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BELIEFS ABOUT MATERNAL LABOUR SUPPLY*

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We provide representative evidence on the perceived returns to maternal labour supply. A mother's decision to work is perceived to have sizeable impacts on child skills, family outcomes, and the mother's future labour market outcomes. Beliefs about the impact of additional household income can account for some, but not all, of the perceived positive effects. We further document labour supply intentions under different policy scenarios related to childcare availability and quality, two factors that are perceived as important. Finally, we show that perceived returns are predictive of labour supply intentions, over and above what can be explained by other factors.

JEL codes: I26, J13, J22

There are substantial gaps in earnings between men and women, which significantly widen upon the arrival of the first child, primarily because women reduce their labour supply after childbirth.[1] While the effect of parenthood on women's labour supply has been extensively documented, it is not well understood what drives maternal labour supply decisions. A mother's decision to work can have a range of different implications, not only for the labour market outcomes of the mother,

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[1] A large body of literature has documented the existence of, and potential reasons for, gender earnings inequality (see, e.g., Blau and Kahn, 2000; Olivetti and Petrongolo, 2016; 2017). Recent work highlights the importance of parenthood for the existence and persistence of gender inequality in the labour market (see, e.g., Angelov *et al.*, 2016; Kuziemko *et al.*, 2018; Kleven *et al.,* 2019a; Kleven *et al*., 2019b; Andresen and Nix, 2022).

but also for children's skills or family well-being. There is, however, a void in our knowledge of how individuals *perceive* the benefits and costs to this decision, which is surprising, given the role of beliefs for individual decision-making, which has been documented in a variety of other contexts.[2] In a context in which decisions are made dynamically, those beliefs may also have implications for other *ex ante* decisions, such as fertility choices, educational investments, or occupational choices (Adda *et al.*, 2017).

Our goal is to shed light on the following inter-related questions: (*i*) How do individuals, on average, perceive the returns to maternal labour supply for a typical German family, and what are the channels through which the effects are perceived to operate? Are beliefs about returns for the typical German family heterogeneous across the population, and which factors predict individual beliefs about returns? (*ii*) How do individuals perceive local constraints with regard to childcare availability and quality, and what are individual labour supply intentions under different policy scenarios? (*iii*) Can the beliefs we measure predict individual labour supply intentions over and above what can be predicted by other factors? To answer these questions, we design a novel survey that we administer to a representative sample of 4,000 childless adults in Germany between the ages of 18 and 45. Using hypothetical scenarios, we elicit perceived returns to maternal labour supply for a typical German family. Importantly, this approach allows us to (*i*) fix key characteristics of the family, (*ii*) specify the counterfactual to maternal time, and (*iii*) fix related decisions such as the father's labour supply decision or subsequent fertility decisions. The advantage of this methodology is that we can isolate the effect of interest—namely, the perceived impact of changes to maternal labour supply—while holding other factors constant. The data we collect allow us to examine how childless adults, on average, perceive the returns to maternal labour supply for a typical family in Germany—a context in which only a minority of mothers choose to work full-time, and a majority of the population endorses the norm that women should stay home or work part-time when they have young children. In addition to documenting perceptions about the returns to maternal labour supply for an average German family—which are likely to shape preferences for family and labour market policies[3]—we also examine whether the beliefs we measure predict individuals' own labour supply intentions. To the best of our knowledge, ours is the first paper to systematically study beliefs about the returns to maternal labour supply.

More specifically, using a set of realistic hypothetical scenarios featuring a specific hypothetical family for which we vary whether the mother stays at home, works part-time or full-time, we document how individuals perceive the impact of the mother working while her child is of preschool age on (*i*) child skills, (*ii*) family outcomes, and (*iii*) the future labour market outcomes of the mother. Maternal labour supply can affect child and family outcomes through two distinct channels. First, an increase in a mother's labour supply may reduce the amount of time she can dedicate to childcare and family responsibilities, which may directly impact child and family outcomes. Second, maternal labour supply usually results in higher household income, which can indirectly affect child and family outcomes, for example by enabling greater investment in educational resources, improved housing, or relocation to neighbourhoods with better opportunities. The goal of our study is to shed light on the perceived total effect of maternal

[2] See, e.g., Dominitz and Manski (1996), Manski (2004), Kaufmann and Pistaferri (2009), Jensen (2010), Attanasio and Kaufmann (2014), Wiswall and Zafar (2015; 2018; 2021), Giustinelli (2016), Boneva and Rauh (2018), Delavande and Zafar (2019) and Cunha *et al.* (2022).

[3] For instance, empirical studies on welfare (Gilens, 1999) and immigration (Alesina *et al.*, 2023) show that subjective beliefs about 'typical' welfare recipients, and the perceived effort, deservingness, or behaviour of those recipients, shape policy preferences.

labour supply, as well as the channels through which this effect is perceived to operate. For this purpose, we design two sets of vignettes that allow us to separately elicit (*i*) beliefs about the 'total effect' of maternal labour supply in the preschool years (vignettes A), and (*ii*) beliefs about the 'income effect', i.e., the effect stemming from changes to household income alone (vignettes B). Both sets of vignettes feature a 'typical' German family: a married couple who have a one-year-old child and average household income (before the birth of their child). In vignettes A, we exogenously vary whether the mother stays at home, works part-time (20 hours/week) or full-time (40 hours/week) while her child is 1–5 years old. In vignettes B, we only vary household income, while keeping maternal labour supply constant across the scenarios.

Our analyses of individual beliefs reveal several striking patterns. Child skills are perceived to increase with maternal labour supply, i.e., respondents on average believe that the child of this hypothetical family will acquire *more* skills if their mother works more and the child spends more time in childcare. The average perceived returns are sizeable. For example, the child is perceived to rank 17 percentiles higher in terms of their social skills relative to other children in Germany if their mother works part-time rather than not at all, and an additional 9 percentiles higher if the mother works full-time rather than part-time. A substantial share (but not all) of this positive effect is perceived to operate through the additional income that the household has available if the mother works more. When it comes to family outcomes, such as the satisfaction/well-being of the child or the quality of the mother–child relationship, a distinct picture emerges. All outcomes related to family satisfaction are perceived to improve if the mother works part-time rather than not at all, and deteriorate if the mother works full-time rather than part-time. This is despite the fact that these outcomes are perceived to improve as income rises. Turning to the perceived impact of maternal labour supply on the future labour market opportunities of the mother, we document that the perceived likelihood of the mother having a full-time job when the child enters school significantly increases with maternal work hours in the five preceding years. Moreover, hours worked when the child is of preschool age are perceived to have a convex impact on the future earnings of the mother. These average perceived returns mask a considerable degree of heterogeneity in perceived returns, which we explore further in our analyses. Consistent with socialisation playing a role in the formation of beliefs, we find that respondents whose own mother worked while they were young and respondents who attended school in East Germany perceive the returns to full-time relative to part-time work in terms of child skills and family outcomes as significantly higher.

Our second contribution is to provide evidence on maternal labour supply intentions, perceptions about childcare availability and quality, and the subjective impact of (the lack of) high-quality, full-time childcare on labour supply intentions. When asked to imagine a scenario in which they have a child, 67% of childless women (men) in our sample state that they (their partner) would intend to work part-time in the preschool years, while only 19% state that they (their partner) would intend to work full-time. These intentions are consistent with the fact that the respondents in our sample are on average rather pessimistic about the availability and quality of childcare in their local area. To study the perceived importance of childcare constraints, we additionally elicit maternal labour supply intentions in two policy scenarios, in which we progressively relax constraints related to the availability of full-time childcare (policy scenario 1), and childcare quality (policy scenario 2). When presented with policy scenario 2, in which we ask our survey participants to imagine a situation in which childcare is available full-time and is of high quality, the share of respondents preferring the full-time option more than doubles relative to the baseline. While these results emphasise the importance of the availability of full-time,

high-quality childcare, we note that even in this 'best case' scenario *only* 55% of our respondents prefer the maternal full-time work option, highlighting that other factors such as beliefs about returns are likely to be critical in this choice.

A natural question which emerges is whether the beliefs we elicit through our survey predict own labour supply intentions over and above what can be predicted by other factors. If respondents' beliefs about their own (private) returns and their beliefs about the average family's returns are positively correlated, and if respondents' decisions are contingent on their beliefs about their own returns, then we would expect a positive association between respondents' labour supply intentions and their perceptions of the returns to maternal labour supply for the average family. Our choice model estimates reveal that beliefs about returns for the average family are indeed predictive of individuals' own intended choices. For example, a perceived improvement in family outcomes by 10 percentile ranks in the part-time (full-time) scenario is associated with a 4.5 (3.9) percentage point increase in the probability that the respondent chooses the part-time (full-time) option.

In addition, we report on the results of a supplementary study in which we explore whether providing respondents with truthful information about the returns to mothers working can shift beliefs about returns and stated labour supply intentions. To study this question, we conduct a randomised information experiment on a second representative sample of 1,000 German adults without children, between the ages of 18 and 45. Our results reveal that providing respondents with information about the findings of a recently published article (Nicoletti *et al.*, 2023) shifts beliefs about returns for the average family, as well as own labour supply intentions. While these treatment effects may be short-lived, they are suggestive of the fact that beliefs are malleable, and that labour supply decisions are contingent on individual beliefs about (population) returns. Whether or not informational interventions can affect the actual labour supply of mothers is a question that future research should address.

This paper builds on and contributes to several strands of the literature. First, it contributes to the extensive literature on the determinants of female labour supply decisions, which dates back to Mincer (1962) and Becker (1965), who first considered the trade-off between housework and paid work. Recent research has, for example, examined the role of childcare and different public policies in determining women's labour supply decisions (Del Boca and Wetzels, 2010; Olivetti and Petrongolo, 2017). A large literature has also explored the relationship between (perceived) cultural norms and female employment (e.g., Fortin, 2005; Fernandez and Fogli, 2009; Bursztyn *et al.*, 2017; Nicoletti *et al.*, 2018; Cavapozzi *et al.*, 2021; Boelmann *et al.* 2025).[4] Our study most closely relates to work by Kuziemko *et al.* (2018) and Gong *et al.* (2022), which studies the anticipated employment effects of motherhood, and to work by Schrenker (2023), which examines subjective expectations about the impact of working a different number of hours on hourly wages. Our study is also related to recent work by Costa-Ramón *et al.* (2024), who show that mothers are largely inattentive to the long-term financial consequences of reduced work hours, and demonstrate that providing individualised information about these costs increases demand for financial planning and leads to higher labour supply.

Second, we contribute to the growing literature studying beliefs and decision-making. Beliefs have been shown to be important for a range of different decisions such as consumption or financial investment decisions (e.g., Kaufmann and Pistaferri, 2009; Armantier *et al.*, 2015),

[4] As part of this growing literature, Bursztyn *et al.* (2020), Grewenig *et al.* (2020), Bursztyn *et al.* (2023), Boneva *et al.* (2024) and Cortés *et al.* (2024) utilise survey data to provide novel evidence on misperceptions regarding gender norms and their role in shaping attitudes towards work and gender policies.

students' decisions to obtain further schooling (e.g., Dominitz and Manski, 1996; Jensen, 2010; Attanasio and Kaufmann, 2014; Almås *et al.*, 2016; Bleemer and Zafar, 2018; Belfield *et al.*, 2020; Boneva and Rauh, 2020; Boneva *et al.*, 2022), students' choice of major, high-school track, or university (e.g., Zafar, 2013; Wiswall and Zafar, 2015; 2018; 2021; Giustinelli, 2016; Delavande and Zafar, 2019), and human capital investment decisions made by parents (e.g., Boneva and Rauh, 2018; Cunha *et al.*, 2022). We build on this literature and study beliefs about returns to a different choice, namely maternal labour supply.

The remainder of the paper is structured as follows. Section 1 provides details on the survey design, while Section 2 presents information on the sample and context. Section 3 presents the evidence on beliefs about returns to maternal labour supply for a hypothetical (average) family. Section 4 documents perceptions about local constraints, as well as individual labour supply intentions under different policy scenarios. Section 5 explores which individual-level determinants predict labour supply intentions. Section 6 provides supplementary evidence from a survey experiment. Section 7 concludes, discussing avenues for future work.

1. Survey Design

The main objectives of this research study are three-fold. First, we aim to document how individuals perceive the returns to maternal labour supply for a typical German family on a range of different outcomes, and we aim to shed light on the channels through which the effects are perceived to operate. Second, our goal is to explore perceptions about local constraints to maternal labour supply, and to document individual labour supply intentions under different policy scenarios related to childcare availability and quality. Third, we aim to examine whether the perceived returns we elicit can predict own labour supply intentions, over and above what can be predicted by other factors. To achieve these objectives, we design a novel survey that we administer to a representative sample of 4,000 German adults without children. We deliberately choose to survey a sample of childless adults, as this limits concerns related to *ex post* rationalisation.[5] The survey is divided into different survey blocks, described in detail below in the order in which they were presented to respondents. Online Appendix D presents the exact wording of the survey questions.

1.1. *Beliefs About Returns for a Hypothetical (Average) Family*

In this section, we describe how we design our survey in order to elicit perceived returns to maternal labour supply for a 'typical' German family. Our primary objective is to measure the perceived impact of maternal labour supply in the preschool period on (*i*) child skills, (*ii*) family outcomes, and (*iii*) the future labour market outcomes of the mother. Using a set of realistic hypothetical scenarios, we elicit respondents' beliefs about the returns to hours worked on these outcomes for a 'typical' German family, for which we fix certain related decisions (including the counterfactual to maternal time) and which has certain pre-specified characteristics (e.g., average household income before the birth of the child). As our study is the first to systematically measure beliefs about returns to maternal labour supply, we chose to measure beliefs about returns for a typical German family, not only because it provides a natural starting point, but

[5] In fact, in a previous version of the study, we surveyed both childless adults and adults with children. We note that the patterns of perceived returns were extremely similar across these two subgroups. To limit concerns related to *ex post* rationalisation, we redesigned our sampling strategy and now focus our study exclusively on childless adults. An interesting avenue for future research is to explore belief updating, which would require panel data.

also because these beliefs are likely to shape preferences for family and labour market policies. Moreover, the primary advantage of using a specific hypothetical family is that many factors can be held constant, thereby allowing us to measure the object of interest. For example, to isolate the perceived impact of maternal labour supply, it is essential to keep other decisions fixed, such as the labour supply of the father or subsequent fertility choices, which may respond endogenously and directly affect the outcomes. A second key advantage lies in our ability to specify other aspects, such as the counterfactual to maternal time being the child's attendance in formal childcare, which facilitates the interpretation of our results. A third advantage of eliciting beliefs about the same object is that it allows for a more straightforward interpretation of the differences in perceived returns across subgroups. By holding many important aspects of the hypothetical situation fixed (such as subsequent fertility decisions or the counterfactual to maternal time), we can avoid confounding the effect stemming from differences in information sets with the effect stemming from (perceived) differences in these other decisions across subgroups.

While our main objective is to elicit perceived returns to maternal labour supply for an average German family, a secondary objective is to explore the channels through which child skills and family outcomes are perceived to be affected. Conceptually, there are two channels through which maternal labour supply can affect child skills and family outcomes. On the one hand, an increase in the mother's labour supply may lead to a decrease in the time she has available to care for her child and family. This 'direct effect' of maternal labour supply on child and family outcomes may be positive or negative, depending on whether the mother's time is more or less productive than the counterfactual of formal childcare.[6] On the other hand, an increase in maternal labour supply is likely to result in higher household income, which may indirectly influence child and family outcomes, e.g., through changes in the amount of money spent on educational resources or a move to a better neighbourhood ('income effect').

To shed light on the perceived returns to maternal labour supply for a 'typical' German family, as well as the channels through which the effects are perceived to operate, we design two sets of vignettes that allow us to separately elicit (*i*) beliefs about the 'total effect' of maternal labour supply in the preschool years (vignettes A), and (*ii*) beliefs about the 'income effect', i.e., the effect stemming from changes to household income alone (vignettes B). Vignettes A are presented to about three-quarters of randomly selected study participants, while vignettes B are presented to the remaining quarter of respondents.[7] The two sets of vignettes feature the same hypothetical family, a typical German couple with average household earnings and one child. Many aspects are intentionally kept constant across vignette types A and B to facilitate comparisons across the two sets of scenarios. Each set of vignettes features three hypothetical scenarios (see Table 1), which vary in the mother's labour supply and corresponding household income (vignettes A) or household income only (vignettes B). We elicit beliefs about returns to these scenarios for a range of different outcomes (see Table 2). All design features are explained in detail below.

[6] In this study, we examine beliefs about the impact of maternal labour supply on a range of child and family outcomes, where the alternative to spending time with the mother is for the child to attend formal childcare. We chose to specify this counterfactual as most children of working mothers in our setting attend formal childcare. In Germany, only a small fraction of grandparents provide regular informal childcare to working mothers (Garcia-Moran and Kuehn, 2017).

[7] We randomise a larger share of respondents to vignette type A, as the main goal of our analysis is to study beliefs about the total effect of maternal labour supply and examine how those beliefs relate to maternal labour supply intentions. We deliberately decided not to present the participants with both types of vignettes, as this would have considerably increased the length and complexity of the survey. As a result, we cannot directly infer beliefs about the direct returns to maternal labour supply/attending formal childcare at the individual level.

Table 1. *Overview of Hypothetical Scenarios.*

	Mother	Father	Household income
Vignettes A			
Scenario 1	Stays home (€0)	Works full-time (€40k)	€40k gross/year
Scenario 2	Works part-time (€20k)	Works full-time (€40k)	€60k gross/year
Scenario 3	Works full-time (€40k)	Works full-time (€40k)	€80k gross/year
Vignettes B			
Scenario 1	Stays home (€0)	Works full-time (€40k)	€40k gross/year
Scenario 2	Stays home (€0)	Works full-time (€60k)	€60k gross/year
Scenario 3	Stays home (€0)	Works full-time (€80k)	€80k gross/year

Notes: This table illustrates the key features of each of the three scenarios in the two versions of the vignettes. Columns 1 and 2 present information on the labour supply and annual gross earnings (in brackets) of the mother and the father, respectively, while column 3 displays the total household income of the family in the scenarios. Vignettes A are designed to elicit beliefs about the total effect of maternal labour supply in the preschool period, while vignettes B are designed to elicit beliefs about the income effect.

Table 2. *Overview of Outcomes.*

Outcomes	Scale
Child skills	
Vocabulary	Relative rank
Intelligence	(0–100)
Concentration	
Work independently	
Social skills	
Family outcomes	
Satisfaction child	Relative rank
Satisfaction mother	(0–100)
Satisfaction father	
Mother–child relationship	
Mother–father relationship	
*Maternal labour market outcomes**	
Probability full-time job (age 36)	Probability (0–100%)
Earnings (age 36)	Euro
Earnings (age 42)	Euro

Notes: This table provides an overview of the three sets of outcomes and their corresponding scales: child skills, family outcomes and maternal labour market outcomes. *Perceived maternal labour market outcomes are only elicited in vignettes A.

Hypothetical family: Both sets of vignettes feature an average married couple living in Germany. The two spouses, Sarah and Michael, are described as being 30 years old and having a one-year-old child. The following additional information is provided about the spouses: before the birth of their child, they were both working full-time and each of them earned €38,000 gross/year.[8] During the 12 months following the birth of their child, the father kept working full-time and earned €38,000 gross in that year, while the mother was on maternity leave. We further specify that the family does not want to have additional children, the mother wants to return to work after the 12 months of maternity leave, and household expenditure decisions are taken jointly.

[8] This level of earnings corresponds to the average earnings of respondents to the GSOEP around the age of 30, without children and working full-time.

Vignettes A: The first set of vignettes is designed to elicit the perceived *total effect* of maternal labour supply on the outcomes of interest for a 'typical' hypothetical (average) family.[9] Respondents are presented with the information that places in childcare centres are limited and that it is decided by chance which of the three scenarios the family finds themselves in while the child is 1–5 years old (see Table 1). In Scenario 1, the family cannot get access to childcare, the mother stays at home and has zero earnings. In scenario 2, the family gets access to childcare for half the day, the mother works part-time (20 hours/week) and earns €20,000 gross/year. In scenario 3, the family gets access to childcare for the full day, the mother works full-time (40 hours/week) and earns €40,000 gross/year. In all three scenarios, the father works full-time (40 hours/week) and earns €40,000 gross/year. To highlight the differences across the scenarios, this information is additionally presented in a table, which displays the hours worked by the father and mother, maternal and paternal income, as well as total household income for each of the three scenarios.[10]

Vignettes B: The second set of vignettes is designed to elicit beliefs about the *income effect*, i.e., the perceived effect of additional household income per se. Again, it is explained that places in childcare centres are limited. This time respondents are presented with the information that the family cannot get access to childcare, and that the mother stays at home and earns nothing while her child is 1–5 years old. To introduce plausibly random variation in household income, it is stated that a different employer opens a new subsidiary close to where the family lives, and it is decided by chance whether the father is offered a job that pays €40,000 gross/year (scenario 1), €60,000 (scenario 2) gross/year, or €80,000 gross/year (scenario 3). The jobs are described as otherwise identical and it is stated explicitly that in all three scenarios the father changes jobs and works 40 hours/week for the new employer. Once the scenarios have been described, respondents view a summary screen with a table illustrating the differences in parental hours worked, parental income, as well as total household income. Notice that in both vignette types A and B, household income is €40,000 gross/year in scenario 1, €60,000 gross/year in scenario 2, and €80,000 gross/year in scenario 3. A comparison of responses across vignettes allows us to study how the perceived total effect of maternal labour supply, i.e., the composite effect of additional income and a different allocation of maternal time, compares to the perceived effect of additional income only.[11]

Perceived outcomes: We elicit individual beliefs about a set of different outcomes (see Table 2). The choice of variables is motivated by existing studies documenting the impact of maternal labour supply on a range of child and family outcomes (see, e.g., Kottelenberg and Lehrer, 2017; Felfe and Lalive, 2018), as well as the future labour market opportunities of the mother (see, e.g., Blundell *et al.*, 2016). First, we elicit beliefs about five child skills at the time when the child enters school, namely the child's (*i*) vocabulary, (*ii*) intelligence, (*iii*) ability to concentrate, (*iv*) ability

[9] For the sake of brevity, we refer to the perceived returns elicited for this specific, typical German family with average earnings before child birth as the 'perceived returns for an average German family'.

[10] We deliberately ask respondents to imagine that the mother wants to return to work, that she would work while the child is in childcare, and that it is decided by chance which of the three scenarios the family finds themselves in. Fixing ideas about the intentions of the mother allows us to ensure that respondents are not making inferences about the mother (or the child) from the choice she is making. For simplicity, we vary maternal labour supply for the entire preschool period.

[11] In both types of vignettes respondents are asked to assume that household expenditure decisions are taken jointly. When comparing responses across vignette types, we implicitly assume that the within-household distribution of income does not affect people's perceptions about the returns to household income. Understanding whether the within-household distribution of income matters for perceived returns to household income is beyond the scope of this paper, but an interesting question for future work. Related research indicates that unexpected financial windfalls may affect men's and women's family formation outcomes differently, with distinct impacts on their likelihood of marriage, divorce, and having children (Cesarini *et al.*, 2023).

to work independently, and (*v*) social skills. Second, we elicit beliefs about five family outcomes, namely (*i*) the satisfaction of the child, (*ii*) the satisfaction of the mother, (*iii*) the satisfaction of the father, (*iv*) the quality of the mother–child relationship, and (*v*) the quality of the mother–father relationship. Finally, we elicit beliefs about maternal labour market outcomes. We proceed in two steps. First, we ask respondents to assume that Sarah *wants to return to full-time work* when her child enters school (i.e., when she is 36 years old), and we ask respondents to state how likely they think it is that she will have a full-time job at age 36, in each of the three scenarios. We deliberately ask respondents to assume that the mother wants to work full-time, as our aim is to capture perceptions about changes in employment prospects that are not driven by differences in beliefs about whether the mother actually has a preference for working full-time.[12] Second, we ask respondents to assume that Sarah works full-time from the age of 36, and we ask respondents to state what they think Sarah is likely to earn gross per year at the ages of 36 and 42, in each of the three scenarios.[13] Respondents who are presented with vignettes A are asked the full set of questions. Respondents who are presented with vignettes B are only asked about child and family outcomes, since the mother's labour supply is constant across the three scenarios in vignettes B.

Scale: A challenge with eliciting beliefs about child and family outcomes is that these outcomes are of a non-pecuniary nature and do not have a natural metric. We propose a method that allows us to obtain quantitative, interpersonally comparable measures. First, we anchor beliefs about the outcomes in scenario 1.[14] More specifically, respondents are told that if one compared the child/family to all other children/families in Germany, the child/family would have average outcomes in scenario 1, i.e., they would have a rank of '50'. Second, we ask respondents to indicate how they believe that the child/family would rank relative to other children/families in Germany in scenarios 2 and 3 on a scale from '0' to '100'.[15] By comparing responses across scenarios, we can infer the perceived changes in percentile ranks. Beliefs about the probability of having a full-time job at the age of 36 are elicited on a 0–100% chance scale, while beliefs about maternal earnings at the ages of 36 and 42 (conditional on working full-time) are captured by the perceived gross annual earnings of the mother (in euros).[16] By comparing beliefs across scenarios, we can infer individual beliefs about the labour market returns to the mother working part- or full-time while the child is 1–5 years old.

1.2. *Perceived Local Constraints and Labour Supply Intentions*

The second main objective of our study is to provide evidence on perceived local constraints to maternal labour supply, and to document individual labour supply intentions under different

[12] We note that studying beliefs about whether a mother's preference for full-time work may change as a result of spending more time with her child is an interesting avenue for future work.

[13] Respondents are further asked to assume there is no inflation.

[14] Anchoring beliefs about the non-pecuniary child and family outcomes in scenario 1 has the advantage that we can elicit perceived percentile rank changes relative to a pre-defined benchmark that is the same across all respondents. We acknowledge that by setting the rank of the child and family outcomes in scenario 1 to 50 for all respondents, we are only able to identify the perceived returns to maternal labour supply at one particular point of the distribution of child/family outcomes (i.e., at the median). Moreover, as a result of this design choice, the possible effects of part-time or full-time work (relative to no work) can only range between −50 and +50.

[15] To ease comprehension, we provide explanations of the scale. See Online Appendix D for the exact wording.

[16] For simplicity, we do not model the father's labour supply or elicit beliefs about paternal earnings. Instead, we state that the father keeps working full-time and earns €45,000 gross/year at the age of 36 and €50,000 gross/year at the age of 42. We also did not elicit beliefs about the variance in the mother's earnings, as this would have substantially increased the complexity and length of the survey.

policy scenarios related to childcare availability and quality. In the following, we describe how we design the survey questions to elicit this information from respondents.

Perceived local constraints: To elicit individual perceptions about local childcare constraints, we ask respondents to imagine a hypothetical family with a one-year-old child living in their neighbourhood. First, we ask respondents to state how likely they think it is that the family would be able to find an available place at a childcare centre. Second, we ask respondents to imagine that the family obtains access to childcare and elicit individual perceptions about (*i*) the likelihood of the childcare centre being open full day (08:00–17:00), and (*ii*) the likelihood of the childcare centre being of high quality. We specify that we consider a childcare centre to be of high quality if the teachers lovingly care for the children and if the children-to-teacher ratio does not exceed three. All three responses are elicited on a 0–100% chance scale.

Labour supply intentions: To measure labour supply intentions, we ask respondents to imagine that they had a one-year-old child and we ask women (men) what they (their partner) would most likely do while their child is 1–5 years old ('not work', 'work part-time', 'work full-time'). In addition, we are interested in the (perceived) impact of different policies affecting the availability and quality of childcare on labour supply intentions. For this purpose, we ask two additional questions. In particular, we ask women (men) what they (their partner) would most likely do while their child is 1–5 years old if (*i*) full-time childcare was available (policy scenario 1), and (*ii*) if full-time childcare was available and the childcare was of high quality (policy scenario 2).[17] By comparing individual responses in these two 'policy scenarios' to the benchmark case in which individuals are not explicitly asked to make any further assumptions about the availability or quality of childcare, we can gain insights into how intended labour supply choices might be affected if such policies were implemented.

1.3. *Additional Individual-Level Determinants*

To study individual-level heterogeneity, we further collect information on the following individual-specific factors.

Background characteristics: We collect detailed information on respondents' background characteristics including their age, gender, and highest level of education. We further elicit information on whether the respondent is married, has a migration background, is religious, and whether the respondent's own mother worked while they were 1–5 years old. We further obtain information on the current federal state of residence, as well as on the federal state in which the respondent went to school (if the respondent went to school in Germany).

Perceived social norms: To obtain information on perceived social norms, we ask respondents to imagine that they have a child. We ask women (men) to state what they think their family and friends would approve of most if full-time childcare was abundant: that they (their partner) work(s) part-time, full-time, or not at all while their child is 1–5 years old. We elicit perceptions of the friends' and families' opinions in a scenario in which full-time childcare is abundant because otherwise beliefs about other people's approval might be conflated with views on the feasibility of the different options.

Perceived childcare costs: To elicit the perceived local costs of childcare, we ask respondents to think about a family with average household income living in their neighbourhood. We then

[17] Again, we specify that we consider a childcare centre to be of high quality if the teachers lovingly care for the children and if the children-to-teacher ratio does not exceed three.

ask respondents to provide their best available estimate of how much this family has to pay for a full-day place in childcare (including food) for their one-year-old child.

2. Data and Context

2.1. *Sample*

We collect primary survey data for a large representative sample of childless German adults. The sample comprises 4,000 respondents aged 18–45 who do not have children. The data were collected in collaboration with the professional survey company Pureprofile during March–May 2022. All respondents were part of the company's online panel and participated in the survey online.[18] The median time to complete the survey was 13 minutes. We screened out participants who did not pass an attention check or completed the survey in less than five minutes. We used a stratified sampling approach to ensure that the sample represents the German population of interest in terms of gender, education, and federal states. Online Appendix Table A.1 presents the characteristics of our sample and provides a comparison to a nationally representative sample from the 2019 German Socioeconomic Panel (GSOEP). The distribution of demographic characteristics in our sample closely matches the distribution in the nationally representative sample.

2.2. *German Context*

Germany provides an ideal setting to study maternal labour supply as there is a substantial degree of variation in mothers' labour supply decisions. According to recent employment statistics, about 36% of mothers work full-time, 37% work part-time, and 27% stay at home to care for their family.[19] Consistent with these statistics, gender-conservative views are still prevalent in German society, although Germany is not an outlier in the international context.[20] There is also substantial variation in maternal labour supply across regions within Germany, partly driven by the historical differences in family, labour market, and childcare policies between the German Democratic Republic (GDR) and the Federal Republic of Germany (see, e.g., Krueger and Pischke, 1992; Klammer *et al.*, 2005; Domscheit-Berg, 2016; Boelmann *et al.* 2025). In East Germany, full-time employment of women was strongly encouraged through a range of different policies such as generous maternity leave arrangements and the provision of full-time childcare for children of all ages. In West Germany, the state promoted traditional gender roles through policies such as joint income taxation, and the provision of public childcare was extremely limited. To this day, substantial differences remain in maternal labour supply, the percentage of children attending childcare, and the availability of childcare, despite the fact that childcare costs are negligible and all children above the age of one technically have the legal right to a place in

[18] The survey was scripted in the online survey software Qualtrics. Respondents received modest incentives for completing the survey.

[19] The figures refer to the labour supply of mothers with at least one child aged 0–14. Source: OECD Family Database (Organisation for Economic Co-operation and Development, 2019b). See Online Appendix Figure A.1 for an international comparison.

[20] Online Appendix Figures A.2 and A.3 use data from the 2012 wave of the International Social Survey Programme (ISSP Research Group, 2016) to provide an international comparison of attitudes towards maternal labour supply. Online Appendix Figure A.2 displays the percentage of respondents who believe women should stay at home or work part-time (a) when there is a child under school age and (b) after the youngest child starts school. Online Appendix Figure A.3 displays the percentage of respondents agreeing or strongly agreeing with the two statements 'A preschool child is likely to suffer if his or her mother works' and 'All in all, family life suffers when the woman has a full-time job'.

childcare.[21] In practice, due to a lack of public investment and staff shortages, not all families with young children can be offered a place in daycare. Recent estimates suggest that in 2023 there were 384,000 fewer places in daycare than would have been necessary to meet the demand (Bertelsmann Stiftung, 2022).

3. Evidence on Beliefs About Returns for a Hypothetical (Average) Family

The primary goal of our study is to investigate how respondents perceive the returns to maternal labour supply for a typical German family. We begin by examining the average perceived returns to maternal labour supply on child skills and family outcomes (Section 3.1). In this section, we do, not only present evidence on the perceived total effect of maternal labour supply, but we also explore how individuals perceive the impact of additional household income alone. This additional analysis allows us to shed some light on the mechanisms through which the effects are perceived to operate. Next, we analyse the average perceived impact of maternal labour supply on the mother's future labour market outcomes (Section 3.2). Lastly, we explore the heterogeneity in perceived returns and study which individual-level factors predict beliefs about returns (Section 3.3).

3.1. *Child Skills and Family Outcomes*

The survey data allow us to examine how individuals perceive the returns to maternal labour supply and household income (for an average hypothetical family) on child skills and family outcomes. Let $b^v_{i,j,k}$ denote respondent i's belief about outcome k in scenario j and vignette type $v \in (A, B)$. For each vignette type and outcome, we calculate the individual perceived return to scenario 2 relative to scenario 1 (i.e., $b^v_{i,2,k} - 50$), and the individual perceived return to scenario 3 relative to scenario 2 (i.e., $b^v_{i,3,k} - b^v_{i,2,k}$).[22] For vignettes A, the former represents the perceived return to part-time relative to no work, while the latter represents the perceived return to full-time relative to part-time work.[23] For vignettes B, the former corresponds to the perceived return to €60,000 of household income relative to €40,000, while the latter corresponds to the perceived return to €80,000 relative to €60,000. Figure 1 illustrates the perceived returns for all child and family outcomes k, averaged across respondents.[24] The dark bars depict the average perceived returns to part-time work (Scenario 2) relative to no work (Scenario 1) in Figure 1(a), panel A, and (b), panel A, and full-time work (Scenario 3) relative to part-time work (Scenario 2) in Figure 1(a), panel B, and (b), panel B. The light bars display the average perceived returns to a household income of €60,000 (Scenario 2) relative to €40,000 (Scenario 1) in Figure 1(a), panel A, and (b), panel A, and €80,000 (Scenario 3) relative to €60,000 (Scenario 2) in Figure 1(a), panel B, and (b), panel B. Put differently, while the dark bars illustrate the average perceived

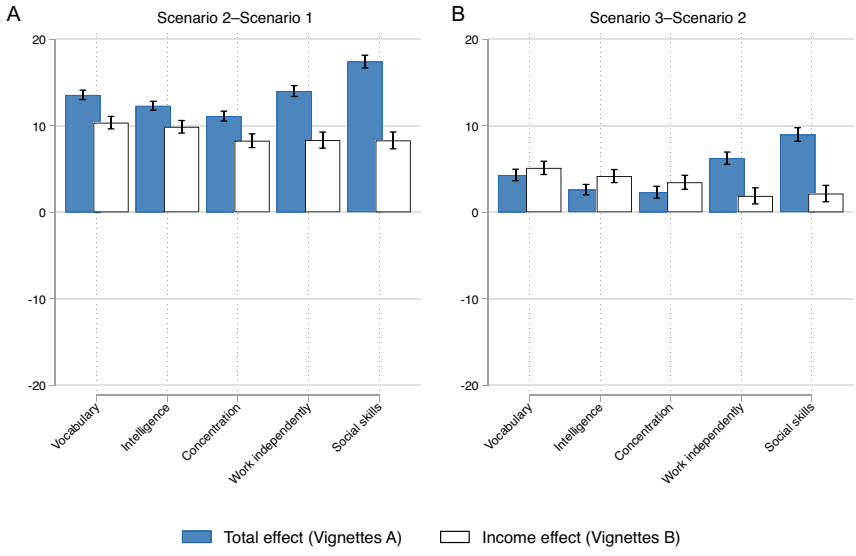
[21] Online Appendix Figure A.4 presents a comparison of childcare costs across countries, showing that they are the second lowest in Germany compared to other OECD countries (Organisation for economic Co-operation and Development, 2019a).

[22] As explained above, we anchor beliefs in scenario 1 to the value of 50 for all respondents.

[23] When interpreting the results of our study, we implicitly assume that the quality of the childcare centre the family has access to is not affected by whether this particular family receives a place in the childcare centre for half the day or the full day.

[24] Online Appendix Table A.2 presents the average responses to the different hypothetical scenarios in vignette type A (left) and vignette type B (right) for all child and family outcomes.

(a) Child outcomes



(b) Family outcomes

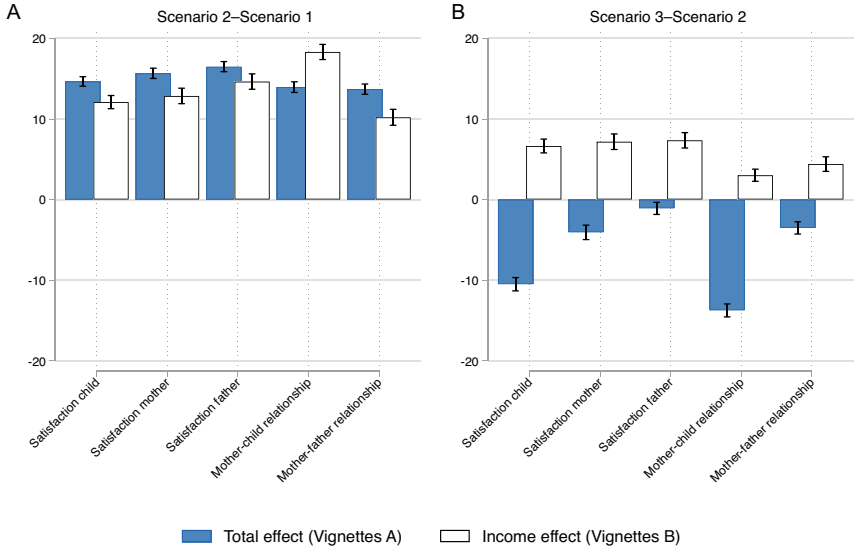


Fig. 1. *Average Perceived Returns—Child and Family Outcomes.*
Notes: This figure illustrates the average perceived returns for the five child outcomes (a) and the five family outcomes (b). The dark bars depict the average perceived returns to part-time (Scenario 2) relative to no work (Scenario 1) in panels A, and full-time (Scenario 3) relative to part-time work (Scenario 2) in panels B. The light bars display the average perceived returns to a household income of €60,000 (Scenario 2) relative to €40,000 (Scenario 1) in (a) panel A and (b) panel A; and €80,000 (scenario 3) relative to €60,000 (scenario 2) in (a) panel B and (b) panel B. The perceived total effects (dark bars) are calculated from responses to vignettes A, while the perceived income effects (light bars) are calculated from responses to vignettes B. The thin bars represent the 95% confidence intervals.

total effect of maternal labour supply, the light bars illustrate the average perceived effect that stems from additional household income per se (i.e., the *income effect*).

How do individuals perceive the total returns to the mother (in this typical German family) working part-time or full-time? Strikingly, we find that for *all* child skills and family outcomes that we measure, respondents on average believe that the child and family *fare significantly better* if the mother works part-time rather than not at all (Figure 1(a), panel A, and (b), panel A, dark bars).The magnitudes of the perceived effects are sizeable and range between 11 and 17 percentile ranks for child skills and between 13 and 17 percentile ranks for family outcomes. The highest perceived return that we document is for the child's social skills: the child is perceived to rank 17 percentile ranks higher if the mother works part-time and the child attends childcare for half the day than if the mother does not work and the child stays with the mother. A different pattern emerges when we examine average perceived returns to full-time relative to part-time work (dark bars, Figure 1(a), panel B, and (b), panel B). On average, respondents believe that all five child skills improve even further, although the returns are now more muted and only range between 2 and 9 percentile ranks. By contrast, for all five family outcomes, we document that the average perceived returns are significantly *negative*, ranging between −1 and −14 percentile ranks. The strongest negative impacts can be found for the satisfaction of the child, which is perceived to worsen by 11 percentile ranks if the mother works full-time rather than part-time, and the quality of the mother–child relationship, which is expected to deteriorate by 14 percentile ranks.

Turning to the perceived returns to income alone (light bars), we document that the average perceived returns to a household income of €60,000 relative to €40,000 (Figure 1(a), panel A, and (b), panel A) are significantly positive for all child skills and family outcomes, which is also true for the average perceived return to €80,000 relative to €60,000 (Figure 1(a), panel B, and (b), panel B), albeit to a smaller extent. A comparison between the perceived total effect (dark bars) and the perceived income effect (light bars) yields several insights. The average perceived return to €60,000 relative to €40,000 is sizeable, but significantly smaller, than the average perceived return to the mother working part-time for nine of the ten outcomes, suggesting that the direct effect stemming from changes in labour supply (i.e., the mother's time allocation) alone is perceived to be positive for those outcomes.[25] This is not the case for the mother–child relationship, for which the perceived return to the additional €20,000 is perceived as significantly higher than the return to the mother working part-time (and earning €20,000 more), indicating that the perceived direct effect stemming from changes in maternal labour supply is negative. When comparing the average perceived return to €80,000 relative to €60,000 with the average perceived return to full-time relative to part-time work, we find that the average perceived return to additional income alone is significantly higher for seven of the ten outcomes.[26] The most striking difference can be seen for the perceived returns to full-time work on family outcomes: while respondents on average think that the family will fare *better* if household income is €20,000 higher, respondents believe that the family will fare substantially *worse* if the mother works full-time rather than part-time to earn this additional income. Put differently, the perceived direct impacts stemming from changes to the allocation of maternal time must be so large and

[25] Results are based on a two-sided *t*-test of difference in means, with a 10% significance level.

[26] Results are based on a two-sided *t*-test of difference in means, with a 10% significance level. We did not detect significant differences between the perceived total effect and the perceived income effect for the child's vocabulary skills. For the child's social skills and the child's ability to work independently, the perceived income effect is significantly smaller than the perceived total effect.

negative that they are perceived to more than offset the perceived positive impacts of additional income.

Are beliefs about returns on average correct? While estimating the causal returns to maternal labour supply lies beyond the scope of this paper, the patterns we document echo findings from the prior literature that has examined the impacts of maternal labour supply on child development. For example, our respondents perceive maternal work hours to have a positive effect on child skills, and they perceive the indirect effect of income as making up a significant share of the perceived total effect. This is consistent with results from Nicoletti *et al.* (2023), who examine the impact of maternal labour supply on child development in the context of Norway, and find an overall positive effect that is almost entirely driven by a sizeable and positive impact of additional household income.[27] An interesting avenue for future work is to examine the channels through which increases in household income (are perceived to) affect child outcomes.[28]

3.2. *Maternal Labour Market Outcomes*

We follow a similar procedure to calculate the perceived return to maternal labour supply in terms of the future labour market outcomes of the mother we describe in the hypothetical scenarios. Following the same notation as above, the individual perceived return to scenario 2 relative to scenario 1 is calculated as $(b^A_{i,2,k} - b^A_{i,1,k})$, while the individual perceived return to scenario 3 relative to scenario 2 is calculated as $(b^A_{i,3,k} - b^A_{i,2,k})$.[29] Figure 2 shows the average perceived returns to part-time relative to no work (a) and full-time relative to part-time work (b).[30] The average perceived likelihood of the mother having a full-time job at the age of 36 increases by 22 percentage points if she worked part-time rather than not at all in the five preceding years (from a baseline of 42%), and it further increases by 20 percentage points if she worked full-time rather than part-time. Given that we explicitly asked respondents to assume that the mother wants to work full-time at age 36, these results cannot be explained by differences in beliefs about the mother's preference for working full-time across the three scenarios.[31]

We now turn to the beliefs about maternal earnings at the ages of 36 and 42, assuming that the mother returns to full-time work from the age of 36 onward. On average, respondents expect the mother to earn €31,557 when she returns to full-time work at the age of 36 if she stayed home with her child in the five preceding years.[32] She is perceived to earn approximately €6,900 (+21.9%)

[27] In both Germany and Norway the counterfactual to a mother's time tends to be subsidised, formal childcare. Whether or not the results generalise to other countries in which childcare is more expensive or of poorer quality is an open question. We also note that, while not directly comparable to our study, existing evidence on the causal impact of universal childcare programmes on child outcomes is mixed (see, for example, Baker *et al.*, 2008; 2019; Havnes and Mogstad, 2011; Felfe *et al.*, 2015; Carta and Rizzica, 2018; Felfe and Lalive, 2018).

[28] The literature has identified different channels through which additional income can affect child outcomes, e.g., through higher investments in children (Carneiro and Ginja, 2016), a move to a different neighbourhood with better schools, or access to different peers/networks (Chetty *et al.*, 2014; 2016; 2022a,b; Nicoletti *et al.*, 2023). It is also conceivable that additional household income leads to an improvement in parental mental health and parenting practices.

[29] Note that we do not anchor beliefs in scenario 1 to any specific value and we only elicit maternal labour market outcomes for vignette type A.

[30] Online Appendix Table A.3 shows the average responses to the questions in table form.

[31] We note that our survey design does not allow us to explore in more detail *why* respondents perceive the employment probabilities to differ across the three scenarios. Perceived differences may, for example, be driven by differences in perceptions about the probability of receiving any job offer for a full-time job, as well as differences in the perceived likelihood of the mother accepting a specific wage offer for a full-time job, which may differ across the scenarios (e.g., due to human capital depreciation or employer discrimination).

[32] Consistent with a model in which human capital depreciates when the mother is not working, this average value is *lower* than the earnings of the mother before the birth of her child (€38,000).

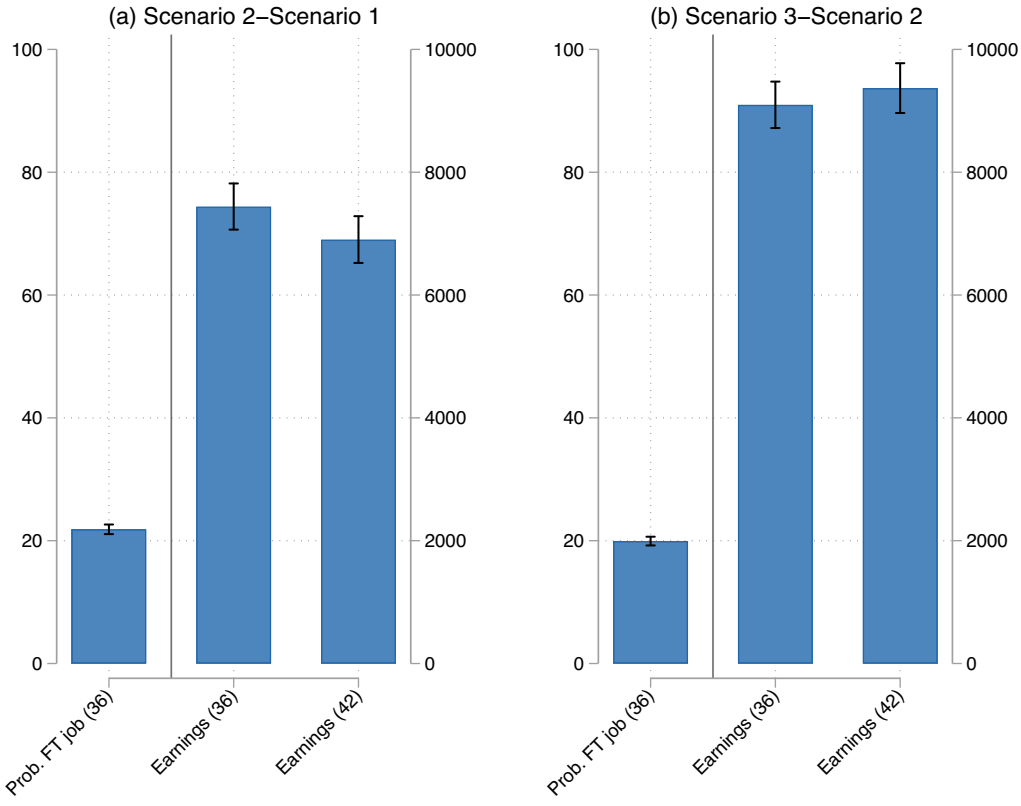


Fig. 2. *Average Perceived Returns—Maternal Labour Market Outcomes.*
Notes: This figure illustrates the average perceived returns for the three maternal labour market outcomes. The bars depict the average perceived returns to part-time (Scenario 2) relative to no work (Scenario 1) in panel (a) and full-time (Scenario 3) relative to part-time work (Scenario 2) in panel (b). The three outcomes are the mother's probability of being able to return to full-time work at the age of 36, and the mother's earnings at the ages of 36 and 42. These perceived total effects are calculated from responses to vignettes A. The thin bars represent the 95% confidence intervals.

more at that age if she worked part-time rather than not at all while her child was young, and an additional €9,369 (+29.7%) more if she worked full-time rather than part-time. In other words, the perceived part-time penalty is positive, but lower than the penalty of not working at all. These patterns are consistent with prior literature showing that there are sizeable differences in the accumulation of experience between part- and full-time work, and that returns to hours worked are convex (Francesconi, 2002; Blundell *et al.*, 2016). How do respondents perceive the impact on the trajectory of earnings? At the age of 42, the mother is expected to earn €34,877 if she stayed home to look after her child. This average value is perceived to be €7,437 (+21.3%) higher if the mother worked part-time and is perceived to further increase by €9,116 (+26.1%) if she worked full-time. While the penalties at the age of 42 are perceived as similar in absolute terms compared to the penalties at the age of 36, they are perceived to decrease in percentage terms as average earnings rise over the life cycle.

3.3. *Heterogeneity in Beliefs About Returns*

Having documented the average perceived returns to maternal labour supply for the hypothetical (average) German family, we now turn to the heterogeneity in individual beliefs. Given that all respondents were presented with the exact same hypothetical situations, which allows us to fix the counterfactual to maternal time, as well as other important related decisions, we can document individual-level heterogeneity about the same object of interest. First, we note that the average perceived returns that we document in our study mask a considerable degree of heterogeneity. For the child and family outcomes, Online Appendix Figures A.5 and A.6 display the distribution of perceived returns for vignettes A and B, respectively. Not only is the variance in perceived returns sizeable, but a non-negligible share of respondents perceive the returns as negative (positive) even when the average perceived returns are positive (negative).[33] With regard to the perceived impact on the mother's future labour market outcomes, there is also a considerable degree of heterogeneity in individual perceived returns (see Online Appendix Figure A.7).

A natural question that arises is how those beliefs are shaped or formed. Arguably, socialisation during childhood is likely to be important in the process of belief formation. While we cannot provide a definite answer to the question of how beliefs are shaped, we show that beliefs about returns are associated with the respondents' own mothers' labour supply while they were young, as well as the cultural context in which they were raised.

For the purpose of this analysis, we first construct a composite measure of perceived child skills for each individual i and scenario j, c_{ij}, by taking the average of the five perceived child skills we elicit in each respective scenario (see Table 2). Similarly, we construct a composite measure of perceived family outcomes for each individual i and scenario j, f_{ij}, by taking the average of the five perceived family outcomes in each scenario. For each individual i, the composite measures of individual perceived returns in terms of child skills and family outcomes are then calculated as $r^c_{i2} = (c_{i3} - c_{i2})$ and $r^f_{i2} = (f_{i3} - f_{i2})$ for the returns to full-time work (relative to part-time work), and as $r^c_{i1} = (c_{i2} - c_{i1})$ and $r^f_{i1} = (f_{i2} - f_{i1})$ for the returns to part-time work (relative to no work). We choose this approach to mitigate concerns related to measurement error, and to ease the interpretation of the results.[34] For maternal earnings, we first calculate the expected earnings of the mother at the age of 36 for each individual i and scenario j, y_{ij}, as the product of the perceived likelihood of having a full-time job and the expected annual earnings (conditional on having a full-time job) at the age of 36. For each individual i, the perceived returns to full-time work (relative to part-time work) and the perceived returns to part-time work (relative to no work) are then calculated as $r^y_{i2} = (y_{i3} - y_{i2})$ and $r^y_{i1} = (y_{i2} - y_{i1})$, respectively.

Using these composite measures of individual perceived returns, we then explore which individual-level factors predict beliefs about returns to maternal labour supply for an average hypothetical family. We first regress the three resulting measures that capture beliefs about the returns to full-time relative to part-time work on (*i*) two binary variables indicating whether the respondent's own mother worked mostly full-time or part-time while they were 1–5 years old, (*ii*) a binary variable indicating whether the respondent went to school in West Germany, and (*iii*) a range of respondent background characteristics (i.e., gender, age, university education, marital

[33] Online Appendix Table A.4 presents the share of respondents perceiving the returns as strictly positive.

[34] The returns in terms of the different child/family outcomes are generally quite strongly correlated within the same category (i.e., within the category of child skills and within the category of family outcomes). Online Appendix Tables A.5 and A.6 show the Spearman rank correlations between all returns in terms of child, family and maternal labour market outcomes that we elicit, for returns to part-time work relative to no work, and full-time work relative to part-time work, respectively.

Table 3. *Predictors of Perceived Returns (Full-Time Minus Part-Time).*

	Panel A: Returns			Panel B: Positive returns		
	Child skills	Family outcomes	Earnings age 36	Child skills	Family outcomes	Earnings age 36
Mother working FT	2.334***	3.571***	−0.051	0.074***	0.099***	−0.017
	(0.72)	(0.83)	(0.65)	(0.02)	(0.02)	(0.01)
Mother working PT	0.729	1.778**	−0.754	0.021	0.038*	−0.021*
	(0.64)	(0.74)	(0.56)	(0.02)	(0.02)	(0.01)
West	−2.622***	−3.020***	−0.046	−0.032	−0.070***	0.005
	(0.66)	(0.80)	(0.63)	(0.02)	(0.02)	(0.01)
Female	1.104**	−3.967***	2.717***	0.017	−0.118***	0.058***
	(0.55)	(0.64)	(0.48)	(0.02)	(0.02)	(0.01)
Age	−0.085**	0.177***	−0.074**	−0.001	0.003**	0.000
	(0.04)	(0.04)	(0.04)	(0.00)	(0.00)	(0.00)
University degree	−1.082*	−0.728	1.152**	−0.007	−0.042**	0.041***
	(0.64)	(0.71)	(0.53)	(0.02)	(0.02)	(0.01)
Married	0.457	1.811**	−0.814	0.004	0.096***	−0.052***
	(0.84)	(0.90)	(0.72)	(0.03)	(0.03)	(0.02)
Migrant background	0.584	−0.739	−1.133*	−0.007	−0.032	−0.030**
	(0.70)	(0.78)	(0.62)	(0.02)	(0.02)	(0.01)
Religious	−0.824	−0.383	−1.523***	−0.047**	0.039**	−0.036***
	(0.63)	(0.73)	(0.56)	(0.02)	(0.02)	(0.01)
Observations	2,872	2,872	2,915	2,872	2,872	2,915
R^2	0.018	0.045	0.022	0.009	0.045	0.030
Mean dep. variable	4.881	−6.638	15.200	0.670	0.350	0.915

Notes: The dependent variables in Panel A are returns to maternal full-time work relative to part-time work (vignettes A) in terms of a measure of child skills composed of the mean of the five skills (column 1), a measure of family outcomes composed of the mean of the five outcomes (column 2) and the expected maternal earnings at age 36 in thousands of euro (column 3). The dependent variables in Panel B are binary indicators for strictly positive returns. The composite measures are calculated by averaging the difference in the five child or family outcomes we measure, between the scenario where the mother works full-time and the scenario where she works part-time. Both composite measures of returns can range from −100 to 100. Returns in terms of maternal earnings at age 36 are calculated as probabilised earnings at age 36 under the full-time work scenario, minus the corresponding figure for the part-time work scenario. Probabilised earnings are the perceived probability that the mother will be able to work full-time at age 36 times the expected earnings at that age when working full-time. 'Mother working FT' and 'Mother working PT' are indicators capturing whether the respondent's mother predominantly worked full-time or part-time while they were aged 1–5. 'West' indicates whether the respondents went to school in former West Germany. 'Female' indicates whether the respondent is female. Age is measured in years. 'University' indicates whether the respondent has completed university education. 'Married' indicates whether the respondent is married. 'Migrant background' indicates whether the respondent has at least one parent born outside of Germany. 'Religious' indicates whether religion is important to the respondent. Robust standard errors are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

status, migrant background and religiosity). The results are presented in Panel A of Table 3 and reveal some striking patterns. The perceived returns to full-time relative to part-time work on child and family outcomes are perceived as significantly larger if the respondent's own mother worked full-time and they are perceived as significantly smaller if the respondent was raised in West Germany.[35] We find little association between the other background variables and the perceived earnings returns to full-time work. In Panel B, we show that respondents whose mothers worked full-time while they were young and respondents who were raised in East Germany are more likely to perceive the returns to full-time work on child and family outcomes as positive.[36]

[35] Online Appendix Table A.7 presents results on the determinants of perceived returns to part-time work relative to not working. Respondents whose mothers worked part-time while they were young perceive the returns to the extensive margin of labour supply as significantly higher.

[36] Conversely, we find no significant association between perceived returns to household income alone and the labour supply of respondents' mothers or the area in which the respondents grew up—see Online Appendix Table A.8.

These results are consistent with socialisation playing a role in the formation of beliefs. Turning to other background characteristics, we find that women perceive the returns to full-time work in terms of child outcomes as significantly higher than men, but the opposite is true for returns to maternal labour supply in terms of family outcomes. Furthermore, female respondents also perceive the earnings returns to working full-time as higher than men. Respondents who hold a university degree perceive the returns to full-time relative to part-time work on child and family outcomes as lower than participants without university education.

Arguably, individual perceived returns to maternal labour supply/childcare attendance for the hypothetical average family are likely to be associated with the quality of the daycare the hypothetical family is perceived to have access to. More specifically, we would expect a positive association between the perceived (average) quality of daycare and the returns to maternal labour supply on child and family outcomes. While we did not elicit beliefs about the perceived quality of daycare the hypothetical family has access to, we note that respondents' perceptions about local childcare quality positively predict the perceived returns to full-time (relative to part-time) work on child and family outcomes. Moreover, we note that the results reported in Table 3 are robust to controlling for perceived childcare quality in the local area (see Online Appendix Table A.9).

4. Evidence on Perceived Local Constraints and Labour Supply Intentions

Having examined how individuals perceive the returns to maternal labour supply for an average family, we now turn to the second set of questions we set out to answer. More specifically, we are interested in how respondents perceive the availability and quality of childcare in their neighbourhood, which is a question we explore in Section 4.1. Whether or not relieving these constraints can impact stated labour supply intentions is a question we turn to in Section 4.2.

4.1. *Perceived Availability and Quality of Childcare*

Figure 3 documents how individuals perceive the probability that a family living in their neighbourhood would find childcare for their one-year-old child (a), as well as how individuals perceive the likelihood of the childcare centre being open full day (b) and being of high quality (c). Overall, respondents' views are rather pessimistic. While there is considerable heterogeneity in individual responses, the average perceived likelihood of finding a place in childcare is only 58%. Conditional on childcare being available, the perceived likelihood of the childcare centre being open full day is 54%, while the perceived likelihood of it being of high quality is 55%. Taken together, the average perceived likelihood of finding daycare that is open full day is 31%, which is the same as the average perceived likelihood of finding high-quality daycare. We further note that, on average, respondents perceive the average cost of childcare (including the cost of meals) to be low (approximately €350 per month).

4.2. *Labour Supply Intentions Under Different Policy Scenarios*

To study maternal labour supply intentions, we ask women (men) what they (their partner) would most likely do while their child is 1–5 years old. Figure 4 shows the distribution of individual responses to this question ('Baseline'). Two-thirds of respondents state that they (their partner) would work part-time. Only 19% of respondents report that they (their partner) would work full-time, while the remaining 14% state that they (their partner) would stay at home. To shed light

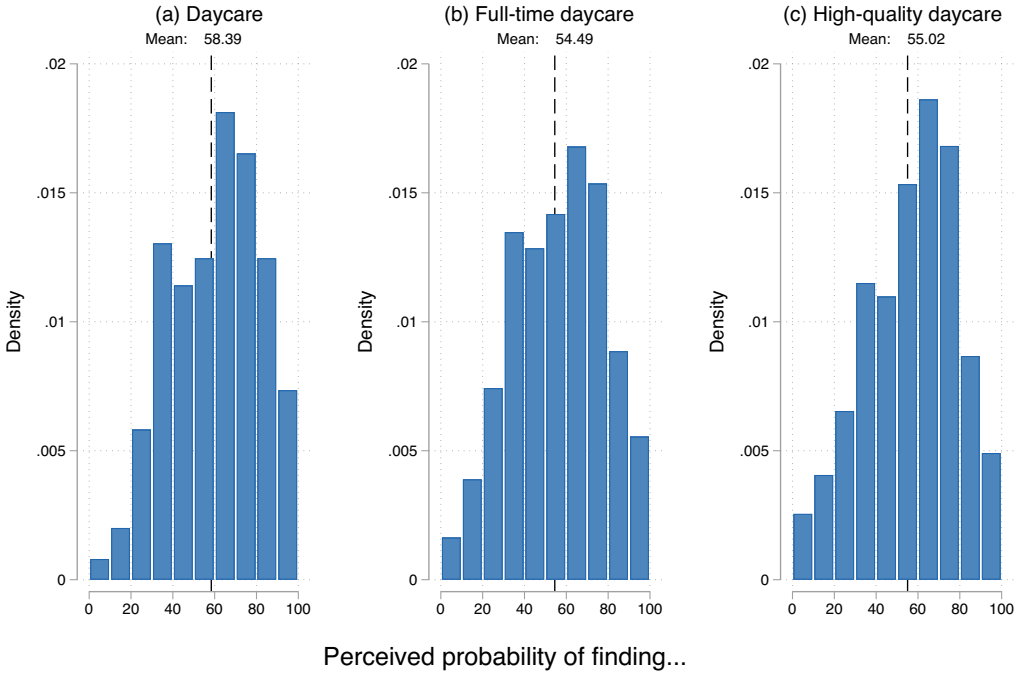


Fig. 3. *Distribution of Perceived Constraints to Childcare.*
Notes: The graphs illustrate the distribution of the perceived probability that a family with a one-year-old child living in the same neighbourhood as the respondent would get access to childcare (a), and, conditionally on having access, that the childcare would be available for the full day (b) or of high quality (c).

on the perceived importance of childcare constraints, we then ask respondents what they (their partner) would most likely do if (*i*) full-time childcare was abundant (policy scenario 1), and (*ii*) if full-time childcare was abundant *and* of high quality (policy scenario 2). The differences in responses are striking. When presented with policy scenario 1 ('Full-day childcare'), the share of respondents preferring the full-time option rises by nearly 24 percentage points, and it rises further by an additional 12 percentage points in policy scenario 2 ('Full-day and high-quality childcare'). Put differently, the share of respondents stating that they or the mother of their child would most likely work full-time increases from 19% to 55%, which corresponds to a 2.8-fold increase. Remarkably, we find qualitatively and quantitatively similar results if we separately examine the responses of women about their own labour supply intentions under the different policy scenarios or the responses of men about the likely labour supply of their partners (see Online Appendix Figure A.8). For this reason, we do not present the results separately by gender in the remaining analyses.

The large increase in willingness to work full-time once childcare constraints are relaxed has implications for public policy, as it highlights the importance of the availability of full-time, high-quality childcare for maternal labour supply decisions. At the same time, it is noteworthy that even when respondents are asked to imagine abundant high-quality childcare that is open full day, the share of respondents stating that they or the mother of their child would work full-time

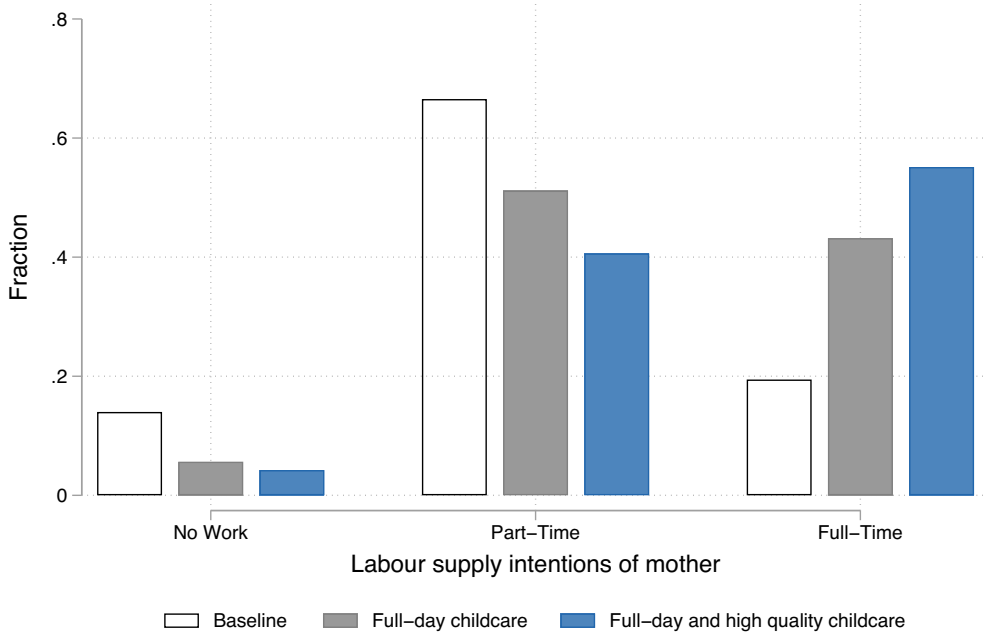


Fig. 4. *Maternal Labour Supply Intentions and Policy Scenarios.*
Notes: This figure shows the distribution of maternal labour supply intentions for the baseline case, the policy scenario in which full-day childcare is available, and the policy scenario in which childcare is available and of high quality.

is still *only* 55%. This result points to the importance of other factors in the choice, such as perceptions about the benefits and costs to maternal labour supply or beliefs about social norms.

5. Individual-Level Determinants of Labour Supply Intentions

In this section, we explore whether beliefs about returns to maternal labour supply for the average family, which is the object of interest in this study, can predict own labour supply intentions, over and above what can be predicted by other factors. We first discuss the distinction between self-beliefs and beliefs for the average family, and then provide empirical evidence on the link between the beliefs we elicit in this study and respondents' own labour supply intentions.

5.1. *Self-Beliefs and Beliefs About a Hypothetical Average Family*

There is an important distinction between individual beliefs about returns to maternal labour supply for a hypothetical average family and beliefs about returns as they pertain to the individuals themselves (self-beliefs). Let the individual perceived returns for the hypothetical average family be denoted as $r_i = \{r_{ik}^o \mid o \in \{c, f, y\} \wedge k \in \{1, 2\}\}$. Theoretically, the link between these beliefs,

which we measure in our study, and the corresponding self-beliefs, r_i^{self}, can be written as:[37]

$$r_i^{self} = f(\mathbf{X_i}, \Omega_\mathbf{i}),$$

where $f(.)$ is a function which maps individual i's demographic characteristics, $\boldsymbol{X_i}$, and individual i's information set, $\boldsymbol{\Omega_i}$, to self-beliefs. An individual's information set may contain both self (private) information, such as the individual's perception of their skill to impart knowledge on their child, information about the (local) quality of childcare, as well as the individual's perception of the returns to maternal labour supply for the average family (i.e., r_i). We note that individual beliefs about returns for the hypothetical average family may differ from the actual returns to maternal labour supply for this type of family because the information set about these returns may vary across individuals. Relatedly, respondents may hold different beliefs about the returns for the average family as they perceive the (average) quality of daycare in Germany as different.

While the direction of the relationship between self-beliefs and beliefs for the average family is ambiguous a priori, prior empirical research has demonstrated that there is a strong positive relationship between self-beliefs and population beliefs in other contexts (e.g., Wiswall and Zafar, 2015; Bleemer and Zafar, 2018).[38] These empirical findings led us to hypothesise that self-beliefs and beliefs for the average family are also likely to be positively associated in our setting. While we cannot provide direct evidence on the association between self-beliefs and beliefs for the average family, we can test whether beliefs for the average family are associated with own labour supply intentions. If (*i*) beliefs for the average family and self-beliefs are positively associated, and (*ii*) decision-making is contingent on one's self-beliefs, then one would expect to find a positive association between own labour supply intentions and beliefs about returns to maternal labour supply for the average family. Whether or not the individual beliefs we measure predict own labour supply intentions is an empirical question, to which we turn in the next section.

5.2. *Choice Model Estimation*

We estimate two separate multinomial probit choice models, where the choice of interest is the labour supply decision that an individual states that they (or their partner) would make (*i*) in the baseline scenario, and (*ii*) the scenario in which full-time childcare is available.[39] In both choice models, individual i can choose between $J = 3$ alternatives: not working ($l_i = 1$), working part-time ($l_i = 2$) or working full-time ($l_i = 3$) while the child is 1–5 years old.[40] Let the utility that individual i derives from choosing alternative j, $u_{ij} = u(l_i = j)$, be a linear, additive function of perceived outcomes, perceived adherence to social norms, perceived costs, and individual background characteristics:

$$u_{ij} = \alpha_j + \beta_1 c_{ij} + \beta_2 f_{ij} + \gamma y_{ij} + \delta s_{ij} + \lambda_j p_i + \xi_j X_i + \varepsilon_{ij}.$$

[37] The exposition in this section closely follows Bleemer and Zafar (2018) who study self-beliefs and population beliefs about the returns to a college degree.

[38] For example, in the context of educational decisions, Wiswall and Zafar (2015) and Bleemer and Zafar (2018) show that there is a strong positive association between self-beliefs and population beliefs, and that providing individuals with objective information on population returns leads to a revision in self-beliefs and (expected) educational choices.

[39] We do not estimate a choice model for labour supply intentions under the scenario in which childcare is available full-time and of high quality because we did not elicit beliefs for a scenario in which the available childcare is of high quality.

[40] For both male and female respondents, we study what predicts respondents' views about what the *mother* of the child would most likely do in these hypothetical situations.

Table 4. *Choice Model Estimating Maternal Employment Intentions.*

	Baseline	Full-time childcare
Child skills	0.2990	0.6398***
	(0.2265)	(0.2317)
Family outcomes	1.8938***	1.6438***
	(0.2651)	(0.2649)
Maternal earnings (36)	−0.0016	0.0047**
	(0.0020)	(0.0021)
Family's opinion	0.3377***	0.3799***
	(0.0474)	(0.0484)
Friends' opinion	0.1842***	0.3700***
	(0.0491)	(0.0546)
Observations	2,873	2,873
Controls	Yes	Yes

Notes: The table presents the estimates of multinomial probit choice models. The dependent variables are the intended labour supply choices of the mother in the baseline scenario (column 1) and in the policy scenario where full-time daycare was available (column 2). 'Child skills' is a composite measure constructed by averaging the five perceived child outcomes, separately for each alternative j, and dividing by 100. 'Family outcomes' is a composite measure constructed in an analogous way by averaging the five family outcomes that we elicit and then dividing by 100, separately for each alternative j. Therefore, 'Child skills' and 'Family outcomes' can range from 0 to 1 for part- and full-time scenarios and by construction are 0.5 for the no-work scenario. Given work scenario j from age 30 to 35, 'Maternal earnings (36)' are computed as the expected earnings divided by 1,000 and multiplied by the perceived probability of working full-time at age 36. Controls include perceived costs of full-time childcare, age and binary indicators for being a woman, having a university degree, being married and living in East Germany. Standard errors are in parenthesis. ** $p < 0.05$, *** $p < 0.01$.

α_j represents the alternative-specific constant. c_{ij} and f_{ij} are the composite measures of child and family outcomes, while y_{ij} are the expected maternal earnings at age 36, as perceived by individual i in scenario j.[41] s_{ij} is a vector with two dummy variables that equal 1 if individual i thinks choice j coincides with what their family and friends would approve of most, p_i are the perceived local costs of childcare, and X_i are individual background characteristics (age, gender, university education, marital status, region of residence).[42] ε_{ij} is the error, which has a multivariate normal distribution with mean zero and variance-covariance matrix Σ.[43] Following the standard approach in the literature, individual i selects alternative j to maximise the utility derived from their choice, u_{ij}. The probability that individual i will choose alternative j can then be written as: $Pr(i chooses j) = Pr(u_{ik} \leq u_{ij}) \forall k \neq j$.[44]

The results of the choice model estimation are presented in Table 4. Column 1 displays the results for a model where the dependent variable is the choice that individuals state they would make under the baseline scenario. Column 2 presents the results for a model in which the

[41] See Section 3.3 for a description of how those variables are constructed from the respondents' replies.

[42] Online Appendix Table A.10 shows results from a model where we additionally include as a control a dummy for whether choice j coincides with the labour supply decision of the respondent's own mother when the respondent was growing up, and the respondent's perceived probability of finding a childcare spot in their local area. All conclusions remain qualitatively and quantitatively unchanged.

[43] The multinomial probit choice model allows for correlated errors via the variance–covariance matrix Σ, rather than—for instance—a conditional logit model, which assumes independence. This is important to accommodate the idea that preferences for part- and full-time work relative to not working might be correlated.

[44] Neither all coefficients nor all entries of the variance–covariance matrix Σ are identifiable. The model requires normalisation because both the location (level) and the scale of the utilities are irrelevant. See Online Appendix B for more technical details, including information on the normalisation and estimation approach used.

dependent variable is the choice that individuals state they would make in the policy scenario in which full-time childcare is available. Focusing on the results in column 1, we find that the perceived family outcomes (for the average hypothetical family) significantly predict own intended labour supply in the baseline scenario, over and above what can be predicted by other factors, while perceived child skills and maternal earnings are not predictive of individual intentions.[45] The estimated marginal effects for family outcomes are sizeable. A perceived improvement in family outcomes by 10 percentile ranks in the part-time (full-time) scenario is associated with a 4.5 (3.9) percentage point increase in the probability that the respondent chooses the part-time (full-time) option.[46] Consistent with the results from the previous literature, we also find that perceived adherence to social norms positively predicts intended labour supply: for example, if the respondents' family is perceived to approve of the part-time (full-time) option most, this is associated with an 8.0 (6.9) percentage point increase in the probability that the respondent chooses that option.[47]

Turning to the results presented in column 2, in which we relax constraints related to full-time childcare availability, we find that *all* perceived outcomes that we measure are significant predictors of labour supply intentions under this policy scenarios. Not only are perceived family outcomes significantly related to choices, but so are perceived child skills and perceived maternal earnings.[48] Focusing on the results from the choice model estimated in column 2, when we calculate the marginal effects we find that an improvement in child skills by 10 percentile ranks in the part-time (full-time) scenario is associated with a 1.4 (1.5) percentage point increase in the probability that the respondent chooses the part-time (full-time) option when full-time childcare is available. A perceived improvement in family outcomes by 10 percentile ranks in the part-time (full-time) scenario is associated with a 3.7 (3.9) percentage point higher probability that the respondent chooses the part-time (full-time) option. For maternal earnings, we find that a €10,000 increase in expected earnings of the mother at the age of 36 in the part-time (full-time) scenario is associated with a 1.0 (1.1) percentage point increase in the probability that the respondent will choose the part-time (full-time) option.

To facilitate the interpretation of the coefficients from the choice model, we can further make a back-of-the-envelope calculation of respondents' willingness to pay (WTP) for an improvement in child skills and family outcomes by comparing the coefficients associated with those outcomes to the coefficient for maternal earnings at the age of 36.[49] We find that respondents' willingness

[45] The in-sample McFadden's Pseudo R^2 (McFadden, 1974) of the model presented in column 1 is 0.143, suggesting a reasonable fit. Online Appendix Figure A.9 also shows the out-of-sample performance of the same model trained on 70% of the sample. The ROC-AUC (receiver operating characteristic-area under the curve), a widely accepted performance measure for predictive power (Fawcett, 2006), is 0.90, suggesting a strong out-of-sample predictive performance of the model.

[46] See Online Appendix Figure A.10 for a graphical representation of the marginal effects of the alternative-specific variables on intended choices.

[47] When asked about the perceived approval of their family members, 46% (41%) state that they think they would obtain the highest approval from their family if they decided to work part-time (full-time). When asked about the perceived approval of their friends, 43% report that they think the approval of their friends would be highest if they decided to work part-time, while 51% think the approval would be highest if they worked full-time.

[48] While we can only speculate about why we find different results in columns 1 and 2, one possibility is that once (perceived) constraints in terms of childcare availability are relaxed, respondents can make a choice which is more likely to reflect what they personally consider optimal, given their beliefs about the likely benefits and costs of this decision.

[49] The WTP for outcome n can be calculated as: $WTP_n = \frac{1000}{10}\frac{\beta^n}{\gamma}$, where β^n is the coefficient attached to either child skills or family outcomes, and γ is the coefficient on expected maternal earnings at the age of 36. Standard errors of these non-linear combinations of estimators are calculated using the Delta method. The WTP can be interpreted as the amount of yearly gross expected maternal earnings at the age of 36 that an individual would be willing to give up for a 10 percentile rank increase in child skills (or family outcomes).

to pay for child and family outcomes is sizeable: in the policy scenario where full-time childcare is available, individuals would be willing to give up around €13,600 of yearly maternal earnings at the age of 36 for a 10-percentile rank increase in child skills, and €35,000 for an equivalent improvement in family outcomes.

The estimated associations between beliefs for the average family and own labour supply intentions are consistent with a model in which self-beliefs and beliefs for the average family are positively correlated, and beliefs matter for individual labour supply decisions. Individuals are more likely to select options for which they perceive the outcomes for the average family to be more positive. In the next section, we leverage an information intervention to explore whether providing information on population returns can causally affect own labour supply intentions.

6. Supplementary Evidence: The Experimental Survey

Having established that beliefs about returns for an average German family are associated with individual labour supply intentions, a natural question that emerges is whether providing respondents with truthful information about the (population) returns to mothers working can shift individual perceptions and stated labour supply intentions. To study this question, we conduct a randomised information experiment on a second representative sample of 1,000 German adults without children, between the ages of 18 and 45. The structure of the survey is as follows. After eliciting respondents' priors, we provide respondents randomised into the treatment group with truthful information about the results of a published article by Nicoletti *et al.* (2023). In this study, the authors use data from Norway to estimate the causal impact of an increase in maternal work hours while children are 1–5 years old on child human capital at age 15. To examine whether the information provision affects labour supply intentions, we then ask respondents how many hours per week they (their partner) would intend to work if they had a young child and full-time childcare was available. Finally, to measure belief updating, we elicit beliefs about the returns to maternal labour supply on child skills using the same hypothetical scenarios as in our main survey (vignettes A). We provide detailed information on the sampling, survey design, and the results of this supplementary study in Online Appendix C.

To summarise the findings, we document that the majority of respondents in our sample (70%) significantly underestimate the positive effect of maternal labour supply on child outcomes. Moreover, we find that providing respondents with information about the study's results shifts beliefs about returns (for the average family), as well as own labour supply intentions. Treated respondents report they (their partner) would intend to work 1.8 hours more per week compared to control group respondents, which corresponds to a 7.4% increase over the control group mean. Taken together, these results are suggestive of the fact that beliefs are malleable, and that individual labour supply intentions are contingent on individual beliefs about (population) returns.[50] We acknowledge, however, that we only measure intentions within the same survey, and do not observe the actual labour supply decisions of the women when they have young children. Studying whether informational interventions can affect the actual labour supply decisions of mothers is an interesting avenue for future research.

[50] Our results are consistent with the findings of Boelmann *et al.* (2025), who provide compelling evidence that West German mothers, who were previously exposed to East German mothers, work more hours when they have young children. The evidence reported in Boelmann *et al.* (2025) strongly suggests that the main mechanism for these findings is that West German women update their beliefs about the benefits and costs of maternal labour supply.

7. Conclusion

In this study, we leverage novel survey data to explore several inter-related questions. First, we study how respondents perceive the returns to maternal labour supply for a typical German family, and we shed light on the channels through which these effects are perceived to operate. On average, respondents perceive the (negative) impact of reduced work hours during the preschool period on the mother's future labour market outcomes as sizeable. At the same time, respondents on average believe that the child's skills will improve the more the mother works and the longer the child attends childcare. A substantial share of this perceived (positive) total effect of maternal labour supply on child skills is perceived to stem from increased household income. Another key insight is that respondents perceive the returns to part-time work on family outcomes as positive, but they perceive the returns to full-time work as negative. On average, respondents believe that the satisfaction of the child, the satisfaction of the mother, the quality of the mother–child relationship, and the quality of the mother–father relationship will be significantly lower if the mother works full-time rather than part-time in the preschool period. These average perceived returns mask a considerable degree of heterogeneity, which is partly systematic. Respondents who were raised in (former) East Germany, as well as respondents whose own mothers worked full-time while they were young perceive the returns to full-time work on child and family outcomes as significantly greater, and they are significantly more likely to perceive them as positive. While this correlational evidence is merely suggestive, the results are consistent with socialisation playing an important role in the formation of beliefs.

Second, we provide novel evidence on the perceived local constraints to maternal labour supply, and we document own labour supply intentions under different policy scenarios related to childcare availability and quality. On average, respondents to our survey are rather sceptical about the availability and quality of childcare in their local area. Consistent with those findings, we find that respondents are significantly more likely to state that they (or their partner) would work full-time if constraints related to the availability and/or quality of childcare were relaxed. Nevertheless, we note that even in the 'best case' scenario of high-quality childcare that is open the full day, only 55% of respondents state that they (or their partner) would work full-time. These results are suggestive of the fact that other (non-pecuniary) factors, such as the perceived costs to full-time work in terms of family outcomes, are likely to play an important role in individual decisions. The results of our choice model estimation are consistent with this interpretation. We find that respondents' beliefs about the returns to maternal labour supply on child and family outcomes (for the average family) are a significant predictor of own labour supply intentions.

Finally, the results from our information experiment suggest that beliefs about perceived returns are malleable, and that providing information about population returns can affect own labour supply intentions. An open question that emerges is whether such low-cost interventions could also induce shifts in *actual* labour supply. Future work could investigate the effectiveness of different types of information interventions and also study their impacts on actual labour supply decisions.

More broadly, we demonstrate that it is crucial to shed light on the perceived pecuniary and non-pecuniary impacts of maternal labour supply to obtain a full picture of what drives child penalties and gender inequality in labour market outcomes. Moreover, in a context where decisions are made dynamically, our results suggest that perceived returns to future maternal labour supply may have implications for fertility choices, as well as other types of decisions that are taken prior to having children, such as, e.g., investments in education or occupational choices.

Future research could examine the relationship between perceived returns to mothers working and human capital investment decisions taken earlier in life.

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Additional Supporting Information may be found in the online version of this article:

Online Appendix
Replication Package

References

Adda, Jérôme, Christian Dustmann, and Katrien Stevens. (2017). 'The career costs of children', *Journal of Political Economy*, vol. 125(2), pp. 293–337.
Alesina, Alberto, Armando Miano, and Stefanie Stantcheva. (2023). 'Immigration and redistribution', *The Review of Economic Studies*, vol. 90(1), pp. 1–39.
Almås, Ingvild, Alexander W. Cappelen, Kjell G. Salvanes, Erik Ø. Sørensen, and Bertil Tungodden. (2016). 'What explains the gender gap in college track dropout? Experimental and administrative evidence', *American Economic Review*, vol. 106(5), pp. 296–302.
Andresen, Martin Eckhoff, and Emily Nix. (2022). 'What causes the child penalty? Evidence from adopting and same-sex couples', *Journal of Labor Economics*, vol. 40(4), pp. 971–1004.
Angelov, Nikolay, Per Johansson, and Erica Lindahl. (2016). 'Parenthood and the gender gap in pay', *Journal of Labor Economics*, vol. 34(3), pp. 545–79.
Armantier, Olivier, Wändi Bruine de Bruin, Giorgio Topa, Wilbert Van der Klaauw, and Basit Zafar. (2015). 'Inflation expectations and behavior: Do survey respondents act on their beliefs?', *International Economic Review*, vol. 56(2), pp. 505–36.
Attanasio, Orazio, and Katja Kaufmann. (2014). 'Education choices and returns to schooling: Intra-household decision making, gender and subjective expectations', *Journal of Development Economics*, vol. 109, pp. 203–16.
Baker, Michael, Jonathan Gruber, and Kevin Milligan. (2008). 'Universal child care, maternal labor supply, and family well-being', *Journal of Political Economy*, vol. 116(4), pp. 709–45.
Baker, Michael, Jonathan Gruber, and Kevin Milligan. (2019). 'The long-run impacts of a universal child care program', *American Economic Journal: Economic Policy*, vol. 11(3), pp. 1–26.
Becker, Gary S. (1965). 'A theory of the allocation of time', Economic Journal, vol. 75(299), pp. 493–517.
Belfield, Chris, Teodora Boneva, Christopher Rauh, and Jonathan Shaw. (2020). 'What drives enrolment gaps in further education? The role of beliefs in sequential schooling decisions', *Economica*, vol. 87(346), pp. 490–529.
Bertelsmann Stiftung. (2022). '2023 fehlen in Deutschland rund 384.000 Kita-Plätz'. https://www.bertelsmann-stiftung.de/de/themen/aktuelle-meldungen/2022/oktober/2023-fehlen-in-deutschland-rund-384000-kita-plaetze (last accessed 15 August 2024).
Blau, Francine D., and Lawrence M. Kahn. (2000). 'Gender differences in pay', *Journal of Economic Perspectives*, vol. 14(4), pp. 75–99.
Bleemer, Zachary, and Basit Zafar. (2018). 'Intended college attendance: Evidence from an experiment on college returns and costs', *Journal of Public Economics*, vol. 157, pp. 184–211.
Blundell, Richard, Monica Costa Dias, Costas Meghir, and Jonathan Shaw. (2016). 'Female labor supply, human capital, and welfare reform', *Econometrica*, vol. 84(5), pp. 1705–53.
Boelmann, Barbara, Anna Raute, and Uta Schönberg. (2025). 'Wind of change? Cultural determinants of maternal labor supply', *American Economic Journal: Applied Economics*, vol. 17(2), pp. 41–74.
Boneva, Teodora, Ana Bras-Monteiro, Marta Golin, and Christopher Rauh. (2024). 'Are men's preferences for couple equity misperceived? Evidence from six countries', Discussion Paper 19734, CEPR.
Boneva, Teodora, Marta Golin, and Christopher Rauh. (2022). 'Can perceived returns explain enrollment gaps in postgraduate education?', *Labour Economics*, vol. 77, article ID 101998.
Boneva, Teodora, and Christopher Rauh. (2018). 'Parental beliefs about returns to educational investments: The later the better?', *Journal of the European Economic Association*, vol. 16(6), pp. 1669–711.

Boneva, Teodora, and Christopher Rauh. (2020). 'Socio-economic gaps in university enrollment: The role of perceived pecuniary and non-pecuniary returns', HCEO Working paper, Human Capital and Economic Opportunity Group.
Bursztyn, Leonardo, Alexander W. Cappelen, Bertil Tungodden, Alessandra Voena, and David H. Yanagizawa-Drott. (2023). 'How are gender norms perceived?', Working Paper 31049, National Bureau of Economic Research.
Bursztyn, Leonardo, Thomas Fujiwara, and Amanda Pallais. (2017). ' "Acting wife": Marriage market incentives and labor market investments', *American Economic Review*, vol. 107(11), pp. 3288–319.
Bursztyn, Leonardo, Alessandra L. González, and David Yanagizawa-Drott. (2020). 'Misperceived social norms: Women working outside the home in Saudi Arabia', *American Economic Review*, vol. 110(10), pp. 2997–3029.
Carneiro, Pedro, and Rita Ginja. (2016). 'Partial insurance and investments in children', Economic Journal, vol. 126(596), pp. F66–F95.
Carta, Francesca, and Lucia Rizzica. (2018). 'Early kindergarten, maternal labor supply and children's outcomes: Evidence from Italy', *Journal of Public Economics*, vol. 158, pp. 79–102.
Cavapozzi, Danilo, Marco Francesconi, and Cheti Nicoletti. (2021). 'The impact of gender role norms on mothers' labor supply', *Journal of Economic Behavior and Organization*, vol. 186, pp. 113–34.
Cesarini, David, Erik Lindqvist, Robert Östling, and Anastasia Terskaya. (2023). 'Fortunate families? The effects of wealth on marriage and fertility', Working Paper 31039, National Bureau of Economic Research.
Chetty, Raj, Nathaniel Hendren, and Lawrence F. Katz. (2016). 'The effects of exposure to better neighborhoods on children: New evidence from the Moving to Opportunity experiment', *American Economic Review*, vol. 106(4), pp. 855–902.
Chetty, Raj, Nathaniel Hendren, Patrick Kline, and Emmanuel Saez. (2014). 'Where is the land of opportunity? The geography of intergenerational mobility in the United States', *The Quarterly Journal of Economics*, vol. 129(4), pp. 1553–623.
Chetty, Raj, Matthew O. Jackson, Theresa Kuchler, Johannes Stroebel, Nathaniel Hendren, Robert B. Fluegge, Sara Gong, Federico Gonzalez, Armelle Grondin, Matthew Jacob et al. (2022a). 'Social capital I: Measurement and associations with economic mobility', *Nature*, vol. 608(7921), pp. 108–21.
Chetty, Raj, Matthew O. Jackson, Theresa Kuchler, Johannes Stroebel, Nathaniel Hendren, Robert B. Fluegge, Sara Gong, Federico Gonzalez, Armelle Grondin, Matthew Jacob et al. (2022b). 'Social capital II: Determinants of economic connectedness', *Nature*, vol. 608(7921), pp. 122–34.
Cortés, Patricia, Gizem Koşar, Jessica Pan, and Basit Zafar. (2024). 'Should mothers work? How perceptions of the social norm affect individual attitudes toward work in the US', *Review of Economics and Statistics*, published ahead of print.
Costa-Ramón, Ana, Ursina Schaede, Michaela Slotwinski, and Anne Ardila Brenøe. (2024). '(Not) thinking about the future: Inattention and maternal labor supply', Working Paper 11359, CESifo.
Cunha, Flávio, Irma Elo, and Jennifer Culhane. (2022). 'Maternal subjective expectations about the technology of skill formation predict investments in children one year later', *Journal of Econometrics*, vol. 231(1), pp. 3–32.
Delavande, Adeline, and Basit Zafar. (2019). 'University choice: The role of expected earnings, non-pecuniary outcomes, and financial constraints', *Journal of Political Economy*, vol. 127(5), pp. 2343–93.
Del Boca, Daniela, and Cecile Wetzels. (2010). *Social Policies, Labour Markets and Motherhood*, Cambridge: Cambridge University Press.
Dominitz, Jeff, and Charles Manski. (1996). 'Eliciting student expectations of the returns to schooling', *Journal of Human Resources*, vol. 31(1), pp. 1–26.
Domscheit-Berg, Anke. (2016). 'Familienpolitik in Ost- und Westdeutschland und ihre langfristigen Auswirkungen', Working paper, Heinrich Böll Stiftung.
Fawcett, Tom. (2006). 'An introduction to ROC analysis', *Pattern Recognition Letters*, vol. 27(8), pp. 861–74.
Felfe, Christina, and Rafael Lalive. (2018). 'Does early child care affect children's development?', *Journal of Public Economics*, vol. 159, pp. 33–53.
Felfe, Christina, Natalia Nollenberger, and Nuria Rodriguez-Planas. (2015). 'Can't buy mommy's love? Universal childcare and children's long-term cognitive development', *Journal of Population Economics*, vol. 28(2), pp. 393–422.
Fernandez, Raquel, and Alessandra Fogli. (2009). 'Culture: An empirical investigation of beliefs, work, and fertility', *American Economic Journal: Macroeconomics*, vol. 1(1), pp. 146–77.
Fortin, Nicole M. (2005). 'Gender role attitudes and the labour-market outcomes of women across OECD countries', *Oxford Review of Economic Policy*, vol. 21(3), pp. 416–38.
Francesconi, Marco. (2002). 'A joint dynamic model of fertility and work of married women', *Journal of Labor Economics*, vol. 20(2), pp. 336–80.
Garcia-Moran, Eva, and Zoe Kuehn. (2017). 'With strings attached: Grandparent-provided child care and female labor market outcomes', *Review of Economic Dynamics*, vol. 23, pp. 80–98.
Gilens, Martin. (1999). *Why Americans Hate Welfare: Race, Media, and the Politics of Antipoverty Policy*, Chicago: University of Chicago Press.
Giustinelli, Pamela. (2016). 'Group decision making with uncertain outcomes: Unpacking child–parent choice of the high school track', *International Economic Review*, vol. 57(2), pp. 573–602.
Gong, Yifan, Ralph Stinebrickner, and Todd Stinebrickner. (2022). 'Marriage, children, and labor supply: Beliefs and outcomes', *Journal of Econometrics*, vol. 231(1), pp. 148–64.

Grewenig, Elisabeth, Philipp Lergetporer, and Katharina Werner. (2020). 'Gender norms and labor-supply expectations: Experimental evidence from adolescents', Working Paper 8611, CESifo.
Havnes, Tarjei, and Magne Mogstad. (2011). 'No child left behind: Subsidized child care and children's long-run outcomes', *American Economic Journal: Economic Policy*, vol. 3(2), pp. 97–129.
ISSP Research Group. (2016). 'ISSP 2012—"Family and Changing Gender Roles IV" ', Data set version: ZA5900 (v4.0.0), ISSP.
Jensen, Robert. (2010). 'The (perceived) returns to education and the demand for schooling', *The Quarterly Journal of Economics*, vol. 125(2), pp. 515–48.
Kaufmann, Katja, and Luigi Pistaferri. (2009). 'Disentangling insurance and information in intertemporal consumption choices', *American Economic Review*, vol. 99(2), pp. 387–92.
Klammer, Ute, Christina Klenner, Christiane Ochs, Peter Radke, and Astrid Ziegler. (2005). *WSI-Frauen Daten Report*, Berlin: Edition Sigma.
Kleven, Henrik, Camille Landais, Johanna Posch, Andreas Steinhauer, and Josef Zweimüller. (2019a). 'Child penalties across countries: Evidence and explanations', *AEA Papers and Proceedings*, vol. 109, pp. 122–6.
Kleven, Henrik, Camille Landais, and Jakob Egholt Søgaard. (2019b). 'Children and gender inequality: Evidence from Denmark', *American Economic Journal: Applied Economics*, vol. 11(4), pp. 181–209.
Kottelenberg, Michael J., and Steven F. Lehrer. (2017). 'Targeted or universal coverage? Assessing heterogeneity in the effects of universal child care', *Journal of Labor Economics*, vol. 35(3), pp. 609–53.
Krueger, Alan B., and Jorn-Steffen Pischke. (1992). 'A comparative analysis of East and West German labor markets: Before and after unification', Working paper, National Bureau of Economic Research.
Kuziemko, Ilyana, Jessica Pan, Jenny Shen, and Ebonya Washington. (2018). 'The mommy effect: Do women anticipate the employment effects of motherhood?', Working Paper 24740, National Bureau of Economic Research.
Manski, Charles F. (2004). 'Measuring expectations', *Econometrica*, vol. 72(5), pp. 1329–76.
McFadden, Daniel. (1974). 'Conditional logit analysis of qualitative choice behavior', in (Paul Zarembka, ed.), *Frontiers in Econometrics*, pp. 105–42, New York: Academic Press.
Mincer, Jacob. (1962). 'Labor force participation of married women: A study of labor supply', in (National Bureau Committee for Economic Research, ed.), *Aspects of Labor Economics*, pp. 63–105, Princeton, NJ: Princeton University Press.
Nicoletti, Cheti, Kjell G. Salvanes, and Emma Tominey. (2018). 'The family peer effect on mothers' labor supply', *American Economic Journal: Applied Economics*, vol. 10(3), pp. 206–34.
Nicoletti, Cheti, Kjell G. Salvanes, and Emma Tominey. (2023). 'Mothers working during preschool years and child skills: Does income compensate?', *Journal of Labor Economics*, vol. 41(2), pp. 389–429.
Olivetti, Claudia, and Barbara Petrongolo. (2016). 'The evolution of gender gaps in industrialized countries', *Annual Review of Economics*, vol. 8, pp. 405–34.
Olivetti, Claudia, and Barbara Petrongolo. (2017). 'The economic consequences of family policies: Lessons from a century of legislation in high-income countries', *Journal of Economic Perspectives*, vol. 31(1), pp. 205–30.
Organisation for Economic Co-operation and Development. (2019a). 'Childcare cost estimates based on 2019 data', OECD Data Explorer. http://data-explorer.oecd.org/s/2cw (last accessed: 1 July 2025).
Organisation for Economic Co-operation and Development. (2019b). 'OECD family database: LMF1.2 Maternal employment'. https://www.oecd.org/els/family/database.htm (last accessed: 9 August 2022).
Schrenker, Annekatrin. (2023). 'Do women expect wage cuts for part-time work?', *Labour Economics*, vol. 80, article ID 102291.
Wiswall, Matthew, and Basit Zafar. (2015). 'Determinants of college major choice: Identification using an information experiment', *The Review of Economic Studies*, vol. 82(2), pp. 791–824.
Wiswall, Matthew, and Basit Zafar. (2018). 'Preference for the workplace, investment in human capital, and gender', *The Quarterly Journal of Economics*, vol. 133(1), pp. 457–507.
Wiswall, Matthew, and Basit Zafar. (2021). 'Human capital investments and expectations about career and family', *Journal of Political Economy*, vol. 129(5), pp. 1361–424.
Zafar, Basit. (2013). 'College major choice and the gender gap', *Journal of Human Resources*, vol. 48(3), pp. 545–95.

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