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Teodora Boneva, Marta Golin, Katja Kaufmann, Christopher Rauh

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Beliefs about Maternal Labor Supply

Abstract

This paper provides representative evidence on the perceived returns to maternal labor supply. We design a novel survey to elicit subjective expectations, and show that a mother's decision to work is perceived to have sizable impacts on child skills, family outcomes, and the future labor market outcomes of the mother. Examining the channels through which the impacts are perceived to operate, we document that beliefs about the impact of additional household income can account for some, but not all, of the perceived positive effects. Beliefs about returns substantially vary across the population and are predictive of labor supply intentions under different policy scenarios related to childcare availability and quality, two factors that are also perceived as important. Consistent with socialization playing a role in the formation of beliefs, we show that respondents whose own mother worked perceive the returns to maternal labor supply as higher.

JEL-Codes: J220, J130, I260.

Keywords: subjective expectations, maternal labor supply, childcare, child penalties.

Teodora Boneva
University of Bonn / Germany
tboneva@uni-bonn.de

Marta Golin
University of Zurich / Switzerland
marta.golin@econ.uzh.ch

Katja Kaufmann
Bayreuth University / Germany
katja.kaufmann@uni-bayreuth.de

Christopher Rauh
University of Cambridge / United Kingdom
cr542@cam.ac.uk

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1 Introduction

There are substantial gaps in earnings between men and women, which significantly widen upon the arrival of the first child.[1] The impact of parenthood on women's labor supply and earnings is sizable and can account for a substantial share of existing gender earnings inequality. To better understand gender inequality in labor market outcomes, it is therefore crucial to shed more light on the drivers of maternal labor supply. While maternal labor supply decisions can have a range of different implications, not only for the labor market outcomes of the mother but also for children's skills or family well-being, there is a void in our knowledge of how individuals *perceive* the benefits and costs of this decision. Given the importance of beliefs for individual decision-making, which has been documented in a variety of different contexts, it is surprising that so little is known about the perceived returns to maternal labor supply. Our goal is to fill this gap in the literature.

In particular, we aim to answer the following questions: How do individuals perceive the returns to mothers working while their children are young, and what are the channels through which the effects are perceived to operate? Are beliefs about the returns to maternal labor supply decisions predictive of labor supply intentions, over and above what can be predicted by other factors (such as childcare availability), and are there systematic differences in beliefs across groups in the population? A chief obstacle to studying these questions is the lack of appropriate data. Observed choices can be consistent with various combinations of beliefs, preferences, and constraints, which is why it is not possible to rely on choice data alone (Manski 2004). For this reason, we design a novel survey in which we elicit beliefs about returns, labor supply intentions, and beliefs about other factors that could potentially influence the choice. We administer this survey to a large representative sample of 4,000 German adults without children to study the questions of interest.

Our main contributions are threefold. First, we provide evidence on the perceived returns to maternal labor supply. More specifically, our focus lies on examining how individuals

[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 labor market (see, e.g., Angelov, Johansson and Lindahl 2016; Kuziemko et al. 2018; Kleven, Landais and Søgaard 2019a; Kleven et al. 2019b; Andresen and Nix 2022).

perceive the benefits and costs to mothers working part- or full-time while their child is of pre-school age (1-5 years old) as opposed to not working. The mother's decision concerning how many hours to work during that period can have important consequences for a variety of different outcomes. In this paper, we study how a representative sample of childless German adults aged 18-45 perceives the impact of this decision on a range of child skills and family outcomes as well as the future labor market outcomes of the mother.

Conceptually, there are two channels through which maternal labor supply can affect child skills and family outcomes. On the one hand, an increase in the mother's labor supply may lead to a decrease in the number of hours that she has available to care for her child and family. This 'direct effect' of maternal labor supply on child and family outcomes may be positive or negative, depending on whether the mother's time is more or less productive compared to the counterfactual of formal childcare.[2] On the other hand, an increase in maternal labor supply may lead to 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 neighborhood. The goal of our study is to shed light on the perceived effect of maternal labor supply as well as the channels through which changes in maternal labor supply are 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 labor supply in the pre-school 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 hypothetical married couple living in Germany who have a one-year-old 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 labor supply constant across the scenarios.

Our analyses reveal several striking patterns. Child skills are perceived to increase in line with maternal labor supply, i.e., respondents on average believe that a child will acquire *more*

[2]In this study, we examine beliefs about the impact of maternal labor 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).

skills if their mother works more and the child spends more time in childcare. The average perceived returns are sizable. For example, a 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). Turning to the channels through which these impacts are perceived to operate, we find that the perceived return to income is positive, and in most cases it can account for some (but not all) of the perceived total effect of maternal labor supply on child skills. 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 peak when the mother works part-time. For example, the quality of the mother-child relationship is perceived to be 14 percentile ranks higher if the mother works part-time (rather than not at all), and 14 percentile ranks lower if she works full-time (rather than part-time). The latter is the case even though all family outcomes are perceived to improve as income rises. Put differently, family outcomes are perceived to deteriorate if the mother works full-time rather than part-time, despite the fact that household income would be higher in that scenario.

In addition to measuring beliefs about the impact of maternal labor supply in the pre-school years on child and family outcomes, we also elicit beliefs about the impact of this decision on the future labor market opportunities of the mother. When a mother chooses to stay at home or work part-time while her child is young, this may reduce her earnings potential over the life cycle. We elicit beliefs about the returns to maternal labor supply in the pre-school years on the probability of being able to find full-time employment when the child enters school, as well as potential future earnings, provided that the mother returns to full-time work when the child enters school. The perceived likelihood of the mother being able to return to full-time work when the child enters school increases by 22 percentage points if she worked part-time (rather than not at all) in the five preceding years, and it further increases by 20 percentage points if she worked full-time (rather than part-time). Moreover, the impact of hours worked on future earnings is perceived to be convex: a mother is perceived to earn on average 22% more when she returns to full-time work if she worked part-time (rather than not at all) in the pre-school years, and an additional 30% more on

average if she worked full-time (rather than part-time). These impacts are perceived as relatively stable over the life cycle.

Our second contribution is to provide representative evidence on maternal labor supply intentions, perceptions about childcare, and the subjective impact of (the lack of) high-quality, full-time childcare on labor supply intentions. The main motivation for this analysis is that choices may not only be driven by beliefs about returns but also constraints, whereby it seems critical to not only study beliefs about returns in isolation. 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 pre-school years, while only 19% state that they (their partner) would intend to work full-time. Respondents in our sample are on average rather pessimistic about the availability and quality of childcare in their local area. The average perceived likelihood of finding a place in childcare for a one-year-old child is 58%. Conditional on being able to find a place, the average perceived likelihood of the childcare center being open the full day is 54%, while the average perceived likelihood of it being of high quality is 55%. To study the perceived importance of childcare constraints, we additionally elicit maternal labor supply intentions in two policy scenarios, one in which full-time childcare is abundant (policy scenario 1), and one in which full-time childcare is abundant *and* of high quality (policy scenario 2). When presented with policy scenario 1, the share of respondents preferring the full-time option rises by 24 percentage points, and it further increases by an additional 12 percentage points in policy scenario 2, reflecting a 2.8-fold increase relative to the baseline. While these results emphasize the importance of the availability of full-time, high-quality childcare, we note that even in this 'best case' scenario *only* 55% prefer the full-time option, highlighting that other factors such as beliefs about returns are also likely to be critical in this choice.

Our third contribution is to provide evidence on belief heterogeneity and study whether beliefs are predictive of labor supply intentions. We document that individuals considerably differ in their beliefs about the returns to maternal labor supply decisions. Not only is the variance in perceived returns sizable, but a non-negligible share of respondents perceive the returns as negative even when the average perceived returns are positive, and vice versa. We explore whether beliefs about returns are predictive of maternal labor supply intentions under

the different policy scenarios. For this purpose, we estimate multinomial choice models, and explore whether perceived returns to maternal labor supply predict respondents' intended maternal labor supply, over and above what can be predicted by other factors such as respondents' background characteristics or beliefs about social norms. Consistent with a model in which beliefs play a role in individuals' decisions, we find that beliefs about returns are indeed predictive of intended choices and the associations are stronger when childcare constraints are relaxed. For example, a perceived improvement in child skills by 10 percentile ranks in the part-time (full-time) scenario is associated with a 2.5 (2.7) percentage point increase in the probability of choosing the part-time (full-time) option in the scenario in which full-day, high-quality childcare is available, but not in the baseline scenario. On the other hand, perceived family outcomes are predictive of maternal labor supply intentions regardless of the scenario that we examine. The estimated marginal effects are sizable. For instance, a perceived improvement in family outcomes by 10 percentile ranks in the part-time (full-time) scenario is associated with a 2.9 (3.1) percentage point higher probability that the respondent chooses the part-time (full-time) option in the scenario in which full-day, high-quality childcare is available. Beliefs about returns to maternal labor supply on the future labor market outcomes of the mother are also predictive of choices, albeit only in the scenarios in which childcare constraints are relaxed. 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 2.5 (2.7) percentage point increase in the probability that the respondent will choose the part-time (full-time) option.

Finally, we explore which factors predict beliefs about returns. Consistent with socialization playing an important role in the formation of beliefs, we find that individuals whose own mothers worked while they were young and individuals who attended school in (former) East Germany perceive the returns to full-time work in terms of child skills and family outcomes (relative to part-time work) as significantly higher, and they are more likely to perceive the returns as positive.

This paper builds on and contributes to several strands of the literature. First, it contributes to the literature on the determinants of female labor supply decisions, which dates back to Mincer (1962) and Becker (1965), who first considered the trade-off between house-

work and paid work. More recent work has examined the role of childcare subsidies and the availability of childcare facilities (e.g., Attanasio, Low and Sánchez-Marcos 2008; Bauernschuster and Schlotter 2015; Blundell et al. 2016), welfare policies, family policies, tax treatment of second earners, child benefits, paid maternity and parental leaves, and part-time employment opportunities (e.g., Del Boca and Wetzels 2010; Olivetti and Petrongolo 2017). Other studies have investigated the relationship between cultural norms and female employment (e.g., Fortin 2005; Fernandez and Fogli 2009; Nicoletti, Salvanes and Tominey 2018; Bursztyn, González and Yanagizawa-Drott 2020; Boelmann, Raute and Schönberg 2021; Cavapozzi, Francesconi and Nicoletti 2021) and the intergenerational transmission of norms related to female employment (Fernández, Fogli and Olivetti 2004; Galassi, Koll and Mayr 2019). Our study also relates to recent work by Kuziemko et al. (2018) and Gong, Stinebrickner and Stinebrickner (2022), who study the anticipated employment effects of motherhood. We contribute to this literature by eliciting and examining subjective expectations about the returns to maternal labor supply, and studying how these beliefs relate to maternal labor supply intentions under different policy scenarios.

Second, we contribute to the literature studying beliefs and decision-making. Beliefs have been shown to be important for a range of different decisions such as consumption decisions and financial investment decisions (e.g., Kaufmann and Pistaferri 2009; Armantier et al. 2015), 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; Boneva and Rauh 2020; Belfield et al. 2020; Boneva, Golin and Rauh 2021), students' choice of major, high-school track and university (e.g., Zafar 2013; Wiswall and Zafar 2015; Giustinelli 2016; Wiswall and Zafar 2018; Delavande and Zafar 2019), or human capital investment decisions made by parents (e.g., Boneva and Rauh 2018; Cunha, Elo and Culhane 2022). We build on this literature and study beliefs about a different choice, namely maternal labor supply.

The remainder of the paper is structured as follows. Section 2 presents a stylized model of parental behavior and motivates our research design, while Section 3 provides details on our survey. Section 4 presents information on the data and context. Sections 5 and 6 present the results. Section 7 provides a discussion, and Section 8 concludes.

2 Maternal Labor Supply: General Framework

To motivate our survey design, we illustrate the key drivers of maternal labor supply decisions using a stylized two-period model of altruistic parental behavior (see, e.g., Becker and Tomes 1986; Attanasio, Cattan and Meghir 2022). In this stylized framework, $t = 1$ corresponds to the early childhood (pre-school) period, while $t = 2$ corresponds to the period when the child attends school. Household i chooses the consumption path, $\{c_{t,i}\}_{t=1,2}$, and maternal labor supply, $\{l^m_{t,i}\}_{t=1,2}$, to maximize the utility derived from their choice, subject to a number of constraints:

$$\max_{\{c_{t,i}, l^m_{t,i}\}_{t=1}^2} \sum_{t=1}^{2} \beta^{t-1} U_i(c_{t,i}) + V_i(h_{2,i}) + \kappa_i \mathbb{1}[s_{1,i} = l^m_{1,i}] \tag{1}$$

$$s.t. \qquad c_{1,i} = Y^m_1(l^m_{1,i}) + Y^f_1(\bar{l}^f_{1,i}) - p l^m_{1,i} \tag{2}$$

$$c_{2,i} = \rho(l^m_{1,i}) Y^m_2(l^m_{1,i}, l^m_{2,i}) + Y^f_2(\bar{l}^f_{1,i}, \bar{l}^f_{2,i}) \tag{3}$$

$$h_{2,i} = f(h_{1,i}, l^m_{1,i}, \bar{l}^f_{1,i}, Y^m_1(l^m_{1,i}), Y^f_1(\bar{l}^f_{1,i}), X_i, \epsilon_{1,i}) \tag{4}$$

$$l^m_{1,i} \leq d_{1,i} \tag{5}$$

$U_i(c_{t,i})$ is the instantaneous utility derived from household consumption $c_{t,i}$, β is the discount factor, $V_i(h_{2,i})$ is the utility derived from child skills and family outcomes, $h_{2,i}$, and κ_i is the additional utility the household derives from the mother's labor supply decision in $t = 1$ coinciding with local social norms about maternal employment in that period, $s_{1,i}$. The household maximizes the sum of discounted utility specified in equation (1) subject to two budget constraints (equations (2) and (3)), a production function for child skills and family outcomes (equation (4)), and a childcare availability constraint (equation (5)).

Let $l^m_{t,i}$ and $l^f_{t,i}$ denote the mother's and father's labor supply in period t, respectively. For simplicity, we do not model the father's labor supply decision and assume he is working $l^f_{t,i} = \bar{l}^f_i$ in every period. $Y^m_1(l^m_{1,i})$ and $Y^f_1(l^f_{1,i})$ denote the mother's and father's labor income in period $t = 1$, which depend on their respective labor supply in that period. Assuming that

the household needs to pay for childcare at an hourly rate of p for the number of hours that the mother spends at work, the childcare costs in period 1 that enter the budget constraint specified in equation (2) amount to $pl^m_{1,i}$.

A reduction in labor supply in the pre-school period can have negative consequences for the future labor market outcomes of the mother. We model these dynamics in the following way. In the second period, the mother's probability of being offered a job, $\rho(l^m_{1,i})$, is modeled as a function of her labor supply in the previous period. If she is not offered a job in $t = 2$, she does not work in that period and does not receive an income. If she is offered a job, then she chooses how much labor to supply, $l^m_{2,i}$, and receives earnings $Y^m_2(l^m_{1,i}, l^m_{2,i})$, which depend on both the present ($l^m_{2,i}$) and past labor supply ($l^m_{1,i}$).

The household further faces a production function for child skills and family outcomes. Let $h_{2,i} = f(h_{1,i}, l^m_{1,i}, \bar{l}^f_{1,i}, Y^m_1(l^m_{1,i}), Y^f_1(\bar{l}^f_{1,i}), X_i, \epsilon_{1,i})$ denote the true production function for child and family outcomes, which depend on $h_{1,i}$, the mother's and father's labor supply, $l^m_{1,i}$ and $\bar{l}^f_{1,i}$, the income of both spouses, $Y^m_1(l^m_{1,i})$ and $Y^f_1(\bar{l}^f_{1,i})$, household characteristics, X_i, and unobserved shocks, $\epsilon_{1,i}$.

Finally, $d_{1,i}$ denotes childcare availability, i.e., the maximum number of hours that the child can spend in childcare. Assuming that the mother takes care of the child if childcare availability is limited, the constraint $l^m_{t,i} \leq d_{t,i}$ guarantees that the mother cannot work more hours than are available to her.

Since consumption in the two periods can be rewritten as a function of maternal labor supply, the maximization problem is effectively solved by choosing the level of maternal labor supply in the two periods, $l^m_{1,i}$ and $l^m_{2,i}$, to maximize household utility subject to the production function for child skills and family outcomes (equation (4)), and the childcare availability constraint (equation (5)). In this stylized framework, there are no costs to maternal labor supply in the second period, so the mother chooses $l^m_{2,i}$ equal to the maximum possible amount if she is offered a job. In the pre-school period, the choice of maternal labor supply, $l^m_{1,i}$, will depend on (i) the effect of maternal labor supply on child skills and family outcomes, (ii) the effect of maternal labor supply on maternal labor market outcomes in the second period, (iii) the cost and availability of childcare, and (iv) the local social norms about maternal employment in the pre-school period.

Given the complexity of this decision, it is conceivable that individuals lack information about certain aspects of this decision problem when deciding how much labor to supply in the pre-school period. For example, it is possible that individuals do not have complete information about the production function for child and family outcomes, $f(.)$. Instead, when taking their decision, they may maximize utility subject to a *perceived* production function for child skills and family outcomes, $\tilde{h}_{2,i} = \tilde{f}_i(h_{1,i}, l^m_{1,i}, \bar{l}^f_{1,i}, Y^m_1(l^m_{1,i}), Y^f_1(\bar{l}^f_{1,i}), X_i, \epsilon_{1,i}|\Omega_i)$, which depends on the household's information set, Ω_i. Individuals may misperceive certain properties of the production function, so it is possible that the perceived production function, $\tilde{f}_i(.)$, differs from the true production function, $f(.)$. Similarly, it is conceivable that individuals may not know how maternal labor supply decisions in the first period influence the future labor market opportunities of the mother, and their beliefs about the impacts may or may not coincide with the true impacts. Finally, there may be incomplete information about childcare availability and costs, or prevalent local social norms.

Motivated by this theoretical framework, we aim to study four sets of related research questions. First, we aim to uncover beliefs about the properties of the production function for child skills and family outcomes, and examine whether those perceptions are related to maternal labor supply intentions. Child skills can – for example – be the child's social skills or ability to work independently, while family outcomes may comprise the well-being of the different family members or the quality of the mother-child relationship. We are particularly interested in how individuals *perceive* the return to changes in maternal labor supply in $t = 1$ on child skills and family outcomes:

$$\underbrace{\frac{\partial \tilde{h}_{2,i}(.)}{\partial l^m_{1,i}}}_{\text{total effect}} = \underbrace{\frac{\partial \tilde{f}_i(.)}{\partial l^m_{1,i}}}_{\text{direct effect}} + \underbrace{\frac{\partial \tilde{f}_i(.)}{\partial Y^m_1(.)} \frac{\partial Y^m_1(.)}{\partial l^m_{1,i}}}_{\text{income effect}}. \tag{6}$$

Changes to maternal labor supply can alter child skills and family outcomes through two channels. When maternal labor supply increases, there is a direct effect on outcomes stemming from a different allocation of maternal time, and an indirect effect stemming from additional income. Arguably, beliefs about the composite or 'total effect' matter in maternal labor supply decisions, which is why our primary goal is to elicit and document beliefs about the total effect, and examine how those beliefs relate to maternal labor supply intentions.

However, it is interesting to decompose this belief further and study how individuals perceive the returns to household income alone. This allows us to gain insights into why individuals may think that maternal labor supply matters for child and family outcomes. To study these research questions, we design two sets of vignettes and elicit beliefs both about the total effect as well as the income effect (see Section 3.1). We document patterns in beliefs and use the elicited beliefs about the total effect when estimating the choice models of maternal labor supply.

Second, maternal labor supply decisions in the pre-school period can have important consequences for the future labor market opportunities of the mother. For this reason, we elicit perceptions about the impact of maternal labor supply on the mother's labor market opportunities in future periods (see Section 3.1). We examine patterns in beliefs and study the extent to which those beliefs are related to maternal labor supply intentions. In particular, we are interested in how individuals *perceive* the marginal return to changes in maternal labor supply in $t = 1$ on the probability of finding a job in $t = 2$ as well as earnings:

$$\frac{\partial \tilde{\rho}_i(l^m_{1,i})}{\partial l^m_{1,i}}, \frac{\partial \tilde{Y}^m_{2i}(l^m_{1,i}, l^m_{2,i})}{\partial l^m_{1,i}}. \tag{7}$$

Third, a potentially binding constraint to maternal labor supply is the availability of childcare. To study the perceived importance of this constraint in maternal labor supply decisions, we elicit beliefs about the availability of childcare and provide evidence on whether individuals perceive this constraint as binding (see Sections 3.2 and 3.3). We also elicit beliefs about childcare costs and use this information when estimating the choice models.

Finally, individuals may derive additional utility from the fact that maternal labor supply does not deviate from the perceived social norm. We elicit beliefs about prevalent norms and study whether beliefs about social norms are predictive of choices (see Section 3.4).

3 Survey Design

To study the questions posed above, we design a survey that we administer to a representative sample of German adults without children. The survey is divided into different survey blocks, described in detail below. Appendix C presents the exact wording of the survey questions.

3.1 Beliefs about Returns

We design two sets of vignettes to elicit individual perceived returns to maternal labor supply (vignettes A) and household income (vignettes B). Vignettes A are presented to approximately 75% of randomly selected study participants, while vignettes B are presented to approximately 25% of respondents.[3] The two sets of vignettes feature the same hypothetical family, and 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 labor 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 features are explained in detail below.

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.[4] 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.

Vignettes A: The first set of vignettes is designed to elicit the perceived *total effect* of maternal labor supply on the outcomes of interest (see equation (6)). Respondents are presented with the information that places in childcare centers 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).[5] In scenario 1, the family cannot gain access to childcare, the

[3]We randomize 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 labor supply and examine how those beliefs relate to maternal labor 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.

[4]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.

[5]We note that this setting is realistic because virtually no region in Germany has sufficient childcare coverage to accommodate all children (see, e.g., Jessen, Schmitz and Waights 2020).

mother stays at home, and earns nothing. In scenario 2, the family gains access to childcare for half the day, the mother works part-time (20h/week), and earns €20,000 gross/year. In scenario 3, the family gains access to childcare for the full day, the mother works full-time (40h/week), and earns €40,000 gross/year. In all three scenarios, the father works full-time (40h/week) and earns €40,000 gross/year. To highlight the differences across the scenarios, this information is additionally presented in a table on the following screen, 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.

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 alone. Again, it is explained that places in childcare centers are limited. This time respondents are presented with the information that the family cannot gain 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 department 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 40h/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 labor 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.

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 labor 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 labor supply in the pre-school period, while vignettes B are designed to elicit beliefs about the income effect.

Perceived Outcomes: We elicit individual beliefs about a set of outcomes that are likely to be relevant in maternal labor supply decisions (see Table 2).[6] 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 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 labor market outcomes, namely the probability that the mother finds a full-time job at the age of 36, as well as her earnings at the ages of 36 and 42, conditional on her returning to full-time work from the age of 36.[7] We elicit beliefs about all of these outcomes in vignettes A, as all of those beliefs are likely to be relevant in maternal labor supply decisions. We further elicit beliefs about child and family outcomes in vignettes B, allowing us to shed light on the perceived income effect on those outcomes.

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

[6]The choice of variables is motivated by existing studies documenting the impact of maternal labor 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 labor market opportunities of the mother (see, e.g., Blundell et al. 2016).

[7]Respondents are asked to assume that Sarah wants to return to full-time work when she is 36 years old and that there is no inflation.

method that allows us to obtain quantitative, interpersonally comparable measures. First, we anchor beliefs about the outcomes in scenario 1. 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'.[8] 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'. By comparing responses across scenarios, we can infer the perceived changes in percentile ranks. Beliefs about the probability of finding 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).[9] By comparing beliefs across scenarios, we can infer individual beliefs about the labor market returns to the mother working part- or full-time while the child is 1-5 years old.

3.2 Beliefs about Childcare

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 neighborhood. First, we ask respondents to state how likely they think it is that the family would be able to find an available slot at a childcare center. Second, we ask respondents to imagine that the family obtains access to childcare and elicit individual perceptions about (i) the likelihood of the childcare center being open the full day (8AM-5PM) and (ii) the likelihood of the childcare center being of high quality. We specify that we consider a childcare center 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. In addition, we elicit the perceived cost of childcare. In particular, we ask respondents what they think a family with an average income living in their neighborhood would have to pay for a full-day

[8] To ease comprehension, we provide further explanations of the scale. See Appendix B for exact wording.

[9] For simplicity, we do not model the father's labor 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.

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 labor 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 labor market outcomes. * Perceived maternal labor market outcomes are only elicited in vignettes A.

place in childcare (including the costs for meals).

3.3 Labor Supply Intentions and Policy Scenarios

To measure labor 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 labor 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).[10]

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

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 labor supply choices might be affected if such policies were implemented.

3.4 Beliefs about Social Norms

To obtain information on perceived social norms – which have been shown to be important in the context of maternal labor supply – 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.

3.5 Background Characteristics

We collect detailed information on respondents' background characteristics including their age, gender, place of residence and where the respondent went to school, as well as their 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.

4 Data and Context

4.1 Sample

We collect primary survey data for a large representative sample of 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.[11] The median time to complete the survey was 13 minutes. We screened out participants who do not pass an attention check or speed through 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. 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.

4.2 German Context

Germany provides an ideal setting to study maternal labor supply as there is a substantial degree of variation in mothers' labor 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.[12] Consistent with these statistics, gender-conservative views are still prevalent in German society, although Germany is not an outlier in the international context.[13] There is also substantial variation in maternal labor supply across regions within Germany, partly driven by the historical differences in family, labor market, and childcare policies between the German Democratic Republic (GDR) and the Federal Republic of Germany (see, e.g., Krueger and Pischke 1992; Domscheit-Berg 2016; Klammer et al. 2020; Boelmann, Raute and Schönberg 2021). 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

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

[12] The figures refer to the labor supply of mothers with at least one child aged 0-14. Source: OECD Family Database (OECD, 2019*a*). See Appendix Figure A.1 for an international comparison.

[13] Appendix Figures A.2 and A.3 use data from the 2012 wave of the International Social Survey Program (ISSP Research Group, 2012) to provide an international comparison of attitudes towards maternal labor supply. 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. Appendix Figure A.3 displays the percentage of respondents agreeing or strongly agreeing with the two statements 'A pre-school 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'.

taxation, and the provision of public childcare was extremely limited. To this day, substantial differences remain in both maternal labor supply and the percentage of children attending childcare, despite the fact that childcare costs are negligible and all children above the age of one have the legal right to a place in childcare.[14]

5 Beliefs and Labor Supply Intentions

5.1 Evidence on Beliefs about Returns

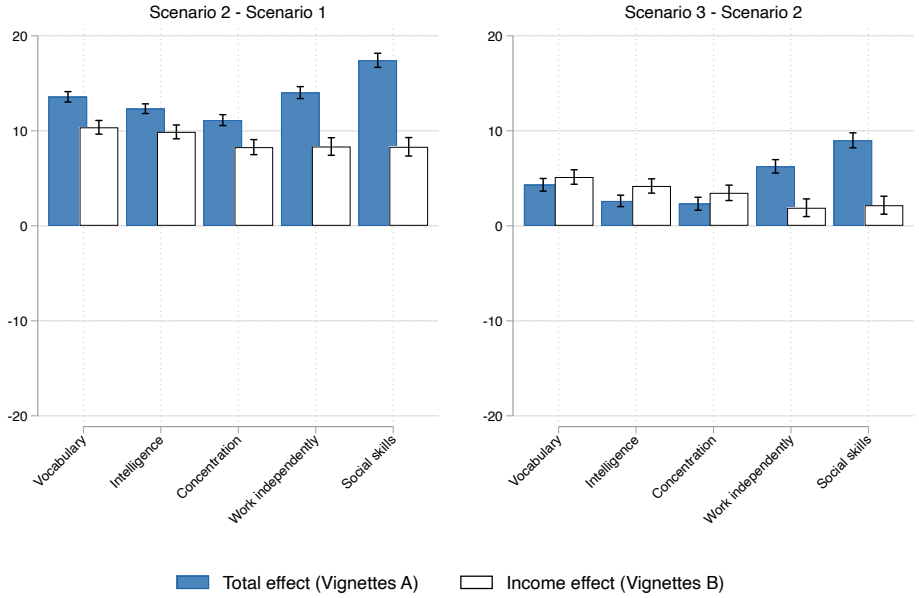
Child Skills and Family Outcomes: The survey data allows us to examine how individuals perceive the returns to maternal labor supply and household income on child skills and family outcomes. Let $r^v_{i,j,k}$ denote respondent i's belief in scenario j and vignette type $v \in (A, B)$ about outcome k. For each vignette type and outcome, we calculate the individual perceived return to scenario 2 relative to scenario 1 (i.e., $r^v_{i,2,k} - 50$), and the individual perceived return to scenario 3 relative to scenario 2 (i.e., $r^v_{i,3,k} - r^v_{i,2,k}$). 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. 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 outcomes k, averaged across respondents.[15] The blue bars depict the average perceived returns to part-time (scenario 2) relative to no work (scenario 1) on the left and full-time (scenario 3) relative to part-time work (scenario 2) on the right. The white bars display the average perceived returns to a household income of €60,000 (scenario 2) relative to €40,000 (scenario 1) on the left and €80,000 (scenario 3) relative to €60,000 (scenario 2) on the right. Put differently, while the blue bars illustrate the average perceived *total effect* of maternal labor supply, the white bars illustrate the average perceived effect that stems from additional household income alone (i.e., the *income effect*).

[14] 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 (OECD, 2019*b*).

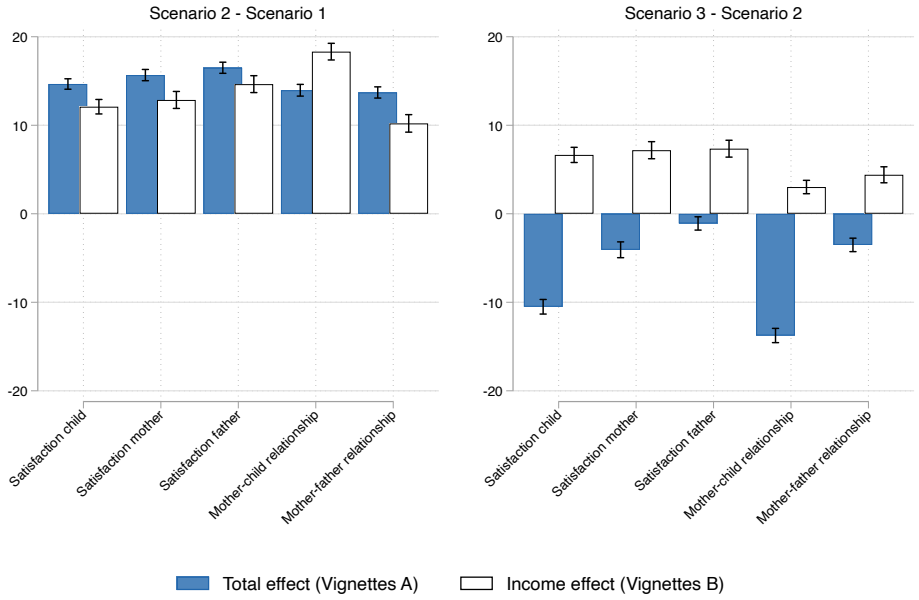
[15] Appendix Table A.2 presents the average responses to the different hypothetical scenarios in vignettes A (left) and vignettes B (right) for all child and family outcomes

Figure 1: Average perceived returns – Child and family outcomes

(a) Child outcomes



(b) Family outcomes



Notes: This figure illustrates the average perceived returns for the five child outcomes (top) and the five family outcomes (bottom). The blue bars depict the average perceived returns to part-time (scenario 2) relative to no work (scenario 1) on the left and full-time (scenario 3) relative to part-time work (scenario 2) on the right. The white bars display the average perceived returns to a household income of €60,000 (scenario 2) relative to €40,000 (scenario 1) on the left and €80,000 (scenario 3) relative to €60,000 (scenario 2) on the right. The perceived total effects (blue bars) are calculated from responses to vignettes A, while the perceived income effects (white bars) are calculated from responses to vignettes B. The thin bars represent the 95% confidence intervals.

How do individuals perceive the total returns to mothers working part- 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 (blue bars, left panels). The magnitudes of the perceived effects are sizable and range between 11-17 percentile ranks for child skills and between 13-17 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 (blue bars, right panels). On average, respondents believe that all five child skills improve even further, although the returns are now more muted and only range between 2-9 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 (white bars), we document that the average perceived returns to a household income of €60,000 relative to €40,000 (left panels) 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 (right panels), albeit to a smaller extent. A comparison between the perceived total effect (blue bars) and the perceived income effect (white bars) yields interesting insights and helps to gauge the perceived effect of changes in maternal labor supply holding constant family income. The average perceived return to €60,000 relative to €40,000 is sizable 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 labor supply alone is perceived to be positive for those outcomes.[16] 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

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

return to the mother working part-time (and earning €20,000 more), indicating that the perceived direct effect stemming from changes in maternal labor 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.[17] 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 only 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 negative that they are perceived to more than offset the perceived positive impacts of additional income.

Do all respondents hold similar beliefs about the returns that we measure? The average perceived returns that we document in our study mask a considerable degree of heterogeneity. 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 sizable, but a non-negligible share of respondents perceive the returns as negative (positive) even when the average perceived returns are positive (negative).[18] We explore this heterogeneity in further detail in Section 6.2.

Maternal Labor Market Outcomes: We follow a similar procedure to calculate the perceived return to maternal labor supply in terms of the future labor market outcomes of the mother. Following the same notation as above, the individual perceived return to scenario 2 relative to scenario 1 is calculated as $(r^A_{i,2,k} - r^A_{i,1,k})$, while the individual perceived return to scenario 3 relative to scenario 2 is calculated as $(r^A_{i,3,k} - r^A_{i,2,k})$.[19] Figure 2 shows the average perceived returns to part-time relative to no work (left) and full-time relative

[17] 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 child's social skills and the child's ability to work independently, the perceived income effect is significantly smaller than the perceived total effect.

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

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

to part-time work (right).[20] The average perceived likelihood of the mother being able to return to full-time work 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.

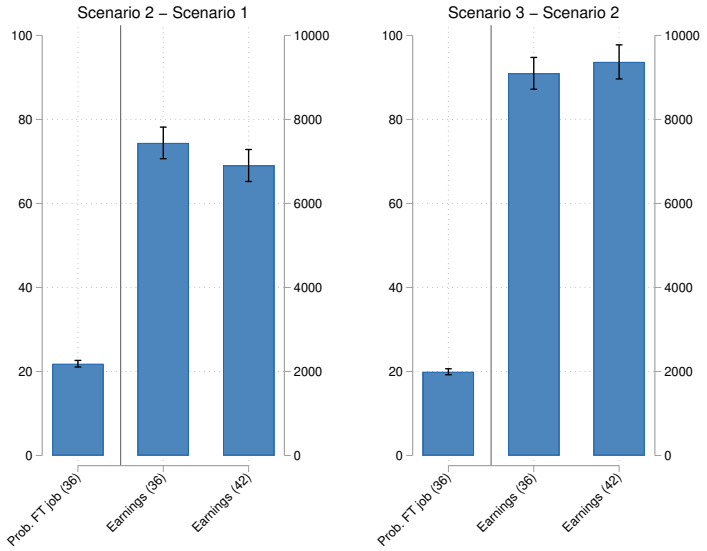
We now turn to the beliefs about maternal earnings at the ages of 36 and 42, assuming that the mother returns to full-time work from the age of 36. Mothers who stay at home for five years to look after their children are on average expected to earn €31,557 when they return to full-time work at the age of 36.[21] They are perceived to earn approximately €6,900 (+21.9%) more at that age if they worked part-time rather than not at all while their children were young, and an additional €9,369 (+29.7%) more if they worked full-time rather than part-time. Consistent with returns to hours worked being convex (Blundell et al. 2016), the part-time penalty is perceived as lower than the penalty of not working at all. How do respondents perceive the impact on the trajectory of earnings? At the age of 42, mothers are perceived as earning €34,877 if they stayed at home to look after their children. 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.

As with child and family outcomes, there is a considerable degree of heterogeneity in individual perceived returns (see Appendix Figure A.6), which we explore in further detail in the following sections.

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

[21] 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).

Figure 2: Average perceived returns – Maternal labor market outcomes

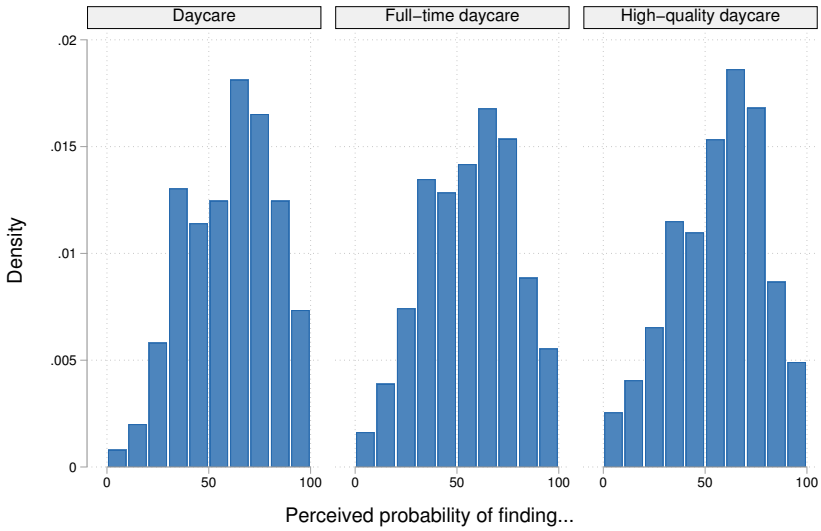


Notes: This figure illustrates the average perceived returns for the three maternal labor market outcomes. The bars depict the average perceived returns to part-time (scenario 2) relative to no work (scenario 1) on the left and full-time (scenario 3) relative to part-time work (scenario 2) on the right. The three outcomes are the mother's probability of being able to return to full-time work at the age of 36 (left axis), and the mother's earnings at the ages of 36 and 42 (right axis). These perceived total effects are calculated from responses to vignettes A. The thin bars represent the 95% confidence intervals.

5.2 Evidence on Beliefs about Childcare

Figure 3 documents how individuals perceive the probability that a family living in their neighborhood would find childcare for their one-year-old child (left), as well as how individuals perceive the likelihood of the childcare center being open the full day (center) and being of high quality (right). 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 center being open the 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 the full day is 31%, which is the same as the average perceived likelihood of finding high-quality daycare. On average, respondents perceive the average cost of childcare (including the cost of meals) to be low (approx. €350 per month).

Figure 3: Distribution of perceived constraints to childcare availability



Notes: The figures illustrate the distribution of the perceived probability that a family with a one-year-old child living in the same neighborhood as the respondent would gain access to childcare (left), and, conditionally on having access, that the childcare would be available for the full day (center) and of high quality (right).

5.3 Evidence on Labor Supply Intentions

To study maternal labor supply intentions, we ask women (men) what they (their partner) would most likely do while their child was 1-5 years old. Figure 4 shows the distribution of individual responses to this question (white bars). 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 study the perceived importance of childcare constraints, we 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 (gray bars), the share of respondents preferring the full-time option rises by nearly 24 percentage points, and it further rises by an additional 12 percentage points in policy scenario 2 (blue bars). 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.[22]

[22]We find qualitatively and quantitatively similar results if we separately examine the responses of women about their own labor supply intentions or the responses of men about the likely labor supply of their

This result has important implications for public policy, as it highlights the importance of the availability of full-time, high-quality childcare. At the same time, it is noteworthy that even when respondents are asked to imagine abundant high-quality childcare that is open the full day, the share of respondents stating that they or the mother of their child would work full-time 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 labor supply or beliefs about social norms.

Figure 4: Maternal labor supply intentions and policy scenarios

Notes: This figure shows the distribution of maternal labor supply intentions for the baseline case (white bars), the policy scenario in which full-day childcare is available (gray bars), and the policy scenario in which childcare is available and of high quality (blue bars).

5.4 Evidence on Beliefs about Social Norms

As documented in the literature (see, e.g. Bursztyn, González and Yanagizawa-Drott 2020), perceived social norms are likely to be an important determinant of maternal labor supply. To capture beliefs about the views of people in the immediate social network, we ask respondents to state what they think their family and friends would approve of most if they had a young child and full-time childcare was available to them. When asked about the perceived approval

partners.

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.

6 A Choice Model of Labor Supply Intentions with Heterogeneous Beliefs

Individuals considerably differ in their beliefs about the returns to maternal labor supply decisions. In this section, we explore whether individual beliefs about returns that we elicit through vignettes A are predictive of maternal labor supply intentions under the different policy scenarios (Section 6.1), and we study which background characteristics of the respondents predict differences in beliefs about returns (Section 6.2).

6.1 Do Beliefs About Returns Predict Labor Supply Intentions?

Guided by our theoretical framework, we first examine whether individual beliefs about the returns to maternal labor supply – which we elicit through vignettes A – are predictive of maternal labor supply intentions under the different policy scenarios, over and above what can be predicted by other factors such as beliefs about social norms or individual background characteristics. Our theoretical framework yields several testable predictions. First, we expect individuals to be more likely to choose a specific alternative the more favorable that they expect the outcomes of that alternative to be (relative to the other alternatives). Second, we expect the associations between perceived outcomes and labor supply intentions to be stronger the less binding the constraints that individuals perceive to face are. Intuitively, individuals are more likely to act on their beliefs if they face fewer constraints, so we expect the associations to be stronger if childcare constraints are relaxed.

To test those predictions, we estimate three separate multinomial probit choice models, where the choice of interest is the labor supply decision that an individual states that they

would make (i) in the baseline scenario, (ii) the scenario in which full-time childcare was available, and (iii) the scenario in which full-time childcare was available *and* of high quality. In all three choice models, individual i can choose between $J = 3$ alternatives: not working ($l_i^m = 1$), working part-time ($l_i^m = 2$), or working full-time ($l_i^m = 3$) while the child is 1-5 years old.[23] For the purpose of this analysis, we construct a composite measure of perceived child skills for each alternative j, h_{2ij}^C, by taking the average of the five perceived child skills that we elicit in each respective scenario (see Table 2), and rescaling the resulting variable to range from 0 to 1. Similarly, we construct a composite measure of perceived family outcomes for each scenario j, h_{2ij}^F, by taking the average of the five perceived family outcomes in each scenario and rescaling the resulting variable. We choose this approach to mitigate concerns related to measurement error, and ease the interpretation of the results.[24]

Let the utility that individual i derives from choosing alternative j, $u_{ij} = u(l_i^m = j)$, be a linear, additive function of perceived outcomes, perceived adherence to social norms, perceived costs, and individual background characteristics:

$$u_{ij} = \alpha_j + \beta_1 h_{2ij}^C + \beta_2 h_{2ij}^F + \gamma \rho_{ij} Y_{2ij}^m + \delta s_{1ij} + \lambda_j p_i + \xi_j X_i + \varepsilon_{ij}.$$

α_j represents the alternative-specific constant, h_{2ij}^C and h_{2ij}^F are the perceived child skills and family outcomes in scenario j, $\rho_{ij} Y_{2ij}^m$ are expected maternal earnings at the age of 36 in scenario j, calculated as the product of the perceived likelihood of finding full-time employment and expected annual earnings (conditional on full-time work) at the age of 36. s_{1ij} are 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 costs of childcare, X_i are individual background characteristics (age, gender, university education, marital status, region of residence), and ε_{ij} is the error, which has a multivariate normal distribution with mean zero and variance-covariance matrix Ω.[25] Following the standard approach in the

[23] We note that 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.

[24] We note that there is a strong correlation between some of the returns that we elicit. Appendix Tables A.5 and A.6 show the Spearman rank correlations between all returns in terms of child, family and maternal labor 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.

[25] We note that the multinomial probit choice model allows for correlated errors via the variance-covariance matrix Ω, rather than – for instance,– a conditional logit model, which assumes independence. This is

literature, individual i selects alternative j to maximize utility derived from their choice, u_{ij}. The probability that individual i will choose alternative j can then be written as: $Pr(i\ chooses\ j) = Pr(u_{ik} \leq u_{ij}) \forall k \neq j$.[26]

The results of the choice model estimations are presented in Table 3. Column 1 presents the results for a model where the dependent variable is the choice that individuals state they would make under the baseline scenario. Columns 2 and 3 present the results for models in which the dependent variables are the choices that individuals state they would make in the policy scenario in which full-time childcare was available and the policy scenario in which full-time, high-quality childcare was available. Focusing on the results in column 1, we find that perceived family outcomes significantly predict intended labor 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. The estimated marginal effects for family outcomes are sizable. A perceived improvement in family outcomes by ten 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.[27] Consistent with the results from the previous literature, we also find that perceived adherence to social norms positively predicts intended labor supply: for example, if the respondents' family is perceived to approve of the part-time (full-time) option most, this is associated with a 8.0 (6.9) percentage point increase in the probability that the respondent chooses that option.

Turning to the results presented in columns 2 and 3, in which we progressively relax childcare constraints, we find that *all* perceived outcomes that we measure are significant predictors of labor supply intentions under the respective policy scenarios. Not only are perceived family outcomes significantly related to choices, but so are perceived child skills and maternal earnings. Focusing on the results from the choice model estimated in column 3, when we calculate the marginal effects we find that an improvement in child skills by ten

important to accommodate the idea that preferences for part- and full-time work relative to not working might be correlated.

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

[27]See Appendix Figure A.8 for a graphical representation of the marginal effects of the alternative-specific variables on intended choices.

percentile ranks in the part-time (full-time) scenario is associated with a 2.5 (2.6) percentage point increase in the probability that the respondent chooses the part-time (full-time) option when full-time, high-quality childcare is available. A perceived improvement in family outcomes by 10 percentile ranks in the part-time (full-time) scenario is associated with a 2.9 (3.1) 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 2.5 (2.7) 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.[28] We find that respondents' willingness to pay for child and family outcomes is sizable: in the policy scenario where full-time, high-quality childcare is available, individuals would be willing to give up around €10,000 of maternal earnings at the age of 36 for a ten-percentile rank increase in child skills, and €11,600 for an equivalent improvement in family outcomes.

The estimated associations between beliefs and labor supply intentions cannot be interpreted as causal in our setting, as there is no exogenous variation in beliefs that we can exploit to identify causal effects. However, we note that the results are consistent with a model in which beliefs matter for individual labor supply decisions. Individuals are more likely to select options for which they perceive the outcomes to be more positive, and these relationships tend to be stronger once childcare constraints are relieved.

There are two additional caveats that we would like to note. When estimating the choice model, we estimate the relationship between labor supply intentions and beliefs about child, family, and labor market outcomes that we elicit using hypothetical vignettes featuring an

[28] 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 probabilized maternal earnings at the age of 36 that an individual would be willing to give up for a ten percentile ranks increase in child skills (or family outcomes).

average family living in Germany (rather than the respondent's own family). Eliciting beliefs for the average family has the advantage that all respondents are presented with the exact same scenarios, which facilitates the comparison of responses across respondents. However, it is conceivable that the actual returns to maternal labor supply are heterogeneous across the population, and that individuals hold private information about those returns. An interesting avenue for future research is to study whether individuals believe that the returns to their own labor supply decisions differ from the returns for an average family. We hypothesize that the associations between perceived private returns and labor supply intentions would be even stronger than what is suggested by our choice model estimates. The second caveat that we would like to mention is that we only elicit beliefs about returns for the baseline scenario, i.e., we do not have information about how individuals would perceive the returns if – for example – full-time, high-quality childcare was available. Whether or not policies can affect perceived returns is an open question.

Table 3: Choice model estimating maternal employment intentions

		Childcare	
	Baseline	Full-time	Full-time & high quality
Child skills	0.2990	0.6398***	1.2615***
	(0.2265)	(0.2317)	(0.2794)
Family outcomes	1.8938***	1.6438***	1.4621***
	(0.2651)	(0.2649)	(0.2832)
Maternal earnings (36) - in 000's Euro	-0.0016	0.0047**	0.0126***
	(0.0020)	(0.0021)	(0.0029)
Family's opinion	0.3377***	0.3799***	0.4276***
	(0.0474)	(0.0484)	(0.0586)
Friends' opinion	0.1842***	0.3700***	0.3809***
	(0.0491)	(0.0546)	(0.0615)
Observations	2873	2873	2873
Controls	Yes	Yes	Yes

Notes: The table presents the estimates of the multinomial probit choice model. The dependent variables are the intended labor supply choices of the mother in the baseline scenario (column 1) and in the policy scenarios where full-time daycare was available (column 2) and of high quality (column 3). 'Child skills' is a composite measure constructed by summing the five perceived child outcomes, separately for each alternative j, diving by 5 and rescaling by 100 so that the measure ranges between 0 and 1. 'Family outcomes' is a composite measure constructed in an analogous way by averaging the five family outcomes that we elicit, separately for each alternative j. Maternal earnings are computed as the expected earnings at age 36 of working full-time, divided by 1000 and multiplied by the perceived probability that the mother will be working full time at age 36. Controls include perceived costs of full-time childcare, age and binary indicators for being female, having a university degree, being married and living in East Germany. Standard errors are in parenthesis. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

6.2 Which Factors Predict Beliefs about Returns?

Beliefs about child outcomes, family outcomes, and future labor market opportunities are heterogeneous and predict maternal labor supply intentions. A natural question that arises is how those beliefs are shaped or formed. Arguably, socialization 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' labor supply while they were young, as well as the cultural context in which they were raised.

To shed light on the predictors of the perceived returns to full-time work, we first calculate the difference between full- and part-time work for our composite measures of perceived child skills and family outcomes, as well as the expected maternal earnings at the age of 36. The composite measures of returns in terms of child skills and family outcomes are calculated as $(h^C_{2ij=3} - h^C_{2ij=2})$ and $(h^F_{2ij=3} - h^F_{2ij=2})$. For maternal earnings, we calculate the difference in expected earnings at the age of 36 between the full- and part-time scenario: $(\rho_{ij=3} Y^m_{2ij=3} - \rho_{ij=2} Y^m_{2ij=2})$.

We regress the resulting measures that capture beliefs about the returns to full-time relative to part-time work on (i) a dummy variable indicating whether the respondent's own mother worked while they were 1-5 years old, (ii) a dummy variable indicating whether the respondent went to school in (former) West Germany, and (iii) a range of respondent background characteristics (i.e., gender, age, university education, marital status, migrant background, and religiosity). The results are presented in Panel A of Table 4 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 own mother worked, and they are perceived as significantly smaller if the respondent was raised in (former) West Germany. We find little association between these background variables and the perceived earnings returns to full-time work. In Panel B, we show that respondents whose mothers worked while they were young and respondents who were raised in (former) East Germany are more likely to perceive returns in child and family outcomes as positive.[29]

[29] Conversely, we find no significant association between perceived returns to household income alone and the labor supply of respondents' mothers or the area in which the respondents grew up - see Appendix

Table 4: 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
Own mother working	1.347**	2.466***	-0.483	0.041**	0.061***	-0.019*
	(0.58)	(0.66)	(0.51)	(0.02)	(0.02)	(0.01)
West Germany	-3.054***	-3.507***	-0.234	-0.047**	-0.086***	0.004
	(0.64)	(0.76)	(0.59)	(0.02)	(0.02)	(0.01)
Woman	1.099**	-3.965***	2.716***	0.017	-0.118***	0.058***
	(0.55)	(0.64)	(0.48)	(0.02)	(0.02)	(0.01)
Age	-0.076*	0.186***	-0.070**	-0.001	0.003***	0.000
	(0.04)	(0.04)	(0.03)	(0.00)	(0.00)	(0.00)
University degree	-1.012	-0.659	1.179**	-0.005	-0.040*	0.041***
	(0.63)	(0.71)	(0.53)	(0.02)	(0.02)	(0.01)
Married	0.463	1.820**	-0.808	0.004	0.096***	-0.052***
	(0.84)	(0.90)	(0.72)	(0.03)	(0.03)	(0.02)
Migration background	0.671	-0.636	-1.093*	-0.004	-0.029	-0.030**
	(0.69)	(0.78)	(0.61)	(0.02)	(0.02)	(0.01)
Religious	-0.855	-0.420	-1.538***	-0.048**	0.038*	-0.036***
	(0.63)	(0.73)	(0.56)	(0.02)	(0.02)	(0.01)
Observations	2872	2872	2915	2872	2872	2915
R^2	0.016	0.043	0.022	0.007	0.043	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 composite measure of child skills (column 1), a composite measure of family 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 are on a 0-100 scale. Returns in terms of maternal earnings at age 36 are calculated as probabilized earnings at age 36 under the full-time work scenario, minus the corresponding figure for the part-time work scenario. Probabilized 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. 'Own mother working' indicates if the respondent's mother predominantly worked full-time or part-time (as opposed to not at all) 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. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

7 Discussion

Given the patterns that we document, a further question that arises is whether perceptions about returns to mothers working are on average correct. To study this question, we would need to compare the average perceived returns (for the average family) as measured through our survey to the estimated causal effect of maternal employment on the outcomes that

Table A.7.

we measure. Identifying the causal effect of maternal employment on pecuniary and non-pecuniary outcomes is a challenging task partly due to a lack of data (e.g., on the non-pecuniary outcomes that we measure) and partly due to the difficulty of finding a credible source of exogenous variation that we could exploit to identify the causal impact of mothers' employment while her child is 1-5 years old.

While estimating the causal returns to mothers' labor supply lies beyond the scope of this paper, we can compare certain notable patterns in our data to existing empirical evidence from other studies. For instance, respondents in our sample believe that career interruptions have a negative effect on women's later-life earnings and they perceive the returns to hours worked to be convex. These patterns are consistent with existing empirical evidence. For example, Francesconi (2002) and Blundell et al. (2016) find that there are sizable differences in the accumulation of experience between part- and full-time work, which is why any part-time work experience accumulated during the child-rearing years tends to depress the earnings profiles of mothers who return to full-time work.

Regarding child outcomes, most closely related to our work is a study by Tominey, Nicoletti and Salvanes (2022) that uses Norwegian population-wide administrative data and a partially overlapping peer approach to estimate the causal effect of maternal labor supply while the child is 1-5 years old on child human capital. The identification strategy allows the authors to estimate the total effect of maternal labor supply and separately identify the two channels through which an increase in maternal labor supply can affect child outcomes, namely the direct effect originating from a change in maternal time allocation as well as the indirect effect stemming from changes in household income.[30] The study finds that the direct effect of hours on child human capital is negative but not statistically significant, while the estimated indirect effect of income is positive and statistically significant. Overall, the positive indirect effect of income generates a positive total effect on child human capital of 26% of a standard deviation for a 10-hour increase in mothers' weekly hours in the pre-school years. Consistent with those results, respondents to our survey perceive the indirect effect

[30]While the contexts are not directly comparable to ours, we note that other work also studies the causal impact of additional income on a range of different child outcomes, using a variety of different research methods (see, e.g., Løken 2010; Løken, Mogstad and Wiswall 2012; Dahl and Lochner 2012; Akee et al. 2018).

of income as well as the total effect of maternal labor supply as positive and sizable. In both Germany and Norway, the counterfactual to a mother's time tends to be subsidized, formal childcare. Whether or not the results are generalizable to other countries in which childcare is more expensive (or of poorer quality) is an open question.[31]

Another avenue for future research is to study beliefs about the returns to maternal labor supply for various groups in the population. In our study, we deliberately examine how respondents perceive the returns to maternal labor supply for the *average family*. This approach has the advantage that responses are comparable across respondents as all respondents are presented with the exact same hypothetical family. Differences in beliefs therefore cannot be attributed to actual differences in returns for this specific family. In future work, it could be worth examining whether individuals believe that the returns vary with the characteristics of the family (or the child). It would also be interesting to explore whether respondents believe that the returns to their *own* labor supply decision are systematically higher or lower than the return they expect for the average family. Evidence from previous studies suggests that the returns may indeed vary across households with different characteristics. For example, Blundell et al. (2016) find that the returns to full-time work experience on later-life earnings are higher for higher-skilled groups. Regarding child outcomes, Tominey, Nicoletti and Salvanes (2022) find that the direct effect of mothers' hours on child human capital is more negative in households where the mother has university education.[32]

Finally, one should explore *why* respondents believe that additional income plays such an important role for child development. The literature has identified different channels through which additional income can affect child outcomes. For example, additional income may allow the family to raise investments in their children (Carneiro and Ginja 2016), or move to a different neighborhood with better schools or access to different peers/networks (Chetty et al.

[31] While not directly comparable to our study, we note that existing evidence on the causal impact of universal childcare programs on child outcomes is mixed, with mean effects ranging from negative to positive depending on the country and context. For example, Havnes and Mogstad (2011), Felfe, Nollenberger and Rodriguez-Planas (2015) and Felfe and Lalive (2018) document sizable positive mean effects for Norway, Spain, and Germany, respectively, while Carta and Rizzica (2018) find no effect for Italy, and Baker, Gruber and Milligan (2008) and Baker, Gruber and Milligan (2019) find negative mean effects for Quebec.

[32] Consistent with these results, a growing body of evidence on the returns to childcare attendance suggests that treatment effects are heterogeneous, with positive effects being concentrated among children in socioeconomically disadvantaged families (see, e.g., Havnes and Mogstad 2015, Kottelenberg and Lehrer 2017, Cornelissen, Raute and Schönberg 2018, Fort, Ichino and Zanella 2020).

2014; Chetty, Hendren and Katz 2016; Chetty et al. 2022*a*,*b*; Tominey, Nicoletti and Salvanes 2022). It is also conceivable that additional household income leads to an improvement in parental mental health and parenting practices. Studying the (perceived) channels through which income affects child outcomes seems to hold the utmost policy importance given the large socioeconomic gradients observed in child human capital that emerge early in life and manifest themselves over the life cycle.

8 Conclusion

In this study, we leverage novel survey data from a representative sample of German adults without children and present evidence on subjective expectations about the returns to maternal labor supply decisions. We study how respondents perceive the returns to mothers working while their children are of pre-school age, shed light on the channels through which these returns are perceived to operate, and examine the extent to which those beliefs are related to maternal labor supply intentions. Choices may not only be driven by beliefs about returns but also by constraints. For this reason, we further examine how respondents perceive childcare availability and quality, and we study how individuals' stated intentions change under different policy scenarios.

To shed light on beliefs about the returns to maternal labor supply in terms of child and family outcomes, we design hypothetical scenarios that allow us to elicit beliefs about both the 'total effect' of mothers working full- or part-time while their children are young (relative to not working) as well as the 'income effect', i.e. the effect stemming from changes to household income alone. On average, children's skills are perceived to improve the more that mothers work and the longer that children attend childcare. We also find a positive and large perceived effect of additional household income on child skills. Despite its magnitude, the perceived income effect alone cannot account for all of the perceived total effect of maternal labor supply on child skills.

We document different patterns for the range of family outcomes that we measure, such as the quality of the mother-child relationship or the satisfaction of different family members. As for child skills, we find that family outcomes are perceived to monotonically increase

with additional household income. However, when we examine the perceived total effect of maternal labor supply, we find that family outcomes are perceived to peak when the mother works part-time, and deteriorate when the mother works full-time rather than part-time. In addition to measuring beliefs about the returns to maternal labor supply on child and family outcomes, we also elicit beliefs about the returns to mothers working while their children are young on the future labor market opportunities of the mother. The perceived likelihood of the mother being able to return to full-time work when the child enters school increases linearly with maternal hours worked in the pre-school period, and the impact of hours worked on future maternal earnings (conditional on working full-time) is perceived as convex.

The average perceived returns mask a considerable degree of heterogeneity, which is at least partly systematic. Consistent with socialization playing an important role in the formation of beliefs, we find that the family and the local environment in which respondents grew up significantly predict individual beliefs about the returns to maternal labor supply.

Having documented beliefs about returns, we additionally provide representative evidence on beliefs about childcare quality and availability, and labor supply intentions. Respondents in our sample are on average rather pessimistic about the availability and quality of childcare in their local area. These perceived constraints could at least partly explain why 67% of women (men) in our sample state that they (the mother of their child) would work part-time if they had a young child. Importantly, even when asked about their intentions in a scenario where full-time, high-quality childcare was available, only 55% of respondents state that they would prefer the full-time option. This finding underscores the importance of accounting for the role of other considerations in maternal labor supply choices. Indeed, when we estimate a choice model of maternal labor supply intentions, we find that both the perceived pecuniary and non-pecuniary returns to maternal labor supply significantly predict labor supply intentions in the scenario in which full-day, high-quality childcare is abundant, over and above what can be explained by other factors.

Taken together, our results demonstrate that it is crucial to shed more light on both the pecuniary and non-pecuniary motives of maternal labor supply to obtain a full picture of what drives child penalties and gender inequality in labor market outcomes.

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Beliefs about Maternal Labor Supply: Online Appendix

Teodora Boneva, Marta Golin, Katja Kaufmann and Christopher Rauh

December 7, 2022

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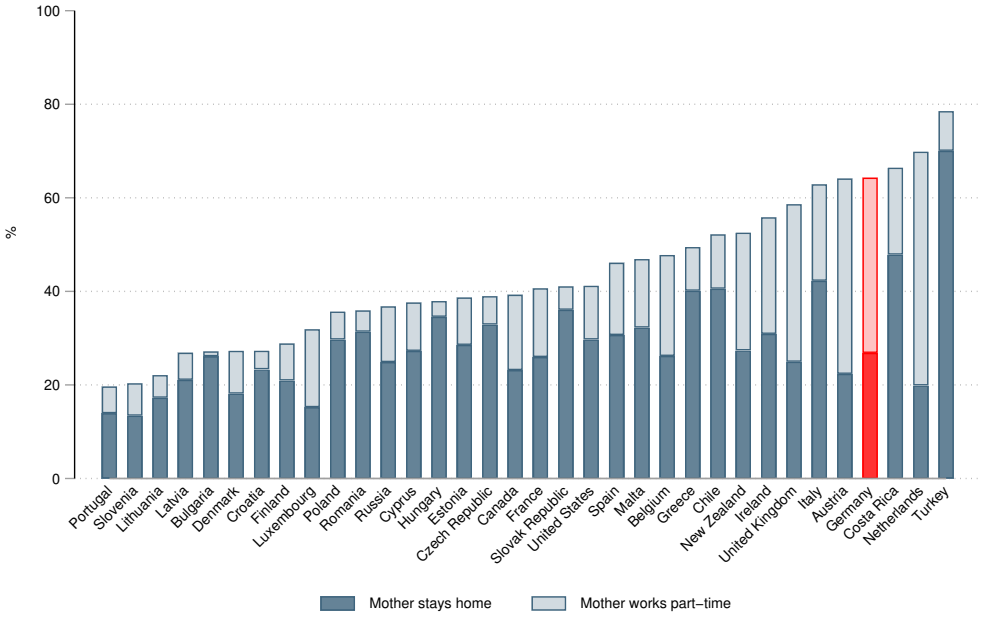
A Supplementary Figures and Tables

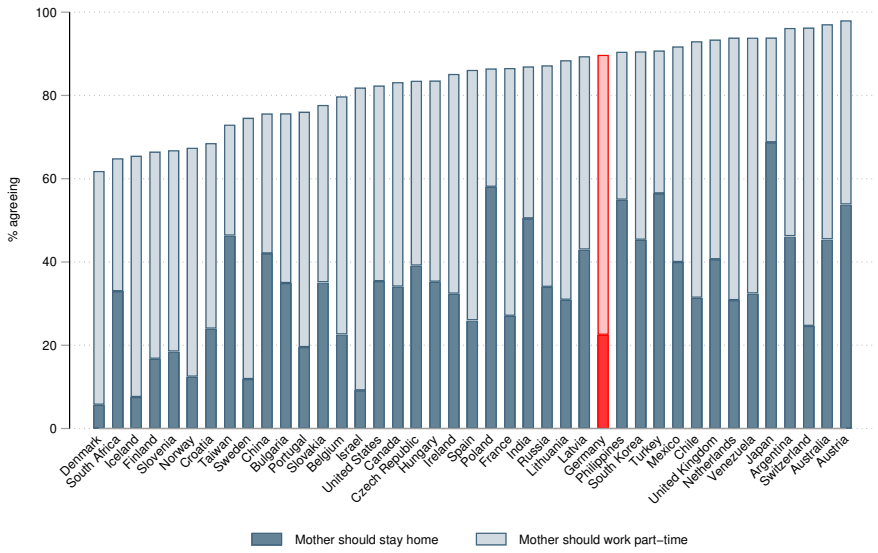
Figure A.1: Mothers staying at home or working part-time



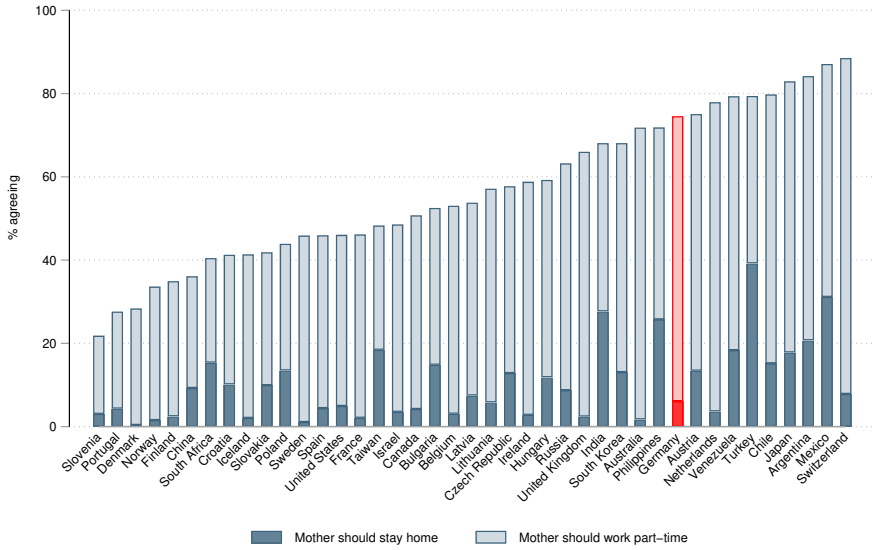
Notes: This figure displays the percentage of women (15-64 years old) with at least one child aged 0-14 staying at home or working part-time (rather than full-time). The data used come from the 2019 OECD Family Database (OECD, 2019*a*).

Figure A.2: What should women do under the following circumstances?

(a) 'When there is a child under school age'



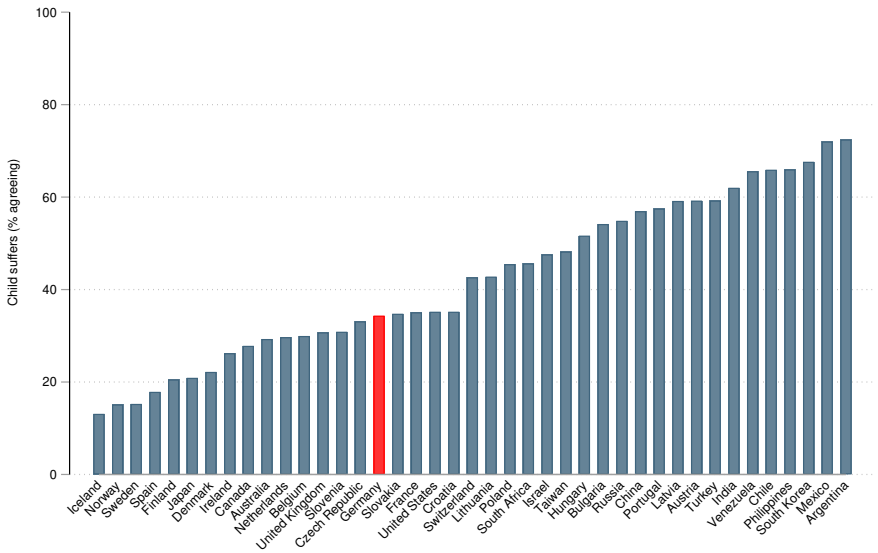
(b) 'After the youngest child starts school'



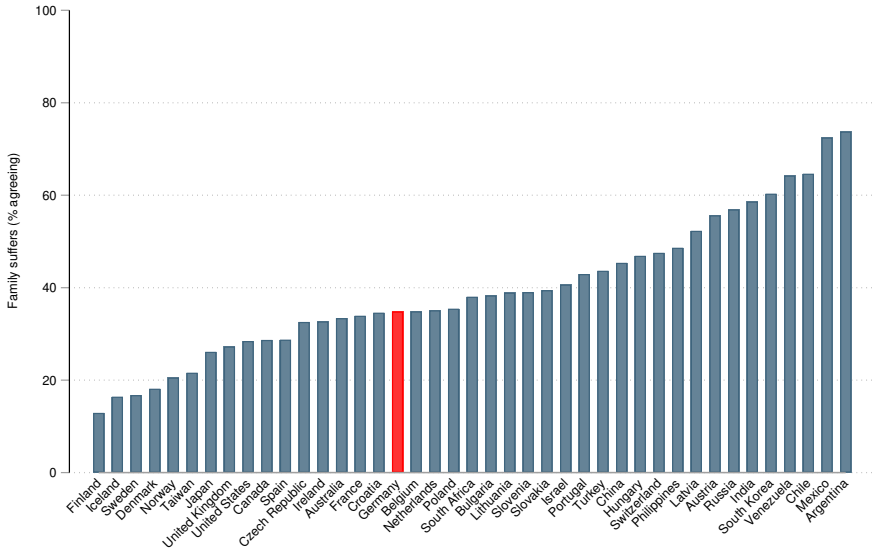
Notes: Panel (a) displays the percentage of respondents who state that the woman should stay at home or work part-time when she has a child under school age, while Panel (b) depicts the percentage of respondents who state that the woman should stay at home or work part-time when the youngest child starts school. The data used is the 2012 wave of the International Social Survey Program (ISSP Research Group, 2012). Calculations are based on the responses to the question 'Do you think that women should work outside the home full-time, part-time or not at all under the following circumstances?'.

Figure A.3: Agreement with statements about maternal labor supply

(a) 'A pre-school child is likely to suffer if his or her mother works.'

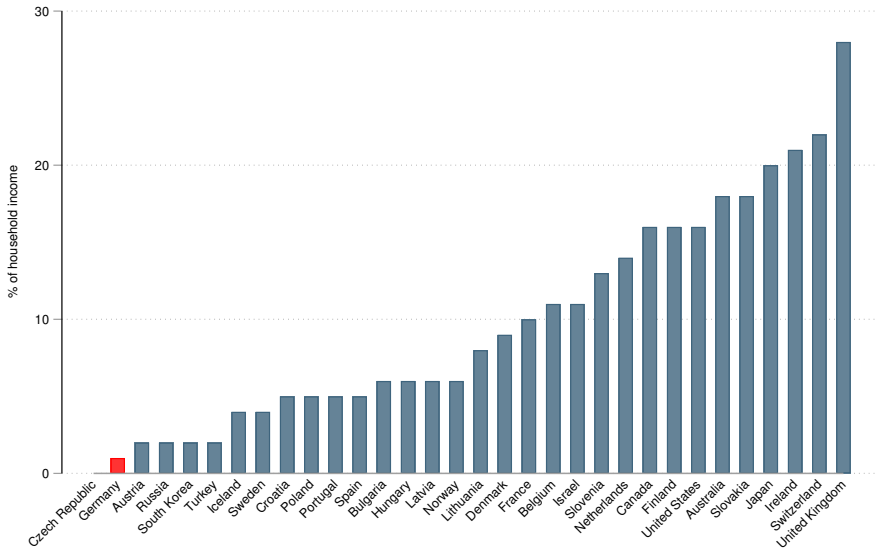


(b) 'All in all, family life suffers when the woman has a full-time job.'



Notes: Panel (a) depicts the percentage of respondents by country who agree or strongly agree with the statement 'A pre-school child is likely to suffer if his or her mother works', while Panel (b) presents the percentage of respondents who agree or strongly agree with the statement 'All in all, family life suffers when the woman has a full-time job'. The data used is the 2012 wave of the International Social Survey Program (ISSP Research Group, 2012).

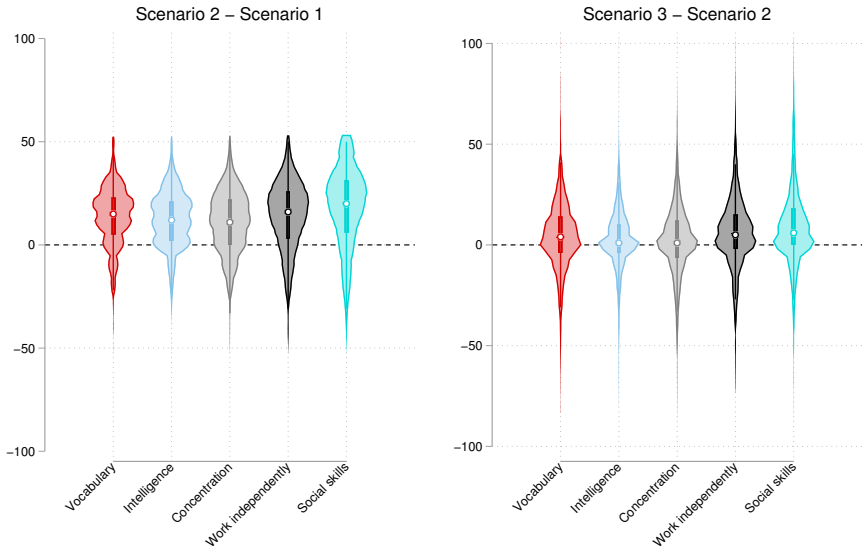
Figure A.4: Childcare costs



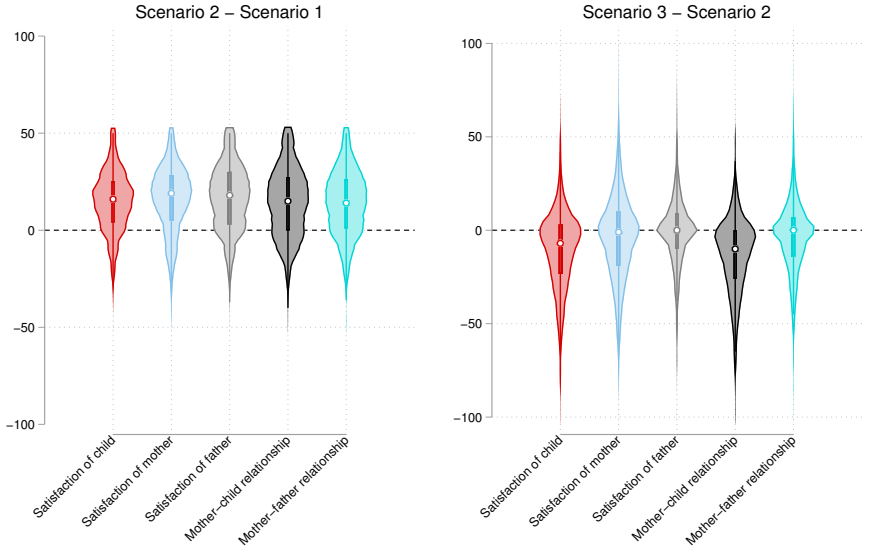
Notes: This figure displays net childcare costs (as a % of household income) for parents using full-time center-based childcare. It is calculated assuming a two-parent family with two children aged 2 and 3, where both parents are assumed to have average earnings. The data used come from the 2019 OECD Family Database 2019 (OECD, 2019*b*).

Figure A.5: Distribution of perceived total effects - Child and family outcomes

(a) Child outcomes



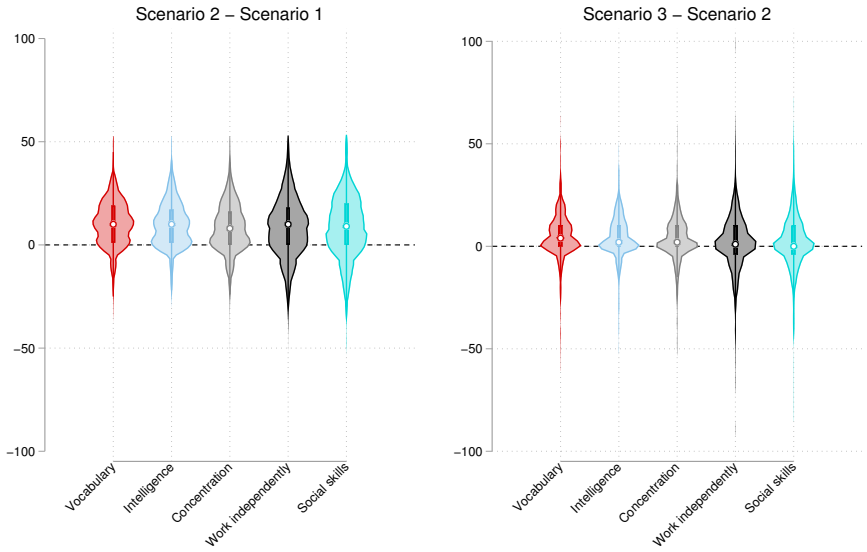
(b) Family outcomes



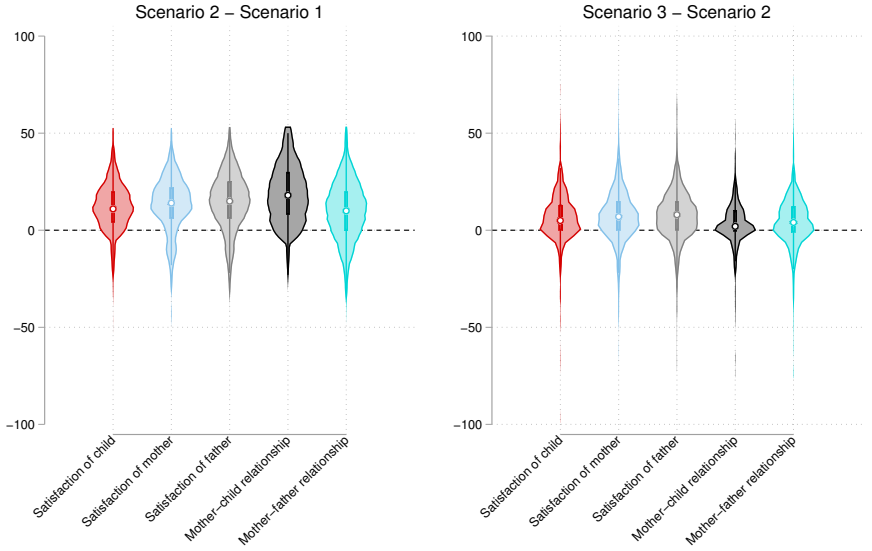
Notes: The figures illustrate the distribution of perceived returns to part-time (scenario 2) relative to no work (scenario 1) on the left and full-time (scenario 3) relative to part-time work (scenario 2) on the right for the five child outcomes (Panel a) and the five family outcomes (Panel b). Perceived returns are calculated from responses to vignettes A (total effect). The width of the violin plots represents the density of responses, the circle represents the median, the bar covers 50% of the responses, while the thin line covers 95% of responses.

Figure A.6: Distribution of perceived income effects - Child and family outcomes

(a) Child outcomes



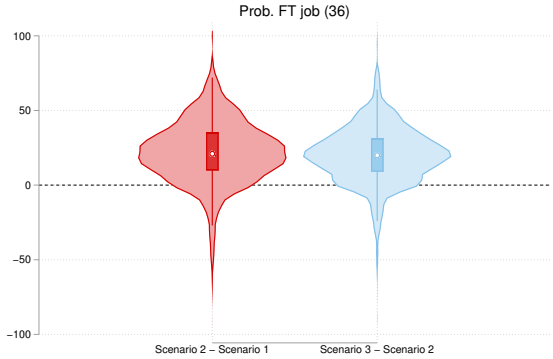
(b) Family outcomes



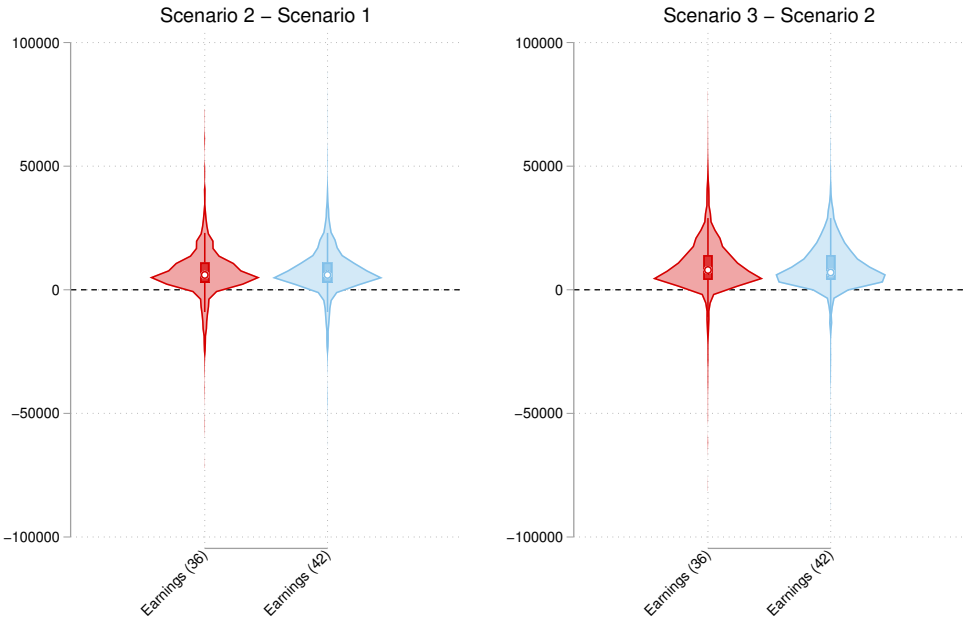
Notes: The figures illustrate the distribution of perceived returns to a household income of €60,000 gross per year (scenario 2) relative to €40,000 gross per year (scenario 1) on the left and €80,000 gross per year (scenario 3) relative to €60,000 gross per year (scenario 2) on the right for the five child outcomes (Panel a) and the five family outcomes (Panel b). Perceived returns are calculated from responses to vignettes B (income effect). The width of the violin plots represents the density of responses, the circle represents the median, the bar covers 50% of the responses, while the thin line covers 95% of responses.

Figure A.7: Distribution of perceived total effects - Maternal labor market outcomes

(a) Probability full-time job (36)



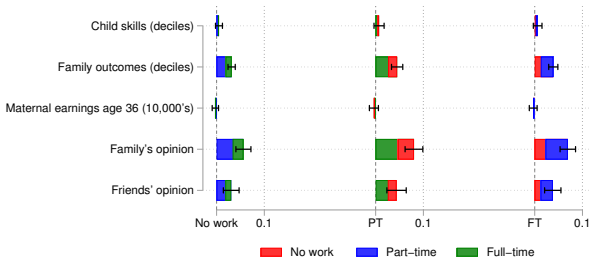
(b) Earnings



Notes: The figures illustrate the distribution of perceived returns to part-time relative to no work (left) and full-time relative to part-time work (right) for the mother's probability of being able to return to full-time work at the age of 36 (Panel a) and the mother's earnings at the ages of 36 and 42 (Panel b). Perceived returns are calculated from responses to vignettes A (total effect). The width of the violin plots represents the density of responses, the circle represents the median, the bar covers 50% of the responses, while the thin line covers 95% of responses.

Figure A.8: Marginal effects - Alternative-specific variables

(a) Baseline



(b) Full-time childcare

(c) Full-time & high-quality childcare

Notes: The different panels display the marginal effects of the alternative-specific variables from multinomial probit choice models where the dependent variables are maternal labor supply intentions in the baseline scenario (panel a) and intentions in scenarios where childcare is available full-time (panel b), or available full-time and of high quality (panel c). Each bar represents the change in the marginal choice probability displayed on the x-axis for a one-unit change in the alternative-specific variable indicated on the y-axis. Any increase in a marginal choice probability comes at the expense of the other two choices, which are represented by the respective colors. The thin lines represent the 95% confidence intervals. The coefficients are presented in Table 3 in the main text.

Table A.1: Sample representativeness

	Sample	National population
Woman	0.44	0.43
University degree	0.22	0.26
Age*	29.55	28.64
Married*	0.15	0.15
Migrant background*	0.24	0.29
States		
Baden-Wuerttemberg	0.13	0.14
Bayern	0.15	0.15
Berlin	0.05	0.05
Brandenburg	0.02	0.02
Bremen	0.01	0.01
Hamburg	0.02	0.02
Hessen	0.08	0.09
Mecklenburg-Vorpommern	0.02	0.02
Niedersachsen	0.09	0.09
Nordrhein-Westfalen	0.24	0.24
Rheinland-Pfalz	0.04	0.04
Saarland	0.01	0.01
Sachsen	0.05	0.05
Sachsen-Anhalt	0.03	0.03
Schleswig-Holstein	0.03	0.03
Thueringen	0.02	0.02

Notes: This table displays the sample characteristics of the survey sample (column 1) as well the characteristics of a nationally representative sample (column 2). The national population figures are calculated from the relevant population of respondents to the 2019 German Socioeconomic Panel (GSOEP). * indicates variables that were not targeted through the quota-based sampling approach.

Table A.2: Average responses - Child and family outcomes

	Vignettes A				Vignettes B			
Variable	No work	Part-time	Full-time	Diff. FT - PT	40K	60K	80K	Diff. 80K - 60K
Child skills								
Vocabulary	50.00	63.58	67.89	4.32	50.00	60.37	65.53	5.16
	(0.00)	(0.28)	(0.34)	(0.44)	(0.00)	(0.37)	(0.47)	(0.59)
Intelligence	50.00	62.33	64.92	2.59	50.00	59.89	64.07	4.18
	(0.00)	(0.26)	(0.32)	(0.41)	(0.00)	(0.37)	(0.47)	(0.60)
Concentration	50.00	61.12	63.47	2.35	50.00	58.28	61.77	3.49
	(0.00)	(0.29)	(0.34)	(0.45)	(0.00)	(0.40)	(0.52)	(0.66)
Work independently	50.00	64.02	70.24	6.22	50.00	58.35	60.36	2.01
	(0.00)	(0.32)	(0.35)	(0.47)	(0.00)	(0.47)	(0.60)	(0.77)
Social skills	50.00	67.42	76.35	8.93	50.00	58.31	60.50	2.19
	(0.00)	(0.38)	(0.35)	(0.51)	(0.00)	(0.50)	(0.60)	(0.78)
Family outcomes								
Satisfaction child	50.00	64.66	54.19	-10.47	50.00	62.10	68.76	6.67
	(0.00)	(0.30)	(0.39)	(0.50)	(0.00)	(0.42)	(0.52)	(0.66)
Satisfaction mother	50.00	65.67	61.60	-4.06	50.00	62.86	70.03	7.17
	(0.00)	(0.32)	(0.39)	(0.51)	(0.00)	(0.49)	(0.57)	(0.75)
Satisfaction father	50.00	66.50	65.39	-1.11	50.00	64.64	71.94	7.30
	(0.00)	(0.32)	(0.37)	(0.49)	(0.00)	(0.49)	(0.57)	(0.75)
Mother-child relationship	50.00	63.96	50.21	-13.75	50.00	68.32	71.29	2.98
	(0.00)	(0.34)	(0.40)	(0.52)	(0.00)	(0.48)	(0.53)	(0.71)
Mother-father relationship	50.00	63.71	60.21	-3.49	50.00	60.21	64.59	4.38
	(0.00)	(0.32)	(0.38)	(0.50)	(0.00)	(0.50)	(0.64)	(0.81)
Observations	3,001	3,001	3,001	3,001	999	999	999	999

Notes: This table displays the average perceived child and family outcomes in each of the three scenarios for vignettes A (columns 1-4) and vignettes B (columns 5-8). We note that perceived outcomes were anchored to a benchmark value of 50 in the scenario in which the woman does not work (column 1) and the scenario in which household income is €40,000 gross/year (column 5). Columns 2 and 3 display the average perceived outcomes in the part-time and full-time scenarios from vignette A, whereas columns 6 and 7 display the average perceived outcomes in the scenarios from vignette B where household income is €60,000 or €80,000 gross/year, respectively. Standard errors are displayed in brackets. Columns 4 and 8 display the average differences in perceptions between part-time and full-time work, and household income of €60,000 and €80,000 gross/year, respectively, together with the corresponding standard errors.

Table A.3: Average responses - Maternal labor market outcomes

Variable	No work	Part-time	Full-time	Diff. FT - PT
Prob. FT job (36)	41.84	63.72	83.63	19.91
	(0.40)	(0.31)	(0.34)	(0.46)
Earnings (36)	31556.82	38456.37	47825.14	9368.77
	(256.07)	(235.45)	(265.95)	(355.20)
Earnings (42)	34877.67	42314.84	51430.82	9115.98
	(260.37)	(240.11)	(274.53)	(364.72)
Observations	3,001	3,001	3,001	3,001

Notes: This table displays the average perceived probability that the mother will find full-time employment at age 36 and the average perceived earnings of the mother at ages 36 and 42 for the scenario in which the woman does not work (column 1), in which she works part-time (column 2) and full-time (column 3). Standard errors are displayed in brackets. Column 4 displays the average differences in perceptions between the part-time and full-time work scenarios, together with the corresponding standard errors.

Table A.4: Share of respondents perceiving returns as strictly positive

	Vignettes A		Vignettes B	
	PT - NO	FT - PT	60K - 40K	80K - 60K
Child skills				
Vocabulary	80.28	57.15	78.33	62.54
Intelligence	78.29	52.28	75.10	56.81
Concentration	73.81	52.82	70.28	55.86
Work independently	78.80	62.51	68.25	50.76
Social skills	79.81	64.72	68.32	49.85
Family outcomes				
Satisfaction child	80.82	30.02	82.86	65.89
Satisfaction mother	80.35	41.87	82.39	70.11
Satisfaction father	80.42	44.17	84.01	70.21
Mother-child relationship	73.58	22.11	86.32	56.50
Mother-father relationship	75.69	39.70	73.68	59.41
Maternal labor market outcomes				
Probability work FT (36)	84.25	83.82		
Earnings(36)	85.49	90.77		
Earnings(42)	86.76	90.61		

Notes: This table reports the share of respondents who perceive the returns to different maternal labor supply choices (columns 1-2) or household income (columns 3-4) as strictly positive. Column 1 refers to returns to part-time work relative to no work, and column 2 refers to returns to full-time work relative to part-time work. Column 3 refers to returns to household income of 60,000€ gross/year instead of 40,000€ gross/year, and column 4 refers to returns to household income of 80,000€ gross/year instead of 60,000€ gross/year.

Table A.5: Spearman rank correlations between returns (part-time minus no work)

	Child skills					Family outcomes					Labor market outcomes		
Variable	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)
Child skills													
(1) Vocabulary	1.00												
(2) Intelligence	0.63	1.00											
(3) Concentration	0.57	0.61	1.00										
(4) Work independently	0.48	0.51	0.53	1.00									
(5) Social skills	0.57	0.50	0.52	0.58	1.00								
Family outcomes													
(1) Satisfaction child	0.37	0.38	0.36	0.30	0.30	1.00							
(2) Satisfaction mother	0.33	0.34	0.33	0.31	0.33	0.51	1.00						
(3) Satisfaction father	0.31	0.34	0.29	0.29	0.31	0.43	0.57	1.00					
(4) Mother-child relationship	0.26	0.31	0.27	0.22	0.16	0.55	0.38	0.32	1.00				
(5) Mother-father relationship	0.30	0.32	0.34	0.32	0.30	0.43	0.55	0.55	0.47	1.00			
Labor market outcomes of mother													
(1) Prob. FT job (36)	0.10	0.03	0.03	0.07	0.14	0.08	0.12	0.10	0.01	0.02	1.00		
(2) Earnings (36)	0.01	0.01	0.03	-0.00	0.03	0.03	0.04	0.04	0.05	0.01	0.21	1.00	
(3) Earnings (42)	0.01	0.02	0.04	0.01	0.01	0.03	0.04	0.02	0.04	0.02	0.18	0.59	1.00

Notes: This table displays the Spearman rank correlations between the perceived returns to part-time relative to the no work scenarios.

Table A.6: Spearman rank correlations between returns (full-time minus part-time)

	Child skills					Family outcomes					Labor market outcomes		
Variable	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)
Child skills													
(1) Vocabulary	1.00												
(2) Intelligence	0.54	1.00											
(3) Concentration	0.50	0.52	1.00										
(4) Work independently	0.35	0.37	0.42	1.00									
(5) Social skills	0.47	0.37	0.38	0.41	1.00								
Family outcomes													
(1) Satisfaction child	0.22	0.24	0.25	0.12	0.13	1.00							
(2) Satisfaction mother	0.21	0.20	0.23	0.13	0.15	0.47	1.00						
(3) Satisfaction father	0.19	0.19	0.20	0.12	0.14	0.37	0.57	1.00					
(4) Mother-child relationship	0.11	0.16	0.14	0.05	-0.00	0.58	0.38	0.27	1.00				
(5) Mother-father relationship	0.17	0.18	0.17	0.13	0.13	0.40	0.47	0.47	0.42	1.00			
Labor market outcomes of mother													
(1) Prob. FT job (36)	0.11	0.09	0.07	0.14	0.13	-0.07	0.04	0.06	-0.13	0.05	1.00		
(2) Earnings (36)	0.07	0.04	0.06	0.06	0.09	0.01	0.04	0.04	-0.03	0.02	0.14	1.00	
(3) Earnings (42)	0.07	0.06	0.07	0.05	0.08	0.02	0.03	0.03	-0.02	0.02	0.14	0.60	1.00

Notes: This table displays the Spearman rank correlations between the perceived returns to full-time relative to the part-time scenarios.

Table A.7: Predictors of perceived returns (80K minus 60K)

	Panel A: Returns		Panel B: Positive returns	
	Child skills	Family outcomes	Child skills	Family outcomes
Mother working	0.404	-0.404	0.032	0.006
	(0.62)	(0.63)	(0.03)	(0.03)
West	0.564	1.743**	0.032	0.066*
	(0.68)	(0.87)	(0.04)	(0.03)
Female	-0.382	-0.403	-0.044	-0.051*
	(0.59)	(0.66)	(0.03)	(0.03)
Age	0.105**	0.088**	0.001	0.001
	(0.04)	(0.04)	(0.00)	(0.00)
University degree	0.645	-0.448	0.072*	0.030
	(0.67)	(0.84)	(0.04)	(0.03)
Married	-0.950	-0.822	-0.058	-0.052
	(0.88)	(0.95)	(0.05)	(0.04)
Migrant background	-0.361	1.325	-0.018	0.010
	(0.76)	(0.83)	(0.04)	(0.03)
Religious	0.899	-1.051	0.047	-0.024
	(0.66)	(0.74)	(0.03)	(0.03)
Observations	952	958	952	958
R^2	0.013	0.016	0.011	0.011
Mean dep. variable	3.419	5.757	0.628	0.756

Notes: The dependent variables in Panel A are returns to a household income of 80,000 €relative to 60,000 (vignettes B) in terms of a composite measure of child skills (column 1), and a composite measure of family outcomes (column 2). 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 total household income is 80,000 €and the scenario where total household income is 60,000 €. Both composite measures are on a 0-100 scale. 'Own mother working' indicates if the respondent's mother predominantly worked full-time or part-time (as opposed to not at all) 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. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

B Technical Appendix

In the estimation of our multinomial probit choice model with three possible alternatives, we follow Train (2009) and normalize the location by choosing alternative $j = 1$ (no work) as the base alternative, and taking the difference between the utility from that alternative and the other two alternatives $j \in \{2, 3\}$:

$$\begin{aligned}
\nu_{ij} &= u(l_i^m = j) - u(l_i^m = 1) \\
&= (\alpha_j - \alpha_1) + \beta_1(h_{2,ij}^C - h_{2,i1}^C) + \beta_2(h_{2,ij}^F - h_{2,i1}^F) + \\
&+ \gamma(\rho_{ij} Y_{2ij}^m - \rho_{i1} Y_{2i1}^m) + \delta(s_{1ij} - s_{1i1}) + (\lambda_j - \lambda_1)p_i + (\xi_j - \xi_1)X_i + (\varepsilon_{ij} - \varepsilon_{i1}) \\
&= A_j + \beta_1 H_{ij}^C + \beta_2 H_{ij}^F + \gamma y_{ij} + \delta S_{ij} + \Lambda_j p_i + \Xi_j X_i + \eta_{ij}
\end{aligned}$$

where $A_j \equiv \alpha_j - \alpha_1$, $H_{ij}^C \equiv h_{2ij}^C - h_{2i1}^C$, $H_{ij}^F \equiv h_{2ij}^F - h_{2i1}^F$, $y_{ij} \equiv \rho_{ij} Y_{2ij}^m - \rho_{i1} Y_{2i1}^m$, $S_{ij} \equiv s_{1ij} - s_{1i1}$, $\Lambda_j \equiv \lambda_j - \lambda_1$, $\Xi_j \equiv \xi_j - \xi_1$, and $\eta_{ij} \equiv \varepsilon_{ij} - \varepsilon_{i1}$. Thereby, we have reduced the dimensionality of the covariance matrix to $(J-1) \times (J-1)$ and denote it as Σ. We can now – for example – write the probability that respondent i chooses alternative 1 as:

$$\begin{aligned}
Pr(i \ chooses \ 1) &= Pr(\nu_{i2} \leq 0, \nu_{i3} \leq 0) \\
&= Pr(\eta_{i2} \leq -(A_2 + \beta_1 H_{i2}^C + \beta_2 H_{i2}^F + \gamma y_{i2} + \delta S_{i2} + \Lambda_2 p_i + \Xi_2 X_i), \\
&\eta_{i3} \leq -(A_3 + \beta_1 H_{i3}^C + \beta_2 H_{i3}^F + \gamma y_{i3} + \delta S_{i3} + \Lambda_3 p_i + \Xi_3 X_i))
\end{aligned}$$

With 'no work' as the baseline choice normalizing the location of coefficients, the variance-covariance matrix Σ for the error is a 2×2 Cholesky matrix. To normalize for scale, one of the diagonal elements of Σ must be fixed to a constant. The standard deviation for the utility error associated with the difference between part-time work and no work (η_{i2}) is fixed to one. Consequently, there are two identifiable variance-covariance parameters: the variance of the error for the difference between full-time work and no work (η_{i3}), and the covariance between η_{i2} and η_{i3}. The choice probabilities are evaluated using simulations because a closed-form solution does not exist. The likelihood evaluator implements the Geweke - Hajivassiliou - Keane algorithm to approximate the multivariate distribution function (Geweke 1989; Keane

and Wolpin 1994; Hajivassiliou and McFadden 1998).

C Questionnaire

C.1 Beliefs about Returns to Maternal Labor Supply

Introduction to Scenarios

In the following, we would like to ask you to imagine a thought experiment. Please imagine an average German married couple: Sarah and Michael Müller. For Sarah and Michael, a great wish has come true: they have become parents! Both are very happy, but they are now facing new challenges.

Sarah and Michael are both 30 years old. Before the birth of their child, they both worked full-time (40h/week) and each of them earned 38,000 euros gross per year. Sarah now goes on parental leave for 12 months. Michael continues to work full-time and earns 38,000 euros gross in that year. After the 12 months of parental leave, Sarah wants to return to work. Will the family find a place in childcare? The places are limited and it is unclear whether the family will get a place. Imagine that it is decided by chance which of the following three cases occurs.

> **Case 1: The family does not find a place in childcare and Sarah does not work.** For the next five years, Sarah stays at home and takes care of the child. Sarah earns nothing during this time.
>
> **Case 2: The family finds a place in childcare for half the day and Sarah works part-time.** Sarah works part-time (20h/week) for the next five years and the child is in childcare for half the day. Sarah earns an average of 20,000 euros gross per year.
>
> **Case 3: The family finds a place in childcare for the full day and Sarah works full-time.** Sarah works full-time (40h/week) for the next five years and the child attends childcare for the full day. Sarah earns an average of 40,000 euros gross per year.

In all three cases, Michael works full-time (40h/week) and earns an average of 40,000 euros gross per year. Sarah and Michael do not want to have additional children and household

expenditure decisions are taken jointly.

As a reminder, the three cases differ in whether the mother does not work, works part-time (20h/week), or full-time (40h/week) while her child is 1-5 years old. They also differ in how many hours the child spends in childcare per week. The average annual income of the family also differs across the three cases and depends on how much the mother works.

Case	**1**	**2**	**3**
	Weekly hours		
Father (work)	Full-time (40h)	Full-time (40h)	Full-time (40h)
Mother (work)	None	Part-time (20h)	Full-time (40h)
Child (child-care)	None	Part-time (20h)	Full-time (40h)
	Average annual income		
Father	40,000	40,000	40,000
Mother	0	20,000	40,000
Total	40,000	60,000	80,000

Introduction to Scale

Is it better or worse for the child and the family if the mother returns to work? The following questions are difficult and there are no right or wrong answers. We are interested in your personal assessment.

To answer the following questions, imagine that there are 100 other families in Germany who – like Sarah and Michael – have a young child. For the following questions, we will ask you to compare Sarah and Michael's child with the other children in Germany on the following scale. [Display slider with 0-100 scale]

A value of 0 means that the child scores worse than all other children. A value of 100 means that the child scores better than all other children. A value of 50 means that Sarah and Michael's child is average, i.e. better than 50 of the other children.

Example 1: A value of 40 means that Sarah and Michael's child scores better than 40 of the 100 children (and thus below average).

Example 2: A value of 60 means that Sarah and Michael's child scores better than 60 of the 100 children (and thus above average).

Once you have internalized the scale, please proceed with the survey to get to the questions.

Elicitation of Beliefs about Child Outcomes

Case 1: The family does not find a place in childcare and Sarah does not work. Think about the first case in which the family cannot find a place in childcare and Sarah stays at home for the five years. Imagine that in this case the child's performance is average at the time when the child enters school. The child thus scores better than 50 of the 100 children in Germany and receives the value "50". Compared to case 1, how does the child perform relative to the other children in Germany if one of the other cases occurs? In all cases, assume that the behavior of the other families does not change.

Case 2: The family finds a place in childcare for half the day and Sarah works part-time. Compared to case 1, does the child perform equally well, better, or worse? Remember: a value of 50 means that the child's performance is average and therefore the same as in the case in which Sarah stays at home. [Display sliders with 0-100 scale for each of the following outcomes:] Vocabulary, Intelligence, Concentration, Working independently, Social skills

Case 3: The family finds a place in childcare for the full day and Sarah works full-time. Compared to case 1, does the child perform equally well, better or worse? Remember: a value of 50 means that the child's performance is average and therefore the same as in the case in which Sarah stays at home. [Display sliders with 0-100 scale for each of the following outcomes:] Vocabulary, Intelligence, Concentration, Working independently, Social skills

Elicitation of Beliefs about Family Outcomes

Case 1: The family does not find a place in childcare and Sarah does not work. Think about the first case in which the family cannot find a place in childcare and Sarah stays at home for the five years. This time the question is whether the family members are satisfied. Imagine that in the first case, the family's score is average ("50") at the time the child enters schools. Compared to case 1, how does the family score relative to other families in Germany if one of the other cases occurs? In all cases, assume that the behavior of the other families does not change.

Case 2: The family finds a place in childcare for half the day and Sarah works part-time. Compared to case 1, is the family equally, more, or less satisfied? Remember: a value of 50 means that the family's score is average and therefore the same as in the case in which Sarah stays at home. [Display sliders with 0-100 scale for each of the following outcomes:] Satisfaction of child, Satisfaction of mother, Satisfaction of father, Relationship between mother and child, Relationship between mother and father

Case 3: The family finds a place in childcare for the full day and Sarah works full-time. Compared to case 1, is the family equally, more, or less satisfied? Remember: a value of 50 means that the family's score is average and therefore the same as in the case in which Sarah stays at home. [Display sliders with 0-100 scale for each of the following outcomes:] Satisfaction of child, Satisfaction of mother, Satisfaction of father, Relationship between mother and child, Relationship between mother and father

Elicitation of Beliefs about Maternal Labor Market Outcomes

Sarah and Michael's child starts school at the age of 6. From this point, Sarah wants to return to full-time work. How do you assess Sarah's employment prospects depending on whether Sarah did not work, worked part-time or full-time during the five years when her child was young? Michael, who always worked full-time, earns 45,000 euros gross per year at the age of 36 and 50,000 euros gross per year at the age of 42.

As a reminder, when Michael and Sarah were 30 years old and did not have a child, they both worked full-time and each of them earned 38,000 euros gross per year. For all questions, assume that there is no inflation (i.e., prices do not increase) and that Sarah wants to return to full-time work at the age of 36.

On a scale of 0 ("extremely unlikely") to 100 ("extremely likely"), how likely do you think it is that Sarah will have a full-time job at the age of 36, ...
[Display sliders with 0-100 scale for each of the following cases:] If Sarah did not work for five years (case 1), If Sarah worked part-time for five years (case 2), If Sarah worked full-time for five years (case 3)

Suppose that Sarah works full-time from the age of 36. What do you think that Sarah is most likely to earn gross per year at the age of 36, ...
[Display sliders with 0-100,000 scale for each of the following cases:] If Sarah did not work for five years (case 1), If Sarah worked part-time for five years (case 2), If Sarah worked full-time for five years (case 3)

Continue to assume that Sarah works full-time from the age of 36. What do you think that Sarah is most likely to earn gross per year at the age of 42, ...
[Display sliders with 0-100,000 scale for each of the following cases:] If Sarah did not work for five years (case 1), If Sarah worked part-time for five years (case 2), If Sarah worked full-time for five years (case 3)

C.2 Beliefs about Income Effect

Introduction to Scenarios

In the following, we would like to ask you to imagine a thought experiment. Please imagine an average German married couple: Sarah and Michael Müller. For Sarah and Michael a big wish has come true: they have become parents! Both are very happy, but they are now facing new challenges.

Sarah and Michael are both 30 years old. Before the birth of their child, they both worked full-time (40h/week) and each of them earned 38,000 euros gross per year. Sarah now goes on parental leave for 12 months. Michael continues to work full-time and earns 38,000 euros gross in that year. After the 12 months of parental leave, Sarah wants to return to work, but the family cannot find a place in childcare. For the next five years, Sarah therefore stays at home and takes care of the child. She earns nothing during this time. How much does Michael earn during that time? Will new job opportunities open up for him? Imagine that a different employer opens a new department nearby and offers Michael a better-paid job. Please consider the following three cases, which only differ in the amount of money that Michael is offered as a salary. Imagine that it is decided by chance which of the following three cases occurs.

> **Case 1: Michael earns an average of 40,000 euros gross per year over the next five years.** A new department opens and Michael is offered a job that pays an average of 40,000 euros gross per year. Michael accepts the job offer and changes the employer.
>
> **Case 2: Michael earns an average of 60,000 euros gross per year over the next five years.** A new department opens and Michael is offered a job that pays an average of 60,000 euros gross per year. Michael accepts the job offer and changes the employer.
>
> **Case 3: Michael earns an average of 80,000 euros gross per year over the next five years.** A new department opens and Michael is offered a job that pays an average of 80,000 euros gross per year. Michael accepts the job offer and changes the employer.

Please assume that the three cases are identical in every other respect and that Michael works full-time (40h/week) in all three cases. Sarah and Michael do not want to have additional children and household expenditure decisions are taken jointly.

As a reminder, the three cases differ in whether the father earns an average of 40,000 euros, 60,000 euros, or 80,000 euros gross per year while the child is 1-5 years old. The average

annual income of the family is also different in the three cases and depends on how much the father earns.

Case	**1**	**2**	**3**
	Weekly hours		
Father (work)	Full-time (40h)	Full-time (40h)	Full-time (40h)
Mother (work)	None	None	None
Child (child-care)	None	None	None
	Average annual income		
Father	40,000	60,000	80,000
Mother	0	0	0
Total	40,000	60,000	80,000

Introduction to Scale

How does the higher household income affect the child and the family? The following questions are difficult and there are no right or wrong answers. We are interested in your personal assessment.

To answer the following questions, imagine that there are 100 other families in Germany who, like Sarah and Michael, have a small child. For the following questions, we will ask you to compare Sarah and Michael's child with the other children in Germany on the following scale.

[Display slider with 0-100 scale]

A value of 0 means that the child scores worse than all other children. A value of 100 means that the child scores better than all other children. A value of 50 means that Sarah and Michael's child is average, i.e. better than 50 of the other children.

> **Example 1:** A value of 40 means that Sarah and Michael's child scores better than 40 of the 100 children (and thus below average).

Example 2: A value of 60 means that Sarah and Michael's child scores better than 60 of the 100 children (and thus above average).

Once you have internalized the scale, please proceed with the survey to get to the questions.

Elicitation of Beliefs about Child Outcomes

Case 1: Michael earns an average of 40,000 euros gross per year over the next five years. Think about the first case, in which Michael earns an average of 40,000 euros gross per year over the next five years. Imagine that in this case the child's performance is average at the time the child enters school. The child thus scores better than 50 of the 100 children in Germany and receives the value "50". Compared to case 1, how does the child perform relative to the other children in Germany if one of the other cases occurs? In all cases, assume that the behavior of the other families does not change.

Case 2: Michael earns an average of 60,000 euros gross per year over the next five years. Does the child perform equally well, better or worse compared to case 1? Remember: a value of 50 means that the child's performance is average and thus the same as in the case in which Michael earns an average of 40,000 euros gross per year. [Display sliders with 0-100 scale for each of the following outcomes:] Vocabulary, Intelligence, Concentration, Working independently, Social skills

Case 3: Michael earns an average of 80,000 euros gross per year over the next five years. Does the child perform equally well, better or worse compared to case 1? Remember: a value of 50 means that the child's performance is average and thus the same as in the case in which Michael earns an average of 40,000 euros gross per year. [Display sliders with 0-100 scale for each of the following outcomes:] Vocabulary, Intelligence, Concentration, Working independently, Social skills

Elicitation of Beliefs about Family Outcomes

Case 1: Michael earns an average of 40,000 euros gross per year over the next five years. Think about the first case, in which Michael earns an average of 40,000 euros

gross per year over the next five years. This time the question is whether the family members are satisfied. Imagine that in the first case, the family's score is average ("50") at the time when the child enters schools. Compared to case 1, how does the family score relative to other families in Germany if one of the other cases occurs? In all cases, assume that the behavior of the other families does not change.

Case 2: Michael earns an average of 60,000 euros gross per year over the next five years. Compared to case 1, is the family equally, more, or less satisfied? Remember: a value of 50 means that the family's score is average and therefore the same as in the case in which Michael earns an average of 40,000 euros gross per year. [Display sliders with 0-100 scale for each of the following outcomes:] Satisfaction of child, Satisfaction of mother, Satisfaction of father, Relationship between mother and child, Relationship between mother and father

Case 3: Michael earns an average of 80,000 euros gross per year over the next five years. Compared to case 1, is the family equally, more, or less satisfied? Remember: a value of 50 means that the family's score is average and therefore the same as in the case in which Michael earns an average of 40,000 euros gross per year. [Display sliders with 0-100 scale for each of the following outcomes:] Satisfaction of child, Satisfaction of mother, Satisfaction of father, Relationship between mother and child, Relationship between mother and father

C.3 Beliefs about Availability, Quality and Cost of Childcare

Think about the neighborhood in which you live. How likely is it that a family with a one-year-old child can find a place in childcare for their child? (in %)
[Display slider with 0-100 scale]

Suppose that the family finds a place in childcare. How likely is it that the childcare center would offer full-day care (8 a.m.-5 p.m.)? (in %)
[Display slider with 0-100 scale]

Suppose that the family finds a place in childcare. How likely is it that the childcare center would be of very high quality? (in %) By very high quality, we mean that the teachers lovingly care for the children and that there are only three children per teacher in each age group.
[Display slider with 0-100 scale]

What do you think that a family with average household income living in your neighborhood has to pay for a full-day place in childcare (including food) for their one-year-old child?
[0-99 euros per month/.../900-999 euros per months/More than 1000 euros per month]

C.4 Intended Labor Supply

The following questions are differently framed for men and women. Parts that differ for male respondents are displayed in square brackets in the question text.

Imagine that you have a child. What would you [your partner/the child's mother] most likely do while your child is 1-5 years old?
[Not be in paid employment/Work part-time/Work full-time]

Imagine that you have a child and a full-day place in childcare was available to you. In this case, what would you [your partner/the child's mother] most likely do while your child is 1-5 years old?
[Not be in paid employment/Work part-time/Work full-time]

Imagine that you have a child and a full-day place in a very high-quality childcare center was available to you. By very high quality, we mean that the teachers lovingly care for the children and that there are only three children per teacher in each age group. In this case, what would you [your partner/the child's mother] most likely do while your child is 1-5 years old?
[Not be in paid employment/Work part-time/Work full-time]

C.5 Perceived Social Norms

Imagine that you have a child and a full-day place in childcare was available to you. What do you think the following people would approve of most?

Parents/relatives: That you [your partner/the mother] are [is] not in paid work, work[s] part-time, work[s] full-time.

Friends: That you [your partner/the mother] are [is] not in paid work, work[s] part-time, work[s] full-time.

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