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Is there a Motherhood Gap in the Willingness to Compete for Pay? Evidence from the Netherlands, the UAE and the USA

Aur lie Dariel and Nikos Nikiforakis

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Is there a motherhood gap in the willingness to compete for pay? Evidence from the Netherlands, the UAE and the USA.*

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Nikos Nikiforakis

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 attitudes toward competition with labor-market outcomes, we explore the association between motherhood and the willingness to compete for pay. In two behavioral studies, one in the UAE and one in the USA, we find that mothers aged 18-30 are considerably less likely to choose a competitive payment scheme than similar women without children. The motherhood gap in competitiveness is not mediated by differences in ability, beliefs, risk attitudes, marital status, parental education, or the time since the last pregnancy. In a third study, using survey data from a Dutch panel, we do not find support for the hypothesis that motherhood causes women's competitiveness to drop. Instead, the findings suggest that the reduced competitiveness of mothers predates the birth of their children. Fathers, across studies, are at least as willing as non-fathers to compete for pay.

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, nikos.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, Luca Henkel, Moritz Janas, Aaron Kamm, Mayada Oudah, Ernesto Reuben, Bettina Rockenbach, Nishtha Sharma, Lise Vesterlund, Marie Claire Villeval, John Wooders, 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. This is an updated version of the September 2022 Working Paper, which did not include Study 3.

I Introduction

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, Landais, & Sjøgaard, 2019; Kleven, Landais, Posch, et al., 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, Landais, & Sjøgaard, 2019) 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, Landais, & Sjøgaard, 2019), 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 non-mothers.¹

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.

In this paper, we ask whether there is a motherhood gap in the willingness to 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; Sutter et al., 2016).² The advantage of this measure is that it allows us to control for 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.

To answer our research question, we begin by collecting data from samples in two different countries. Specifically, we start our investigation by conducting a classroom experiment with a sample of women aged 18-30 from the United Arab Emirates (UAE). This population has an attractive property for our purposes: Emirati women tend to have children in early adulthood, which implies that a substantial fraction of undergraduate students are already mothers. This allows 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. We continue our investigation by recruiting a sample from the USA — a country whose population has been widely studied by behavioral scientists, and the motherhood gap has been robustly observed (Juhn & McCue, 2017; Kleven, Landais, Posch, et al., 2019) — for an online experiment. The US sample allows to explore the existence of the motherhood gap in a very different population from that in the first study, as well as the choices of non-students, fathers and non-fathers.

Lastly, we use data from a nationally representative panel in the Netherlands to explore the point at which the gap in competitiveness emerges. Panel members were asked in 2017 about their competitiveness using a survey question that has been found to strongly correlate with career choices, individual earnings, and incentivized measures of competitiveness. Using information from the panel concerning the arrival of a respondent’s children, we can explore whether the gap in

²The particular measure of competitiveness we use 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).

competitiveness predates the birth of children or whether the gap emerges after birth.

II Study 1

The sample consisted of women studying at 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 is minimized. Participants were seated far away from each other to ensure that they could not influence each other’s choices (see *Supplementary Information, SI*). Taking advantage of the gender-segregated campus, we recruited 306 women, 20.5% of which are classified as mothers ($N_m = 63$) and the remaining as non-mothers ($N_n = 243$).³ Details about the recruitment of our sample can be found in the *SI*, as well as in (Dariel et al., 2017). 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).

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 *SI*).

In addition to the behavioral measures, we collected background information from participants

³Inspired by evidence showing that significant neuro-biological changes happen during pregnancy (Hoekzema et al., 2017), we also classify as “mothers” a small number of women that reported being pregnant for the first time. As we show below, this classification does not affect our conclusions as these women are as likely to compete as women who have already given birth.

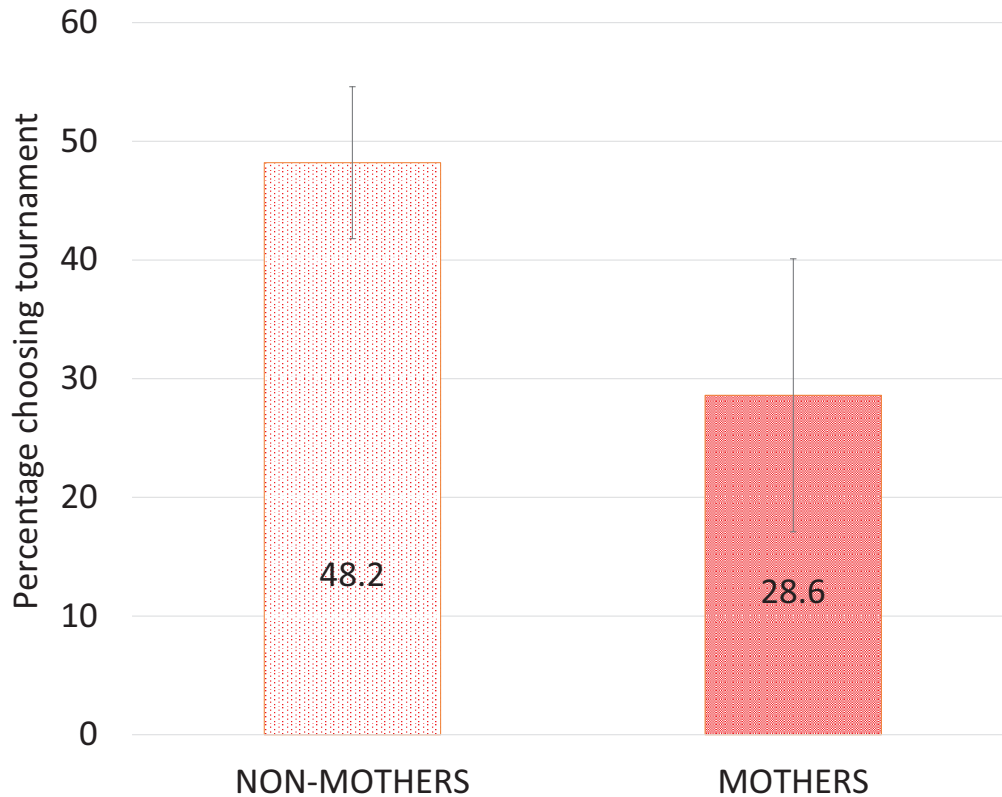


Figure 1: Percentage of women with and without children choosing the competitive payment scheme in Study 1 (UAE sample). Error bars indicate 95% confidence intervals.

to use as controls in our analysis. The information reveals that mothers and non-mothers are similar in many dimensions. As shown in Table S1 in the *SI*, we do not find economically 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. Mothers are 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 ($N =$

Table 1: The determinants of women’s willingness to compete in Study 1

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

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 Task 1 and Task 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. Individual controls include a participant’s age, family wealth, parental education, academic major, and their responses to seven questions taken from the World Values Survey concerning their views on gender roles. Treatments varied whether groups were single-sex or mixed-sex. 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.

$306, x^2(1) = 7.777, P = 0.005$, 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 economically and statistically insignificant, and are hence not presented for brevity. 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 survey data we collected permit us to explore other mechanisms beyond those considered in Table 1. *(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) 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 statistical comparison ($N = 12$ and $N = 8$, respectively). We address this issue in Study 2. *(iii) 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%). *(iv) 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%; $N = 293, \chi^2(1) = 5.517, P = 0.019$, 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).

III Study 2

To study the robustness of the motherhood gap in competitiveness, we recruited participants from the USA — a country whose population has been widely studied by behavioral scientists, and the motherhood gap in earnings is well documented (Juhn & McCue, 2017; Kleven, Landais, Posch, et al., 2019). Since many women studying in the USA 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, as mothers and non-mothers have relatively easy access to the online platform. An advantage of online experiments is that they allows us to reach a more diverse sample of participants, including non-students.

The sample for Study 2 consists of 300 women (153 of which are mothers) and 166 men (49 of

which are fathers; see *SI* for sampling and power calculations), all between the ages 18 and 30, who reported being married or to be “living together as-if married” (henceforth, “married”). We chose to focus on individuals aged 18-30 for two reasons: *i* to increase comparability with Study 1 in which 98% of our sample fell in this category, and *ii* 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, Landais, & Sjøgaard, 2019). We recruited married individuals so that any differences in competitiveness between mothers and non-mothers cannot be attributed to an individual’s marital status. We also recruited married fathers and non-fathers to explore whether a similar gap can be observed for men. 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 at least as willing to compete for pay as non-fathers.

We measure the willingness to compete using 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.

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 economically and statistically significant ($N = 300, x^2(1) = 4.209, P = 0.040$, 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 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 ($N = 214, x^2(1) = 5.277, P = 0.022$, two-sided). Since mothers and non-mothers in Study 2 differ in several dimensions including in their performance in Task 1 and Task 2, their age, their level of education and family income (see *SI*, Table S2), we turn to a regression analysis. Table 2 presents the findings from a regression analysis similar to that in Table 1. The results show that

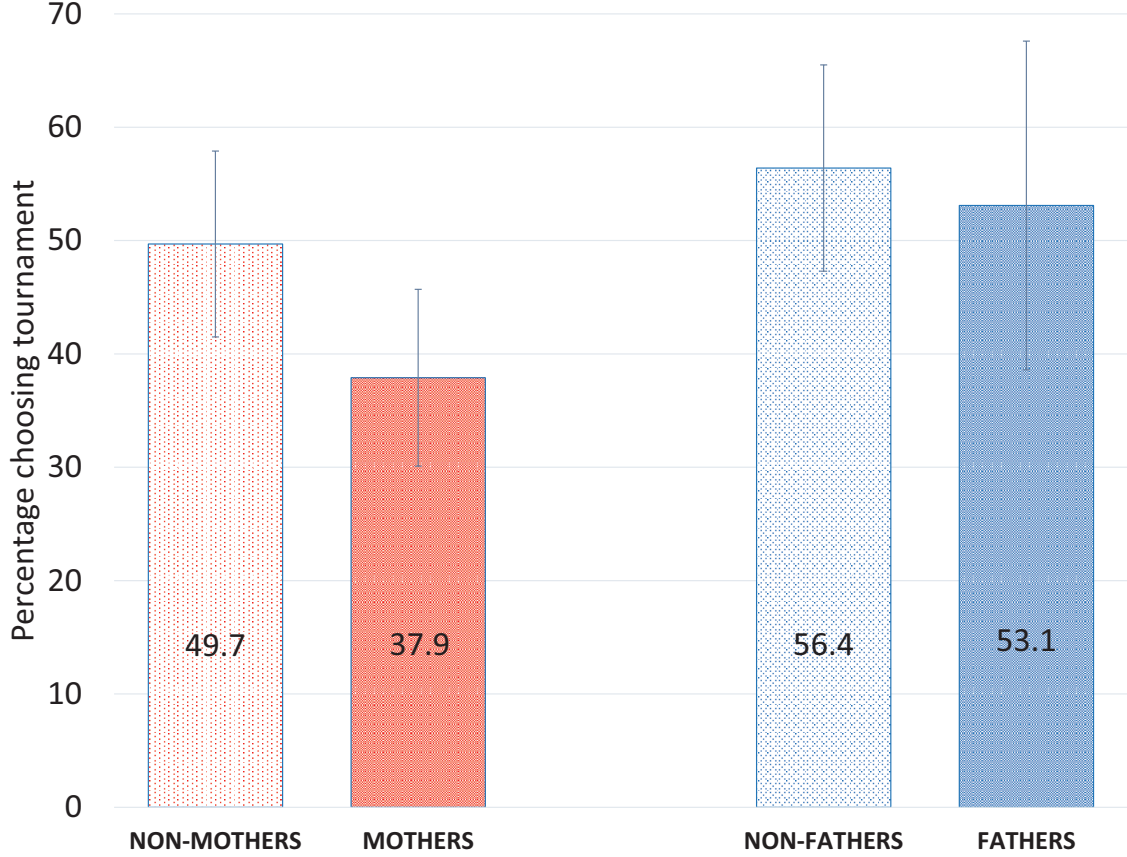


Figure 2: Percentage of women and men, with and without children, choosing the competitive payment scheme in Study 2 (USA sample). Error bars indicate 95% confidence intervals.

the difference in the willingness to compete between mothers and non-mothers is not explained by our controls.

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 ($N = 166, x^2(1) = 0.157, P = 0.692$, two-sided; see Table S4, for a regression analysis). Interestingly, fathers are found to compete significantly more frequently than mothers ($N = 202, x^2(1) = 3.508, P = 0.061$, two-sided), but non-mothers and non-fathers choose to compete at similar and statistically indistinguishable rates ($N = 264, x^2(1) = 1.191, P = 0.275$, two-sided).⁴ The lack of a gender difference among married non-parents may reflect the disappearance of social pressures that women experience pre-marriage

⁴Cassar et al. (2016) explore the willingness of mothers and fathers to compete for pay. Similar to us, they find that fathers are more willing to compete than mothers. Cassar et al. (2016) do not sample non-parents. Hence, they cannot compare mothers to non-mothers, and fathers to non-fathers.

Table 2: The determinants of women’s willingness to compete in Study 2

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

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. Individual controls include age, education and family income. Standard errors are shown in parentheses. ***, **, * indicate significance at the .01, .05, .10 levels, respectively.

(Bursztyn et al., 2017).

Another explanation for the absence of a substantial (or statistically significant) gender difference among our (married) non-parents 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. Interestingly, 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, $P = 0.001$, x^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.

IV Study 3

The first two studies provide clear evidence of a negative association between motherhood and the willingness to compete for pay. However, the data do not allow us to determine whether the gap

in competitiveness arises after the arrival of children or whether a gap already exists prior to that. This is an important question as the former (but not the latter) would suggest that motherhood negatively affects a woman’s competitiveness. We address this question using data from a Dutch panel based on a true probability sample of households drawn from the population register by Statistics Netherlands: the LISS panel (www.lissdata.nl). Members of the panel complete online questionnaires at regular intervals and are paid for each completed questionnaire; those that could not participate otherwise are provided with a computer and internet connection.

In March 2017, LISS panel members were asked the following question: “How competitive do you consider yourself to be? Please choose a value on the scale below, where the value 0 means *not competitive at all* and the value 10 means *very competitive*.” Buser et al. (2021) show that answers to this question are strongly associated with incentivized measures of competitiveness such as those used in Study 1 and Study 2, as well as with education and labor market outcomes.⁵

To investigate when the motherhood gap in competitiveness emerges, we use information regarding the timing of the arrival of one’s children. Specifically, we use family information from the 2017 wave of the LISS Core Study, i.e., the same year the competitiveness module was administered, and the 2021 wave, which is the most recent wave of the survey. We classify women into one of three categories: *mothers*, i.e., women who reported having children in 2017; *non-mothers*, i.e., women that were childless in 2017 and 2021; and, *mothers-to-be*, i.e., women that were childless in 2017, but had children in 2021. If mothers are less competitive than non-mothers, but non-mothers are as competitive as mothers-to-be (i.e., women who will become mothers in a few years) this would be evidence in line with the hypothesis that the arrival of children negatively impacts competitiveness. On the other hand, if mothers-to-be are less competitive than non-mothers, it will be evidence that the gap predates the birth of children, suggesting that competitiveness could predict selection into motherhood. We do an analogous classification and analysis for men.

Our sample consists of 293 women (170 non-mothers, 75 mothers, and 48 mothers-to-be) and 197 men (134 non-fathers, 40 fathers, and 23 fathers-to-be). This the number of all individuals in the LISS panel aged 18-35 in 2017 who answered the competitiveness question and participated in both the 2017/2021 waves of the LISS Core Study. The average age of mothers at first birth is 30 years according to Statistics Netherlands (www.cbs.nl). If we, therefore, restricted the age

⁵Following this question on general competitiveness, Buser et al. (2021) asked a hypothetical question related to competitiveness. The authors write: “From our analysis of the data, we conclude that the general question results in a better measure of competitiveness than the hypothetical question. Both are correlated significantly with the incentivized measure but the general measure shows stronger associations with education and labor market variables.” We follow Buser et al. (2021) in focusing only on the question on general competitiveness.

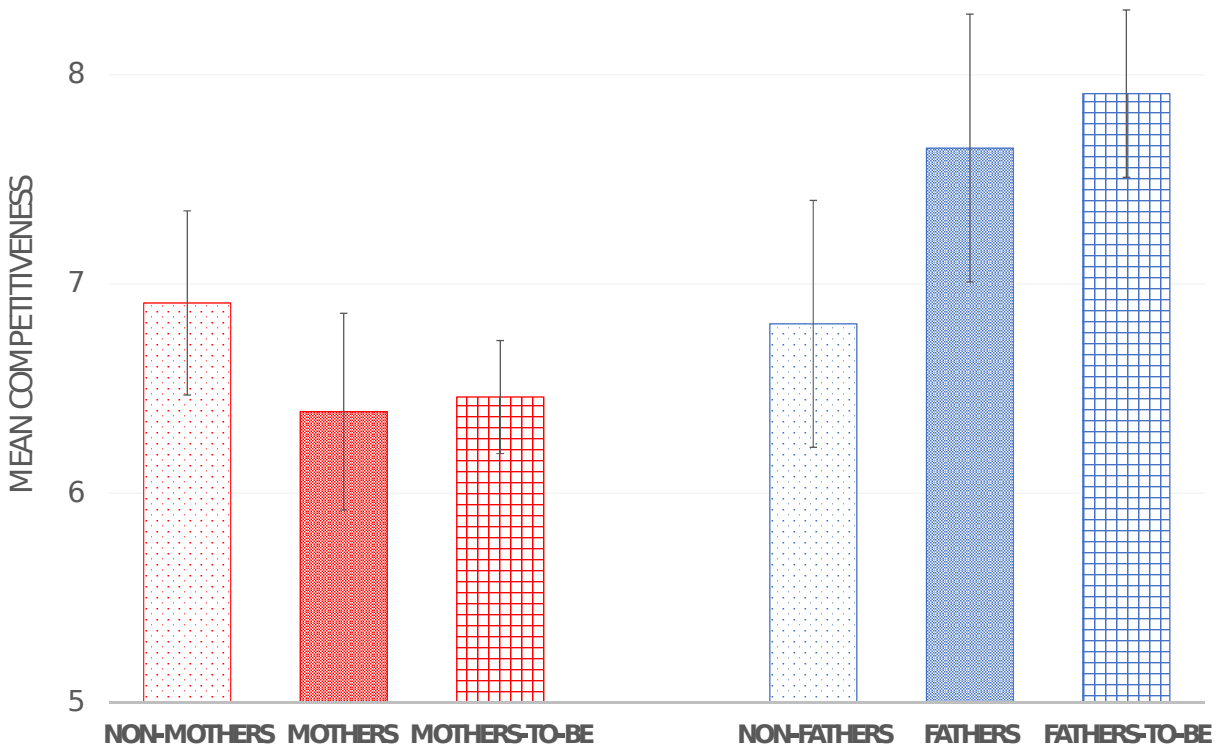


Figure 3: Mean competitiveness of women and men, with and without children in 2017, in Study 3 (Dutch sample). “Mothers-to-be” and “fathers-to-be” refer to individuals who had children sometime between 2017 and 2021. Error bars indicate 95% confidence intervals.

of our sample to 18-30, as we did in Study 1 and 2, we would be left with an insufficient number of mothers/mothers-to-be to perform a meaningful statistical analysis. We obtain quantitatively similar results if we restrict our sample to individuals aged 18-30, although some of our tests are under-powered.

Fig. 3 shows that, similar to Study 1 and Study 2, mothers are significantly less competitive than non-mothers in our Dutch sample ($N=245$, $P = 0.023$, Mann-Whitney test, two tailed).⁶ For comparison, we note that the size of the motherhood gap (0.52; 6.91 for non-mothers and 6.39 for mothers) is not smaller to that between men and women in our data (0.42; 7.12 for men and 6.70 for women; $N=490$, $P = 0.005$, Mann-Whitney test, two tailed). In Table S11 in the *SI*, we show that the gap in competitiveness between mothers and non-mothers cannot be explained by differences in women’s age and education level. In fact, the estimated gap increases from 0.52 ($P = 0.031$, OLS regression) to 0.69 ($P = 0.030$, OLS regression).

⁶The motherhood gap in competitiveness is statistically significant if we pool the observations of non-mothers and mothers-to-be, and compare them to those of mothers ($N=293$, $P = 0.083$, Mann-Whitney test, two tailed).

As can also be seen in Fig. 3, mothers-to-be report being less competitive than non-mothers ($N=218$, $P = 0.023$, Mann-Whitney test, two tailed). The gap in competitiveness between non-mothers and mothers-to-be cannot be explained by differences in age and educational levels. In fact, if we control for them the difference is strengthened (see Table S12 in the *SI*). Given that mothers-to-be are childless in 2017, this finding suggests that women selecting earlier into motherhood are less competitive. On the other hand, the difference between mothers-to-be and mothers is small and statistically insignificant ($N=123$, $P = 0.753$, Mann-Whitney test, two tailed) indicating that the gap does not appear to increase significantly after the arrival of children.

Turning to men, Fig. 3 reveals that fathers are more competitive than non-fathers in our Dutch sample. The difference is statistically significant whether we pool non-fathers with fathers-to-be ($N=197$, $P = 0.019$, Mann-Whitney test, two tailed) or compare only non-fathers to fathers ($N=174$, $P = 0.004$, Mann-Whitney test, two tailed). Interestingly, fathers-to-be are *more* competitive than non-fathers ($N=157$, $P = 0.002$, Mann-Whitney test, two tailed). The gap between fathers and non-fathers is also statistically significant if we control for respondents' age and education ($P = 0.009$, OLS regression; see Table S13 in *SI*). Finally, we observe a difference between fathers and fathers-to-be, the sample is too small and, hence, the difference is not significant ($N=63$, $P = 0.460$, Mann-Whitney test, two tailed).

V Discussion

This paper presents evidence linking motherhood with a reduced willingness to compete for pay in three samples drawn from different countries: the Netherlands, the UAE, and the USA. Neither differences in ability, beliefs about one's relative ability, their risk attitudes, marital status, parental education, parental employment, nor differences in relative wealth were found to mediate the observed motherhood gap in the willingness to compete for pay in Study 1 and 2. Our findings do not support the hypothesis that motherhood negatively affects women's willingness to compete. Using information about the arrival of children from a Dutch panel in Study 3, we found evidence suggesting that the gap in competitiveness predates the arrival of children.

Given the existence of studies linking attitudes toward for-pay competition with labor market outcomes (Buser et al., 2014; Buser, Peter, & Wolter, 2017; Buser et al., 2021; Kleinjans, 2009; Reuben et al., 2015, 2017), our findings suggest a novel explanation for the motherhood gap: mothers (or soon-to-be mothers) may choose career paths that lead to lower earnings because

they are less willing to engage in pay-related competition. This explanation suggests that policies that encourage women with children to compete for pay could help reduce the motherhood gap in earnings and, by extension, the gender earnings gap.

The existence of differences in pay-related competitiveness between young women with and without children in three different countries point to a novel research program. A question of obvious importance is, where do the differences in competitiveness come from? While evidence has shown that women's competitiveness can differ greatly across societies with different gender norms (Andersen et al., 2013; Bertrand et al., 2015; Davis & Greenstein, 2009; Gneezy et al., 2003; Kleven, Landais, Posch, et al., 2019), research is needed to understand how women within the same society can come to have different attitudes toward competition. Another important question is whether, beyond competitiveness, young mothers could differ in other dimensions from non-mothers, e.g., time preferences. 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. 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, Landais, & Sogaard, 2019; Kleven, Landais, Posch, et al., 2019; Lundberg & Rose, 2000; Paull, 2008; Waldfogel, 1998), this research program would appear to be of some significance.

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Supplementary Information for

Is there a motherhood gap in the willingness to
compete for pay? Evidence from the Netherlands, the
UAE and the USA.

Aurélie Dariel and Nikos Nikiforakis

This file includes:

Supplementary text

Fig. S1

Tables S1 to S13

References for SI reference citations

Supplementary Information Text

Study 1: The UAE sample

Study location. The study was conducted at Zayed University – the largest public university in the UAE’s capital of Abu Dhabi. The majority of students (86%) are female, while the student body consists almost exclusively of Emirati nationals (97%). The campus is divided in two; one sub-campus for women and one for men. This is ideal for the present study that required us to focus on the willingness of women – whether mothers or non-mothers – to compete. While undergraduate students in a given class are always of the same sex, instructors often are of the opposite sex.

Sample recruitment. We targeted upper-division courses (i.e. students in the two final years of college) to increase the fraction of mothers in our sample. We asked the professors teaching such courses to allow us to run a classroom experiment in their class without providing them with any details about the study, our research questions, or any monetary incentives. The classes of professors who agreed to help us were randomly assigned to treatments.

Procedures. Students were not informed that a classroom experiment would take place. A day prior to the experiment, they were informed via email from their professor that there will be a “special activity” during class and to bring their laptop along. We brought several extra laptops for forgetful or inattentive students. Once students arrived in class, they were seated far away from each other. Any students that had more than one class scheduled for the experiment would be told to leave the room before the experiment started. In total, 20 different sessions were conducted with 18.6 students on average.

The study was conducted in English as all students are fluent (English is widely spoken in the UAE and is a prerequisite for studying at Zayed University). The study was computerized using o-Tree (Chen et al. 2016). The study lasted one hour – as long as the normal class. Professors were not permitted in the classroom. The study was administered by three researchers (1 male and 2 female) who randomly alternated in reading aloud the instructions.

The study took place over 10 days, between January 30 and March 7, 2017. We find no evidence that the timing of a session affects our main conclusion. As an indication we note that, if we use observations only from the first two days of the study (January 30 and February 1), we find that mothers select the tournament 31.6% of the time and non-mothers 42.6%. Similarly, if we repeat our analysis in Table 2 but cluster standard errors either at the day or the session level, the motherhood gap in the willingness to compete is significant at least at the 5-percent level.

Treatments. Our study was designed to answer the question of whether motherhood reduces the willingness to compete for pay. Although our intention was never to study the motherhood gap in competitiveness separately in different treatments (as this would require many more observations than we could collect), to ensure the robustness of any effect, participants were randomly assigned to one of four treatments. The main variation was whether groups were single-sex or mixed-sex. The regressions in Table 1 control for treatment fixed effects. Here, we note that the propensity of mothers (non-mothers) to select the tournament is 25.0% (46.7%) in single-sex groups, and 33.3% (49.2%) in mixed-sex groups. Therefore, the motherhood gap is observed irrespective of group composition. In addition, as Emirati nationals tend to be wealthy, we wanted to ensure that the monetary compensation employed was sufficient to motivate them to sign up for a behavioral study. For this reason, at the end of the behavioral task, we allowed participants to donate their proceeds to one of many charities. We varied whether subjects knew about this opportunity in advance. The regressions in Table 1 control for treatment fixed effects. Here, we note that the propensity of

mothers (non-mothers) to select the tournament is 27.2% (54.3%) when participants know in advance they will be able to give to charity, and 29.3% (45.1%) when they do not know it. Therefore, again, we find no evidence to suggest that this affects our main conclusion. We also find no evidence that this information affected participation in the study as, across all sessions, we only had 4 instances of subjects wishing to leave the study.

Behavioral tasks.

Measuring the willingness to compete for pay: The behavioral part of the study consists of three tasks which consist of adding up a series of two-digit numbers for 3 minutes like: $24+35=...$. The only difference between the three tasks is the way students are paid according to their performance or score, i.e., the number of correct additions they can do within the 3 minutes. Task 1 is presented to the students as the “individual performance task” in the sense that students are paid for correct answers using a piece rate of 2 AED (1 USD = 3.67 AED) per correct sum. Task 2 is presented to the students as the “compared performance task”. Students have to compete in anonymous groups of four and the winner of the group receives 8 AED per correct sum, while the others receive nothing. In case of a tie, a single student is randomly selected as the winner. The group composition is common knowledge and students are being told that they compete either in a mixed-sex group of 4 or in a single-sex group. Task 3 is presented to the students as “the choice task”. Participants have to choose between the individual performance or the compared performance task as a compensation scheme and they have to perform the selected task one final time. Performance in Task 3 is compared to that of others in Task 2. As Niederle and Vesterlund (2017) mention this approach has several advantages. For instance, “while beliefs regarding relative performance in a tournament may affect the decision to enter the tournament, beliefs regarding the choices of others will not. Furthermore, since a participant’s choice does not affect the payment of any other participant we can rule out the possibility that women may shy away from competition because by winning the tournament they impose a negative externality on others.” Task 3 is our measure of taste for competition.

At the end of each task, students are informed about their own performance but do not know anything about the performance of others in their group. There are no penalties for incorrect answers. Moreover, they are informed about the gender composition of their group (single-sex or mixed-sex group) but do not know the people who are in their group. Students learn their private earnings at the end of the behavioral task, before the post-questionnaire.

Measuring beliefs: At the end of the behavioral tasks, before being informed of their earnings, students are asked if they think they solved correctly more or fewer additions than the others in their group in task 2.

Measuring risk tolerance: We ask students in the post-experiment questionnaire if they think they are generally a person who tries to avoid taking risks. Responses to this question have been shown to be robust and stable over time (Dohmen et al. 2011, Lönnqvist et al. 2015). The same question used in our study was also experimentally validated by Falk et al. (2018).

One of the three tasks was randomly selected for payment at the end of the behavioral part of study. In addition, each participant received a show-up fee of 30 AED. Students received detailed feedback (which task is selected for payment and their earnings) after Task 3 was completed. Students were paid privately outside the class after completing the post-experiment questionnaire.

Identifying mothers. In total, 306 women participated in the classroom experiment (243 non-mothers, 63 mothers). To determine whether a woman was a mother, we used their responses in the post-experiment questionnaire. Following recent evidence showing that significant biological changes happen during pregnancy (Hoekzema et al. 2017), we also classify as “mothers” women who reported being pregnant. In particular, of the 63 women classified as mothers, 21 were pregnant for the first time. These women are as exactly as likely to select the tournament as women who have already given birth (28.6%). We note that, given the small size of this group, we obtain very similar results if we classify these 21 women as “non-mothers”. In that case, we find that mothers and non-mothers choose to compete in Task 3, respectively, 28.6% and 46.6% of the time ($N=306$, $\chi^2 = 4.7723$, $P = 0.029$, two-sided, χ^2 test). Recall, that with the classification used in the paper, mothers were found to select the tournament 28.6% and non-mothers 48.2% of the time ($N=306$, $\chi^2 = 7.777$, $P = 0.005$, two-sided, χ^2 test).

Comparing mothers and non-mothers. Table S1 presents summary statistics and balance tests for mothers and non-mothers in Study 1.

Table S1. Summary statistics and balance tests

| | <i>All</i> | <i>Non-Mothers</i> | <i>Mothers</i> | <i>P-value</i> |
|---|------------|--------------------|----------------|----------------|
| <i>Piece rate score</i> | 11.50 | 11.71 | 10.67 | 0.198 |
| <i>Tournament score</i> | 12.49 | 12.76 | 11.44 | 0.113 |
| <i>Percent choosing tournament</i> | 44.11 | 48.15 | 28.57 | 0.005 |
| <i>Percent believing others did better</i> | 59.47 | 59.67 | 58.73 | 0.501 |
| <i>Risk tolerance</i> | 4.88 | 4.95 | 4.63 | 0.165 |
| <i>Age</i> | 22.79 | 22.21 | 25.03 | 0.000 |
| <i>Percentage married</i> | 19.93 | 4.53 | 79.36 | 0.000 |
| <i>Percentage whose mother completed university</i> | 33.67 | 37.45 | 19.08 | 0.000 |
| <i>Percent father completed university</i> | 53.58 | 55.14 | 47.62 | 0.287 |
| <i>Mother had a job (1=No, 2=Yes)</i> | 1.32 | 1.34 | 1.27 | 0.307 |
| <i>Family relative wealth[‡]</i> | 1.16 | 1.17 | 1.09 | 0.263 |
| <i>Below are questions taken from the World Values Survey (1=strongly disagree; 7=strongly agree)</i> | | | | |
| <i>When jobs are scarce, men should have more right to a job than women.</i> | 3.17 | 2.91 | 4.19 | 0.000 |
| <i>If a woman earns more money than her husband, it's almost certain to cause problems.</i> | 3.25 | 3.19 | 3.44 | 0.392 |
| <i>Having a job is the best way for a woman to be an independent person</i> | 5.95 | 6.02 | 5.7 | 0.039 |
| <i>A university education is more important for a boy than for a girl</i> | 3.58 | 3.45 | 4.06 | 0.015 |
| <i>Being a housewife is just as fulfilling as working for pay.</i> | 2.01 | 1.87 | 2.54 | 0.016 |
| <i>Women are encouraged to study at the university.</i> | 3.63 | 3.48 | 4.21 | 0.016 |
| <i>When a mother works for pay outside the home, the children suffer.</i> | 6.45 | 6.53 | 6.16 | 0.004 |
| N | 306 | 243 | 63 | |

All entries are variable means unless otherwise specified. The *p*-values are from Mann-Whitney U tests (two tailed), except when comparing percentages in which case we use χ^2 tests. [¶] Education was classified as follows: "No schooling completed" = 0, "Primary school" = 1, "High school" = 2, "Technical or vocational degree" = 3, "Bachelor's degree" = 4, "Master's degree" = 5, "Professional degree" = 6, "Doctorate degree" = 7. [‡] Participants were asked whether relative to other Emiratis the family's wealth was "Below average" = 0, "Average" = 1, "Above average" = 2.

One-time mothers vs. non-mothers. Of the 63 mothers in our sample in Study 1, 13 have more than one child, i.e., 20.6%. If we drop these women from the analysis and compare the willingness of non-mothers and one-time mothers to compete, we obtain very similar results. One-time mothers (non-mothers) select the tournament 30.0% (48.2%) of the time ($N=293$, $\chi^2(1)=5.517$, $P=0.019$, two-tailed, χ^2 test).

Age of the youngest child. Although we have relatively few observations to perform a meaningful statistical investigation of the relationship between the age of the youngest child and a mother's willingness to compete, it is interesting to explore whether there is evidence to suggest such a relationship may exist. This, for instance, could suggest that the "motherhood gap" in the willingness to compete is temporary. However, we find no such evidence. If we regress the age of the 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 do a median split of mothers based on the age of their youngest child (which is 1 year), 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%)

Post-study survey on family norms. Four weeks after the end of the last session of the classroom experiment, in April 2017, an email was sent to all female participants to explore social norms pertaining to family. Specifically, we were interested to know the extent to which parents play a major role in determining who their daughter will marry and to what extent marriage entails an expectation that the woman will become pregnant soon after her wedding day. The email contained a link to an online survey with only the two questions below. Of the 306 participants, 142 responded to both questions. We find no evidence that these subjects are in any way different than those who did not respond.

1. *In Abu Dhabi, there is an expectation that Emirati women will get pregnant soon after they get married.*

- i. I agree (65.5%)
- ii. I am not sure (19.7%)
- iii. I disagree (14.8%)

2. *In Abu Dhabi, parents generally have a major role, sometimes even the main role, in determining who and when their daughters will marry."*

- i. I agree (75.4%)
- ii. I am not sure (20.4%)
- iii. I disagree (4.2%)

For both questions, we can reject the null hypothesis that respondents are not sure about the statement for the alternative hypothesis that they agree with it ($N=142$, $P<0.01$, two tailed, Wilcoxon sign-rank test).

Relation to Dariel et al. (2017). Given the lack of previous studies with Emirati nationals, Dariel et al. (2017) was conceived as a pre-study for the present paper. In that paper, we address two questions: (i) Can we observe a gender gap similar to that observed in other student populations? (ii) To what extent is the willingness of Emiratis (especially Emirati women) to compete sensitive to variations in the gender-mix of one's group? As explained in footnote 9 of Dariel et al. (2017, p. 125): "This project is part of a larger one on the effect of motherhood on the willingness to compete. Here, we report data only from treatments for which we have observations for both men and women, excluding observations from mothers and pregnant women." A small fraction of our data in Study 1 (26.4%) was used in the analysis of Dariel et al. (2017). Specifically, Dariel et al. (2017) report data from 66 males and 81 females (all non-mothers). In the present study, we use the data from these 81 non-mothers along with that from 162 more non-mothers (for a total of 243 non-mothers) and 63 mothers.

Experimental instructions. You are now taking part in an experiment. You will receive a transport and subsistence allowance which will depend on decisions made in the experiment, with a minimum allowance of 30 AED. It is therefore important that you read the instructions carefully as they explain how your decisions will affect the allowance you receive at the end of today's session. You cannot use any electronic devices or communicate with others throughout the experiment. Violation of this rule will disqualify you from payment. As you complete parts of the experiment you will receive a score expressed in "points". 1 point is equivalent to 2 AED. Your allowance will be paid in Dirhams (AED) in private at the end of the session. No one will be informed about your decisions in the experiment. After the experiment, you will have the possibility of donating a percentage of your allowance to a charity.

In the experiment you will be asked to complete three different tasks. No task will take more than 3 minutes. At the end of the experiment one of the tasks will be randomly selected, and you will be paid based on your performance in that task. Before each task you will receive specific instructions. These instructions will explain how you make decisions, and how your decisions and the decisions of other participants influence your allowance. Before the experiment is over, you will be asked to fill out a questionnaire.

Task 1 Instructions. In this part of the experiment, you will be presented with a series of two two-digit numbers (for example, 11 and 22) which you will have to add (for example, $11 + 22 = 33$). This part will last 3 minutes. If Task 1 is the one randomly selected to determine the amount you receive as an allowance for participating in this experiment, then you will get 1 point for each correct answer. Your score will not decrease if you provide an incorrect answer. For each point, your allowance will increase by 2 AED. Remember that you will have the option to donate part of your allowance to charity. You cannot use a calculator or your phone to solve these additions, but you are welcome to make use of the provided pen and paper. After 3 minutes, the task will stop and you will receive a summary of the results. Please raise your hand and alert an experimenter if you have any questions.

Task 2 Instructions. In this task, as in Task 1, you will have 3 minutes to calculate the correct sum of a series of two two-digit numbers. Your final score will depend on your performance relative to that of a group of other female students at Zayed University participating in this experiment under similar circumstances. In the case of single-sex groups for men, this sentence was replaced with: "Your final score will depend on your performance relative to that of a group of other male students at Zayed University participating in this experiment under similar circumstances." [In the case of mixed-sex groups, the sentence was: "Your final score will depend on your performance relative to that of a group of other male and female students at Zayed University participating in this experiment under similar circumstances."] Each group consists of four people. The three other

members of your group will be randomly selected. You will never know the names of the other people in your group and they will never know your name or actions.

There are two possible outcomes if Task 2 is randomly selected to determine your allowance. If you are the individual who correctly solves the largest number of additions in your group, you will receive 4 points for each correct addition. If you are not this individual, you will receive zero points for this task. For example, if you correctly completed 10 additions, and the three other members of your group completed 7, 8, and 9, then you will earn 40 points ($4 * 10$) if Task 2 is selected at the end of the experiment. That is, 80 AED. In the event that more than one individual perform the same number of correct additions, and they are tied for the first place, a single player will be randomly chosen as the winner. For each point, your allowance will increase by 2 AED. Remember that you will have the option to donate part of your allowance to charity. You will not be informed about whether or not you won or lost in this task until later in the experiment.

Please raise your hand and alert an experimenter if you have any questions.

Task 3 Instructions. As in the previous tasks you will be given 3 minutes to calculate the correct sum of a series of two 2- digit numbers. Before we begin with the task, you will have to choose whether your allowance depends on your individual performance (as in Task 1) or your compared performance (as in Task 2). If Task 3 is randomly selected to determine your allowance, then:

- If you choose individual performance you will receive 1 point per problem you solve correctly (as in Task 1).
- If you choose the compared performance your performance will be compared to that of the other three participants in your group in Task 2. If you are the individual who correctly solves the largest number of additions, you will receive 4 points for each correct addition. If you are not this individual, you will receive zero points in this task.

For each point, your allowance will increase by 2 AED. Remember that you will have the option to donate part of your allowance to charity.

Individual performance

Compared performance (as in Task 2)

When you are ready to start, click the next button.

Performance Question. Please answer the following

What do you think: The other members of your group solved correctly more or fewer additions than you in Task 2?

Probably more additions

Probably fewer addition

Post-experiment questionnaire. This is the final part of the experiment. Before you may leave, you must complete the following questionnaire. This will take approximately 10 minutes.

Percent responses for each question are show in parenthesis. These values are calculated over the full sample of 305 responses.

What gender are you?

Female

Male

What year were you born? []

Which program are you currently enrolled in? []

- 1 College of Business (37.9%)
- 2 College of Communication and Media Sciences (35.9%)
- 3 College of Education (7.2%)
- 4 College of Sustainability Sciences and Humanities (11.4%)
- 5 College of Technological Innovation (3.3%)
- 6 Other (4.2%)

What is your marital status?

- 1 Married (19.9%)
- 2 Other (2%)
- 3 Single (78.1%)

[Some questions to follow depend on the gender and marital status of the respondent. Questions vary by gendered pronoun, references to prospective or existing marriage contract, or about one's wife or self. The following text will be from a married female respondent.]

From a scale of 1 to 7 (1 = completely disagree; 7 = completely agree), tell us how much you agree with the following statements:

- When jobs are scarce, men should have more right to a job than women.
- I am generally a person who is fully prepared to take risks.
- If a woman earns more money than her husband, it's almost certain to cause problems.
- Having a job is the best way for a woman to be an independent person.

From a scale of 1 to 7 (1 = completely disagree; 7 = completely agree), tell us how much you agree with the following statements:

- A university education is more important for a boy than for a girl.
- When a mother works for pay outside the home, the children suffer.
- Being a housewife is just as fulfilling as working for pay.
- Women are encouraged to study at the university.

Please answer the following questions

Do you have children?

- 1 No (86.3%)
- 2 Yes (13.7%)

{for "Do you have children?" "Yes" is selected:} Given that you have children, please kindly answer the following,

Use the box below to indicate the ages of your children. (For example, if you children are 6-months, 3-years and 4-years, you would type 0.5,3,4)

{for "Do you have children?" "Yes" is selected:} Were any of your children breastfeed?

- 1 No (2.9%)
- 2 Yes (10.5%)

{for "Do you have children?" "Yes" is selected:} Are any of your children currently breastfeeding?

- 1 No (9.5%)

2 Yes (3.6%)

Are you expecting a child by the end of the academic year?

1 Yes (11.8%)

2 No (74.5%)

3 Decline to answer (13.7%)

Did your mother have a job outside the home at any point after you were born?

1 No (67.6%)

2 Yes (32.4%)

What is the highest level of education your mother completed?

1 Elementary school (19.6%)

2 High School (35.3%)

3 University (33.7%)

4 None (11.4%)

What is the highest level of education your father completed?

1 Elementary school (12.1%)

2 High School (30.1%)

3 University (53.6%)

4 None (4.2%)

Relative to other Emiratis, is your family's wealth:

1 Above average (18.6%)

2 Average (78.4%)

3 Below Average (2.9%)

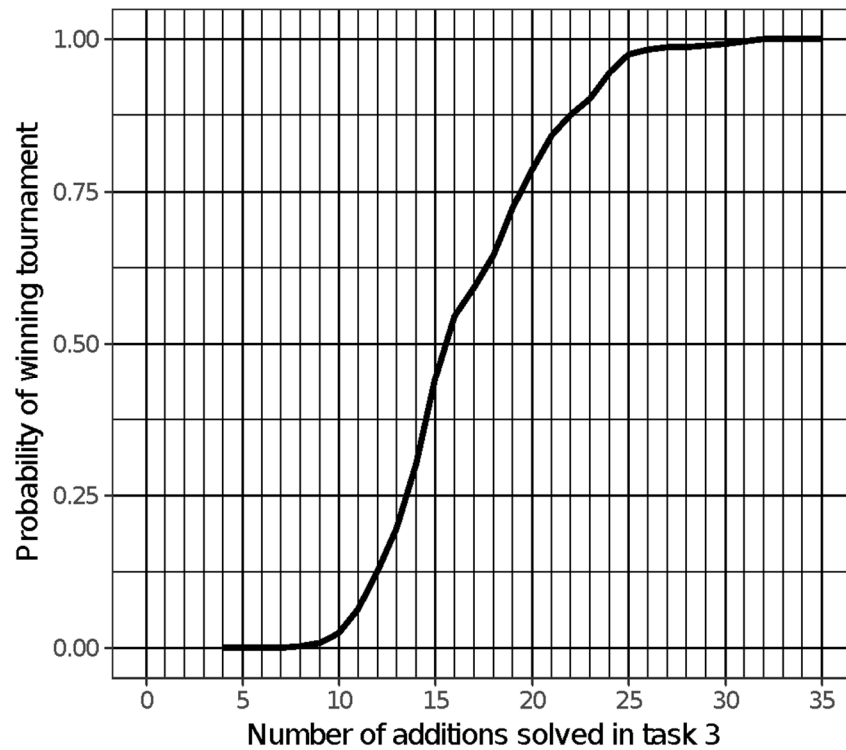
Simulations. Do mothers shy away from competition? Do non-mothers compete too much? To answer these questions, we performed a simulation to estimate the probability that a person with a given score in Task 3 will win the tournament. A risk-neutral, money-maximizing participant should select the tournament in Task 3 only if she believes she will achieve a score that gives her a chance of winning that is at least 25%.

For the simulation, we randomly created 20,000, 3-person counterpart-groups from our sample: 10,000 for all-female groups and 10,000 for mixed-sex groups. For the mixed-sex simulation, the likelihood that a man or woman in our sample is randomly selected reflects the ratio of men and women attending Zayed University. This approach seems reasonable given that the information about the relative fraction of men and women is public information and can be easily found online. According to university records, this is 14.4% (709 men and 4202 women). Note however that our conclusions from the simulation are not sensitive to this assumption. We obtain the same conclusions qualitatively if we do not reweigh our sample. The results from the simulation are presented in Fig. S1.

As can be seen, women who expect to have a score of 14 or more have a chance greater than 25% to win the tournament. In order to estimate the fraction of participants who meet that threshold we cannot use the performance in Task 2 as the data reveals there is a clear “learning” effect from one task to the next. Similarly, we cannot use the data from Task 3 as some participants selected in the tournament and some in the piece rate. To overcome this problem, we predict individual performance in Task 3 by estimating the average learning effect between tasks 2 and 3, and then this to Task 3. In particular, we first regress the score in Task 3 to the score in Task 2, and obtain

an OLS coefficient of 0.86 ($P < 0.001$).¹ We then assume that for each participant i , Score in Task 3 = Score in Task 2 * (1+(1-0.86)). Using these estimates, we find that 46.1% of non-mothers are predicted to have a score of 25% and above, and should thus compete. This is remarkably close to the 48.2% of non-mothers who actually chose to compete. In contrast, we find that 38.1% of mothers should be competing. This is substantially higher than the 28.6% that chose to compete. We can therefore conclude that mothers seem to shy away from competition.²

Fig. S1. Cumulative distribution function of winning in Study 1



¹ We also ran the regression separately for those who chose the tournament (coeff.=0.91, $P < 0.001$) and those who chose the piece rate (coeff.=0.79, $P < 0.001$). This indicates that those choosing to compete, on average, increased their performance but more, but both groups increased their performance. The average increase in scores between scores in tasks 2 and 3 is smaller than that between scores in tasks 1 and 2 (coeff.=0.75, $P < 0.001$).

² Why should a smaller fraction of mothers compete when their performance in Task 2 was similar to that of non-mothers (12.76 vs. 11.44, $N=306$, $P=0.103$, two-tailed, Mann-Whitney test)? The reason is that there is a large concentration of observations with scores close to 14 in Task 2. As a result, as can be seen in Fig.1, a small difference in scores implies a large difference in the probability of winning. Our estimation implies that, on average, the Task 3 score will be 14.55 for non-mothers (i.e., just above the critical threshold) and 13.05 for mothers (i.e., just below the threshold). Despite this, mothers are still considerably less likely to select the tournament than what our simulation suggests would be optimal.

Study 2: The USA sample

Study location and sample recruitment. The study was conducted online, using Amazon Mechanical Turk (MTurk). Data was collected during working days between March 16 and June 1, 2018. Approximately, 90% of the observations were collected between 7 AM and midnight (California time). Participants were informed that the study will take less than 10 minutes. For the study we targeted participants living in the USA. For the reasons explained in the paper, we targeted individuals aged 18-30. We did this by using MTurk's Premium Qualifications (Age group 1: 18-24; Age group 2: 25-30). Inadvertently, some older individuals took part in our experiment (25 in total). We do not include these observations in our analysis, but note that some of our results become stronger if we do. Similarly, some individuals (24 in total) participated using an IP address that we could either not confirm as being in the US or we identified as being outside the US. We keep these observations in our analysis as individuals could well be US citizens or residents travelling abroad or logging on MTurk using VPNs.

Behavioral tasks.

Measuring the willingness to compete for pay: The online study followed closely our classroom experiment with three identical tasks in which participants faced different compensation schemes. To avoid cheating, rather than using arithmetic tasks, participants had to count the number of zeros in 6x6 matrices. In each task, subjects had 90 seconds to give as many correct answers as possible. In Task 1, subjects are paid a piece rate of \$0.10 per correct answer. In Task 2, subjects' earnings depend on their performance relative to another participant in the study with whom s/he is randomly matched. The winner is paid \$0.20 per correct answer and the other one gets nothing. If there is a tie, each subject earns \$0.10 per correct answer. In Task 3, subjects choose which of the two schemes, piece rate or tournament, they want to apply to their performance. Subjects who choose the tournament payment scheme have their Task 3 performance compared to their opponent's score in Task 2. At the end of each task subjects are informed about their own performance, but are not told the outcome of the tournament or their opponent's score. There are no penalties for incorrect answers.

Measuring beliefs: After completing the three tasks, subjects were asked if they think they solved correctly more or fewer additions than his/her opponent in Task 2. If they guessed correctly, \$0.10 was added to their earnings.

Measuring risk tolerance: As with our classroom experiment, we included a question in the post-experiment questionnaire to see if a given participant thought s/he was generally a person who tries to avoid taking risks.

Payment: Subjects received a guaranteed \$0.40 for completing the study, plus a bonus of up to \$3.75 based on their own performance and the performance of others. After the behavioral task and the post-questionnaire subjects were informed about the task randomly selected for payment, but not their earnings. They are notified that they will be paid within one business day.

Sample size and power calculations. In Study 1, we identified a difference of approximately 20 percentage points in the willingness of mothers and non-mothers to select the tournament. If the same difference was to be found in our online study, we would need a total of 192 observations to detect it as significant at the 5-percent level, 80-percent of the time using a two-tailed χ^2 test. Since a previous study on MTurk (Apicella et al. 2017) provided evidence suggesting the gap in competitiveness may be smaller on MTurk than in lab experiments, we decided to recruit 300

married women, i.e., roughly the same number as that in Study 1 (which had 306 women). With such a sample size, we are able to detect differences as small as 15.5 percentage points as significant at the 5-percent level, 80-percent of the time using a two-tailed χ^2 test. Note that, we neither had a reason a priori to expect a difference between fathers and non-fathers in their willingness to compete nor did we have a previous study to base our power calculations on. We therefore decided to recruit “married” men until we met our threshold of 300 “married” women. As it turns out, the take up rate among men was low, leaving us with a sample of 166 men. However, as anticipated, the difference between fathers and non-fathers was so small (56.4% for non-fathers vs. 53.1% for fathers) that, if this was the actual difference in the population, we would need 7,140 subjects to detect it as significant at the 5-percent level, 80-percent of the time using a two-tailed χ^2 test.

Identifying mothers. In total, of the 300 married women in our sample, 153 were classified as mothers and 147 as non-mothers based on their answers in the post-experiment questionnaire. There are two unanticipated differences to our sample of mothers in Study 1. First, as mentioned in the paper, a higher fraction of mothers has more than one child (20.6% in Study 1 and 53.3% in Study 2). Second, only 5 of the 153 mothers (3.2%) are pregnant for the first time only (compared to 33.3% in Study 1).

Comparing mothers and non-mothers. Table S3 presents summary statistics and balance tests for mothers and non-mothers in Study 2.

Table S2. Summary statistics and balance tests

| | <i>All</i> | <i>Non-Mothers</i> | <i>Mothers</i> | <i>P-value</i> |
|---|------------|--------------------|----------------|----------------|
| <i>Piece rate score</i> | 7.38 | 7.69 | 7.09 | 0.12 |
| <i>Tournament score</i> | 8.66 | 8.99 | 8.35 | 0.09 |
| <i>Percent choosing tournament</i> | 43.66 | 49.66 | 37.91 | 0.03 |
| <i>Percent believing others did better</i> | 43.66 | 41.5 | 45.75 | 0.27 |
| <i>Age</i> | 26.77 | 26.34 | 27.18 | 0.00 |
| <i>Risk tolerance</i> | 4.02 | 4.01 | 4.03 | 0.992 |
| <i>Education[¶]</i> | 3.38 | 4.61 | 4.09 | 0.000 |
| <i>Family income</i> | 6.23 | 6.64 | 5.84 | 0.001 |
| <i>Below are questions taken from the World Values Survey (1=strongly disagree; 7=strongly agree)</i> | | | | |
| <i>When a mother works for pay outside the home, the children suffer.[†]</i> | 2.33 | 2.13 | 2.54 | 0.04 |
| <i>If a woman earns more money than her husband, it's almost certain to cause problems.[‡]</i> | 1.94 | 1.75 | 2.15 | 0.06 |
| <i>Having a job is the best way for a woman to be an independent person.[‡]</i> | 4.74 | 4.87 | 4.61 | 0.48 |
| <i>When jobs are scarce, men should have more right to a job than women.[‡]</i> | 1.61 | 1.49 | 1.73 | 0.14 |
| <i>A university education is more important for a boy than for a girl.[‡]</i> | 1.39 | 1.28 | 1.50 | 0.13 |
| <i>Being a housewife is just as fulfilling as working for pay.[‡]</i> | 5.05 | 4.81 | 5.31 | 0.03 |
| <i>N</i> | 300 | 147 | 153 | |

All entries are variable means unless otherwise specified. The p-values are from Mann-Whitney U tests (two tailed), except when comparing percentages in which case we use χ^2 tests. [¶] Education was classified as follows: "No schooling completed" = 0, "Primary school" = 1, "High school" = 2, "Technical or vocational degree" = 3, "Bachelor's degree" = 4, "Master's degree" = 5, "Professional degree" = 6, "Doctorate degree" = 7. For Family Income categories, see the post-experiment questionnaire. [†] These questions were not asked on all days, there are 83 missing values, 35 non-mothers and 48 mothers.

Comparing fathers and non-fathers. Table S4 presents summary statistics and balance tests for fathers and non-fathers in Study 2.

Table S3. Summary statistics and balance tests

| | <i>All</i> | <i>Non-Fathers</i> | <i>Fathers</i> | <i>P-value</i> |
|---|------------|--------------------|----------------|----------------|
| <i>Piece rate score</i> | 6.84 | 6.90 | 6.71 | 0.54 |
| <i>Tournament score</i> | 8.39 | 8.62 | 7.86 | 0.12 |
| <i>Percent choosing tournament</i> | 55.40 | 56.40 | 53.10 | 0.69 |
| <i>Percent believing others did better</i> | 28.90 | 25.60 | 36.70 | 0.16 |
| <i>Age</i> | 27.00 | 26.74 | 27.80 | 0.02 |
| <i>Risk tolerance</i> | 4.82 | 5.04 | 4.74 | 0.14 |
| <i>Education[¶]</i> | 3.77 | 3.84 | 3.61 | 0.25 |
| <i>Family income</i> | 6.47 | 6.59 | 6.18 | 0.38 |
| <i>Below are questions taken from the World Values Survey (1=strongly disagree; 7=strongly agree)</i> | | | | |
| <i>When a mother works for pay outside the home, the children suffer.[†]</i> | 2.76 | 2.76 | 4 | 0.00 |
| <i>If a woman earns more money than her husband, it's almost certain to cause problems.[†]</i> | 2.65 | 2.39 | 3.13 | 0.08 |
| <i>Having a job is the best way for a woman to be an independent person.[†]</i> | 4.42 | 4.50 | 4.28 | 0.60 |
| <i>When jobs are scarce, men should have more right to a job than women.[†]</i> | 2.65 | 2.37 | 3.18 | 0.06 |
| <i>A university education is more important for a boy than for a girl.[†]</i> | 2.41 | 2.18 | 2.83 | 0.11 |
| <i>Being a housewife is just as fulfilling as working for pay.[†]</i> | 4.35 | 4.08 | 4.88 | 0.04 |
| N | 166 | 117 | 49 | |

All entries are variable means unless otherwise specified. The p-values are from Mann-Whitney U tests (two tailed), except when comparing percentages in which case we use χ^2 tests. [¶] Education was classified as follows: "No schooling completed" = 0, "Primary school" = 1, "High school" = 2, "Technical or vocational degree" = 3, "Bachelor's degree" = 4, "Master's degree" = 5, "Professional degree" = 6, "Doctorate degree" = 7. For Income categories, see the post-experiment questionnaire. [†] These questions were not asked on all days, there are 50 missing values, 41 non-fathers and 9 fathers.

“Unmarried” participants. In addition to our main sample of 300 married women and 166 married men, we recruited a sample of unmarried individuals for two reasons. First, we wanted to explore whether we can replicate the usual gender gap in the willingness to compete between unmarried men and women. The data indicates that there is a significant gender gap in this sample as unmarried women choose to compete 35.5% of the time compared to unmarried men who choose to compete 47.3% of the time ($N=839$, $\chi^2(1)=11.788$, $P=0.001$, two-tailed, χ^2 test). As noted in the paper, the absolute difference in the willingness to compete between these men and women – 11.8 percentage points – is exactly the same as the difference between (married) mothers and non-mothers. Second, we were interested to explore the behavior of single parents. This is the reason that the sample of unmarried individuals is substantial. Unfortunately, the fraction of single mothers was low (9.1%; 33 out of 361 “unmarried women”) and that of single fathers even lower (2.5%; 12 out of 478 of all “unmarried” men). For this reason, we decided to stop collecting this data as it was not the focus of the present paper.

Regression analysis for men in Study 2. Table 2 in the paper explores the determinants of women’s willingness to compete in Study 2. Table S4 presents the analogous regression analysis for married men in our study.

Table S4. The determinants of men’s willingness to compete in Study 2

| | Men | | |
|--------------------------------------|-------------------|--------------------|---------------------|
| | (1) | (2) | (3) |
| <i>Father</i> | -0.033 (0.084) | 0.007 (0.080) | -0.045 (0.080) |
| <i>Tournament Score</i> | | 0.033** (0.015) | 0.034** (0.015) |
| <i>Tournament - Piece Rate Score</i> | | 0.022 (0.018) | 0.017 (0.017) |
| <i>Beliefs</i> | | -0.162* (0.085) | -0.197** (0.084) |
| <i>Risk tolerance</i> | | 0.058** (0.020) | 0.061*** (0.020) |
| <i>Age</i> | | | 0.027 (0.015) |
| <i>Education</i> | | | -0.079 (0.084) |
| <i>Income</i> | | | -0.030 (0.015) |
| <i>Observations</i> | 166 | 166 | 166 |

***p<0.01, **p<0.05, * p<0.1

Experimental instructions. You are now participating in a three-part experiment. Each part consists of a 90-second task. At the end of the experiment, one of the three tasks will be selected and your performance and the performance of other participants will be used to determine your bonus. There will also be an opportunity to add to your bonus during the concluding survey.

Task 1: In task 1, you will be presented with a series of tables consisting of 1s and 0s, like the one pictured below. Your job is to count the number of zeros and enter your answer in the space provided. You will have 90 seconds to enter as many correct answers as possible. After 90 seconds, the task will end automatically and you will see your score. There is no penalty for incorrect answers. If task one is randomly selected for payment, you will be paid a piece rate of \$0.10 per correct answer. Click next when you are ready, and your 90 seconds will begin.

```
0 1 1 0 1 0
0 0 0 0 1 1
1 0 0 1 1 1
1 1 1 0 0 1
1 1 1 0 1 0
0 1 0 1 0 0
```

Task 2: In task 2, you will again be given 90 seconds to correctly count the zeros in as many tables as possible. However, your earnings in this task depend on your performance relative to another participant in the experiment with whom you will be randomly matched. If task 2 is randomly selected for payment, your payment will be determined as follows. If you solve more tables than the other participant, you will earn \$0.20 per correct answer. If the other participant solves more tables, you will earn \$0.00 for this task. If there is tie, you will earn \$0.10 per correct answer. We call this the tournament payment scheme. Press continue when you are ready, and your 90 seconds will begin.

Task 3: In task 3, you will again be given 90 seconds to correctly count the zeros in as many tables as possible. For this task, you will choose which of the two previous payment schemes you prefer to have to determine your bonus if task 3 is selected for payment. If you choose the Piece Rate scheme, you will be paid \$0.10 for every correct answer. If you choose the Tournament scheme, your task 3 score will be compared to the task 2 score of the participant with whom you are randomly paired. If your score is higher, you will be paid \$0.20 per correct answer. If your score is lower, you will be paid \$0.00 for this task. If you tie, you will be paid \$0.10 per correct answer.

Please select a payment scheme. Once you have selected a payment scheme, press continue when you are ready and your 90 seconds will begin.

- Piece Rate scheme (as in Task 1)
- Tournament scheme (as in Task 2)

Once you have selected a payment scheme, press continue when you are ready and your 90 seconds will begin.

Post-study survey. Please complete the survey below about your experience and some demographic information. There is also an opportunity to add to your bonus. Percent responses for each question are shown in parenthesis. These values are calculated over the full sample of 466 responses.

In Task 2, do you believe that the other person you were matched with counted more or fewer 0s correctly, compared to you? If you guess correctly, \$0.10 will be added to your bonus.

- The other person probably counted more zeros correctly in task 2
- The other person probably got fewer zeros correctly in task 2

Do you generally see yourself as a person who is fully prepared to take risks or do you try to avoid taking risks? Choose a rank between 1 and 7 (1= avoid risks as much as possible; 7=fully prepared).

From a scale of 1 to 7 (1 = completely disagree; 7 = completely agree), please tell us how much you agree with the following statements:

- When a mother works for pay outside the home, the children suffer.
- If a woman earns more money than her husband, it's almost certain to cause problems.
- Having a job is the best way for a woman to be an independent person.
- When jobs are scarce, men should have more right to a job than women.
- A university education is more important for a boy than for a girl.
- Being a housewife is just as fulfilling as working for pay.

Were you interrupted in any way during the experiment?

- 1 No, not at all (90.6%)
- 2 Somewhat, a little bit (7.7%)
- 3 Yes, a lot (1.7%)

What is your age?

What is your gender?

- 1 Female (64.4%)
- 2 Male (35.6%)

What is the highest degree or level of education you have completed?

- 1 No schooling completed (0%)
- 2 Primary school (0.2%)
- 3 High school (25.5%)
- 4 Technical or vocational degree (16.5%)
- 5 Bachelor's degree (40.6%)
- 6 Master's degree (14.8%)
- 7 Professional degree (1.7%)
- 8 Doctorate degree (0.6%)

Are you currently:

- 1 Married (65.2%)
- 2 Living together as married (34.8%)
- 3 Married (0%)
- 4 Living together as married (0%)
- 5 Divorced (0%)
- 6 Separated (0%)
- 7 Widowed (0%)
- 8 Single (0%)

Do you have any biological children?

- 1 No (57.7%)
- 2 Yes (42.3%)

How many biological children do you have? (insert 0 if no children)

What is the age of your youngest biological child? (If less than one years old, please insert 0)

What is the age of your oldest biological child? (If less than one years old, please insert 0)

Are you (or your partner) pregnant? (Yes, No, I'm not sure/I don't want to answer)

Do you have any non-biological children (e.g., step-children, adopted children)? (Yes, No)

How many non-biological children (e.g., step-children, adopted children) do you have? (insert 0 if no children)

What is the age of your youngest non-biological child? (If less than one years old, please insert 0)

What is the age of your oldest non-biological child? (If less than one years old, please insert 0)

Are you employed now or not? If yes, about how many hours a week? If more than one job: only for the main job

- 1 Yes, I have paid employment: Full time employee (30 hours a week or more) (60.1%)
- 2 Yes, I have paid employment: Part time employee (less than 30 hours a week) (10.9%)
- 3 Yes, I have paid employment: Self employed (10.5%)
- 4 No, no paid employment: Retired/pensioned (0%)
- 5 No, no paid employment: Housewife/husband not otherwise employed (10.3%)
- 6 No, no paid employment: Student (4.3%)
- 7 No, no paid employment: Unemployed (3%)
- 8 No, no paid employment: Other (write in) (0.9%)

We would like to know in what wealth group your household is. Please, select the appropriate range, including all wages, salaries, pensions and other incomes that come in

- 1 Up to \$12,500 (3.9%)
- 2 \$12,501 to \$20,000 (5.4%)
- 4 \$20,001 to \$27,500 (7.5%)
- 5 \$27,501 to \$35,000 (10.3%)
- 6 \$35,001 to \$42,500 (11.6%)
- 7 \$42,501 to 50,000 (10.3%)
- 8 \$50,001 to \$62,500 (13.1%)
- 9 \$62,501 to \$75,000 (12.7%)
- 10 \$75,501 to \$100,000 (14.4%)
- 11 \$100,001 to \$150,000 (9.2%)
- 12 \$150,001 or more (1.7%)

Survey on motherhood and the willingness to compete for pay in daily life. The survey discussed in the discussion section was administered four months after the end of Study 2. We recruited 199 mothers living in the US, aged 18-30. They were informed that the survey should take 5-7 minutes to complete and that each will receive a \$1.5 for completing the survey. The order of the questions as well as the order of the potential responses was randomized.

Question 1) Recent research suggests that mothers may be less willing to work in excessively competitive environments than non-mothers. An excessively competitive work environment can be defined as one where colleagues have to compete with each other on a regular basis for either promotion, salary, control, power or other resources in an organization. From your own experience, would you agree 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.

- Strongly agree (29.2%)
- Somewhat agree (35.7)
- Neither agree nor disagree (12.1%)
- Somewhat disagree (11.1%)
- Strongly disagree (10.1%)
- Doesn't apply to me

Question 2) One possible explanation for the reduced willingness of mothers to work in excessively competitive environments is that they feel pressured by their families/society to avoid excessive competition at work and to focus on their families.

From your own experience as a mother, would you agree with the following statement?

After becoming a mother, I felt there was an expectation from my family/society that I should avoid excessively competitive working environments, even if this would imply lower personal earnings.

- Strongly agree (15.6%)
- Somewhat agree (25.6%)
- Neither agree nor disagree (12.1%)
- Somewhat disagree (24.12%)
- Strongly disagree (19.6%)
- Doesn't apply to me

Question 3) Another explanation for the reduced willingness of mothers to work in excessively competitive environments is that the experience of motherhood changes the preferences of women themselves, and that they enjoy excessively competitive work environments less than they did before becoming mothers.

From your own experience as a mother, would you agree with the following statement?

After becoming a mother, I felt I would personally enjoy working in an excessively competitive environment less than I did before.

- Strongly agree (24.1%)
- Somewhat agree (27.6%)
- Neither agree nor disagree (10.1%)
- Somewhat disagree (10.6%)
- Strongly disagree (4.0%)
- Doesn't apply to me

Question 4) As a mother, would you agree with the following statement? In my society, mothers are expected to be the main caregivers to young children; fathers are expected to be the main breadwinners.

- Strongly agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree

Question 5) What is your age?

Question 6) What is the highest degree or level of education you have completed?

- No schooling completed
- Primary school
- High school
- Technical or vocational degree
- Bachelor's degree
- Master's degree
- Professional degree
- Doctorate degree

Question 7) Are you currently

- Married
- Living together as married
- Divorced
- Separated
- Widowed
- Single

Question 8) Do you have any biological children?

- Yes
- No

Question 9) How many biological children do you have? (insert 0 if no children)

Question 10) What is the age of your youngest biological child? (If less than one years old, please insert 0)

Question 11) What is the age of your oldest biological child? (If less than one years old, please insert 0)

Question 12) Are you (or your partner) pregnant? (Yes, No, I'm not sure/I don't want to answer)

Question 13) Please describe how your job situation has changed since becoming a mother.

- I work more hours (41.7%)
- I work fewer hours (11.1%)
- I work the same number of hours (15.6%)
- NA

Question 14) Has your partner scaled back or scaled up their work since becoming a parent?

- Scaled up (50.8%)
- Scaled back (8.0%)
- No change (41.2%)

Question 15) How many individuals in your household earn an income?

Question 16) Who is the main breadwinner in your family?

- Myself (20.1%)
- My partner (65.8%)
- Equal Earnings (11.6%)
- Not applicable

Question 17) We would like to know in what wealth group your household is. Please, select the appropriate range, including all wages, salaries, pensions and other incomes that come in.

- Up to \$12,500
- \$12,501 to \$20,000
- \$20,001 to \$27,500
- \$27,501 to \$35,000
- \$35,001 to \$42,500
- \$42,501 to 50,000
- \$50,001 to \$62,500
- \$62,501 to \$75,000
- \$75,501 to \$100,000
- \$100,001 to \$150,000
- \$150,001 or more

Simulations. Some readers may wonder whether we performed a similar simulation as the one that we conducted for Study 1. Anticipating this, we asked ourselves whether there is some value in such simulation. The key assumption underlying the analysis we did in Study 1 is that subjects have *rational expectations* about others' abilities (scores) and are rationally choosing to maximize their payoffs. This seems to be a defensible assumption when participants know who the other subjects are and have a good sense of their abilities and experimental conditions. This is the case in Study 1 as subjects know the other participants are students from the same university, and that they participate under very similar experimental conditions. In Study 2, however, this assumption seems very difficult to defend. First, subjects on MTurk are very heterogeneous, and perform the tasks under different circumstances. Second, subjects were not told that we would be targeting exclusively individuals aged between 18-30. For these reasons, we concluded that there is no value in conducting a similar simulation analysis as that in Study 1.

Comparing our MTurk sample to a representative sample of the adult US population aged 18-30. We wanted to see how our MTurk sample of married men and women compared to the US population, after controlling for age (18-30) and marital status. For this purpose, we included a number of questions from the World Values Survey in our post-experiment questionnaire. We compare responses to those given in the 2011 wave of the WVS. We note that, in the WVS, some questions seek answers using the scale "Agree Strongly", "Agree", "Disagree", "Strongly Disagree", while others seek responses on the "Agree", "Neither", "Disagree" scale. In Study 2, we sought responses on the scale of 1 to 7 (1 = completely disagree; 7 = completely agree). To facilitate the comparison, we normalize on a scale as follows:

- Study 2 response 1 is "Disagree Strongly",
- Study 2 response 2 - 3 is "Disagree",
- Study 2 response 4 is "Neither",
- Study 2 response 5 - 6 is "Agree",
- Study 2 response 7 is "Agree Strongly",

As can be seen below, our sample appears to be more progressive with regards to the role of women in the labor force than a representative US sample. Arguably, this makes our findings even more striking as one would expect an even stronger effect of motherhood in a sample with more traditional family values.

Table S5. *“When a mother works for pay outside the home, the children suffer.” (WVS V50, Study 2, Q146 1)*

| Study | Ages | Sex | Marital Status | Maternal Status | Strongly Disagree | Disagree | Neither | Agree | Agree Strongly | Other |
|---------|-------|--------|----------------|-----------------|-------------------|----------|---------|--------|----------------|-------|
| Study 2 | 18-30 | Female | Married | non-mother | 45.54% | 38.39% | 2.68% | 13.39% | 0.00% | NA |
| WVS | 18-30 | Female | Married | non-mother | 13.04% | 60.87% | NA | 26.09% | 0.00% | 0.00% |
| Study 2 | 18-30 | Female | Married | mother | 35.24% | 36.19% | 14.29% | 12.38% | 1.90% | NA |
| WVS | 18-30 | Female | Married | mother | 13.16% | 57.89% | NA | 18.42% | 10.53% | 0.00% |
| Study 2 | 18-30 | Male | Married | non-father | 33.33% | 36.23% | 10.14% | 17.39% | 2.90% | NA |
| WVS | 18-30 | Male | Married | non-father | 15.79% | 57.89% | NA | 21.05% | 5.26% | 0.00% |
| Study 2 | 18-30 | Male | Married | father | 21.28% | 23.40% | 14.89% | 29.79% | 10.64% | NA |
| WVS | 18-30 | Male | Married | father | 4.76% | 47.62% | NA | 28.57% | 14.29% | 4.76% |

Table S6. *“If a woman earns more money than her husband, it’s almost certain to cause problems” (WVS V47, Study 2, Q146 2)*

| Study | Ages | Sex | Marital Status | Maternal Status | Strongly Disagree | Disagree | Neither | Agree | Agree Strongly | Other |
|---------|-------|--------|----------------|-----------------|-------------------|----------|---------|--------|----------------|-------|
| Study 2 | 18-30 | Female | Married | non-mother | 58.04% | 32.14% | 5.36% | 4.46% | 0.00% | NA |
| WVS | 18-30 | Female | Married | non-mother | NA | 69.57% | 26.09% | 4.35% | NA | 0.00% |
| Study 2 | 18-30 | Female | Married | mother | 47.62% | 33.33% | 8.57% | 7.62% | 2.86% | NA |
| WVS | 18-30 | Female | Married | mother | NA | 63.16% | 21.05% | 15.79% | NA | 0.00% |
| Study 2 | 18-30 | Male | Married | non-father | 49.28% | 27.54% | 8.70% | 11.59% | 2.90% | NA |
| WVS | 18-30 | Male | Married | non-father | NA | 73.68% | 21.05% | 5.26% | NA | 0.00% |
| Study 2 | 18-30 | Male | Married | father | 36.17% | 23.40% | 12.77% | 12.77% | 14.89% | NA |
| WVS | 18-30 | Male | Married | father | NA | 52.38% | 33.33% | 9.52% | NA | 4.76% |

Table S7. “Having a job is the best way for a woman to be an independent person.” (WVS V48, Study 2 Q146 3)

| Study | Ages | Sex | Marital Status | Maternal Status | Strongly Disagree | Disagree | Neither | Agree | Agree Strongly | Other |
|---------|-------|--------|----------------|-----------------|-------------------|----------|---------|--------|----------------|-------|
| Study 2 | 18-30 | Female | Married | non-mother | 2.68% | 15.18% | 18.75% | 48.21% | 15.18% | NA |
| WVS | 18-30 | Female | Married | non-mother | NA | 39.13% | 21.74% | 39.13% | NA | 0.00% |
| Study 2 | 18-30 | Female | Married | mother | 10.48% | 15.24% | 19.05% | 36.19% | 19.05% | NA |
| WVS | 18-30 | Female | Married | mother | NA | 28.95% | 28.95% | 42.11% | NA | 0.00% |
| Study 2 | 18-30 | Male | Married | non-father | 11.59% | 10.14% | 23.19% | 47.83% | 7.25% | NA |
| WVS | 18-30 | Male | Married | non-father | NA | 26.32% | 36.84% | 36.84% | NA | 0.00% |
| Study 2 | 18-30 | Male | Married | father | 8.51% | 23.40% | 19.15% | 40.43% | 8.51% | NA |
| WVS | 18-30 | Male | Married | father | NA | 23.81% | 38.10% | 33.33% | NA | 4.76% |

Table S8. *When jobs are scarce, men should have more right to a job than women” (WVS V45, Study 2 Q146 4)*

| Study | Ages | Sex | Marital Status | Maternal Status | Strongly Disagree | Disagree | Neither | Agree | Agree Strongly | Other |
|---------|-------|--------|----------------|-----------------|-------------------|----------|---------|--------|----------------|-------|
| Study 2 | 18-30 | Female | Married | non-mother | 77.68% | 14.29% | 4.46% | 2.68% | 0.89% | NA |
| WVS | 18-30 | Female | Married | non-mother | NA | 78.26% | 13.04% | 8.70% | NA | 0.00% |
| Study 2 | 18-30 | Female | Married | mother | 68.57% | 20.00% | 5.71% | 3.81% | 1.90% | NA |
| WVS | 18-30 | Female | Married | mother | NA | 78.95% | 15.79% | 5.26% | NA | 0.00% |
| Study 2 | 18-30 | Male | Married | non-father | 56.52% | 20.29% | 7.25% | 13.04% | 2.90% | NA |
| WVS | 18-30 | Male | Married | non-father | NA | 63.16% | 36.84% | 0.00% | NA | 0.00% |
| Study 2 | 18-30 | Male | Married | father | 40.43% | 14.89% | 14.89% | 19.15% | 10.64% | NA |
| WVS | 18-30 | Male | Married | father | NA | 52.38% | 42.86% | 0.00% | NA | 4.76% |

Table S9. “A university education is more important for a boy than for a girl” (WVS V52, Study 2, Q146 5)

| Study | Ages | Sex | Marital Status | Maternal Status | Strongly Disagree | Disagree | Neither | Agree | Agree Strongly | Other |
|---------|-------|--------|----------------|-----------------|-------------------|----------|---------|--------|----------------|-------|
| Study 2 | 18-30 | Female | Married | non-mother | 84.82% | 11.61% | 1.79% | 1.79% | 0.00% | NA |
| WVS | 18-30 | Female | Married | non-mother | 43.48% | 47.83% | NA | 8.70% | 0.00% | 0.00% |
| Study 2 | 18-30 | Female | Married | mother | 77.14% | 16.19% | 1.90% | 2.86% | 1.90% | NA |
| WVS | 18-30 | Female | Married | mother | 52.63% | 36.84% | NA | 2.63% | 5.26% | 2.63% |
| Study 2 | 18-30 | Male | Married | non-father | 57.97% | 18.84% | 10.14% | 10.14% | 2.90% | NA |
| WVS | 18-30 | Male | Married | non-father | 47.37% | 52.63% | NA | 0.00% | 0.00% | 0.00% |
| Study 2 | 18-30 | Male | Married | father | 46.81% | 19.15% | 8.51% | 17.02% | 8.51% | NA |
| WVS | 18-30 | Male | Married | father | 19.05% | 71.43% | NA | 4.76% | 0.00% | 4.76% |

Table S10. *“Being a housewife is just as fulfilling as working for pay” (WVS V54, Study 2, Q146 6)*

| Study | Ages | Sex | Marital Status | Maternal Status | Strongly Disagree | Disagree | Neither | Agree | Agree Strongly | Other |
|---------|-------|--------|----------------|-----------------|-------------------|----------|---------|--------|----------------|-------|
| Study 2 | 18-30 | Female | Married | non-mother | 6.25% | 16.07% | 19.64% | 34.82% | 23.21% | NA |
| WVS | 18-30 | Female | Married | non-mother | 0.00% | 17.39% | NA | 73.91% | 8.70% | 0.00% |
| Study 2 | 18-30 | Female | Married | mother | 3.81% | 12.38% | 16.19% | 31.43% | 36.19% | NA |
| WVS | 18-30 | Female | Married | mother | 5.26% | 10.53% | NA | 39.47% | 44.74% | 0.00% |
| Study 2 | 18-30 | Male | Married | non-father | 14.49% | 20.29% | 26.09% | 27.54% | 11.59% | NA |
| WVS | 18-30 | Male | Married | non-father | 5.26% | 15.79% | NA | 57.89% | 21.05% | 0.00% |
| Study 2 | 18-30 | Male | Married | father | 12.77% | 14.89% | 12.77% | 25.53% | 34.04% | NA |
| WVS | 18-30 | Male | Married | father | 0.00% | 23.81% | NA | 47.62% | 23.81% | 4.76% |

Study 3: The Dutch sample

Table S11 *The determinants of competitiveness for mothers and non-mothers in Study 3*

| | (1) | (2) |
|---------------------|---------------------|---------------------|
| <i>Mothers</i> | -0.519** (0.240) | -0.694** (0.318) |
| <i>Age</i> | | 0.026 (0.029) |
| <i>High School</i> | | 1.222 (0.786) |
| <i>College</i> | | 1.089 (0.734) |
| <i>University</i> | | 1.366* (0.750) |
| <i>Constant</i> | 6.906*** (0.133) | 5.123*** (0.931) |
| <i>Observations</i> | 245 | 245 |

Ordinary Least Squares regression. The dependent variable is the response to the question: “How competitive do you consider yourself to be? Please choose a value on the scale below, where the value 0 means *not competitive at all* and the value 10 means very competitive. ***p<0.01, **p<0.05, * p<0.1

Table S12 *The determinants of competitiveness for non-mothers and mothers-to-be in Study 3*

| | (1) | (2) |
|----------------------|---------------------|---------------------|
| <i>Mothers-to-be</i> | -0.224* (0.135) | -0.287** (0.142) |
| <i>Age</i> | | 0.031 (0.027) |
| <i>High School</i> | | 2.051*** (0.699) |
| <i>College</i> | | 1.900*** (0.637) |
| <i>University</i> | | 2.014*** (0.655) |
| <i>Constant</i> | 7.130*** (0.224) | 4.563*** (0.830) |
| <i>Observations</i> | 218 | 218 |

Ordinary Least Squares regression. The dependent variable is the response to the question: “How competitive do you consider yourself to be? Please choose a value on the scale below, where the value 0 means *not competitive at all* and the value 10 means very competitive. ***p<0.01, **p<0.05, * p<0.1

Table S13 *The determinants of competitiveness for fathers and non-fathers in Study 3*

| | (1) | (2) |
|---------------------|---------------------|---------------------|
| <i>Fathers</i> | 0.862*** (0.342) | 1.052*** (0.399) |
| <i>Age</i> | | -0.033 (0.033) |
| <i>High School</i> | | 1.873** (0.816) |
| <i>College</i> | | 2.064*** (0.775) |
| <i>University</i> | | 2.021** (0.795) |
| <i>Constant</i> | 6.813*** (0.155) | 5.123*** (0.931) |
| <i>Observations</i> | 174 | 174 |

Ordinary Least Squares regression. The dependent variable is the response to the question: "How competitive do you consider yourself to be? Please choose a value on the scale below, where the value 0 means *not competitive at all* and the value 10 means very competitive. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

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