

# Career costs of desiring a large family

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## Abstract

We investigate the direct link between women's desired family size in early adulthood and their long-term career choices by matching the Danish Longitudinal Survey of Youth with rich administrative records. We control for time preferences, cognitive ability, educational aspirations, and detailed socio-demographics in adolescence, and follow individual labor market trajectories over four decades.

We find that desiring a large family of at least three children is associated with annual wage losses over career equivalent to 7% of sample mean relative to desiring a small family of two children or less. Despite a significant correlation between family desires and realized family formation, the key mechanism driving wage losses is greater adjustments of career behavior in response to childbirth among women desiring a large family. Particularly through selection out of paid employment and into self-employment. Subgroup analyses indicate that wage losses associated with desired family size increase in patience, cognitive ability and educational aspirations in adolescence. Hence, women with a higher earnings potential pay a higher price for desiring a large family.

**JEL Classification:** J13, J22, J24

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# 1 Introduction

**Motivation.** The negative impact of childbearing on women’s labor market performance is a stylized fact in the applied labor and family literature. Exogenous variation in childbearing is found to causally reduce the employment of mothers (Angrist and Evans, 1996; Rosenzweig and Wolpin, 1980b; Bronars and Grogger, 1994; Agüero and Marks, 2008; Lundborg et al., 2017; Kleven et al., 2019; Angelov et al., 2016). Exogeneity is achieved by assuming that timing of birth is quasi-random or by relying on variation from unexpected childbirth. Therefore the empirical evidence is considered robust to selection issues, such that desired family formation can safely be ignored.<sup>1</sup>

The applied approach stands in contrast to the structural literature on joint fertility and labor supply choices, which takes selection into employment and childbearing as joint and endogenous decisions, posing that career behavior responds to anticipated fertility - both before and after birth. This has motivated the estimation of dynamic life-cycle models, in which savings behavior, human capital investments, family formation and career behavior are guided by maximization of intertemporal utility in response to stable preferences.

The difference between the two approaches is not in their predictions on the effect of childbirth on mother’s labor supply, e.g., reduced labor market performance after birth can be modelled by interacting mother’s utility of leisure with the presence of children, but rather whether such changes are perfectly foreseen and reflect individual preferences. However, with a few exceptions, major contributions in the structural literature have had to rely on observed family and career outcomes, while individual preferences have remained unobserved.

Our contribution in this paper, no doubt less sophisticated, is to deliver direct empirical evidence on the link between elicited family desires in early adulthood and education and career outcomes across childbearing and over full careers. Specifically, we investigate how individual women’s education and career behavior, including career changes after birth, respond to their desired family size in early adulthood, and whether desiring a large family entails higher career costs than desiring a small family.

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<sup>1</sup>In Lundborg et al. (2017) exogenous variation is due to successful in-vitro fertilization (IVF) among a sample of individuals desiring pregnancy, while an unexpected childbirth occurs, when a woman desiring one additional child, ends up giving birth to twins. (Bronars and Grogger, 1994; Rosenzweig and Wolpin, 1980b)

Though our investigation rests on a structural foundation, we believe our findings are relevant to the applied literature. Particularly, we pose that anticipated fertility introduces an important source of heterogeneity into documented career costs at childbirth. First, career costs at birth may vary according to human capital investments and choice of occupation made in anticipation of family formation, and second, career adjustments at birth may vary with expectations of additional births and with taste for fertility, such that occupational changes at birth reflect individual preferences.

**Theory.** The theory on joint fertility and labor supply choices proposes three mechanisms through which desired fertility may influence career outcomes of women. First, family desires may influence education and occupation choices in anticipation of family formation. On one hand, young risk-averse adults with limited access to credit and liquidity may pursue human capital investments to increase their expected earnings and mitigate their income risk. Their incentives to accumulate human capital and savings are then likely to increase with anticipated fertility. On the other hand, individuals expecting repeated absences from the labor market due to multiple births may reduce their educational investments or select into childrearing compatible occupations in anticipation of family formation. The pecuniary incentives to invest in human capital would, in turn, decrease with expected fertility. Second, desired fertility may affect the probability of selecting into marriage and parenthood, just as fertility desires may directly affect realized family formation. This implies that women desiring a large family face higher cumulative career costs, because they have more children. Finally, career adjustments at birth may increase with desired fertility, if greater desires translate into a desire to invest more time in childrearing or in expectation of continued childbearing. Greater fertility desires would then drive larger career adjustments at birth, e.g. into part-time and self-employment. This last mechanism would introduce heterogeneity into motherhood penalties on after-birth labor market performance of women - irrespective of number of children.

**Method and data.** We investigate the direct link between fertility desires and career behavior before and after birth empirically relying on a unique matched dataset combining the Danish Longitudinal Survey of Youth (DLSY) and comprehensive administrative registers on family formation, educational attainment, employment and earnings over four

decades. The DLSY follows a random sample of individuals from age 14 through adulthood, eliciting their aspirations, ability, patience, and socio-demographic background in adolescence, as well as their desired fertility in early adulthood. Though our analysis remains correlational, access to detailed data on early individual preferences and ability combined with reliable data on labor market trajectories over full careers, allows us to zoom in on the direct link between family desires and outcomes, while controlling for important aspects of individual skills and aspirations.

**Findings.** Arranging fertility desires into categories of desired family size, we find that desiring a large family of at least three children is associated with annual wage losses over career equivalent to 7% of sample mean relative to desiring a small family of two children or less. Additionally, we find that substantial career costs arise from births in excess of desires.

Despite significant positive associations between desiring a large family and both probability of parenthood (+5 ppts.,  $p \leq 0.05$ ) and number of children (+0.4 children,  $p \leq 0.01$ ), neither selection into motherhood nor realized fertility can explain wage losses over career. Similarly, a lower probability of selecting into motherhood (−18 ppts.,  $p \leq 0.01$ ), lower realized fertility (−0.3 children,  $p \leq 0.05$ ) and delayed first birth (+1.0 year,  $p \leq 0.1$ ) associated with having no desire for a family fail to translate into significant wage gains relative to desiring a small family.

The key mechanism generating wage losses among individuals desiring a large family is greater adjustments of labor market behavior in response to childbirth, particularly through selection into part-time and flexible employment. Individuals desiring a large family are significantly more likely to select out of full-time and into self-employment and employment as an assisting spouse after birth. Earnings from flexible employment, particularly self-employment, moderate wage losses associated with desiring a large family. Meanwhile individuals desiring to remain childless are less likely to sort out of full-time employment and make occupational changes at birth.

Finally, subgroup results lend evidence to the idea that opportunity costs of childrearing increase with individual earnings potential as wage losses associated with desiring a large family increase with patience, cognitive ability and educational aspirations. Hence,

conditional on motherhood, women with a higher earnings potential pay a higher price for desiring a large family.

**Contribution.** Our study contributes to the existing literature on the negative effects of motherhood on women’s labor market performance. First, we document that motherhood penalties associated with desiring a large family arise after childbirth and last until retirement, resulting in significant accumulated wage losses over full careers relative to individuals desiring a small family. As such, our findings complement a rich literature documenting the negative effects of motherhood on labor market performance of women, (see e.g. Cortés and Pan, 2020; Bertrand, 2020; Kleven et al., 2019; Angelov et al., 2016; Andresen and Nix, 2019; Rosenbaum, 2019) for the short and medium-term. Particularly, our paper sheds light on the role of selection into motherhood in response to fertility desires and demonstrates that fertility desires introduce heterogeneity into behavioral responses to planned births. Surprisingly, this result holds irrespective of realized family size. Career adjustments after birth are, in line with forward-looking utility maximizing behavior and classical consumption smoothing, significantly stronger among individuals desiring a large family, who sort out of full-time employment to pursue flexible employment.

Second, we contribute to a more recent literature on self-employment and motherhood. Lack of flexibility, limited mobility and general constraints of childrearing responsibilities are found to constrain the employment possibilities of mothers with young children, pushing mothers to seek alternative employment opportunities combining pecuniary gains and greater control over work schedule, labor supply and employment location.(Bari et al., 2021; Cai et al., 2019; King, 2020; Lim, 2019) We find that family formation in response to desiring a large family is associated with increased selection into self-employment, which generates earnings to moderate post-birth wage losses. Hence, we identify self-employment as a moderating factor of pecuniary child penalties, which additionally reduces childbearing risks, i.e. the risk of having fewer children than desired. Also, Berniell et al. (2020) identify self-employment as an important mechanism to balance work and family demands during childrearing years, though they find that mothers who select into self-employment lack the personality traits predictive of entrepreneurial success, e.g., openness and willingness to take risks.

Finally, we contribute to the seminal literature on the role of preferences, personality traits and cognitive skills for human capital investments and as determinants of long term outcomes, including life-time earnings and well-being (see e.g. Golsteyn et al., 2014; Heckman et al., 2006; Epper et al., 2011, 2020). First, we confirm that women’s educational attainment and choice of occupation takes place in response to time preferences, cognitive ability, educational aspirations and socio-demographic background, rather than in response to particular fertility preferences. Second, our findings shed light on the documented association between norm-deviating fertility desires and level of education in the demographic literature.(Heiland et al., 2005; Testa et al., 2016). Specifically, we demonstrate that norm-deviating desires, i.e., desiring a large family or desiring to remain childless, originate from individual human capital endowment and family size in adolescence, which in turn drive educational investments. Hence, the documented positive association between college completion and fertility desires originates from human capital endowment in adolescence, while the negative gradient between childbearing and college completion originates from the negative association between cognitive ability and childbearing. Desiring a large family is overall associated with a higher likelihood of parenthood and with having more children, but desiring a large family is also associated with a high risk of not achieving one’s fertility target. In isolation, having either very low or high ability increases the risk of having fewer children than desired, but desiring a large family can mute this risk for the highly able.

**Layout of the paper.** The remainder of the paper is organized as follows. In Section 2, we derive empirically testable hypotheses based on existing theory. Section 3 presents the setting and Section 4 presents the data and sample population, as well as descriptive evidence on fertility desires, socio-demographics, human capital endowment, and outcomes. Our empirical strategy and results are presented in Section 5, while Section 6 concludes.

## 2 Theory

To understand the association between fertility desires and women’s career outcomes, the question is through which channels fertility desires might affect the career outcomes of women. A rich theoretical literature on joint labor supply and fertility choices of women suggests several channels. In the present paper we focus on three, namely human capital

investments in anticipation of birth, realized family formation, and career adjustments after birth. In Sections 2.1, 2.2, and 2.3, we present each in turn. Particularly, we discuss how the introduction of heterogeneous fertility preferences alters predictions of existing theoretical models, allowing us to develop hypotheses to guide our empirical analysis.

## 2.1 Human capital investments

Traditionally, dynamic choices of human capital investment are modelled as if based on optimization of a trade-off between expected future earnings and current pecuniary and non-pecuniary costs of pursuing education. Non-pecuniary costs are assumed decreasing in an individual's aspirations and human capital endowment, including her time preferences, cognitive skills, and non-cognitive skills, (see e.g. Abbott et al., 2013; Golsteyn et al., 2014; Heckman et al., 2006; Mischel et al., 1988; Epper et al., 2020). Similar mechanisms drive early career investments characterized by substantial time investments and limited immediate rewards, but paving the way for future rewards in response to accumulated labor market experience. Hence, the key theoretical prediction is that human capital investments increase with human capital endowment and human capital aspirations as these factors reduce the non-pecuniary costs of pursuing education, while at the same time increasing expected future earnings due to complementarities between skills and education.

Given this framework, the question is how individual incentives to invest in human capital are affected by desired fertility. Recent structural models of joint fertility and labor supply choices build on earlier buffer-savings models (Carroll et al., 1992; Carroll and Samwick, 1997; Deaton Angus, 1991) and assume that young risk-averse households face credit and liquidity constraints as well as uninsurable financial uncertainty. As a consequence, they delay family formation to after accumulation of human capital and buffer savings (see e.g. Agüero and Marks, 2008; Gayle et al., 2012; Sommer, 2016; Choi, 2017; Ejrnæs and Jørgensen, 2020). Hence, desire for building a family drives investments in education and early career with the dual purpose of collecting sufficient savings and mitigating expected aggregate and idiosyncratic income risk.

Assuming that having children is costly and similar to investing in a durable good, i.e. involving continued payment commitments, while the child is growing up, incentives to invest in education (and collect savings) in anticipation of birth should increase with

expected number of children. Similarly, having no desire for children reduces the incentives to collect buffer-savings, though higher expected labor force participation implies higher expected earnings over career, and as such draws in the opposite direction.<sup>2</sup>

On the other hand, if a woman expects to supply less labor over career in response to higher expected childbearing, resulting in repeated absences from the labor market and reduced labor-supply during childrearing, her expected pay-off to investments in human capital will decrease, because periods of absence imply foregone earnings and depreciation of human capital. Because expected absences are likely to increase with number of children desired, her disincentives to invest in human capital grow with her anticipated fertility. This line of reasoning is reflected in the dynamic model of occupational choice presented in Adda et al. (2017). The key assumption of the model is that choice of occupation is based on a trade-off between expected future earnings and opportunity costs of expected absences from work due to childbirth, including foregone earnings and depreciation of human capital. The authors distinguish between abstract and non-abstract occupations, with the latter being characterized by greater childrearing compatibility. They propose that abstract occupations are knowledge-intensive and involve higher rates of human capital depreciation during absences, while non-abstract occupations are characterized by automatic or routine procedures, rendering absences from work less costly.<sup>3</sup> In addition, the authors assume that agents have heterogeneous ability and fertility preferences, such that women with low fertility preferences have greater incentives to select into abstract occupations, while women with high fertility preferences have greater incentives to select into non-abstract occupations. The authors present reduced-form evidence on vocational-specialization in secondary education for a sample of young women in Germany, and document that individuals selecting into abstract occupations experience higher starting wages and wage growth during career, but also increasing career costs of childbearing up until intermediate career. Instead career costs of childbearing are found to be low and stable over career in non-abstract occupations. Finally, they estimate the preference parameters of their model to fit observed data on occupation-specific childbearing, i.e.

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<sup>2</sup>Also, having no desire for a family is likely to reduce the likelihood of marriage, increasing the value of education as a means to mitigate future income uncertainty.

<sup>3</sup>An example of a non-abstract and flexible occupation with great childrearing compatibility is the pharmacist occupation. Knowledge does not depreciate fast and employees are very substitutable, as opposed to abstract occupations such as law or business consultants, which are very inflexible due to lack of substitutability and higher depreciation rates of knowledge. (Goldin and Katz, 2016).



to match increased childbearing among individuals in non-abstract occupations. Survey evidence from a recent Dutch cohort presented in Keijer et al. (2019) confirms that choice of field of study reflects joint occupational and fertility preferences in adolescence. The authors find that preferences for studies and jobs emphasizing caring and social interactions are associated with fertility expectations among adolescent girls and boys.

Due to the opposing predictions of the buffer-savings model with uninsurable risk and the choice of occupation model with heterogeneous fertility preferences, we test two different hypotheses on human capital investments in response to anticipated fertility.

First, we test whether level of educational increases with desired fertility, such that desiring a large family is positively correlated with level of education in line with the buffer-saving theory predicting greater pre-birth education and early career investments in response to anticipated fertility.

Our second hypothesis, motivated by the occupation choice theory of Adda et al. (2017), is that the probability of selecting into non-abstract occupations is higher among women desiring a large family relative to women desiring a small family due to greater childrearing compatibility. Similarly, we expect occupational choices of individuals with no desire to be independent of expected childbearing.

## **2.2 Family formation**

Since the first static models of fertility choice, fertility preferences have been modelled as a positive marginal utility contribution arising from each additional childbirth and potentially from the quality of children (see e.g. Becker, 1960, 1965; Becker and Lewis, 1973). Children are considered a normal good, and utility contributions from children are thus assumed concave in number of children, implying that individuals are willing to forgo almost endless amounts of consumption to have a first child, while having additional children even in response to desires may be too costly given resource constraints. Heterogeneity of fertility preferences may be introduced by including individual specific taste multipliers on utility contributions from children. Essentially, this implies that a higher taste for fertility is equivalent to the individual deriving a higher utility from each additional child, resulting *ceteris paribus* in a higher level of realized fertility at the individual level, when utility is assumed separable across children and consumption, and time and budget constraints are non-binding.

As the structural literature aims to explain the observed negative gradient between earnings (and education) and childbearing, fertility choices are hardly ever analyzed in isolation of labor supply or human investment choices. Early and more recent models of joint fertility and labor supply choices account for the negative relationship between earnings and fertility by either the quantity-quality trade-off or the theory of optimal time allocation of households. The quantity-quality trade-off approach, pioneered by Becker (1960) and Becker and Lewis (1973), models preferences in which parents value not only the quantity of children, but also the quality of children, such that women with higher earnings choose to realize lower fertility. In the time-allocation approach pioneered in Mincer (1963), Becker (1965), Gary et al. (1981) and Willis (1973) childcare is treated as a labor intensive activity - more or less costly depending on the mother's opportunity costs of working, i.e., her outside option characterized by potential wage earnings from employment. The theory holds that a woman with a higher earnings ability will optimally choose to dedicate more time to work and less to childrearing due to her time-allocation trade-off.<sup>4</sup> Depending on their specific focus, recent structural models vary on the assumptions regarding an individual's joint preferences and skills, particularly the presence of heterogeneous preferences.

In the model of Adda et al. (2017), the preferences of individual female agents are reflected in increasing concave utility contributions taking as inputs number of children, occupation, leisure and marital status. The model involves two types of agents characterized by either high or low taste for fertility. Individual taste for fertility is modelled via scalars on the separate utility contributions from first- and second-born children. Other than affecting the utility of children, the taste for fertility parameter affects the probability of marriage, which is modelled as an exogenous non-linear function of the age of a woman and her career stage. Marginal costs of childrearing are assumed decreasing in childrearing compatibility of occupation and in sharing the responsibility with a husband. Quality of children is included in the model by interacting the utility of leisure with utility of children reflecting complementarities between leisure and childrearing. This is equivalent to assuming that child quality resulting from parental time investments increases the utility of children as in the seminal analysis by Becker (1960) and Becker and Lewis

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<sup>4</sup>Another consequence of the time allocation framework is that no more than one household member would optimally choose to allocate time to both market production and house production (childcare) due to gains from specialization.

(1973). In turn, the observation that women in high-paying occupations have fewer children, reflects their steeper trade-offs between childrearing and labor supply, rather than their lower fertility preferences.

The positive relationship between fertility desires and realized fertility is also documented in a rich demographic literature. Based on survey evidence, several studies find that the lifetime fertility target of an individual is strongly correlated with her realized fertility (see e.g. Schoen et al., 1999; Berrington, 2004; Bhrolcháin et al., 2010; Günther and Harttgen, 2016; Miller and Pasta, 1995; Bongaarts, 2001; Quesnel-Vallée and Morgan, 2003), though individuals tend to overestimate the number of children they will give birth to over their reproductive career. Given the existing theoretical and empirical evidence, we assume that desiring a large family is associated with a higher likelihood of motherhood and with having a higher number of children, and that having no desire is associated with reduced fertility on both extensive and intensive margins, when opportunity costs as reflected by human capital endowment is held fixed.

Timing of birth is another important aspect of family formation. According to theory, in the absence of financial constraints and uncertainty, a woman desiring children would *ceteris paribus* pursue family formation as soon as possible, as positive utility contributions from children would then accrue over a longer period. However, observed data document that timing of birth does vary significantly across individuals, indicating that realization of fertility is subject to binding constraints in early adulthood. Fertility delays are modelled as resulting from human capital investments in anticipation of family formation (Ejrnæs and Jørgensen, 2020; Choi, 2017; Sommer, 2016). Additionally, education incentivizes delayed matching according to the assortative matching theory, as it paves the way for superior marriage market opportunities, i.e. it increases the likelihood of finding a match combining a high insurance value and high expected quality of parental time investments (Abbott et al., 2013). Finally, fertility delays are *per se* assumed to increase age-related biological fertility risks, which may prolong the time to conceive or increase the risk of childlessness as modelled in Choi (2017) and Ejrnæs and Jørgensen (2020). *A priori*, it is unclear how these mechanisms would be affected by the introduction of heterogeneous fertility preferences. We, therefore, base our hypothesis on the correlation between desired fertility and timing of birth on the occupation choice theory of Adda et al. (2017). In this framework, individuals selecting into non-abstract occupations face

constant career costs of childbirth and are free to choose early childbearing, while individuals selecting into abstract occupations face increasing career costs incentivizing delayed childbearing. Hence, we assume that desiring a large family is associated with anticipation of first birth in response to certain occupational choices, while having no desire is associated with delayed family formation in response to different occupational choices.

The empirical evidence on timing of birth is mixed. While Herr (2016) and Miller (2011) find that early career childbearing is more costly than intermediate career due to diminishing returns to experience over career, Black et al. (2008), Rosenbaum (2015) and Karimi (2014) present causal evidence that timing of birth is strictly related to human capital investments as a reflection of individual-specific skills and educational institutions. Hence, greater career costs from earlier childbearing are purely an artifact of selection on observables and exogenous constraints. Keijer et al. (2019) finds no correlation between preferred field of study and preferences for fertility timing.

A final aspect of family formation to consider is that of fertility risks. Existing structural models propose several mechanisms to explain deviations between target and realized fertility. First, the transmission from desires to realized births may be sensitive to the successful establishment and maintenance of stable relationships and to individual specific biological fertility risks, which increase with fertility delays (see e.g. Choi, 2017; Ejrnæs and Jørgensen, 2020; Sommer, 2016). Next, intra-couple preferences may deviate, such that realized fertility is the result of intra-household bargaining as documented in Doepke and Kindermann (2019). Finally, according to Becker's seminal theory on specialization and time allocation of household members, women with a higher cognitive ability face higher opportunity cost of childbearing than women with lower ability, and pursuing education may exacerbate this tendency due to complementarities between skills and education (Becker, 1965; Becker and Lewis, 1973). As a consequence, more skilled women face steeper incentives to trade-off extensive childbearing for greater human capital investments and more intensive work-lives, (see e.g. Eckstein and Wolpin, 1989; Sommer, 2016; Conesa, 2002; Caucutt et al., 2002; Choi, 2017). This implies that childbearing on the intensive margin might respond negatively to a woman's earnings ability, such that individuals with higher ability are more likely to realize fertility below desires. The proposed negative gradient between level of education and childbearing is corroborated by cross-sectional demographic evidence showing that highly educated women are more

likely to miss their fertility target than the less educated (see e.g. Heiland et al., 2005; Bhrolcháin et al., 2010). Based on theory and prior empirical evidence, we assume imperfect transmission of family desires to realized fertility. First, desiring a large family is likely to be associated with a higher risk of realizing fertility below desires due to a direct mechanical effect, second, skills and preferences, which increase individual opportunity costs or tighten individual time constraints are likely to increase fertility risks.

Typically, the probability of incurring an unplanned birth, i.e., a birth in excess of desires, is modelled as some exogenous low probability of experiencing an unplanned birth across fertile age. The exogenous risk assumption may be extended by assuming that the risk is higher for women with non-binding time constraints. This would be the case if women with a stronger preference for home production have a higher probability of experiencing excess fertility. In support of this view, Shreffler and Johnson (2013) find that the association between fertility intentions and realized fertility is stronger among women with higher career aspirations. Hence, we assume that non-participation and flexible employment will be associated with a higher risk of excess fertility because of non-binding time constraints.

The fertility risks of women with no desire for family formation have gained little attention in the prior literature. By definition, the desire to remain childless prevents one from experiencing a fertility deficit. Based on intra-couple bargaining theories and the low likelihood of finding a partner with no desire for children, we hypothesize that a substantial share of women with no desire will end up as mothers, despite lower expected utility contributions - potentially zero - from childbearing.

### **2.3 Labor market behavior**

Given early career investments made in anticipation of childbirth, how does women's labor market behavior at birth respond to their fertility preferences? According to the theoretical framework in Adda et al. (2017), choice of occupation is an important source of heterogeneity in explaining post-birth labor market adjustments of women as their incentives and trade-offs at birth are predetermined by their choice of occupation. Particularly, women who select into abstract occupations face steeper utility trade-offs between childrearing and earnings at birth due to higher career costs of absences. As leave-taking is associated with extensive depreciation of human capital, they pursue reduced child-

bearing and make smaller career adjustments at birth. Instead, women who select into non-abstract occupations face more lenient trade-offs at birth reflecting lower human capital depreciation during absences. Hence conditional on selection into a childrearing compatible occupation, desiring a large family is associated with greater adjustments of labor supply.

One immediate challenge for the forward-looking occupation choice theory is how to interpret the extensive evidence on women's career changes in response to birth. Quasi-experimental event-studies of women's labor market behavior around the time of birth (see e.g. Angelov et al., 2016; Kleven et al., 2019; Andresen and Nix, 2019; Rosenbaum, 2019) document that earnings of men and women follow very similar trends until the time of childbirth, at which point earnings of women drop dramatically, and only partially recover over time. While Kleven et al. (2019) attribute reduced earnings after birth mainly to reduced labor supply, they document that women respond to childbirth by changing from the private to the public sector, by selecting into family-friendly firms, and by selecting out of managerial responsibilities. Hence, extensive occupational changes at birth are rather common.

If we assume that initial occupational choices were made to accommodate childrearing, how should we interpret this evidence? Do women incur taste shocks at birth, do they underestimate the time costs of childrearing, or do these radical changes take place only in response to unexpected or unplanned pregnancies? Kuziemko et al. (2018) present survey evidence documenting that women tend to overestimate the number of hours they will work after first birth, i.e. they underestimate the time costs of childrearing, while Kleven et al. (2019) cites an OECD survey documenting that the percentage of women believing mothers should decrease their working hours, while their children are small, increases with the arrival of children. This indicates that mothers do indeed experience taste shocks as they transition into motherhood.

However, we suggest an alternative theory to reconcile endogeneity of fertility and career choices with the empirical evidence on career adjustments at birth. Particularly, we extend the buffer-savings framework, and suggest that stronger family preferences incentivize making greater savings prior to birth, allowing in turn for greater dissaving and career adjustments at birth. Behavioral adjustments are motivated by taste for childrearing and anticipation of further childbearing, which increase with fertility desires. We

call this the family investment theory. Essentially, it results from the introduction of heterogeneous fertility preferences into the classical buffer-savings consumption-smoothing model.

The theory differs from the quantity-quality theory pioneered to explain the observation that women with higher earnings realize lower fertility as presented in Becker (1960) and Becker and Lewis (1973), as it does not assume that quality of children substitutes for number of children. Instead, individuals with high desires plan to have a large family and make large career adjustment at the onset of family, namely at first birth to invest in family formation, i.e. in anticipation of additional births. This could be modelled by allowing utility contributions from leisure to vary with both fertility preferences and realized motherhood. One piece of evidence that desired fertility affects behavior at birth is found in Ejrnæs and Jørgensen (2020). The authors estimate a dynamic household model relying on British survey evidence on household fertility intentions. They find that households dissave to smooth consumption in response to planned births, while their savings are unchanged, when unplanned births occur. However, they also find that unplanned and planned children affect mothers' labor supply and earnings in a similar manner. We posit that rules on leave and work hours may be given institutionally, such that labor supply and earnings are affected similarly by a planned and unplanned birth, while other aspects of career and savings behavior differ across the plannedness of children. Moreover, we posit that desiring a large family will be associated with greater career adjustments at first birth than desiring a small family.

The nature of career adjustments taking place in connection with a planned birth are likely to vary with career aspirations and cognitive skills, e.g., individuals valuing both children and home production might adjust their working lives by reducing work hours or withdrawing entirely from the labor market, while women valuing both a career and family formation may select into flexible work lives allowing them to plan market work around childrearing (Shreffler and Johnson, 2013). Clearly, financial constraints and spouse characteristics may also impact the nature of career adjustments.

One way to achieve greater control over work conditions, e.g., over work schedule, weekly hours and work location, is by selecting into self-employment, particularly solo self-employment defined as self-employment with no employees. Generally, the entry barriers and initial capital costs for solo-self-employment are low, while it may offer greater work-

life flexibility, less accountability to colleagues and less managerial tasks. Recent anglo-saxon studies document that mother entrepreneurs typically work fewer hours and spend more hours on childcare and domestic work relative to both self-employed men and other women in paid employment (Bari et al., 2021), while studies of self-employed mothers in the Nordics find that they spend as many hours on market work as their peers in paid salary. As Noseleit (2014) documents that family size causally affects selection into self-employment, while self-employment does not causally affect family size, we hypothesize that desired family size is positively correlated with selection into self-employment.

Career adjustments after birth, whether into self-employment, part-time paid employment or non-participation, are likely to result in reduced labor supply and earnings from paid employment after birth, which in turn result in cumulative wage losses over career, though wage losses may be partially mitigated by alternative income sources. Meanwhile, individuals with no family desires are likely to make smaller career adjustments at birth, as their births are per definition unplanned. Having lower levels of precautionary savings and having no additional expectation of childrearing is likely to result in muted career adjustments at birth and a lower likelihood of pursuing alternative employment.

The family investment theory introduces an important source of heterogeneity into the career consequences of motherhood, which are documented in the applied literature (see e.g. Bronars and Grogger, 1994; Rosenzweig and Wolpin, 1980a; Angrist and Evans, 1996; Lundborg et al., 2017). It poses that the career adjustments taking place at birth vary with fertility desires, and that the career consequences of planned and unplanned births differ in nature.

### **3 Background: The Danish Context**

Denmark provides an ideal setting for studying the role of desired fertility for education and career choices as pecuniary constraints on education and family formation are limited, allowing us to zoom in on non-pecuniary factors such as preferences, skills and aspirations. First, everyone has free access to public education from age 6 and up until University graduation. Additionally, the State provides student transfers and loans during higher-education to cover some share of students' living expenses.<sup>5</sup> The sampled cohort were

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<sup>5</sup>Student benefits were introduced in 1970, when individuals in our sample were 15 to 17 years old. Student benefits were originally means tested on income of parents.



born around 1954 and were all attending 7th grade in 1968, when they were sampled for the first survey wave. In 1968 it was obligatory to complete a minimum of 9 years of schooling (1st to 9th grade). After 7th grade, students were faced with the choice of selecting into vocational track Lower Secondary Education (LSE) completing 8th and 9th grade, and potentially 10th grade, or selecting into academic track LSE, completing 8th to 10th grade and taking the LSE-exam (Realeksamen). The vocational track paved the way for vocational education (technical school), which prepared individuals to work as skilled labor through academic courses and practical training. The academic track paved the way for Upper Secondary Education (USE) such as tri-annual gymnasium or bi-annual Higher Preparatory Exam. The LSE exam after 10th grade also paved the way for completing a professional Bachelor such as nurse, primary school teacher or office clerk, while completion of an USE exam paved the way for University studies, including Bachelor programs followed by Master programs for becoming, e.g., a doctor, an engineer, or a lawyer. Finally, after completing a Master's, individuals could continue to take a PhD, paving the way for an academic career.

Regarding child benefits, working mothers in our sample had access to parental leave with benefits for 14 weeks. The cohort in question experienced a massive increase in access to public childcare for the 0 to 6-year-olds. Around 1973 (age 19) only 1/4 of Danish children attended daycare, while by 1983 (age 29) 1/2 of children were enrolled. Finally, Danish women gained access to the birth prevention pill from 1966 (age 12), and to provoked abortions until week 12 from 1973 (age 19), reducing the number of unwanted pregnancies substantially.

## 4 Data, sample and descriptives

In this section, we present our data and our samples. We introduce our key variable of interest, elicited fertility desires in early adulthood, as well as potential confounders elicited prior to (or at the time of) fertility desires. Next, we present descriptives on fertility desires in Section 4.5, on socio-demographics and human capital endowment in Section 4.7, and on outcome measures in Section 4.8.

## 4.1 Data

Our main data source is the Danish Longitudinal Survey of Youth (DLSY), which is a panel study of 3,151 individuals born around 1954. Individuals attending 152 7th grade classes around Denmark were sampled to be nationally representative. They were first interviewed in 1968 around age 14. The original sample consisted of 50 percent males and females. Throughout their adolescence and adult life, individuals were invited to participate in follow-up waves. Some attrition took place, but response rates remained high with more than 70 pct. of the original sample still participating in the latest wave in 2001 (age 47). We focus on the subsample of females, relying in particular on survey evidence on fertility desires at age 22 as well as on time preferences, cognitive ability, taste for education and socio-demographic background characteristics in adolescence. In addition, we make use of survey evidence on family formation and relationships at elicitation of desires and through adulthood.

We merge the data from DLSY with high quality registers at the individual level administered by Statistics Denmark. From the registers, we observe individuals' family formation, educational attainment and labor market histories across career. The medical birth registers start in 1973, and include number of births and year of birth across fertile age<sup>6</sup>, while population registers include marriages, cohabitations and divorces across adult life. Registers on educational outcomes include level of education and field of study, while registers on labor market outcomes and income include participation, labor supply, occupation and earnings. Labor market outcomes are observed across career from age 22 until age 65 (1976-2019), while labor market earnings are observed from age 26 until age 65 (1980-2019).<sup>7</sup>

## 4.2 Samples

The original DLSY enrolled 1,563 females. Our sample contains 1,546 individuals, when observations with a missing birth year and individuals with a teenage pregnancy, defined as a birth prior to age 17, are removed. Merging further with registers and limiting the sample to individuals for whom data on human capital endowment, socio-economic

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<sup>6</sup>For births prior to 1973, we rely on survey evidence from the DLSY.

<sup>7</sup>We rely on the following registers: LPRMFRLF, MFR, BEF, AKM, IDAP, UDDA, IND.

background and fertility desires is available in DLSY, our final sample consists of 1,225 females.

Table 1: Waves of the Danish Longitudinal Survey of Youth

Year of survey	1968	1973	1976	1992	2001
Average age in years	14	19	22	38	47
<b>Total (<i>Sample 1</i>)</b>	1,546	1,380	1,246	1,196	1,125
<i>Sample 1 merged</i>			1,225		
<b>Parental status, 1976</b>					
Early mothers			362		
Other respondents ( <i>Sample 2</i> )			884		
<i>Sample 2 merged</i>			867		
<b>Early mother</b>					
Desiring (more) children			261		
No (more) desire			94		
Don't know			7		
<b>Other respondents</b>					
Desiring children			774		
No desire			88		
Don't know			22		

*Note:* 85% of individuals are born in 1954, while the remaining 15% are born in 1953 or 1955. This implies that individuals' age is between 13 and 15 years at the first DLSY wave in 1968. By 2017, 10% of individuals have died.

From Table 1, we see that more than 1/3 of individuals in our main sample were mothers in 1976, when their fertility desires were elicited. We refer to this subgroup as *Early mothers*, while the rest are referred to as *Other respondents*. We cannot rule out that fertility desires correlate with parental status at elicitation. Hence, in addition to the full sample, *Sample 1*, we define a reduced sample, *Sample 2*, restricted to individuals with no birth at elicitation. When merging with registers, sample 2 consists of 867 individuals. While restricting the sample allows us to rule out interaction between desires and current childbearing, it generates a select sample and limits the statistical power. To ensure robustness, we conduct our analysis on both samples.

### 4.3 Measure of fertility desires

As a proxy for fertility preferences, we rely on a one-off measure of fertility desires elicited in 1976, when individuals were around 22 years old. We take this measure to be a valid proxy for an individual's ideal level of fertility in early adulthood, i.e. the fertility target an individual would strive to achieve in the absence of constraints and uncertainty.

Individuals in DLSY were asked "*Would you like to have (additional) children?*", and if answering "*Yes*", they received the follow-up question: "*How many children would*

you like to have (including the ones you already have)?". By combining answers and interpreting "No desire for children" as a desire for zero children, we construct our key variable of interest, namely "Desired family size". This categorical measure consists of the categories: *Desires no family*, *Desires a small family of 1 or 2 children* and *Desires a large family of at least 3 children*. Individuals answering "I don't know" in either the first or second question on fertility desires are pooled into a residual category.

Without repeated survey elicitation, evaluating the stability of preferences across fertile age is not possible. However, earlier studies have found that measures of unconstrained desired fertility are relatively stable over time, and more stable than alternatives such as expected, planned or intended fertility, which change in response to perceived constraints and the current situation of the individual or couple. (Mueller et al., 2019).<sup>8</sup>

Only in one situation are individuals found to systematically change their desired fertility, namely when they end up having more children than originally desired. (Mueller et al., 2019; Heiland et al., 2008) In our setting, this would imply that early mothers, who initially had no family desire, but end up as mothers due to an unplanned pregnancy, subsequently change their desired fertility to match current number of children. In our setting, it is unproblematic, when early mothers report desire for additional children, as this is unlikely to be influenced by current number of children, but for early mothers with no additional desire, it is unclear, whether they have either reached their target or never desired children in the first place. To accommodate this concern, we control for parental status at elicitation interacted with *no additional desire* and *additional desire*, respectively, in our empirical estimations. Survey questions on parental status at elicitation are presented in Appendix A.1. We do not present coefficients on these interaction terms, as our main focus is the estimates on desired family size for individuals with no childbearing.

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<sup>8</sup>*Expected fertility* has been found to take into consideration long term constraints known to the respondent at elicitation, e.g. health and infertility constraints, while measures of *fertility intentions* or *planned fertility* have been found to reflect short-term fertility plans. The latter measures are then influenced by considerations of optimal timing of fertility in light of the individual's current situation. Individuals and couples alike have been found to adjust their short-term fertility intentions in response to economic uncertainty, changes in the institutional framework, but also in line with their perceived ability to have a child or under the influence of broader social norms on reproductive age.

A related concern is the influence of current relationship status on elicited desires. Around 2/3 of women were married or cohabiting at elicitation of desires.<sup>9</sup> One might speculate that entry into a stable relationship could generate taste shocks to fertility desires if salience of family formation increases with couple formation. Moreover, elicited desires of individuals living with a partner may reflect joint household desires rather than individual desires. Regarding the latter concern, Doepke and Kindermann (2019) document substantial intra-household discrepancies in fertility intentions of married spouses. We accommodate further concerns by controlling for relationship status at elicitation in our empirical estimations. Survey questions on relationship status are presented in Appendix A.2.

#### 4.4 Human Capital Endowment

To isolate the effect of fertility desires on labor market outcomes, it is important to control for potential confounders, i.e. factors correlated with fertility desires, and exerting a significant and sizeable influence on career outcomes of individuals. While we cannot control for all potential confounders, and thus fail to deliver causal evidence, particularly failing to control for individual earnings potential would increase the risk of biased estimates.

Demographic studies have found systematic covariation between desired fertility and completed level of education. Individuals completing higher education are found to be more likely to desire a large family than individuals completing lower education (see e.g. Bongaarts, 2001; Quesnel-Vallée and Morgan, 2003; Testa, 2014; Iacovou and Tavares, 2011). The positive correlation between completed education and desires could reflect that high desires incentivize human capital investments, or it may imply that high-skilled individuals are fundamentally more likely to develop desires that deviate from dominating norms. Heiland et al. (2005) document that the variance of desires increases with level of completed education, such that the frequency of desiring either no family or a large family is higher among the highly educated, while Testa et al. (2016) finds that mother's socio-demographics influence the fertility intentions of daughters.

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<sup>9</sup>Almost 90% of early mothers were cohabiting or married at elicitation, while only 6% had no partner. Among other respondents a little more than half were cohabiting or married, while 1/6 had a partner, and 1/4 had no partner.

Simultaneously, human capital endowment and educational attainment are known to be positively associated with long-term economic outcomes. Both non-cognitive and cognitive skills, as well as patience, are found to have long lasting positive effects on earnings, health and the well-being of individuals (see e.g. Golsteyn et al., 2014; Heckman et al., 2006; Epper et al., 2020). Also, these factors may affect family formation indirectly via opportunity costs of childrearing, duration of education and access to the marriage market.

These insights confirm the relevance of controlling for individual human capital endowment and socio-demographics in our empirical analysis of labor market performance in response to fertility desires. Hence, we control for educational aspirations, cognitive ability scores and time preferences in all estimations. The survey measures are presented in Appendix A.4. While we lack direct measures of non-cognitive skills, we control for a rich set of socio-demographic background factors, such as both parents' education and occupation, number of siblings and individual's parity, as well as both parents living with the child during upbringing (Heckman et al., 2006; Abbott et al., 2013). These are arguably proxying non-cognitive skills.

The fact that desires are elicited (around age 22) after most individuals have already initiated their final education and chosen their field of study, begs the question whether choices of level of education and occupation can truly be assumed to reflect anticipated childbearing, as these choices were to a large extent made prior to elicitation of desires. Only, if we are willing to assume stable preferences across adolescence and early adulthood, may we rely on the results from estimations of level and field of education on desires to conclude on the association between fertility desires and human capital investments. Acknowledging that education may be another potential confounder of the relation between economic outcomes and fertility desires, in our preferred estimation of labor market outcomes on fertility desires, we include level and field of education among controls.

## **4.5 Distribution of desired family size**

The distributions of desired family size among early mothers and other respondents are shown in Figure 1. The categories included are: No family desire, desires a small family of two children or less, desires a large family of at least three children, and a residual category of individuals, who answered that they do not know. We note that desiring a small family

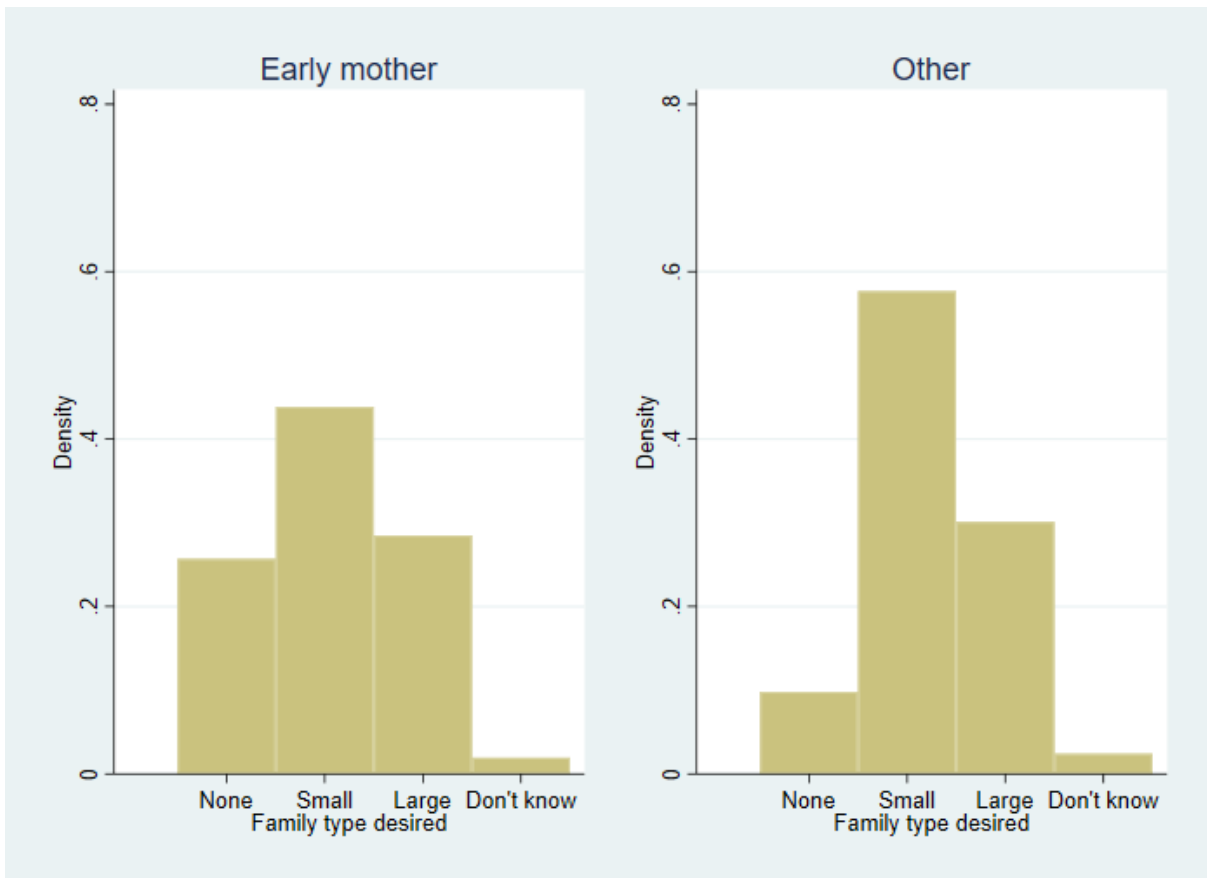
is practically equivalent to desiring two children, as very few individuals express a desire for only one child. Moreover,  $3/4$  of individuals desiring a large family, in reality desire 3 children. From Figure 1, we see that  $1/4$  of early mothers have no additional desire, close to half desire a small family, while  $1/3$  desire a large family. Among other respondents,  $1/10$  have no desire for a family, more than half desire a small family, while close to  $1/3$  desire a large family. For both groups, the residual category holds very small shares. The figures illustrate a strong anchoring of desires around the two-child norm. Among early mothers and other respondents alike, there is a high level of congruence between having (additional) desire and subsequent childbearing. The probability of having more children is 83% among early mothers with desire, while it is 85% among other respondents, indicating similar childbearing in response to desire. In contrast, only  $1/5$  of early mothers with no (additional) desire end up having an additional birth, while as many as 65% of other respondents with no desire for children realize childbearing. This indicates that fertility desires of other respondents with no desire are less stable than those of early mothers with no desire. Further descriptive statistics on fertility desires are found in Table A.3 in Appendix A.6. On average, both early mothers and other respondents with positive desire, desire 2.5 children.

## 4.6 Desired family size and human capital endowment

Next, we present descriptives on the distribution of desired family size in relation to human capital endowment, namely above and below median cognitive ability and high and low patience. We focus on the reduced sample. Distributions in Figure 2 show that desiring a small family dominates for all combinations of patience and ability.

Comparing across horizontally, patience appears to be orthogonal to the distribution of desired family size, while a vertical comparison indicates that the distribution varies with cognitive ability. The distributions among individuals with above median ability are characterized by greater variance than those of individuals with below median ability. This is reflected in higher shares desiring either no family or a large family among individuals with above median ability. Similar patterns are found for expected secondary education and completed education as seen from Figures A.1 and A.2 in Appendix A.6. Higher educational aspirations are associated with a greater likelihood of norm-deviating desires. This carries through to educational attainment as individuals completing a University

Figure 1: Desired family size



Note: Based on sample 1. Separate histograms are presented for early mothers ( $n = 364$ ) and other respondents ( $n = 911$ ).

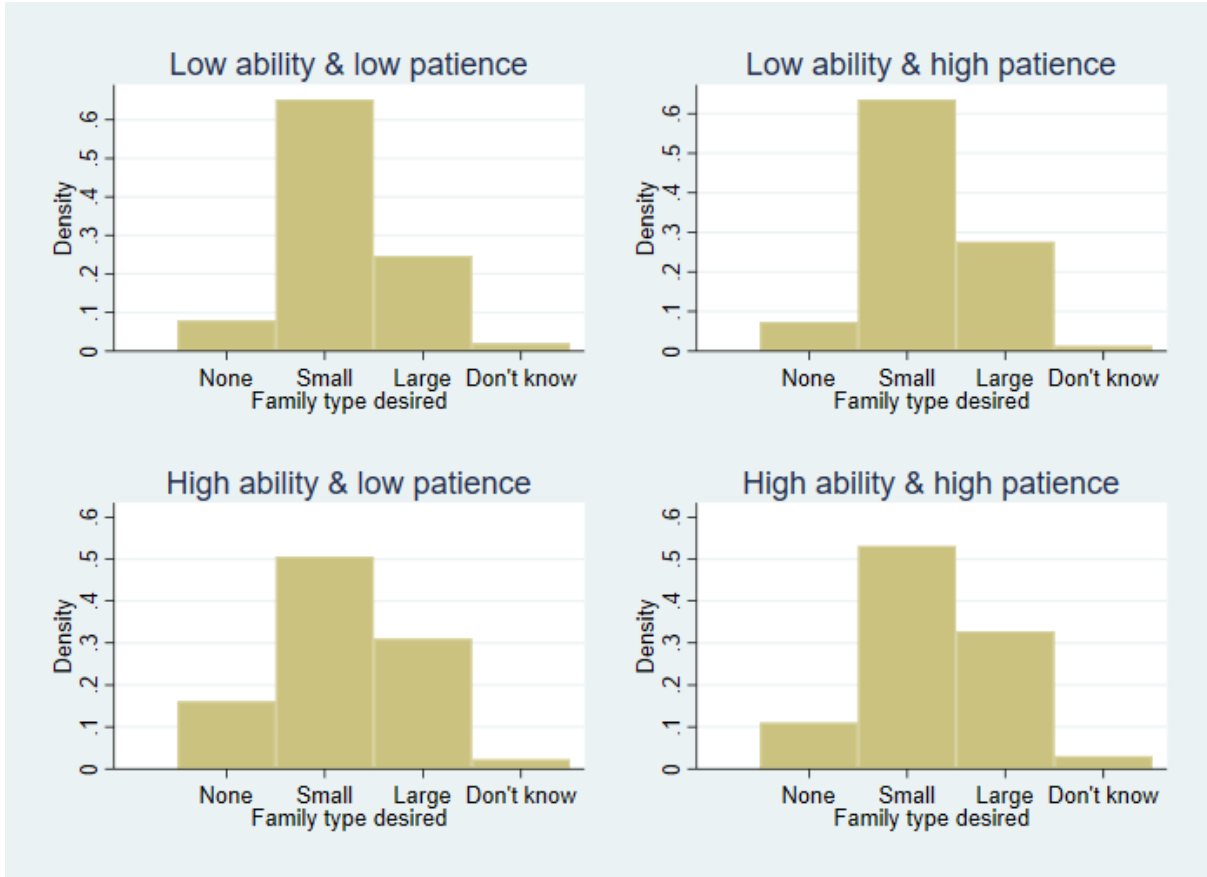
degree are found to be more likely to desire either no family or a large family than individuals with no degree.<sup>10</sup>

In Table A.4 in Appendix A.6 we regress desired family size on human capital endowment factors and socio-demographics in adolescence, controlling for school and birth year fixed effects. The main insights are that cognitive ability and educational aspirations are positively correlated with norm-deviating desires. Desiring a family, particularly a small family is positively correlated with having had a stable childhood, while having many sibling and a working mother, while growing up is positively associated with desiring a large family.

<sup>10</sup>The link between variance of desires and level of education has previously been documented in Heiland et al. (2005). Moreover, it has been found that individuals completing more education ultimately end up having fewer children than the less educated, (see e.g. Testa, 2014; Iacovou and Tavares, 2011; Hofferth, 1984).



Figure 2: Desired family size by ability and patience



Note: Based on Sample 2. There are three categories of patience in DLSY. Individuals in categories 2=*Patient* and 3=*Very patient* have been merged in the category *High patience*, while the category "Low patience" consists of the category 1=*Impatient*. High and low cognitive ability are based on inductive test scores above or below median.

## 4.7 Descriptives on socio-demographics and human capital endowment

In the following, we present descriptives on socio-demographic background and human capital endowment of individuals in our full sample, and divided by subgroups of early mothers and other respondents. Table 2 presents descriptives on family composition, income, and parents' occupation, while Table 3 presents descriptives on parents' education. Finally, Table 4 presents descriptives on individuals' human capital endowment in adolescence.

From Table 2, we see that around 85% of individuals had a stable childhood as proxied by growing up with both parents. On average individuals had 2.2 siblings, though 1/3 had 3 or more. Half of individuals came from a family with an annual breadwinner income between 20.000 and 39.000 DKK (1967), while close to 1/4 came from a family with lower income, and a little more than 1/4 came from a family with a higher income. Only 5% of

individuals came from a family with no breadwinner income in the past year.<sup>11</sup> Almost all individuals had working fathers, primarily employed as unskilled and skilled labor, white-collar employees and farmers. 1/4 of fathers had subordinates. Regarding employment of mothers, almost 1/2 of individuals had stay-at-home mothers, 2/5 of individuals had working mothers in either unskilled or white-collar jobs, 7% had mothers employed as assisting spouses, and finally 2% of individuals had no mother.

A majority of parents completed obligatory schooling up to 8th grade (64-68%), 10% graduated with a middle school exam, while the remaining 12% completed either lower or upper secondary education. Regarding post-secondary education, half of parents completed no vocational education, 1/3-1/4 completed (some) vocational education, and only 6% obtained higher education.

A comparison of socio-demographic background of early mothers and other respondents demonstrates significant differences with regard to socio-economic conditions during upbringing. Early mothers came from larger and poorer families with less educated parents, occupied in less prestigious occupations. More than 70% of parents of early mothers completed only obligatory schooling, while parents of other respondents were significantly more likely to complete secondary and higher education. In addition, early mothers were more likely to grow up with working mothers (49% vs. 40%) and with fathers employed as unskilled labor (32% vs. 17%). Fathers of other respondents were significantly more likely to be self-employed business professionals with subordinates or white-collar employees.

Table 4 presents descriptives on human capital endowment as elicited in adolescence. For educational aspirations, we see that 37% of individuals expected to complete obligatory schooling (vocational track 9th or 10th grade), 38% expected to complete an LSE exam (academic track), while only 1/5 expected to complete USE. Of the residual, 5% expected to complete less than obligatory schooling and 3% did not know. Early mothers were significantly less likely to expect to complete secondary education compared to other respondents.<sup>12</sup>

Complementing elicitation of educational aspirations, in 7th grade, individuals completed three ability tests on inductive, verbal and spatial ability, respectively. We consider the inductive test score a proxy for individual cognitive ability. Mean test scores are shown

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<sup>11</sup>"No response" categories have been left out of descriptive tables for the sake of space, but are used in estimations. Selection into the "No response" category does not differ across subgroups.

<sup>12</sup>The link between lower educational aspirations and early motherhood is in line with findings of Black et al. (2008) that length of schooling causally influences timing of family formation.

Table 2: Background descriptives

<i>Variable</i>	Sample 1		Early mothers		Others		Diff.	P-value
	Mean	Std	Mean	Std	Mean	Std		
Stable upbringing*	0.87	0.33	0.85	0.35	0.88	0.32	0.03	(0.18)
<b>Siblings and parity</b>								
0-2 sibl.	0.62	0.49	0.55	0.50	0.65	0.48	0.10**	(0.00)
3-6 sibl.	0.35	0.48	0.42	0.49	0.32	0.47	-0.10**	(0.00)
First born	0.37	0.48	0.36	0.48	0.37	0.48	0.00	(0.88)
Second born	0.30	0.46	0.27	0.44	0.31	0.46	0.04	(0.16)
Born 3rd or later	0.33	0.47	0.37	0.48	0.32	0.47	-0.04	(0.14)
<b>Household income, DKK(1967)</b>								
0	0.05	0.21	0.03	0.17	0.05	0.22	0.02	(0.08)
1-9.000	0.02	0.14	0.01	0.12	0.02	0.15	0.01	(0.21)
10-19.000	0.15	0.36	0.18	0.39	0.14	0.35	-0.04	(0.07)
20-29.000	0.28	0.45	0.33	0.47	0.26	0.44	-0.06*	(0.02)
30-39.000	0.24	0.43	0.26	0.44	0.24	0.43	-0.02	(0.38)
40-49.000	0.15	0.35	0.13	0.34	0.15	0.36	0.02	(0.26)
50-59.000	0.05	0.21	0.03	0.16	0.05	0.22	0.03*	(0.03)
60-69.000	0.03	0.18	0.02	0.13	0.04	0.20	0.02*	(0.01)
70-79.000	0.02	0.13	0.01	0.09	0.02	0.15	0.02*	(0.03)
80-89.000	0.01	0.09	0.00	0.00	0.01	0.10	0.01**	(0.00)
90-99.000	0.00	0.06	0.00	0.05	0.00	0.07	0.00	(0.62)
<b>Father occ.</b>								
NLF	0.02	0.12	0.02	0.14	0.01	0.12	-0.01	(0.48)
Unskill.	0.21	0.41	0.32	0.47	0.17	0.37	-0.15***	(0.00)
Skilled	0.11	0.31	0.14	0.34	0.10	0.29	-0.04*	(0.05)
White collar	0.29	0.45	0.20	0.40	0.33	0.47	0.13***	(0.00)
Self-empl. farmer	0.23	0.42	0.20	0.40	0.24	0.43	0.03	(0.18)
Self-empl. crafts	0.06	0.23	0.06	0.23	0.06	0.23	-0.00	(0.92)
Self-empl. business/proff.	0.07	0.25	0.04	0.19	0.08	0.27	0.04**	(0.00)
Has subordinates	0.24	0.42	0.18	0.38	0.26	0.44	0.09***	(0.00)
<b>Mother empl.</b>								
Not employed	0.46	0.50	0.42	0.49	0.48	0.50	0.05	(0.08)
Mother works	0.43	0.49	0.49	0.50	0.40	0.49	-0.09**	(0.00)
Assisting spouse	0.07	0.26	0.05	0.21	0.08	0.27	0.03*	(0.03)
Mother dead/No resp.	0.05	0.21	0.04	0.20	0.05	0.22	0.01	(0.57)
<b>Mother occ.</b>								
Housewife/NLF	0.49	0.50	0.45	0.50	0.51	0.50	0.06*	(0.05)
Unskilled	0.03	0.17	0.03	0.16	0.03	0.18	0.00	(0.70)
Skilled	0.00	0.05	0.00	0.05	0.00	0.05	-0.00	(0.88)
White collar	0.21	0.41	0.17	0.37	0.22	0.42	0.05*	(0.02)
Self-empl. business/sales	0.01	0.08	0.01	0.07	0.01	0.08	0.00	(0.79)
Self-empl. craftsman	0.00	0.06	0.01	0.09	0.00	0.03	-0.01	(0.15)
Mother dead/No resp.	0.02	0.14	0.02	0.14	0.02	0.14	-0.00	(0.99)
Observations	1225		362		884		1246	

*Note:* \*\*\*/\*\*/\* indicate statistical difference at the 1%/5%/10%-level. P-values in parentheses. \*Stable upbringing proxied by living with both parents in 1968.

in Table 4, while we rely on standardized scores in the empirical analysis. The average score on the inductive test is 23/40 points (standardized mean: 0.045) and 37/58 points on the verbal test (standardized mean: 0.061). Finally, the average spatial test score is 22/38 points (standardized mean: -0.06). Regarding time preferences elicited around age

Table 3: Parent's education

<i>Variable</i>	Sample 1		Early mothers		Others		Diff.	P-value
	Mean	Std	Mean	Std	Mean	Std		
<b>Father educ.</b>								
7/8th grade	0.64	0.48	0.72	0.45	0.61	0.49	-0.11***	(0.00)
Mid. school	0.10	0.30	0.07	0.25	0.11	0.32	0.04*	(0.01)
LSE/USE	0.12	0.32	0.06	0.23	0.15	0.35	0.09***	(0.00)
<b>Father voc. edu.</b>								
None	0.62	0.49	0.71	0.45	0.58	0.49	-0.13***	(0.00)
Vocational	0.30	0.46	0.26	0.44	0.32	0.47	0.07*	(0.03)
Higher educ.	0.06	0.24	0.02	0.15	0.07	0.26	0.05***	(0.00)
<b>Mother educ.</b>								
7/8th grade	0.68	0.47	0.73	0.44	0.65	0.48	-0.08**	(0.00)
Mid. school	0.10	0.30	0.09	0.29	0.11	0.31	0.02	(0.31)
LSE/USE	0.12	0.33	0.06	0.24	0.15	0.36	0.09***	(0.00)
<b>Mother voc. edu.</b>								
None	0.52	0.50	0.61	0.49	0.48	0.50	-0.13***	(0.00)
Vocational	0.33	0.47	0.24	0.43	0.36	0.48	0.12***	(0.00)
Higher educ.	0.06	0.24	0.03	0.16	0.08	0.27	0.05***	(0.00)
Observations	1225		362		884		1246	

Note: \*\*\*/\*\*/\* indicate statistical difference at the 1%/5%/10%-level. P-values in parentheses.

Table 4: Human capital endowment

<i>Variable</i>	Sample 1		Early mothers		Others		Diff.	P-value
	Mean	Std	Mean	Std	Mean	Std		
<b>Expected SE</b>								
7th/8th	0.05	0.21	0.09	0.28	0.03	0.18	-0.05***	(0.00)
9th/10th	0.38	0.49	0.52	0.50	0.32	0.47	-0.20***	(0.00)
LSE	0.36	0.48	0.27	0.44	0.39	0.49	0.12***	(0.00)
USE	0.19	0.39	0.09	0.29	0.23	0.42	0.13***	(0.00)
No resp.	0.03	0.18	0.03	0.17	0.03	0.18	0.00	(0.82)
<b>Cognitive ability</b>								
Inductive score	22.95	8.08	20.48	8.17	23.99	7.87	3.51***	(0.00)
Verbal score	37.21	7.53	34.86	7.80	38.20	7.22	3.33***	(0.00)
Spatial score	22.39	6.87	21.09	7.20	22.94	6.68	1.85***	(0.00)
<b>Time preferences</b>								
Impatient	0.25	0.43	0.33	0.47	0.22	0.41	-0.11***	(0.00)
Patient	0.51	0.50	0.47	0.50	0.53	0.50	0.06	(0.05)
Very patient	0.22	0.41	0.19	0.39	0.24	0.42	0.05	(0.06)
No resp.	0.02	0.13	0.01	0.12	0.02	0.14	0.00	(0.52)
Observations	1225		362		884		1246	

Note: \*\*\*/\*\*/\* indicate statistical difference at the 1%/5%/10%-level. P-values in parentheses.

19, 1/4 of individuals in our sample are categorized as impatient, 1/2 are classified as patient, and finally 1/4 are classified as very patient. Both the inductive test score and the measure of time preferences in DLSY are found to be positively and significantly associated with later economic outcomes in Brenoe and Epper (2019) for both genders. From subgroup statistics, we see that individuals with early childbearing are character-

ized by lower innate ability as proxied by ability test scores, greater impatience and lower educational aspirations relative to other respondents.

## 4.8 Outcomes

We conduct our analysis on outcomes for educational attainment, family formation, and labor market performance. Below we present descriptives for the full sample and divided by subgroups of early mothers and other respondents. The significant subgroup differences in socio-demographics and human capital endowments of early mothers and other respondents carry through to realized outcomes.

### 4.8.1 Education

Regarding human capital investments in anticipation childbearing, we aim to test whether educational attainment increases with desired family size, and whether selection into non-abstract (and out of abstract) occupations is positively (negatively) associated with desiring a large family. For educational attainment, we construct a dummy for completing Upper Secondary Education (USE) and a dummy for completing a University degree. Finally, we proxy choice of occupation by field of study in highest completed education.

The indicator for USE completion takes the value one for individuals, who completed Higher Preparatory Exam (HPE) or the USE exam (with Specialization in Languages or Math). The indicator for University degree takes the value one for individuals, who completed a Bachelor's degree or a higher education at University. In Table 5 we present descriptives on educational status around elicitation of desires, and, based on the registers, on educational attainment and field of study for highest completed education.<sup>13</sup>

In 1976 at elicitation of desires, practically everyone in our sample had finished primary and secondary education. 2/5 had completed 7th-10th grade, 1/3 LSE, and 24% USE. Among the latter group, 6% completed the Higher Preparatory Exam (HPE), 12% a Social sciences and Languages USE, and 5% a Scientific or Mathematical USE according to registers. In 1976, 1/4 had left the educational system without any tertiary education, while almost 1/2 had completed some post-secondary education. The remaining 1/4 were still attending education. According to the register on highest completed

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<sup>13</sup>The registers contain 19 fields in total, including Missing, though almost 1/3 of our sample cannot be classified by field as they completed only primary schooling. Fields with less than 1.0% of the sample have been omitted from Table 5.

Table 5: Educational attainment

<i>Variable</i>	Sample 1		Early mothers		Others		Diff.	P-value
	Mean	Std	Mean	Std	Mean	Std		
<b>DLSY: Education status, 1976</b>								
Att. post-SE	0.28	0.45	0.10	0.30	0.35	0.48	0.25**	(0.00)
Compl. post-SE	0.48	0.50	0.40	0.49	0.51	0.50	0.11**	(0.00)
<b>Registers</b>								
<b><i>Secondary education</i></b>								
Dummy USE	0.24	0.42	0.08	0.28	0.30	0.46	0.21**	(0.00)
SE grad age	17.58	2.21	17.05	1.98	17.79	2.26	0.74**	(0.00)
7th/1. real	0.06	0.23	0.10	0.30	0.04	0.20	-0.05*	(0.00)
8th/2. real	0.05	0.21	0.09	0.29	0.03	0.17	-0.07**	(0.00)
9th/3. real	0.44	0.50	0.49	0.50	0.42	0.49	-0.07	(0.02)
10th/Training	0.21	0.41	0.22	0.42	0.20	0.40	-0.02	(0.46)
Higher prep.	0.06	0.24	0.04	0.19	0.07	0.26	0.04*	(0.01)
STX/Linguistic	0.12	0.33	0.03	0.17	0.15	0.36	0.12**	(0.00)
HTX/HHX/Math	0.05	0.22	0.02	0.13	0.07	0.25	0.05**	(0.00)
Missing	0.00	0.04	0.01	0.12	0.02	0.13	0.00	(0.68)
<b><i>Higher education</i></b>								
Dummy College	0.36	0.48	0.17	0.38	0.45	0.5	0.27**	(0.00)
Final grad age	24.68	10.01	24.60	11.70	24.74	9.26	0.14	(0.84)
Lower secondary	0.31	0.46	0.45	0.50	0.25	0.43	-0.20**	(0.00)
Upper secondary/VOC	0.33	0.47	0.38	0.48	0.30	0.46	-0.07	(0.02)
Short cycle tertiary	0.04	0.19	0.01	0.09	0.05	0.22	0.04**	(0.00)
Bachelor or similar	0.26	0.44	0.14	0.34	0.30	0.46	0.17**	(0.00)
Master or above	0.06	0.23	0.01	0.12	0.07	0.26	0.06**	(0.00)
<b><i>Field of study</i></b>								
Bus./admin./law	0.20	0.40	0.19	0.39	0.20	0.40	0.01	(0.75)
Engin./techn.	0.01	0.11	0.00	0.00	0.02	0.13	0.02**	(0.00)
Human sciences	0.03	0.16	0.00	0.05	0.04	0.19	0.03**	(0.00)
Primary school	0.31	0.46	0.45	0.50	0.25	0.43	-0.20**	(0.00)
Services	0.01	0.11	0.02	0.16	0.01	0.08	-0.02	(0.03)
Social and health	0.30	0.46	0.25	0.43	0.32	0.47	0.06	(0.02)
Social sciences	0.02	0.13	0.01	0.10	0.02	0.13	0.01	(0.32)
Teach. and learn.	0.06	0.23	0.02	0.14	0.07	0.25	0.05**	(0.00)
USE	0.03	0.16	0.01	0.12	0.03	0.17	0.02	(0.06)
Missing	0.00	0.04	0.01	0.12	0.02	0.13	0.00	(0.68)
<b><i>Occupation</i></b>								
Abstract	0.22	0.42	0.20	0.40	0.23	0.42	0.03	(0.31)
Non-abstract	0.36	0.48	0.27	0.44	0.38	0.49	0.11**	(0.00)
Observations	1225		362		884		1246	

Note: \*\*\*/\*\*/\* indicate statistical difference at the 1%/5%/10%-level. P-values in parentheses.

education, eventually almost 1/3 of individuals left schooling after obligatory schooling, 1/3 completed vocational education, while close to 1/3 completed a Bachelor's degree or more education.<sup>14</sup> Individuals graduated from secondary education around age 18, while those who continued to post-secondary education graduated around age 25. Comparing the educational attainment of early mothers and other respondents, we see from

<sup>14</sup>Only 6.3% completed a Master's degree or higher.

Table 5 that early mothers completed significantly less education than other respondents did. Only 8% of early mothers completed USE compared to 1/3 of other respondents. Also, other respondents were significantly more likely to complete a University degree than early mothers (45% vs. 17%), while early mothers were somewhat more likely to complete vocational education (38% vs. 30%).

For field of study, we see from Table 5 that individuals were concentrated in a handful of fields reflecting gender divides characteristic of the period. The main fields are *Business, Economics, Administration and Law* (1/5), *Social Services and Health* (1/3) and *Teaching and Learning* (6%). To test whether desiring a large family is positively associated with selection into non-abstract fields, we create indicator variables for abstract and non-abstract occupations. The fields most likely to proxy an occupation with abstract tasks are *Business, Economics, Administration and Law*. Moreover, these fields may be linked to private sector employment. The fields most likely to proxy occupations with non-abstract tasks are *Social Services and Health* and *Teaching and Learning*, which may be linked to public sector employment. Using this definition, 1/5 of individuals selected into abstract fields, while approximately 1/3 selected into non-abstract fields. The shares of early mothers and other respondents selecting into abstract fields are similar, while other respondents are somewhat more likely to select into non-abstract fields (38% vs. 27%).

#### 4.8.2 Family Formation

Regarding family formation, we want to test if desiring a large family is associated with lower age at first birth and with having more children. In addition, we want to shed light on fertility risks in response to desires, skills and career choices. Hence, outcomes of interest are age at first birth and number of children over fertile age. For fertility risks, we rely on realized number of children relative to number of children desired, forming indicators of excess fertility, fertility deficit and for fertility equal to desires. In Table 6, we present descriptives for the full sample and divided by subgroups, keeping *ad notam* that family formation of early mothers per definition takes place before that of other respondents.

Overall, 89% of individuals in our sample end up as mothers, though only 83% of other respondents realize motherhood. Despite high probabilities of parenthood, almost half of other respondents (48%) end up with fewer children than desired, e.g., almost 1/5

Table 6: Descriptives on fertility

<i>Variable</i>	Sample 1		Early mothers		Others		Diff.	P-value
	Mean	Std	Mean	Std	Mean	Std		
<b>Parenthood</b>								
Mother, 1973	0.08	0.28	0.28	0.45	0.00	0.00	-0.28***	(0.00)
Mother, 1976	0.30	0.46	1.00	0.05	0.01	0.12	-0.98***	(0.00)
Ever parent	0.89	0.31	1.00	0.00	0.83	0.38	-0.17***	(0.00)
<b>Sequence graduation/family</b>								
Marriage pregrad	0.22	0.41	0.29	0.45	0.19	0.39	-0.10**	(0.00)
Birth pregrad	0.26	0.44	0.42	0.49	0.21	0.41	-0.21**	(0.00)
<b>No. of children</b>								
0 children	0.11	0.31	0.00	0.00	0.17	0.38	0.17***	(0.00)
1 children	0.18	0.39	0.14	0.35	0.20	0.40	0.06**	(0.01)
2 children	0.48	0.50	0.48	0.50	0.47	0.50	-0.00	(0.90)
3 children	0.16	0.37	0.25	0.43	0.12	0.33	-0.12***	(0.00)
4+ children	0.06	0.24	0.14	0.34	0.03	0.18	-0.10***	(0.00)
Avg. no. of children	1.90	1.07	2.43	1.02	1.66	1.03	-0.77***	(0.00)
Age 1st birth	24.96	5.01	20.08	1.36	27.35	4.36	7.27***	(0.00)
Age last birth	29.91	5.39	26.99	5.50	31.32	4.73	4.33***	(0.00)
<b>Fertility on/off target</b>								
Excess fertility	0.17	0.38	0.19	0.39	0.16	0.37	-0.03	(0.28)
Fertility = desires	0.39	0.49	0.44	0.50	0.37	0.48	-0.08*	(0.01)
Fertility deficit	0.44	0.50	0.37	0.48	0.48	0.50	0.10***	(0.00)
Observations	1225		362		884		1246	

*Note:* \*\*\*/\*\*/\* indicate statistical difference at the 1%/5%/10%-level. P-values in parentheses.

of other respondents end up having just one child though desiring two or more. 37% of other respondents have as many children as desired, while only 1/6 have more children than desired. Among early mothers with (additional) desire, 1/3 of individuals realize fertility below desires, 2/5 have as many children as they desired, while 1/5 have more children than desired. On average, early mothers have their first birth at age 20, while other respondents, conditional on motherhood, have their first birth at age 27. Early mothers give birth to almost 2.5 children on average, while other respondents give birth to 1.7.

Pursuing family formation and education in parallel is fairly common among the cohort in question. 1/4 of individuals have their first child and 1/5 get married before graduation. This pattern is even more common among early mothers, where 42% have their first child prior to graduation.<sup>15</sup>

<sup>15</sup>The Danish State introduced means-tested student benefits in 1970 to support young people during education, providing some level of financial security for individuals combining studies and early childbearing.



### 4.8.3 Earnings

Regarding labor market earnings, we aim to test if desiring a large family is associated with lower cumulative earnings over career. We rely on annual earnings from 1980 to 2019, when individuals are approximately 26 to 65 years old. Our main outcome is average annual wage earnings from paid employment. However, to test if adjustments at birth, e.g. selection out of paid employment and into self-employment, generate additional income, we also consider other earnings and total labor market earnings, calculated as the sum of wages and other earnings.

To construct cumulative and average earnings over working career, we first correct annual earnings for price developments over time to achieve a panel dataset of annual earnings in fixed 2020-prices. The procedure is described in Section A.5 in the Appendix. Next, we cumulate annual earnings over career years, in which pensions are not the main source of income. Finally, we divide by number of career years to find average annual earnings. To deliver evidence on dynamics across childbearing, we also calculate average annual earnings in pre- and post-birth years.

Table 7: Descriptives on income

<i>Variable</i>	Sample 1		Early mothers		Others		Diff.	P-value
	Mean	Std	Mean	Std	Mean	Std		
<b>Registers, 1980-2019</b>								
<i>Cumulative, mill. DKK</i>								
Gross Income	12.07	4.82	10.75	3.98	12.61	5.02	1.86***	(0.00)
Earnings excl. wages	0.46	2.55	0.26	1.20	0.54	2.92	0.27*	(0.02)
Wages	9.40	4.94	8.02	4.66	9.96	4.94	1.93***	(0.00)
Transfers, incl. pensions	2.60	2.36	3.10	2.46	2.39	2.28	-0.71***	(0.00)
Capital income	0.20	0.53	0.11	0.36	0.24	0.58	0.13***	(0.00)
<i>Average, mill. DKK</i>								
Annual wage	0.24	0.12	0.20	0.12	0.25	0.12	0.05***	(0.00)
Observations	1225		359		869		1228	

*Note:* \*\*\*/\*\*/\* indicate statistical difference at the 1%/5%/10%-level. P-values in parentheses.

From Table 7, we see that individuals had a cumulative gross income of 12.7 mill. DKK measured in 2020-price levels over career, consisting of other labor market earnings of 1/2 mill. DKK, wage earnings of 9.5 mill. DKK, transfers and pensions of 2.6 mill. DKK, and capital income of .2 mill. DKK. Overall, wage earnings account for almost 3/4 of individual gross income. Annual wage income in non-pension years is approximately 240.000DKK. Comparing early mothers and other respondents, from Table 7, we see that wage income of early mothers amounts to 80% of the wage income of other respondents.

#### 4.8.4 Labor Market Outcomes

Concerning labor market performance across career, we aim to test how labor market behavior responds to family desires pre- and post-birth, focusing particularly on extensive and intensive margin labor supply and occupational characteristics.

For early career, we rely on a cumulative measure of labor market experience from 1964 to 1979 (up to age 25) measured in full time years. For full career labor supply, we construct annual employment degrees from obligatory contributions to the public pension fund (ATP) for the period 1976 to 2007,<sup>16</sup> and from registered annual working hours in paid employment for the period from 2008 to 2017<sup>17</sup>. Annual employment degrees, which can be translated into annual working hours, allow us to construct measures of share of career in full-time (> 30 hours per week) and part-time employment (10 – 30 hours per week) over career.

Apart from labor supply, we measure paid participation over career as a positive labor supply (and positive earnings) in paid employment. We supplement with a measure of total participation, which includes paid employment, self-employment, and employment as assisting spouse. Relying on occupational categories, we construct indicators for ever self-employed and ever assisting spouse. For labor market entry, we rely on self-reported age at employment entry, defined as age at first job lasting more than 6 months, from DLSY wave 2001. Descriptives on labor market outcomes are reported in Table 8.<sup>18</sup>

On average individuals collected 1.5 full-time years of experience prior to 1979 (age 25), and were employed for close to 36 years during the period from 1976 to 2019, of which 34 years in paid employment. By 2019 around age 65, 99% of individuals had started to receive pension benefits.<sup>19</sup> In the period from 1976 to 2017, individuals worked 26 hours per week on average equivalent to an employment degree of 70%. On average, individuals spent 1/5 of their career in no employment (0-9 hours/week), close to 1/3 in part-time (10-

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<sup>16</sup>Annual contributions reflect how many hours the individual was working in paid employment over the year. Annual employment degrees are constructed by dividing observed annual ATP contributions by maximum yearly contribution of 1166DKK, which is equivalent to full time work over the year.

<sup>17</sup>Annual working hours are translated into annual employment degrees by dividing observed hours by full time employment (52 weeks x 37 hours = 1924 hours).

<sup>18</sup>The original data also cover sector of employment, number of jobs over career, duration of jobs, years in management positions, and weeks of unemployment. However, none of these factors are found to differ between individuals desiring a large and a small family.

<sup>19</sup>The official retirement age for individuals in our sample ranges from 65 to 67 years. However, already around age 61, almost half had started to receive some pension benefits. 75% had retired by age 64 and 99% by age 65.

Table 8: Descriptives on labor market outcomes

<i>Variable</i>	Sample 1		Early mothers		Others		Diff.	P-value
	Mean	Std	Mean	Std	Mean	Std		
<b>Participation, 1976-2019</b>								
Retired, 2019	1.00	0.00	0.99	0.09	0.98	0.13	-0.01	(0.18)
Years, paid empl.	34.01	10.49	31.70	11.40	34.97	9.93	3.27***	(0.00)
Years, any particip.	35.74	9.34	33.38	10.54	36.72	8.60	3.34***	(0.00)
Early labor supply*	1.51	0.81	1.27	0.77	1.60	0.81	0.33**	(0.00)
<b>1976-2017</b> Cum. empl. degr.	28.35	11.04	25.31	11.74	29.00	11.18	3.70***	(0.00)
Avg. hours/week	26.13	9.05	23.32	9.99	26.73	9.13	3.41***	(0.00)
Share w/ full time	0.51	0.28	0.42	0.28	0.54	0.28	0.13***	(0.00)
Share w/ part time	0.28	0.19	0.30	0.19	0.27	0.19	-0.03**	(0.01)
Share w/ no empl.	0.20	0.22	0.27	0.25	0.17	0.20	-0.09***	(0.00)
Ever self employed	0.16	0.37	0.16	0.37	0.16	0.37	-0.00	(0.92)
Ever assisting spouse	0.05	0.21	0.05	0.22	0.05	0.21	-0.00	(0.74)
<b>DLSY, 1976</b>								
Prefers housewife	0.18	0.39	0.36	0.48	0.11	0.31	-0.25***	0.00
<b>DLSY, 2001</b>								
Entry year (job>6m)	1973.39	4.26	1972.51	4.43	1973.74	4.13	1.23***	(0.00)
Entry after B1	0.19	0.39	0.31	0.47	0.14	0.34	-0.18***	(0.00)
Observations	1225		362		884		1246	

*Note:* \*\*\*/\*\*/\* indicate statistical difference at the 1%/5%/10%-level. P-values in parentheses.\*Early labor supply in full time years (1964-1979).

30 hours/week) and about half in full time (>30 hours/week). Though paid employment is the dominating occupational category, 16% were self-employed and 5% employed as an assisting spouse at some point of their career. Comparing subgroups, early mothers participated close to 3 years less in the labor market than other respondents and had a lower weekly labor supply during periods of employment. From the DLSY wave in 2001, we see that on average individuals recall having entered the labor market around age 19. Early mothers recall having entered the labor market more than 1 year earlier than other respondents, i.e. around age 18 on average. Regarding sequencing of labor market entry and family formation, 1/3 of early mothers entered the labor market after their first birth, while this is true for 1/6 of other respondents.

## 5 Results

In the following section, we present the results of our empirical analysis in several steps. First, we present evidence on the association between desired family size and realized family formation to validate our measure of desired family size. Particularly, we test if the likelihood of parenthood, number of children and age at first birth respond to desired family size as predicted. Then, we present our main results on the association between

wage income over career and desired family formation. Specifically, we test whether desiring a large family is, on average, negatively associated with annual wage income over career. To shed light on behavioral adjustments in relation to childbearing, we supplement with results on wage income divided by pre- and post-birth career spans for individuals realizing motherhood. Next, we investigate which mechanisms drive the association between wage income and desired family size in early and late career, focusing on labor force participation, intensive margin labor supply and choice of occupation. Finally, we test whether career costs of desiring a large family vary between subgroups of individuals based on their human capital endowment and realized family size. We end by presenting our results on fertility risks in response to desires and career choice.

Before presenting our results, we present our estimation strategy.

## 5.1 Estimation Strategy

To test our empirical hypotheses, we rely on reduced-form estimations of the relationship between outcomes and desired family size according to the following empirical model:

$$y_i = \beta_0 + \beta_1 NoDes_i + \beta_2 Large_i + \beta_3 NoDes \times Mom_i + \beta_4 Des \times Mom_i \\ + \beta_5 HCE_i + \beta_6 Rela76 + \beta_7 X_i + \varepsilon_i$$

where  $NoDes_i$  is an indicator for no family desired,  $Large_i$  is an indicator for large family desired,  $NoDes \times Mom_i$  an indicator for early mother interacted with no (additional) desire and  $Des \times Mom_i$  is an indicator for early mother interacted with (additional) desire. Note that the reference category is "Other respondent, Small family desired". Note that we do not report coefficients on the interaction terms. For estimations on the reduced sample, the interaction terms drop out.  $HCE_i$  is a vector of human capital endowment factors, including standardized ability scores for verbal, spatial and cognitive ability, time preferences and expected secondary education, cf. Table 4,  $Rela76$  is a vector of relationship indicators at elicitation of desires, cf. Table A.2 in Appendix A.3, and  $X_i$  is a vector of socio-demographics in adolescence, cf. Tables 2 and 3. We include birth year fixed effects to accommodate for age in 1968 varying from 13 to 15 years, and school fixed effects (152 schools) to accommodate peer effects and geographical differences. Finally,  $y_i$  denotes the outcome variable of interest, e.g., average annual wage income.

Our empirical model estimates the correlation between outcomes and desired family size controlling for a broad set of covariates and fixed effects. It is flexible enough to accommodate non-monotonous effects of desired family size on outcomes. However, coefficients on desired family size cannot be interpreted as causal due to the risk of confounding factors, i.e. unobservables in the error term  $\varepsilon_i$  correlating systematically with family desires. In all empirical estimations, we rely on robust standard errors for inference. It should be noted that for binary indicator outcome variables, e.g., ever self-employed, the regression model is the linear probability model.

In addition, we gradually extend the simple model with level of education, field of study, realized family formation and labor supply. This allows us to assess which mechanisms matter most for the association between desires and wage income over career. Hence, we estimate the following model:

$$y_i = \beta_0 + \beta_1 NoDes_i + \beta_2 Large_i + \beta_3 NoDes \times Mom_i + \beta_4 Des \times Mom_i \\ + \beta_5 HCE_i + \beta_6 Rela76 + \beta_7 X_i + \beta_8 educ_i + \beta_9 fam_i + \beta_{10} lab_i + \varepsilon_i$$

where  $educ_i$  is a vector of indicator variables of education level and fields of study.  $fam_i$  is a vector of family formation factors, while  $lab_i$  is a vector of variables relates to labor supply.

## 5.2 Family formation

To validate our key measure of desired family size, we investigate the association between desired family size and realized family formation. Specifically, we test the hypothesis that desiring a large family is associated with earlier and increased childbearing, where childbearing includes parenthood and number of children. Results for the full and reduced samples are presented in Table 9. From columns (1) and (2), we see that desiring a large family is indeed associated with a substantial increase in number of children of approximately 0.4 children ( $p < 0.01$ ), while having no desire for a family is associated with a decrease in number of children of 0.3 children ( $p < 0.05$ ) relative to the reference group of individuals desiring a small family. Taken together, fertility desires, human capital endowment, socio-demographics and early relationships explain approximately 1/3 of the variation in number of children, while 2/3 remain unexplained. Considering

the reduced sample of individuals with no children at elicitation of desires, we see from column (3) that desiring a large family is associated with an increased likelihood of parenthood of 7 percentage points ( $p < 0.05$ ), while having no desire is associated with a decrease in the likelihood of 17 percentage points ( $p < 0.01$ ).

Table 9: Realized fertility

Variable	No. of children				Parent		Age at first birth			
	(1)		(2)		(3)		(4)		(5)	
	Sample 1		Sample 2		Sample 2		Sample 1		Sample 2	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
<b>Desired family size</b>										
No family	-0.26**	(0.125)	-0.31**	(0.131)	-0.17***	(0.047)	1.03*	(0.542)	0.75	(0.664)
Large family	0.43***	(0.070)	0.38***	(0.084)	0.07**	(0.030)	-0.35	(0.260)	-0.33	(0.371)
Don't know	-0.42*	(0.232)	-0.41*	(0.239)	-0.13	(0.086)	-0.49	(1.004)	-0.57	(1.221)
Constant	1.00**	(0.447)	0.51	(0.533)	0.33*	(0.192)	25.98***	(1.863)	25.92***	(2.795)
HCE	Yes		Yes		Yes		Yes		Yes	
Relation 1976	Yes		Yes		Yes		Yes		Yes	
Background	Yes		Yes		Yes		Yes		Yes	
Education	No		No		No		No		No	
Fixed effects	Yes		Yes		Yes		Yes		Yes	
Observations	1225		867		867		1084		726	
$R^2$	0.31		0.29		0.28		0.62		0.40	

*Note:* Robust standard errors in parentheses \*\*\*/\*\*/\* indicate statistical significance at the 1%/5%/10%-level. *HCE* consists of inductive, spatial and verbal ability scores, expected secondary education and time preferences. *Background* consists of father's education, mother's education, parity, siblings, dummy for working mother, dummy for grew up with both parents, father's occupation and annual taxable income of family breadwinner in year 1967 in 1000DKK. Fixed effects consist of birth year and school fixed effects. *Education* contains categories of level and field of study.

Considering next timing of family formation, i.e. age at first birth, the sample is reduced to individuals, who experience motherhood over fertile age. Results in columns (4) and (5) of Table 9 indicate that desiring a large family is associated with anticipation of childbearing by 1/3 of a year relative to desiring a small family, but the coefficient is not statistically significant. Having no desire for a family is associated with a statistically significant delay of childbearing of close to one year ( $p < 0.1$ ) relative to desiring a small family. For timing of birth, the covariates explain close to 62% of the variation.

Our findings on family formation are robust to the inclusion of educational and marital outcomes, cf. Table A.5 in Appendix A.6. For both samples, marriage increases number of children by .9 children ( $p < 0.01$ ), while divorce reduces fertility by -.2 to -.3 children ( $p < 0.01$ ). Also, divorce is associated with delayed fertility, as it increases age at first birth by more than one year ( $p < 0.01$ ) for individuals in the reduced sample. Finally, the coefficient on likelihood of parenthood among individuals desiring a large family is

reduced to 4 percentage points and becomes statistically insignificant, when education and marital factors are accounted for. This indicates that family desires and the establishment of stable relationships are complements in realizing parenthood.

Overall, results in this section confirm that our key measure of desired family size is directly associated with realized childbearing, including likelihood of parenthood and number of children. Our hypothesis of a positive association between number of children and desiring a large family is confirmed, while only having no desire is associated with significant changes in timing of birth, as individuals with no desire tend to delay first birth.

### 5.3 Earnings over career

Having established the validity of our key measure, we present our main results on earnings over career in response to desired family size. Specifically, we test the hypothesis that desiring a large family is associated with lower wage income over career relative to desiring a small family due to post-birth career adjustments.

**Annual wage income.** First, we present our results on annual wage income over career in Table 10. From results in column (1), we see that, on average, desiring a large family is associated with annual wage losses of 14,000DKK ( $p < 0.1$ ) equivalent to 6% of sample mean relative to desiring a small family, when controlling for socio-demographics, human capital endowment, relationship status at elicitation and fixed effects. Next, from results in column (2), we see that factoring out level and field of education increases the association between fertility desires and wage income, both in size and statistical significance. The associated wage loss increases to 17,000DKK ( $p < 0.05$ ) equivalent to 7% of sample mean. This may reflect that individuals desiring a large family complete more education or that their initial human capital endowment is higher on average, resulting in increased returns to education. To test if career costs are generated by the direct transmission of desires to realized family formation, we control for marriage and number of children. From results in column (3), we see that the coefficient on desiring a large family is robust to the inclusion of realized family formation. This is an important result as it indicates that career costs are not a reflection of number of children, i.e. realized family formation

is not the primary cause of career costs in response to family desires.<sup>20</sup> Each realized childbirth is associated with an annual wage loss of 6,000DKK, but the coefficient is not statistically significant.

Table 10: Annual wages in mill. DKK (1980-2019), sample 1

<i>Variable</i>	(1)		(2)		(3)		(4)	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
<b>Desired family type</b>								
No family	-0.009	(0.015)	-0.013	(0.015)	-0.015	(0.014)	-0.001	(0.017)
Large family	-0.014*	(0.008)	-0.017**	(0.008)	-0.015*	(0.008)	-0.018**	(0.008)
Don't know	-0.031	(0.028)	-0.037	(0.024)	-0.035	(0.024)	-0.035	(0.023)
<b>Family formation</b>								
Ever married					0.017	(0.014)	0.015	(0.014)
No. of children					-0.006	(0.003)		
Excess children							-0.012**	(0.005)
Constant	0.146***	(0.043)	0.109	(0.099)	0.105	(0.096)	0.103	(0.096)
HCE	Yes		Yes		Yes		Yes	
Relationship, 1976	Yes		Yes		Yes		Yes	
Background	Yes		Yes		Yes		Yes	
Fixed effects	Yes		Yes		Yes		Yes	
Education	No		Yes		Yes		Yes	
Observations	1225		1225		1225		1225	
$R^2$	0.27		0.34		0.34		0.35	

*Note:* Robust standard errors. \*\*\*/\*\*/\* indicate statistical significance at the 1%/5%/10%-level. *HCE* consists of inductive, spatial and verbal ability scores, expected secondary education and time preferences. *Background* consists of father's education, mother's education, parity, siblings, dummy for working mother, dummy for grew up with both parents, father's occupation and annual taxable income of family breadwinner in year 1967 in 1000 DKK. Fixed effects consist of birth year and school fixed effects. *Education* contains categories of level and field of study.

Finally, we test if children in excess of desires, i.e. unplanned children, generate career costs in addition to planned fertility. From results in column (4), we see that when controlling for excess fertility, rather than total number of children, our coefficient on desiring a large family increases to 18,000DKK ( $p < 0.05$ ), while excess children are associated with additional career costs. Each unplanned birth is associated with an annual wage loss of approximately 12,000DKK equivalent to 5% ( $p < 0.05$ ) of sample mean. This is likely to reflect selection, as unplanned births are found to occur at a higher frequency among individuals with lower career aspirations, (Shreffler and Johnson, 2013). This last specification (column 4) is our preferred specification, as it separates the impact of anticipated fertility and unplanned births. When considering individuals with no desire for a family, we see that the associations between no desire and annual wage income are insignificant and disappear once excess fertility is controlled for, cf. columns (1) to (4).

<sup>20</sup>Note that the coefficient on desiring a large family is also robust to the inclusion of an indicator variable for parenthood.



**Cumulative wage income.** Over career, annual wage losses associated with desiring a large family result in substantial cumulative wage losses. Results in Table A.7 in Appendix A.6 show that across specifications desiring a large family is associated with cumulative wage losses of 650,000-720,000DKK over career relative to desiring a small family. This is equivalent to 6-8% of sample mean. In addition, each realized childbirth is associated with cumulative wage costs over career of 60,000DKK, though the coefficient is statistically insignificant. Finally, when considering our preferred specification, the wage penalty associated with excess births is estimated to 400,000DKK per child over career. Findings on cumulative wage costs over career are robust across samples, cf. Table A.8 in Appendix A.6. When excluding early mothers, wage losses associated with desiring a large family are estimated to 760,000DKK ( $p < 0.1$ ) equivalent to 8% of sample mean. Instead, the penalty on excess children is only half-sized and statistically insignificant among individuals in the reduced sample. This implies that unplanned births are associated with higher career costs among early mothers.

Our estimated career costs on desiring a large family (6-8% of sample mean) and on excess children (5% of sample mean) for the 40-year horizon are lower than long term child penalties of 10% per child found in Kleven et al. (2019) for the 20-year horizon. However, we measure the marginal cost from desiring a large family and from unplanned births relative to desiring a small family of two children or less, which is likely to be lower than the full cost of a childbirth.

To initiate our investigation on key mechanisms driving wage losses associated with desiring a large family, in Table A.11 in Appendix A.6, we report results from regressing cumulative wage income on desired family size, controlling for early career labor supply (1964-1979) and labor supply over career (1976-2017). We see that wage losses associated with desired family size, practically, disappear once cumulative labor supply in paid employment is controlled for. This indicates that employment behavior over career is the overarching driver of wage losses in response to desired family size.

**Wage dynamics.** Next, we turn our attention to wage dynamics across childbearing. Particularly, we test if wage income in anticipation of and after birth respond to desired family size. We focus on individuals, who end up realizing parenthood, as we define pre- and post-periods in relation to first birth. Results on wage income in the pre-birth period

for the reduced sample are presented in Table A.12 in Appendix A.6. We find no evidence of a significant link between average annual earnings and desired family size prior to birth. Coefficients are close to zero and statistically insignificant. One caveat is that our income data only starts, when individuals are around 26 years old. This implies that close to half of individuals in the reduced sample have already had their first child prior to our first observation of annual wage income. In essence, we only observe pre-birth wage income for 1/3 of individuals in our sample.

Table 11: Post birth income (1980-2019), sample 1

Variable	(1)		(2)		(3)		(4)		(5)	
	Avg. wages Non-pension years		Avg. wages Participation years		Total wages All years		Earnings All years		Total earnings** All years	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
<b>Desired family type</b>										
No family	0.01	(0.022)	-0.00	(0.017)	0.23	(0.826)	-0.24	(0.234)	1.39	(0.884)
Large family	-0.02**	(0.009)	-0.01**	(0.007)	-0.77**	(0.340)	0.29*	(0.151)	-0.66*	(0.396)
Don't know	0.01	(0.027)	-0.01	(0.021)	0.75	(0.950)	-0.76**	(0.370)	-0.29	(0.911)
<b>Family formation</b>										
Ever married	-0.02	(0.019)	-0.00	(0.015)	-0.15	(0.636)	0.25	(0.256)	-0.01	(0.669)
Excess children	-0.01	(0.007)	-0.01	(0.005)	-0.42*	(0.248)	0.17	(0.114)	-0.55**	(0.276)
Constant	0.10	(0.064)	0.14**	(0.054)	3.14	(2.603)	1.45	(1.066)	2.83	(3.456)
HCE	Yes		Yes		Yes		Yes		Yes	
Relationship, 1976	Yes		Yes		Yes		Yes		Yes	
Background	Yes		Yes		Yes		Yes		Yes	
Fixed effects	Yes		Yes		Yes		Yes		Yes	
Education	Yes		Yes		Yes		Yes		Yes	
<i>N</i>	1084		1076		1084		1084		868	
<i>R</i> <sup>2</sup>	0.39		0.43		0.35		0.39		0.42	

Note: Robust standard errors. \*\*\*/\*\*/\* indicate statistical significance at the 1%/5%/10%-level. *HCE* consists of inductive, spatial and verbal ability scores, expected secondary education and time preferences. *Background* consists of father's education, mother's education, parity, siblings, dummy for working mother, dummy for grew up with both parents, father's occupation and annual taxable income of family breadwinner in year 1967 in 1000 DKK. Fixed effects consist of birth year and school fixed effects. *Education* contains categories of level and field of study. \*\*Total earnings consist of wages and other labor market earnings. Note that for results in column (5) individuals, who were ever self-employed are excluded.

Considering next post-birth wage income, in Table 11 we present results on annual wages, cumulative wage income, other earnings and total earnings in after-birth years for the full sample. Considering first average annual wage income <sup>21</sup>, from results in column (1), we see that, on average, desiring a large family is associated with annual wage losses of 20.000DKK ( $p \leq 0.05$ ) relative to desiring a small family. From results in column (2), we see that in years with paid employment participation, annual wage losses are reduced to 10.000DKK ( $p \leq 0.05$ ) on average. The annual wage losses are equivalent to 8% and 4% of sample mean, respectively. This indicates that both participation and labor supply in paid

<sup>21</sup>excluding years where pensions are the main source of income

employment drop in after birth years in response to desiring a large family. As seen from results in column (3), post-birth wage losses result in significant cumulative wage losses of 770.000DKK ( $p \leq 0.05$ ) over career. Finally, results in column (4) show that desiring a large family is associated with an increase in other earnings of 290.000DKK ( $p \leq 0.1$ ) over career. This provides evidence that wage losses are mitigated by other sources of income. For individuals in the reduced sample, the association between other earnings and desiring a large family is even greater and of higher statistical significance (+560.000 DKK,  $p \leq 0.01$ ), cf. Table A.13 in Appendix A.6, indicating greater engagement in self-employment. Excluding individuals, who engage in self-employment during their career, from results in column (5) of Table 11, we see that total labor market earnings losses associated with desiring a large family amount to 660.000DKK ( $p \leq 0.01$ ), increasing to 830.000DKK ( $p \leq 0.01$ ) for individuals in the reduced sample. Meanwhile, individuals engaging in self-employment are found to experience much smaller overall earnings losses. Overall, we find that post-birth wage income responds strongly to family desires. This supports our child-investment theory.

**Wage growth.** We found no evidence of anticipatory effects for average annual wage income. However, insignificant results could disguise the fact that a subset of individuals reduce their participation in anticipation of birth to dedicate themselves to "nest building" in anticipation of family formation, while others engage in early career to boost their human capital and savings in anticipation of family formation. Table 12 presents cross-sectional evidence on average annual wage growth across childbearing among individuals in the reduced sample, conditioning on participation in the labor market.

From results in column (1), we see that desiring a large family is overall associated with reduced wage growth over career (-2 ppts.,  $p < 0.05$ ), but separating observations into pre- and post-birth periods, we find that desiring a large family is associated with substantially higher wage growth prior to birth (9 ppts.,  $p < 0.01$ ), and substantially lower wage growth after having children (-13 ppts.,  $p < 0.01$ ). Hence, a subset of the sample appears to be making large career investments in anticipation of birth in accordance with buffer-savings behavior. We note that parenthood alone is found to reduce annual wage growth by 6 percentage points ( $p < 0.05$ ).

Table 12: Annual wage growth, sample 2

<i>Variable</i>	(1)		(2)	
	Coef.	SE	Coef.	SE
<b>Desired family type</b>				
No family	0.03*	(0.016)	0.02	(0.028)
Large family	-0.02**	(0.011)	0.09***	(0.027)
Don't know	-0.11***	(0.036)	-0.4***	(0.097)
<b>Family formation</b>				
Parent			-0.06**	(0.016)
No desire, parent			-0.01	(0.033)
Large family, parent			-0.13***	(0.028)
Don't know, parent			0.40***	(0.100)
Constant	12.03***	(0.090)	12.05***	(0.090)
HCE	Yes		Yes	
Relationship, 1976	Yes		Yes	
Background	Yes		Yes	
Fixed effects	Yes		Yes	
Education	Yes		Yes	
Experience	Yes		Yes	
Observations	22818		22818	
$R^2$	0.27		0.27	

*Note:* Robust standard errors in parentheses \*\*\*/\*\*/\* indicate statistical significance at the 1%/5%/10%-level. *Earnings potential* consists of inductive, spatial and verbal ability score, expected secondary education and time preferences. *Background* consists of father's education, mother's education, parity, siblings, dummy for working mother, dummy for grew up with both parents, father's occupation and annual taxable income of family breadwinner in year 1967 in 1000 DKK. Fixed effects consist of birth year, year and school fixed effects. *Education* contains level and field of study. Experience is cumulative employment degree and cumulative employment degree squared.

Summing up, overall we find suggestive evidence that a subset of individuals act in accordance with the buffer-saving theory with heterogeneous fertility preferences, though overall we detect no significant association between pre-birth earnings and desiring a large family. However, cumulative earnings over career and post-birth earnings are negatively associated with desiring a large family, and this cannot be explained by realized family formation. Other earnings mitigate post-birth wage losses among individuals, who engage in self-employment after birth.

## 5.4 Education and early career behavior

In the following, we test if human capital investments, i.e. educational attainment and early career engagement, respond systematically to anticipated fertility in accordance with either the buffer-savings theory of increasing incentives in response to family desires, or the occupation-choice theory of decreasing incentives in response to family desires. First,

we test whether desiring a large family is associated with increased educational investments, and second, whether selection into non-abstract and out of abstract occupations is associated with desired family size as hypothesized. Finally, we consider, whether early career behavior and preferences respond to anticipated family formation.

**Educational attainment.** Empirical results on the association between educational attainment and desired family size among individuals in the full sample are shown in Table 13.

Table 13: Educational attainment, sample 1

<i>Variable</i>	Upper Secondary				University degree			
	(1)		(2)		(3)		(4)	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
<b>Desired family type</b>								
No family	0.09	(0.055)	-0.01	(0.055)	0.11	(0.058)	0.01	(0.058)
Large family	0.03	(0.027)	0.00	(0.026)	0.07**	(0.031)	0.04	(0.030)
Don't know	0.54***	(0.088)	0.42**	(0.091)	0.37***	(0.095)	0.21**	(0.100)
Constant	0.27***	(0.018)	0.12**	(0.189)	0.40***	(0.021)	0.41**	(0.187)
HCE*	No		Yes		No		Yes	
Relation, 1976	No		Yes		No		Yes	
Background	No		Yes		No		Yes	
Fixed effects	No		Yes		No		Yes	
Observations	1223		1223		1225		1225	
$R^2$	0.08		0.45		0.08		0.41	

*Note:* Robust standard errors in parentheses \*\*\*/\*\*/\* indicate statistical significance at the 1%/5%/10%-level. *HCE* consists of inductive, spatial and verbal ability score, expected secondary education and time preferences. *Background* consists of father's education, mother's education, parity, siblings, dummy for working mother, dummy for grew up with both parents, father's occupation and annual taxable income of family breadwinner in year 1967 in 1000 DKK. Fixed effects consist of birth year and school fixed effects.

In columns (1) and (3), we show the unconditional associations between desiring a large family and educational attainment as proxied by completion of Upper Secondary Education (USE) and completing a University degree. We find that desiring a large family is associated with an increased likelihood of completing USE of 3 percentage points, though the coefficient is statistically insignificant, and with an increased likelihood of completing a University degree of 7 percentage points ( $p < 0.05$ ) relative to desiring a small family. Similarly, having no desire for a family is associated with higher educational attainment of respectively 9 and 11 percentage points relative to desiring a small family. As seen from results in columns (1) and (3) of Table A.14 in Appendix A.6 the coefficients on desiring a large (and having no desire) are even larger and of higher statistical signifi-

cance for individuals in the reduced sample. The results confirm findings in Heiland et al. (2005) and Testa (2014) that higher educational attainment is associated with having no desire for children and with desiring a large family. At first glance, this confirms that incentives to invest in education increase with desiring a large family (and with having no desire).

Next, when conditioning on human capital endowment and socio-demographics in adolescence, the results in columns (2) and (4) show only a weak association between family desires and educational attainment. For completion of USE, the positive association disappears altogether, while it is reduced from 7 to 4 percentage points for completion of a University degree, and the coefficient is no longer statistically significant. The results for individuals with no desire are similar, and results are robust across samples as seen from Table A.14 in Appendix A.6. Hence, we find only weak support for the hypothesis that human capital investments prior to birth vary with desired family size. Rather, individuals in our sample complete education in response to their educational aspirations, cognitive ability, time preferences, and socio-demographic background, and perhaps in accordance with some common unobservables among individuals with high and no desire, indicating that educational patterns are similar among individuals with norm-deviating desires.

**Choice of occupation.** Considering, next, the association between family desires and initial occupational choices of individuals in the full sample, from results in columns (1) and (2) in Table 14, we see that desiring a large family is associated with an increased probability of 5 percentage points ( $p < 0.05$ ) of selecting out of abstract fields and into non-abstract fields. In isolation, this indicates that desiring a large family increases the probability of selecting into childrearing compatible non-abstract fields as proposed by the occupation choice theory in Adda et al. (2017).

However, the results have two caveats. First, having no desire for children is even more strongly associated with selecting out of abstract fields and into non-abstract fields than desiring a large family, which implies that choice of occupation may be driven by common unobservables among individuals desiring a large and no family, rather than by anticipated fertility. Second, the results are not robust across samples, as seen from results in columns (3) and (4).

Table 14: Occupation choice

<i>Variable</i>	Sample 1				Sample 2			
	Abstract		Non-abstract		Abstract		Non-abstract	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
<b>Desired family type</b>								
No family	-0.08**	(0.039)	0.08*	(0.042)	-0.04	(0.039)	0.04	(0.044)
Large family	-0.05**	(0.022)	0.05**	(0.024)	-0.01	(0.025)	0.01	(0.028)
Don't know	-0.00	(0.072)	-0.06	(0.078)	0.01	(0.071)	-0.07	(0.081)
Constant	0.08	(0.269)	-0.18	(0.292)	-0.06	(0.164)	0.44**	(0.185)
HCE*	Yes		Yes		Yes		Yes	
Relation, 1976	Yes		Yes		Yes		Yes	
Background	Yes		Yes		Yes		Yes	
Fixed effects	Yes		Yes		Yes		Yes	
Education	Yes		Yes		Yes		Yes	
Observations	1225		1225		867		867	
$R^2$	0.57		0.61		0.64		0.66	

*Note:* Robust standard errors in parentheses \*\*\*/\*\*/\* indicate statistical significance at the 1%/5%/10%-level. *HCE* consists of inductive, spatial and verbal ability score, expected secondary education and time preferences. *Background* consists of father's education, mother's education, parity, siblings, dummy for working mother, dummy for grew up with both parents, father's occupation and annual taxable income of family breadwinner in year 1967 in 1000 DKK. Fixed effects consist of birth year and school fixed effects.

One explanation could be that the full sample association is primarily due to occupational choices of early mothers made in response to realized fertility rather than in anticipation of fertility. Another explanation is that the occupation-choice theory holds only for women pursuing vocational education, as empirical results in Adda et al. (2017) are based on observational data on choice of vocational track. Yet, none of these explanations can account for the sizable association between having no desire and selecting into non-abstract fields.

**Early career.** For early career behavior, we test if desiring a large family increases early career engagement as proxied by employment experience in paid employment up to age 25, age at job market entry, sequencing of labor market entry and family formation, and preferences for home production at age 22. Results are presented in Table 15.

From results in column (1), we see that individuals desiring a large family spend slightly less time in market production in their early career relative to individuals desiring a small family. Specifically, desiring a large family is associated with a reduction in cumulative labor market experience of 0.15 full-time years ( $p \leq 0.01$ ), equivalent to 2 months. However, we find only weak evidence of delayed employment entry and reverse sequencing of birth and job entry relative to individuals desiring a small family,

Table 15: Early career, sample 1

<i>Variable</i>	(1) Early Experience		(2) Age at 1st job >6m		(3) B1 before job entry		(4) Prefers housewife	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
<b>Desired family type</b>								
No family	-0.12	(0.083)	-1.25**	(0.527)	-0.04	(0.043)	-0.05	(0.032)
Large family	-0.15***	(0.049)	-0.08	(0.302)	0.04	(0.027)	0.07***	(0.027)
Don't know	-0.17	(0.208)	1.48	(1.177)	-0.09	(0.074)	0.02	(0.067)
Constant	0.86	(0.597)	16.52***	(1.434)	0.7***	(0.253)	-0.07	(0.230)
HCE	Yes		Yes		Yes		Yes	
Relation, 1976	Yes		Yes		Yes		Yes	
Background	Yes		Yes		Yes		Yes	
Fixed effects	Yes		Yes		Yes		Yes	
Education	Yes		Yes		Yes		Yes	
Observations	1224		1033		1225		1225	
R2	0.43		0.29		0.22		0.31	

*Note:* Robust standard errors in parentheses \*\*\*/\*\*/\* indicate statistical significance at the 1%/5%/10%-level. *Earnings potential* consists of inductive, spatial and verbal ability scores, expected secondary education and time preferences. *Background* consists of father's education, mother's education, parity, siblings, dummy for working mother, dummy for grew up with both parents, father's occupation and annual taxable income of family breadwinner in year 1967 in 1000 DKK. Fixed effects consist of birth year and school fixed effects. *Education* contains level and field of study.

cf. results in columns (2) and (3). Finally, from column (4), we see that desiring a large family is positively associated with preferences for staying at home as a housewife in early career. The estimated increase in preferences for staying at home is 7 percentage points ( $p < 0.01$ ).<sup>22</sup> The statistically significant coefficient on taste for home production is robust across samples, as seen from Table A.15 in Appendix A.6.

Overall, human capital investments in education and choice of occupation do not appear to be guided by anticipated fertility. Particularly, educational investments of individuals with no desire and with desire for a large family follow similar patterns. Our results indicate that individuals with high human capital endowments are more likely to develop fertility desires that deviate from social norms, while in parallel making greater human capital investments. Hence, our results confirm that the main drivers of educational attainment are socio-demographics, time preferences, cognitive ability and aspirations in adolescence, which is line with prior findings focusing mainly on samples of young men, (see e.g. Golsteyn et al., 2014; Epper et al., 2020; Heckman et al., 2006; Abbott et al., 2013). However, we do find suggestive evidence that desiring a large family is associated

<sup>22</sup>DLSY respondents were asked at age 22, if they would like to spend the next 3-4 years at home as a housewife.



with greater aspirations for home production in early career, while having no desire is associated with anticipated labor market entry.

## 5.5 Labor market performance over full career

Next, we investigate labor market behavior across full career. We focus on labor force participation, intensive margin labor supply (1976-2017) and occupational changes over full career, and in anticipation of and in response to birth. Particularly, we test the hypothesis that desiring a large family increases labor market adjustments after childbirth.

**Participation.** Our results on labor force participation for the full sample are presented in Table 16. We distinguish between overall participation in either paid employment, self-employment or employment as assisting spouse, and participation in paid employment in isolation.

Table 16: Labor participation, sample 1

<i>Variable</i>	(1) Participation		(2) Paid employment		(3) Self-empl.		(4) Ass. spouse	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
<b>Desired family type</b>								
No family	0.31	(1.277)	0.70	(1.397)	-0.64	(0.795)	-0.30	(0.254)
Large family	-1.29**	(0.660)	-2.27***	(0.761)	0.59*	(0.314)	0.23	(0.230)
Don't know	-0.30	(1.667)	-0.74	(1.872)	0.86	(1.366)	-0.11	(0.250)
<b>Family formation</b>								
Excess kids	-0.25	(0.484)	-0.76	(0.553)	0.73**	(0.355)	0.06	(0.156)
Ever married	3.07***	(1.102)	3.50***	(1.222)	-0.42	(0.678)	0.42**	(0.196)
Constant	9.91	(7.058)	7.88	(6.934)	2.83	(2.961)	-0.89	(0.737)
HCE*	Yes		Yes		Yes		Yes	
Relationship, 1976	Yes		Yes		Yes		Yes	
Background	Yes		Yes		Yes		Yes	
Fixed effects	Yes		Yes		Yes		Yes	
Education	Yes		Yes		Yes		Yes	
Observations	1225		1225		1225		1225	
$R^2$	0.25		0.26		0.28		0.22	

*Note:* Robust standard errors in parentheses \*\*\*/\*\*/\* indicate statistical significance at the 1%/5%/10%-level. *Earnings potential* consists of inductive, spatial and verbal ability score, expected secondary education and time preferences. *Background* consists of father's education, mother's education, parity, siblings, dummy for working mother, dummy for grew up with both parents, father's occupation and annual taxable income of family breadwinner in year 1967 in 1000 DKK. Fixed effects consist of birth year and school fixed effects. *Education* contains level and field of study. Years of participation from 1976-2019.

Results in column (1) show that desiring a large family is associated with a reduction in overall participation over career of 1.2 years ( $p \leq 0.05$ ), while desiring a large family is associated with a reduction in paid employment participation of more than 2 years

( $p \leq 0.01$ ) over career relative to desiring a small family. Interestingly, as seen from column (3), desiring a large family is associated with spending additional .6 years ( $p \leq 0.1$ ) in self-employment, and additional .2 years employed as assisting wife relative to desiring a small family. This indicates that individuals desiring a large family exchange paid employment for flexible employment with greater childrearing compatibility. The results are robust across samples as seen from Table A.16 in Appendix A.6, albeit the coefficient on participation in self-employment is larger for the reduced sample (.74 years,  $p \leq 0.05$ ).

**Participation across childbearing.** For participation dynamics across childbearing, we present results on pre- and post-birth labor force participation focusing on the reduced sample.<sup>23</sup> The results are presented in Table 17.

Table 17: Labor force participation (1976-2017), sample 2

<i>Variable</i>	(1)		(2)		(3)		(4)	
	Participation Pre-birth		Paid participation Pre-birth		Participation Post-birth		Paid participation Post-birth	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
<b>Desired family type</b>								
No family	3.28***	(1.209)	2.98**	(1.186)	-2.88	(1.931)	-0.53	(2.153)
Large family	-0.77**	(0.387)	-0.66*	(0.387)	-0.16	(0.854)	-1.39	(0.939)
Don't know	-0.94	(1.426)	-0.93	(1.415)	2.33	(2.087)	3.22	(2.334)
<b>Family formation</b>								
Ever married	-0.02	(0.042)	-0.03	(0.034)	-0.02	(0.045)	-0.03	(0.035)
Excess children	-1.48***	(0.437)	-1.41***	(0.428)	1.74**	(0.724)	0.62	(0.917)
Constant	2.83	(2.865)	2.84	(2.856)	15.10**	(6.075)	8.80	(6.653)
HCE	Yes		Yes		Yes		Yes	
Relationship, 1976	Yes		Yes		Yes		Yes	
Background	Yes		Yes		Yes		Yes	
Fixed effects	Yes		Yes		Yes		Yes	
Education	Yes		Yes		Yes		Yes	
Observations	718		718		726		726	
$R^2$	0.36		0.36		0.30		0.34	

*Note:* Robust standard errors. \*\*\*/\*\*/\* indicate statistical significance at the 1%/5%/10%-level. *HCE* consists of inductive, spatial and verbal ability scores, expected secondary education and time preferences. *Background* consists of father's education, mother's education, parity, siblings, dummy for working mother, dummy for grew up with both parents, father's occupation and annual taxable income of family breadwinner in year 1967 in 1000 DKK. Fixed effects consist of birth year and school fixed effects. *Education* contains categories of level and field of study.

Results in columns (1) and (2) show that desiring a large family is associated with a reduction of 0.77 years ( $p \leq 0.05$ ) in pre-birth labor force participation, while the estimated reduction in paid employment participation is 0.66 years ( $p \leq 0.1$ ) relative to desiring a small family. Pre-birth participation effects are likely to reflect increased investments in

<sup>23</sup>We have no pre-birth observations for early mothers.

homemaking and nest building in anticipation of family formation. Having no desire for a family is associated with greater pre-birth participation, perhaps as an artifact of delayed childbirth. In post-birth career, overall labor force participation is practically identical for individuals desiring a large and a small family, respectively, though participation in paid employment differs with desired family size. Desiring a large family is associated with a reduction in paid employment participation of 1.4 years, though the coefficient is not statistically significant for the reduced sample. For the full sample, the post-birth reduction in paid employment participation is larger (-1.8,  $p \leq 0.05$ ) and statistically significant, cf. Table A.17. Hence, overall participation is similar after birth, but individuals desiring a large family shift into flexible occupations.

Interestingly, excess births are associated with statistically significant pre-birth reductions in overall and paid employment participation of -1.48 years ( $p \leq 0.01$ ) and -1.41 years ( $p \leq 0.01$ ). This indicates that individuals, who gather less early career experience resulting in lower opportunity costs of absences, are more likely to engage in excess fertility later in their childbearing. In addition, their after birth participation is significantly higher (+1.74 years,  $p \leq 0.01$ ), cf. column (3), indicating that engagement in flexible employment allows them to combine childrearing and market production.

**Labor supply.** Considering, next, intensive margin labor supply (in paid employment), the results in column (1) of Table 18 show that desiring a large family is associated with a reduction in work hours of 1.6 hours per week ( $p \leq 0.05$ ) across career relative to individuals desiring a small family. As seen from results in column (2), lower labor supply reflects a lower share of career in full time employment defined as paid employment of 30 hours or more per week, and a higher share in part-time employment defined as 10-29 hours per week. Over career, desiring a large family is associated with a reduction in share of career in full time of 6 percentage points ( $p \leq 0.01$ ) and an increase in share of career in part-time of 3 percentage points ( $p \leq 0.05$ ) relative to desiring a small family. The findings are robust across samples as seen from Table A.18 in Appendix A.6.

**Labor supply across childbearing.** Considering next labor supply in anticipation of and following birth among individuals, who do experience motherhood, we find no evidence of labor supply responses to desired family size in anticipation of birth, cf. Table A.19 in Appendix A.6, while we find a significant association between after birth labor

Table 18: Labor supply, sample 1

<i>Variable</i>	(1)		(2)		(3)	
	Avg. hours/week (1976-2017)		Share w/ full time		Share w/ part time	
	Coef.	SE	Coef.	SE	Coef.	SE
<b>Desired family type</b>						
No family	0.27	(1.216)	0.01	(0.040)	-0.02	(0.025)
Large family	-1.55**	(0.653)	-0.06***	(0.020)	0.03**	(0.014)
Don't know	-2.09	(1.764)	-0.11**	(0.047)	0.06**	(0.032)
<b>Family formation</b>						
Excess kids	-1.13**	(0.456)	-0.04***	(0.014)	0.04***	(0.010)
Ever married	2.03*	(1.040)	0.04	(0.032)	0.03	(0.021)
Constant	5.68	(5.810)	0.15	(0.178)	0.03	(0.109)
HCE	Yes		Yes		Yes	
Relationship, 1976	Yes		Yes		Yes	
Background	Yes		Yes		Yes	
Fixed effects	Yes		Yes		Yes	
Education	Yes		Yes		Yes	
Observations	1225		1225		1225	
$R^2$	0.27		0.28		0.26	

*Note:* Robust standard errors in parentheses \*\*\*/\*\*/\* indicate statistical significance at the 1%/5%/10%-level. *Earnings potential* consists of inductive, spatial and verbal ability score, expected secondary education and time preferences. *Background* consists of father's education, mother's education, parity, siblings, dummy for working mother, dummy for grew up with both parents, father's occupation and annual taxable income of family breadwinner in year 1967 in 1000 DKK. Fixed effects consist of birth year and school fixed effects. *Education* contains level and field of study. Average hours per week from 1976 to 2017.

supply and desired family size. Results in Table 19 for both samples show that desiring a large family is associated with a reduction in share of career in full time employment of 7 percentage points ( $p \leq 0.01$ ), cf. columns (1) and (3) and with an increase in share of career in part-time employment of 3-4 percentage points relative to desiring a small family, though the association with part-time is not statistically significant. Hence, desiring a large family is associated with selection out of full-time employment in response to childbirth.

The associations between labor supply and unplanned children are qualitatively similar as the associations with desiring a large family, i.e. having excess children is more likely to occur for individuals with large initial drops in labor supply after birth.

**Occupational adjustments.** Finally, we test whether individuals desiring a large family are overall more likely to select into flexible occupations, such as self-employment and employment as assisting spouse, and whether occupational changes take place in anticipation of or in response to realized fertility.

Table 19: Labor supply in post birth career

Variable	Sample 1				Sample 2			
	(1)		(2)		(3)		(4)	
	Full time	SE	Part time	SE	Full time	SE	Part time	SE
<b>Desired family type</b>								
No family	0.05	(0.052)	0.02	(0.040)	0.06	(0.065)	-0.01	(0.047)
Large family	-0.07***	(0.022)	0.03	(0.016)	-0.07***	(0.027)	0.04	(0.020)
Don't know	-0.03	(0.051)	0.09**	(0.042)	-0.01	(0.059)	0.05	(0.048)
<b>Family formation</b>								
Ever married	-0.02	(0.042)	-0.03	(0.034)	-0.02	(0.045)	-0.03	(0.035)
Excess children	-0.05***	(0.015)	0.02	(0.013)	-0.06**	(0.027)	0.03	(0.020)
Constant	0.30	(0.189)	-0.00	(0.108)	0.12	(0.222)	0.11	(0.126)
HCE	Yes		Yes		Yes		Yes	
Relationship, 1976	Yes		Yes		Yes		Yes	
Background	Yes		Yes		Yes		Yes	
Fixed effects	Yes		Yes		Yes		Yes	
Education	Yes		Yes		Yes		Yes	
Observations	1084		1084		726		726	
$R^2$	0.30		0.27		0.36		0.32	

*Note:* Robust standard errors. \*\*\*/\*\*/\* indicate statistical significance at the 1%/5%/10%-level. *HCE* consists of inductive, spatial and verbal ability scores, expected secondary education and time preferences. *Background* consists of father's education, mother's education, parity, siblings, dummy for working mother, dummy for grew up with both parents, father's occupation and annual taxable income of family breadwinner in year 1967 in 1000 DKK. Fixed effects consist of birth year and school fixed effects. *Education* contains categories of level and field of study.

We present results for the reduced sample in Table 20. From results in columns (1) and (2), we see that individuals desiring a large family are significantly more likely to engage in flexible employment across career, cf. columns (1) and (2). This appears to be driven by career adjustments taking place in response to birth.<sup>24</sup> After first childbirth, individuals desiring a large family are 8 percentage points ( $p \leq 0.01$ ) more likely to select into self-employment and 4 percentage points ( $p \leq 0.05$ ) more likely to select into employment as an assisting wife relative to individuals desiring a small family. These occupational adjustments are in contrast to those of individuals with no desire for a family. Having no desire is associated with overall lower probabilities of selecting into self-employment and employment as assisting spouse, also in response to childbirth. Finally, we find that unplanned births are overall positively associated with selection into employment as an assisting spouse and with selection into self-employment in response

<sup>24</sup>Results on pre-birth occupational choices are presented in Table A.20 in Appendix A.6. Individuals desiring a large family are almost as likely as individuals desiring a small family to select into being an assisting wife prior to birth (+1 ppts.), while they are slightly less likely to select into self-employment prior to birth (-2 ppts.).

Table 20: Flexible employment, sample 2

<i>Variable</i>	(1) Ever Self-empl.		(2) Ever assisting		(3) Self-empl. Post-b1		(4) Assisting Post-b1	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
<b>Desired family type</b>								
No family	-0.08	(0.058)	-0.07***	(0.027)	-0.14***	(0.045)	-0.06**	(0.025)
Large family	0.06*	(0.032)	0.04**	(0.019)	0.08***	(0.029)	0.04**	(0.018)
Don't know	0.07	(0.099)	-0.01	(0.024)	-0.03	(0.061)	-0.00	(0.021)
<b>Family formation</b>								
Ever married	0.01	(0.045)	0.04*	(0.019)	0.03	(0.035)	0.03*	(0.018)
Excess kids	0.03	(0.029)	0.03**	(0.016)	0.05**	(0.024)	0.02*	(0.014)
Constant	0.39	(0.274)	-0.01	(0.088)	0.28	(0.251)	-0.01	(0.087)
HCE	Yes		Yes		Yes		Yes	
Relation, 1976	Yes		Yes		Yes		Yes	
Background	Yes		Yes		Yes		Yes	
Fixed effects	Yes		Yes		Yes		Yes	
Education	Yes		Yes		Yes		Yes	
Observations	867		867		867		867	
$R^2$	0.31		0.29		0.30		0.30	

*Note:* Robust standard errors in parentheses \*\*\*/\*\*/\* indicate statistical significance at the 1%/5%/10%-level. *Earnings potential* consists of inductive, spatial and verbal ability scores, expected secondary education and time preferences. *Background* consists of father's education, mother's education, parity, siblings, dummy for working mother, dummy for grew up with both parents, father's occupation and annual taxable income of family breadwinner in year 1967 in 1000 DKK. Fixed effects consist of birth year and school fixed effects. *Education* contains level and field of study.

to birth. This indicates that selecting into flexible employment loosens time constraints of individual women.

## 5.6 Heterogeneity

In the following section, we investigate how wage losses associated with desiring a large family vary between subgroups defined by human capital endowment and realized child-bearing, respectively.

### 5.6.1 Heterogeneity on human capital

To shed light on the sources of variation in wage income over career in response to family desires, we first test whether human capital endowment factors are associated with career costs of desiring a large family as a reflection of opportunity costs of labor market absences and career adjustments at birth. We split our sample into subgroups based on their level of cognitive ability, aspirations and patience. In Table 21 we present coefficients and their respective p-values, from estimations of cumulative wage income

over career on desiring a large family. The set of controls and fixed effects are the same as in previous estimations. We find suggestive evidence that career costs increase both in size and statistical significance across levels of patience, educational aspirations and cognitive ability, while career costs are relatively constant across levels of education, except for at Master's level or above. Coefficients on desiring a large family increase in human capital endowment, such that they are low and more imprecisely estimated for individuals with low human capital endowment, and higher and of greater statistical significance for individuals with high aspirations, patience and intelligence. The results indicate that women desiring a large family and with a greater earnings potential face steeper trade-offs between realizing family and a career, while women desiring a large family with a preference for home production face no such trade-off.

### **5.6.2 Heterogeneity on realized fertility**

Realized family formation in relation to desired family size may be another source of variation in wage income over career. This motivates testing, whether career costs of desiring a large family increase with parenthood and family size. First, we find that there is a premium on desiring a large family, but remaining childless, though the coefficient is not precisely estimated. Second, we find that career costs of desiring a large family decrease with realized family size. The career costs associated with desiring a large family are estimated to 1.5 million DKK for women, who end up having only one child, while they are estimated to .7 million DKK for women, who end up having two children. Finally, they are low and insignificant among women with three or more children. Hence, individuals realizing a large family face similar career costs independently of their desired family size. The variation picked up in our main estimation is generated by women desiring a large family, who end up with a small family, relative to women desiring and realizing a small family. This indicates that greater career adjustments after birth in anticipation of a large family, play a role for our results.

### **5.6.3 Fertility risks**

In the final part of this paper, we present our results on fertility risks in response to desired family size. We focus on the likelihood of having fewer children than desired and on the likelihood of having unplanned children. Particularly, we investigate if higher

Table 21: Wage income, mill., 1980-2019

Subgroup	Coef.	P-value	Observations
<i>Preference for housewife</i>			
Yes	0.8	(0.59)	226
No	-0.6	(0.135)	999
<i>Patience</i>			
Impatient	0.4	(0.51)	169
Patient	-0.5	(0.16)	629
Very patient	-1.2	(0.12)	270
<i>Aspirations</i>			
10th or less	-0.3	(0.53)	522
LSE	-0.6	(0.20)	437
USE	-1.8	(0.05)	277
<i>Ability</i>			
Low	-0.3	(0.52)	368
Medium	-0.7	(0.22)	372
High	-0.9	(0.08)	485
<i>Education</i>			
Vocational or less	-0.7	(0.05)	788
BA	-0.6	(0.178)	364
MA	-6.4	(0.04)	71
<i>Children</i>			
0	1.9	(0.31)	136
1	-1.5	(0.19)	222
2	-.7	(0.06)	591
3 or more	-.3	(0.64)	276
HCE	Yes		
Relation 1976	Yes		
Background	Yes		
Education	Yes		
Fixed effects	Yes		
Desires	Yes		
Family	Yes		

*Note:* The first column holds estimated coefficients on desiring a large family, robust p-values are reported in the second column. Number of observations in the third column. *HCE* consists of inductive, spatial and verbal ability scores, expected secondary education and time preferences. *Background* consists of father's education, mother's education, parity, siblings, dummy for working mother, dummy for grew up with both parents, father's occupation and annual taxable income of family breadwinner in year 1967 in 1000DKK. Fixed effects consist of birth year and school fixed effects. *Education* contains categories of level and field of study. *Desires* contains desires none, mother and desires more, mother and does not desire any more, *Family* contains ever married and number of excess children.

opportunity costs due to higher ability or lower opportunity costs due to career choices moderate or exacerbate fertility risks.

For our analysis on the likelihood of experiencing a fertility deficit, we focus on individuals in the reduced sample, who desire a family, while for the analysis on likelihood of experiencing an unplanned birth, we focus on all individuals in the reduced sample. We



present our results in Table 22. In columns (1) and (3) we control for pre-birth covariates, including level and field of education, while in columns (2) and (4) we add marital status and occupational changes into self-employment.

Table 22: Fertility risk on desired family type, sample 2

Variable	Fertility deficit				Excess fertility			
	(1)		(2)		(3)		(4)	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
<b>Desired family type</b>								
No family					0.54***	(0.081)	0.58***	(0.077)
Large family	0.44***	(0.054)	0.48***	(0.052)	-0.08**	(0.036)	-0.10***	(0.036)
<b>Ability</b>								
Low ability	0.10	(0.059)	0.10*	(0.055)	0.05	(0.042)	0.06	(0.041)
High ability	0.10*	(0.060)	0.09	(0.058)	0.01	(0.043)	0.03	(0.043)
Low ability, no family					-0.12	(0.092)	-0.13	(0.093)
High ability, no family					-0.04	(0.071)	-0.04	(0.072)
Low ability, large family	-0.00	(0.103)	0.02	(0.095)	-0.01	(0.142)	-0.08	(0.136)
High ability, large family	-0.09	(0.091)	-0.09	(0.087)	-0.35	(0.263)	-0.39	(0.254)
<b>Field of education</b>								
Non-abstract	-0.13**	(0.058)	-0.10*	(0.055)	0.03	(0.026)	0.02	(0.038)
<b>Family formation</b>								
Ever married			-0.24***	(0.057)			0.14***	(0.041)
Ever divorced			0.16***	(0.039)			-0.04*	(0.025)
Ever abortion			-0.15***	(0.041)			-0.06*	(0.030)
<b>Occupation</b>								
Self-empl., preb1			0.35***	(0.083)			-0.18***	(0.062)
Assisting, preb1			0.34*	(0.182)			-0.06	(0.258)
Self-empl.			-0.12**	(0.056)			0.07	(0.047)
Assisting			-0.28***	(0.074)			0.19**	(0.077)
<b>Labor supply</b>								
Share in part-time			-0.21**	(0.093)			0.17**	(0.076)
Constant	0.62**	(0.302)	0.77***	(0.272)	-0.11	(0.148)	-0.27*	(0.157)
HCE*	Yes		Yes		Yes		Yes	
Relation, 1976	Yes		Yes		Yes		Yes	
Background	Yes		Yes		Yes		Yes	
Fixed effects	Yes		Yes		Yes		Yes	
Education**	Yes		Yes		Yes		Yes	
Observations	775		775		867		867	
$R^2$	0.38		0.41		0.37		0.42	

Note: Robust standard errors. \*\*\*/\*\*/\* indicate statistical significance at the 1%/5%/10%-level. *HCE* consists of inductive, spatial and verbal ability scores, expected secondary education and time preferences. *Background* consists of father's education, mother's education, parity, siblings, dummy for working mother, dummy for grew up with both parents, father's occupation and annual taxable income of family breadwinner in year 1967 in 1000 DKK. Fixed effects consist of birth year and school fixed effects. *Education* contains categories of level of study.

From results in column (1), we see that desiring a large family is mechanically associated with substantially higher likelihood of experiencing a fertility deficit (44 ppts.,  $p \leq 0.01$ ) relative to desiring a small family. This is true despite a higher likelihood of parenthood among individuals desiring a large family. Next, we see that cognitive ability in the tails of the distribution is associated with a higher probability of experiencing

a fertility deficit. Results in column (1) show that having either low or high cognitive ability<sup>25</sup> is associated with an increased likelihood of experiencing a fertility deficit of 10 percentage points, though only the coefficient on high cognitive ability is statistically significant. Surprisingly, desiring a large family mitigates the association between ability and experiencing a fertility deficit among high ability individuals. This indicates that the correlation between high ability and experiencing a fertility deficit is mitigated by strong family desires. One mechanism to explain this is assortative matching. Both individuals with low and high ability face shallower marriage markets, but individuals with high ability can compensate by lowering their threshold of acceptance for a match, while this is not possible for individuals with low ability. In addition, our results indicate that establishing and maintaining stable relationships in early and late adulthood are central for an individual's ability to realize their family desires. From results in column (2), we see that marriage is associated with a reduced risk of experiencing a fertility deficit, while the opposite is true for divorce.

For career choices, we find that selection into non-abstract fields is associated with a lower risk of experiencing a fertility deficit (-13 ppts.,  $p \leq 0.05$ ). This indicates that non-abstract occupations are conducive to reaching planned fertility, irrespectively of fertility desires. For after-birth career adjustments, we find that selection into self-employment (-12 ppts.,  $p \leq 0.05$ ) and employment as assisting wife (-28 ppts.,  $p \leq 0.01$ ) are associated with reduced fertility risks, cf. column (2). Moreover, share of career in part-time employment is negatively associated with the risk of experiencing a fertility deficit (-21 ppts.,  $p \leq 0.05$ ). Hence, selection into flexible employment after birth is generally associated with lower fertility risks. Lower fertility risks may reflect a relaxation of either time or pecuniary constraints.<sup>26</sup>

Concerning excess fertility, results in column (3) show that desiring to remain childless is mechanically associated with an increase of 54 percentage points ( $p \leq 0.01$ ) in the likelihood of experiencing an unplanned birth. This reflects a high likelihood of parenthood among individuals with no desire. Instead, desiring a large family is negatively associated with excess fertility (-8 ppts.,  $p \leq 0.05$ ). We find no evidence that pre-birth factors, such as cognitive ability or selection into non-abstract fields are associated with unplanned

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<sup>25</sup>Low and high ability are defined as scores below the 25th and above the 75th-percentiles on the inductive ability test at age 14.

<sup>26</sup>Pre-birth self-employment has the opposite effect (+35 ppts.,  $p \leq 0.01$ ), but only 5% of the sample pursue self-employment prior to birth.

fertility, but after birth selection into employment as assisting wife and share of career in part-time employment are associated with significantly higher probabilities of excess fertility of 19 and 17 percentage points ( $p \leq 0.05$ ). Hence, post-birth career adjustments loosening individual time constraints are associated with a higher likelihood of incurring excess fertility. Moreover, stable relationships are conducive to excess fertility as seen from results in column (4). Being married increases the likelihood of an excess birth by 14 percentage points ( $p \leq 0.01$ ), while divorce reduces the likelihood by 4 percentage points ( $p \leq 0.1$ ).

## 6 Discussion

In this paper, we studied the direct link between desired family size of individuals and their career behavior before and after birth. Specifically, we tested the predictions of the family investment theory on career adjustments in response to desired family size. The theory holds that fertility preferences directly affect the value individuals attach to time for childrearing after birth, including the value of a flexible work schedule, which allows them to plan market production around childrearing. The results of our empirical investigation show that anticipated fertility has first order effects on family formation and is associated with career adjustments after birth resulting in significant cumulative career costs from desiring a large family.

Desiring a large family in early adulthood is associated with a higher probability of motherhood and with having more children, while desiring to remain childless is associated with a lower probability of motherhood, having fewer children and delaying first birth relative to desiring a small family. However, realized fertility in response to desires is not the main driver of career costs associated with desiring a large family. Instead, these career costs reflect greater adjustments of career behavior after first birth, perhaps in anticipation of continued childbearing. This is a key result as it documents that fertility desires introduce heterogeneity into career costs experienced by mothers at birth. Subgroup results indicate that career costs of desiring a large family increase in opportunity costs proxied by individual ability and educational aspirations, while they are non-existing for individuals aspiring to housewife.

Labor market adjustments at birth are reflected in reduced participation in paid employment, as individuals desiring a large family select out of full-time and into part-time

employment and flexible employment at higher rates than individuals desiring a small family in response to childbirth. Labor market earnings from self-employment moderate wage losses from paid employment, and moreover, selection into part-time and flexible employment tend to reduce overall fertility risks, i.e. individuals are less likely to miss their fertility target.

**Policy relevance.** Results on selection out of full-time paid employment and into self-employment in response to fertility desires indicate that women desiring a large family place a high value on flexible work lives that allow them to organize their work around childrearing obligations. As a result of their selection into flexible employment after birth, we find that their fertility risks and wage losses are mitigated. However, our study sheds no light on general efficiency concerns, i.e. whether selection into self-employment in response to fertility desires reduces individual market productivity with consequences for aggregate productivity.

While Berniell et al. (2020) present evidence that women selecting into self-employment in response to birth lack both skills and personality traits associated with entrepreneurial success, there is a need for gathering more evidence on how mothers are rewarded for temporary spells of self-employment in the regular labor market, and whether they pursue reentry or remain at the margins of the labor market, even when their children are grown up. This is relevant for efficiency of labor markets and allocation of talent. Survey evidence from the Nordics document that self-employed mothers work as much as their peers in paid employment and perform less housework, and correlational evidence on the Swedish registers indicate that mothers with self-employment have higher income and revenues than self-employed women without children. More empirical contributions on whether mothers selecting into self-employment contribute to aggregate growth and job creation in a similar manner as other self-employed is warranted. Evidence in the affirmative would suggest that solo-selfemployment may be to the benefit of families, individuals and societies. Finally, it is worth noting that if similar degrees of flexibility for juggling childrearing and work could be achieved in careers based on paid employment, women aspiring for a family and a career would not have to make a choice between full-time paid employment with fertility risks, and flexible employment with a greater likelihood of fulfilling their fertility desires. Perhaps greater access to remote work in the aftermath of

covid will offer similar benefits as solo self-employment, though there are imminent risks regarding the gendered division of childcare and housework duties, whenever home is the location of mothers' work.

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## A Appendix (for Online Publication)

### A.1 Survey questions on parental status

Before, the elicitation of fertility desires in DLSY, individuals answered the following question on their parental status: *Do you have any children of your own?* To which they could answer: *Yes*, *Yes - but they do not all live with me* or *No*. This measure reveals that 1/3 of female individuals were already mothers at elicitation of desires. For early mothers, elicited desire are no longer in accordance with the idea of an unconstrained fertility target. Particularly, the answer *No desire* could have multiple interpretations, e.g. it could be taken to mean *No, I have already reached my target* or *No, I never wanted children in the first place*. Whether the elicitation of desires for early mothers desiring additional children can be taken as a proxy of an unconstrained fertility target is also subject for discussion. Assuming that individuals expressing a desire for additional children, answer *Yes [...I would like additional children]* to confirm that they have not reached their target yet. This implies that their reported desires can be interpreted as their unconstrained fertility target, conditional on current fertility. This assumption follows the evidence of Mueller et al. (2019) that motherhood does not change fertility desires except when women have a child in excess in desires and end up adjusting their desires to accommodate the birth of this excess child. To control for parental status at elicitation, we include dummies for early mothers with additional desire and for early mothers with no additional desire in all empirical estimations. This approach has one caveat. The interpretation of parameters for early mothers with no desire is not straight forward.

### A.2 Survey questions on early relationships

In 1976, respondents of the DLSY were asked *Are you married or going steady with someone?* and individuals with a partner were further asked *Have you considered getting married or moving in together?* From the two 1976 questions, we form the following relationship categories at elicitation of desires: 1: *No partner or partner with no wish to move in*, 2: *Going steady*, 3: *Engaged*, 4: *Cohabiting*, 5: *Married*. Since relationships may affect elicited desires, we control for relationship categories in all estimations. Particularly, we control for categories 1, 4 and 5, while 2 and 3 are merged into a benchmark category. We do not report coefficients on relationship status in 1976.

### A.3 Descriptives on relationships

Table A.2 contains descriptives on relationships for our sample. Over adult life, practically all individuals enter stable relationships and 90% end up marrying, while only 1% never enter a stable relationship. Among individuals with one or more stable relationships, more than 1/2 have just one stable relationship over adult life, 1/4 have two stable relationships, and 12% have three or more. On average 1/2 of individuals experience a divorce or a split up of a cohabitation over adult life. Age at first cohabitation or marriage is 21 years, while age at first marriage is 23.5 years on average. Average age at first break-up is almost 32 years, while average age at first divorce is 36 years.

Table A.1: Descriptives on desires and relationships

<i>Variable</i>	Sample 1		Early mothers		Others		Diff.	P-value
	Mean	Std	Mean	Std	Mean	Std		
<b>Relationships, 1976</b>								
None	0.18	0.39	0.05	0.23	0.23	0.42	0.18***	(0.00)
Going steady	0.12	0.33	0.04	0.20	0.16	0.36	0.11***	(0.00)
Engaged	0.02	0.15	0.01	0.07	0.03	0.17	0.02***	(0.00)
Cohabiting	0.35	0.48	0.25	0.43	0.39	0.49	0.14***	(0.00)
Married	0.32	0.47	0.65	0.48	0.19	0.39	-0.47***	(0.00)
<b>Relationships ever</b>								
Ever married or cohabiting	0.97	0.16	0.99	0.07	0.97	0.18	-0.03***	(0.00)
Ever married	0.90	0.30	0.98	0.16	0.87	0.33	-0.10***	(0.00)
Ever splitup	0.49	0.50	0.53	0.50	0.47	0.50	-0.07*	(0.03)
Ever divorced	0.37	0.48	0.49	0.50	0.33	0.47	-0.16***	(0.00)
<b>Timing of relationships</b>								
Age of first cohab	21.57	4.75	19.29	2.78	22.53	5.07	3.24***	(0.00)
Age at first marriage	23.54	7.32	20.80	5.72	24.77	7.62	3.97***	(0.00)
Age of first splitup	31.85	10.04	30.06	9.17	32.67	10.32	2.60**	(0.00)
Age of first divorce	36.29	10.62	32.37	9.35	38.63	10.65	6.26***	(0.00)
Observations	1225		362		884		1246	

Note: \*\*\*/\*\*/\* indicate statistical difference at the 1%/5%/10%-level. P-values in parentheses.

Particular ages of matching and breaking-up are likely to be specific to the cohort in question. Early mothers are significantly more likely to engage in stable relationships over adult life. They are both significantly more likely to be married at age 22 (65% vs. 19%) as reflected also in a significantly lower age at first marriage (21 vs. 25 years) and significantly more likely to be married over adulthood (98% vs. 87%). However, their relationships tend to be less robust, and they are significantly more likely to experience divorce than other respondents (49% vs. 33%). This is also reflected in a higher probability of having had more than one relationship over adult life (45% vs. 37%).

Table A.2: Descriptives on desires and relationships

<i>Variable</i>	Sample 1		Early mothers		Others		Diff.	P-value
	Mean	Std	Mean	Std	Mean	Std		
<b>Relationships, 1976</b>								
None	0.18	0.39	0.05	0.23	0.23	0.42	0.18***	(0.00)
Going steady	0.12	0.33	0.04	0.20	0.16	0.36	0.11***	(0.00)
Engaged	0.02	0.15	0.01	0.07	0.03	0.17	0.02***	(0.00)
Cohabiting	0.35	0.48	0.25	0.43	0.39	0.49	0.14***	(0.00)
Married	0.32	0.47	0.65	0.48	0.19	0.39	-0.47***	(0.00)
<b>Relationships ever</b>								
Ever married or cohabiting	0.97	0.16	0.99	0.07	0.97	0.18	-0.03***	(0.00)
Ever married	0.90	0.30	0.98	0.16	0.87	0.33	-0.10***	(0.00)
Ever splitup	0.49	0.50	0.53	0.50	0.47	0.50	-0.07*	(0.03)
Ever divorced	0.37	0.48	0.49	0.50	0.33	0.47	-0.16***	(0.00)
<b>Timing of relationships</b>								
Age of first cohab	21.57	4.75	19.29	2.78	22.53	5.07	3.24***	(0.00)
Age at first marriage	23.54	7.32	20.80	5.72	24.77	7.62	3.97***	(0.00)
Age of first splitup	31.85	10.04	30.06	9.17	32.67	10.32	2.60**	(0.00)
Age of first divorce	36.29	10.62	32.37	9.35	38.63	10.65	6.26***	(0.00)
Observations	1225		362		884		1246	

Note: \*\*\*/\*\*/\* indicate statistical difference at the 1%/5%/10%-level. P-values in parentheses.

## A.4 Survey questions on human capital endowment

Social mobility across generations is a main focus area of DLSY. Therefore the survey panel contains several questions related to the human capital endowment of an individual including on their time preferences, taste for education and their cognitive ability. The measure of respondent's expectations of own secondary education are indicative of their educational aspirations, while inductive, verbal and spatial ability scores are indicative of their cognitive ability. Finally, the socio-economic characteristics of individuals' parents, such as parental education, occupation, employment status and household income are indicative of individuals' non-cognitive ability (Abbott et al., 2013; Heckman et al., 2006). We do not report the coefficients on factors related to human capital endowment nor on socio-economic background factors such as family size, parity of individuals and whether they had a stable childhood as proxied by growing up with both parents.

For educational aspirations, We rely on elicited expectation of secondary education among individuals. In 1968 in 7th grade, the final year of obligatory schooling, individuals were asked : *With which grade do you expect to leave school?* to which they could answer *7th, 8th, 9th, 10th, Lower Secondary Education* or *Upper Secondary Education*. Parents of individuals were similarly asked one year later in 1969: *After which grade you think*

*your child will leave school?*. Expectations of children and parents are closely correlated. Hence, we include only respondents' own expectations in the estimations.<sup>27</sup>

Also, in 1968 individuals were asked to complete a row of cognitive ability tests designed to test three aspects of their cognitive ability. The first set of tests dealt with individuals' verbal ability and included several linguistic comprehension and power of abstraction tests. The second set of tests focused on individuals' spatial ability and included tests of threedimensional and geometric comprehension. Finally, the third set of tests dealt with individuals' inductive ability and included a series of mathematical and logical tests. The three tests are described in Ørum (1971: pp. 25-28) and Hansen (1995: pp. 67-68 and 101-102). Individuals' total score in each of the three tests is available in the DLSY dataset. We include standardized test scores for all three tests in the estimations.

In 1973 (at age 19), individuals answered the following question regarding their time preferences: *If you were offered three jobs now and you could choose, which one would you take?* to which they could choose among the following answers: *A job with average pay right from the beginning, A job with low pay the first two years, but high pay later, A job with very low pay the first four years, but very high pay later and Don't know.* This implies 3 degrees of patience leaving out individuals answering that they *Don't know*. We collect patient and very patient individuals in one category, which leaves us with a dummy-measure taking the value 1 if the respondent is patient. This measure is included in all estimations. In comparison to other experimental measures of time preferences (see e.g. Epper et al., 2011), the survey measure on time preferences in DLSY has both advantages and disadvantages. The possibly most important advantages is that the survey question is short, simple, and less abstract than typical intertemporal choices employed in experiments. Specifically, subjects are asked about their choice in a real-life situation with substantial economic consequences. This contrasts with experimental measures that typically ask subjects to repeatedly choose between sooner smaller amounts and later larger amounts (usually materializing within some weeks or a few months). This context-dependence might also be viewed as a shortcoming of the measure, in that considerations other than pure time preferences might lead subjects to choose a particular wage profile.

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<sup>27</sup>Lower Secondary Education, "Realeksamen", is equivalent to the completion of an academic track 8th-10th grade. The resulting LSE exam was a pre-requisite for direct admission into educations such as secretary, nurse and primary school teacher. It was common, but not a requirement, for entry into Upper Secondary Education such as *Gymnasium* or *Higher Preparatory Exam (HF)*. A non-academic track 8th-10th grade was available for students preparing for vocational education or less.

One worry is that elicited time preferences may respond to experienced motherhood. This is a concern for estimations for sample 1 that includes early mothers of which some have experienced motherhood between age 17 and 19.

The patience indicator from DLSY is both internally and externally valid. Epper et al. (2020) documents that the DLSY measure is highly predictive of time preferences elicited in an experiment with real monetary incentives among a broad and heterogeneous population born between 1967 and 1986. Furthermore, examining the validity of the measure in an experiment with a large representative sample of the Danish population, Epper et al. (2020) find that the DLSY survey measure is a good predictor for experimentally elicited time preferences. Finally, individuals categorized as patient face significantly better socioeconomic outcomes in adulthood, even when controlling for a wide range of childhood family characteristics.

## A.5 Calculation of cumulative income 1980-2019

Income measures are created from data series of yearly nominal income from Statistics Denmark. The income series are available for the time period 1980-2019, i.e. for a total of 40 years over working lives of individuals in our sample. The series follow individuals from around age 26 to age 65. Taking 2020 as our base year (Index=100), we deflate annual nominal income measures using the following formula:

$$y_t = Y_t * (Index_t / (1 + \pi_t))$$

Where  $y_t$  is real income in year  $t$ ,  $Y_t$  is nominal income in year  $t$ ,  $Index_t$  is price index relative to 2020, and  $\pi_t$  is observed inflation from year  $t - 1$  to  $t$ . Inflation rates are downloaded from Statistics Denmark <https://www.statistikbanken.dk/10072>. We create two measures of income, namely individual cumulative income over career, which is the sum of annual real income over the full period observed (1980-2019). This measure ignores whether individuals have missing observations for some income years. The second measure is average annual income, calculated as cumulative income over career divided by number of years with income observations in the registers, excluding years in which pension income is the main source of income. Individuals, who have died will have no yearly observations in the registers after dying, hence their average will be based on years alive.

$$cum_y = \frac{\sum_{t=1980}^{T=2019} y_t}{Years}$$

We make use of a broad range of income measures, including total gross income as well as subcategories. The subcategories include gross earnings from paid employment and other labor market activities, e.g. self-employment, gross public transfers including public pensions and transfers, and gross capital income. Finally, we use disposable net-income after tax. This measure is available with and without approximated value of renting one's own house or apartment. Results on net-income in the main text are based on the measure, which excludes the value of renting one's own property.

## A.6 Additional Figures

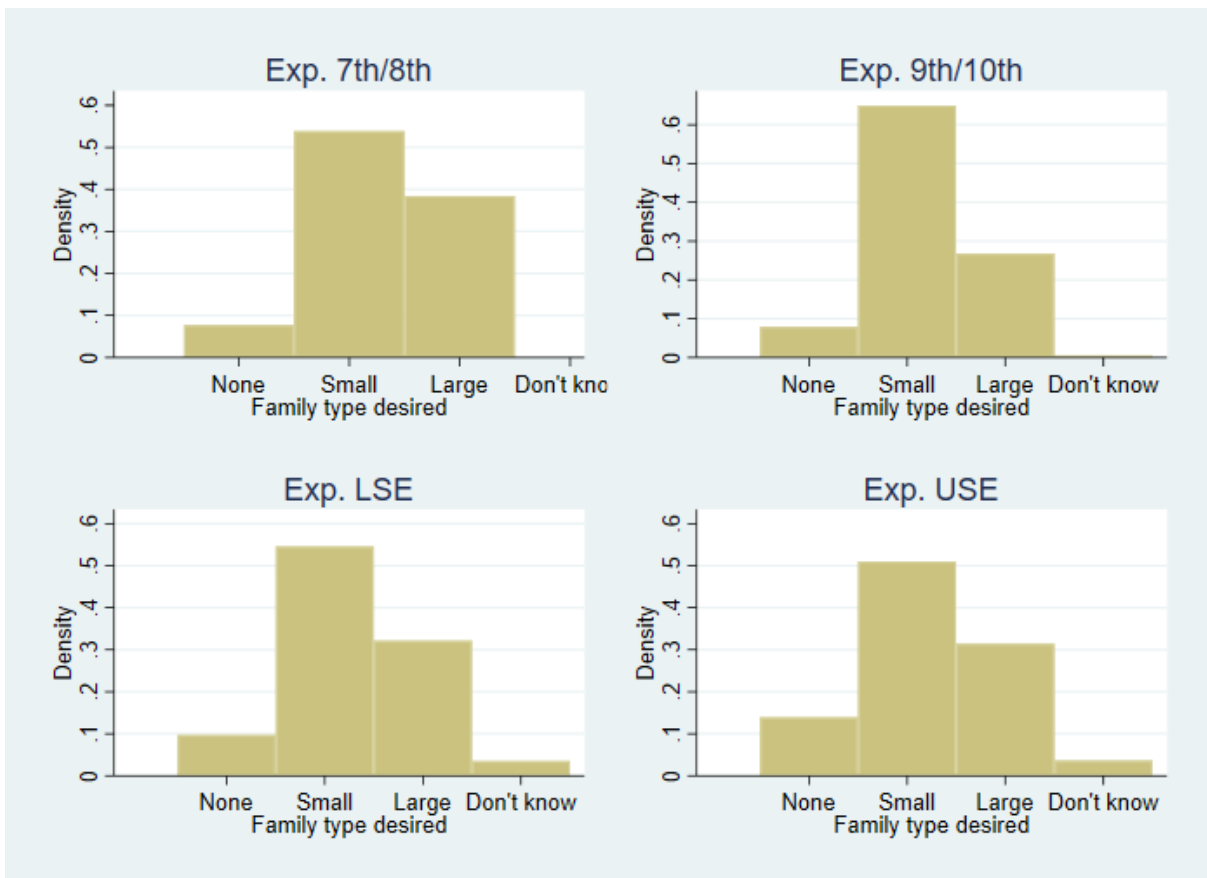
Table A.3: Descriptives on desires

<i>Variable</i>	Sample 1		Early mothers		Others		Diff.	P-value
	Mean	Std	Mean	Std	Mean	Std		
<b>Desire</b>								
No desire for (more)	0.14	0.35	0.26	0.44	0.10	0.30	-0.16***	(0.00)
Desires (more)	0.85	0.36	0.73	0.44	0.89	0.31	0.16***	(0.00)
Don't know	0.01	0.09	0.01	0.10	0.01	0.09	-0.00	(0.75)
<b>Desires</b>								
Desires 1	0.02	0.15	0.01	0.10	0.03	0.16	0.02*	(0.04)
Desires 2	0.51	0.50	0.43	0.50	0.55	0.50	0.12***	(0.00)
Desires 3	0.24	0.43	0.22	0.41	0.25	0.44	0.04	(0.15)
Desires 4 or more	0.05	0.23	0.07	0.25	0.05	0.21	-0.02	(0.16)
Don't know	0.02	0.15	0.02	0.14	0.02	0.16	0.01	(0.54)
<b>Desired family size</b>								
No family	0.14	0.35	0.26	0.44	0.10	0.30	-0.16***	(0.00)
Small family	0.54	0.50	0.44	0.50	0.57	0.49	0.14***	(0.00)
Large family	0.30	0.46	0.28	0.45	0.30	0.46	0.02	(0.53)
Don't know	0.02	0.15	0.02	0.14	0.02	0.16	0.01	(0.54)
Observations	1225		362		884		1246	

*Note:* \*\*\*/\*\*/\* indicate statistical difference at the 1%/5%/10%-level. P-values in parentheses.

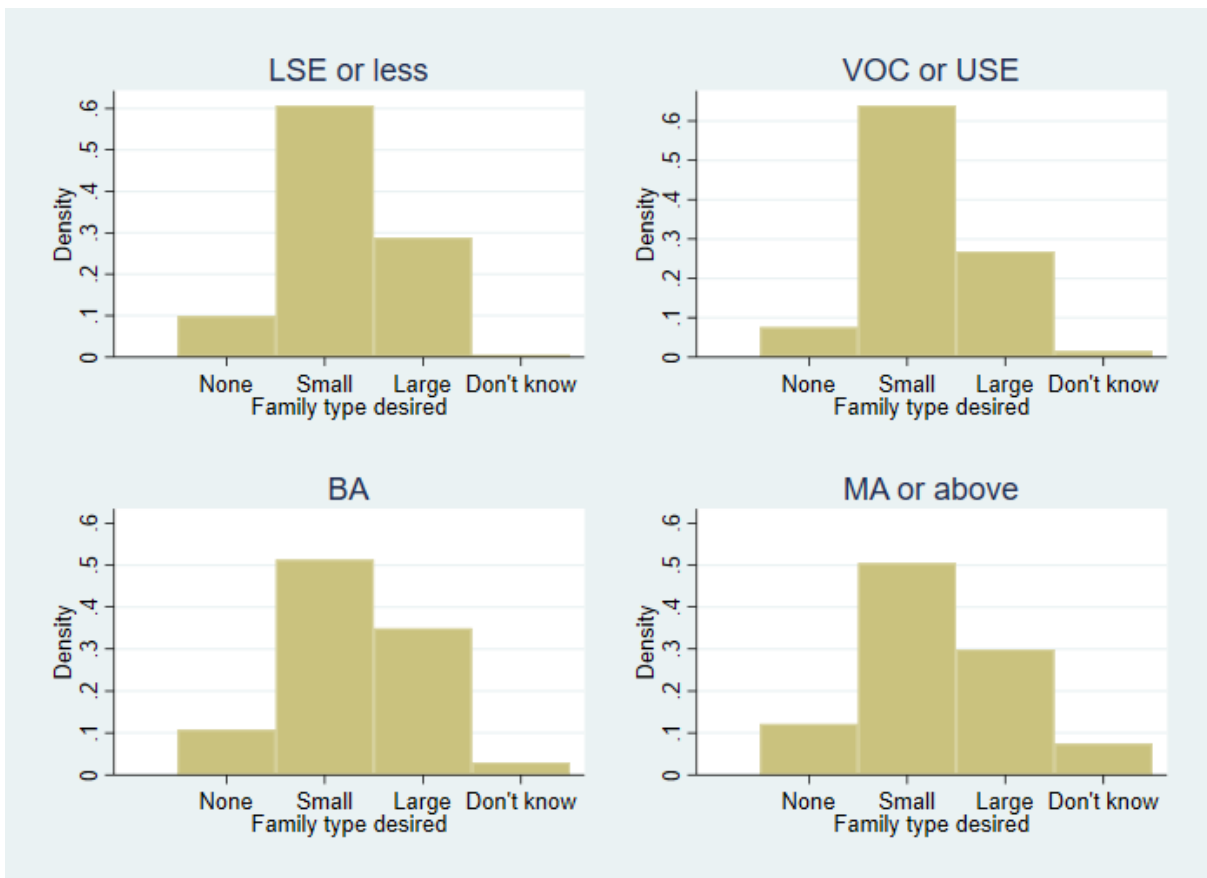


Figure A.1: Desired family size by expected secondary education



Note: Based on Sample 2 ( $n = 911$ ). Expected secondary education was elicited in 1968, when individuals were attending 7th grade.

Figure A.2: Desired family size by completed education



Note: Based on Sample 2.

Table A.4: Desired family size

<i>Variable</i>	(1)		(2)		(3)		(4)	
	No family		Family desired		Small family		Large family	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
<b>Human capital endowment</b>								
Exp. LSE	0.02	(0.031)	-0.02	(0.031)	-0.11**	(0.051)	0.07	(0.049)
Exp. USE	0.03	(0.038)	-0.03	(0.039)	-0.13**	(0.067)	0.08	(0.065)
No resp.	-0.19	(0.137)	0.18	(0.140)	0.71***	(0.162)	-0.40**	(0.158)
Std. cog. skills	0.04**	(0.018)	-0.04**	(0.018)	-0.08***	(0.029)	0.03	(0.027)
Std. spa. skills	-0.02	(0.015)	0.02	(0.016)	0.03	(0.025)	0.00	(0.023)
Std. verb. skills	-0.01	(0.020)	0.01	(0.021)	0.02	(0.033)	-0.00	(0.029)
Patient	-0.00	(0.028)	-0.01	(0.028)	-0.02	(0.045)	0.02	(0.043)
<b>Family factors</b>								
No. of siblings	0.01	(0.011)	-0.01	(0.012)	-0.08***	(0.021)	0.07***	(0.021)
Parity	-0.02*	(0.011)	0.02*	(0.011)	0.03	(0.021)	-0.01	(0.021)
Mother employed	-0.05	(0.028)	0.04	(0.029)	0.03	(0.044)	0.03	(0.039)
Stable upbringing	-0.14**	(0.055)	0.14**	(0.056)	0.16**	(0.074)	-0.02	(0.067)
Ann.inc. (1000DKK)	0.01	(0.007)	-0.01	(0.008)	-0.01	(0.013)	0.00	(0.011)
<b>Father's SE</b>								
Middle school	-0.05	(0.043)	0.03	(0.049)	0.05	(0.066)	-0.02	(0.062)
LSE/USE	0.07	(0.051)	-0.08	(0.052)	-0.00	(0.071)	-0.10*	(0.061)
<b>Mother's SE</b>								
Mid. school	0.03	(0.041)	-0.02	(0.042)	-0.05	(0.065)	0.03	(0.061)
LSE/USE	-0.03	(0.042)	0.02	(0.046)	0.07	(0.065)	-0.05	(0.059)
<b>Father's occupation</b>								
Unskill.	0.02	(0.051)	0.06	(0.087)	0.00	(0.163)	0.08	(0.156)
Skilled	0.08	(0.056)	0.00	(0.092)	0.03	(0.168)	-0.01	(0.160)
White collar	-0.01	(0.050)	0.11	(0.091)	-0.01	(0.163)	0.13	(0.153)
S.e. farmer	0.03	(0.050)	0.06	(0.085)	-0.01	(0.161)	0.06	(0.154)
S.e. crafts	0.00	(0.060)	0.09	(0.093)	-0.03	(0.176)	0.13	(0.167)
S.e. business/proff.	-0.04	(0.061)	0.12	(0.096)	-0.06	(0.172)	0.19	(0.162)
No resp.	-0.11	(0.100)	0.21*	(0.123)	0.07	(0.210)	0.15	(0.199)
<b>Relationship, 1976</b>								
No relationship	0.11***	(0.039)	-0.11**	(0.042)	-0.02	(0.061)	-0.06	(0.059)
Live with a partner	0.01	(0.034)	-0.01	(0.036)	0.08	(0.060)	-0.07	(0.057)
Married	0.01	(0.037)	-0.01	(0.040)	0.07	(0.069)	-0.05	(0.066)
Constant	0.31	(0.235)	0.61**	(0.244)	0.68**	(0.308)	-0.09	(0.233)
Fixed effects	Yes		Yes		Yes		Yes	
Observations	836		836		836		836	
$R^2$	0.27		0.26		0.26		0.25	

Note: Robust standard errors. \*\*\*/\*\*/\* indicate statistical significance at the 1%/5%/10%-level. Fixed effects consist of birth year and school fixed effects.

Table A.5: Realized fertility

Variable	No. of children				Parent		Age at first birth			
	(1)		(2)		(3)		(4)		(5)	
	Sample 1		Sample 2		Sample 2		Sample 1		Sample 2	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
<b>Desired family size</b>										
No family	-0.26**	(0.121)	-0.31**	(0.124)	-0.18***	(0.044)	1.01*	(0.547)	0.67	(0.673)
Large family	0.38***	(0.068)	0.30***	(0.080)	0.04	(0.028)	-0.34	(0.262)	-0.22	(0.376)
Don't know	-0.20	(0.224)	-0.15	(0.227)	-0.04	(0.081)	-0.57	(1.011)	-0.56	(1.233)
<b>Family formation</b>										
Ever married	0.90***	(0.108)	0.94***	(0.115)	0.39***	(0.041)	-0.59	(0.539)	-0.10	(0.718)
Ever divorced	-0.17***	(0.060)	-0.34***	(0.073)	-0.07***	(0.026)	0.41*	(0.239)	1.06***	(0.359)
No. of abort.	0.12***	(0.041)	0.14***	(0.051)	0.05***	(0.018)	-0.14	(0.160)	-0.37	(0.242)
Constant	0.17	(0.835)	-0.21	(0.597)	-0.11	(0.212)	25.00***	(3.235)	28.08***	(3.308)
HCE	Yes		Yes		Yes		Yes		Yes	
Relation 1976	Yes		Yes		Yes		Yes		Yes	
Background	Yes		Yes		Yes		Yes		Yes	
Education	Yes		Yes		Yes		Yes		Yes	
Fixed effects	Yes		Yes		Yes		Yes		Yes	
Observations	1225		867		867		1084		726	
R <sup>2</sup>	0.39		0.40		0.41		0.64		0.43	

Note: Robust standard errors in parentheses \*\*\*/\*\*/\* indicate statistical significance at the 1%/5%/10%-level. *HCE* consists of inductive, spatial and verbal ability scores, expected secondary education and time preferences. *Background* consists of father's education, mother's education, parity, siblings, dummy for working mother, dummy for grew up with both parents, father's occupation and annual taxable income of family breadwinner in year 1967 in 1000DKK. Fixed effects consist of birth year and school fixed effects. *Education* contains categories of level and field of study.

Table A.6: Annual wages in mill. DKK (1980-2019), sample 2

Variable	(1)		(2)		(3)		(4)	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
<b>Desired family type</b>								
No family	-0.007	(0.016)	-0.014	(0.015)	-0.015	(0.015)	-0.004	(0.019)
Large family	-0.015	(0.010)	-0.018*	(0.010)	-0.018*	(0.010)	-0.020**	(0.010)
Don't know	-0.027	(0.029)	-0.032	(0.025)	-0.028	(0.025)	-0.028	(0.025)
<b>Family formation</b>								
Ever married					0.022	(0.016)	0.022	(0.016)
No. of children					-0.002	(0.005)		
Excess Children							-0.009	(0.008)
Constant	0.132**	(0.059)	0.119	(0.079)	0.106	(0.080)	0.104	(0.081)
HCE	Yes		Yes		Yes		Yes	
Relationship, 1976	Yes		Yes		Yes		Yes	
Background	Yes		Yes		Yes		Yes	
Fixed effects	Yes		Yes		Yes		Yes	
Education	No		Yes		Yes		Yes	
Observations	867		867		867		867	
R <sup>2</sup>	0.28		0.35		0.36		0.36	

Note: Robust standard errors. \*\*\*/\*\*/\* indicate statistical significance at the 1%/5%/10%-level. *HCE* consists of inductive, spatial and verbal ability scores, expected secondary education and time preferences. *Background* consists of father's education, mother's education, parity, siblings, dummy for working mother, dummy for grew up with both parents, father's occupation and annual taxable income of family breadwinner in year 1967 in 1000 DKK. Fixed effects consist of birth year and school fixed effects. *Education* contains categories of level and field of study.

Table A.7: Cumulative wages in mill. DKK (1980-2019), sample 1

<i>Variable</i>	(1)		(2)		(3)		(4)	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
<b>Desired family type</b>								
No family	-0.12	(0.633)	-0.31	(0.624)	-0.32	(0.618)	0.15	(0.719)
Large family	-0.57*	(0.352)	-0.66**	(0.332)	-0.65*	(0.343)	-0.72**	(0.334)
Don't know	-0.77	(1.114)	-0.97	(0.947)	-0.79	(0.922)	-0.79	(0.917)
<b>Family formation</b>								
Ever married					0.97	(0.609)	1.01*	(0.606)
No. of children					-0.06	(0.148)		
Excess children							-0.41*	(0.236)
Constant	4.43**	(1.822)	0.67	(2.845)	0.34	(2.728)	0.30	(2.719)
HCE	Yes		Yes		Yes		Yes	
Relationship, 1976	Yes		Yes		Yes		Yes	
Background	Yes		Yes		Yes		Yes	
Fixed effects	Yes		Yes		Yes		Yes	
Education	No		Yes		Yes		Yes	
Observations	1225		1225		1225		1225	
$R^2$	0.27		0.34		0.34		0.35	

*Note:* Robust standard errors. \*\*\*/\*\*/\* indicate statistical significance at the 1%/5%/10%-level. *HCE* consists of inductive, spatial and verbal ability scores, expected secondary education and time preferences. *Background* consists of father's education, mother's education, parity, siblings, dummy for working mother, dummy for grew up with both parents, father's occupation and annual taxable income of family breadwinner in year 1967 in 1000 DKK. Fixed effects consist of birth year and school fixed effects. *Education* contains categories of level and field of study.

Table A.8: Cumulative wages in mill. DKK (1980-2019), sample 2

<i>Variable</i>	(1)		(2)		(3)		(4)	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
<b>Desired family type</b>								
No family	-0.06	(0.662)	-0.38	(0.642)	-0.34	(0.634)	-0.15	(0.801)
Large family	-0.58	(0.432)	-0.67*	(0.406)	-0.77*	(0.420)	-0.76*	(0.413)
Don't know	-0.72	(1.191)	-0.87	(1.043)	-0.58	(0.995)	-0.60	(1.001)
<b>Family formation</b>								
Ever married					1.09*	(0.653)	1.25*	(0.653)
No. of children					0.12	(0.190)		
Excess children							-0.21	(0.360)
Constant	3.73	(2.434)	2.81	(3.348)	2.17	(3.344)	2.04	(3.372)
HCE	Yes		Yes		Yes		Yes	
Relationship, 1976	Yes		Yes		Yes		Yes	
Background	Yes		Yes		Yes		Yes	
Fixed effects	Yes		Yes		Yes		Yes	
Education	No		Yes		Yes		Yes	
Observations	867		867		867		867	
$R^2$	0.27		0.35		0.35		0.35	

*Note:* Robust standard errors. \*\*\*/\*\*/\* indicate statistical significance at the 1%/5%/10%-level. *HCE* consists of inductive, spatial and verbal ability scores, expected secondary education and time preferences. *Background* consists of father's education, mother's education, parity, siblings, dummy for working mother, dummy for grew up with both parents, father's occupation and annual taxable income of family breadwinner in year 1967 in 1000 DKK. Fixed effects consist of birth year and school fixed effects. *Education* contains categories of level and field of study.

Table A.9: Cumulative wages in mill. DKK (1980-2019), sample 1

<i>Variable</i>	Full sample		Ex. self-emp./ ass.		Ex. self.		Ex. ass.	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
<b>Desired family type</b>								
No family	0.15	(0.719)	0.47	(0.806)	0.44	(0.807)	0.38	(0.697)
Large family	-0.72**	(0.334)	-0.53	(0.378)	-0.53	(0.367)	-0.74**	(0.342)
Don't know	-0.79	(0.917)	-1.42	(0.965)	-1.41	(0.985)	-0.72	(0.893)
Mom: No Desire	-1.06	(0.802)	-1.48	(0.917)	-1.40	(0.910)	-1.39*	(0.788)
Mom: Desire	-0.42	(0.353)	-0.34	(0.412)	-0.43	(0.400)	-0.30	(0.366)
Mom: Don't know	2.26	(2.589)	4.36	(3.022)	4.68	(3.038)	1.80	(2.553)
<b>Family formation</b>								
Ever married	1.01*	(0.606)	1.13*	(0.663)	1.13*	(0.662)	1.03*	(0.606)
Excess children	-0.41*	(0.236)	-0.45*	(0.263)	-0.45*	(0.260)	-0.51**	(0.230)
Constant	0.30	(2.719)	-1.74	(3.690)	-1.28	(3.411)	-0.05	(2.869)
HCE	Yes		Yes		Yes		Yes	
Relationship, 1976	Yes		Yes		Yes		Yes	
Background	Yes		Yes		Yes		Yes	
Fixed effects	Yes		Yes		Yes		Yes	
Education	Yes		Yes		Yes		Yes	
Observations	1225		980		1022		1166	
$R^2$	0.33		0.41		0.40		0.35	

*Note:* Robust standard errors. \*\*\*/\*\*/\* indicate statistical significance at the 1%/5%/10%-level. *HCE* consists of inductive, spatial and verbal ability scores, expected secondary education and time preferences. *Background* consists of father's education, mother's education, parity, siblings, dummy for working mother, dummy for grew up with both parents, father's occupation and annual taxable income of family breadwinner in year 1967 in 1000 DKK. Fixed effects consist of birth year and school fixed effects. *Education* contains categories of level and field of study.

Table A.10: Cumulative wages in mill. DKK (1980-2019), sample 2

<i>Variable</i>	Full sample		Ex. self-emp./ ass.		Ex. self.		Ex. ass.	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
<b>Desired family type</b>								
No family	-0.15	(0.801)	-0.04	(0.905)	0.01	(0.907)	0.08	(0.772)
Large family	-0.76*	(0.413)	-0.76*	(0.458)	-0.65	(0.445)	-0.80*	(0.424)
Don't know	-0.60	(1.001)	-1.34	(1.053)	-1.24	(1.061)	-0.57	(0.985)
<b>Family formation</b>								
Ever married	1.25*	(0.653)	1.75**	(0.694)	1.78***	(0.686)	1.20*	(0.653)
Excess kids	-0.21	(0.360)	-0.23	(0.389)	-0.29	(0.386)	-0.29	(0.342)
Constant	2.04	(3.372)	-0.19	(4.280)	0.07	(4.299)	1.26	(3.380)
HCE	Yes		Yes		Yes		Yes	
Relationship, 1976	Yes		Yes		Yes		Yes	
Background	Yes		Yes		Yes		Yes	
Fixed effects	Yes		Yes		Yes		Yes	
Education	Yes		Yes		Yes		Yes	
Observations	867		694		722		826	
$R^2$	0.35		0.46		0.45		0.36	

*Note:* Robust standard errors. \*\*\*/\*\*/\* indicate statistical significance at the 1%/5%/10%-level. *HCE* consists of inductive, spatial and verbal ability scores, expected secondary education and time preferences. *Background* consists of father's education, mother's education, parity, siblings, dummy for working mother, dummy for grew up with both parents, father's occupation and annual taxable income of family breadwinner in year 1967 in 1000 DKK. Fixed effects consist of birth year and school fixed effects. *Education* contains categories of level and field of study.

Table A.11: Cumulative wages in mill. DKK (1980-2019)

<i>Variable</i>	Sample 1				Sample 2			
	(1)		(2)		(3)		(4)	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
<b>Desired family type</b>								
No family	0.20	(0.616)	-0.26	(0.312)	-0.06	(0.711)	-0.06	(0.361)
Large family	-0.43	(0.316)	0.08	(0.160)	-0.50	(0.397)	0.03	(0.202)
Don't know	-0.52	(1.038)	-0.03	(0.525)	-0.50	(1.120)	0.06	(0.568)
<b>Family formation</b>								
Ever married	0.79	(0.503)	-0.04		0.96*	(0.575)	0.23	(0.292)
Excess children	-0.26	(0.236)	0.16		-0.13	(0.341)	-0.00	(0.173)
<b>Labor supply</b>								
1964-79	1.80***	(0.199)	-0.45***		1.79***	(0.275)	-0.58***	(0.150)
1976-2017			0.38***				0.41***	(0.009)
Constant	1.02	(5.145)	-2.26	(2.603)	3.73	(2.934)	3.08**	(1.487)
HCE	Yes		Yes		Yes		Yes	
Relationship, 1976	Yes		Yes		Yes		Yes	
Background	Yes		Yes		Yes		Yes	
Fixed effects	Yes		Yes		Yes		Yes	
Education	Yes		Yes		Yes		Yes	
Observations	1225		1225		867		867	
$R^2$	0.38		0.84		0.39		0.84	

*Note:* Robust standard errors. \*\*\*/\*\*/\* indicate statistical significance at the 1%/5%/10%-level. *HCE* consists of inductive, spatial and verbal ability scores, expected secondary education and time preferences. *Background* consists of father's education, mother's education, parity, siblings, dummy for working mother, dummy for grew up with both parents, father's occupation and annual taxable income of family breadwinner in year 1967 in 1000 DKK. Fixed effects consist of birth year and school fixed effects. *Education* contains categories of level and field of study.

Table A.12: Pre birth income(1980-2019), sample 2

<i>Variable</i>	(1)		(2)		(3)		(4)	
	Pre-birth							
	Avg. wages		Avg. wages*		Total wages**		Other Earnings	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
<b>Desired family type</b>								
No family	-0.04	(0.039)	-0.00	(0.000)	0.34	(0.573)	0.02	(0.026)
Large family	0.01	(0.019)	0.00	(0.000)	0.15	(0.253)	0.01	(0.010)
Don't know	0.11*	(0.064)	0.00**	(0.000)	1.29	(0.790)	0.00	(0.013)
<b>Family formation</b>								
Ever married	0.02	(0.029)	0.00	(0.000)	0.12	(0.375)	-0.00	(0.005)
Excess children	0.01	(0.018)	0.00	(0.000)	-0.27	(0.284)	-0.00	(0.013)
Constant	0.11	(0.131)	0.00	(0.000)	1.29	(2.275)	0.02	(0.046)
HCE	Yes		Yes		Yes		Yes	
Relationship, 1976	Yes		Yes		Yes		Yes	
Background	Yes		Yes		Yes		Yes	
Fixed effects	Yes		Yes		Yes		Yes	
Education	Yes		Yes		Yes		Yes	
Observations	341		337		341		341	
R2	0.58		0.59		0.70		0.49	

*Note:* Robust standard errors. \*\*\*/\*\*/\* indicate statistical significance at the 1%/5%/10%-level. *HCE* consists of inductive, spatial and verbal ability scores, expected secondary education and time preferences. *Background* consists of father's education, mother's education, parity, siblings, dummy for working mother, dummy for grew up with both parents, father's occupation and annual taxable income of family breadwinner in year 1967 in 1000 DKK. Fixed effects consist of birth year and school fixed effects. *Education* contains categories of level and field of study.\* Annual wages in years with participation. \*\*Total earnings consist of wages and other labor market earnings.



Table A.13: Post birth income(1980-2019), sample 2

<i>Variable</i>	(1)		(2)		(3)		(4)		(5)	
	Avg. wages		Avg. wages		Total wages		Earnings		Total earnings**	
	Non-pension years	Participation years	All years	All years	All years	All years	All years	All years	All years	All years
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
<b>Desired family type</b>										
No family	0.01	(0.030)	0.00	(0.024)	0.13	(1.100)	-0.39	(0.415)	1.16	(1.213)
Large family	-0.02	(0.012)	-0.01	(0.009)	-0.75*	(0.433)	0.56***	(0.207)	-0.83*	(0.514)
Don't know	0.02	(0.032)	0.00	(0.024)	1.09	(1.093)	-0.70	(0.473)	-0.01	(1.024)
<b>Family formation</b>										
Ever married	-0.13	(0.642)	-0.20	(0.647)	-0.01	(1.315)	-1.04	(1.402)		
Excess children	-0.01	(0.012)	-0.01	(0.010)	-0.21	(0.455)	0.29	(0.222)	-0.33**	(0.480)
Constant	0.26***	(0.094)	0.29***	(0.068)	7.45**	(3.307)	4.08***	(2.051)	7.93	(3.749)
HCE	Yes		Yes		Yes		Yes		Yes	
Relationship, 1976	Yes		Yes		Yes		Yes		Yes	
Background	Yes		Yes		Yes		Yes		Yes	
Fixed effects	Yes		Yes		Yes		Yes		Yes	
Education	Yes		Yes		Yes		Yes		Yes	
Observations	726		723		726		726		582	
$R^2$	0.41		0.46		0.37		0.49		0.46	

*Note:* Robust standard errors. \*\*\*/\*\*/\* indicate statistical significance at the 1%/5%/10%-level. *HCE* consists of inductive, spatial and verbal ability scores, expected secondary education and time preferences. *Background* consists of father's education, mother's education, parity, siblings, dummy for working mother, dummy for grew up with both parents, father's occupation and annual taxable income of family breadwinner in year 1967 in 1000 DKK. Fixed effects consist of birth year and school fixed effects. *Education* contains categories of level and field of study.\*\*Total earnings consist of wages and other labor market earnings. Note that for results in column (5) individuals, who were ever self-employed are excluded.

Table A.14: Educational attainment, sample 2

<i>Variable</i>	Upper Secondary				University degree			
	(1)		(2)		(3)		(4)	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
<b>Desired family type</b>								
No family	0.09*	(0.056)	-0.02	(0.060)	0.12**	(0.059)	0.03	(0.063)
Large family	0.06	(0.035)	0.00	(0.034)	0.09**	(0.038)	0.03	(0.038)
Don't know	0.55***	(0.088)	0.43**	(0.089)	0.37***	(0.096)	0.23**	(0.109)
Constant	0.26***	(0.020)	0.14**	(0.236)	0.39***	(0.022)	0.34	(0.223)
HCE*	No		Yes		No		Yes	
Relation, 1976	No		Yes		No		Yes	
Background	No		Yes		No		Yes	
Fixed effects	No		Yes		No		Yes	
Observations	867		867		867		867	
$R^2$	0.04		0.47		0.02		0.43	

*Note:* Robust standard errors in parentheses \*\*\*/\*\*/\* indicate statistical significance at the 1%/5%/10%-level. *HCE* consists of inductive, spatial and verbal ability score, expected secondary education and time preferences. *Background* consists of father's education, mother's education, parity, siblings, dummy for working mother, dummy for grew up with both parents, father's occupation and annual taxable income of family breadwinner in year 1967 in 1000 DKK. Fixed effects consist of birth year and school fixed effects.

Table A.15: Early career, sample 2

<i>Variable</i>	(1) Early Experience		(2) Age at 1st job >6m		(3) B1 before job entry		(4) Prefers housewife	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
<b>Desired family type</b>								
No family	-0.10	(0.082)	-1.31**	(0.565)	-0.01	(0.045)	-0.04	(0.032)
Large family	-0.13	(0.056)	-0.25	(0.369)	0.03	(0.030)	0.08***	(0.030)
Don't know	-0.09	(0.224)	1.86*	(1.044)	-0.04	(0.078)	0.00	(0.063)
Constant	-0.84	(0.583)	17.33***	(1.807)	0.37	(0.245)	0.29*	(0.169)
HCE	Yes		Yes		Yes		Yes	
Relation, 1976	Yes		Yes		Yes		Yes	
Background	Yes		Yes		Yes		Yes	
Fixed effects	Yes		Yes		Yes		Yes	
Education	Yes		Yes		Yes		Yes	
Observations	867		728		867		867	
R2	0.55		0.40		0.23		0.29	

*Note:* Robust standard errors in parentheses \*\*\*/\*\*/\* indicate statistical significance at the 1%/5%/10%-level. *Earnings potential* consists of inductive, spatial and verbal ability scores, expected secondary education and time preferences. *Background* consists of father's education, mother's education, parity, siblings, dummy for working mother, dummy for grew up with both parents, father's occupation and annual taxable income of family breadwinner in year 1967 in 1000 DKK. Fixed effects consist of birth year and school fixed effects. *Education* contains level and field of study.

Table A.16: Labor participation on desired family type, sample 2

<i>Variable</i>	(1) Participation		(2) Paid employment		(3) Self-empl.		(4) Ass. spouse	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
<b>Desired family type</b>								
No family	-0.87	(1.397)	-0.62	(1.444)	-0.16	(0.889)	-0.53	(0.330)
Large family	-0.99	(0.766)	-2.14**	(0.894)	0.74**	(0.347)	0.26	(0.273)
Don't know	-0.65	(1.867)	-0.56	(2.052)	0.46	(1.477)	-0.14	(0.265)
<b>Family formation</b>								
Excess kids	0.69	(0.560)	0.30	(0.701)	0.42	(0.425)	0.28	(0.221)
Ever married	2.85**	(1.200)	3.57***	(1.283)	-0.59	(0.707)	0.47*	(0.269)
Constant	9.46	(7.252)	2.83	(6.877)	6.23**	(3.033)	-0.12	(0.856)
Earnings potential	Yes		Yes		Yes		Yes	
Relationship, 1976	Yes		Yes		Yes		Yes	
Background	Yes		Yes		Yes		Yes	
Fixed effects	Yes		Yes		Yes		Yes	
Education	Yes		Yes		Yes		Yes	
Observations	867		867		867		867	
R <sup>2</sup>	0.28		0.33		0.33		0.34	

*Note:* Robust standard errors in parentheses \*\*\*/\*\*/\* indicate statistical significance at the 1%/5%/10%-level. *Earnings potential* consists of inductive, spatial and verbal ability score, expected secondary education and time preferences. *Background* consists of father's education, mother's education, parity, siblings, dummy for working mother, dummy for grew up with both parents, father's occupation and annual taxable income of family breadwinner in year 1967 in 1000 DKK. Fixed effects consist of birth year and school fixed effects. *Education* contains level and field of study. Years of participation from 1976-2019.

Table A.17: Labor force participation (1976-2017), sample 1

<i>Variable</i>	(1)		(2)	
	Participation Post-birth		Paid participation Post-birth	
	Coef.	SE	Coef.	SE
<b>Desired family type</b>				
No family	-2.88	(1.931)	-0.53	(2.153)
Large family	-0.90	(0.709)	-1.79**	(0.790)
Don't know	2.41	(1.817)	3.35*	(1.907)
<b>Family formation</b>				
Ever married	1.01	(1.247)	0.15	(1.342)
Excess children	0.07	(0.544)	-0.83	(0.628)
Constant	13.86*	(8.023)	10.59	(8.420)
HCE	Yes		Yes	
Relationship, 1976	Yes		Yes	
Background	Yes		Yes	
Fixed effects	Yes		Yes	
Education	Yes		Yes	
Observations	1084		1084	
$R^2$	0.24		0.25	

*Note:* Robust standard errors. \*\*\*/\*\*/\* indicate statistical significance at the 1%/5%/10%-level. *HCE* consists of inductive, spatial and verbal ability scores, expected secondary education and time preferences. *Background* consists of father's education, mother's education, parity, siblings, dummy for working mother, dummy for grew up with both parents, father's occupation and annual taxable income of family breadwinner in year 1967 in 1000 DKK. Fixed effects consist of birth year and school fixed effects. *Education* contains categories of level and field of study.

Table A.18: Labor supply, sample 2

<i>Variable</i>	(1)		(2)		(3)	
	Avg. hours/week (1976-2017)		Share w/ full time		Share w/ part time	
	Coef.	SE	Coef.	SE	Coef.	SE
<b>Desired family size</b>						
No family	-0.60	(1.275)	0.00	(0.044)	-0.03	(0.029)
Large family	-1.37*	(0.744)	-0.06**	(0.024)	0.03*	(0.017)
Don't know	-1.92	(1.880)	-0.10**	(0.049)	0.05	(0.034)
<b>Family formation</b>						
Ever married	1.93*	(1.101)	0.04	(0.034)	0.02	(0.024)
Excess kids	-0.39	(0.588)	-0.04*	(0.020)	0.04***	(0.014)
Constant	0.51	(5.636)	-0.13	(0.191)	0.22*	(0.125)
HCE	Yes		Yes		Yes	
Relationship, 1976	Yes		Yes		Yes	
Background	Yes		Yes		Yes	
Fixed effects	Yes		Yes		Yes	
Education	Yes		Yes		Yes	
Observations	867		867		867	
$R^2$	0.32		0.31		0.31	

*Note:* Robust standard errors in parentheses \*\*\*/\*\*/\* indicate statistical significance at the 1%/5%/10%-level. *Earnings potential* consists of inductive, spatial and verbal ability score, expected secondary education and time preferences. *Background* consists of father's education, mother's education, parity, siblings, dummy for working mother, dummy for grew up with both parents, father's occupation and annual taxable income of family breadwinner in year 1967 in 1000 DKK. Fixed effects consist of birth year and school fixed effects. *Education* contains level and field of study. Experience is cumulative employment degree and cumulative employment degree squared.

Table A.19: Pre-birth labor supply, sample 2

<i>Variable</i>	(1)		(2)	
	Full time		Part-time	
	Coef.	SE	Coef.	SE
<b>Desired family type</b>				
No family	-0.08	(0.075)	0.05	(0.067)
Large family	-0.01	(0.057)	-0.02	(0.050)
Don't know	-0.20	(0.134)	0.07	(0.138)
<b>Family formation</b>				
Ever married	0.08	(0.061)	0.05	(0.057)
Excess children	0.00	(0.046)	0.02	(0.045)
Constant	-0.09	(0.295)	0.37	(0.320)
HCE	Yes		Yes	
Relationship, 1976	Yes		Yes	
Background	Yes		Yes	
Fixed effects	Yes		Yes	
Education	Yes		Yes	
Observations	477		477	
$R^2$	0.50		0.45	

*Note:* Robust standard errors. \*\*\*/\*\*/\* indicate statistical significance at the 1%/5%/10%-level. *HCE* consists of inductive, spatial and verbal ability scores, expected secondary education and time preferences. *Background* consists of father's education, mother's education, parity, siblings, dummy for working mother, dummy for grew up with both parents, father's occupation and annual taxable income of family breadwinner in year 1967 in 1000 DKK. Fixed effects consist of birth year and school fixed effects. *Education* contains categories of level and field of study.

Table A.20: Flexible employment - prebirth

<i>Variable</i>	(1)		(2)		(3)		(4)	
	Sample 1				Sample 2			
	Pre-b1 Self-empl.		Pre-b1 Assisting		Pre-b1 Self-empl.		Pre-b1 Assisting	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
<b>Desired family type</b>								
No family	0.05	(0.035)	-0.00	(0.005)	0.06	(0.041)	-0.00	(0.007)
Large family	-0.01	(0.013)	0.00	(0.004)	-0.02	(0.019)	0.01	(0.006)
Don't know	0.11	(0.083)	-0.00	(0.006)	0.11	(0.084)	-0.00	(0.008)
<b>Family formation</b>								
Ever married	-0.03	(0.032)	0.00	(0.004)	-0.02	(0.036)	0.00	(0.007)
Excess kids	-0.02	(0.010)	0.00	(0.003)	-0.03	(0.018)	0.00	(0.005)
Constant	0.18**	(0.088)	-0.00	(0.010)	0.11	(0.135)	-0.00	(0.018)
HCE	Yes		Yes		Yes		Yes	
Relation, 1976	Yes		Yes		Yes		Yes	
Background	Yes		Yes		Yes		Yes	
Fixed effects	Yes		Yes		Yes		Yes	
Education	Yes		Yes		Yes		Yes	
Observations	1225		1225		867		867	
$R^2$	0.23		0.17		0.30		0.22	

*Note:* Robust standard errors in parentheses \*\*\*/\*\*/\* indicate statistical significance at the 1%/5%/10%-level. *Earnings potential* consists of inductive, spatial and verbal ability scores, expected secondary education and time preferences. *Background* consists of father's education, mother's education, parity, siblings, dummy for working mother, dummy for grew up with both parents, father's occupation and annual taxable income of family breadwinner in year 1967 in 1000 DKK. Fixed effects consist of birth year and school fixed effects. *Education* contains level and field of study.