Department of Quantitative Social Science

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Nurse or Mechanic? The Role of Parental Socialization and Children's Personality in the Formation of Sex-Typed Occupational Aspirations

Javier Polavieja[1] and Lucinda Platt[2]

Abstract

This study investigates the role of parental socialization and children's agency in the formation of sex-typed occupational preferences using data for British children aged between 11 and 15. We anchor agency in observable psychological attributes associated with children's capacity to act in the face of constraints. We focus on two such attributes, motivation and self-esteem. Our findings identify two main sources of parental influence: 1) parental socio-economic resources, which affect children's occupational ambition, and 2) parental sex-typical behaviors, from which children learn which occupations are appropriate for each sex. We find, additionally, that girls with high motivation and both girls and boys with high self-esteem are less likely to aspire to sex-typical occupations, net of inherited traits and parental characteristics. Motivation and self-esteem help girls to aim higher in the occupational ladder, which automatically reduces their levels of sex-typicality. In the case of boys, however, self-esteem reduces sex-typicality at all levels of the aspired occupational distribution. This suggests that boys with high self-esteem are better equipped to contradict the existing social norms regarding sex-typical behavior. The implications of our findings are discussed.

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"..We are struck by how modest our collective social science accomplishments are after several decades of research directed at explaining occupational sex segregation. Novel approaches to documented supply —and demand side—mechanisms by which segregation is created and maintained are still sorely needed" (Okamoto and England 1999:577).

INTRODUCTION

Even today, most people work in jobs occupied largely by persons of their own sex (see e.g. Chang 2004; Tomaskovic-Devey et al. 2006). Although this is true for both men and women, segregation is more acute for the latter as they tend to concentrate in fewer occupations. Predominantly female occupations offer lower wages and fewer opportunities for career advancement, and hence segregation is often regarded as the main source of women's labor-market disadvantage (see e.g. Maume 1999; Tomaskovic-Devey 1993). It is therefore not surprising that the study of gender segregation has for long been placed at the center of gender stratification research.

Gender segregation in occupations is the result of the actions and interactions of both firms and workers. Discrimination and social closure explanations focus on the role that employers, managers and male co-workers play in hindering women's access to particular jobs (Roscigno, Garcia and Bobbitt-Zeher 2007). However insightful, demand-side approaches cannot explain the existence of significant sex-differences in career preferences and occupational aspirations, not only amongst adults, but also amongst young children who lack labor-market experience (Harper and Haq 2001; Okamoto and England 1999).

Sociologists have long stressed the crucial role that socialization processes play in the transmission of sex-specific norms, values and aspirations leading to segregated occupational outcomes (England et al. 1994; Hitlin 2006; Okamoto and England 1999). Gender socialization approaches provide a supply-side alternative to human capital and sphere specialization models in economics (*Blinded ref.*) as well as to socio-biological and evolutionary explanations of gender-role differentiation (Kanazawa 2001; Penner 2008; Udry 2000).

The existing empirical literature on gender socialization suffers, however, from two important limitations. First, research has been much more concerned with establishing empirical associations, typically associations between parents' and children's characteristics, than with explaining the mechanisms whereby socialization influences operate (Reskin 2003). Consequently, we still know little about the actual channels and processes involved in the intergenerational transmission of sex-typed preferences. Secondly, empirical studies often draw on adult samples to address socialization processes that are thought to take place during childhood, which further complicates the identification of transmission mechanisms. As a result of these caveats, socialization is still largely a black-box in gender stratification research.

Gender socialization models have also been criticized on theoretical grounds for leaving very little room for individual agency in the formation of preferences (Hakim 1991; 1995; Hays 1994). It has been argued that socialization models portray actors as passive receptors of gender values and norms, and assume that all individuals are equally malleable by social influences. This leads to an over-socialized conception of human behavior. Understanding what the role of individual agency is and how it interacts with the social environment in the

formation of sex-typical preferences is crucial for the development of gender socialization theory. Yet such a task poses one fundamental methodological challenge: how to measure human agency.

In much of the existing empirical literature agency has been equated with preference heterogeneity (see e.g. Hakim 1991; 2000). Since individual preferences are seldom observed, it is often assumed that agency is to some extent represented by the amount of unexplained variance in empirical models (Hitlin and Elder 2007). In other words, individual agency is typically not measured but only inferred.[1] This indirect approach carries with it the serious risk of over-individualization —i.e. magnifying individuals' real capacity to make independent choices. In order to shed empirical light on the socialization vs. agency debate, it is therefore essential to find more direct ways of measuring the role of individual agency in preference formation.

This paper investigates the degree of sex-typicality in the occupational aspirations of British children under 16 and tests for different mechanisms involved in the acquisition of sex-typical occupational preferences. We address two main research questions: *First*, we want to know *how* parental characteristics and parental behavior influence the degree of sex-typing in children's occupational aspirations. To this end, we propose a rather eclectic theory of parental socialization that incorporates explicit channels and mechanisms, which are empirically testable.

Secondly, we investigate what is the role of children's agency in the formation of occupational preferences. Hitlin and Elder (2007) argue that current sociological treatments of agency are too abstract to offer guidance for empirical research but can be illuminated by social psychology. They call for anchoring the 'slippery concept' of agency to measurable psychological attributes in future research. We put their recommendation into practice. We expect that individual heterogeneity in occupational preferences is associated with the distribution of certain psychological characteristics in the population. We are interested, specifically, in those psychological attributes that can exert a significant influence on individuals' capacity to act in the face of constraints. We focus on two such attributes: motivation and self-esteem. We argue that if agency plays a role in the formation of occupational preferences, we should find an association between these personality attributes and the level of sex typicality in children's occupational aspirations.

We test our model using information on parental, relational, and psychological variables for a representative sample of over 3,000 British children aged between 11 and 15. This sample is drawn from waves 4 to 18 of the British Household Panel Survey (1994-2008). By investigating early gender differences in occupational aspirations, our approach helps to open the black-box of parental gender-role socialization, sheds light on the agency-structure debate and fills an important gap in the sociological literature on gender segregation.

THEORETICAL FRAMEWORK

Parental socialization

Following Arnett (1995:618) we can define socialization as "the process by which people acquire the behavior and beliefs of the social world —that is, the culture— in which they

live". The most important —but not the only— agent of primary socialization in gender roles is the family (Bandura 1977; Cunningham 2001; Hitlin 2006; Okamoto and England 1999). But how do families shape children's occupational aspirations? Drawing on social stratification, social learning and developmental psychology, we identify two main channels of parental influence: 1) parental socio-economic resources and 2) parental behavior in the economic and domestic spheres.

Parental resources and the scope of occupational horizons

The educational and occupational attainment of children is highly dependent on parental resources (Breen and Jonsson 2005; Gamoran 1996). Families with fewer cultural and economic resources tend to have lower attainment aspirations for their offspring and to transmit these aspirations to children themselves. This, we believe, has interesting implications for the degree of sex-typicality in children's occupational preferences.

Family socio-economic resources, education in particular, are expected to influence the degree of sex-typing in children's occupational aspirations, especially in the case of girls. Top-level occupations are traditionally male-dominated. This means that boys have many sex-typical occupations to choose from at both ends of the occupational distribution. Hence, for boys, high occupational ambition is fully compatible with gender typical aspirations. For girls, however, aiming high in the occupational ladder typically means aspiring to occupations that are not female-dominated. Hence greater occupational ambition should reduce girls' levels of sex-typicality almost automatically by virtue of the vertical dimension of occupational sex-segregation. Parental resources affecting children's occupational ambition are therefore expected to be particularly relevant for the degree of sex-typing in daughters' occupational aspirations (H1).

Behavioral role-modeling: occupational imitation and sex-role learning

According to role-model theories, children learn about gender roles by observing and emulating the behaviors of their parents (Bandura 1977; Bem 1981; Cunningham 2001; van Putten, Dykstra and Schippers 2008). Several empirical studies have found a significant statistical association between the present behavior of daughters and the past behavior of their mothers in areas such as family formation, housework distribution and female labor market participation. This evidence has been interpreted as proof of behavioral role modeling. Yet it is still unclear *how* role-modeling actually operates. This is partly due to the shortage of data which measures parental behavior contemporaneous with the formation of children's preferences.

We distinguish between two different forms of sex-role modeling: simple *imitation* and *behavioral sex-role learning*. Imitation is an essential component in children's observational learning based on live models (Bandura 1977). Developmental psychologists have shown that a mechanism of pure imitation of same-sex parents plays a crucial role in infants' sex-role learning (see e.g. Meltzoff and Moore 2002). The essential precondition for same-sex imitation is children's identification with their same-sex parent. Today there is growing consensus amongst developmental psychologists that same-sex identification is probably innate as it requires some form of preexisting gender identity (Martin, Ruble and Szkrybalo 2002).

We propose to test for *direct occupational imitation* as one potential mechanism of occupational socialization. Occupational imitation is expected to be homo-lineal, that is, daughters are expected to aspire to their mothers' occupation, whilst sons are expected to aspire to their fathers'. Direct occupational imitation will lead to sex-typed aspirations amongst daughters/sons insofar as their mothers/fathers work in segregated occupations themselves (H2). Occupational reproduction through imitation could therefore be the simplest form of intergenerational transmission of sex-typed occupational aspirations.

Behavioral sex-role learning is the process by which children discover and absorb what the prescribed behavior for their sex is by observing the actions of their parents (see e.g. Crouter, Manke and McHale 1995). This learning process is indeed more complex and cognitively demanding than simple imitation. Children first identify gender-role norms by examining the behavior of their own parents and then learn to comply with these norms. Compliance is stimulated by parental sanctions and rewards, which can be more or less subtle (Bandura 1977).

In doing what they do both at home and at work, parents are constantly enacting gender roles. Children learn from these gender displays what type of behavior is socially appropriate for their sex (Cunningham 2001). A traditional enactment of gender roles could thus promote sex-typical occupational aspirations among children (e.g. nurse for girls, mechanic for boys) even if such aspirations do not entail copying the exact occupations of their same-sex parents.

More precisely, we expect that girls (boys) whose mothers (fathers) are employed in traditionally female (male) occupations develop more sex-typical occupational aspirations than girls (boys) whose mothers (fathers) are employed in less-traditional jobs (H3a). Similarly, we expect that children living in households with a traditional —i.e. gender unequal— distribution of housework (H3b) and children of mothers with low labor-market attachment (H3c) develop more sex-typical occupational aspirations than children living in households with less traditional arrangements.

The role of personality

In recent years research in economics and sociology has paid increasing attention to the study of certain psychological attributes that are shown to be relevant to socio-economic success (Bowles and Gintis 2002; Heckman, Stixrud and Urzua 2006; Jackson 2006). In research practice, these attributes are often reduced to composite indices that tap on the correlation between various measures of personal drive, motivation and self-esteem (Carneiro and Heckman 2005). In competitive environments, such personality characteristics, often referred to as non-cognitive skills, are expected to exert a crucial influence on individuals' attainment chances. This idea that personality attributes and dispositions might exert a crucial influence on goal-oriented behavior comes from psychology. Developmental psychologists have shown that children's motivation and their beliefs about self-competence are crucial factors influencing their achievement-related choices (Bandura 1997; Jacobs et al. 2002; Wigfield and Eccless 2000).

In this study we focus on two psychological attributes, motivation and self-esteem, which are relevant in influencing children's capacity to act in the face of constraints. While both promote achievement-oriented behavior, and can be regarded as partially overlapping, self-esteem is expected to have the additional effect of enhancing agents' capacity to make independent choices, even when such choices clash with the existing social norms. This

expectation follows directly from Bandura's self-efficacy theory (Bandura 1977), which sees individuals' beliefs about their own capabilities as the core psychological determinant of human agency, understood as human's capacity for action in the face of constraints (see also Hitlin and Elder 2007).[2]

We thus posit that motivation and self-esteem could affect the degree of sex-typicality of children's occupational choices through two distinctive mechanisms: First, children with high levels of motivation and self-esteem are expected to aim 'higher' in the occupational structure. Note that this *ambition* effect should reduce the level of sex-typicality in girls' occupational aspirations, but not necessarily in boys', for the reasons explained above (H4a). Secondly, children with high levels of self-esteem are expected to be better equipped to make independent choices, and hence to act against the existing social norms, than their low-esteem counterparts. This *autonomy* effect should make children more likely to choose occupations that are outside the range of what is socially prescribed for their sex (e.g. nurses for boys, mechanics for girls). We therefore expect more autonomous children to be more likely to choose sex-atypical occupations whatever their occupational ambition (H4b).

How personal are personality attributes?

Research in developmental psychology and neurobiology suggests that personality is influenced both by heredity and social environment (see e.g. Jacobs et al. 2002; Raevuori et al. 2007). Social scientists have also argued that attributes such as motivation and self-esteem can be transmitted from parents to children through both inheritance and socialization processes (see e.g. Bowles and Gintis 2002; Jackson et al. 2007; Hitlin 2006). The intergenerational transmission of non-cognitive attributes is now considered to be an important mechanism in the reproduction of social (dis)advantage, since working-class children are more likely to have parents who lack incentive-enhancing traits (Bowles and Gintis 2002; Farkas 2003).

We do not dispute these claims about the intergenerational transmission of personality. Yet we contend that variation in personality has an inherent individual component that is *not* determined by direct inheritance from parents. This is what makes personality personal, after all. This component would be responsible for the degree of intrinsic individual variation in psychological attributes, including motivation and self-esteem, thus reflecting pure individual heterogeneity (see also Trzesniewski, Donnellan, and Robins 2003). Bellow we capture this intrinsic component by extracting the residuals from two basic inheritance regression models, which use a host of parental characteristics, including personality traits, as predictors of children's motivation and self-esteem.

DATA AND METHODOLOGY

Data Sources

British Household Panel Survey

The British Household Panel Survey is a longitudinal study of individuals who were living in private households in Great Britain in 1991. The original sample comprised around 5,500 households with around 10,300 respondent adults. These original sample members are followed over time and re-interviewed each year, along with other members of their households aged 16 and over. Data are available for all years up to 2008 (or wave 18).

In 1994 a youth questionnaire designed for self completion was introduced for children in the panel aged 11-15 and, again, the questionnaire has been administered annually since, with the latest data available being from 2008. It is these data collected directly from children under 16 (the Youth Panel) that form the main basis of this paper. We are also, however, able to link information from this youth panel to household and individual adult respondent files in order to relate children's and their parents' responses to each other, to include family context and to apply appropriate weights. Having contemporaneous self-reported data from both parents and older children provides us with a distinctively rich resource of family information.

Overall just over 5,000 individual children were surveyed through the youth questionnaire over the 15 waves. Only about one-third of these were observed 5 times, which is the maximum number of waves a single respondent can stay in the youth panel, around 15 per cent were observed for each of two, three or four waves, and 19 per cent were observed only once. Moreover, many of the questions, including those of particular interest to this study, are not asked in every sweep, meaning that some children are missed altogether for some questions and others will have varying numbers of repeated observations on any particular measure. As a result, and in order to maximize the completeness of the variables we can cover for each child, we focus our analysis on unique children, using as much data from across the sweeps in which they were observed as we can in order to provide rich information on their occupational aspirations and their psychological characteristics.

Roughly 3,700 children provided a valid response to an open-ended question on occupational aspirations at some point. This question forms the basis of our dependent variable (see below). The question was not asked in waves 9, 10 or 11, so we do not have observations for those years. We utilize the latest valid response they provided across their observations, in order to have their aspirations at a point prior to, but most proximate to, their entry into the labor market. For nearly half of the children this was at age 15. Since different questions are asked in different years, answers to other variables may have taken place at earlier ages (when they were asked in the survey).

For the child-level independent variables, such as age, where possible we measure them concurrently with the measure of occupational aspirations. Where they occurred only in prior or later waves, we utilize the latest observation. However, for the psychological variables, where we expect them to capture underlying, stable dispositions, such as with our measures of motivation and self-esteem, we utilize information from all observations on each child to construct a child-specific measure (see below).

By these means, we construct a cross-sectional data set, which accommodates the distinctive structure of the study, but which utilizes as much information as possible from across the observations. An illustration of this structure is given in Figure 1.

[Figure 1 about here]

Information from co-resident parents of each child was matched using a similar approach. Allowing for missing data and questions not asked of particular children or parents because of the question cycles, our final analysis sample comprises 3,132 children, that is, 84 per cent of those for whom we have valid coded occupational aspirations.

Measuring sex typicality: the Labour Force Survey

In order to measure the level of sex typicality in children's favored occupations we calculated segregation measures using the UK Labour Force Survey (LFS). We used 28 pooled quarters of the LFS, from the first quarter of 1994 (which corresponds to the start of the BHPS Youth Panel) to the last quarter of 2000. This gives us a pooled nationally representative sample of 673,604 adults of all ages, of whom we have current occupational information for 367,006 across 371 occupations. Using this pooled sample, we calculated the average proportion of women for each three-digit occupation[3] and then matched this information to children's identified job preferences as well as to each parent's job.[4]

We also use the LFS to calculate the average wage for each three-digit occupation in the dataset. This provides a measure of the relative position of respondents' aspired occupation in the overall occupational distribution and hence accounts for the vertical dimension of occupational aspirations, which we use to differentiate between the *ambition* and the *autonomy* effects of children's motivation and self-esteem (see below).

Variables

Outcome variable

Children's favored occupation was identified by an open question of the form: "What job would you like to do once you leave school or finish your full-time education?" This was coded to three-digit SOC90 occupational codes. The proportion of women typically employed in each of these occupational codes was calculated using the LFS, as explained above, and matched to the occupational choice. While there was a degree of clustering of children's occupational choices, overall the 1,868 boys for whom we have valid responses identified 122 occupations and the 1,880 girls selected 153 occupations between them.[5] The top twenty choices for each sex are listed in Table 1.

[Table 1 about here]

The average proportion of women in children's aspired occupations is 42 per cent (58 per cent for girls and 23 per cent for boys). The LFS adult population experiences an average of 46 per cent women in their occupations (71 per cent for women, 25 per cent for men). Real life occupations are therefore somewhat more segregated for women on average than aspired occupations are for girls.[6] Figure 2 shows the Kernel densities for the proportion of women in children's aspired occupations by sex.

[Figure 2 about here]

Parental variables

Parental resources are measured by parental educational attainment using a dominance approach, whereby we use whichever parent's education is the higher. For children with an absent father, mother's educational attainment is used. Educational attainment is measured using a set of discrete categories: university degree and above; A' levels (typically obtained at age 18) and above but less than university; O' levels or CSEs (typically obtained at age 16); less than this or none. We employ a dummy for absent father to reflect the diminution of parental resources that this implies.

Occupational imitation is measured straightforwardly using dummies to reflect whether there is a direct match between children's aspired occupation and the last occupation of their parents. We use a dummy measuring the incidence of homo-lineal imitation, which is defined as an occupational match between same-sex dyads (i.e. daughters-mothers / sons-fathers). We also compute a dummy measuring the incidence of hetero-lineal imitation (i.e. an occupational match between daughters-fathers / sons-mothers).

We also include several measures for *parental behavior*. The level of sex-segregation of both mother's and father's (last or actual) occupation is measured using a three-category variable that differentiates between sex-atypical, intermediate and sex-typical occupations. The respective cut-off points for these categories were determined on the basis of the observed segregation distributions for adult men and women in the LFS and ensuring comparable sized categories across both sexes.[7] Alternative specifications of segregation measures were explored but did not alter the overall findings. Behavior within the home is captured by two measures. First, we compute a measure of the difference between the number of hours of housework contributed by mothers and the number of hours contributed by fathers, according to their own report. The question asked took the form: "About how many hours do you spend on housework in an average week, such as time spent cooking, cleaning and doing the laundry?" Taking the difference of parents' housework hours allows for housework requirements and preferences differing at the household level. Finally, we compute a variable that measures mothers' labor market attachment by calculating the average incidence over waves of their being out of the labor force looking after the home and family.

Children's psychological attributes

Children's *motivation* is measured as school motivation using responses to the question "How much does it mean to you to do well at school?" with four possible options ranging from "a great deal" to "very little". Self-esteem is measured using children's degree of agreement with the statement "I feel I have a number of good qualities", with again four possible options ranging from "strongly agree" to "strongly disagree". In order to increase measurement stability, responses to each of these questions (reversed) are averaged across waves.

As explained above, we are only interested in the intrinsic individual component of each score. We estimate this component using the residuals from two basic inheritance models, which use family structure characteristics, parental resources and parental personality traits as predictors of children's motivation and self-esteem respectively. Regressions are fitted separately for boys and girls.[8] The parameters of these inheritance regressions provide estimates for the intergenerational transmission of personality, whilst the residuals capture the

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amount of variance that is not explained by inheritance effects. Roughly 95 per cent of the variance in children's motivation and children's self-esteem remains unexplained, which supports the interpretation of these two variables as reflecting personality attributes.[9] Our operationalisation of agency is based on the assumption that motivation and self-esteem are positive characteristics that can demonstrate ambition or autonomy; but our theoretical position does not require their effects to be symmetric. That is, we expect high motivation and high self-esteem to be associated with greater individual agency, and therefore lower sex-typicality in occupational aspirations, but we do not necessarily assume that the influence of motivation and self-esteem on occupational choices is continuous across the distribution. We therefore define children's *high motivation* and children's *high self-esteem* as the top quartiles of their respective sex-specific residual distributions. Our findings are nevertheless robust to an alternative, continuous operationalisation (results available on request).

The final test for our theoretical predictions regarding the role of personality consists of differentiating empirically between the *ambition* and the *autonomy* effects of children's motivation and self-esteem. This we do by introducing the log average wages of each aspired occupation as a measure of occupational hierarchy in the final regression model.[10] The logic of this test is simple: If the effect of any given personality indicator on the degree of sex-typicality in children's occupational preferences disappears after controlling for the average wages in aspired occupations, we should conclude that all the impact of this estimated psychological attribute is due to its effect on children's occupational ambition. If, on the other hand, the effect persists, we should conclude that this given attribute decreases sex-typicality at all levels of the aspired occupational distribution, which would be consistent with an autonomy effect. Note that log average wages should also block the effect of parental resources on girls' sex typing since such the effect is expected to be driven by greater occupational ambition.

In addition to parental and psychological variables, models include age of child, which is the age at which their job aspirations were last measured with a valid response, number of siblings and a dummies for the presence of older male or female siblings. We also include dummies for the wave at which the child is observed. The descriptive statistics for all variables used in the analyses can be found in Table 2.

[Table 2 about here]

The model

We estimate a series of Ordinary Least Squares regression models, fitted to our nationally representative sample of young British children aged between 11 and 15. We explore those groups of factors hypothesized as shaping children's chances of aspiring to a more or less sex-typical occupation. Since we expect most of the independent variables to affect boys and girls in opposite directions (for example, we expect higher parental education to decrease the proportion of women in girls' aspired occupations and increase it for boys), we interact all the variables, except wave, with sex.

For ease of reporting and interpretation we estimate the models twice, using girls as the reference group and boys as the reference group in turn. See equations [1.1] and [1.2] below, where Y is the density of women in the aspired occupation, β_1 is the coefficient for the net average difference in such aspired occupations between boys and girls, V is a vector of independent family and child characteristics and W is a set of controls for wave. V is

interacted by sex of the children. Since the interaction terms drop out for girls in equation 1.1 (i.e. when boys=0) and for boys in equation 1.2 (i.e. when girls=0), we can capture the influences of our independent variables on girls and boys, respectively by reporting the main effects for each model side by side. Such effects are captured by the vector of parameters β_{2v}. This approach allows for an easy and direct interpretation of sex-differences in the effects of the predictor variables, whilst sparing the need to present the numerous coefficients for interacted terms.

$$Y = \alpha + \beta_1 \text{boy} + \beta_{2v}V_v + \beta_v \text{boy·}V_v + \gamma_w W_w + e \; ; \; \text{boy}=\{0,1\} \; v=\{1\ldots V\}; \; w=\{1\ldots 12\} \quad [1.1]$$

$$Y = \alpha + \beta_1 \text{girl} + \beta_{2v}V_v + \beta_{3v} \text{girl·}V_v + \gamma_w W_w + e \; ; \quad \text{girl}=\{0,1\} \; v=\{1\ldots V\}; \; w=\{1\ldots 12\} \quad [1.2]$$

Vector V includes variables for family structure, parental resources, parental behaviors and children's psychological attributes. As explained above, our final test consists of introducing the log average wage in children's aspired occupations, interacted by sex, as a means to control for the vertical dimension of children's occupational preferences, and thereby to disentangle the role of ambition from that of autonomy (equations 2.1 and 2.2).

$$Y = \alpha + \beta_1 \text{boy} + \beta_{2v}V_v + \beta_v \text{boy·}V_v + \gamma_w W_w + \delta_1 \text{Ln(occwage)} + \delta_2 \text{boy·Ln(occwage)} + e \; ;$$
$$\text{boy}=\{0,1\} \; v=\{1\ldots V\}; \; w=\{1\ldots 12\} \quad [2.1]$$

$$Y = \alpha + \beta_1 \text{girl} + \beta_{2v}V_v + \beta_{3v} \text{girl·}V_v + \gamma_w W_w + \delta_1 \text{Ln(occwage)} + \delta_2 \text{girl·Ln(occwage)} + e \; ;$$
$$\text{girl}=\{0,1\} \; v=\{1\ldots V\}; \; w=\{1\ldots 12\} \quad [2.2]$$

In all analyses the data were weighted, using the cross-sectional weight for the wave at which children's occupational aspirations were last measured, to account for non-response in that wave and to take account of the differential weightings for the additional samples. Additionally, standard errors were adjusted for repeat observations in households, that is, where there was more than one child respondent per family, though in practice there were few such cases in our sample.

RESULTS

Table 3 below shows the results of three different regression models on the extent of sex-typing in children's occupational aspirations. In order to facilitate the interpretation of results, each interacted model is presented in two different columns. Explanatory variables represent the main effects for girls in the first column and the main effects for boys in the second. Model 1 is a baseline model, which only includes children's sex interacted with their age, alongside wave dummies. Note that the average proportion of women in girls' aspired occupations is roughly 26 per cent higher than in boys', which is a clear measure of sex-typicality. Note also that age is not significant for girls but it is negative and significant for boys. This suggests that older boys have occupational preferences that are more sex-typical (i.e. more male dominated) than those of younger boys. This basic model alone explains 28 per cent of the variance. Model 2 includes children's socio-demographic characteristics, parental influences and children's personality attributes, as well as a range of controls for family structure. This is the full model represented in equations 1.1 and 1.2 above. Finally, model 3 adds the average log wages of children's aspired occupation as a means to control for occupational hierarchy. Hence model 3 corresponds with equations 2.1 and 2.2 above. Several important findings are worth reporting.

First, consonant with our expectations, we find that parental education is associated with the degree of sex-typing in girls' occupational aspirations but not in boys' (see model 2). Girls from high educational backgrounds aspire to occupations with a significantly lower proportion of women (i.e. 12 per cent on average) than girls with lower educational resources. This is entirely due to the effect that parental SES has on children's occupational ambition. Hence when we introduce average wages in the aspired occupation, the effects of parental education on girls' sex-typicality are explained away (see model 3). In other words, girls from more privileged backgrounds tend to aspire to better-paid occupations, which are on average less sex-typical (since there are few women in the better-paid jobs). Boys, on the other hand, can be occupationally ambitious and sex-typical all at once. Hence it is not surprising that we find no parental SES effects on boys' levels of sex-typicality.

Model 2 also provides evidence that homo-lineal occupational imitation is a transmitter of sex-typicality (H2). Girls (boys) whose occupational aspirations match the exact occupations of their mothers (fathers) are more sex-typical than girls (boys) who do not imitate. Yet it must be noted that only two percent of children in our sample actually imitate. This means that occupational imitation plays only a very minor role in the formation of sex-typical occupational preferences. There are even fewer children who copy the occupations of their parents of the opposite sex (0.5 per cent). In these very few instances, our evidence suggests that hetero-lineal imitation reduces sex-typing for both girls and boys (see model 2).

Model 2 also shows that daughters whose mothers are (or were last) employed in sex-atypical occupations (i.e. male-dominated) hold more sex-atypical aspirations than observationally equivalent girls whose mothers are employed in integrated and sex-typical occupations. This effect is net of direct occupational imitation and parental education. The association between maternal occupational segregation and daughters' degree of sex-typing holds even after controlling for the average wages of aspired occupations (see model 3). This indicates that the transmission of occupational sex-typing from mothers to daughters is not simply driven by the association between mothers' occupational segregation and the occupational ranking of daughters' aspirations.[11] These findings are therefore consistent with behavioral sex-role learning, as they suggest that girls can learn sex-typical roles from observing their mothers' occupations and translate these roles into sex-typical occupational aspirations.

We also find that boys whose fathers are employed in typically masculine jobs are themselves more likely to aspire to occupations containing a lower proportion of women than boys whose fathers are employed in integrated and female-dominated occupations. This effect for boys is also robust to direct occupational imitation and wage controls (see model 3). We find no significant effect of mothers' occupational segregation on their son's aspirations, nor do we find any effect of fathers' occupational segregation on their daughters'. The evidence is therefore consistent with homo-lineal sex-role learning from parental occupations (H3a).

When looking within the household, a traditional distribution of housework tasks between spouses seems to reinforce children's sex-typical occupational aspirations, although in this case effects are only observed for boys. This is an interesting finding as it suggests that parental behavior in the domestic sphere can have sex-role learning effects on children's occupational preferences (H3b). Finally, model 2 shows that, net of other behavioral variables, having a mother who looks after the home has no significant impact on boys' occupational preferences but it seems to have a marginally significant impact on girls'. This suggests that lower labor-market attachment amongst mothers could increase daughters' sex-

typicality, although it must be noted that the coefficient for model 2 is only significant at the 90 per cent level.

[Table 3 about here]

Model 2 also tests for personality effects. As explained above, these effects are measured using motivation and self-esteem residuals that are free from the influence of inheritance and hence tap on the intrinsic individual component of personality. Crucially, both personality indicators seem to have a direct influence on the degree of sex-typing of children's occupational aspirations. Girls —but not boys— with high levels of motivation and both girls and boys with high levels of self-esteem report less sex-typical occupational preferences. We have hypothesized that ambition and self-esteem could influence sex-typicality through two distinctive mechanisms: *ambition* and *autonomy*. By introducing average wages as a control for the hierarchy of children's occupational aspirations, model 3 provides a further test for these mechanisms.

Note that the effect of both school motivation and self-esteem on girls' occupational sex-typicality disappears when occupational hierarchy is accounted for. This suggests that both self-esteem and motivation increase girls' occupational ambition, which by itself decreases occupational sex-typicality (H4a). Yet, given the high correlation between average wages and proportion of female in aspired occupations, we cannot tell whether self-esteem has, as expected, an extra independent effect on girls' levels of sex-typicality. Daughters who aim for high-paid occupations are at the same time ambitious and sex-atypical and this makes it particularly hard to separate autonomy from ambition effects in the case of girls.

It is boys who provide the best grounds for testing the autonomy mechanism —i.e. the idea that self-esteem boosts children capacity to act against the existing social norms regarding sex-typical behavior. Boys can choose male-dominated occupations at both ends of the wage distribution and this implies that ambition and autonomy effects are not necessarily confounded for them. Crucially, model 3 shows that the effect of self-esteem for boys is fully resistant to controlling for the average wage of the aspired occupation. This indicates that self-esteem reduces boys' occupational sex-typicality *at all levels of the aspired occupational hierarchy,* a finding which is fully consistent with the *autonomy* mechanism. Our interpretation of this finding is that boys with high self-esteem are better predisposed to exercise their individual agency and hence more capable of acting independently of those social influences that promote sex-typical behavior (H4b).

DISCUSSION

Occupational sex segregation is an enduring feature of Western labor markets that has been strongly implicated in the perpetuation of gender inequality. Analyzing the factors that influence the formation of sex-typical occupational preferences is therefore critical for illuminating our understanding of gender stratification. It is clear that gendered occupational choices begin early, before girls and boys have any experience of the labor market. Moreover, these early choices have real consequences in later life.

We can follow 1,500 children out of our original sample into their early occupational outcomes. Even though by this stage only a mere six per cent of them work as young adults in the exact occupation that they aspired to as kids, we find that girls and boys with sex-type preferences are significantly more likely to end up in sex-segregated occupations as adults

than young people with gender neutral aspirations. The correlation between concentration of women in aspired and achieved job was over 0.4. Early preference formation has therefore real consequences for gender segregation and consequently for expected wages in adult life.

This study set out to shed light on the factors that shape the degree of sex-typing in early occupational preferences. We have investigated different channels of parental influence on children's occupational aspirations that are relevant for the transmission of sex-typical preferences, whilst at the same time allowing for the role of individual agency in the process of preference formation. In order to avoid the risk of over-individualization, we have defended a restricted definition of agency that is anchored in observable psychological attributes. This definition turns a hitherto intangible concept into one that is both theoretically grounded and empirically testable. Our analytical strategy has allowed us to estimate simultaneously the relative impact of parental influences and individual psychological characteristics on the development of sex-typical occupational aspirations in what constitutes an innovative approach to the study of preference formation.

We identified several distinctive channels of parental influence. We have argued that parental socio-economic resources should affect the degree of sex-typing in occupational preferences by influencing the scope of children's occupational horizons. Given the existence of vertical sex segregation, this effect was expected to be largely restricted to daughters, since, for them, aiming high in the occupational ladder typically means aspiring to occupations where women do not predominate. Boys, on the other hand, can find traditionally male occupations at both ends of the occupational distribution, so higher occupational ambition does not automatically imply lower sex-typicality. This argument is clearly supported by the evidence: parental SES reduces the level of sex-typicality of girls' occupational aspirations, whilst having no significant effect on boys'.

Another crucial channel for gender socialization is parental behavior. We have specified two distinctive mechanisms linking parental behavior to children's occupational preferences: occupational imitation and behavioral sex-role learning. Our empirical models show that children that imitate homo-linearly are significantly more likely to have sex-typical aspirations, whereas the opposite is true for children who imitate hetero-linearly. This suggests that occupational imitation could be a vehicle for the transmission of sex-typed occupational preferences. Yet it has also been noted that very few young children actually imitate, which suggests that this mechanism plays only a very minor role in the intergenerational reproduction of sex-typed preferences.

Consonant with behavioral sex-role modeling, we have found that the daughters of mothers who work in male-dominated jobs tend to aspire to less sex-typical occupations themselves, whilst the sons of fathers who work in traditionally male jobs display more sex-typical aspirations. Moreover, boys —but not girls— living in families with a traditional division of housework tend to aspire to more traditionally male occupations. Parents' enactment of typical gender roles, both inside and outside the household, thus seems to exert a significant influence on the degree of sex-typicality of their children's occupational aspirations.

Finally, we have found that psychological predispositions also have a significant impact on children's occupational preferences. Girls with high school motivation and both girls and boys with high self-esteem are less likely to aspire to gender-typical occupations, regardless of other family influences. Motivation and self-esteem make girls more likely to aim higher in the occupational ladder, where female-dominated jobs are scant. This is why, when we

introduce the average wage of children's aspired occupations in the empirical model, both motivation and self-esteem effects disappear. Vertical segregation makes it particularly hard for us to identify the exact mechanisms linking motivation, and self-esteem to sex-typical preferences in the case of girls.

We have found, however, that the effect of self-esteem on boys' levels of sex-typicality is fully resistant to controls for aspired wages. This means that boys with high self-esteem are significantly less likely to choose traditionally male occupations at all levels of the occupational ladder. We interpret this finding as indicating that boys with high self-esteem are better predisposed to contradict the existing social norms regarding sex typical behavior. This we have called the *autonomy* effect of self-esteem. Autonomy is the core component of agency, understood as the capacity to make independent choices.

To our knowledge, this study provides the first psychologically-anchored test of agency effects in the formation of children's sex-typed occupational aspirations. One interesting implication of this study is that any action directed to increasing children's motivation and self-esteem, if successful, is likely to reduce occupational sex-segregation in the future. Another obvious implication of this study is that boys' preferences also matter. Stressing that supply-side processes leading to occupational sex-segregation concern both genders might seem self-evident, as obviously it takes the two of them to make occupational sex-segregation. Yet the gender literature has traditionally paid much more attention to women's choices than to men's. By focusing disproportionally on women's experiences and preferences, research on gender stratification could be missing out.

Our final comment concerns what we cannot explain. The single most important predictor of the differentiation of occupational aspirations amongst children is still their own sex and although our models show that there is an interpretable structure in the distribution of preferences, their overall contribution to the explanation of segregation in occupational aspirations must be judged only as modest. Children's sex alone accounts for 26 per cent of the variance in occupational aspirations. A full model including primary socialization and personality effects adds only 2.5 percentage points to this adjusted R-square, which amounts roughly to a 10 per cent increase. If the full model is fitted separately by sex, it accounts for between 5 and 6 per cent of the variance within each sex. This means that a lot still remains to be explained.

It could be argued that the impact of other socialization agents, such as schools, peers or the mass media could play an important role in explaining part of the variance currently accounted for by children's own sex (Marini and Brinton 1984; Hitlin 2006). Similarly, recent explanations suggest that in informing their occupational choices children could learn from wider social signals besides their own family experiences (Polavieja 2012). Yet testing for these wider social influences seems particularly hard with the existing data since we lack direct measures for factors of horizontal socialization that are external to the family.[12]

Given these constraints, perhaps the best way of approaching horizontal influences, the impact of which is expected to affect all children at a given time, is by looking at cohort shifts. Cohort shifts should be expected if there are societal changes that affect the socialization milieu in which all children are embedded. Such shifts would include macro-level changes in the labor market and domestic behavior —from which children can learn— as well changes in gender attitudes, values and cultural representations. In all these realms, observed trends in advanced Western societies have worked in favor of greater gender

equalization (see e.g. Brewster and Padavic 2000; Chang 2000; Lueptow, Garovich-Szabo and Lueptow 2001).

Partially consistent with horizontal pressures for gender equalization, our data shows a decline over time (net of other factors) in the tendency for girls —but not boys— to prefer sex-typical occupations. This decline represents a reduction of around four per cent in the aspired proportion female from one decade to the next.[13] Yet we find no significant shift in boys' aspirations over time. Moreover, the sign of the cohort change for boys works in the exact opposite direction to what should be expected if they were also becoming less sex-typical (see Figure 3 below).[14] Given the lack of convergence from boys and the modest size of the effect for girls, we must conclude that even if horizontal socialization pressures for sex-typing are declining over time for girls, it would take several generations before this was reflected in a shift from the current picture of highly segregated aspirations.

[Figure 3 about here]

Meanwhile, we believe this study has already shown that focusing on the interplay between socialization influences and individual psychological predisposition can yield important analytical pay-offs. We have provided new insights into the correlates of sex-typing in the occupational choices of children. Our findings strongly suggest that both social influences and individual psychological predispositions provide the essential cogs and wheels of preference formation. Yet we still lack a clear understanding of how these pieces are assembled. To advance our study of mechanisms further may entail exploring the formation of explicit gendered aspirations and expectations even earlier in children's lives.

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Table 1: Top 20 preferred occupations for girls and boys (those chosen by more than 30), by descending order of popularity, and actual jobs of mothers and fathers by prevalence

Girls	Boys	Mothers	Fathers
Actors, stage managers etc.	Athletes, sports officials etc.	Sales assistants	Drivers of road goods vehicles
Hairdressers	Motor mechanics	Cleaners, domestics	Production, works managers
Primary and nursery education teachers	Armed forces	Care assistants & attendants	Service industry managers etc
Solicitors	Police officers	Educational assistants	Other managers & administrators
Vets	Artists, graphic designers etc.	Nurses	Metal work, maintenance fitters
Artists, graphic designers etc.	Computer analysts, programmers	Clerks	Carpenters & joiners
Nursery nurses	Architects	Accounts clerks, book-keepers	Storekeepers & warehousepersons
Beauticians	Plumbers, heating engineers	Other childcare occupations	Gardeners, groundspersons
Nurses	Aircraft flight deck officers	Community & youth workers	Marketing & sales managers
Authors, writers, journalists	Actors, stage managers etc.	Service industry managers	Motor mechanics etc
Police officers	Carpenters and joiners	Primary, nursery teachers	Builders, building contractors
Travel and flight attendants	Chefs, cooks	Other secretarial personnel	Cab drivers & chauffeurs
Medical Practitioners	Secondary education teachers	Filing and record clerks	Building/contract managers
Secondary education teachers	Authors, writers, journalists	Other financial etc managers	Farm owners & managers etc
University teachers	Medical practitioners	Secondary education teachers	Other construction trades
Other childcare occupations	Solicitors	Retail cash & check-out operators	Electricians
Clothing designers	Electricians	Bar staff	All other laborers
Biological scientists	Builders, building contractors	Receptionists	Computer systems etc managers
Other health professionals	Musicians	Counter clerks & cashiers	Police officers
Psychologists	Chartered and certified accountants	Catering assistants	Plumbers, heating engineers

Source: British Household Panel Survey Waves 4-18.

Table 2: Descriptive statistics of estimation sample

	mean	sd	min	max	count
Proportion of women	0.42	0.30	0.00	1.00	3132
Wave	12.68	4.39	4.00	18.00	3132
Age	13.93	1.39	11.00	16.00	3132
Absent father	0.23	0.42	0.00	1.00	3132
Total number of siblings	1.04	0.93	0.00	7.00	3132
Older brother	0.28	0.45	0.00	1.00	3132
Older sister	0.23	0.42	0.00	1.00	3132
Parental educational level	2.64	0.94	0.00	4.00	3132
Homo-lineal occupational match	0.02	0.14	0.00	1.00	3132
Hetero-lineal occupational match	0.01	0.07	0.00	1.00	3132
Mother occupational segregation	2.23	0.82	1.00	3.00	3132
Father occupational segregation	2.22	0.79	1.00	3.00	3132
Prop time mother housewife	0.22	0.28	0.00	1.00	3132
Housework inequality	12.62	12.89	-53.00	75.00	3132
School motivation	0.25	0.44	0.00	1.00	3132
Self esteem	0.24	0.43	0.00	1.00	3132
Log wage in aspired occupation	2.27	0.42	1.30	3.17	3132

Note: statistics weighted to account for sample design and non-response.

Source: British Household Panel Survey Waves 4-18.

Table 3: Regression model estimates for predicted proportion women in aspired occupation, for girls and boys

	(1) Basic Model		(2) Full Model		(3) Full with wage Controls	
	Girls	Boys	Girls	Boys	Girls	Boys
Girl		0.257*** (0.0220)		0.351*** (0.0550)		1.084*** (0.0685)
Boy	-0.257*** (0.0220)		-0.351*** (0.0550)		-1.084*** (0.0685)	
Age	0.00367 (0.00569)	-0.0152*** (0.00451)	0.00492 (0.00570)	-0.0134** (0.00446)	0.00966* (0.00412)	-0.0138** (0.00437)
Absent father			-0.00484 (0.0271)	-0.0224 (0.0226)	-0.0212 (0.0210)	-0.0272 (0.0225)
Parental qualifications (ref.=none)						
Higher			-0.116*** (0.0304)	0.0334 (0.0248)	0.00428 (0.0222)	0.0395 (0.0247)
Upper secondary			-0.0688* (0.0278)	0.0202 (0.0231)	0.0106 (0.0195)	0.0224 (0.0231)
Lower secondary			-0.0565* (0.0274)	-0.00356 (0.0224)	-0.00828 (0.0184)	-0.00136 (0.0223)
Child's occupation matches with same-sex parent			0.153*** (0.0420)	-0.0986* (0.0424)	0.0965** (0.0330)	-0.108* (0.0424)
Child's occupation matches with opposite sex parent's			-0.240*** (0.0521)	0.270*** (0.0775)	-0.204** (0.0752)	0.251** (0.0769)

Mother's occupational gender-typicality (ref.=intermediate)

Gender Atypical			-0.0612**	0.0199	-0.0462**	0.0211
			(0.0207)	(0.0166)	(0.0150)	(0.0165)
Gender Typical			-0.00881	0.0160	-0.00104	0.0153
			(0.0193)	(0.0142)	(0.0141)	(0.0142)
Father's occupational gender-typicality (ref.= intermediate)						
Gender Atypical			0.0183	-0.0127	-0.0105	-0.0159
			(0.0266)	(0.0216)	(0.0208)	(0.0214)
Gender Typical			0.00767	-0.0415*	-0.0337	-0.0460*
			(0.0238)	(0.0200)	(0.0192)	(0.0198)
Average occasions mother was housewife			0.0545	0.00813	-0.0307	0.00210
			(0.0289)	(0.0232)	(0.0211)	(0.0233)
Housework inequality			-0.000118	-0.00146**	-0.0000494	-0.00147**
			(0.000664)	(0.000512)	(0.000477)	(0.000505)
High motivation			-0.0505**	0.00198	-0.0240	0.00435
			(0.0184)	(0.0140)	(0.0137)	(0.0139)
High esteem			-0.0522**	0.0409**	-0.0153	0.0420**
			(0.0176)	(0.0138)	(0.0136)	(0.0138)
Log Wage in Aspired Occupation					-0.397***	-0.0416*
					(0.00951)	(0.0198)
Observations	3132	3132	3132	3132	3132	3132
Adjusted R^2	0.280	0.280	0.305	0.305	0.482	0.482

Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Note: all models also include controls for wave at which aspired occupation observed and for family structure (number of siblings, whether older brother or sister). Constant not shown.

Source: Estimated by the Authors from the British Household Panel Survey Waves 4-18.

Figure 1: Example of data set structure

Child ID	Original data					Analysis sample			
	Waves observed	Age	Response on occupational choice	Response on VarY	Response on VarZ	Age when latest occupation measured	Last valid response on occupational choice	Last valid response on varY	Last valid response on varZ
1	F	11	fireman	Yes	Sometimes				
1	G	12	fireman	Not asked	Sometimes				
1	H	13	Police officer	Not asked	Missing	13	Police officer	Yes	Always
1	I	14	Not asked	Not asked	Not asked				
1	J	15	Not asked	Not asked	Always				
2	J	11	Not asked	Not asked	Not asked				
2	L	13	Actress	Yes	Not asked				
2	M	14	Actress	Yes	Not asked	14	Actress	Yes	Missing
3	K	12	Nurse	Not asked	Always				
3	L	13	Nurse	No	Always				
3	M	14	Non-response	No	Sometimes				
3	N	15	Teacher	No	Sometimes	15	Teacher	No	Sometimes
4	Q	11	Air pilot	Yes	Not asked				
4	R	12	Air pilot	Missing	Always	12	12	Yes	Always

Note : These cases are illustrative only and do not represent genuine respondents and their responses.

Figure 2: Kernel density distributions of the proportion of women in aspired occupations
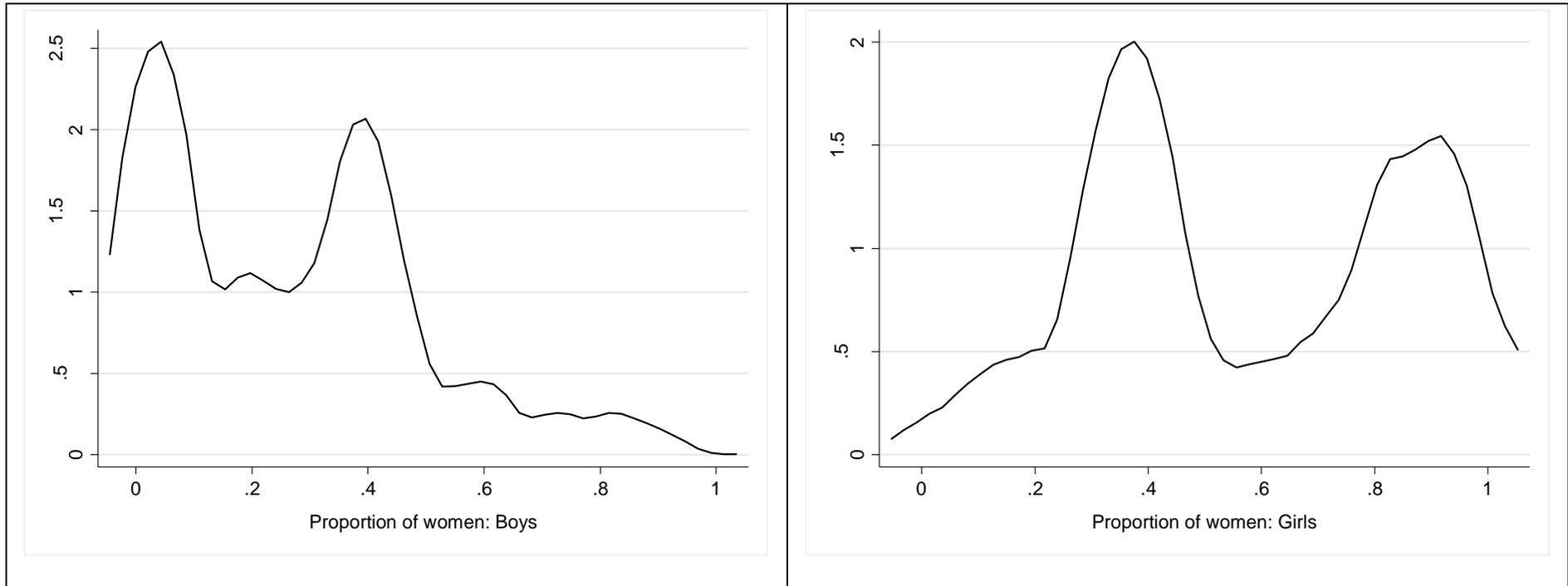
Source: British Household Panel Survey waves 4-18 and UK Labour Force Survey pooled quarters 1994-2000.

Figure 3. Cohort Shifts in the Sex-Typicality of Children's Occupational Aspirations by Sex, Predicted Probability from Full Model
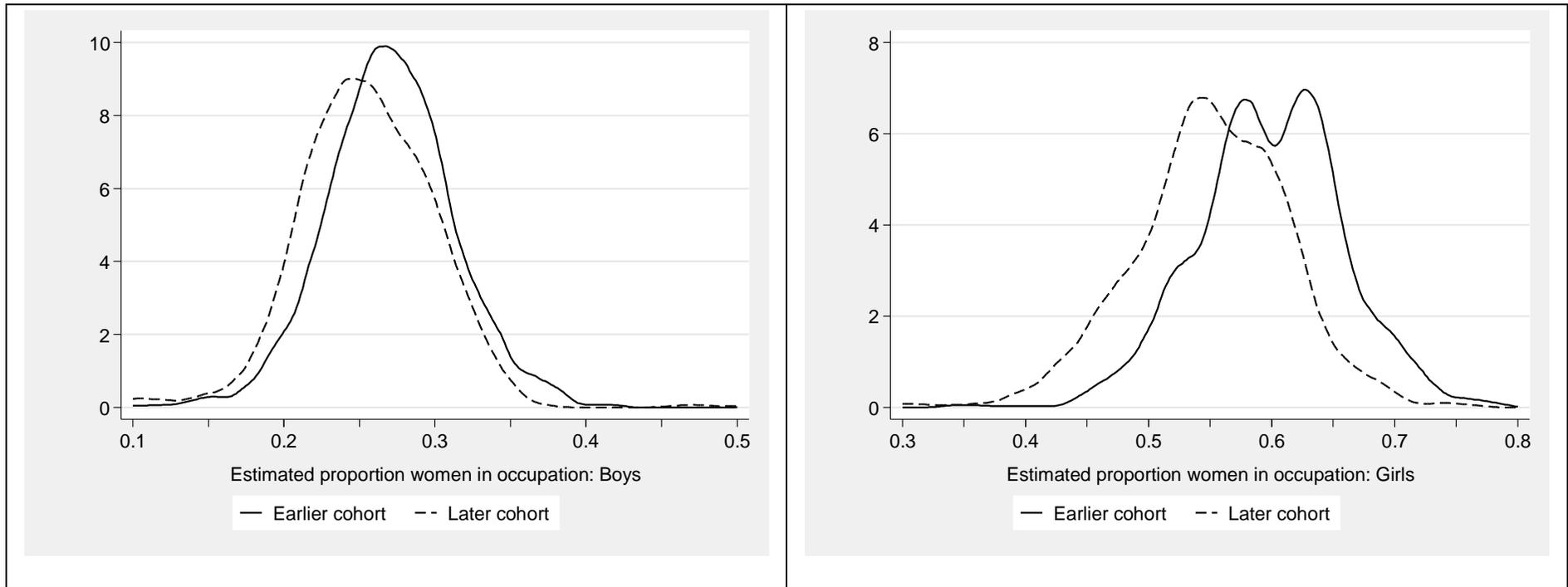
Note: Cohorts are defined so as to split the sample into two equal halves. Earlier cohort comprises observations from waves 4 to 13 (1994-2003), later cohort comprises observations from waves 14 to 18 (2004 -2008).

Source: Probability distributions estimated from full regression models fitted separately by sex, British Household Panel Survey Waves 4-18.

ENDNOTES

[1] The view of agency as preference heterogeneity rests on the assumption that preferences are exogenous to socialization experiences. This is in itself a very problematic assumption (Bowles 1998).

[2] Self-efficacy is a goal-specific concept, whilst self-esteem taps on a general enduring trait. Both constructs overlap, however.

[3] We matched on SOC90 occupational codes, avoiding a series break at the change to SOC2000 in the LFS in 2001.

[4] For parents not currently in paid work, we used information on their last job.

[5] To ensure our findings were not driven by a few favored aspirant occupations of boys and girls, for robustness we estimated an alternative specification of our models excluding the favorite five occupations of both boys and girls. This did not alter our results.

[6] While this measure of proportion of women was our preferred measure of sex-typing, our results reported below were robust to using the rank of gender concentration as an alternative.

[7] More precisely, for mothers, sex-atypical occupations are defined as those containing less than 60 per cent women; intermediate occupations are those containing between 60 and 80 per cent women; and sex-typical occupations are those with more than 80 per cent women. For fathers, sex-atypical occupations are defined as those with more than 35 per cent women; intermediate occupations are those containing between 20 and 35 per cent women; and sex-typical are those with less than 20 per cent women. This operationalization allows for an equivalent distribution of observations for both female and male samples (40 per cent sex-atypical, 40 per cent intermediate and 20 per cent sex-typical).

[8] Inheritance regressions include the following predictors: parental education (dominance approach), maternal labor-market attachment, parental gender attitudes, family structure, quality of the parent-children relationship and five measures of parental personality (i.e openness, contentiousness, extroversion, agreeableness and neuroticism). For most children (2,263) we have full information for both parents. In the case of children for whom there is no information on father's personality, we use mother's personality only (N=1,255). If there is no information on personality for either parent, we use the remaining predictors. Tables are available from authors on request.

[9] Interestingly, girls show lower average levels of self-esteem than boys, but higher average levels of school motivation.

[10] Since average wages are highly endogenous to the outcome variable, we avoid any interpretation of its coefficient in terms of 'effects'.

[11] Further tests not shown indicate that the association between maternal occupational segregation and daughters' sex-typing is observed for both high and low educated mothers. Results available on request.

[12] In an attempt to tap on socialization effects from the media, we have tested for the possible impact of TV exposure on sex-typed aspirations. Results were not significant.

[13] This effect was robust to splitting the period at different points. Results available on request.

[14] It is also worth noting the lower average proportion of women in girls' aspired occupations (58% female) compared to their mothers' achieved occupations (71%), whereas boys aspirations are little different from the average gender concentration experienced by their fathers at around 23%. This is consistent with the observed cohort shift for girls in aspirations.