (0.032)	0.041 (0.032)	0.055 (0.037)	Number of Siblings	0.052 (0.038)	0.033 (0.038)	0.033 (0.043)
East Germany	0.173*** (0.06)	0.08 (0.067)	0.181** (0.085)	East Germany	0.241*** (0.063)	0.129* (0.069)	0.164* (0.088)
Rural Area	-0.17*** (0.053)	-0.108** (0.052)	-0.079 (0.056)	Rural Area	-0.179*** (0.057)	-0.13** (0.055)	-0.095 (0.059)
Number of Moves	-0.083** (0.04)	-0.065 (0.04)	-0.053 (0.045)	Number of Moves	-0.047 (0.044)	-0.026 (0.042)	-0.012 (0.048)
Soft Factors	0.118*** (0.014)	0.081*** (0.015)	0.082*** (0.016)	Soft Factors	0.065*** (0.015)	0.023 (0.015)	0.012 (0.016)
Partner: Soft Factors	0.053*** (0.014)	0.02 (0.014)	0.014 (0.016)	Partner: Soft Factors	0.109*** (0.016)	0.064*** (0.016)	0.078*** (0.017)
Mother's age	0.032*** (0.006)	0.018*** (0.006)	0.017*** (0.007)	Father's age	0.026*** (0.006)	0.019*** (0.006)	0.019*** (0.006)
Migration	-0.01 (0.068)	0.108 (0.071)	0.15* (0.077)	Migration	-0.166** (0.075)	0.02 (0.077)	0.08 (0.083)
Maternal Housework	-0.043*** (0.016)	-0.04** (0.017)	-0.049** (0.02)	Partner: Housework	-0.029 (0.018)	-0.031* (0.018)	-0.039* (0.022)
<i>Human-Capital related characteristics</i>							
Labor Income		-0.012 (0.029)	-0.028 (0.046)	Labor Income		0.033 (0.025)	0.027 (0.032)
Post Gov Income		0.041* (0.023)	0.015 (0.026)	Post Gov Income		-0.007 (0.034)	-0.028 (0.042)
HHPublic Transfers		-0.181 (0.114)	0.083 (0.237)	HHPublic Transfers		-0.197 (0.131)	-0.194 (0.261)
Private Transfers		-0.267 (1)	0.243 (1.16)	Private Transfers		0.993 (1.33)	1.353 (1.425)
Years of Education		0.085 (0.09)	0.05 (0.098)	Years of Education		0.231** (0.099)	0.272** (0.108)
Years of Education ²		-0.002 (0.003)	0 (0.004)	Years of Education ²		-0.006* (0.004)	-0.008** (0.004)
Partner: Years of Educ.		0.242*** (0.093)	0.287*** (0.103)	Partner: Years of Educ.		0.139 (0.098)	0.187* (0.105)
Partner: Years of Educ. ²		-0.007** (0.003)	-0.009** (0.004)	Partner: Years of Educ. ²		-0.003 (0.004)	-0.005 (0.004)
<i>Employment biography characteristics</i>							
Maternal Paid Work			-0.006* (0.003)	Partner: Paid Work			-0.006** (0.003)
Years Fulltime			0.097*** (0.033)	Years Fulltime			-0.02 (0.049)
Years Parttime			0.084*** (0.029)	Years Parttime			-0.022 (0.067)

Years OLF			0.072*** (0.027)	Years OLF			-0.048 (0.055)
Years Fur. Educ.			0.03 (0.128)	Years Fur. Educ.			-0.201 (0.15)
Partner: Years Fulltime			0.029 (0.046)	Partner: Years Fulltime			0.062* (0.036)
Partner: Years Parttime			-0.012 (0.071)	Partner: Years Parttime			0.054 (0.033)
Partner: Years OLF			0.084 (0.09)	Partner: Years OLF			0.033 (0.033)
Partner: Years Fur. Educ.			-0.351* (0.186)	Partner: Yrs Fur. Educ.			-0.143 (0.158)
Occ. prestige			0 (0.001)	Occ. prestige			0.004*** (0.001)
Partner: Occ. prestige			0.005*** (0.002)	Partner: Occ. prestige			0 (0.001)
Constant	-0.977*** (0.272)	-3.336*** (0.755)	-4.332*** (0.938)	Constant	-0.824*** (0.271)	-3.759*** (0.78)	-4.5*** (0.975)
ADJ. R ²	0.2	0.25	0.27	ADJ. R ²	0.2	0.27	0.29
N=	1204	1169	1018	N=	1018	996	876

Hypothesis H1 refers to the influence of what we called ‘soft factors’ indicating notable parental interests and habits. The variable is composed of parental self-stated interest in politics, the participation in local political initiatives, frequency of exercising and interest in further education. We find support for H1, particularly for mothers. Parents’ soft factors are positively associated to the child’s school outcome (Model O1) but the effect size is diminished when parents’ human capital is controlled for (Model O2). Compared to Model O1, the soft variable’s effect size dwindles by roughly a half in all 4 samples, but its significance is kept, with the sole exception of father chaired stable couples. Compared to Model O2, the effect size of parents’ soft factors remains roughly unchanged in Model O3. In all three models, we find a social channel particularly from mothers to their kids. In the mother-chaired stable couple, an increase of the index value by 1 (14.24) point(s) is related to a child performance increase by 0.082 (1.168) units. The leverage on the outcome variable that accrues from the maximum increase of the index value amounts to 26.7 % of the total range of the performance variable (which is 4.377, see Table 1). Mothers’ time use and interests are more decisive than fathers’ in all samples. Zumbuehl et al. (2013) point out that parental involvement enhances the intergenerational transmission of traits. Since this usually requires time investments in the child, the results point to the importance of joint time with the children.

Model O2 comprises of standard SES variables like income and education. *Hypothesis H2* suggests that *income* is positively associated to the outcome, but that the association relaxes in richer model contexts. Indeed, we find support for the diminishing effect size of income in richer models. The positive association of income with the outcome variable can hence not be confirmed in general. Instead, some income variables are insignificant throughout models. Moreover, the significance is reduced when a more homogenous sample, i.e. by taking account of partner data, is used. The only income information that remains significant in model O3 is post-government household income in the mother chaired sample with disregarded partners. Part of this effect may, however, still be due to the correlation of having a partner and higher household income. For father chaired samples, income variables are little decisive

for the outcome. We argue that this is mainly due to a higher share of fathers' earnings on household income compared to mothers'. The relaxing income association, once employment behavior is controlled for, is further stressed by the lost significance of in the public transfer parameter and the maternal labour income parameter in mother chaired samples with disregarded partners. For maternal earnings, we suppose that effects like many working hours are likely to explain the parameter's negative association in Model O2. Private transfers play a (small) role solely in the second model of mother chaired samples with disregarded partner. In sum, it seems that effects of parental employment on children's school performance rather operate via the role model channel than via the income channel.

Parents' education is substantial. Education leverages stronger on children's educational pathway than any other variable in our setting. In this respect, our study replicates former findings.²¹ However, fathers' education proves to be more decisive than mothers'. Maternal education is significant in the mother chaired sample with disregarded partners only.²² For instance, in mother chaired samples in stable couples, Modell O3 predicts that an increasing paternal education by 1 (11) year(s) corresponds to a school performance increase by 0.278 (3.058) units. The value in brackets denotes the leverage effect on the outcome variable accruing from a maximum increase of the input variable. The leverage amounts to 69.9 % of total performance variation (3.058 of 4.377). The squared term shows a negative sign, giving rise to marginally decreasing effects of parental education.

However, as the following results for Model O3 show, parent's employment context is significantly associated to the child's school success even when parents' education, income, habits and demographics are controlled for.

Results for the preferred model specification Model O3

All in all, the associations show a robust pattern across samples, especially between partner samples. The reason is that in many cases the same parental individuals are present, just in opposite positions. But, as described in Section 3, the samples are not completely the same. Unless otherwise stated, coefficient values reported in this paragraph refer to mother chaired samples in stable couples. As in the previous paragraphs, we additionally report leverage effects accruing from a maximum increase of the respective input variable.

In more detail, *hypothesis H3* postulates that parental employment spells are more advantageous for the child's school outcome than unemployment spells. We observe positive effects of maternal employment and hence confirm the hypothesis for mothers only. Mothers' years of full-time experience matter in all four samples. However, maternal part-time and OLF time exhibit lower effect sizes than maternal full-time in mother chaired stable couples and lose significance in father chaired stable couples. For instance, maternal full-time experience of 1 (9) year(s) corresponds to an improved school performance of the child by 0.097

²¹ The outstanding effect size is likely to be due to remaining effects through inherited abilities and unobserved characteristics which are not excluded in our analyses.

²² Separate analyses excluding the squared term of years of education yield a significant maternal education estimate also for stable couples. Apparently, fathers' lead over mothers with respect to the educational leverage particularly refers to highly skilled parents.

(0.873) units (compared to 1 and 9 years of unemployment, respectively). The leverage that is set by the nine years-increase of maternal full-time work amounts to one fifth (19.9 %) of the total range of the child's performance. The maternal employment channel to their kids works both for girls and boys (for gender differentiated effects, see Section 5). The paternal variables exhibit low variation in this respect as most fathers in our sample were almost exclusively full-time employed.²³ Apart from some exceptions in the samples without partner, where years in full-time employment exhibited a positive influence (compared to paternal unemployment), this leads to mostly insignificant results for fathers.²⁴

The positive employment channel from mothers to their kids has to be seen in context with the results for *maternal housework* per day during primary school (child's age 7 to 9). In that time, a 1 (11) hours' increase in housework is related to a performance decrease by 0.049 (0.539) units. The leverage effect in brackets equals 12.3 % of the performance range. We refer to the role model channel here. A mother doing a lot of housework is likely to embody the traditional role model and daughters will not enjoy potential benefits of a working mother. This interpretation is strengthened by additional analyses presented in Section 5 which show that the negative effect is driven by the daughters only. Boys are not significantly affected. Therefore, our findings with respect to maternal housework support *hypothesis H4*.

High *maternal weekly working hours* during primary school are slightly contra-productive in stable partner contexts. In mother chaired stable couples, a maximum increase by 1 (70) hours of weekly working hours corresponds to a performance decrease by 0.006 (0.42) units. The leverage effect in brackets equals 9.6 % of total performance variation. However, the parameter is significant on the 10 %-level only, and in households with disregarded partners, high maternal working hours are even insignificant. For father chaired stable couples, the negative effect is significant at the 5 %-level. We suggest that the stress generating trade-off between time at home and time at work accrues more to mothers in stable couples which are more likely to adhere to traditional gender roles. But even here, as reported, the associations are weak and significance is mixed. Hence, *hypothesis H5* is not unequivocally established. If one argues that advantaged children are more likely to live in stable couples, our results confirm findings of Ruhm (2008) who reports that high working hours harm more advantaged children more than the disadvantaged.

Whereas maternal employment dominates that of fathers in terms of children's school performance, the opposite holds for *occupational prestige* (*hypothesis H6*). Although mothers' jobs are as prestigious as fathers' on average, paternal prestige outweighs the maternal one in multivariate analyses.²⁵ In father chaired stable couples, an increase of 1 (161.2) unit(s) of paternal prestige is associated to a performance increase of the child by 0.004 (0.645) units.

²³ As descriptive statistics shows, fathers' mean years in full-time employment are about 8 of 9, while the mean months spent in unemployment are roughly 6 and part-time and OLF experience as well as educational training are even less present. This also likely explains why we find no effects for factual paternal working hours. For fathers, we only observe significant positive effects emerging from years in part-time in samples without partner.

²⁴ The category "further education" is generally suffering from low variation which makes the coefficients unstable and therefore the variable is not sensibly interpretable.

²⁵ Using the average prestige value over the years of employment instead of the maximum value does not change any of these relations substantially.

The leverage effect in brackets corresponds to 14.73 % of the performance's total range. As far as paternal prestige is controlled for, maternal prestige loses significance, but not the other way round. If we include the maternal prestige only (which is the case in mother chaired samples with disregarded partners), the variable is highly significant. Though, even in samples with disregarded partners the effect size of paternal prestige exceeds the maternal one by far. We interpret this as evidence for prevailing traditional gender roles assigning the main (mostly male) bread winner the role of status default.

For the *socio-demographic variables* we find results that are in accordance with the literature. Robust effects are ascertained through the child's gender whereat we find girls attaining a higher achievement than boys. We thereby confirm results of Voyer and Voyer (2014) for grades. Throughout the estimations, the position in the birth order turns out to be of noticeable importance, too, with the more advantaged the sooner born. This is in line with findings from Lindahl (2008) and Booth and Kee (2005). The number of siblings is sometimes in the first model in mother samples significantly positively, but never negatively, associated with the outcome.²⁶ The number of moves during compulsory school time does hardly play any significant role. Moreover, no effects are brought about by parents having direct migration background. Having indirect migration background exhibits inconsistent associations which can even be positively or negatively significant. Parental age is positively associated to the child's outcome. The effect is diminished if variable-rich specifications are chosen, but remains highly significant as expected. The weakening of the effect when human capital variables are controlled for is plausible since there is a positive correlation between parental age, education and income, as discussed in Section 3. Living in a rural area is significantly negatively associated with the outcome. However, the effect is slightly diminished once human capital and employment biography of parents are controlled for. Moreover, the variable exhibits a lower significance in stable couples than in samples without partner information.

6 | Split analyses and robustness checks

In this section, results from diverse model specifications are reported. For overview reasons we present results for model O3 only. Table 5 provides a shortlist of selected results. The full results of robustness checks listed in Table 5 are provided in Table 8-13 in the appendix. Results on further robustness checks discussed in this chapter are provided from the authors on request.

Table 5 Split analyses and robustness checks: Selected results

Model O3	Mother without partner	Father without partner	Mother with partner		Father with partner	
	Mother	Father	Mother	Partner	Partner	Father
Split analyses by the child's gender						

²⁶ It is possible that birth order already takes up some of the siblings' variable's effect, because a high birth order is only possible with several siblings.

	daughters	sons	daughters	sons	daughters	sons	daughters	sons	daughters	sons	daughters	sons
Education (linear term)	0.249** (0.109)	0.286*** (0.103)	0.322*** (0.118)	0.231* (0.123)	0.071 (0.144)	0.086 (0.136)	0.286** (0.142)	0.293* (0.154)	0.224 (0.151)	0.19 (0.155)	0.268* (0.146)	0.34* (0.174)
Education (quadratic term)	-0.006 (0.004)	-0.009** (0.004)	-0.01** (0.004)	-0.007 (0.004)	0 (0.005)	-0.002 (0.005)	-0.009* (0.005)	-0.009* (0.006)	-0.006 (0.006)	-0.005 (0.006)	-0.008 (0.005)	-0.011* (0.006)
Soft factors	0.094*** (0.017)	0.08*** (0.017)	0.079*** (0.017)	0.049*** (0.018)	0.071*** (0.024)	0.085*** (0.023)	0.044* (0.023)	-0.004 (0.023)	0.09*** (0.026)	0.07** * (0.025)	0.028 (0.024)	-0.001 (0.024)
Full-time experience	0.044 (0.038)	0.094** (0.046)	0.01 (0.065)	0.103 (0.063)	0.051 (0.043)	0.144*** (0.051)	0.007 (0.058)	0.017 (0.081)	0.028 (0.047)	0.099* (0.057)	-0.05 (0.073)	-0.012 (0.07)
Part-time experience	0.029 (0.034)	0.113*** (0.042)	0.027 (0.078)	0.173** (0.082)	0.015 (0.038)	0.155*** (0.046)	-0.087 (0.098)	-0.013 (0.115)	-0.001 (0.044)	0.105* * (0.053)	-0.048 (0.093)	-0.029 (0.104)
OLF experience	0.024 (0.033)	0.092** (0.041)	-0.049 (0.17)	-0.009 (0.188)	0.022 (0.035)	0.124*** (0.044)	0.056 (0.247)	0.102 (0.118)	-0.012 (0.043)	0.077 (0.052)	-0.102 (0.077)	-0.014 (0.088)
Occ. prestige	0.003** (0.001)	0.004*** (0.001)	0.005** (0.002)	0.005*** (0.002)	-0.003 (0.002)	0.002 (0.002)	0.007*** (0.002)	0.004* (0.002)	-0.002 (0.002)	0.001 (0.002)	0.004* (0.002)	0.004* * (0.002)
Maternal housework	-0.033 (0.024)	-0.032 (0.025)	NA	NA	-0.067** (0.029)	-0.039 (0.029)	NA	NA	-0.051 (0.031)	-0.033 (0.031)	NA	NA
Maternal Paid Work	-0.005 (0.004)	-0.003 (0.004)	NA	NA	-0.007 (0.004)	-0.005 (0.005)	NA	NA	-0.006 (0.004)	-0.006 (0.005)	NA	NA
Milieu variables included												
Education (linear term)	0.07*** (0.014)		0.044*** (0.015)		0.043** (0.018)		0.036* (0.019)		0.066*** (0.019)		0.041** (0.019)	
Soft factors	0.088*** (0.013)		0.064*** (0.014)		0.08*** (0.019)		0.013 (0.019)		0.098*** (0.019)		-0.002 (0.019)	
Full-time experience	0.074** (0.035)		0.077 (0.049)		0.129*** (0.041)		0.045 (0.063)		0.09** (0.04)		0.024 (0.052)	
Part-time experience	0.075** (0.032)		0.106* (0.061)		0.109*** (0.037)		-0.018 (0.089)		0.081** (0.037)		0.02 (0.072)	
OLF experience	0.055* (0.031)		0.061 (0.058)		0.089** (0.035)		0.162 (0.148)		0.054 (0.036)		-0.014 (0.059)	
Occ. prestige	0.002* (0.001)		0.006*** (0.001)		0 (0.001)		0.005*** (0.002)		-0.001 (0.001)		0.004** (0.002)	
Maternal housework	-0.02 (0.02)		NA		-0.043* (0.024)		NA		-0.036 (0.024)		NA	
Maternal Paid Work	-0.005 (0.003)		NA		-0.007** (0.003)		NA		-0.006* (0.003)		NA	
Tracking recommendation variable included												
Education (linear term)	0.142* (0.073)		0.133 (0.084)		0.029 (0.096)		0.16 (0.103)		0.108 (0.103)		0.15 (0.108)	
Education (quadratic term)	-0.004 (0.003)		-0.004 (0.003)		0 (0.004)		-0.005 (0.004)		-0.003 (0.004)		-0.005 (0.004)	
Soft factors	0.033*** (0.011)		0.029*** (0.011)		0.026* (0.015)		0.013 (0.015)		0.019 (0.016)		0.021 (0.015)	
Full-time experience	0.077*** (0.028)		0.06 (0.045)		0.1*** (0.033)		-0.036 (0.053)		0.044 (0.033)		-0.028 (0.051)	
Part-time experience	0.059** (0.025)		0.077 (0.055)		0.079*** (0.029)		-0.055 (0.083)		0.021 (0.031)		-0.024 (0.07)	
OLF experience	0.073*** (0.025)		0.048 (0.05)		0.091*** (0.027)		-0.034 (0.084)		0.019 (0.031)		-0.052 (0.053)	
Occ. prestige	0.001 (0.001)		0.002** (0.001)		-0.001 (0.001)		0.002 (0.001)		-0.001 (0.001)		0.001 (0.001)	
Maternal housework	0 (0.016)		NA		-0.006* (0.003)		NA		-0.02 (0.02)		NA	
Maternal Paid Work	-0.004 (0.003)		NA		-0.025 (0.019)		NA		-0.005 (0.003)		NA	
GPA as endogeneous variable												
Education (linear term)	0.163** (0.07)		0.22*** (0.079)		0.008 (0.092)		0.185* (0.098)		0.099 (0.101)		0.204** (0.104)	
Education (quadratic term)	-0.004 (0.003)		-0.006** (0.003)		0.001 (0.003)		-0.005 (0.004)		-0.002 (0.004)		-0.006* (0.004)	

Soft factors	0.077*** (0.012)	0.053*** (0.012)	0.077*** (0.016)	0.013 (0.015)	0.069*** (0.017)	0.019 (0.016)
Full-time experience	0.039 (0.028)	0.031 (0.043)	0.089*** (0.032)	0.072 (0.046)	0.072** (0.035)	-0.015 (0.048)
Part-time experience	0.036 (0.026)	0.072 (0.053)	0.069** (0.029)	0.023 (0.069)	0.054 (0.033)	-0.036 (0.065)
OLF experience	0.023 (0.025)	-0.077 (0.118)	0.062** (0.027)	0.135 (0.086)	0.037 (0.032)	-0.049 (0.053)
Occ. prestige	0.002*** (0.001)	0.004*** (0.001)	0 (0.001)	0.004*** (0.002)	0.004*** (0.001)	0.001 (0.001)
Maternal housework	-0.022 (0.016)	NA	-0.037* (0.019)	NA	-0.027 (0.021)	NA
Maternal Paid Work	-0.005* (0.003)	NA	-0.006** (0.003)	NA	-0.006* (0.003)	NA

Results firstly differ by the *child's gender*, as the results for gender-divided samples suggest (see Table 5 above and Table 8 and Table 9 in the appendix A 2 and A 3). It is observed that sons are almost exclusively influenced by the mother's soft factors. Girls are also mainly influenced by the mother but their fathers' soft factors exert some influence, too. The mother's almost exclusive influence in partner samples is therefore driven more strongly by boys. The negative effect of maternal housework is, as described before, affecting girls much more than boys. We refer to the role model explanation here. Except for this effect, we cannot ascertain effects of maternal employment particular to girls. On the contrary, a close maternal labour market attachment during compulsory school is slightly more beneficial for boys. Moreover, sons are slightly more affected by maternal prestige than girls. On the other hand, in samples without partner data, daughters are more strongly affected by income variables. In mother chaired samples without partner, maternal labor income is slightly negatively associated to daughters' outcomes but lacks significance for sons. Apparently, the positive *gender* role model does not operate via the earnings channel but via the parent's time investment. Furthermore some cross-gender effects may be portrayed. Boys are positively affected not only by their mothers' soft factors but also by their labor market success (particularly in mother samples without partner) and maternal prestige (particularly in stable partnerships chaired by the mother).

We further run robustness checks with modified *specifications of covariates*, referring to (a) our income variables, (b) occupational prestige, (c) an added tracking recommendation, and (d) milieu factors.

(a) As mentioned in Section 3, we run a specification that differentiates between *income accrued in the child's age 7 to 9 and 13 to 15*, respectively as a robustness check of our main specification of pooled income information from 7 to 15. The results essentially resemble those of our main specification. This particularly applies to the positive association of net household income and the negative association of public transfers, both findings being mostly reserved to samples with the mother being the reference parent. A noteworthy exception refers to maternal and paternal labor income that are insignificant throughout all estimations, maybe due to an inherent path dependence of labor market returns.

(b) We also calculate *mean occupational prestige* for available years. Since occupational prestige is usually slow to change, this does not change the results in any substantial way.

(c) We further check a specification that includes a *tracking recommendation variable* as an additional regressor (enlarged model). The underlying theoretical consideration is that the recommendation made by school representatives, i.e. teachers, might reflect the child's abilities as an outcome-relevant but yet omitted information with the covariates at hand. However, it is well known that the tracking recommendation is no suitable measure for the child's "true" (inherent) ability as it is affected by ability assignments which by themselves are influenced by parental home indicators shown up at school, i.e. parents' social prestige. As the tracking recommendation is subject to many of the demographic and human capital related covariates of our model, incorporating this variable means incorporating endogenous information which is highly significant. It is not surprising that as a result, many of the covariates exhibit a reduced (or even lost) significance in the enlarged model. Given the tracking recommendation, the parameters of remaining covariates have to be interpreted as measuring their outcome effect *after* primary school.

In spite of controlling for school tracking, it is highly intriguing that maternal employment history keeps its significance (in stable partnerships irrespective of child) and even becomes more significant in samples without partner. As employment history is measured during the child's age ranging from 7 to 15, we take this finding as evidence for a notable influence of mothers' employment during secondary school.

(d) What changes when the *milieu indicators* are brought into the model (see Table 5 above and Table 10 and 11 in A 4 and A 5 in the appendix)? First of all, the number of observations decreases by about 400. In the mother sample without partner, the most notable changes occur in the housework and in the prestige variable. Both become clearly less significant. Although the effect could be caused by the change in the sample, this is unlikely the case for the prestige variable because social status is (indirectly) part of the milieu creation. On the other hand, we cannot find such a pattern for the father samples without partner. The prestige variable of fathers remains as important as before. The soft factors variable also remains highly significant, only its effect is slightly diminished. Except for maternal housework and maternal prestige variables, the changes attributable to the inclusion of milieu factors are rather small. The fundamental messages remain largely unchanged. As to the milieu variables themselves, the Established milieu was defined to be the reference group. Among the remaining milieus, we find stable negative effects on the child's school outcome for the Consumer-Materialistic milieu. Some more or less stable negative associations were found for other milieus like the middle-class milieu. Little differences were found between the remaining ones.²⁷

Finally, we present comparative results for our *alternative target variable, grade point average* (see Table 5 above and Table 12 and Table 13 in the appendix A 6 and A 7). The main observation is that the significance and effect direction of most parental characteristics are independent of the choice of the endogenous variable. We note some differences between the dependent variables throughout samples, though. The gender effect is stronger or more sig-

²⁷ Note that the share of the Experimental (6 %) and Conservative (3 %) milieu is rather small in our sample.

nificant for the GPA, while the association of living in the Eastern part of Germany to the outcome is in absolute terms smaller for the GPA than for the expected school leave degree. As noted, the latter effect is mainly a selection effect and therefore not to be interpreted as a regional effect. Independent of whether the mother is the reference parent or not, the daily amount of maternal housework between the child's age 7 to 9 is more robustly negatively associated with the expected school leave degree. The same holds true for the maternal employment biography variables in samples without partner data.

7 | Conclusion

This paper analyzes the relevance of parental employment during compulsory school age of their children for their educational outcome at age 15, beyond the well-known effects of parental education, income and demography that have been shown in former studies. Our results mainly support the established hypotheses. Our findings indicate that parents' employment behavior indeed matters for their children's school performance. It seems that the effects operate through role models rather than via generated income. Particularly, results for mothers' time use in favor of paid work point to beneficial outcomes for their children - in some aspects they hold especially for daughters which points to gender role models. Moreover, distinct parental habits that indicate aspirations and self-esteem are highly important. However, the transmission of these soft factors seems to require that the parent is sufficiently present at home. This often applies to mothers since they still bear the lion's share of care and household tasks in German families.

As to the political inferences, what can be learnt from our study? While there is no necessity to further stimulate fathers' participation in the labor market, social policy should foster that of mothers. Beside politics that address the institutional framework like adequate child-care facilities, promoting the societal acceptance of working mothers seems to be an effective tool to reach this goal. Furthermore, our findings stress the importance of time parents spend with their children. In this context, political instruments that foster father's engagement in family tasks are decisive. Our results could be interpreted in favor of a balanced work-family workload of each parent and more egalitarian gender roles. While this is usually postulated in the context of gender mainstreaming issues focusing on women's human capital, we argue that also children's human capital is benefitting.

In this paper, we treated maternal employment as exogenous, relying on a variety of controls that are likely to capture at least part of mother's unobservable traits. Admittedly, it is likely that this is feasible to only some extent. Therefore, the established association to the outcome variable could be most likely improved by instrumenting the maternal employment decision. Under certain assumptions, the cost and availability of childcare can serve as such an instrument. With respect to mothers of children at compulsory school age, this applies to information about after-school care or all-day school supply. Such data are hard to find at a suitable German regional level. Yet, incorporating this information into the model could further validate the results at hand.

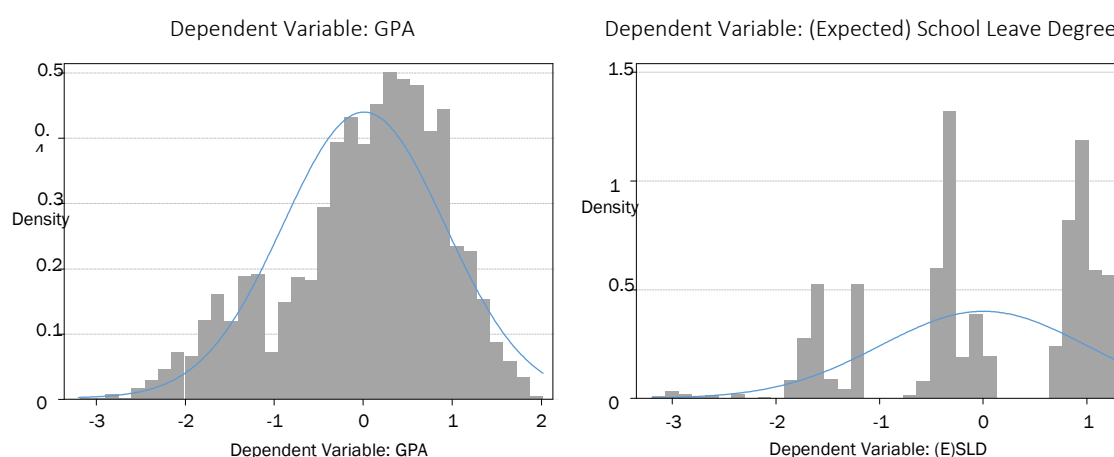
Appendix

A 1 | Endogeneous variables

Table 6 Grade Point Average (GPA) ex-ante standardization

GPA harmonized	GYM	RS	HS
1	1		
2	2	1	
3	3	2	
4	4	3	1
5	5	4	2
6	6	5	3
7		6	4
8			5
9			6

Figure 1 Distribution of the two dependent variables overlaid by a scaled normal probability density function.



Note: Bin size chosen according to: $\min\{\sqrt{n}, 10 \cdot \ln(n)/\ln(10)\}$.

Table 7 Descriptive statistics of endogenous variables, by samples

	Original Variable		Mother w/o partner		Father w/o partner		Mother w partner		Father w partner	
	GPA	(E)SLD	GPA	(E)SLD	GPA	(E)SLD	GPA	(E)SLD	GPA	(E)SLD
Obs	3,705	3,934	1,769	1,858	1,512	1,587	1,292	1,347	1,241	1,300
Mean	0.0232684	0.003548	0.0026982	0.0009049	0.0214058	0.02258	0.0465528	0.0519163	0.0457769	0.0463542
Std. Dev.	0.9107312	0.9965938	0.8835066	.9685928	0.8731508	0.96158	0.8741308	0.9631552	0.8621428	0.9627634
Min	-3.189115	-3.197582	-3.189115	-3.101652	-3.189115	-3.101652	-3.189115	-3.101652	-2.766153	-3.101652

A 2 | Split analyses by the child's gender, samples without partner data

Table 8 Regression results for model O3 by the child's gender, samples without partner data

Reference parent:	Mother	Mother	Father	Father
Child's gender:	Sons	Daughters	Sons	Daughters
Dep.Var.: (E)SLD ²⁸				
<i>Socio-demographic characteristics</i>				
Years with single mother	-0.022* (0.012)	0.003 (0.011)	-0.034* (0.019)	0.011 (0.02)
Years with mother & partner	-0.047*** (0.016)	-0.017 (0.013)	-0.022 (0.021)	-0.019 (0.018)
Years with single father	-0.035 (0.078)	-0.068 (0.135)	-0.023 (0.042)	0.03 (0.095)
Years with father & partner	0.016 (0.052)	0.072 (0.078)	-0.033 (0.056)	-0.008 (0.078)
Years with others	-0.023 (0.07)	-0.005 (0.046)	-0.072 (0.073)	0.028 (0.051)
Birth Order	-0.13*** (0.049)	-0.121*** (0.045)	-0.146*** (0.047)	-0.126*** (0.047)
Number of Siblings	0.047 (0.042)	0.04 (0.042)	-0.031 (0.039)	0.086** (0.043)
East Germany	0.292*** (0.094)	0.093 (0.1)	0.235*** (0.088)	0.05 (0.085)
Rural Area	-0.15** (0.069)	-0.044 (0.064)	-0.113 (0.075)	-0.101 (0.067)
Number of Moves	-0.045 (0.045)	-0.028 (0.041)	-0.003 (0.054)	-0.071 (0.048)
Soft Factors	0.08*** (0.017)	0.094*** (0.017)	0.049*** (0.018)	0.079*** (0.017)
Mother's age	0.027*** (0.008)	0.02*** (0.007)	0.019*** (0.007)	0.011* (0.007)
Migration	0.09 (0.092)	0.195** (0.084)	-0.125 (0.096)	0.029 (0.086)
Maternal Housework	-0.032 (0.025)	-0.033 (0.024)		
<i>Human-capital related characteristics</i>				
Labor Income	-0.012 (0.05)	-0.09* (0.05)	0.024 (0.034)	-0.017 (0.033)
Post Gov Income	0.046 (0.03)	0.061** (0.028)	0.042 (0.043)	0.045 (0.04)
Public Transfers	0.161 (0.396)	-0.49 (0.338)	0.831* (0.499)	-0.611 (0.513)

²⁸ (E)SLD: (Expected) School Leave Degree. GPA: Grade Point Average

Private Transfers	0.571 (0.544)	0.234 (0.342)	3.012*** (1.082)	-1.901 (1.403)
Years of Education	0.286*** (0.103)	0.249** (0.109)	0.231* (0.123)	0.322*** (0.118)
Years of Education ²	-0.009** (0.004)	-0.006 (0.004)	-0.007 (0.004)	-0.01** (0.004)
<i>Employment biography characteristics</i>				
Maternal Paid Work	-0.003 (0.004)	-0.005 (0.004)		
Years Fulltime	0.094** (0.046)	0.044 (0.038)	0.103 (0.063)	0.01 (0.065)
Years Parttime	0.113*** (0.042)	0.029 (0.034)	0.173** (0.082)	0.027 (0.078)
Years OLF	0.092** (0.041)	0.024 (0.033)	-0.009 (0.188)	-0.049 (0.17)
Years Fur. Educ.	0.057 (0.159)	0.129 (0.122)	0.083 (0.087)	-0.016 (0.071)
Occ. prestige	0.004*** (0.001)	0.003** (0.001)	0.005*** (0.002)	0.005*** (0.002)
Constant	-4.355*** (0.838)	-2.971*** (0.858)	-3.878*** (0.97)	-3.021*** (0.975)
ADJ. R ²	0.26	0.25	0.22	0.22
N=	737	720	679	659

Note: Results split in gender of child. Analyses without partner data for both reference parents, employment restriction implicitly fulfilled by MPS-variable.
Significance levels: *: 10%, **: 5%, ***: 1%.

A 3 | Split analyses by the child's gender, samples with partner data

Table 9 Comparison of regression results for model O3 by the child's gender, samples with partner data

Reference parent:	Mother	Mother	Father	Father
Child's gender:	Sons	Daughters	Sons	Daughters
Dep.Var.: (E)SLD ²⁹				
<i>Socio-demographic characteristics</i>				
Years with single mother	0.069 (0.091)	0.047 (0.157)	-0.037 (0.062)	0.069 (0.054)
Years with mother & partner	-0.094*** (0.028)	-0.024 (0.026)	-0.067* (0.038)	-0.021 (0.024)
Years with father & partner	0.005 (0.067)	0	-0.015 (0.065)	0
Years with others	-0.087 (0.093)	0.592 (0.786)	-0.04 (0.097)	0.023 (0.049)
Birth Order	-0.102* (0.058)	-0.139** (0.056)	-0.145** (0.062)	-0.113* (0.06)
Number of Siblings	-0.009 (0.051)	0.119** (0.054)	-0.018 (0.064)	0.106* (0.062)
East Germany	0.264** (0.119)	0.055 (0.124)	0.269** (0.127)	-0.02 (0.127)
Rural Area	-0.121 (0.084)	-0.041 (0.077)	-0.122 (0.089)	-0.078 (0.081)
Number of Moves	-0.071 (0.069)	-0.043 (0.06)	-0.032 (0.074)	-0.002 (0.063)
Soft Factors	0.085*** (0.023)	0.071*** (0.024)	-0.001 (0.024)	0.028 (0.024)
Partner: Soft Factors	-0.004 (0.023)	0.044* (0.023)	0.07*** (0.025)	0.09*** (0.026)
Mother's age	0.013 (0.01)	0.02** (0.009)	0.019** (0.01)	0.016* (0.008)
Migration	0.149 (0.116)	0.124 (0.107)	0.134 (0.128)	0.004 (0.112)
(Partner:)Maternal Housework	-0.039 (0.029)	-0.067** (0.029)	-0.033 (0.031)	-0.051 (0.031)
<i>Human-capital related characteristics</i>				
Labor Income	-0.024 (0.065)	-0.036 (0.066)	0.064 (0.051)	0.003 (0.042)
Post Gov Income	0.023 (0.04)	0 (0.034)	-0.072 (0.065)	-0.004 (0.057)
HHPublic Transfers	0.554 (0.365)	-0.403 (0.321)	-0.055 (0.392)	-0.424 (0.369)

²⁹ (E)SLD: (Expected) School Leave Degree. GPA: Grade Point Average

Private Transfers	1.244 (1.474)	-0.58 (2.086)	2.572 (1.783)	-0.165 (2.793)
Years of Education	0.086 (0.136)	0.071 (0.144)	0.34* (0.174)	0.268* (0.146)
Years of Education ²	-0.002 (0.005)	0 (0.005)	-0.011* (0.006)	-0.008 (0.005)
Partner: Years of Education	0.293* (0.154)	0.286** (0.142)	0.19 (0.155)	0.224 (0.151)
Partner: Years of Education ²	-0.009* (0.006)	-0.009* (0.005)	-0.005 (0.006)	-0.006 (0.006)

Employment biography characteristics

(Partner:) Maternal Paid Work	-0.005 (0.005)	-0.007 (0.004)	-0.006 (0.005)	-0.006 (0.004)
Years Fulltime	0.144*** (0.051)	0.051 (0.043)	-0.012 (0.07)	-0.05 (0.073)
Years Parttime	0.155*** (0.046)	0.015 (0.038)	-0.029 (0.104)	-0.048 (0.093)
Years OLF	0.124*** (0.044)	0.022 (0.035)	-0.014 (0.088)	-0.102 (0.077)
Years Fur. Educ.	-0.123 (0.226)	0.123 (0.154)	-0.265 (0.205)	-0.054 (0.242)
Partner: Years Fulltime	0.017 (0.081)	0.007 (0.058)	0.099* (0.057)	0.028 (0.047)
Partner: Years Parttime	-0.013 (0.115)	-0.087 (0.098)	0.105** (0.053)	-0.001 (0.044)
Partner: Years OLF	0.102 (0.118)	0.056 (0.247)	0.077 (0.052)	-0.012 (0.043)
Partner: Years Fur. Educ.	-0.534** (0.254)	-0.079 (0.305)	-0.225 (0.27)	-0.063 (0.201)
Occ. prestige	0.002 (0.002)	-0.003 (0.002)	0.004** (0.002)	0.004* (0.002)
Partner: Occ. prestige	0.004* (0.002)	0.007*** (0.002)	0.001 (0.002)	-0.002 (0.002)
Constant	-4.842*** (1.43)	-3.472*** (1.3)	-5.451*** (1.403)	-3.533** (1.438)
ADJ. R ²	0.25	0.29	0.26	0.28
N=	528	490	451	425

Note: Results split in gender of child. Analyses with partner data for both reference parents, employment restrictions implicitly fulfilled by MPS-variables.
Significance levels: *: 10%, **: 5%, ***: 1%.

A 4 | Robustness checks with milieu indicators, main samples without partner data

Table 10 Results for models O1-O3 for inclusion of milieu-indicators.

Sample:	Mother Without Partner	Father Without Partner	Mother Without Partner	Father Without Partner	Mother Without Partner	Father Without Partner
Dep.Var.: (E)SLD ³⁰	Model O1	Model O1	Model O2	Model O2	Model O3	Model O3
<i>Socio-demographic characteristics</i>						
Years with single mother	-0.017** (0.008)	-0.006 (0.015)	-0.005 (0.009)	0 (0.015)	-0.003 (0.009)	-0.002 (0.016)
Years with mother & partner	-0.027*** (0.01)	-0.02 (0.015)	-0.032*** (0.01)	-0.023 (0.015)	-0.034*** (0.011)	-0.023 (0.015)
Years with single father	0.016 (0.049)	-0.022 (0.036)	0.025 (0.052)	-0.026 (0.037)	-0.039 (0.064)	-0.012 (0.045)
Years with father & partner	0.032 (0.045)	0.015 (0.048)	0.027 (0.043)	-0.006 (0.047)	0.034 (0.043)	-0.01 (0.047)
Years with others	-0.029 (0.038)	-0.026 (0.044)	-0.028 (0.037)	-0.024 (0.043)	-0.017 (0.039)	-0.019 (0.043)
Gender of child	0.258*** (0.05)	0.287*** (0.052)	0.274*** (0.048)	0.288*** (0.051)	0.288*** (0.05)	0.304*** (0.052)
Birth Order	-0.158*** (0.037)	-0.132*** (0.035)	-0.121*** (0.037)	-0.112*** (0.036)	-0.118*** (0.039)	-0.118*** (0.037)
Number of Siblings	0.04 (0.033)	0.003 (0.027)	0.024 (0.033)	0.004 (0.031)	0.028 (0.036)	0.003 (0.033)
East Germany	0.158*** (0.06)	0.108* (0.062)	0.155** (0.066)	0.123* (0.068)	0.235*** (0.078)	0.147** (0.07)
Rural Area	-0.156*** (0.053)	-0.171*** (0.055)	-0.135*** (0.052)	-0.132** (0.055)	-0.129** (0.054)	-0.142** (0.056)
Number of Moves	-0.019 (0.033)	-0.051 (0.038)	-0.004 (0.033)	-0.031 (0.038)	0.001 (0.034)	-0.039 (0.04)
Soft Factors	0.133*** (0.013)	0.116*** (0.013)	0.087*** (0.013)	0.064*** (0.014)	0.088*** (0.013)	0.064*** (0.014)
Mother's age / Father's age	0.035*** (0.006)	0.019*** (0.005)	0.023*** (0.006)	0.013** (0.005)	0.023*** (0.006)	0.012** (0.005)
Migration	-0.1 (0.069)	-0.157** (0.069)	-0.001 (0.068)	-0.069 (0.07)	0.038 (0.07)	-0.029 (0.071)
Maternal Housework	-0.03* (0.017)		-0.023 (0.018)		-0.02 (0.02)	
Milieu	...	...	...	...	...	...
<i>Human-capital related characteristics</i>						
Labor Income			-0.054* (0.029)	0.027 (0.024)	-0.06 (0.043)	0.012 (0.027)
Post Gov Income			0.087*** (0.024)	0.056* (0.032)	0.08*** (0.025)	0.038 (0.034)

³⁰ (E)SLD: (Expected) School Leave Degree. GPA: Grade Point Average

Public Transfers	-0.678*** (0.212)	-0.274 (0.18)	-0.341 (0.306)	0.282 (0.381)
Private Transfers	0.515 (0.328)	0.657 (1.091)	0.47 (0.332)	1.009 (1.104)
Years of Education	0.083*** (0.012)	0.079*** (0.012)	0.07*** (0.014)	0.044*** (0.015)

Employment biography characteristics

Maternal Paid Work					-0.005 (0.003)	
Years Fulltime					0.074** (0.035)	0.077 (0.049)
Years Parttime					0.075** (0.032)	0.106* (0.061)
Years OLF					0.055* (0.031)	0.061 (0.058)
Years Fur. Educ.					0.107 (0.107)	-0.065 (0.136)
Occ. prestige					0.002* (0.001)	0.006*** (0.001)
Constant	-1.113*** (0.282)	-0.454* (0.263)	-2.009*** (0.297)	-1.628*** (0.29)	-2.535*** (0.419)	-2.089*** (0.525)
ADJ. R ²	0.19	0.14	0.25	0.2	0.26	0.22

N=	1226	1215	1195	1161	1118	1110
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Note: Models O1-O3 for main sample specification, i.e. with employment restriction without partner data. Significance levels: *: 10%, **: 5%, ***: 1%, controlled for milieu variables.

A 5 | Robustness checks with milieu-indicators, main samples with partner data

Table 11 Results for models O1-O3 for inclusion of milieu-indicators.

Sample:	Mother With Partner	Father With Partner	Mother With Partner	Father With Partner	Mother With Partner	Father With Partner
Dep.Var.: (E)SLD ³¹	Model O1	Model O1	Model O2	Model O2	Model O3	Model O3
<i>Socio-demographic characteristics</i>						
Years with single mother	0.015 (0.048)	-0.034 (0.037)	0.036 (0.047)	-0.029 (0.036)	0.089 (0.111)	0.002 (0.044)
Years with mother & partner	-0.054*** (0.015)	-0.051*** (0.019)	-0.052*** (0.016)	-0.046** (0.019)	-0.059*** (0.019)	-0.049** (0.023)
Years with father & partner	0.017 (0.066)	0.044 (0.053)	0.004 (0.064)	-0.009 (0.063)	0.006 (0.063)	-0.012 (0.063)
Years with others	-0.05 (0.045)	-0.026 (0.043)	-0.024 (0.044)	-0.004 (0.042)	-0.092 (0.091)	0.006 (0.045)
Gender of child	0.275*** (0.057)	0.241*** (0.059)	0.294*** (0.056)	0.263*** (0.057)	0.293*** (0.061)	0.316*** (0.062)
Birth Order	-0.163*** (0.044)	-0.129*** (0.044)	-0.115*** (0.043)	-0.102** (0.043)	-0.122*** (0.047)	-0.111** (0.048)
Number of Siblings	0.066 (0.042)	0.013 (0.042)	0.042 (0.042)	0.01 (0.041)	0.038 (0.048)	0.011 (0.049)
East Germany	0.173** (0.069)	0.182** (0.072)	0.055 (0.077)	0.092 (0.078)	0.162 (0.099)	0.133 (0.101)
Rural Area	-0.2*** (0.061)	-0.193*** (0.063)	-0.133** (0.06)	-0.13** (0.062)	-0.097 (0.065)	-0.095 (0.067)
Number of Moves	-0.031 (0.046)	-0.021 (0.048)	-0.014 (0.045)	-0.009 (0.046)	-0.002 (0.051)	0.014 (0.052)
Soft Factors	0.118*** (0.017)	0.046*** (0.017)	0.084*** (0.017)	0.011 (0.017)	0.08*** (0.019)	-0.002 (0.019)
Partner: Soft Factors	0.04** (0.016)	0.118*** (0.017)	0.01 (0.017)	0.078*** (0.017)	0.013 (0.019)	0.098*** (0.019)
Mother's age / Father's age	0.029*** (0.007)	0.022*** (0.006)	0.018*** (0.007)	0.017*** (0.006)	0.017** (0.008)	0.016** (0.007)
Migration	-0.12 (0.08)	-0.181** (0.083)	-0.045 (0.081)	-0.049 (0.083)	0.011 (0.088)	0.012 (0.09)
(Partner:)Housework	-0.046** (0.019)	-0.024 (0.02)	-0.042** (0.02)	-0.031 (0.02)	-0.043* (0.024)	-0.036 (0.024)
Milieu	...	...	...	...	...	...
<i>Human-capital related characteristics</i>						
Labor Income			-0.013 (0.035)	0.04 (0.029)	-0.037 (0.056)	0.038 (0.038)

³¹ (E)SLD: (Expected) School Leave Degree. GPA: Grade Point Average

Post Gov Income	0.05*	0.006	0.026	-0.02
	(0.029)	(0.04)	(0.032)	(0.051)
HHPublic Transfers	-0.203	-0.191	0.307	0.031
	(0.143)	(0.142)	(0.313)	(0.279)
Private Transfers	0.182	2.072	0.357	2.473
	(1.189)	(1.587)	(1.302)	(1.684)
Years of Education	0.048***	0.054***	0.043**	0.041**
	(0.016)	(0.015)	(0.018)	(0.019)
Partner: Years of Education	0.058***	0.064***	0.036*	0.066***
	(0.015)	(0.016)	(0.019)	(0.019)

Employment biography characteristics

(Partner:)Maternal Paid Work					-0.007**	-0.006*
					(0.003)	(0.003)
Years Fulltime					0.129***	0.024
					(0.041)	(0.052)
Years Parttime					0.109***	0.02
					(0.037)	(0.072)
Years OLF					0.089**	-0.014
					(0.035)	(0.059)
Years Fur. Educ.					0.026	-0.221
					(0.143)	(0.164)
Partner: Years Fulltime					0.045	0.09**
					(0.063)	(0.04)
Partner: Years Parttime					-0.018	0.081**
					(0.089)	(0.037)
Partner: Years OLF					0.162	0.054
					(0.148)	(0.036)
Partner: Years Fur. Educ.					-0.403**	-0.117
					(0.203)	(0.175)
Occ. prestige					0	0.004**
					(0.001)	(0.002)
Partner: Occ. prestige					0.005***	-0.001
					(0.002)	(0.001)
Constant	-0.757**	-0.549*	-1.88***	-2.023***	-2.97***	-2.667***
	(0.33)	(0.314)	(0.355)	(0.352)	(0.828)	(0.716)
ADJ. R²	0.2	0.2	0.26	0.27	0.28	0.28

N	902	850	878	834	760	723
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Note: Models O1-O3 for main sample specification, i.e. with employment restrictions. Significance levels: *: 10%, **: 5%, ***: 1%, controlled for milieu variables.

A 6 | Robustness checks with modified target variable, main samples without partner data

Table 12 Comparison of regression results between endogenous variables, main samples without partner data

Sample:	Mother		Father	
Dep.Var.: ³²	(E)SLD	GPA	(E)SLD	GPA
<i>Socio-demographic characteristics</i>				
Years with single mother	-0.009 (0.008)	-0.008 (0.008)	-0.017 (0.014)	-0.018 (0.013)
Years with mother & partner	-0.03*** (0.01)	-0.04*** (0.009)	-0.023* (0.014)	-0.024* (0.013)
Years with single father	-0.056 (0.063)	-0.068 (0.059)	-0.022 (0.037)	0.011 (0.039)
Years with father & partner	0.032 (0.042)	0.051 (0.04)	-0.022 (0.044)	0.047 (0.041)
Years with others	-0.018 (0.038)	-0.04 (0.038)	-0.021 (0.042)	-0.054 (0.043)
Gender of child	0.272*** (0.043)	0.36*** (0.041)	0.293*** (0.047)	0.392*** (0.044)
Birth Order	-0.126*** (0.033)	-0.109*** (0.031)	-0.137*** (0.033)	-0.128*** (0.031)
Number of Siblings	0.047 (0.029)	0.052* (0.028)	0.021 (0.028)	0.056** (0.027)
East Germany	0.213*** (0.068)	0.165** (0.065)	0.159*** (0.061)	0.103* (0.057)
Rural Area	-0.091* (0.047)	-0.047 (0.044)	-0.113** (0.05)	-0.055 (0.046)
Number of Moves	-0.029 (0.03)	-0.009 (0.029)	-0.041 (0.036)	-0.051 (0.034)
Soft Factors	0.085*** (0.012)	0.077*** (0.012)	0.064*** (0.012)	0.053*** (0.012)
Mother's age	0.023*** (0.005)	0.02*** (0.005)	0.016*** (0.005)	0.016*** (0.005)
Migration	0.134** (0.061)	0.054 (0.058)	-0.026 (0.064)	-0.08 (0.06)
Maternal Housework	-0.031* (0.017)	-0.022 (0.016)		
<i>Human-capital related characteristics</i>				
Labor Income	-0.045 (0.035)	-0.044 (0.033)	0.003 (0.024)	0.005 (0.022)
Post Gov Income	0.057*** (0.02)	0.047** (0.019)	0.045 (0.029)	0.022 (0.027)
Public Transfers	-0.248	-0.332	0.127	0.044

³² (E)SLD: (Expected) School Leave Degree. GPA: Grade Point Average

	(0.256)	(0.247)	(0.353)	(0.34)
Private Transfers	0.361 (0.289)	0.409 (0.272)	1.253 (0.84)	1.021 (0.773)
Years of Education	0.255*** (0.074)	0.163** (0.07)	0.265*** (0.085)	0.22*** (0.079)
Years of Education ²	-0.007*** (0.003)	-0.004 (0.003)	-0.008*** (0.003)	-0.006** (0.003)
<i>Employment biography characteristics</i>				
Maternal Paid Work	-0.004 (0.003)	-0.005* (0.003)		
Years Fulltime	0.062** (0.029)	0.039 (0.028)	0.058 (0.045)	0.031 (0.043)
Years Parttime	0.065** (0.026)	0.036 (0.026)	0.098* (0.056)	0.072 (0.053)
Years OLF	0.052** (0.025)	0.023 (0.025)	-0.029 (0.125)	-0.077 (0.118)
Years Fur. Educ.	0.095 (0.097)	0.075 (0.094)	0.032 (0.053)	-0.01 (0.05)
Occ. prestige	0.003*** (0.001)	0.002*** (0.001)	0.005*** (0.001)	0.004*** (0.001)
Constant	-3.674*** (0.587)	-2.647*** (0.562)	-3.572*** (0.683)	-2.99*** (0.644)
Adj. R ²	0.27	0.24	0.23	0.21
N=	1457	1396	1338	1281

Note: Comparison between endogenous variables for main sample specification, i.e. with employment restriction. Significance levels: *: 10%, **: 5%, ***: 1%.

A 7 | Robustness checks with modified target variable, main samples with partner data

Table 13 Comparison of regression results between endogenous variables, main samples with partner data

Sample:	Mother		Father	
Dep.Var.: ³³	(E)SLD	GPA	(E)SLD	GPA
<i>Socio-demographic characteristics</i>				
Years with single mother	0.063 (0.076)	0.055 (0.072)	0.011 (0.04)	0.012 (0.038)
Years with mother & partner	-0.048*** (0.018)	-0.054*** (0.017)	-0.035* (0.02)	-0.039* (0.021)
Years with father & partner	0.011 (0.063)	0.073 (0.059)	-0.019 (0.061)	0.045 (0.058)
Years with others	-0.097 (0.086)	-0.161 (0.181)	-0.004 (0.043)	-0.039 (0.047)
Gender of child	0.299*** (0.052)	0.376*** (0.05)	0.304*** (0.055)	0.414*** (0.053)
Birth Order	-0.124*** (0.04)	-0.118*** (0.038)	-0.122*** (0.042)	-0.117*** (0.041)
Number of Siblings	0.055 (0.037)	0.062* (0.035)	0.033 (0.043)	0.079* (0.042)
East Germany	0.181** (0.085)	0.121 (0.081)	0.164* (0.088)	0.095 (0.085)
Rural Area	-0.079 (0.056)	-0.015 (0.053)	-0.095 (0.059)	-0.067 (0.057)
Number of Moves	-0.053 (0.045)	-0.054 (0.043)	-0.012 (0.048)	-0.027 (0.046)
Soft Factors	0.082*** (0.016)	0.077*** (0.016)	0.012 (0.016)	0.019 (0.016)
Partner: Soft Factors	0.014 (0.016)	0.013 (0.015)	0.078*** (0.017)	0.069*** (0.017)
Mother's age	0.017*** (0.007)	0.016** (0.006)	0.019*** (0.006)	0.013** (0.006)
Migration	0.15* (0.077)	0.073 (0.074)	0.08 (0.083)	0.051 (0.081)
(Partner:)Maternal Housework	-0.049** (0.02)	-0.037* (0.019)	-0.039* (0.022)	-0.027 (0.021)
<i>Human-capital related characteristics</i>				
Labor Income	-0.028 (0.046)	-0.017 (0.043)	0.027 (0.032)	0.048 (0.031)
Post Gov Income	0.015 (0.026)	-0.014 (0.024)	-0.028 (0.042)	-0.068* (0.041)
HHPublic Transfers	0.083	0.295	-0.194	-0.279

³³ (E)SLD: (Expected) School Leave Degree. GPA: Grade Point Average

	(0.237)	(0.238)	(0.261)	(0.252)
Private Transfers	0.243 (1.16)	0.467 (1.088)	1.353 (1.425)	1.327 (1.355)
Years of Education	0.05 (0.098)	0.008 (0.092)	0.272** (0.108)	0.204** (0.104)
Years of Education ²	0 (0.004)	0.001 (0.003)	-0.008** (0.004)	-0.006* (0.004)
Partner: Years of Education	0.287*** (0.103)	0.185* (0.098)	0.187* (0.105)	0.099 (0.101)
Partner: Years of Education ²	-0.009** (0.004)	-0.005 (0.004)	-0.005 (0.004)	-0.002 (0.004)

Employment biography characteristics

(Partner:) Maternal Paid Work	-0.006* (0.003)	-0.006** (0.003)	-0.006** (0.003)	-0.006* (0.003)
Years Fulltime	0.097*** (0.033)	0.089*** (0.032)	-0.02 (0.049)	-0.015 (0.048)
Years Parttime	0.084*** (0.029)	0.069** (0.029)	-0.022 (0.067)	-0.036 (0.065)
Years OLF	0.072*** (0.027)	0.062** (0.027)	-0.048 (0.055)	-0.049 (0.053)
Years Fur. Educ.	0.03 (0.128)	-0.02 (0.122)	-0.201 (0.15)	-0.18 (0.146)
Partner: Years Fulltime	0.029 (0.046)	0.072 (0.046)	0.062* (0.036)	0.072** (0.035)
Partner: Years Parttime	-0.012 (0.071)	0.023 (0.069)	0.054 (0.033)	0.054 (0.033)
Partner: Years OLF	0.084 (0.09)	0.135 (0.086)	0.033 (0.033)	0.037 (0.032)
Partner: Years Fur. Educ.	-0.351* (0.186)	-0.331* (0.176)	-0.143 (0.158)	-0.096 (0.152)
Occ. prestige	0 (0.001)	0 (0.001)	0.004*** (0.001)	0.004*** (0.001)
Partner: Occ. prestige	0.005*** (0.002)	0.004*** (0.002)	0 (0.001)	0.001 (0.001)
Constant	-4.332*** (0.938)	-3.556*** (0.903)	-4.5*** (0.975)	-3.284*** (0.935)
ADJ. R ²	0.27	0.25	0.29	0.27
N=	1018	980	876	838

Note: Comparison between endogenous variables for main sample specification, i.e. with employment restrictions. Significance levels: *: 10%, **: 5%, ***: 1%.

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