

Gendered occupational aspirations among German youth: Role of parental occupations, gender division of labour, and family structure

Helen Law¹, & Pia S. Schober¹

¹ University of Tübingen

Address correspondence to: Pia S. Schober, Department of Sociology, University of Tübingen, Wilhelmstraße 36, 72074 Tübingen (Germany)

Email: pia.schober@uni-tuebingen.de

Abstract

Objective: This study investigates how multiple domains of parental gender role socialisation as well as parent-child relationships and family structure may shape adolescents' gendered occupational aspirations.

Background: Young people with gender-typical aspirations have a higher chance of choosing gender-typical post-secondary education fields and are more likely to work in gender-typical occupations as adults. Gender norms, family structures and parent-child relationships have undergone profound changes in recent decades. We extend the intergenerational transmission literature by considering whether the influence of parental role modelling may vary according to parent-child relationships and family structure.

Method: We draw on data from 2,235 adolescents from the German Socio-Economic Panel and apply logistic regressions.

Results: Children whose fathers were employed in gender-typical jobs had a greater likelihood of aspiring to a more gender-typical occupation. This relationship was not significant among sons who did not live continuously with both parents since birth, who were generally more likely to aspire to gender-typical occupations. Surprisingly, the gender-typicality of fathers' occupations seemed more influential among daughters whose parents had separated than among those who lived continuously with both parents. Regarding the parental gender division of paid and unpaid work, only mothers' continuous non-employment was associated with daughters being more likely to aspire to a gender-typical occupation.

Conclusion: On the whole, our findings suggest a rather weak influence of parental gender role modelling on children's persistently gendered occupational aspirations in Germany. Yet, our study extends existing family research by pointing to significant variations across family structures.

Key words: intergenerational transmission; occupational gender segregation; parental role modelling; gender division of labour, aspirations, adolescence, family structure



1. Introduction

Like many other advanced industrial societies, Germany's labour market and post-secondary education continue to be profoundly segregated by gender, with women and men concentrated in different fields of study and employment (Charles & Bradley, 2009; Charles & Grusky, 2004). Recent German studies, however, showed that even small reductions in the gender segregation of occupations over the past decades (Hausmann & Kleinert, 2014) contributed significantly to compressing the gender wage gap and wage inequality (Witte, 2020). The stratification theory of gender essentialism argues that young people's selections of fields of study and occupations are strongly affected by persistent gender-essentialist beliefs and increasing self-expressive values (Cech, 2013; Charles & Bradley, 2009). Prior research has shown that boys and girls with gender-typical aspirations have a higher chance of selecting gender-typical disciplines in post-secondary education (Law, 2018; Morgan et al., 2013) and are more likely to end up in gender-typical occupations as adults (Polavieja & Platt, 2014). Studies seeking to explain the drivers of the gender wage gap and in particular why gender segregation in educational disciplines contributes so much to this gap have pointed to the importance of gender differences in occupational and earnings aspirations (Gerber & Cheung, 2008; Ochsensfeld, 2014). Therefore, it seems crucial to gain a better understanding of how recent cohorts of young people form their gender-related occupational aspirations and what urges them to follow or deviate from their parents' occupations.

The role of parents for gender differences in occupational aspirations deserves attention because parents continue to be influential socialising agents in childhood and adolescence. However, family structures and processes have undergone profound changes in recent decades. Previously, many children seeking to enter similar educational and occupational fields as their parents could only follow the lead of their fathers, not their mothers, because their mothers had no or little work experience. Due to rising labour force participation among mothers, recent cohorts of children frequently have two parents with occupational experience. Furthermore, fathers' time spent and active involvement with children in two-parent families has increased in Germany as well as in other Western countries (Altintas, 2016; Berghammer, 2013; Kan et al., 2011), presumably leading to greater emotional closeness between fathers and their children. Hence, we follow the example of a few recent studies (Busch-Heizmann, 2015; Polavieja & Platt, 2014) and consider multiple domains of parental gender role socialisation, such as employment and childcare practices, which may be important in shaping adolescents' gender beliefs and aspirations. Furthermore, we extend these prior studies by exploring how parent-child relationships and family structure may moderate the intergenerational transmission of gendered occupational interests and aspirations. This seems warranted as the percentage of children who do not live continuously with the same two parents throughout childhood has been on the rise in recent cohorts (Connelly et al., 2014; Geisler et al., 2018). This study extends existing family research by investigating whether the growing diversity in childcare set-ups, parent-child relationships and parental involvement alters how children adopt their parents' gender role modelling when developing their own occupational aspirations.

2. Previous studies on the intergenerational transmission of gender beliefs and occupational aspirations

Over the past decade, the influence of the gender typicality of parents' occupations on children's has received increasing attention. Gender typicality is defined as the perception that one is a typical member of his or her gender group. With respect to parents' occupations and children's occupational aspirations, this assumes typicality of occupation-related skills and interests that are similar to those of same-gender peers. We conceptualise gender typicality of occupations as a holding an occupation with a large share of same-gender peers.

Previous studies from the Netherlands, US, UK, Germany, Switzerland, and Sweden found that children's aspirations or choices correlated with the gender typicality of education or occupations of both parents (Kaiser & Schels, 2016; Laftman, 2008; Leppel et al., 2001; Polavieja & Platt, 2014; Shu & Marini, 1998), only of their mothers (Buchmann & Kriesi, 2012; Busch-Heizmann, 2015; van der Vleuten et al., 2018) or only of their fathers (Helbig & Leuze, 2012). In some studies, this transmission occurred more strongly between parents and children of the same gender (Helbig & Leuze, 2012; Kaiser & Schels, 2016; Polavieja & Platt, 2014; Shu & Marini, 1998; van der Vleuten et al., 2018), whereas others did not find support for stronger transmission within same-gender dyads (Busch-Heizmann, 2015; Laftman, 2008; Leppel et al., 2001). Based on Swiss data, Buchmann and Kriesi (2012) also showed that the gender-typicality of children's talents ascribed by parents significantly correlated with the gender-typicality of children's occupational aspirations and vocational training choices.

To better understand whether it is parental gender-(a)typical occupations or gender role modelling more generally which shape children's occupational aspirations, it is important to consider parents' enactment of gender roles in several domains. A recent British study by Polavieja and Platt (2014) identified significant associations between maternal gender-typical behaviours in terms of occupation and employment interruptions and girls' gender-atypical occupational aspirations, whereas fathers' gender-atypical occupations and greater involvement in housework were positively correlated with the probability of gender-atypical aspirations among boys. In Germany, however, Busch-Heizmann (2015) found that only mothers' gender-typical occupations significantly predict whether sons and daughters aspire to occupations with a higher share of females. She also reported that male adolescents aspired to more female-dominated occupations when their parents engaged in a non-traditional division of employment and housework, but only if they had a good relationship with their parents. Somewhat surprisingly, girls were more likely to aspire to female-dominated occupations if their mothers worked in such occupations and they reported that their parents were not very important to them. Busch-Heizmann (2015) speculated that this may be due to mothers in families with good family cohesion passing on more information about the disadvantages of female-dominated occupations, which may weaken the intergenerational transmission of occupations. Given the partly contradictory results, we extend these studies by more closely examining the interdependence of these effects with parent-child relationships and with co-residence of fathers. To date, only Laftman (2008) has investigated variations in the influence of parents' fields of study and occupations on adolescents' gendered

educational choices across family types. She found no significant differences between resident and non-resident fathers in Sweden in the relationships between fathers' educational backgrounds and their children's likelihood of choosing the natural science/technology programme in upper secondary school. The influence of non-resident fathers did not vary by geographical distance. Stepfathers' educational background and occupations were significantly related to boys' but not girls' choices. In this study, by focusing on Germany, a country where non-resident fathers tend to be less actively involved with their children than in Sweden (Fritzell et al., 2020; Geisler et al., 2018), we provide interesting evidence as to whether reduced contact with one's father due to parental separation reduces the intergenerational transmission of occupational interests by non-resident fathers.

3. Conceptual framework

According to Gottfredson's (1981), occupational aspirations reflect young people's self-concept, made up of all the beliefs about themselves, including personality, interests, and perceived place in society, as well as their knowledge of different occupations. In the formation of occupational aspirations children pass through various stages and eliminate a large number of "inappropriate" career alternatives. Until about age 9, this process first mainly involves circumscription meaning identifying one's most desirable options, whereas from the early teens the focus shifts to societal valuations and the prestige of occupations and considering one's internal characteristics such as motivation, values, and ability. This study will focus on the occupational aspirations of 17-year-olds who are still in school in Germany. Their aspirations can be classified as somewhat realistic as they probably reflect the realistic accessibility of career choices to some extent because they already decided against leaving school early and switching to a vocational training. With respect to subject choices in tertiary education, however, the students' aspirations may still be influenced by idealistic preferences and considerations of suitability rather than accessibility of jobs on which students often lack information (Finger et al., 2020; Peter et al., 2016).

Different theoretical perspectives of the gender segregation of education and occupations have proposed supply- and demand-side influences both at the macro and micro level (for an overview, see Kriesi & Imdorf, 2019). To conceptualise micro-level influences on the formation of occupational aspirations, our theoretical framework combines theories from social and cognitive psychology focusing on gender construction and development (Bussey & Bandura, 1999; Eccles, 1994; Wood & Eagly, 2012) with sociological and integrated socialisation perspectives (Hurrelmann & Bauer, 2015). Socialisation can be understood as the dynamic individual development of an individual's self and personality in constant interaction with the surrounding social structures. Importantly, individuals are assumed to actively and productively process socialisation experiences (Habermas, 1976; Hurrelmann & Bauer, 2015). In their social cognitive theory of gender development, Bussey and Bandura (1999) underline the importance of role modelling in addition to direct tuition and enactive experience, e.g. praise or

disapproval for specific gender-related behaviours. With respect to parents as socialising agents, children are therefore more likely to develop less gender-typical occupational aspirations when their parents hold more gender egalitarian ideologies, practise a more gender-equal division of paid and domestic work, and work in less gender-typical occupations. Potentially important mechanisms include role modelling, discussion of gender beliefs and opportunities to engage in less gender-typical activities. Inconsistencies between the different mechanisms may weaken the transmission (Bussey & Bandura, 1999).

Following expectancy-value theory (Eccles, 1983), parents are thought to influence their offspring's aspirations by shaping their ability self-concept in gender-(a)typical subjects, their interests and their long-term goals. Parents' occupational interests may promote similar intrinsic interests in children. Parents transmit occupation-specific skills and values, cultural capital, and social networks to their children regardless of how gendered this occupation is (Van de Werfhorst & Luijkx, 2010). Parents' gender beliefs and their own gender division of labour are likely to shape children's long-term goals in terms of the importance attached to earning a lot of money and providing for one's family vs. achieving work-family balance. Furthermore, parents constitute an important information source regarding the relevance of specific subjects or educational choices for reaching various long-term goals. Parents' beliefs also impact the relative costs of different choices, as children whose aspirations contradict their parents' interests and role modelling may experience less support and more pressure to change.

3.1 Transmission of occupational gender norms and occupational interests

Two key intergenerational transmission mechanisms are likely to consist of the *transmission of occupational gender norms and of specific occupational interests*, respectively. Both mechanisms reinforce each other when it comes to transmission from parents to children of the same gender, whereas they predict contradictory relationships and might possibly offset each other with respect to transmission from parents to children of different genders. Mothers who work in more female-dominated jobs, on the one hand, may transmit an interest in female-typed occupations to their sons but, on the other hand, they may also confirm norms that these occupations are more suitable for women than for men. Similarly, fathers who work in male-dominated occupations may foster their daughters' interests in these occupations, yet they may also confirm gender norms that male-typed occupations are more suitable for men. In combination, this is likely to result in weaker relationships between the gender typicality of the occupation of the opposite-sex parent and children's gender-typical occupational aspirations. Hence, we formulate the following hypothesis:

Hypothesis 1: Fathers' gender-typical occupations should be positively and more strongly associated with aspiring to gender-typical occupations for sons than for daughters (H1a), whereas stronger positive associations of mothers' gender-typical occupations are predicted for daughters than for sons (H1b).

In addition, we may expect the influence of fathers' gender-typical occupations (as in H1a) to be stronger than of mothers' occupations (as in H1b) for two reasons. First, mothers are often less strongly integrated in their occupational careers than fathers due to

career interruptions, working hours reductions and downward mobility (Aisenbrey et al., 2009; Boeckmann et al., 2015), and second, young women are likely to develop a greater self-interest in adopting gender equality beliefs (Bolzendahl & Myers, 2004) and aspiring to less feminised higher-status occupations than young men (Polavieja & Platt, 2014).

Parents' gender division of labour in two-parent families is conceptualised as mothers' and fathers' time spent on paid work and childcare. We consider relative and absolute time spent by each partner on formal employment and childcare. With respect to the normative influences of *parents' gender division of labour*, we hypothesize:

Hypothesis 2: Children whose parents have practised a more gender-traditional time allocation of paid and unpaid labour are more likely to aspire to gender-typical occupations.

As the transmission mechanisms through parents' more gender-typical occupations and more gender-traditional division of labour may reinforce each other, we also examine empirically whether they represent additive effects or moderate each other's influence.

3.2 Moderating processes: parent-child relationships and family structure

To identify with someone as a role model, young people need to have the opportunity to develop personal connections and emotional closeness with them (Archer et al., 2010; Buck et al., 2008). Therefore, parents have a high chance of being recognised as role models. On the one hand, a parent's influence on their child's gender beliefs and occupational aspirations may be stronger when the two have a close relationship characterised by mutual trust, frequent exchange of thoughts and beliefs and constructive two-way communication about problems. On the other hand, an emotionally close parent-child-relationship may also allow children to focus more on their own talents and interests and distance themselves from their parents as occupational role models and may ensure parental support also for non-normative occupational choices, as has been shown for women and men who aspire to gender-atypical jobs (Schwiter et al., 2014). It is a priori difficult to predict which of the two effects may dominate or whether they may offset each other. Hence, we do not formulate any unidirectional hypothesis but rather investigate possible moderator relationships of stronger or weaker influences of parental occupations depending on parent-child-relationships in the empirical analysis.

An increasing number of children experience parental separation and live in a single-parent family for part of their childhood (Geisler et al., 2018). In Germany, about 80 percent of children live fully or mostly with their mother after parental separation (Geisler et al., 2018). Children in single-parent families might learn broader, less traditional definitions of gender (Kurdek & Siesky Jr., 1980), as single parents frequently have to assume a wider range of responsibilities in terms of breadwinning and stereotypically masculine and feminine household tasks after divorce. Earlier studies based on small, non-representative samples found only modest differences in the gender typicality of personality attributes, beliefs and behaviours among children who grew up, at least partly, in single-mother families compared to two-parent families (for a meta-analysis, see Stevenson & Black, 1988a). Both boys and girls were found to be more androgynous, scoring high on both masculine and feminine attributes (Kurdek & Siesky Jr., 1980). Single parents, particularly single mothers, frequently face greater economic constraints

and more severe work-family conflict (Reimann et al., 2020). As a result, gender essentialist norms and self-expressive values may affect children in single-parent families less, whereas earning prospects may be more relevant for them. As male-dominated occupations on average pay higher wages than female-dominated occupations, the combination of both processes may reduce girls' gender-typical occupational aspirations. For boys, as a result of these opposing processes, the direction of the association is difficult to predict a priori. Due to the frequently reduced contact between children and their fathers after parental separation, fathers' role modelling and the transmission of interests, help with occupation-related school work and information about their occupations is likely to be less influential for these children compared to children who have lived continuously with both parents since birth. As we predicted the transmission of occupational interests and gender stereotypes through fathers' employment in gender-typical occupations to be particularly relevant for boys in two-parent families, we expect reduced contact with fathers after parental separation to affect this transmission channel more strongly for sons. At the same time, the influence of mothers' occupations may be strengthened in terms of transmitting interests in and information about their occupations. However, children are likely to also be aware of the work-family conflict and career compromises experienced by many single mothers (Reimann et al., 2020), which may reduce the role modelling effect. On the whole, we therefore expect a stronger association of mothers' gender-typical occupations with occupational aspirations of children whose parents separated compared to those who continuously lived with both parents since birth.

We therefore formulate the following hypotheses regarding *variations across family structures*:

Hypothesis 3: Girls who have not continuously lived with their mother and father since birth are less likely to aspire to gender-typical occupations than those in biological two-parent families.

Hypothesis 4: For children who have not continuously lived with their biological fathers since birth, mothers' gender-typical occupations may be more strongly associated with gender typical occupational aspirations of these children (H4a), whereas gender-typical occupations of fathers may be less strongly associated with sons' gender-typical occupational aspirations (H4b) than in biological two-parent families.

4. Data and method

We used data from the German Socio-Economic Panel (SOEP) version 33.1 (Goebel et al., 2019) covering the years 1984 to 2016. Adolescents completed the supplementary youth questionnaire, which has been included in the SOEP since 2000, when they reached the age of 17. After applying cross-sectional design and wave non-response weights, 7009 adolescents completed the youth questionnaire. As we are interested in parental socialisation influences on somewhat idealistic occupational aspirations, and the occupational aspirations of young people who have already started vocational training are significantly affected by accessibility of jobs and labour market demand and therefore are

heavily influenced by their realised vocational choices (Basler et al., 2020), we restricted our sample to adolescents who were not enrolled in vocational education or training when they filled in the youth questionnaire. Therefore, we omitted 1769 adolescents from our analysis. As the variables on supportive parenting only became available in 2001, 160 adolescents who completed the youth questionnaire in 2000 were further excluded from our analysis. We excluded another 774 adolescents from our sample because they had never lived with their fathers since birth. Among the remaining 4306 adolescents, 2235 (1067 girls and 1168 boys) reported their occupational aspirations; they constitute our sample for analysis.

We estimated logistic regression models of whether or not young people at age 17 aspire to gender-typical occupations with over 70 % of workers of their own gender to test the influence of their parents working in a gender-typical occupations and of the parental gender division of labour measured in the years from birth to age 15 of the children (Hypotheses 1 and 2) and of family structure (Hypothesis 3). To examine possible variations in the influences of parents' gender-typical occupations across families in terms of parent-child-closeness and family structure (Hypothesis 4), we include interaction effects in additional modelling steps.

The fact that 48 percent of the adolescents in our sample did not report any occupational aspirations may indicate a selection problem. To reduce this selection bias, we additionally estimated probit regression models with Heckman selection correction. Based on the sample of adolescents who reported their occupational aspirations as well as those who did not, we followed the same strategy as Busch-Heizmann (2015) and, based on a SOEP question about how the young people approach finding a suitable occupation, included a dichotomous variable only in the selection equation: whether the adolescents agreed that they are still trying to find out what their talents are and which occupation is right for them. This variable is assumed to affect adolescents' non-response probability on the occupational aspirations question but not the gender typicality of their occupational aspirations directly after controlling for gender typicality of parents' occupations and the parental gender division of labour. Using logistic regression models of non-response to the occupational aspiration question, we found that young women and men who reported that they were still trying to find out what their talents are and which occupation is right for them had a 47- and 41-percentage-point higher probability of not answering the question regarding their aspired occupation (see Table A1 in the [online appendix](#)). Few of the other variables significantly predicted non-response on the aspired occupation. Given that ρ , the correlation of the error terms of the selection equation and the equation of interest in the Heckman selection model was low (around 0.12 for females and -0.16 for males) and the Wald test of independent equations indicated that the null hypothesis that $\rho = 0$ was not rejected, the Heckman selection correction models did not seem to be preferable. Hence, we report the results of logistic regression models without Heckman selection correction. The Heckman selection correction models provided substantively the same results and are shown in the [online appendix](#) (see Table A2).

We applied design and wave non-response weights and adjusted the standard errors for clustering within households. Across all analyses, we imputed missing values on the independent variables resulting from item nonresponses using multiple imputation with chained equations (five cycles). The results, however, do not differ substantively when

using listwise deletion. We conducted separate analyses for young women and men, as some hypotheses predict varying relationships by children's gender.

4.1 Variables

4.1.1 Dependent variable

Gender typicality of occupational aspirations. Adolescents' occupational aspirations were identified with an open question: "Do you have a career aspiration? What kind of occupation is that? Please state as precisely as possible." The SOEP provides a coding of occupational aspirations based on the 1992 and 2010 versions of the German Federal Statistical Office's job classification scheme (4-digit kldB 92 and 5-digit kldB 2010). We linked these with information on the numbers of men and women in each occupation for the respective years based on Germany's annual microcensus (Federal Statistical Office, 1993-2016). Based on these, we constructed a binary measure as to whether young people aspired to gender-typical occupations with over 70 percent of same-gender peers because we assume that they are only able to roughly distinguish between occupations that are gender-typical and those who are not. They are unlikely to be well informed about the exact shares of men and women in different occupations which a gradual linear measure would assume. As shown in the descriptive statistics in Table 1, 44 percent of young women and 64 percent of young men aspired to a gender-typical occupation. Although a few studies have shown that the minority group of children who aspire to gender-atypical occupations may differ from others in terms of higher academic achievement and more privileged socio-economic family background (Jann & Hupka-Brunner, 2020; Schwiter et al., 2014), we are unable to explore more in detail what drives young people to specifically aim for or avoid gender-atypical occupations due to sample size restrictions. In our sample, only about 8 percent of women and men aspired to a gender-atypical occupation with less than 30 percent of same-gender peers.

4.1.2 Independent variables

Gender typicality of mothers' and fathers' occupations. Based on the average share of same-gender workers in each occupation in mothers' and fathers' employment history up to when their child was 15 years old, we created binary measures capturing whether or not mothers and fathers worked in gender-typical occupations defined as those with shares of over 70 percent of workers of the respective gender. Each occupation in parents' employment history was identified by an open question in the individual questionnaire: "What is your current position/occupation?" The SOEP also provides a coding of occupations with the same 4-digit kldB 92 and 5-digit kldB 2010. Similar to the adolescents' aspired occupations, we measured the gender typicality of mothers' and fathers' occupations by the proportion of same-gender workers in each occupation each year based on the kldB 92 between 1993 and 2011 and on the kldB 2010 between 2012 and 2016. For occupations prior to 1993, we measured gender typicality using the proportion of women or men in 1993. As shown in Table 1, 57 percent of mothers and 72 percent of fathers in our sample held gender-typical occupations. Comparing these percentages to those for children's aspired occupations at age 17, we note that recent cohorts of German

youth, especially women, aspire to less gender-typical occupations than those held by their parents' generation.

Parental gender division of paid work and childcare. Four variables were included to measure the gender division of paid work and childcare among intact couple families. First, we measured the *mother's average share of paid work hours up to when the respondent was age 15*. We obtained the number of hours the mother and the father spent on paid work during their employment history up to when the respondent was age 15. We then obtained the average number of hours of paid work for the mother and father and calculated the mother's share. This variable ranges between 0 percent (father performs all paid work) and 100 percent (mother performs all paid work). We also created a dummy variable indicating that the *mother was continuously not employed up to when the child was 15 years old* to capture very traditional arrangements and control for cases for which we do not have any information about the mother's occupations. The third and fourth indicators measured the *average number of hours the mother and father, respectively, spent on childcare on a typical weekday during all observed interviews up to when the respondent was age 15*. These childcare hours are not child-specific but refer to all time spent on childcare. We also tested an alternative measure of the relative division of childcare, but this correlated more strongly with the division of paid work.

Supportive parenting by mother and father. These two scales were based on the Supportive Parenting Scale by Simons and colleagues (1992) and have been used in the SOEP youth questionnaire since 2001 (Richter et al., 2017). Supportive parenting describes a style of childrearing based on an authoritative and sensitive communication style and interactions within the parent-child relationship. The scales comprise the following nine items reported by the adolescents: (1) Are you and your mother (father) able to find a solution together to problems you have with each other? Does your mother (father) ... (2) talk to you about things you do or things you have experienced? ... (3) bring up things that bother or worry you? ... (4) ask for your opinion prior to making decisions that affect you? ... (5) express their opinion when you do something that they like or approve of? ... (6) give you the impression that they really trust you? ... (7) ask for your opinion before they make decisions on family matters or issues? ... (8) give you an explanation for their decisions? ... (9) show you that they really love you? These items were presented with the 5-point Likert-type response options "very often", "often", "sometimes", "seldom" and "never". We constructed the scales measuring supportive parenting by the mother and father respectively based on the mean of responses to these nine items. The scales were coded as missing if the respondents did not respond to five or more items. Higher values indicate more supportive parenting. The scales were standardised to have a mean of 0 and a standard deviation of 1 for the regression analyses. The two scales exhibited Cronbach's alphas of 0.83 and 0.89, respectively.

Respondent did not continuously live with both parents in their first 15 years. This is measured by a dichotomous variable indicating whether the respondent experienced parental separation up to age 15 or had lived with both biological parents since birth. The former applies to about one quarter of the sample. Unfortunately, our subsample of young people whose parents separated is too small to further categorise by the timing of the relationship breakdown. The majority of adolescents experienced their parents' separation during their teenage years. We were also unable to differentiate between single mothers,

single fathers and stepfamilies, as the latter two family forms remain minorities in our sample.

Table 1: Respondent characteristics by gender: means and proportions

	Girls		Boys		Min.	Max.	N	Missing values
	Mean/ Prop.	SD	Mean/ Prop.	SD				
Dependent variable: Aspiring to a gender-typical occupation								
>70% of workers of same gender in aspired occupation	44.02		64.38		0	1	2235	0
Independent variables								
Mother in gender-typical occupation (>70% of women)	68.42	21.06	69.18	22.33	1.52	99.14	1621	614
Father in gender-typical occupation (>70% of men)	78.01	20.73	77.72	21.34	4.16	100	1666	569
Average mother's share (%) of paid work hours when respondent's age ≤ 15 ^a	37.95	26.05	35.67	27.49	0	100	2025	210
Mother was continuously not employed when respondent's age ≤ 15	0.20		0.19		0	1	2227	8
Average number of hours mother spent on childcare on a weekday	4.92	3.62	4.54	3.26	0	16	1971	264
Average number of hours father spent on childcare on a weekday	1.39	1.38	1.51	1.54	0	16	1727	508
Supportive parenting by mother	3.79	0.63	3.73	0.60	1	5	2203	32
Supportive parenting by father ^a	3.38	0.87	3.51	0.74	1	5	2096	139
Respondent did not continuously live with both parents for first 15 years	0.27		0.24		0	1	2154	81
Father's average occupational status higher than mother's	0.01	0.10	0.02	0.10	-0.25	0.30	1402	833
Highest educational level of either parent (ref. = secondary school or below)								
University	0.24		0.23		0	1	2220	15
Vocational qualification	0.14		0.14		0	1	2220	15
Comparative advantage in maths grades versus German grades ^a	-0.41	1.08	0.23	1.12	-4	4	1914	321
Attended gymnasium (ref. = other school types)	0.25		0.21		0	1	2235	0
Lived in East Germany	0.15		0.15		0	1	2235	0
Number of siblings	0.88	1.10	0.87	1.13	0	11	2235	0
Migration background ^a	0.30		0.23		0	1	2235	0
Heckman's selection variable:								
Still trying to find out what my talents are and which occupation is right for me (totally/partly agree)	0.32		0.28		0	1	2224	11

Note: Sample statistics are weighted. ^a indicates that the difference between girls and boys in that variable is statistically significant at $p < 0.05$

Source: SOEP version 33.1

4.1.3 Control variables

Father's average occupational status higher than mother's. To control for parents' relative occupational status, we converted the occupational codes for mothers and fathers from the International Standard Classification of Occupations (ISCO-88) into the standard International Socio-Economic Index (ISEI) of occupational status scores using conversion tools (Ganzeboom & Treiman, 1996). We obtained the average of these ISEI scores up to the point when the adolescent respondent was 15 years of age. We followed van der Vleuten et al. (2018) and divided the father's average ISEI score by the sum of the mother's and father's ISEI scores and subtracted 0.5. Positive values indicate that the father has a higher occupational status than the mother on average, whereas negative values mean that the mother has a higher occupational status than the father on average. A value of zero indicates that the mother and father have equal occupational status on average.

Highest educational level of either parent. To control for the family's socio-economic status, we considered the educational level of the parent who held the highest educational qualification in the family. This variable consists of three categories: (1) university degree, (2) vocational qualification or (3) secondary school degree or below.

Comparative advantage in mathematics grades versus German grades at school. The youth questionnaire contains information on the respondents' most recent school grades in German and mathematics. We controlled for the comparative advantage in mathematics grades versus German grades on the respondent's latest report card, as more gender-typical competencies are associated with more gender-typical occupational aspirations and choices (Buchmann & Kriesi, 2012; Jonsson, 1999).

Other control variables include whether the respondents attended the university-preparatory type of school known as *Gymnasium* in Germany (versus other types of schools), the respondents' number of siblings and migration background, whether the respondents lived in East Germany, and dummy variables indicating the year when the respondents completed the youth questionnaire between 2001 and 2016 to control for period effects.

5. Results

5.1 Role modelling and normative influences of the gender typicality of parental occupations and gender division of labour

Hypothesis 1a assumed that fathers' gender-typical occupations will be positively and more strongly associated with the gender typicality of sons' aspirations than those of daughters. We find that girls and boys whose fathers work in more male-dominated jobs are more likely to aspire to a more gender-typical occupation by 11 and 8 percentage points, respectively (see Table 2). Additional tests of an interaction effect in a joint logistic regression model for boys and girls showed that the gender difference in the association with the gender typicality of fathers' occupations is not statistically significant, hence not supporting H1a.

Table 2: Average marginal effects based on logistic regression models of aspiring to a gender-typical occupation

	Girls		Boys	
	AME	Standard error	AME	Standard error
Mother in gender-typical occupation	0.022	0.045	-0.016	0.044
Father in gender-typical occupation	0.111*	0.051	0.080*	0.040
Average mother's share (%) of paid work hours when respondent's age \leq 15	0.001	0.001	-0.000	0.001
Mother was continuously not employed when respondent's age \leq 15	0.146*	0.063	-0.003	0.052
Average number of hours mother spent on childcare on a weekday when respondent's age \leq 15	0.001	0.008	0.008	0.006
Average number of hours father spent on childcare on a weekday when respondent's age \leq 15	0.007	0.016	0.006	0.013
Supportive parenting by mother	-0.009	0.022	-0.005	0.026
Supportive parenting by father	-0.013	0.024	-0.002	0.030
Respondent did not continuously live with both parents for first 15 years	0.004	0.052	0.086+	0.050
Father's average occupational status higher than mother's	-0.101	0.261	-0.016	0.044
Highest educational level of either parent (ref. = secondary school or below)				
University	-0.077	0.052	0.067*	0.220
Vocational qualification	-0.032	0.062	-0.103	0.045
Comparative advantage in maths grades versus German grades	-0.058**	0.018	-0.081	0.057
Attended gymnasium (ref. = other school types)	-0.200***	0.051	0.015**	0.019
Lived in East Germany	-0.002	0.052	-0.156	0.051
Number of siblings	0.008	0.027	-0.011	0.046
Migration background	-0.142**	0.050	-0.014	0.021
Survey year dummies, 2001-2016	yes		yes	
N	1067		1168	
F statistic	2.16***		2.01***	

Note: Estimates weighted and standard errors adjusted for clustering within households. + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: SOEP version 33.1

We also do not find any evidence supporting Hypothesis 1b, which assumed that the relationship with the gender typicality of mothers' occupations would be stronger for girls' occupational aspirations than with those of boys. Our results show that the gender typicality of mothers' occupations is not significantly associated with the gender typicality of either girls' or boys' occupational aspirations.

Hypothesis 2 postulates that children whose parents have practised a more egalitarian division of paid and unpaid labour have a higher likelihood of aspiring to more gender-atypical occupations. We measure the gender division of paid and unpaid labour with four variables: (1) the mother's average share of paid work hours, (2) whether the mother has never been employed since the child's birth, and the average number of hours (3) the mother and (4) the father spent on childcare on a typical weekday up to the point when the respondent was 15 years old. We find some evidence supporting Hypothesis 2 only with respect to maternal non-employment for girls. While neither mothers' relative work hours nor mothers' or fathers' childcare hours are associated with the gender typicality of occupations aspired to by children, girls whose mothers were never employed since their birth are 15 percentage points more likely to aspire to more female-dominated occupation. This might suggest that a very traditional maternal employment arrangement influences girls' occupational choices.

5.2 *The role of parent-child relationships and family structures*

Next, we test whether greater closeness and communication with children moderates the parent-child transmission of occupational interests. In Table 3 (Panel A and B), we present interactions between the average share of women in the mother's or father's occupations with supportive parenting styles by the mother or the father. The interaction effects are not statistically significant for either girls or boys, meaning that the intergenerational transmission of more gender-typical occupational aspirations between parents and children does not differ across families depending on whether mothers and fathers practise more or less supportive parenting styles

Hypothesis 3 expected that daughters who did not continuously live with their mothers and fathers since birth may aspire to less gender-typical occupations, whereas the direction of the associations for sons was a priori less clear. As presented in Table 2, Hypothesis 3 is rejected for girls. However, sons who did not continuously live with their parents since birth are 9 percentage points more likely to aspire to a male-dominated occupation. Possibly sons of separated parents attach more value to the higher earnings prospects and economic security of male-dominated occupations and this may outweigh any potential influence of mothers' less traditional role modelling in families with separated parents.

As shown in Panel C of Table 3, the interaction effects of gender typicality of the mother's occupation with whether the child has continuously lived with parents since birth does not reach statistical significance for either boys or girls. We therefore do not find any evidence supporting Hypothesis 4a which suggested that the effect of the gender typicality of mothers' occupations may be stronger in families where children did not continuously co-reside with the father since birth.

Table 3: Interactions between gender typicality of mother's and father's occupation and supportive parenting (Panel A and B) and co-residence with both parents (Panel C and D), respectively

	Girls		Boys	
	OR	Standard error	OR	Standard error
A. Interactions between gender typicality of mother's occupation and supportive parenting of mother				
Mother in gender-typical occupation	1.111	0.235	0.900	0.197
Mother's supportive parenting	1.065	0.167	1.164	0.204
Mother in gender-typical occupation X supportive parenting	.830	0.158	0.720	0.170
N	1067		1168	
F statistic	2.10***		1.96***	
B. Interactions between gender typicality of father's occupation and supportive parenting of father				
Father in gender-typical occupation	1.655*	0.396	1.457*	0.196
Father's supportive parenting	1.237	0.230	0.990	0.208
Father in gender-typical occupation X supportive parenting	0.689	0.145	0.992	0.250
N	1067		1168	
F statistic	2.18***		1.93**	
C. Interactions of gender typicality of mother's occupation with non-continuous co-residence with both parents (Hypothesis 4a)				
Mother in gender-typical occupation	1.189	0.293	1.017	0.246
Respondent did not continuously live with both parents	1.184	0.427	1.907 ⁺	0.697
Mother in gender-typical occupation X non-continuous co-residence	0.769	0.365	.648	0.359
N	1067		1168	
F statistic	2.12***		1.96**	
D. Interactions of gender typicality of father's occupation with non-continuous co-residence with both parents (Hypothesis 4b)				
Father in gender-typical occupation	1.216	0.319	1.609*	0.364
Respondent did not continuously live with both parents	0.470 ⁺	0.192	2.234 ⁺	1.069
Father in gender-typical occupation X non-continuous co-residence	3.175*	1.653	0.587 ⁺	0.232
N	1067		1168	
F statistic	2.19***		1.96***	

Note: Panels A, B, C, and D show the interaction effects added to the logistic regression models presented in Table 2. ⁺ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Source: SOEP version 33.1

We find mixed support for Hypothesis 4b. For girls, a significant positive interaction effect of fathers' gender-typical with non-continuous co-residence with both parents shows that fathers' gender-typical occupations are more strongly associated with them aspiring to a female-dominated occupation if they did not continuously live with both parents (see Panel D in Table 3 and Figure A1 in the [online appendix](#)). This points to stronger rather than weaker transmission of gendered occupational aspirations for daughters. In line with H4b, sons whose fathers work in gender-typical occupations are less likely to aspire to a male-dominated occupation if the sons have not continuously lived with both their mother and father since birth, even though the interaction is only significant at the 10-percent level (see Panel D in Table 3). As shown in Figure A2 in the [online appendix](#), sons who have not continuously lived with both parents do not seem to be significantly influenced by the gender-typicality of their fathers' occupations. Irrespective of the fathers' occupation, these boys who did not continuously live with both parents are more likely to aspire to a male-dominated occupation. By contrast, boys in intact-couple families whose fathers do not work in male-dominated occupations are also less likely to aspire to such occupations themselves. However, it has to be noted that the interaction effect is only marginally significant and the confidence intervals overlap and therefore these findings should be treated with caution.

5.3 Sensitivity analyses

We performed a number of sensitivity analyses to explore how the results would change if we used different analytical strategies and operationalisation of variables. Regression models using Heckman selection correction (see Table A2 in the [online appendix](#)) showed substantively very similar results. OLS regressions operationalising the gender-typicality of young people's aspirations as a continuous measure of the share of same-gender workers in the occupation yielded largely similar results except that fathers' gender-typical occupations were not significantly associated with daughters' aspirations.

We also examined alternative specifications of several key independent variables including considering only more recent years since child age 6, a categorical operationalisation of the mother's share of paid work hours, mother's share of net earned income, and considering parents' relative share of childcare rather than absolute hours. These alternative measures also yielded non-significant associations. Rather than measure mothers' employment status, we tested the number of years mothers worked full-time, which likewise yielded non-significant results. We also tested whether the associations with the gender-typicality of parents' occupations were stronger in families where fathers or mothers reported spending more time with children on weekdays in relative or absolute terms, but did not find any significant interaction effects along these lines.

In addition, we checked the correlations among our variables and did not find any multicollinearity issues. We also tested whether the inclusion of adolescents who were already in vocational education and training in the sample would produce different results, but it yielded similar findings. One might suppose that fathers in more gender-typical occupations influence their sons' occupational aspirations by shaping what their sons value about different occupations, e.g. by increasing the value they attach to monetary benefits. Therefore, we examined whether adolescents' work values might

mediate some of the significant associations between fathers' occupations and sons' aspirations. After controlling for four dimensions of work values (social, intrinsic, extrinsic and materialist), the associations were slightly weaker but remained statistically significant.

6. Discussion

In light of the substantial increases in maternal employment, paternal childcare involvement and the plurality of family forms, yet persistent gender-essentialist beliefs in Western post-industrial societies, this study aims to shed new light on various parental influences on how recent generations of young people form their still mostly gender-typical occupational aspirations. We have considered multiple domains of parental gender role socialisation that may be important in shaping adolescents' gender beliefs and aspirations, including parents' occupations as well as their employment and domestic work practices. Furthermore, we extend previous studies by exploring in more detail potential influences of children's closeness with both parents and the experience of family breakdown for the intergenerational transmission of gendered occupational aspirations.

Based on our measure of occupations' gender typicality, the occupational aspirations of young people in Germany appear to be slightly less gendered than their parents' actual occupations. Our findings show that sons and daughters are more likely to aspire to a gender-typical occupation when their fathers work in male-dominated occupations. These results therefore do not support the hypothesis of stronger intergenerational transmission in same-gender parent-child dyads. The gender typicality of mothers' occupations is not significantly associated with children's occupational aspirations. This may be due to mothers in Germany compromising more in their career choices due to their greater family responsibilities compared to fathers. While these results are partly in line with a previous German study (Helbig & Leuze, 2012), they contradict Busch-Heizmann's (2015) study, which based on less recent waves of the same data only found an influence of mothers' occupations at child age 15 on both sons' and daughters' aspirations.

Despite numerous tests with different operationalisations of the parental gender division of paid and unpaid labour in terms of employment hours, earnings and childcare, we find only weak relationships with adolescents' gender-typical occupational aspirations. Only mothers' continuous non-employment was strongly associated with a greater probability of aspiring to a more female-typed occupation among girls. These findings exhibit some similarities to those by Polavieja and Platt (2014), who reported that maternal employment histories correlated with girls' aspirations. While Busch-Heizmann (2015) did not report significant associations with maternal employment, this may be explained by measurement differences. She measured this only at child age 15, whereas we considered employment histories since birth. The other non-significant relationships for the gender division of paid and unpaid work are in line with Busch-Heizmann's (2015) study. For Germany, these results suggest that an altered gender division of labour in terms of increased maternal employment hours and greater paternal involvement in childcare is unlikely to result a substantial reduction in occupational gender segregation in

future generations. Our findings do not support the assumption that a supportive parenting style and emotionally close relationships with children either strengthen or weaken the role model effect of mothers' or fathers' occupations. Possibly both effects offset each other. Despite our more comprehensive scale assessing parent-child relationships, these findings are similar to Busch-Heizmann's (2015) study, which used a one-item measure of family cohesion and found this to strengthen the intergenerational transmission only for some specific groups but not to be of relevance for most others.

With respect to variations across family structures, our results suggest that children who have not continuously lived with both parents are not less likely to aspire to gender-typical occupations than children in stable families with both biological parents. For girls, family structure does not seem to matter, whereas boys whose parents separated are even more likely to aspire to male-dominated occupations than those in stable families with both biological parents. This is possibly due to the greater earning prospects of these occupations, which boys who experienced their mothers' greater economic constraints after separation, may attach greater value to. The result for girls is in line with Laftman (2008), who found no significant differences across family types in children's likelihood of selecting science/technology programmes in Swedish upper secondary schools after accounting for non-resident fathers' educational and occupational backgrounds. On the whole, we do not find support for our assumption that children who do not live with both parents in Germany may be significantly less influenced by norms of gender essentialism or self-actualisation. This finding from a large representative sample of adolescents provides important new evidence on gender development among children who have less contact with their fathers. This question has been subject to a recurring debate since the 1970s but has mostly been studied in small non-representative samples (for reviews, see Boothroyd & Cross, 2017; Stevenson & Black, 1988b).

Our study, however, did provide some support for the assumption that fathers' gender-typical occupations are less influential among boys who did not continuously live with both parents and most likely lived with a single mother for part of their childhood. Surprisingly, we found the opposite association among daughters. Fathers' gender-typical occupations correlated more positively with aspiring to a gender-typical occupation among girls with separated parents than among girls who continuously lived with both parents. These results contradict Laftman's (2008) findings for Sweden, where the associations of occupations in science/technology were quite similar for resident and non-resident fathers. Overall, these findings warrant further investigation of the moderating influence of family structures and more specific forms of contact arrangements.

This study was subject to significant limitations in so far as we focussed mainly on parental gender socialisation influences and were unable to consider influences of social networks and schools, which are likely to be of increasing importance during adolescence (Raabe et al., 2019; Van der Vleuten et al., in press). Due to data limitations, we were also unable to consider parents' ideologies regarding the gender division of labour or gender-essentialist beliefs regarding occupational choices in our analyses. Furthermore, the cross-sectional nature of our data on youth's occupational aspirations around age 17, after many German youth have already started vocational training, did not allow us to investigate parental influences on vocational training choices, which tend to be more gendered than field of study choices in higher education. Longitudinal data would also allow us to get

closer to analysing causal relationships—for example, causal effects of family structure, parent-child contact and closeness on variations in children’s occupational aspirations over time. These represent important avenues for future research to pursue. Nevertheless, our study significantly extends existing family research by considering how the growing diversity in fathers’ childcare involvement and parent-child relationships and contact may or may not alter how children adopt their parents’ gender role modelling and occupational preferences when developing their own occupational aspirations. On the whole, our results suggest a rather weak influence of parental gender role modelling except for maternal continuous non-employment and the gender typicality of fathers’ occupations. Our results, however, provide first exploratory evidence of significant variation across family structures. Children aspire to only slightly less gender-typical occupations than those of their parents’ generation. It might be promising for future research to investigate influences of peer and friendship networks that may contribute to upholding gender norms regarding suitable occupations as well as labour market constraints that may result in young people ending up in similarly gender-typical jobs as their parents irrespective of their less gendered aspirations.

Data availability statement

For purposes of scientific research, the German Socio-Economic Panel is available free of charge upon signing an agreement (for details, see [DIW Berlin: Data Access](#)).

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Information in German

Deutscher Titel

Geschlechtsspezifische berufliche Aspirationen der Jugend in Deutschland: welche Rolle spielen elterliche Berufe, geschlechtsspezifische Arbeitsteilung und Familienstruktur?

Zusammenfassung

Fragestellung: Diese Studie untersucht den Einfluss elterlicher Geschlechterrollensozialisation in mehreren Bereichen sowie der Eltern-Kind-Beziehung und der Familienstruktur auf geschlechtsspezifische berufliche Aspirationen von Jugendlichen.

Hintergrund: Jugendliche mit geschlechtstypischen Aspirationen wählen häufiger geschlechtstypische Ausbildungs- und Studienfächer und sind auch als Erwachsene öfter in geschlechtstypischen Berufen tätig. Geschlechternormen, Familienstrukturen und Eltern-Kind-Beziehungen haben sich in den letzten Jahrzehnten stark gewandelt. Wir ergänzen die bisherige Literatur zu intergenerationaler Transmission, indem wir den Einfluss elterlicher Vorbildwirkung in Abhängigkeit von Eltern-Kind-Beziehung und Familienstruktur betrachten.

Methode: Wir verwenden logistische Regressionsanalysen auf Basis von 2.235 Jugendlichen im Deutschen Sozio-Oekonomischen Panel.

Ergebnisse: Kinder mit Vätern in geschlechtstypischen Berufen strebten häufiger selbst nach geschlechtstypischen Berufen. Eine Ausnahme bildeten Söhne, die nicht ununterbrochen bei beiden Eltern aufgewachsen waren, die generell häufiger geschlechtstypische Berufe anstrebten. Überraschenderweise schienen Töchter, deren Eltern sich getrennt hatten, stärker davon beeinflusst, ob ihre Väter in geschlechtstypischen Berufen tätig waren, als Töchter, die ununterbrochen bei beiden Eltern aufgewachsen waren. Bezüglich der elterlichen Aufteilung von Erwerbs- und Haushaltsarbeit war nur die durchgehende Nicht-erwerbstätigkeit der Mutter signifikant korreliert mit stärkeren geschlechtstypischen beruflichen Aspirationen für Töchter.

Schlussfolgerung: Alles in allem weisen unsere Ergebnisse auf einen relativ schwachen Einfluss elterlicher Vorbildwirkung auf die nach wie vor häufig geschlechtsspezifischen beruflichen Aspirationen ihrer Kinder in Deutschland hin. Sie weisen jedoch auch auf signifikante Unterschiede in Abhängigkeit der Familienstruktur hin und tragen damit zu einem Erkenntnisgewinn der Familienforschung bei.

Schlagwörter: intergenerationale Transmission; berufliche Geschlechtersegregation; elterliche Vorbilder; geschlechtsspezifische Arbeitsteilung; Aspirationen; Jugend; Familienstruktur

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Helen Law: <https://orcid.org/0000-0001-9137-4582>

Pia S. Schober: <https://orcid.org/0000-0003-1953-1197>



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