Is there a motherhood gap in the willingness to compete for pay?

Aurélie Dariel and Nikos Nikiforakis

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Abstract

A substantial fraction of the gender gap in earnings is due to wage disparities between women with and without children. Inspired by evidence linking labor-market outcomes with attitudes toward competition, we explore the association between motherhood and the willingness to compete for pay. In two behavioral studies, we find that mothers are considerably less likely to choose a competitive payment scheme than similar women without children. Fathers are as willing to compete as non-fathers. The motherhood gap is not mediated by differences in ability, beliefs, risk attitudes, marital status, parental education, parental employment, or the time since the last pregnancy.

JEL Classification: C90, D82, D91, J16
Keywords: motherhood gap, gender gap, competition, experiment

* Aurélie Dariel: Division of Social Science, and Center for Behavioral Institutional Design, New York University, Abu Dhabi, PO Box 129188, United Arab Emirates, apd5@nyu.edu. Nikos Nikiforakis [Corresponding Author]: Division of Social Science, and Center for Behavioral Institutional Design, New York University, Abu Dhabi, PO Box 129188, United Arab Emirates, nicos.nikiforakis@nyu.edu. We thank Curtis Kephart and Christina Zenker for their valuable input and assistance at the early stages of this project. For comments, we thank James Andreoni, Paul Glimcher, John Ham, Moritz Janas, Aaron Kamm, Ernesto Reuben, Bettina Rockenbach, Nishtha Sharma, Lise Vesterlund, Marie Claire Villeval, Songfa Zhong, and participants at the 2019 Science of Diversity and Inclusion Conference at the University of Chicago, the 2019 Asia-Pacific Meeting of the Economic Science Association in Abu Dhabi, the 2018 World Meeting of the Economic Science Association in Berlin, and the 2018 International Meeting of Experimental Social Scientists at NYU New York. The protocols for Study 1 and Study 2 were approved by the IRB at NYU Abu Dhabi (024-2016 and 104-2017, respectively). Informed consent was obtained from all participants. Nikos Nikiforakis gratefully recognizes financial support by Tamkeen under the NYU Abu Dhabi Research Institute Award CG005.
The persistent gap in earnings between men and women has been a topic of continuous discussion among social scientists (Blau & Kahn, 2017). A growing body of evidence indicates that a substantial fraction of this gap is due to a wage disparity between women with and without children (Adda et al., 2017; Angelov et al., 2016; Cortés & Pan, in press; Fernandez-Kranz et al., 2013; Hardoy et al., 2017; Juhn & McCue, 2017; Kleven et al., in press, 2019; Lundberg & Rose, 2000; Paull, 2008; Waldfogel, 1998). In fact, recent estimates of the “motherhood gap” seem to support an old adage that “[t]he greatest barrier to economic equality is children” (Fuchs, 1990): 60% of the overall gender gap in earnings in Sweden (Angelov et al., 2016), about two-thirds in the USA (Cortés & Pan, in press), and 80% in Denmark (Kleven et al., in press) is due to differences in the outcomes of women with and without children. The motherhood gap also accounts for most of the gender differences among high-skilled professionals (Bertrand et al., 2010; England et al., 2016; Goldin & Katz, 2016). Given its significance (Cortés & Pan, in press; Juhn & McCue, 2017; Kleven et al., in press), understanding the causes of the motherhood gap is a topic of obvious importance.

Traditional explanations emphasizing the role of human capital (Becker, 1991; Fernandez-Kranz et al., 2013; O’Neill & Polachek, 1993), the division of labor in couples (Angelov et al., 2016; Becker, 1985), and discrimination by employers (Correll et al., 2007), all account for part of the motherhood gap. A considerable fraction of it, however, remains unexplained (Cortés & Pan, in press; Juhn & McCue, 2017). A factor that could help explain the motherhood gap is women’s attitudes toward pay-related competition. Such competition plays a central role in labor markets, whether individuals compete to secure a job, a promotion, a wage increase, a performance bonus, or the profitability of their own firm. Indeed, behavioral research has provided evidence showing that the willingness to engage in pay-related competition predicts career choices and individual earnings (Buser et al., 2014; Buser, Peter, & Wolter, 2017; Buser et al., 2021; Kleinjans, 2009; Reuben et al., 2015, 2017). If mothers are less willing to compete for pay than similar women without children, it could help explain differences in their career paths and earnings. However, there is no research to date on the willingness of mothers to compete for pay relative to others.  

In this paper, we ask whether there is a motherhood gap in the willingness to

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1Throughout the paper, we refer to “pay-related” or “for pay” competition in recognition of the fact that mothers may be as willing to compete as others in other domains, e.g., when the well-being of their children is at stake. Also, for brevity in the exposition, we will sometimes refer to women and men without children as “non-mothers” and “non-fathers,” respectively.
compete for pay. We follow a literature in behavioral economics which measures the willingness to compete for pay by using individual choices between competitive and non-competitive payment schemes in controlled experiments (Balafoutas & Sutter, 2012; Balafoutas et al., 2018; Banerjee et al., 2018; Buser, Dreber, & Möllerström, 2017; Datta Gupta et al., 2013; Niederle & Vesterlund, 2007; Niederle et al., 2013; Reuben et al., 2014; Sutter & Glätzle-Rützler, 2014). The advantage of this approach is that it allows us to objectively measure ability, and ensure that the time commitment required is the same across compensation schemes. Differences in choices between mothers and non-mothers in our study, therefore, cannot be driven by differences in human capital, division of labor, or personal circumstances. We complement our measure of competitiveness and ability by collecting extensive survey data to explore the mechanisms underlying any differences in competitiveness that we may observe between mothers and non-mothers.

We measure women’s willingness to compete for pay in two studies which use different samples and are deployed in different settings. We begin our investigation by conducting a classroom experiment with a sample of women from the United Arab Emirates (UAE). For the purpose of our research, this population has attractive properties as many Emirati women have children in early adulthood. This implies that a substantial fraction of undergraduate students are already mothers thus allowing us to compare the choices of mothers to those of non-mothers with similar academic ability, socioeconomic background, and career paths in a controlled environment. In a second study, we recruit a sample from the US — a country whose population has been widely studied by behavioral scientists, and the motherhood gap has been robustly observed (Juhn & McCue, 2017; Kleven et al., 2019) — for an online experiment. The second study allows to explore the existence of the motherhood gap in a sample drawn from a very different population, as well as the choices of non-students, fathers and non-fathers.

Our paper is organized as follows. The next section presents the design and findings of the study using the sample of Emirati women. We then present the study on the US sample. The paper concludes with a discussion about the interpretation, limitations, and implications of our findings.

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2This measure has been found to predict career choices and individual earnings (Buser et al., 2014; Buser, Peter, & Wolter, 2017; Buser et al., 2021; Kleinjans, 2009; Reuben et al., 2015, 2017). The literature also documents robust gender differences in competitiveness, with men been more willing to compete for pay. For a review, see Niederle (2016).
Study 1

We measure the willingness to compete for pay using a design similar to that in (Niederle & Vesterlund, 2007). The design consists of three tasks, one of which is randomly selected for pay at the end. In each task, participants are asked to add up a series of two-digit numbers for 3 minutes. The tasks differ in how individuals are compensated for their performance. In Task 1 (forced piece rate), participants are paid for each correct answer using a piece rate of 2 points per correct sum. In Task 2 (forced tournament), participants compete in groups of four; the one with the highest number of correct summations at the end receives 8 points per correct sum, while the others receive nothing. Groups could be either single-gender or mixed-gender, depending on the treatment. Finally, in Task 3 (choice of payment scheme), participants must choose between the piece rate and the tournament, and perform the task one final time. The choice in Task 3 is our measure of individuals’ attitudes towards pay-related competition. To explore the mechanisms driving the willingness to compete, at the end of Task 3, participants fill out a survey with questions concerning motherhood, their children, their parents, their relative wealth, their risk attitudes, confidence in their performance in Task 2, and more (see Supplementary Information, SI).

The sample was recruited from the largest public university in Abu Dhabi, the capital of the UAE. The study was conducted during normal class hours, without pre-announcing it to students such that self-selection into the study, which could bias our estimates of the relative willingness of mothers and non-mothers to compete for pay, is minimized. Participants were seated far away from each other to ensure that they could not influence each other’s choices (see SI). Our sample consists of 306 women. Based on the responses to the survey, 20.5% of our participants are classified as mothers ($N_m = 63$) and the remaining as non-mothers ($N_n = 243$).\footnote{Following recent evidence showing that significant neuro-biological changes happen during pregnancy (Hoekzema et al., 2017), we also classify as “mothers” women who reported being pregnant for the first time. As we mention later in the paper, these women are as likely to compete as women who have already given birth. Given the small number of women in this category, this classification does not affect our conclusions. More information can be found in the SI.} We also recruited 66 male participants to create mix-as well as single-gender groups to explore whether the willingness of mothers and non-mothers to compete is sensitive to the presence of men. Only one of the 66 participants was a father. The data from the male participants is discussed in (Dariel et al., 2017).
As anticipated, mothers and non-mothers are similar in many dimensions in this sample. Specifically, as shown in Table S1 in the SI, we do not find substantial or statistically significant differences between mothers and non-mothers in how they perform in Task 1, in Task 2, in Task 3, in how risk tolerant they are, in their beliefs about their relative performance in Task 2, in how wealthy their families are in relative terms, in whether their fathers attended university, and in how likely they are to have mothers who held a job after giving birth. Nevertheless, we do find that mothers are significantly more likely to have mothers who attended university than non-mothers ($N = 306, x^2(1) = 7.586, P = 0.006$, two-sided), are 2.8 years older on average ($N = 306, z = -7.366, P = 0.000$, two-sided, Mann-Whitney test), are more likely to be married ($N = 306, x^2(1) = 7.586, P = 0.006$, two-sided), and to hold more traditional views concerning gender roles (see lower panel in Table S1, SI).

Fig. 1 shows the percentage of mothers and non-mothers that chose to compete for pay in Task 3. Mothers are 68.5% or 19.6 percentage points less likely to
select the tournament than non-mothers (28.6% vs. 48.2%). The difference is large and statistically significant ($N = 306, x^2(1) = 7.777, P = 0.005$, two-sided). To explore the determinants of the choice to compete, Table 1 presents the results from a regression analysis. Similar to previous studies, the likelihood that individuals select to compete for compensation in Task 3 increases with their performance in the tournament and their tolerance to risk, while it decreases if they believe others performed better than they did. These variables, however, do not appear to explain the gap in the propensity of mothers and non-mothers to select the competitive compensation scheme. Regressions (II)–(IV) also control for participants’ age, family wealth, parental education, academic major, the gender composition of their group, and their responses to seven questions taken from the World Values Survey concerning participants’ views on gender roles (see Table S1 in the SI). The coefficients for these variables are both small and statistically insignificant, and are hence not presented. Importantly, as seen in Table 1, these variables do not appear to explain the difference in competitiveness between mothers and non-mothers as the coefficient for mothers is essentially unchanged across regressions (I)–(IV).

The behavioral and survey data we collected permit us to explore a variety of other mechanisms beyond those considered in Table 1, that could help shed light on our findings. (i) Children’s age: The gap is not associated to the age of a woman’s youngest child in our sample. If we regress the age of a woman’s youngest child on the willingness to compete, we obtain a marginal effect close to 0 ($mfx = 0.004, N = 41, P = 0.870$, Probit regression). Similarly, if we perform a median split on the sample of mothers based on the age of their youngest child (which is 1 year in our sample), we find that mothers above the median compete at a very similar rate as mothers who are below the median (27.3% and 26.3%). (ii) Gender of competitors: The gap is similar whether women compete in single-sex groups (non-mothers: 46.9%; mothers: 25.0%; $N = 151, x^2(1) = 5.436, P = 0.020$, two-tailed) or in mix-gender groups (non-mothers: 49.2%; mothers: 33.3%), although we have a relatively small number of mothers ($N = 27$) in the latter case ($N = 155, x^2(1) = 2.262, P = 0.133$, two-tailed). (iii) Marital status: The gap does not seem to be driven by marital status either. If we condition on marital status, we find that, among married women, non-mothers choose competition 41.7% and mothers 29.1% of the time. Among unmarried women, non-mothers choose to compete 48.5% and mothers 25.0% of the time. Having said that, the sample of unmarried mothers and married non-mothers is too small to permit a meaningful
Table 1: The determinants of women’s willingness to compete in Study 1

<table>
<thead>
<tr>
<th></th>
<th>(I)</th>
<th>(II)</th>
<th>(III)</th>
<th>(IV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mothers</td>
<td>-0.201***</td>
<td>-0.213***</td>
<td>-0.212***</td>
<td>-0.202***</td>
</tr>
<tr>
<td></td>
<td>(0.069)</td>
<td>(0.077)</td>
<td>(0.077)</td>
<td>(0.078)</td>
</tr>
<tr>
<td>Tournament score</td>
<td>0.018***</td>
<td>0.019***</td>
<td>0.020***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.007)</td>
<td>(0.007)</td>
<td>(0.008)</td>
<td></td>
</tr>
<tr>
<td>Tourn – PR score</td>
<td>-0.008</td>
<td>-0.008</td>
<td>-0.011</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.009)</td>
<td>(0.009)</td>
<td>(0.009)</td>
<td></td>
</tr>
<tr>
<td>Beliefs</td>
<td>-0.144***</td>
<td>-0.142***</td>
<td>-0.138**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.055)</td>
<td>(0.054)</td>
<td>(0.055)</td>
<td></td>
</tr>
<tr>
<td>Risk tolerance</td>
<td>0.036**</td>
<td>0.034**</td>
<td>0.032*</td>
<td></td>
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<tr>
<td></td>
<td>(0.016)</td>
<td>(0.016)</td>
<td>(0.017)</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>306</td>
<td>306</td>
<td>306</td>
<td>306</td>
</tr>
<tr>
<td>Indiv. &amp; family controls</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Treatment fixed effects</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Major fixed effects</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Marginal effects from probit regressions. The dependent variable is a dummy indicating whether a participant selected the tournament. Mothers is a dummy indicating whether a participant was a mother. Tournament score is the score of a participant in Task 2. Tourn – PR score is the difference in a participant’s score in tasks 1 and 2. Beliefs is a dummy indicating whether a participant believed others in her group were likely to have a better score in Task 2. Risk tolerance is a discrete variable indicating one’s taste for risk. “Major” refers to academic major. For more information on the controls, see SI, Table S1. Standard errors are shown in parentheses. ****, ***, * indicate significance at the .01, .05, .10 levels, respectively.

Statistical comparison (N = 12 and N = 8, respectively). We address this issue in Study 2. (iv) Pregnancy status: Women who are pregnant for the first time (N = 21) are exactly as likely to choose to compete as those that have already given birth (28.6%). (v) Number of children: We find a similar gap in competitiveness if we restrict our sample of mothers to one-time mothers only (non-mothers: 48.2%; one-time mothers: 30.0%; N = 293, x²(1) = 5.517, P = 0.019, two-tailed). (vi) Parental attitudes towards family: Parental attitudes do not appear to drive the gap in competitiveness. Specifically, we conducted a post-study survey, a month after the original study, asking participants about the involvement of their parents in family planning (see SI). If we restrict our analysis only to women who responded that their parents play a significant role in determining when their daughters marry, we obtain a similar result: 24.0% of mothers chose the tournament, compared to 47.1% of non-mothers (N = 93, x²(1) = 4.022, P = 0.045, two-tailed).
Additional details for the tests above can be found in the SI, where we also present results from a simulation suggesting that mothers (but not non-mothers) compete less than what would be optimal in monetary terms (see SI, Fig. S1).

**Study 2**

For Study 2, we recruited participants from the US — a country whose population has been widely studied by behavioral scientists, and the motherhood gap has been robustly observed (Juhn & McCue, 2017; Kleven et al., 2019). Since many women studying in the US delay motherhood until after they complete their education, a classroom experiment similar to that in Study 1 was not possible. Instead, we decided to conduct an online experiment on Amazon MTurk. An advantage of this approach is that both mothers and non-mothers have relatively easy access to the online platform. In addition, it allows us to target a more diverse sample of participants, including non-students. On the other hand, a drawback is that, unlike in Study 1, we cannot prevent self-selection into the study. If competitiveness predicts selection into the study and mothers are less willing to compete for pay than non-mothers, then it is possible that we would be underestimating the motherhood gap in competitiveness.

The sample in Study 2 allows us to cleanly disentangle the effect of motherhood from that of marital status. To achieve this, our study focuses on women who are either married or are “living together as-if married” (henceforth, “married”). By focusing on married women, we ensure that any difference between mothers and non-mothers cannot be driven by their marital status. Study 2 also provides us with the opportunity to compare the willingness of fathers and non-fathers to compete for pay. We regard the latter as a useful “reality check.” If attitudes toward competition play an important role in determining labor market outcomes, the absence of a “fatherhood gap” in earnings (Juhn & McCue, 2017; Waldfogel, 1998) would imply that we should be expecting fathers to be similarly willing to compete for pay as non-fathers.

The sample for Study 2 consists of 300 married women (153 of which are mothers) and 166 married men (49 of which are fathers; see SI for sampling and power calculations), all between the ages 18 and 30. We focus on this age-range, first, to increase comparability with Study 1 in which 98% of our sample fell in this category and, second, because this is the age-range in which women are more likely to be first time mothers — when decisions have the greatest impact on their career (Kleven et
al., in press). Despite these restrictions, as expected, mothers and non-mothers differ significantly in many respects, including in their performance in tasks 1 and 2, their age, level of education and family income (see SI, Table S2). Differences are overall smaller between fathers and non-fathers and, with exception of age, not statistically significant (see SI, Table S3).

To measure the willingness to compete, we used a similar design to that in Study 1, with two minor differences that were inspired by another study conducted on MTurk (Apicella et al., 2017): (i) to avoid cheating, in tasks 1, 2 and 3, instead of presenting participants with numbers to add, we asked them to count the number of 0s in a series of 6x6 matrices with 0s and 1s over 90 seconds; (ii) to simplify instructions, we used two-person groups, and participants were told that they would be randomly matched with another individual.
Table 2: The determinants of women’s willingness to compete in Study 2

<table>
<thead>
<tr>
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<th>(I)</th>
<th>(II)</th>
<th>(III)</th>
<th>(IV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mothers</td>
<td>-0.117**</td>
<td>-0.104*</td>
<td>-0.169**</td>
<td>-0.140**</td>
</tr>
<tr>
<td></td>
<td>(0.056)</td>
<td>(0.056)</td>
<td>(0.071)</td>
<td>(0.069)</td>
</tr>
<tr>
<td>Tournament score</td>
<td>0.012</td>
<td>0.002</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.013)</td>
<td>(0.015)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tourn – PR score</td>
<td>0.011</td>
<td>0.014</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.016)</td>
<td>(0.017)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beliefs</td>
<td>-0.223***</td>
<td>-0.222***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.053)</td>
<td>(0.061)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk tolerance</td>
<td>0.055***</td>
<td>0.067***</td>
<td></td>
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<tr>
<td></td>
<td>(0.015)</td>
<td>(0.018)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>300</td>
<td>300</td>
<td>214</td>
<td>214</td>
</tr>
<tr>
<td>Individual controls</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Marginal effects from probit regressions. The dependent variable is a dummy taking the value of 1 if a woman selected the tournament, and 0 otherwise. For explanations of the regressors, see Table 1. Models (III) and (IV) exclude observations from mothers with more than one child. Standard errors are shown in parentheses. ***, **, * indicate significance at the .01, .05, .10 levels, respectively.

Fig. 2 shows the percentage of individuals that chose to compete in Task 3. Mothers are 31.1% or 11.8 percentage points less likely to select the tournament than non-mothers (37.9% vs. 49.7%). The difference is both substantial and statistically significant \( (N = 300, x^2(1) = 4.209, P = 0.040, \text{two-sided}) \). Although the size of the difference (11.8 percentage points) is smaller than that in Study 1 (19.6 percentage points), it is similar in magnitude to that for gender in another MTurk study on the willingness to compete (12.2 percentage points) (Apicella et al., 2017). We will return to this issue shortly. We also note that there is a substantially larger fraction of mothers with more than one child than in Study 1 (see SI). If we restrict our comparison to first-time mothers and non-mothers (which arguably offers a cleaner test of our hypothesis), we find an even larger difference in the willingness of first-time mothers (32.8%) and non-mothers (49.7%) to select the tournament \( (N = 214, x^2(1) = 5.277, P = 0.022, \text{two-sided}) \). Table 2 shows that none of our controls can fully account for the difference in the propensity of mothers and non-mothers to select the tournament.
As can be seen in Fig. 2, fathers and non-fathers, select the tournament at similar rates (53.1% and 56.4%, respectively) which do not differ significantly ($N = 166, \chi^2(1) = 0.157, P = 0.692$, two-sided; see Table S4, for a regression analysis). Interestingly, whereas in line with (Cassar et al., 2016) mothers are found to compete significantly less often than fathers ($N = 202, \chi^2(1) = 3.508, P = 0.061$, two-sided), non-mothers and non-fathers choose to compete at similar and statistically indistinguishable rates ($N = 264, \chi^2(1) = 1.191, P = 0.275$, two-sided). Intuitively, this is what one would expect if attitudes toward competition help explain the motherhood gap.

One might wonder about the reasons for the absence of a substantial (or statistically significant) gender difference among our (married) non-parents, given the robust evidence of such differences from lab studies (Dariel et al., 2017; Niederle, 2016). One possible explanation is that there is something unique about our MTurk experiment. To explore this possibility, we collected additional data for unmarried individuals (see SI). In summary, we find the usual gender difference among unmarried participants suggesting that there is nothing extraordinary with our MTurk sample. Intriguingly, the observed gender difference is of exactly the same magnitude as that seen in Fig. 2 for mothers and non-mothers (11.8 percentage points, $P = 0.001$, $\chi^2$ test, two tailed). That is, the motherhood gap in competitiveness does not appear to be smaller than the well-documented gender gap in competitiveness in our sample. The lack of a gender difference among married non-parents may reflect the disappearance of social pressures that women experience pre-marriage (Bursztyn et al., 2017).

Discussion

Our paper contributes to a literature exploring factors that can help account for the motherhood gap in earnings and, by extension, the gender earnings gap. By presenting the first evidence linking motherhood with a reduced willingness to compete for pay, our findings suggest a novel explanation for the motherhood gap: mothers may choose career paths that lead to lower earnings because they are less willing to engage in pay-related competition. More specifically, differences in pay-related competitiveness could help account for the observation that women disproportionately shift to low-paying jobs after becoming mothers — jobs that are likely to require them to compete less — a factor that accounts for a sizeable fraction of the motherhood gap in earnings (Cortés & Pan, in press). Our research also contributes to the behavioral literature on
competitiveness by suggesting the existence of a nuanced relationship between gender and pay-related competitiveness. Specifically, our findings indicate that the marital and child-rearing status of women could predict their willingness to compete for pay.

Given the potentially far reaching implications of our research, it is important to highlight the limits to the inferences that can be drawn from our data. The data we collected has allowed us to explore a number of channels that could account for the gap in competitiveness: differences in ability, beliefs about one’s relative ability, risk attitudes, marital status, parental education, parental employment, and relative wealth, among others. None of these factors was found to mediate the observed motherhood gap in the willingness to compete for pay. Hence, our data does not allow us to rule out the possibility that motherhood and a woman’s willingness to compete for pay are directly linked. However, this does not imply that such a link exists. This is a limitation that our research shares with previous studies documenting the existence of gender differences in competitiveness. At first pass, this may not be obvious as gender, unlike motherhood which is (largely) endogenously determined in adulthood, is (largely) exogenously determined at birth. However, as gender is not randomly assigned by the experimenter, similar inference problems apply to those studies that apply to ours, e.g., due to missing variables, and self-selection into the sample.⁴ The inability to randomly assign gender or parental status that one cannot deduce the existence of a causal link with competitiveness.

Even if a causal relationship exists between the willingness to compete for pay and motherhood, its direction is not obvious. For instance, it is possible that women who are less willing to compete for pay select earlier into motherhood. To explore this possibility and to investigate different channels that could be driving the motherhood gap in pay-related competitiveness, we conducted a survey on MTurk with US mothers aged 18-30, which did not participate in Study 2. Among others, they were asked to state to what extent they agreed/disagreed with the following statement: “After becoming a mother, I was less willing to work in an excessively competitive environment (i.e., one where colleagues have to compete with each other on a regular basis for promotion, salary etc.) than I was before, even if this implied lower personal earnings.” This question aims to bypass the issue of selection by asking women of how their willingness to compete changed after becoming mothers – a before and after comparison. The question also

⁴See Dariel et al. (2021) for an example of how self-selection into a study can bias the estimates of the gender gap in competitiveness.
investigates whether a woman’s change in competitiveness (if any) after becoming a mother was strong enough for her to consider changing career paths, even if this would be at a monetary cost.

The majority of mothers (64.9%) agreed that they were less willing to compete for pay after becoming mothers, even if this would imply a reduction in their earnings. Only 21.2% of the mothers disagreed. We can thus reject the null hypothesis that respondents neither agree nor disagree with the statement, in favor of the alternative that respondents agree that they were less willing to compete after becoming mothers ($N = 199, z = 6.111, P = 0.000$, two-sided, Wilcoxon sign-rank test). The survey also provides suggestive evidence that the reduction in the willingness to compete is driven by a feeling that they would enjoy competing less that they did before ($N = 152, z = 4.813, P = 0.000$, two-sided Wilcoxon sign-rank test). In contrast, we do not find support for the hypothesis that women felt that there was an expectation from society or their family to avoid excessively competitive environments after becoming mothers ($N = 193, z = -0.690, P = 0.490$, two-sided, Wilcoxon sign-rank test).

Although the survey evidence above has its own limitations, it is interesting to note that it is broadly in line with the findings in Kuziemko et al. (2018). Using data from the British Household Panel Survey and three different sources from the US (including the National Longitudinal Surveys of Young and Mature Women), Kuziemko et al. (2018) find that “[w]hereas before motherhood most women say that work does not inhibit women’s ability to be good wives and mothers, after the birth of their first child they become significantly more negative toward female employment.” The authors attribute this (as well as the large drop in employment rates in the first year following the birth of a woman’s first child) to the fact that women tend to “underestimate the employment costs of motherhood”. The latter include “the emotional cost of being separated from the child while at work, guilt over (perceived or real) underperformance as an employee or mother.” These emotional costs could help explain the reduced willingness of mothers to engage in competition for pay.\(^5\)

Our study is silent concerning the extent to which the motherhood gap in competitiveness captured in our data could be related to social or other factors. A priori, there are reasons to expect that a mother’s pay-related competitiveness may be

\(^5\)Kuziemko et al. (2018) also report finding “no meaningful pre-[birth] trends, a steep change around the time of the first child’s birth, and no recovery in the medium-run” suggesting the existence of a causal relationship between motherhood and attitudes toward employment with long-lasting implications in their samples.
negatively impacted by social forces. For instance, in countries around the world, there exist social norms prescribing the role of the main “breadwinner” in the family to fathers and of the main caregiver to mothers (Andersen et al., 2013; Bertrand et al., 2015; Davis & Greenstein, 2009; Gneezy et al., 2003; Kleven et al., 2019). In societies where adherence to such norms is strong, women are expected to devote more resources to their families after becoming mothers and, by extension, less resources to competing for pay. Indeed, social norms have been shown to have a strong influence on the willingness to compete for pay in controlled settings such as ours (Andersen et al., 2013; Gneezy et al., 2009). Similarly, it seems a priori possible that the numerous biological changes women experience during pregnancy, which are believed to serve the purpose of strengthening the care-giving role of mothers (Dulac et al., 2014; Feldman, 2016; Hoekzema et al., 2017; Parsons et al., 2017), could affect their willingness to compete for pay. Future studies, therefore, could explore the extent to which social or biological factors affect a mother’s willingness to engage in pay-related competition.

The discovery of differences in pay-related competitiveness between women with and without children in two distinct samples suggests an avenue for future research that, given the fact that the gender gap in earnings is unlikely to fully disappear without closing the motherhood gap (Cortés & Pan, in press; Adda et al., 2017; Angelov et al., 2016; Fernandez-Kranz et al., 2013; Hardoy et al., 2017; Juhn & McCue, 2017; Kleven et al., in press, 2019; Lundberg & Rose, 2000; Paull, 2008; Waldfogel, 1998), would appear to be of some significance. In light of our findings, researchers could investigate the nature of the relationship between motherhood and competitiveness, its origins, as well as how it affects educational attainment, career choices, and outcomes in labor markets. Such research program could provide novel insights to help understand the causes of the motherhood gap in labor markets and design policies to reduce it. If successful, these policies will also help close the gender gap in earnings.

References


