

Gender Gaps in Parental Investments in Young Children: Uncovering the Role of Parental Beliefs*

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Abstract

Recent research shows that differences in childcare responsibilities led to larger employment losses for women during the COVID-19 recession, contributing to a widening of gender inequalities. This paper explores a new potential mechanism for gender gaps in parental investments: differences in beliefs between fathers and mothers of young children. By surveying fathers and mothers about their own inputs as well as their partner's inputs, we first demonstrate the presence of large discrepancies between the two data sources. Investment gaps vary from zero – when fathers report the inputs of both parents – to 2.2σ – when mothers report both inputs. We then show that fathers are significantly less likely to believe in the importance of parental investments for child development compared to mothers. Differences in beliefs explain up to 13% of the gender gap in the time spent doing educational activities with the child. In comparison, controlling for differences in employment reduces this gap by up to 46%. This novel finding points to the potential for informational parenting interventions to mitigate gender inequality by increasing the enrollment of fathers in their programs.

Keywords: gender inequality, parental beliefs, parental investments, survey data

JEL Codes: C81, D13, D83, J13, J16

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1 Introduction

Gender inequality in the division of domestic work has been studied for decades, across various fields of research, and multiple countries. Evidence shows that even though gender gaps in housework have generally decreased over time, women continue doing the lion's share of household labor (see [Lachance-Grzela and Bouchard \(2010\)](#) for a review). Focusing on parenting chores specifically, [Dotti Sani and Treas \(2016\)](#) show that among the 11 European and North-American countries they study, the average time mothers spend on childcare per day went from 54 minutes in 1965 to 104 minutes in 2012. For fathers, over the same period of time, the average time went from 16 to 59 minutes. When the COVID-19 pandemic started, these questions reached an unprecedented level of concern, and many claimed that the recession was countervailing decades of progress towards a more equitable division of household labor, and towards gender equality more generally. Countless papers have shown that women massively left the labor market or reduced their work hours (e.g., [Albanesi and Kim \(2021a\)](#), [Collins et al. \(2021\)](#), [Adams-Prassl et al. \(2020\)](#), [Landivar et al. \(2020\)](#), [Qian and Fuller \(2020\)](#)), leading to what rapidly became coined as a "shecession" ([Alon et al. \(2021\)](#), [Gupta \(2020\)](#)). Several reasons explain why female employment was disproportionately affected by the COVID shock. One reason is the composition of female employment, with women being more concentrated in service occupations that were more severely impacted by the lockdown at the beginning of the pandemic ([Alon et al. \(2020\)](#), [Montenovo et al. \(2020\)](#)). Another reason is that after the closure of childcare facilities and schools, parents of young or school-age children had to increase their time spent on childcare and that responsibility mostly fell on women ([Hansen et al. \(2022\)](#), [Albanesi and Kim \(2021b\)](#), [Carlson et al. \(2021\)](#), [Collins et al. \(2021\)](#), [Couch et al. \(2021\)](#), [Farré et al. \(2020\)](#), [Alon et al. \(2020\)](#)), leading some scholars to relabel the recession as a "momcession" ([OECD \(2021\)](#)).

What remains unsettled and is the focus of our paper is why such differences between fathers and mothers in childcare, and domestic work more broadly, widened during the pandemic, even when we account for employment differences. As suggested by [Champeaux and Marchetta \(2021\)](#), the lockdown in the first year of the pandemic could have offered the opportunity to renegotiate housework and childcare division between parents, but it did not. Several studies in fact point to a clear asymmetry in the way mothers and fathers responded to the COVID-19 shock. Focusing on two waves of the pandemic in Italy, in April 2020 and November 2020, [Del Boca et al. \(2020\)](#) and [Del Boca et al. \(2021\)](#) show that while women increased their time spent on housework and childcare independently of their partner's working arrangement, in

contrast, men reduced their housework and childcare time when their partners were at home. Similarly, [Sevilla and Smith \(2020\)](#) find that the increase in childcare hours completed by women in May 2020 in England was less sensitive to their employment than it was for men. Over the same time period in England as well, [Andrew et al. \(2020\)](#) additionally show that mothers who stopped working for pay during the crisis did far more housework than fathers in the equivalent situation did. [Zamarro and Prados \(2021\)](#) reveal similar patterns in the U.S., where they show that working mothers increased childcare provision to a significantly larger extent than working fathers. What this set of findings demonstrates is that asymmetries between men and women in the impact of the pandemic on housework and childcare go beyond differences in employment and are rooted in deeper gendered forces. In this paper, we test a new potential mechanism for gender inequality in parental inputs by exploring the role of differences in parental beliefs about child development.

To do so, we conducted surveys among fathers and mothers asking them about the time they spend doing different types of activities with their child. The study was implemented in Phoenix, AZ, between November 2020 and October 2022 among parents who have a child below age 5. We collected demographic information, including employment and work hours, and elicited parents' beliefs about the impact of parental investments on child development. Our analyses point to several unique insights. First, we find that depending on the data used to measure gender gaps in parental inputs, one can reach vastly different conclusions. When we use reports from fathers about their own time inputs as well as the time inputs of their partner, there is no gender gap in any of the activities we asked about (a mix of educational activities such as playing or reading and routine tasks such as preparing meals for the child or giving them a bath). Fathers systematically report the same times for themselves and for their partner. On the contrary, when we use reports from mothers about their own time inputs and their partner's inputs, the gender gaps are all significantly different from zero at the 1% level and can be as high as 2.2σ (for the time spent preparing meals for the child). In the second part of our analysis, we review the factors in which fathers and mothers differ and check whether these factors are associated with their inputs. This exploration leads to two main conclusions. First, fathers are twice more likely to be employed and work more hours than mothers – consistent with the evidence from other studies conducted during the pandemic – but they are also significantly less likely to believe that parental inputs matter for child development. Second, we find that the association between parental beliefs and parental inputs tends to be asymmetrical between the two parents. While mothers who are more likely to believe that parental inputs matter are also more likely to spend time doing educational activities with the child, for fathers, beliefs and inputs are weakly

correlated. In the last part of our analysis, we re-estimate the gender gaps in the different types of parental inputs controlling for differences in employment and beliefs between fathers and mothers. Our results show that differences in employment explain a substantial share of the gender gaps in educational inputs regardless of how we measure the inputs of each parent (using their own self-reports or using mothers' reports only). By contrast, they explain a small share of the gaps in care activities such as meal preparation and baths. Differences in beliefs explain between 5 and 13% of the gender gaps in educational activities. Together, these only two factors can shrink the gender gap by up to 68%, compared to 46% when only differences in employment are taken into consideration.

Our paper contributes to three main branches of the literature. First, it speaks to the literature on gender differences in household tasks, and more specifically, differences in parenting. As discussed above, a number of studies conducted during the COVID-19 pandemic show that mothers increased their time spent on housework and childcare more than fathers, whether both parents were working or not ([Del Boca et al. \(2021\)](#), [Del Boca et al. \(2020\)](#), [Andrew et al. \(2020\)](#)). Our paper brings two novel insights to this literature. First, we analyze different types of parental inputs separately, distinguishing between educational activities (playing, reading) and care activities (preparing meals, giving a bath). To our knowledge, the only other papers investigating the heterogeneity of gender inequality according to the nature of the inputs are [Champeaux and Marchetta \(2021\)](#) and studies by Carlson and co-authors ([Carlson et al. \(2021\)](#), [Carlson et al. \(2020\)](#), [Carlson et al. \(2022\)](#)). However, our paper differs from those by relating these gender differences in parental inputs not only to employment differences but also to potential differences in parental beliefs between men and women.

The analysis of this new factor, parental beliefs about the role of parental investments on child outcomes, also leads to our second contribution, to the recent literature studying the relationship between parental beliefs and parents' behaviors. This literature suggests that the beliefs parents hold about the returns to parental inputs predict their investments in their children (e.g., [List et al. \(2021\)](#), [Bhalotra et al. \(2020\)](#), [Cunha et al. \(2020\)](#), [Attanasio et al. \(2019\)](#)). And while those papers document the heterogeneity in parental beliefs across the socioeconomic gradient, our paper is the first to study heterogeneity along the gender dimension and to explore how differences between fathers' and mothers' beliefs and their mapping to parental behaviors can explain the gender gaps in parental investments.

Last, we contribute to the literature investigating reporting biases in survey data, and more particularly, reporting differences between men and women in surveys about household contributions. In a recent study conducted during the COVID-19 pandemic, [Carlson et al. \(2020\)](#)

ask both fathers and mothers about their own time spent on housework and childcare and the time spent by their partner. They find that while there is no disagreement between fathers and mothers about the time spent by mothers, there is disagreement about the fathers' time. Specifically, mothers are less likely to report that fathers increased their housework and childcare time than fathers. [Charles et al. \(2018\)](#) also find strong disagreement between fathers and mothers regarding fathers' involvement, with fathers reporting higher levels than mothers. Symmetrically, [Jessen et al. \(2022\)](#) also obtain significantly different levels of agreement between men and women about the extent to which women took care of childcare during the pandemic. In our analyses, we find disagreement about both parents' time, and we also show that fathers tend to report the exact same time spent on parental inputs for themselves and for their partner while mothers report substantially longer times for themselves than for their partner. In line with this result, a poll by [AP-NORC and UChicago-Harris \(2021\)](#) finds that mothers are more likely to report that they do more housework than fathers while fathers are more likely to report sharing the housework equally with the mothers. Such reporting issues have been studied well before the pandemic and research shows that discrepancies in reported housework contributions between men and women are not new and are prevalent in a variety of contexts (e.g., [Geist \(2010\)](#), [Mikelson \(2008\)](#), [Lee and Waite \(2005\)](#), [Kamo \(2000\)](#), [Press and Townsley \(1998\)](#)), making it particularly challenging to assess the evolution of gender inequalities in housework over time or to compare inequalities across countries, as the main source of information about domestic work comes from survey data.

The remainder of the paper is organized as follows: section 2 describes the data we collected and our sample's demographic characteristics; section 3 presents the gender gaps in the different types of parental inputs depending on who reports the inputs, and section 4 explores the role of demographic and belief differences between parents in determining the gender gaps.

2 Data

We implemented our surveys by leveraging an existing partnership with Southwest Human Development (SWHD) in Phoenix, Arizona, that was developed to test the curriculum of a parenting intervention targeting parents of young children. Nineteen cohorts of fathers and mothers were enrolled between November 2020 and October 2022 via word-of-mouth referrals and flyers shared in public locations and community areas in Phoenix. SWHD also informed parents participating in their other programs about the opportunity to participate in our study. To be eligible, participants had to be aged 18 years or older, have a child between 0 and 5

years of age, and be able to answer surveys in English or Spanish. We offered participants the option to invite the child's other parent or their current partner to also enroll in the study. To do so, they could either share their partner's contact information with us or give them our contact information. In total, we enrolled 290 participants (140 fathers and 150 mothers). Among the 290 parents, 222 are direct enrollments, and 68 were enrolled as secondary caregivers. Surveys were implemented during online Zoom sessions for direct enrollments and over zoom or email for secondary caregiver enrollments, after obtaining the written informed consent of participants, and before primary caregivers started the intervention. All surveys were completed anonymously on an online platform accessible to participants via a log-in process, they were not done face-to-face even though participants were on Zoom with facilitators from our research team.

The overall sample is mostly college-educated, with 31% of our participants having a Bachelor's degree and 20% having a Master's degree or higher; 26% have a household income of more than \$6,200 per month; 60% identify as White, 10% Black, 8% Asian, and 43% Hispanic or Latino. More detailed demographic characteristics distinguishing fathers and mothers are presented and discussed in section 4 (Table 2). We restrict the analysis to fathers and mothers who live with the child full time, which represents 94% of the fathers' initial sample and 98% of the mothers' initial sample.

For every enrolled participant, after collecting their demographic characteristics, we elicited their beliefs about the role of parental inputs on child development using the Survey of Parent/Provider Expectations and Knowledge (SPEAK scale, see [Suskind et al. \(2018\)](#)). This survey aims to capture general knowledge about early skill formation and the role played by parents in general, it does not ask about the perceived returns to participants' own inputs specifically. Last, we asked participants about the time they spend doing different types of activities with the child, and finally, the time their partner spends on these same activities. We turn to the analysis of gender differences in these activities next.

3 Gaps in parental investments

We measured fathers' and mothers' time investments across five dimensions: reading or telling stories, playing, going to outings with the child, preparing meals for the child, and giving the child a bath. For the first three activities, we asked how many hours per week, on average, they spend doing the activity with the child. For the last two activities, because they correspond to

routine tasks, we asked how many days per week, on average, they spend on these tasks. For each of these parental inputs, fathers and mothers had to report both their own time inputs (number of hours or days) and their partner's inputs. In case they had several children, they were asked to answer these questions for only one of their children between 0 and 5 years old.

Table 1 shows the gaps between fathers' and mothers' investments depending on who reports the investments. We first show maternal inputs reported by mothers versus paternal inputs reported by fathers, maternal and paternal inputs both reported by mothers in the second column, maternal and paternal inputs both reported by fathers in the third column, and cross reports in the last column. We present the gaps in each of the different activities parents were asked about, and group reading, playing, and outings into an Educational score, and meal preparation and bath into a Care score. Note that we created z-scores for each input as well as for the two scores to have the same unit throughout all the results (standard deviations of the fathers' self-reported distribution).

A first stark result is the substantial difference in the magnitude of the gap depending on whether we use the inputs reported by the fathers or by the mothers. When we look at the third column, which uses fathers' data only, none of the gaps are significantly different from zero. By contrast, in the second column, which uses mothers' data only, all the gaps are significantly different from zero at the 1% level, ranging from 0.53σ (outings) to 2.19σ (meal preparation). The gap in care activities is roughly twice larger as the gap in educational activities, according to mothers. The first and fourth columns, using inputs self-reported by each caregiver or inputs reported by the other caregiver, respectively, show magnitudes that are in-between the large gaps reported by mothers (second column) and the absence of gaps reported by fathers (third column). These discrepancies have important methodological implications for the use of survey data, as they reveal that one can reach substantially different conclusions depending on which member of the household the survey targets.

Table 1: Investment gaps between fathers and mothers depending on who reports

Mothers' inputs reported by:	mothers	mothers	fathers	fathers
minus				
Fathers' inputs reported by:	fathers	mothers	fathers	mothers
Reading or telling stories	0.58*** (0.12)	1.14*** (0.09)	-0.00 (0.09)	0.56*** (0.11)
Playing with child	0.40*** (0.12)	0.94*** (0.08)	0.01 (0.08)	0.55*** (0.10)
Going to outings	0.10 (0.12)	0.53*** (0.07)	0.00 (0.07)	0.44*** (0.10)
<u>Educational score</u>	0.38*** (0.10)	0.88*** (0.06)	-0.01 (0.07)	0.49*** (0.09)
Preparing meals for child	0.65*** (0.11)	2.19*** (0.11)	0.02 (0.11)	1.56*** (0.14)
Giving child a bath	0.70*** (0.12)	1.26*** (0.12)	0.01 (0.12)	0.57*** (0.13)
<u>Care score</u>	0.65*** (0.09)	1.68*** (0.09)	0.02 (0.09)	1.05*** (0.11)

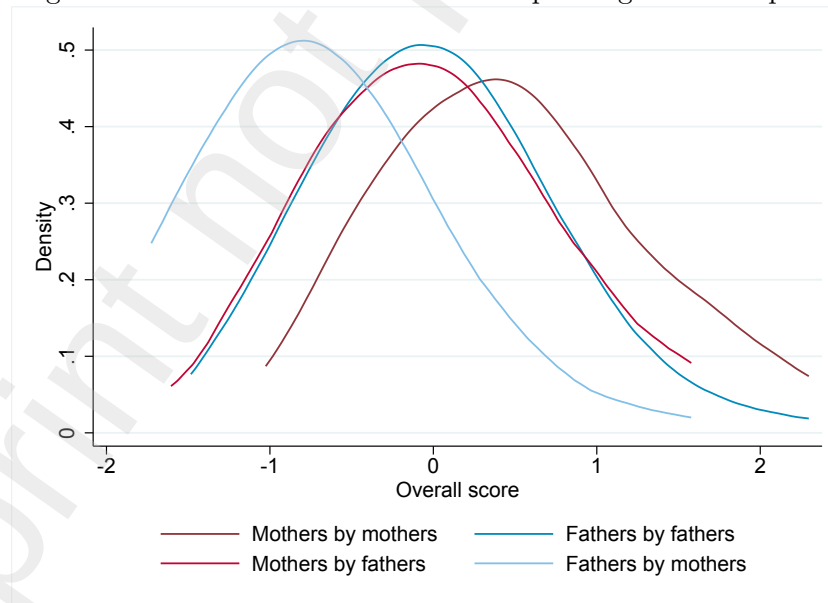
Note: Difference between mothers' and fathers' z-scores, in standard deviations of the fathers' self-reported distribution. Standard errors clustered at the household level in parentheses below. First column compares the mothers' inputs reported by the mothers themselves to the fathers' inputs reported by the fathers themselves. Second column compares the mothers' inputs reported by the mothers themselves to the fathers' inputs reported by the mothers. Third column compares the mothers' inputs reported by the fathers to the fathers' inputs reported by the fathers themselves. Fourth column compares the mothers' inputs reported by the fathers to the fathers' inputs reported by the mothers. * for p-value<0.1, ** for p-value<0.05, *** for p-value<0.01.

If we now compare the columns of Table 1 that only differ by one type of report, we can explore where the discrepancies come from: do they come from fathers reporting lower maternal

inputs than mothers themselves, or from mothers reporting lower paternal inputs than fathers themselves, or both? Columns 1 and 2 only differ in one dimension: fathers' inputs are reported by the fathers themselves in column 1 while they are reported by the mothers in column 2, but in both columns, mothers' inputs are reported by the mothers. The comparison reveals that the discrepancies come from fathers' reported inputs being much higher when fathers report them (column 1) than when mothers report them (column 2) (the same reasoning goes when comparing columns 3 and 4). Similarly, the only difference between columns 1 and 3 is whom mothers' inputs are reported by, mothers themselves or fathers. The comparison indicates that mothers' reported inputs are also much higher when mothers report them than when fathers report them (the same reasoning goes when comparing columns 2 and 4).

Figure 1 below displays the full distributions of the overall score combining all five activities and confirms these patterns. In particular, it shows that the distribution of maternal and paternal inputs reported by the fathers are almost indistinguishable, as suggested by the comparison of means in the third column of Table 1. Wilcoxon rank-sum tests indicate that these two distributions are not statistically different (p-value= 0.84) while all other distributions are significantly different at the 1% level.

Figure 1: Distribution of investments depending on who reports



In Appendix A, we explore whether the gaps reported in Table 1 are heterogeneous across subgroups and time. Table A.1 presents the gaps according to the different data sources across several heterogeneity dimensions: the education level of the respondents (having a high-school

diploma or less as the highest degree, or a Masters' degree or more), identifying as Hispanic or Latino, White, Black or African American, or Asian. Last, following [Jessen et al. \(2022\)](#), we distinguish between two periods, before and after Summer 2021, to test if the lockdown period and the gradual return to pre-pandemic activities after the vaccine became widely available in the U.S. in Summer 2021 reveal any differences in gender inequalities. Even though the sample size limits the precision of our estimates, the analysis suggests that there is a substantial amount of heterogeneity across subgroups. In particular, all data sources show that the gap in care activities tend to be smaller among non-Hispanic respondents compared to Hispanic respondents, with differences in gaps as high as 0.35σ and 0.49σ according to self-reports and fathers' reports, respectively. Focusing on fathers' reports, it is also interesting to note that the null average gaps in Table 1 often mask large differences across subpopulations. For instance, while among respondents with a high-school diploma or less, fathers report that mothers spend more time on educational activities (and to a smaller extent, care activities) than themselves, it is not the case among respondents with education levels above high school, where the reported gap is null (0.68-0.70 and 0.17-0.14 for educational and care activities, respectively). A similar pattern arises among Hispanic versus non-Hispanic respondents, and, for educational activities, among Black versus non-Black respondents, and Asian versus non-Asian respondents.

Next, we explore potential drivers of the differences in parental investments between fathers and mothers. To do so, we check whether fathers and mothers differ in any demographic characteristics as well as in parental beliefs, and we estimate the extent to which factors differentiating fathers and mothers predict their investments.

4 Exploring the determinants of parental investment gaps

4.1 What makes fathers and mothers different?

We start by investigating the differences in socioeconomic characteristics between fathers and mothers, as well as differences in beliefs about child development, that have been shown to play a critical role in determining parental inputs ([List et al. \(2021\)](#), [Bhalotra et al. \(2020\)](#), [Cunha et al. \(2020\)](#), [Attanasio et al. \(2019\)](#)). [List et al. \(2021\)](#), in particular, use the same SPEAK scale we use in this paper, and show that higher beliefs (i.e., a higher propensity to believe parental inputs matter for child development) can lead to higher parental investments.

Table 2 below provides the average of each demographic and belief variable for fathers and mothers, and the difference between the two with the corresponding standard error in the third and fourth columns. It shows that fathers in our sample are on average three years older than mothers and slightly less likely to identify as Hispanic or Latino (difference significant at the 10% level only), but do not significantly differ along race and education characteristics. Mothers and fathers do not significantly differ in their probability to take care of a dependent adult, nor in their probability to receive practical support from friends, relatives, neighbors, or any other member of their community. By contrast, we find large differences in employment and the weekly number of hours worked. 80% of the fathers in our sample are employed for wages versus 41% of the mothers, a difference that is significant at the 1% level. On average, fathers work 43 hours per week while mothers work 35 hours per week, conditionally on being employed (hence the smaller number of observations). These differences in employment and work hours during the pandemic have been widely documented (see the discussion in the introduction) and our sample is representative of broader populations in that respect.

The last two rows of the table describe two types of beliefs we elicited in the survey. The first one asked respondents to state to what extent they agree or disagree with the following statement: "My role as a caregiver gives me a sense of purpose or meaning in my life" (we transformed it into a binary indicator taking value 1 if they strongly agree or agree). The vast majority of our sample agrees with that statement and there is no statistically significant difference between fathers and mothers. However, we find a large difference in terms of beliefs about child development, with mothers being significantly more likely to believe that parental inputs affect early cognitive development. We believe this paper is the first to show such gaps in general parental beliefs about child development along the gender dimension.

Table 2: Differences between fathers and mothers

	Fathers	Mothers	Diff	(s.e.)	N
Age	35.01	32.27	2.74***	(0.67)	276
Hispanic or Latino	0.37	0.48	-0.11*	(0.06)	280
White	0.60	0.59	0.01	(0.06)	281
Black or African American	0.07	0.12	-0.06	(0.04)	281
Asian	0.09	0.07	0.01	(0.03)	281

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... table 2 continued

	Fathers	Mothers	Diff	(s.e.)	N
Educ: HS or less	0.21	0.15	0.06	(0.05)	281
Educ: Bachelors' degree	0.30	0.33	-0.03	(0.06)	281
Educ: Masters or more	0.21	0.20	0.00	(0.05)	281
Employed	0.80	0.41	0.40***	(0.05)	280
Nb hours worked/week	43.06	34.60	8.46***	(1.77)	210
Has practical support	0.88	0.84	0.04	(0.04)	279
Takes care of dependent adult(s)	0.07	0.10	-0.03	(0.03)	281
Sense of purpose caregiving	0.87	0.86	0.01	(0.04)	281
Beliefs about child dvpt (0 to 66)	46.45	49.83	-3.38***	(1.00)	276

Note: Average for fathers in first column and for mothers in second column. Differences in third column, with the corresponding standard error in parentheses in the fourth column. N gives the total number of observations (fathers + mothers). The belief score is the raw score summing the 20 questions. * for p-value<0.1, ** for p-value<0.05, *** for p-value<0.01.

4.2 Are the factors differentiating fathers and mothers predictive of their investments?

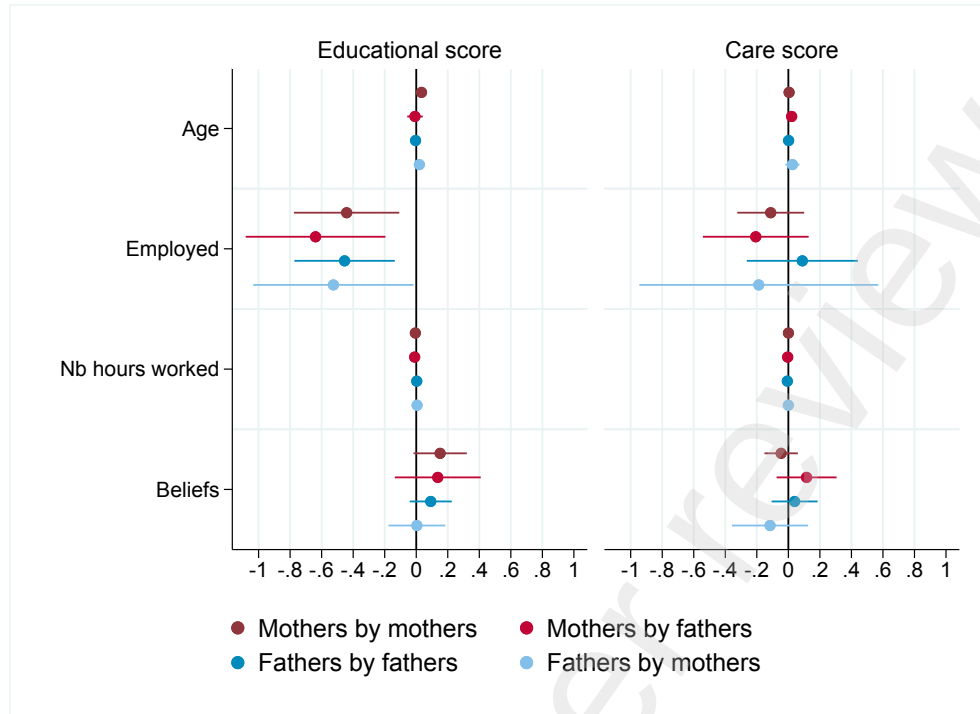
To assess if these differences between mothers and fathers can explain the gender gaps in parental inputs described in Table 1, we examine how the four main factors differentiating mothers and fathers relate to their inputs. Figure 2 below displays the correlations between each factor – age, employment status (= 1 if employed for wages, 0 otherwise), weekly number of hours worked, and beliefs about child development (standardized score) – and the two types of parental inputs presented in Table 1. When we consider mothers' inputs (reported either by mothers or by fathers), we also consider the age, employment status, hours worked, and beliefs of the mothers, and similarly for fathers (blue dots). Therefore, for cross reports (mothers' inputs reported by fathers and fathers' inputs reported by mothers), the estimation sample is limited to the matched subsample where both partners are enrolled in the study, as we do not observe the age, employment status, hours worked, and beliefs of the partner for the rest of the sample by definition. Correlations based on this subsample tend to be noisier given the smaller number of observations and should be interpreted more cautiously.

Our results show that the age and the weekly number of hours worked (conditionally on being employed) are uncorrelated with parental inputs for both parents. This is true for both educational and care activities and whether we measure parental inputs through fathers' or mothers' reports. By contrast, being employed is negatively associated with educational inputs for both mothers and fathers (around -0.4 to -0.6σ), which is consistent with having less time at home to spend with the child, but the correlations are not statistically significant for care activities (meal preparation, bath), which we expect to be less elastic.

The bottom panel of Figure 2 presents the correlation between fathers' and mothers' beliefs and their investments. As the SPEAK scale used to elicit beliefs focuses on the role of educational inputs, it is not surprising that the correlations with care activities are not significantly different from zero for both parents and regardless of who reports the time spent in these activities. The correlations with educational activities suggest an interesting pattern distinguishing mothers and fathers: while fathers' beliefs about the impact of parental inputs on child development are not or weakly correlated with their inputs (0.1σ according to fathers' reports, null correlation according to mothers' reports), the correlation between mothers' beliefs and their inputs tends to be higher (close to 0.2σ according to both reports, with an imprecise estimate based on fathers' reports due to the low number of observations). Figure A.1 in Appendix B shows the correlations for each of the five activities parents were asked about and suggests that for all three educational activities, the correlations between mothers' beliefs and their investments tend to be higher than the correlations between fathers' beliefs and their investments (with less pronounced differences for playing). This means that when mothers are more likely to believe that parental inputs affect child development, they tend to spend more time doing educational activities with their children, but this is less likely to be the case for fathers. The gender asymmetry in reading activities and outings remains true when we control for the employment status of the parent in addition to his or her beliefs, but the estimates are imprecise (Table A.2).¹

¹In a different context, these results are reminiscent of previous findings from Björkman Nyqvist and Jayachandran (2017), who compare the effects of parenting classes on mothers and fathers in Uganda. They find that even though both gain knowledge about child health from the classes, only mothers change their health behaviors.

Figure 2: Correlations between the factors differentiating fathers and mothers and their investments



4.3 How much of the gender gaps do differences in employment and beliefs explain?

Having identified two important differences between fathers and mothers that are also potential drivers of parental investments, we next estimate by how much the gender gaps in parental inputs shrink when we control for differences in employment and beliefs about child development. We focus on the gap measured by self-reports and the gap measured by mothers' reports (columns 1 and 2 of Table 1, respectively). There is no gap to be explained when using fathers' reports only (column 3), and we do not include cross reports (column 4) to focus only on empirically relevant scenarios. Typically, either both members of the household are surveyed about their own activities, or one member of the household is surveyed and reports the activities of several household members.

Table 3 below presents linear regressions of the two types of parental inputs on the gender dummy, with different sets of control variables:

$$Inputs_{ih} = \beta_0 + \beta_1 Female_i + X_{ih}\beta_2 + v_{ih}$$

where i represents each parent and h represents the household, for the subset of observations for whom the father and mother come from the same household. *Female* is a binary variable taking value 1 for mothers, 0 for fathers, and X is a vector of control variables. The estimates presented in Table 3 correspond to β_1 .

The first column serves as a reference and provides the raw gap between fathers' and mothers' inputs without any control ($X_{ih} = \emptyset$). These estimates differ slightly from the one presented in Table 1 (columns 1 and 2) due to the sample restrictions we use in Table 3. Here, we restrict the sample to observations that are non-missing in the two control variables we are interested in – employment status and beliefs about child development – so that the different columns of Table 3 only differ from each other by the variable(s) being controlled for and we can attribute any change in the estimated gap to these variables (and not to the change in estimation sample). As shown in Table 2, we have relatively few missing observations in the employment question and the belief survey so this restriction reduces the sample only marginally.

Following the insights from Table 2 and Figure 2, we first control for differences in employment status between fathers and mothers (column 2), and differences in beliefs about child development (column 3). The fourth column controls for both. In each case, we provide the corresponding percentage change compared to the raw gap (column 1).

Looking at the second column, we see that controlling for differences in employment status (being employed or not) leads to a substantial reduction in the gender gap for educational activities, between 25 and 46%, depending on which reports we use. These results are consistent with the large difference in employment status between fathers and mothers (Table 2) and the strong correlation between employment and educational time investments (Figure 2). Employment differences explain a smaller share of the gender gap in inputs corresponding to routine tasks such as preparing meals for the child or giving them a bath (2 to 4%), due to the lower correlation between employment and these inputs (Figure 2). Table A.3 in Appendix C presents the results for each specific activity and suggests that the gender gaps in reading and playing activities are similarly affected by differences in employment (around 20 to 35%, depending on the data we use) while the gap in going to outings tends to shrink more, proportionally, when we look at mothers' reports (it is not significant when we look at self-reports so we do not comment on this result).

The third column, which controls for differences in beliefs about child development between fathers and mothers, shows a similar asymmetry between educational and care inputs. Gender differences in parental beliefs explain between 5 to 13% of the gaps in educational investments,

depending on whether fathers report their own inputs (13%) or mothers report fathers' inputs (5%). Table A.3 suggests that this share can be as high as 16% for playing activities (we ignore the outings gap as it is imprecisely estimated). On the other hand, controlling for differences in beliefs does not reduce the gender gap in care inputs.

In the last column, we show that these two factors alone – employment and beliefs – explain up to 68% of the gender gap in educational investments when we measure the time investments of fathers and mothers through their own respective reports. The gap shrinks from 0.39σ to 0.12σ .

Overall, fathers' and mothers' differing beliefs about parenting and child development contribute to a non-negligible share of the gender disparities in the time spent raising their children. This finding has important implications given the malleability of these beliefs, in particular, when compared to the structural forces that determine the differences in employment between men and women. Based on the same measure of parental beliefs, List et al. (2021) show that educational interventions can substantially and lastingly change beliefs, and in some cases, change parental behaviors. It is a question for future research to determine whether such parenting interventions, usually evaluated through the lens of child development disparities and targeting mostly mothers, could additionally contribute to a reduction of gender inequality by also targeting fathers.

Table 3: Investment gaps controlling for differences between fathers and mothers

	(1)	(2)	% chg	(3)	% chg	(4)	% chg	N
Educational score								
Self-reports	0.39*** (0.10)	0.21* (0.11)	-46.41	0.34*** (0.10)	-13.31	0.12 (0.11)	-67.67	275
Mothers' reports	0.84*** (0.09)	0.63*** (0.10)	-25.04	0.79*** (0.10)	-5.24	0.55*** (0.12)	-34.57	208
Care score								
Self-reports	0.64*** (0.09)	0.63*** (0.10)	-2.43	0.65*** (0.09)	0.54	0.63*** (0.10)	-1.91	274
Mothers' reports	1.50*** (0.12)	1.44*** (0.12)	-3.73	1.52*** (0.12)	1.81	1.47*** (0.13)	-1.48	208

Continued on next page...

... table 3 continued

	(1)	(2) % chg	(3) % chg	(4) % chg	N
Employed		X		X	
Beliefs child dvpt			X	X	

Note: Difference between fathers' and mothers' z-scores, in standard deviations of the fathers' self-reported distribution. Standard errors clustered at the household level in parentheses below. Self-reports estimate the gap comparing Mothers by mothers minus Fathers by fathers while mothers' reports estimate the gap comparing Mothers by mothers minus Fathers by mothers. * for p-value<0.1, ** for p-value<0.05, *** for p-value<0.01. '% chg' columns give the percentage change in the gap with the inclusion of control variables. N is the number of observations used in the regression.

5 Conclusion

The literature on gender inequality in housework and childcare that abounded during the COVID-19 pandemic suggests that women's careers and earnings will likely be impacted by the current crisis in the long run, reversing historical trends toward more egalitarian societies. In that context, better understanding the roots of gender inequality is essential. One well-documented driver of the widening of gender inequality during the lockdown is the concentration of women in service occupations that were severely affected by the pandemic. What is less understood is the disproportionate increase in childcare hours for mothers that occurred in households where both parents worked or the asymmetry in the way fathers and mothers adjusted their childcare hours according to their partner's working arrangement. These findings point to deep gender dynamics within households and call for more research on their underpinnings.

This paper explores the role of parental beliefs in explaining the gender gaps in parental inputs. We show that mothers are more likely to believe that parental inputs affect child development than fathers, and their beliefs correlate with their inputs, which is less clear for fathers. Controlling for such differences reduces the gender gap in almost all the parental inputs we examine, regardless of how the gap is measured (using mothers' reports of both inputs or using fathers' reports of their own inputs and mothers' reports of their own inputs). These results reveal a novel mechanism in the dynamics of gender inequality within families. They also carry impor-

tant policy implications for parenting programs that tend to disproportionately target mothers. More research needs to be done to determine if parenting programs targeting fathers could change fathers' beliefs and reduce gender gaps in parental investments.

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Appendix

A Heterogeneity in gender gaps across time and subpopulations

Table A.1: Heterogeneity in the investment gaps between fathers and mothers

Dimension		Self-reports		Mothers' reports		Fathers' reports		Cross-reports	
		grp 1	Δ	grp 1	Δ	grp 1	Δ	grp 1	Δ
High-school or -	E	0.42	-0.05	0.85***	-0.01	0.68*	-0.70*	1.11***	-0.66*
	C	0.83***	-0.23	1.68***	-0.20	0.17	-0.14	1.02**	-0.11
Masters or +	E	0.42**	-0.06	0.90***	-0.07	0.08	-0.04	0.55**	-0.05
	C	0.48**	0.21	1.43***	0.11	0.03	0.03	0.98***	-0.07
Hispanic	E	0.38**	0.02	0.60***	0.38*	0.23	-0.27	0.45**	0.08
	C	0.86***	-0.35*	1.66***	-0.20	0.37**	-0.49**	1.17***	-0.34
White	E	0.39***	-0.05	0.90***	-0.15	0.03	0.05	0.54***	-0.05
	C	0.53***	0.29	1.52***	0.01	-0.02	0.22	0.97***	-0.06
Black	E	0.36	0.01	0.93***	-0.10	0.54	-0.53	1.10**	-0.64
	C	0.86**	-0.23	1.20***	0.35	-0.01	0.08	0.33	0.66*
Asian	E	0.67*	-0.32	0.85**	-0.01	0.28	-0.25	0.46*	0.06
	C	0.59	0.06	1.23***	0.32	-0.06	0.16	0.58	0.42
11/20-08/21	E	0.51***	-0.23	0.99***	-0.16	-0.05	0.11	0.43***	0.18
	C	0.55***	0.19	1.58***	0.14	-0.01	0.11	1.02***	0.06

Note: Linear regressions with interaction terms. For each type of report, the 'grp 1' column gives the time investment gap between mothers and fathers for the first subgroup, which is the subgroup described in the 'Dimension' column. The ' Δ ' column gives the difference with the time investment gap for the alternative subgroup. E stands for educational score and C for care score. * for p-value<0.1, ** for p-value<0.05, *** for p-value<0.01.

B Decomposition of correlations by activity

Figure A.1: Correlations between the factors differentiating fathers and mothers and their investments

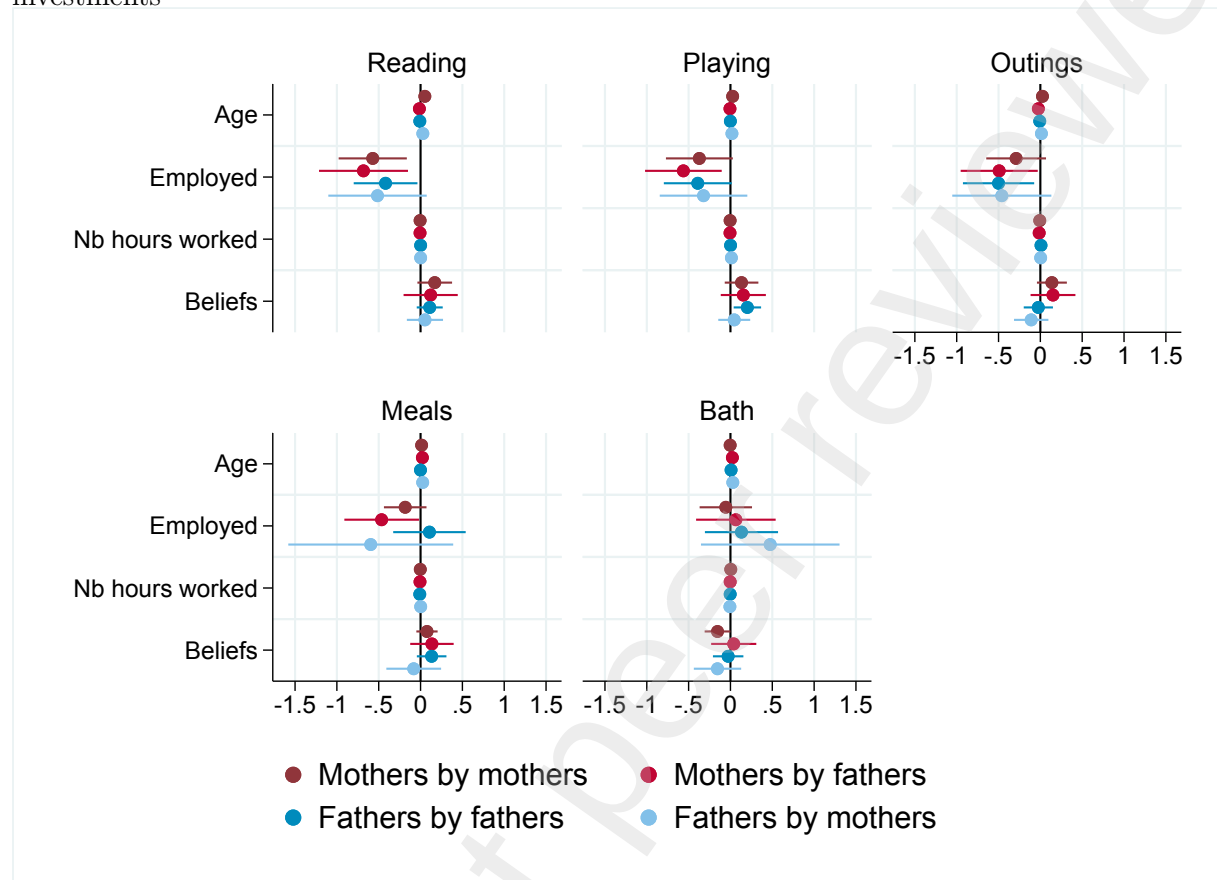


Table A.2: Correlations between parental beliefs and inputs, controlling for employment

	Report	Corr.	(s.e.)	N
Reading:	- Mothers by mothers	0.22**	(0.10)	147
	- Mothers by fathers	0.10	(0.15)	54
	- Fathers by fathers	0.13*	(0.08)	128
	- Fathers by mothers	0.08	(0.11)	62
Playing:	- Mothers by mothers	0.16	(0.10)	147
	- Mothers by fathers	0.16	(0.13)	64
	- Fathers by fathers	0.23***	(0.08)	128
	- Fathers by mothers	0.06	(0.10)	62
Outings:	- Mothers by mothers	0.16*	(0.09)	147
	- Mothers by fathers	0.16	(0.13)	64
	- Fathers by fathers	0.00	(0.09)	128
	- Fathers by mothers	-0.08	(0.10)	62
Meals:	- Mothers by mothers	0.09	(0.06)	146
	- Mothers by fathers	0.15	(0.13)	64
	- Fathers by fathers	0.12	(0.09)	128
	- Fathers by mothers	-0.05	(0.17)	62
Bath:	- Mothers by mothers	-0.15*	(0.08)	146
	- Mothers by fathers	0.04	(0.14)	64
	- Fathers by fathers	-0.03	(0.09)	128
	- Fathers by mothers	-0.19	(0.14)	62

Note: First column gives the correlation between the parent's beliefs and his or her inputs. Standard error in parentheses in the second column, and number of observations in the third column. For each activity, the correlation between mothers' inputs and mothers' beliefs is estimated using either mothers' reports or fathers' reports of the inputs (first two rows), and the correlation between fathers' inputs and fathers' beliefs is estimated using either mothers' reports or fathers' reports of the inputs (last two rows).

C Decomposition of controlled regressions by activity

Table A.3: Investment gaps controlling for differences between fathers and mothers

	(1)	(2)	% chg	(3)	% chg	(4)	% chg	N
Reading								
Self-reports	0.59*** (0.12)	0.39*** (0.14)	-34.47	0.53*** (0.13)	-9.91	0.30** (0.14)	-50.30	275
Mothers' reports	1.10*** (0.11)	0.85*** (0.12)	-22.72	1.05*** (0.12)	-4.93	0.76*** (0.14)	-31.51	209
Playing								
Self-reports	0.42*** (0.12)	0.27** (0.13)	-36.65	0.36*** (0.13)	-16.00	0.17 (0.14)	-60.67	275
Mothers' reports	0.87*** (0.11)	0.71*** (0.13)	-18.63	0.83*** (0.12)	-4.95	0.63*** (0.14)	-27.10	209
Outings								
Self-reports	0.10 (0.11)	-0.04 (0.13)	-143.74	0.08 (0.12)	-26.14	-0.09 (0.13)	-189.75	275
Mothers' reports	0.49*** (0.10)	0.34*** (0.12)	-30.09	0.47*** (0.11)	-5.32	0.29** (0.13)	-40.18	209
Meals								
Self-reports	0.65*** (0.11)	0.63*** (0.12)	-4.07	0.61*** (0.11)	-6.24	0.57*** (0.13)	-12.66	274
Mothers' reports	2.12*** (0.17)	2.00*** (0.17)	-5.52	2.10*** (0.17)	-0.57	1.97*** (0.17)	-6.82	208
Bath								
Self-reports	0.69*** (0.12)	0.69*** (0.13)	0.15	0.73*** (0.12)	5.75	0.74*** (0.13)	7.77	274
Mothers' reports	1.05*** (0.15)	1.06*** (0.16)	1.49	1.11*** (0.16)	6.01	1.15*** (0.17)	10.18	208
Employed		X				X		
Beliefs child dvpt				X		X		

Note: Difference between fathers' and mothers' z-scores, in standard deviations of the fathers' self-reported distribution. Standard errors clustered at the household level in parentheses below. Self-reports estimate the gap comparing Mothers by mothers minus Fathers by fathers while mothers' reports estimate the gap comparing Mothers by mothers minus Fathers by mothers. * for p-value<0.1, ** for p-value<0.05, *** for p-value<0.01. '% chg' columns give the percentage change in the gap with the inclusion of control variables. N is the number of observations used in the regression.