Title
Essays in Psychology and Economics

Author
Tungodden, Jonas

Publication Date
2019

Peer reviewed|Thesis/dissertation

Essays in Psychology and Economics

By

Jonas Tungodden

A dissertation submitted in partial satisfaction of the

requirements for the degree of

Doctor of Philosophy

in

Economics

in the

Graduate Division

of the

University of California, Berkeley

Committee in charge:

Professor Stefano DellaVigna, Chair
Associate Professor Ned Augenblick
Professor Shachar Kariv
Professor Edward Miguel

Spring 2019

Essays in Psychology and Economics

Abstract

Essays in Psychology and Economics
by
Jonas Tungodden
Doctor of Philosophy in Economics
University of California, Berkeley
Professor Stefano DellaVigna, Chair

This dissertation consists of three chapters which all study parental decision-making for their children in the domain of competition. Willingness to compete is an important determinant of education and labor market outcomes. A growing literature has documented a robust gender differences in competitiveness which may explain the observed differences between men and women in these domains. Parents play an important role in shaping children's preferences and long-term outcomes. The key motivation for the dissertation is to understand the influence of parents on gender differences in competitiveness and later life outcomes.

In the first chapter, I study how parents make competitiveness choices for their adolescent children in Norway. In an experiment with 1480 parents and children, parents choose if their child will do a task for a competitive or non-competitive pay scheme. The paper establishes a number of novel facts on parents' choices for children. First, parents choose more competition for boys than for girls. The gender gap in parents' choices is smaller than that in children's own choices. Second, two main mechanisms explain the gender gap in parents' choices: their beliefs about children's preferences and paternalistic behavior. Third, parents' choices are more responsive to the ability of boys than girls, which results in many high-ability girls not entering into competition. Fourth, parent gender matters: fathers are more likely than mothers to enter their child into competition. Finally, children are unaware of the gender difference in parents' choices and believe that parents will make the same choices for boys and girls.

The second chapter uses data from the same experiment as in chapter one, to study the transmission of competitiveness preferences within social networks. I document a positive correlation between preferences both within family and within peer groups. I study parents' beliefs about the correlation of preferences, and find that parents overstate how close their own preferences are to their children's preferences.

In the third chapter, which is joint work with Edward Miguel (UC Berkeley), we study how parents make competitiveness choices for their young children in Kenya. We present preliminary data from two lab-in-the-field experiments, and highlight three findings. First, in the sample of parents, men are more likely than women to compete. Second, in the sample of children, there is no evidence that boys are more competitive than girls. In fact, girls are more likely to compete than boys, but this difference is not significant. Third, when parents are asked to choose if their child should compete or not, there is a significant gender difference in choices; parents choose more competition for boys than for girls. We study mechanisms for parents' competition choices. Importantly, the difference in choices for boys and girls, is not explained by parents' beliefs about their children's preferences.

To my grandparents Berit, Bernt, Gunnvor and Svein.

Contents

Acknowledgments

I thank my exceptional advisor Stefano DellaVigna for his generosity, kindness, insightful comments, and support throughout my academic journey. He is a role model both as a researcher and a person. I am forever thankful to my committee members: Ned Augenblick, Shachar Kariv, and Edward Miguel. Thank you for your patience, never-ending enthusiasm, and always being helpful.

I thank the community at the Norwegian School of Economics, who hosted me for multiple visits during my PhD and assisted in running the experiments for chapter one and two of the thesis. In particular, thank you Alexander W. Cappelen, Kjell G. Salvanes. Without your help this dissertation would not be possible.

This work has benefited greatly from the comments of my classmates and friends; Eric Avis, Tamas Batyi, Benedetta Lerva, Mykyta Bilyi, Tom G. Meling, Ingar Haaland, Johannes Hermle, Nicholas Li, Avner Shlain, Øivind Schøyen, Mauricio Ulate, Ganesh Viswanath, and Michael Walker. I am also incredibly grateful for all the amazing people I have met during my stay in Berkeley. Thank you so much for being part of my life.

I thank my family. My parents for being the best parents, and for their endless love and support. My incredible siblings who remind what the good life is about. You are all an inspiration to me. Thank you so much.

Finally I am thankful for the financial support from the Gateway Foundation, Norges Bank, the Russell Sage Foundation, Xlab at UC Berkeley, and the Research Council of Norway through its Center of Excellence Scheme.

Chapter 1

When Parents Decide: Gender Differences in Competitiveness

1.1 Introduction

Parents play an important role in shaping children's preferences and long-term outcomes (Heckman et al. (2006), Sacerdote (2007), Fagereng et al. (2018)). One key mechanism through which parents exert influence is by making choices for their children during childhood and adolescence. Study physics or sociology? Attend academic or vocational training? Spend evenings studying or relaxing? How parents make such choices is likely to affect both children's preferences and their long-term outcomes.

This paper studies how parents make choices for their children and how the choices relate to children's own choices. I focus on choices in the domain of competition and the role of child gender in parents' choices for their children. The research is motivated by the growing literature on gender differences in competitiveness. The literature has documented a large and robust gender difference in the willingness to compete: women are less willing than men to enter competitive environments (see Kagel and Roth (2016) for a review). The gender gap has been documented across the globe (Gneezy et al. (2009), Zhang (2013), Flory et al. (2018)), and has been shown to exist from an early age (Sutter and Glätzle-Rützler (2015)). Furthermore, recent research finds that willingness to compete correlates with important education choices and that controlling for willingness to compete mitigates gender differences in education outcomes between men and women (Buser et al. (2014), Almås et al. (2015), Flory et al. (2015)).

Given this robust gender difference in willingness to compete, also among children, it becomes important to understand the role of parents. Is it possible that parental gender preferences exacerbate, or even possibly reflect in its entirety, such difference? Or do parental preferences tend to attenuate this difference? Further, because parents sometimes make choices on behalf of children, it is also important to know whether the parents have correct beliefs about their children's preferences in this regard.

To provide evidence on these questions, I cooperated with 15 high schools in Norway to recruit a nationally representative sample of Norwegian adolescent children (10th grade). I then randomly selected either the mother or the father to be invited to participate in

the study. In all, more than 80 percent of invited children and parents participated, and I collected data on more than 1600 parents and children.

The main features of the experimental design are as follows. Children participate in an experiment at their school (the child experiment), while parents take part in an online experiment (the parent experiment). Parents make a real choice for their child: whether they will do a task for a competitive or non-competitive pay scheme. I also observe the child's own choice between the two pay schemes. The experimental design builds on Niederle and Vesterlund (2007), which has been used in numerous papers to study gender differences in competitiveness. The main innovation of this paper is to have parents make a competitiveness choice for their child. I replicate the finding in the literature that boys are more likely than girls to enter competition: 34 percent of boys and 19 percent of girls choose to compete. The gender difference is also substantial and significant when controlling for children's performance on the task, belief about the probability of winning the tournament, and risk preferences. I estimate a simple structural model to quantify the taste for competition among children. I find that both girls and boys dislike competition, equivalent to a loss in income of \$5.90 for girls and \$4.18 for boys.[1]

Turning to parents' choices for their children, the paper establishes a number of novel facts. First, parents choose more competition for boys than for girls. The gender gap in parents' choices is smaller than that in children's choices: 8 versus 15 percentage points. To investigate explanations for the gender gap, I examine mechanisms studied in previous research: ability, beliefs about winning the competition, and risk preferences. I find, consistent with the literature, that these mechanisms explain about 40 percent of the gender gap for children. Interestingly, parallel controls — performance of the child, parents' beliefs about the child's probability of winning the competition, and parents' willingness to take risk for the child — do *not* explain any of the gender gap in parents' choices.

Second, I show that there are two main mechanisms that explain why parents choose differently for boys and girls. Parents believe that boys are more willing to compete than girls, and these beliefs about their children's preferences are an important determinant of their choices. In fact, because parents overestimate the willingness of boys to enter into competition, this mechanism pulls in the direction of an even larger gender gap when parents make choices for children compared with when children make choices for themselves. A counteracting force, however, is that a significant proportion of parents act paternalistically and make a different choice than they believe their child would make. Parents who act paternalistically are 30 percent more likely to enter a daughter than a son into the tournament, which contributes to reducing the gender gap in parents' choices. I extend the study of mechanisms with a structural model for how parents choose for their children. I find that parents dislike competition for both girls and boys (\$5.63 versus \$4.78), and I estimate the relative weight that parents place on paternalistic motivation (versus maximizing the utility of the child) to be 0.4.

Third, I shed light on the extent to which the difference in preferences for competition corresponds to differences in ability. For children, I cannot reject that boys' and girls' competitiveness is equally responsive to ability. On the other hand, parents are more responsive

[1] A pre-analysis plan for the paper is available on the AEA RCT Registry under the title "How Do Parents Make Choices? Competitiveness and Gender". In 1.10, I present the pre-specified analysis.

to ability for boys than for girls in the competition choice. As a consequence, many high-ability girls do not enter into competition. Given that high-ability children potentially have the highest return to competing, this finding may have important welfare consequences.

Fourth, I provide evidence on the role of parent gender. Fathers are more likely than mothers to enter their child into competition, and this difference is sizeable enough to make fathers choose more competition for girls than mothers do for boys. The difference in mothers' and fathers' choices is not explained by a difference in their beliefs about children's preferences. Rather, it appears that parents' choices are partly determined by the competitiveness preferences of parents themselves, with fathers being more willing than mothers to compete (51 percent versus 32 percent).

Finally, the gender gap in parents' choices is not internalized by the children. Children incorrectly believe that their parents are gender-neutral in their competition choices for their children. This suggests that children's beliefs about parents' preferences cannot explain the difference in competitiveness choices among children.

The paper contributes to several literatures. A large literature has documented a gender difference in the willingness to compete among adolescents that may be important for explaining the observed gender differences in education and labor market outcomes (Gneezy et al. (2003), Niederle and Vesterlund (2007), Buser et al. (2014), Sutter and Glätzle-Rützler (2015), Almås et al. (2015), Buser et al. (2017b)). To my knowledge, this paper is the first to document a gender difference in parents' competitiveness choices for their children. This finding highlights the crucial role that parents may have in creating differential life outcomes for their sons and daughters.

The paper also adds to the literature aiming to understand the determinants of gender-specific competitiveness preferences. Previous studies have explored the role of societal influences (Gneezy et al. (2009), Booth and Nolen (2012), Shurchkov (2012), Andersen et al. (2013), Buser et al. (2017a)), as well as biological differences (Hoffman and Gneezy (2010), Apicella et al. (2011), Buser (2012), Wozniak et al. (2014), Sutter and Glätzle-Rützler (2015)). When it comes to the role of parents, Khadjavi and Nicklisch (2018) study the correlation between parents' ambitions and children's willingness to compete, and Cassar et al. (2016) studies willingness to compete when the payoff from competition is given to the child. This paper adds to this literature by studying how parents' competitiveness choices, and children's beliefs about parents' choices, predict gender differences in children's own choices. More broadly, the paper relates to the literature on intergenerational transmission of preferences. Previous studies have considered the transmission of preferences in the domains of dishonesty, time, social, risk, and trust (Dohmen et al. (2011a), Zumbuehl et al. (2013), Houser et al. (2016), Brenøe and Epper (2019), Chowdhury et al. (2019)). This paper studies the intergenerational transmission of competitiveness from parents to children.

Finally, the paper relates to the theoretical literature on parenting and parenting style (Becker and Tomes (1979), Bisin and Verdier (2001), Doepke and Zilibotti (2017). This study provides data on the relationship between parents' choices for their children and parents' beliefs about children's preferences. These data allow for an empirical analysis of motivations for parents' choices for their children. To the best of my knowledge, this is the first paper to document parents' willingness to act paternalistically for their children. This finding also relates to recent work studying paternalistic behavior in the lab (but not for parents and children) (Ambuehl et al. (2019)).

Taken together, this study provides novel insights into how parents make competitiveness choices for their children, which may shed light on both the role of parents in shaping long-term outcomes for children and the intergenerational transmission of preferences. The remainder of the paper is organized as follows. Section 2 describes the study design. Sections 3 and 4 present data on children's and parents' competitiveness choices, respectively. Section 5 discusses parents' beliefs about children and paternalistic behavior among parents. Section 6 presents and estimates a structural model for competitiveness choices. Section 7 presents data on children's beliefs about parents' choices for them. Section 8 concludes.

1.2 Study design

1.2.1 Recruitment of study participants

The study was conducted in Hordaland, Norway, during Spring 2017. Norway is among the most gender-equal countries in the world. Despite this, Norway is also similar to less gender-equal societies in that there are large gender differences in competitiveness, education outcomes, and labor market outcomes (Birkelund and Sandnes (2003), Almås et al. (2015)). Hordaland is the third-largest county in the country, and includes the second-largest city and sparsely populated rural areas. Furthermore, it is close to the national average in terms of distribution of income, education, and occupation.

To recruit subjects, I contacted all junior high schools within 2 hours' driving distance from Bergen for permission to run a 1-hour in-class experiment with 10th-grade students.[2] I informed schools that students would be paid depending on their choices in the experiment and that students' parents would be invited to take part in a related study. Understanding the determinants of adolescents' educational decisions was cited as the motivation for the study.

Altogether, 17 of 38 schools granted permission to run the experiment, of which, two participated in the pilot study. Figure 1.1 shows the locations of the participating and non-participating schools. There appeared to be no systematic differences in the geographical distribution of participating and non-participating schools. Table 1.1a compares average grades between participating schools, non-participating schools, and the national average. The three groups are strikingly similar, suggesting that the participating schools are largely representative of the country.

For each school, three 10th-grade classes were invited to take part in the experiment.[3] The participation rate for children was 81 percent, with 921 students taking part in the experiment. For each participating student, I randomly invited either the mother or the father to participate in an online experiment.[4] I informed parents that their choice to take part would not influence whether their child could attend. In total, 776 parents participated (82 percent of the invited parents). Figure 1.2a illustrates the recruitment process.

[2]Schools with fewer than 25 students in the 10th grade were not invited to participate.

[3]I chose to limit the number of participating classes per school to avoid having to run experiments on different days at the same school. For schools with fewer than three 10th-grade classes, all classes participated.

[4]If the selected parent could not participate, I invited the other parent. In total, 18 percent of parents who took the experiment were not originally selected to participate.

1.2.2 Sample description

Table 1.1b provides descriptive statistics for the study participants. I here focus on participants for which both the parent and the child completed the entire experiment (740 parents and 740 children).[5] The results are robust to running the analysis on the entire sample.

On average, the parents were 46 years old, 63 percent were married, 71 percent lived together with the child, 95 percent were biologically related to the child, and 15 percent spoke a foreign language at home. The parents of boys and girls did not differ significantly along any of these dimensions.

More mothers than fathers participated in the study; 57 percent of parents in the main sample were mothers. The reason for more mothers participating is that children were more likely to provide contact information for mothers than for fathers (children were asked to provide contact information for both). Upon receiving the contact information, I randomized which of the parents (with contact information) would be invited to participate in the study. At this stage, fathers were no less likely than mothers to accept the invitation to participate. Mothers were marginally more likely to participate for girls than for boys; 54 percent of parents for boys were mothers, and 60 percent of parents for girls were mothers ($p = 0.08$).

The children were in 10th grade, age 15 years, 54 percent were female, and boys and girls were equally likely to have a brother, but boys were more likely to have a sister ($p = 0.06$).

1.2.3 Experimental design

Implementation. Experiments were run in March and April of 2017. Because the parent was to make a real choice for the child, the parent experiment had to finish before the start of the child experiment. Furthermore, to avoid the parent and the child influencing each other's choices, I designed the experiments intending to minimize the possibilities of communication.

For each school, the parent and the child completed their experiment on the same day. At 08:00 — after the child had left for school — the parent received a text message with a link to the experiment. To reduce participation costs, the parent experiment was designed to be taken from a smartphone (using the software Qualtrics (2013)). The experiment took 5 minutes to complete and could be accessed at any time between 08:00 and 11:30. Figure 1.2b provides the timeline of the experiment.[6]

The child participated in the experiment at his or her school. The child experiment started after the midday lunch break and lasted between 30 and 45 minutes. The child experiment was computer-based (programmed in z-Tree (Fischbacher (2007))). Classes participated in the experiment sequentially, and I cooperated with teachers to avoid communication between the children who had participated and the children who were waiting to participate in the experiment. Because the experiment was run during school hours, it would be difficult for the parent and the child to share information about the experiment. Furthermore, the

[5] This excludes 163 child observations where the parent did not participate in the experiment, 28 parent observations where the child was registered to participate but did not because of unforeseen circumstances (e.g., sickness), and 12 parent and child observations where both participated, but either the parent or the child did not complete the entire experiment.

[6] In total, 14 percent of parents were unavailable on the day of the experiment. These parents received the text message at 20:00 the night before. Parents could also request to have the link sent by e-mail rather than by text message.

parent was instructed not to tell the child about their involvement in the experiment (until after the child had completed the experiment).

Children. The child received a show-up fee of 100 NOK ($12) and was told that he or she would do tasks in the experiment where they could earn additional money. The task was then described to the child — to add up sets of four two-digit numbers for 3 minutes — and the child was asked if he or she wanted to do the task for piece-rate pay or tournament pay. Piece-rate pay earned the child a fixed rate of 5 NOK per correct answer. Tournament pay earned the child 15 NOK per correct answer, but only if the child outperformed a randomly selected opponent from another school (who did the task for piece-rate pay). The child did the task three times. In round one, the child did the task for his or her own choice of payment scheme. In round two, the child did the task for his or her parent's choice of payment scheme. The child was *not* told that their parent had decided the pay scheme for round two. In round three, all children did the task for the same pay scheme, which provided a common measure of performance. In the third round, the payment for each correct answer was a ticket in a lottery where he or she could win an iPhone 7s.[7]

After completing the three rounds, I elicited beliefs about the probability of winning the tournament, attitudes towards risk-taking, and beliefs about how their mother and father would choose for them between piece-rate pay and tournament pay.

Parents. The parent first received a description of the child experiment. The description was identical to that provided to the child. The parent was then asked to choose between piece-rate pay and tournament pay for the child. The parent was informed that the child would only be told the chosen pay scheme, and not that the pay scheme was chosen by the parent.

After making the choice for the child, the parent was told that the child would also be making the same choice for themselves under similar circumstances to those in which the parent made the choice. The parent was asked about their belief about the child's choice. The belief elicitation was incentivized with tickets to a lottery where the parent could win an iPad. As with the child, I also elicited the parent's preference for tournament or piece-rate pay for themselves, the parent's belief about the child's relative performance, and the parent's attitudes towards risk-taking for the child.

Figure 1.3 shows screenshots from the experiment. Complete instructions for the parent and child are found in Appendix **??**. Table 1.2 provides a summary of the key experimental outcomes.

1.3 Children's choices

This section studies gender differences in children's competitiveness choices and mechanisms explaining children's competitiveness choices.

[7]There were two reasons for doing the third round for lottery tickets rather than a monetary reward: 1) based on pilot studies, it appeared to simplify instructions; and 2) the possibility of winning an iPhone (in addition to the monetary rewards) was helpful when recruiting children to participate in the experiment.

Children's competitiveness choices. I find a significant gender difference in competitiveness: 34 percent of boys chose to compete, compared with 19 percent of girls ($p < 0.01$). In Figure 1.4, I compare the finding to previous results in the literature. The figure includes the competitiveness choices from the first study on gender differences in competitiveness choices and results from all studies on gender differences in competitiveness choices with secondary school or high school students using the math task. This partial meta-analysis highlights the robustness of the gender difference in competitiveness; in all the studies, boys chose to compete more often than girls. Given the motivation of this study — to understand how parents make competitiveness choices for their children — the similarity with other studies is reassuring and validates the sample and competitiveness measure.

In Figure 1.10a, I show the gender difference in children's competitiveness choices across the 15 schools in the main sample. In 12 of the 15 schools, boys competed more than girls, and this difference is significant in six schools. I elicited two additional measures of children's willingness to compete. The first is about children's certainty in their competitiveness choice. After children make their choice between piece-rate and tournament pay, they are asked to indicate how certain they are that their choice was right for them. Figure 1.11a shows the distribution of answers. On this measure, boys were significantly more competitive than girls ($p < 0.01$). Interestingly, boys were also more confident than girls that their choice was right for them ($p < 0.02$). The second measure is a qualitative measure of children's willingness to compete (taken from Buser (2016)): "How willing do you think you are to compete? Answer on a scale from 0 to 10, where 0 means not willing to compete, and 10 means very willing to compete". Boys were significantly more competitive than girls, with the mean answer being 5.82 for boys and 5.37 for girls ($p < 0.02$). The answer on this question was positively correlated with children's decision to enter the tournament (0.18, $p < 0.01$).

In Figure 1.12a and Figure 1.13a in Appendix A, I show a heterogeneity analysis of children's choices by gender of children's siblings, whether a foreign language is spoken at home, and whether parents live together.

Mechanisms. Why do boys compete more than girls? The literature has focused on four main explanations: gender differences in i) ability, ii) beliefs about the probability of winning the tournament, iii) risk preferences, and iv) taste for competing (Niederle and Vesterlund (2007), Yariv et al. (2018), van Veldhuizen (2018)). In Table 1.3A, I study the role of these mechanisms in a regression framework.

Column 1 shows — for comparison — the ordinary least-squares regression of a dummy for tournament entry on a dummy for whether the child is a girl. In column 2, I control for the number of correct answers. Girls significantly outperformed boys in all three rounds in the experiment. I focus on performance in round three, because in this round, the pay scheme was the same for all children. The mean number of correct answers was 5.14 for girls and 4.50 for boys ($p < 0.01$). The number of correct answers correlates positively with tournament entry. Controlling for this variable increases the gender differences in tournament entry to 17.3 percent.

In column 3, I add a control for the child's belief about their probability of winning the tournament. Despite having lower performance, boys were significantly more confident than girls. The mean belief for boys was 0.6, compared with 0.53 for girls. These beliefs are

positively correlated with children's choices, and including this control reduces the coefficient on the girl dummy to -0.123, and the coefficient for the number of correct answers is no longer significant. Compared with a simulated probability of winning the tournament, girls were overconfident by 5 percent, and boys by 22 percent.[8] Figure 1.14 shows the distribution of performance, the simulated probability of winning the tournament, and beliefs about the probability of winning by child gender.

In column 4, I add two measures for children's willingness to take risk. The first is a hypothetical choice between five lotteries with different levels of risk and expected payoff (taken from Eckel and Grossman (2002)). The second is a self-assessment of the willingness to take risk (taken from Dohmen et al. (2011b)). Figure 1.15 shows the distribution of answers by gender. Boys chose riskier lotteries and had a higher self-assessment of their willingness to take risks ($p < 0.01$). The two measures of risk aversion were positively correlated (0.32, $p < 0.01$), and both measures of risk taking were positively correlated with tournament entry. Adding the controls for risk-taking changes the coefficient on the girl dummy from -0.123 to -0.088 (different from zero, $p < 0.04$).

Columns 5 and 6 show the regression from column 4 run separately for boys and girls. For both boys and girls, the number of correct answers is not significantly correlated with tournament entry, while the beliefs about the probability of winning are positively correlated with tournament entry. The risk-taking lottery measure is more predictive for boys' choices, while the risk-taking self-assessment measure is more predictive for girls' choices.

In sum, I find that gender differences in ability, beliefs about the probability of winning, and risk preferences account for 42 percent of gender differences in children's competitiveness choices. The remaining 58 percent of variation could potentially be attributed to gender differences in taste for competition. Similarly, Niederle and Vesterlund (2007) find that 57 percent of the variation can be explained by comparable control variables.

1.4 Parents' choices

In this section, I study parents' competitiveness choices for their children and compare parents' choices to children's own choices. The study of parents' choices for their children is the key contribution of this paper.

Parents' competitiveness choices for children. Figure 1.5 shows parents' choices for their children. On average, parents chose more competition for their children than children chose for themselves (31 percent versus 26 percent, $p < 0.03$). Parents were more likely to choose competition for boys than for girls (35 percent versus 27 percent, $p < 0.03$). The

[8] To obtain a measure of the probability of winning, I drew 1000 randomly selected opponents for each child with replacement and calculated the mean winning probability. As expected, this measure is almost perfectly correlated with performance (0.98). The mean probability of winning the tournament was 0.48 for girls and 0.38 for boys. (Note that the chance of winning was less than 0.5 on average because the child lost the tournament if he or she had the same number of correct answers as the opponent.) The fact that boys were more overconfident than girls seems to suggest that girls were better informed than boys. However, on the other hand, boys' beliefs about their chance of winning the tournament had a higher correlation with their simulated probability of winning (0.49 versus 0.33). This gender difference is robust to removing the large proportion of children who believed their chance of winning the tournament was 50 percent.

difference in parents' choices for girls and boys was 8 percentage points smaller than the gender differences in children's own choices ($p < 0.07$).[9] For boys, parents on average chose the same amount of competition as boys chose for themselves. For girls, parents increased the proportion of girls who competed by 9 percentage points compared with the choices of girls themselves. On an individual level, a positive correlation was observed for between parents' choice for their children's own choices (0.21, $p < 0.01$). This correlation was not significantly different for boys and girls (0.18 versus 0.22, $p < 0.55$). Table 1.7 provides an overview of the correlation between choices, beliefs, and attitudes of parents and children.

How do mothers' and fathers' choices differ? For both girls and boys, fathers were more likely than mothers to enter children into competition ($p < 0.01$). The difference was 10 percentage points for girls and 6 percentage points for boys. The gender difference in mothers' choices was qualitatively larger than that in fathers' choices, but the difference was not statistically different ($p = 0.57$). Both mothers' and fathers' choices correlated positively with their boys' and girls' own choices.

In Figure1.10b, I show parents' choices by school. In 11 of 15 schools, parents chose more competition for boys than for girls, and this difference is significant in two schools. I also elicit an additional measure of parents' willingness to let their children compete; after parents chose piece-rate or tournament pay for their child, I asked them to indicate how certain they were in their choice. Figure 1.11b shows the distribution of parents' certainty in their choice. On this measure, parents appeared to be more competitive on behalf of boys ($p < 0.01$).

In Figure 1.12b and Figure 1.13b, I show a heterogeneity analysis of parents' choices by gender of children's siblings, whether a foreign language is spoken at home, and whether parents live together. In Table 1.8, I show correlations in behavior within classes for both parents and children.

Mechanisms for choices. In Table 1.3b, I study the underlying mechanisms for parents' choices for their children. I conduct a similar exercise to that I did when studying mechanisms for children's choices in Table 31.3a. That is, I study the extent to which the difference in parents' choices for boys and girls can be explained by i) performance of children, ii) parents' belief about their child's probability of winning, and iii) parents' risk preferences over their child's outcomes.

Column 1 shows the regression of parents' choosing to entering their child into competition on a dummy for whether the child is a girl. In column 2, I add a control for the number of correct answers of the child. Children's performance correlates positively with parents entering their child into the tournament, and adding this control changes the coefficient on the girl dummy from -0.076 to -0.089.

In column 3, I control for parents' beliefs about their child's probability of winning. I elicit parents' beliefs in the same way that I elicited children's beliefs about their own probability of winning. Figure 1.14d shows parents' beliefs about their children. Parents were more confident in their child's probability of winning than children themselves ($p < 0.01$). Notably, less than 2.5 percent of parents believed that their child had a less than a 50 percent chance of winning. Parents of girls were more optimistic than parents of boys, but this difference

[9]This p-value is constructed from standard errors clustered at the child-parent pair.

is not significant ($p < 0.24$).[10] Parents' beliefs positively correlates with entering the child into the tournament, and the coefficient on the gender of the child dummy increased from -0.089 to -0.101.

In column 4, I add two controls for parents' risk preferences over child outcomes. These measures closely mirrored the two risk preference measures that were elicited from children. In the first measure, the parent chooses a hypothetical lottery for the child. In the second measure, the parent gives a self-assessment of their willingness to choose risk for the child on a 10-point scale. Figure 1.15 shows parents' risk-taking for children next to children's risk-taking for self. Among children, boys were more willing than girls to take risks. By contrast, the mean difference in parents' risk choice for boys and girls was estimated as a precise zero on both measures. On average, parents' risk choice was between that of boys and girls, with parents being more willing to choose risk than girls, but less willing to choose risk than boys. Both measures of risk choice correlated positively with entering the child into the tournament. However, controlling for these variables did not change the estimated coefficient on the girl dummy.

In all, for parents' choices for their children, controlling for child's performance, parents' beliefs about the probability of their child winning the tournament, and parents' risk choice for their child, does not explain any of the gender difference in parents' choices. By contrast, controlling for parallel controls explains 42 percent of the gender difference in children's own choices. Without controls, the gender difference in children's choices is almost twice that in parents' choices. However, controlling for these variables, the gender difference is, if anything, larger in parents' choices (8.88 percent versus 10.5 percent).

In columns 5 and 6, I run the regression separately for boys and girls. The child's performance and parents' beliefs about their child's probability of winning were more positively correlated with entering boys into the tournament compared with girls. This finding is potentially important. A particular concern in the literature on gender differences in competitiveness is the shortage of high-ability females entering into competition (Buser et al. (2017c)). In Figure 1.6, I show the choices of children and parents conditional on how many correct answers the child achieved in round three. In children's choices, there is a positive relationship between performance and competing for both boys and girls, and I cannot reject that the relationship is the same. For parents, the relationship is significantly stronger for boys ($p < 0.05$).[11]

An implication of the shortage of high-ability girls competing is related to expected earnings from the experiment. To estimate expected earnings, I used performance in round

[10]Parents' beliefs are predictive of their children's chance of winning: for boys, the correlation between parents' beliefs and the child's probability of winning is 0.35, and for girls, it is 0.27. Parents' beliefs also correlate with the beliefs of their children; the correlation is 0.29 for girls' beliefs and 0.47 for boys' beliefs ($p < 0.01$). The low share of parents who reported that their child had less than a 50 percent chance of winning may suggest that parents of low performing children are particularly misinformed about their child's ability. For the bottom 25th percentile of children, in terms of performance on the task, the correlation between parents' beliefs and the simulated probability of winning is 0.07. For the remaining 75 percent, the correlation is 0.22. An alternative explanation to parents being misinformed is that parents, even in an anonymous survey, do not like to state that their child is low performing.

[11]This p-value is from a regression in which I regress parents' choice of pay scheme on child gender, performance on the task, and performance on the task interacted with child gender. Robust standard errors were used.

three and drew 1,000 tournament competitors with replacements. On average, too few children chose to compete relative to what would maximize their expected earnings: 49 percent of boys and 62 percent of girls had higher expected payoffs under tournament than piece-rate pay, while only 34 percent of boys and 19 percent of girls chose tournament pay. If children choose optimally (in terms of expected earnings), boys could increase their profits by 33 percent, and girls by 52 percent (significance on difference, $p < 0.01$).

I next consider the earnings from parents' competitiveness choices for their children. For boys, there is no difference in average earnings when parents made choices. But for girls? Given that too few entered the tournament, and parents entered about 50 percent more girls into the tournament, we might expect parents to increase profits for girls. However, parents' choices did not have higher expected payoffs for girls than girls' own choices. An explanation for this is that while parents increase the number of girls competing, they do not increase the proportion of girls who would benefit the most from competing — the high-ability girls.

1.5 Paternalism

In this section, I present data on parents' beliefs about their children's choices and explore the extent to which these beliefs can explain the difference in parents' choices for boys and girls. This allows me to study whether parents are paternalistic in their competitiveness choices.

Parents' beliefs about children's choices. I asked parents to make a binary statement: do they believe their child will choose piece-rate or tournament pay. Figure 2.2a shows the parents' beliefs. Parents' believed that boys will choose more competition than girls (51 percent versus 25 percent, $p < 0.01$). Comparing parents' beliefs to children's choices, parents overstated the willingness of children to compete ($p < 0.01$). The difference between beliefs and choices is 8 percentage points for girls and 19 percentage points for boys. Parents also overestimated the gender difference in tournament entry choices by about 10 percentage points ($p < 0.02$). As an additional measure, I asked parents to indicate the degree of certainty that their belief was correct. Figure 1.16a shows the distribution of certainty in parents' beliefs. Also on this measure, parents overstated both the likelihood that their children would compete and the gender difference in choices.

Parents' beliefs and parents' choices. To what extent are parents' beliefs important for the choices they make for their children? Choosing what maximizes their children's utility may be an important motivation for parents when making choices for their children; hence, we may expect parents' choices to be strongly correlated with their beliefs. On the other hand, parents may also be motivated to act paternalistically and choose differently from what they believe their child prefers. Overall, 74 percent of parents followed their belief about what they think their child would prefer, while 26 percent chose the opposite to what they believe their child would prefer. The relatively large proportion of parents who were willing to go against their belief about what they think their child wants shows that paternalistic motivation is prevalent among parents.

Parents who chose differently than they believed their children would prefer were 30 percent more likely to enter a daughter into the tournament than a son ($p < 0.00$). Conversely, parents who chose in line with what they believed was their child's preference were 20 percent more likely to enter boys into the tournament. Figure 2.2b shows parents' choices conditional on their beliefs about children's choices. There is no difference in parents' choices for boys and girls, conditional on parents' beliefs about what girls and boys would choose. Figure 1.16b shows parents' choices conditional on their *certainty* in their beliefs; using this measure, there is no difference in choices when conditioning on beliefs.

Can differences in beliefs about children's choices explain why mothers make less competitive choices than fathers? Figure 1.17a shows parents' beliefs split by parent gender. No difference in the beliefs of mothers and fathers was observed. Figure 1.17b shows choices conditional on beliefs; fathers made more competitive choices than mothers when conditioning on beliefs.

What motivates parents to choose differently to what they believe their child wants? One explanation for this may be that parents' themselves have different preferences for competing than what they believe their children have. To explore the role of parents' own preferences for competing, I asked parents what they would choose for themselves between piece-rate and tournament pay if they were in the experiment. Figure 1.8a shows parents' own competitiveness choices. Overall, 40 percent of parents chose the tournament, which is significantly larger than the share of parents choosing the tournament for their child (30 percent) and the share of children choosing the tournament for themselves (25 percent).[12] There was a large difference in the choices of mothers and fathers: 51 percent of fathers and 32 percent of mothers chose the tournament, which is a gender difference of 18 percentage points.

Figure 1.8b shows parents' choices for their children conditional on their own preferences. Parents' stated competitiveness choices for themselves correlates positively with the choice that they make for their child. The correlation is stronger for girls (0.53) than for boys (0.30). Furthermore, parents who believed their child would make different competitiveness choices than themselves were much more likely to act paternalistically. That is, either 1), the parent would choose to compete and believes the child would choose not to compete, or 2), the parent would choose not to compete and believes the child would choose to compete. These parents were 25 percentage points more likely than the parents who shared the competitiveness preferences of the child to act paternalistically for boys and 45 percentage points more likely to act paternalistically for girls.

In Table 1.4, I study the role of parents' own preferences for competing, and parents' beliefs about their children's preferences for competing in explaining parents' choices in a regression framework. In column 1, I show — for comparison — parents' choice of pay scheme on a girl dummy and controls for the child's ability, parents' beliefs about their child's probability of winning the tournament, and parents' risk preferences over child outcomes (which is the same as column 4 in Table 1.3B).

[12]Parents of girls were 7 percentage points less likely than parents of boys to choose the tournament ($p < 0.07$). One interpretation of this finding is that raising a daughter causes parents to become less competitive compared with raising a son. It can also be because parents' have preferences for consistency in their choices, and thus prefer to choose the same for themselves as they chose for their child.

In column 2, I add a control for parents' own preferences for tournament entry. Parents' own preferences are highly predictive for their choice for their child. The inclusion of this variable reduces the coefficient on the gender dummy from -0.105 to -0.078.

In column 3, I add children's own tournament choices as a control variable. Children's preferences predict parents' choices. Controlling for this variable further lowers the coefficient on the gender dummy to -0.060. In column 4, I add controls for parents' binary beliefs about their child's choice. Parents' beliefs about their child's preferences strongly predict parents' choices, and when adding this control variable, no gender differences in parents' choices for girls and boys is observed.

In sum, this analysis suggests that an important reason for parents to make different choices for boys and girls is that they believe that boys and girls have very different preferences for competing.

1.6 Structural analysis

In this section, I present and estimate a structural model of the competitiveness choice. I first consider how children choose between piece-rate and tournament pay for themselves. This exercise allows me to obtain a monetary value for the like (or dislike) of competition by child gender. I then look at parents' choices for their children. The structural analysis of parents' choices provides two key insights: i) an estimate of the weight that parents place on altruistic motivation relative to paternalistic motivation, and ii) a monetary value of parents' taste (or distaste) for having their daughter and son compete.

Children's competitiveness choices. In my main specification, I let children have linear utility over money. To allow for distaste for risk, I incorporate reference-dependent preferences over earnings, where the reference point is expected earnings.[13]

In piece-rate pay, children receive is 5 NOK for each correct answer. I assume that children know with certainty how many questions they will be able to solve, and that there is no cost of effort.[14] I denote child i's belief about his or her performance by a_i^{PR}. Given

[13]For example, a person with expected earnings r and coefficient of loss aversion λ will have utility over money x:

$$U(x) = \begin{cases} x + (x - r), & \text{if } x \geq r \\ x + \lambda(x - r), & \text{if } x < r \end{cases}$$

This use of reference-dependent preferences is closely related to a model with stochastic reference points Kőszegi and Rabin (2006) when assuming linearity in both components of the utility function. For the utility functions in this setup, they will be equivalent. The motivation for this modelling choice is to allow for small-scale risk aversion without having to assume unrealistic amounts of curvature in utility over money. I also show results for a model with constant relative risk aversion (CRRA) in Table 1.5a, where the curvature in utility over money generates a dislike for risk.

[14]A justification for not modeling cost of effort is that children will perform the task under both piece-rate and tournament pay, and hence, the cost will be present in either payment scheme. If performance is similar in the two payment schemes, then cost of effort will also be similar in the two payment schemes. I empirically test whether children's performances differ by considering 169 children who were randomized into either piece-rate or tournament pay, and find no difference in performance.

that there is no uncertainty about children's earnings, there is no impact of the reference-dependent preference part of the utility function. Finally, I include a normally distributed error term ϵ_i^{PR}. Child i's belief about his or her expected utility in piece-rate pay is then:

$$5a_i^{PR} + \epsilon_i^{PR} \tag{1.1}$$

In tournament pay, children receive is 15 NOK for each correct answer if they outperform their opponent, and 0 NOK if they get the same or fewer correct answers. As with piece-rate pay, I assume that children know their performance. I indicate child i's belief about their performance by a_i^T, and I denote child i's belief about their probability of winning the tournament by $\hat{p}_i$.[15]

The child's reference point (the expected earnings) under tournament pay is $\hat{p}_i 15 a_i^T$. If the child wins the tournament, the child's earnings will exceed the reference point, and vice versa if the child loses the tournament. I follow convention and let λ_i denote the degree of loss aversion. I model taste for competition as an additive gender-specific constant t_g, where $g \in \{m, f\}$. I also include a normally distributed error term ϵ_i^T. Children's belief about their expected utility in tournament pay is then:

$$\hat{p}_i 15 a_i^T + \hat{p}_i(15a_i^T - \hat{p}_i 15 a_i^T) - \lambda_i(1 - \hat{p}_i)(\hat{p}_i 15 a_i^T) + t_g + \epsilon_i^T \tag{1.2}$$

I assume that children choose the pay scheme that maximizes their expected utility, as specified in equations 1.1 and 1.2. In the experiment, I observe the choice between piece-rate and tournament pay for each child. I use this choice to estimate the gender-specific taste for competition t_g with a probit model. I calibrate the parameters of the model as follows: I assume $a_i^{PR} = a_i^T$, and let both equal the child's performance.[16] I let $\hat{p}_i$ equal the stated belief of children about their probability of winning. I calibrate λ_i for each child based on which λ_i would rationalize the lottery choices made by the child.[17]

In Table 1.5, column 1, I show the estimates of the model when assuming loss aversion. I find a strong dislike for competition for both girls ($5.90) and boys ($4.18). In comparison, total earnings from the experiment are on average $15. The finding that both boys and girls dislike competition is robust to several adjustments to the model. In column 2, I estimate the model imposing $\lambda_i = 1$ such that children have no loss aversion (and are risk-neutral). The estimates of the distaste for competition are similar to the observed estimates in the loss aversion model. In column 3, I estimate the model with CRRA utility, where risk aversion comes from the curvature of the utility function. That is, I assume children have utility over money x by $\frac{x}{1-r_i}^{1-r_i}$. I then calibrate the risk preferences parameter r_i using the lottery choices. In the CRRA model, the calibration of taste for competition is sensitive to the

[15]Because I assume that children know their own performance, any uncertainty about the probability of winning must come from their beliefs about the distribution of performance by their opponents.

[16]Data support the assumption that performance is independent of payment scheme. In total, 169 children did not have a parent make a choice for them; instead, they were randomized into either piece-rate or tournament pay. For these children, I find no difference in performance in the two treatments. More generally, several previous studies using similar experiments have documented that elasticity of performance to pay is typically low (Ifcher and Zarghamee (2016), DellaVigna et al. (2016), Araujo et al. (2016).)

[17]To calibrate λ_i, I choose the midpoint of the interval between the different λ_is, which would rationalize a given lottery choice. For the end points, I choose the λ_i that makes the child indifferent about that choice, and the next possible lottery.

wealth level at which it is compared to, and the level of risk aversion, as both of these factors influence the curvature of the utility function. The estimates are not as readily comparable to the results from the loss aversion model. In the table, I show estimates for zero wealth at the median level of risk aversion in the sample. Standard errors are constructed using the delta method. In the CRRA model, both girls and boys have a distaste for competition ($\$-9.98$ versus $\$-1.96$).

Parents' competitiveness choices for their children. I model the decision of parents as a trade-off between two motivations:

1. Maximize the expected utility of the child. I refer to this as the *altruistic* motivation.
2. Maximize the expected utility of the child from the parent perspective. I refer to this as the *paternalistic* motivation.

I let α denote the relative weight that parents' place on altruism. I allow for altruistic motivation and paternalistic motivation to differ in two ways. First, the parent's belief about the child's taste for competition may differ from their own taste for having their child compete ($\hat{t}_i \neq t_p$). Second, the parent's belief about the child's loss aversion may differ from their own loss aversion for their child ($\hat{\lambda}_i \neq \lambda_p$).

In my main specification, I use the same assumptions on the utility function as those in the loss aversion estimation for children's own choices; that is, linear utility over money with reference-dependent risk preferences. I assume that parents know their child's performance, and denote the parents' belief about their child's probability of winning the tournament as $\hat{p}_p$. If the child has chosen piece-rate pay, the utility of the parent is:

$$\alpha 5a_i^{PR} + (1-\alpha)5a_i^{PR} + \epsilon_p^{PR} = 5a_i^{PR} \tag{1.3}$$

In tournament pay, the utility of the parent is:

$$\begin{aligned} &\alpha\big((\hat{p}_p 15a_i^T + \hat{p}_p(15a_i - \hat{p}_p 15a_i) + (1-\hat{p}_p)\hat{\lambda}_i(-\hat{p}_p 15a_i) + \hat{t}_i)\big) \\ +(1-\alpha)&\big((\hat{p}_p 15a_i + \hat{p}_p(15a_i - \hat{p}_p 15a_i) + (1-\hat{p}_p)\lambda_p(-\hat{p}_p 15a_i) + t_p)\big) + \epsilon_p^T \end{aligned} \tag{1.4}$$

In the experiment, I observe parents' choices between piece-rate and tournament pay for their child. I assume that parents choose the pay scheme that maximizes their utility given equations 1.3 and 1.4. I then estimate a probit with the aim of estimating α and child-gender-specific t_g and t_b.

I calibrate the parameters of the model with a similar approach as that for the child estimation. I let $a^{PR} = a^T$, and set both equal to the child's performance. I let $\hat{p}$ equal the stated belief of the parent about their child's probability of winning the tournament, and I calibrate λ_p for each parent based on which λ_i would rationalize the lottery choices made by the parent for the child.[18] I use parents' stated probabilistic beliefs about what their child would choose to identify $\hat{t}_i$ and $\hat{\lambda}_i$.

[18]To calibrate λ_i, I choose the midpoint of the interval between the different λ_is that would rationalize a given lottery choice. For the end points, I choose the λ_i that makes the child indifferent about that choice, and the next possible lottery.

Table 1.5b shows the results of the estimation. I find that parents disliked competition for both boys and girls ($5.63 versus $4.78, respectively). I find that $\alpha = 0.59$, suggesting an important role for both altruistic and paternalistic motivation. In the raw data, I found that 26 percent of parents acted strictly paternalistically by choosing the opposite of that which they believed their child would prefer. However, in the raw data, it was not possible to identify whether parents who chose in line with the child's preferences did this for altruistic or paternalistic reasons.

In column 2, I estimate the model when $\lambda_p = 1$ for all parents. The results are similar to those for the loss aversion model: I estimate $\alpha = 0.59$, $t_b = \$ - 5.62$, and $t_g = \$ - 7.23$. In column 3, I estimate a version of the model with CRRA utility, similar to what I did earlier in the estimation for children's choices.[19] I find an α of 0.6, compared with 0.59 in columns 1 and 2. The results for taste for competing replicate s($−3.35 for girls and $−2.24 for boys).[20]

1.7 Children's beliefs

Having collected data on both children and parents, I step back and ask: how much do children's beliefs about their parents' preferences explain the observed difference in competitiveness among children? After all, it is possible that girls enter competition less often than boys because they internalize the competitiveness preference of their parents.

I ask children to guess what their parents, both mothers and fathers, would choose for them between piece-rate and tournament pay. The belief elicitation was not incentivized. Figure 1.9a shows children's beliefs by child gender. For the parents who participated in the experiment, both girls and boys believed that 29 percent of the parents would enter them into the tournament. By contrast, parents entered 27 percent of girls and 35 percent of boys. Children thus underestimated the difference in parents' choices for girls and parents' choices for boys ($p < 0.09$).[21]

Figure 1.9b shows children's beliefs separate for mothers and fathers. Both boys and girls believed that fathers were more likely than mothers to choose the tournament for them. The direction of this belief is correct, but they overstated the magnitude. Girls believed fathers were 30 percentage points more likely than mothers to enter them into the tournament, while boys believed the difference was 18 percentage points. Children vastly overstated the difference between the choices made by mothers and fathers. In the experiment, fathers were 11 percentage points more likely than mothers to enter girls into the tournament, and for boys, the difference was 6 percentage points. Children's beliefs correlate positively with choices of both mothers (0.12) and fathers (0.12), with girls' beliefs being more strongly correlated than boys' beliefs (0.24 versus 0.12, $p = 0.09$).

[19]Here, parents have utility over money x by $\frac{x}{1-r_p}^{1-r_p}$. I calibrate the risk preferences parameter r_p using parents' lottery choices for children. The other parameters are calibrated in the same way as for the loss aversion model

[20]In the CRRA model, the calibration of the taste for competition is sensitive to the wealth level that it is compared to, as well as the level of risk aversion. The reported estimates are for zero wealth and the median level of risk aversion. Standard errors were constructed using the delta method.

[21]The p-value is from a test using standard errors clustered at the parent–child pair.

In Table 1.6, I study the relationship between children's choices and parents' preferences. Column 1 shows, for reference, the regression of child tournament entry on a girl dummy with controls for child ability, child beliefs about his or her probability of winning the tournament, and child risk preferences (which is equivalent to column 4 in Table 1.3A). In column 2, I add a control for parents' own preferences for tournament entry. Qualitatively, parents' own competitiveness preferences are positively correlated with children's choices, but this relationship is not significant.[22] Furthermore, the coefficient on the gender dummy is unchanged when adding the control for parents' own preferences.

In column 3, I control for parents' choice for their child. Parents' choice for their child strongly predict the child's own choice. In column 4, I control for children's beliefs about their parents' choices. Children's beliefs about their mothers' and their fathers' preferences are significantly correlated with children's choices.

However, even after controlling for these variables, the coefficient on the gender dummy is unchanged. This suggests that parents' preferences and children's beliefs about parents' preferences correlate with children's choices; however, they do not explain the gender difference in children's choices.

1.8 Conclusion

The literature consistently finds that boys are more competitive than girls, and that the differences in competitiveness may be a driver for gender differences in education and labor market outcomes (lit. review: Kagel and Roth (2016)). However, parents are also likely to play a role in education and career choices, which suggests that it is important to understand how parents make competitiveness choices for their children.

I present the results from an experiment on more than 1600 parents and adolescent children where i) children make their own competitiveness choices, and ii) parents make competitiveness choices for their children. I find that parents chose 27 percent more competition for boys than for girls, and this difference is larger for the highest performing children. Compared with children's own choices, the gender difference in parents' choices is 50 percent smaller.

Why do parents choose differently for boys and girls? I document that parents' risk attitudes and parents' beliefs about their child's probability of winning the tournament are not important in explaining the difference in choices for boys and girls. Instead, the gender difference in parents' choices is primarily explained by parents' beliefs about their children's preferences. Parents overestimate the gender gap in children's choices, and conditional on parents' beliefs, there is no difference in how parents choose for boys and girls.

A large proportion of parents chose the opposite of what they believed their child preferred, suggesting that paternalistic motivation is important for parents. In a structural model, I estimate that the relative weight on paternalistic motivation is about 0.4. When parents choose differently from what they believe their children prefer, they tend to enter girls into and take boys out of the tournament.

[22] I note that the raw correlation between children's and parents' preferences is positive (0.1, $p < 0.01$). The correlation is not statistically different for girls, boys, mothers, or fathers.

I also compare the choices of mothers and fathers. Fathers make much more competitive choices for their children, both for boys and girls. I attributed this difference between mothers and fathers to the parents' own preferences; fathers like to compete more than mothers, and the parents' own preferences influence the choices they make for their children.

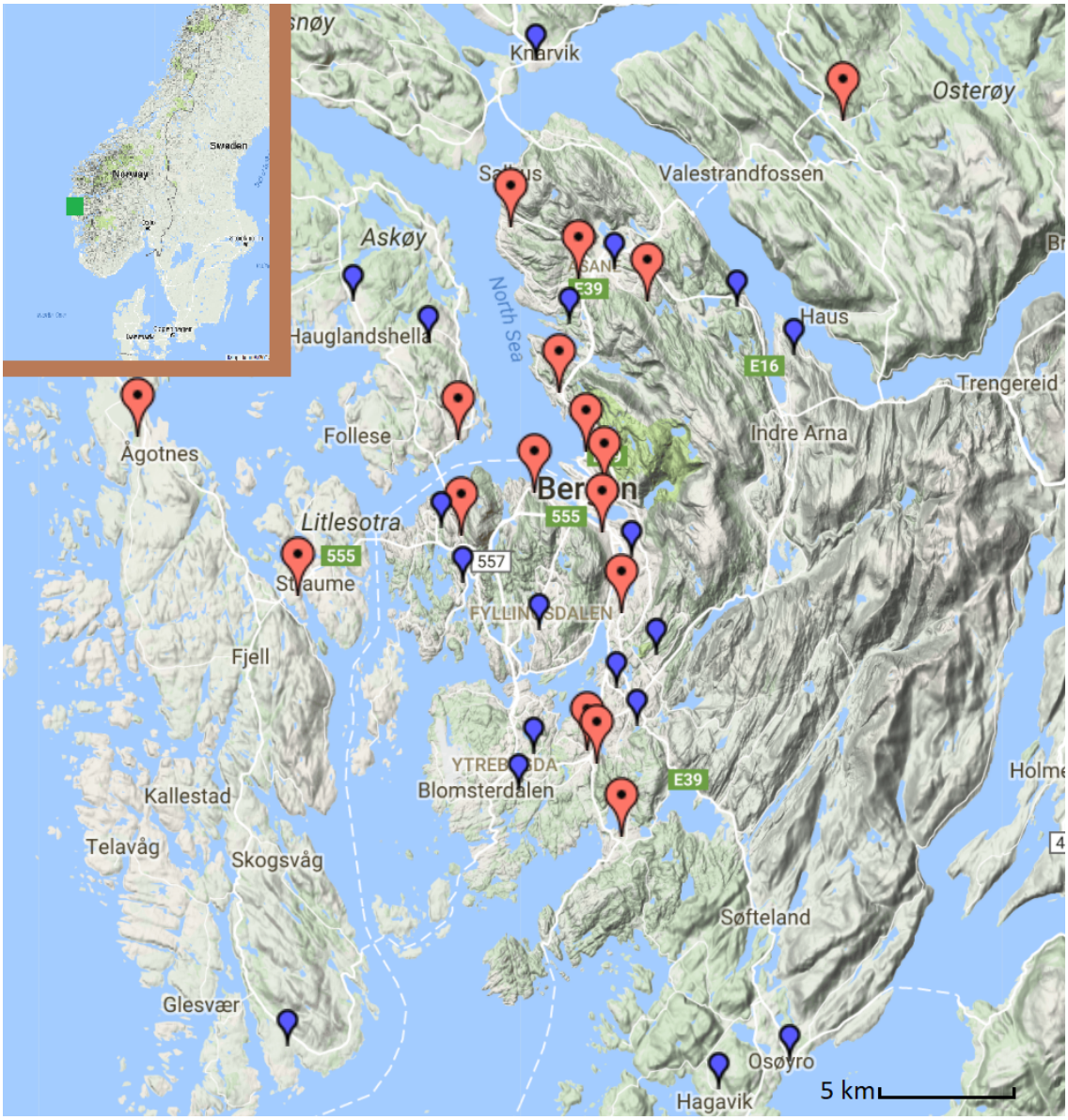
These findings suggest that when parents make choices for their children, we should expect different outcomes for boys and girls. Furthermore, the fact that the gender difference in parents' choices is increasing in child ability may be particularly troubling, as it is precisely the high-ability girls who would benefit the most from pursuing competitive education and career paths.

Do parents generate the gender difference in competitiveness among children? I would argue that the data suggest that this is not the case. First, when parents act paternalistically, they are more likely to enter girls into and take boys out of the tournament. Thus, it appears that parents themselves do not have preferences for having boys compete and having girls not compete. Second, if parents were an important force for generating the observed gender difference, it seems reasonable that this would be known to children. However, children themselves do not believe that parents will make different choices for boys and girls.

This paper suggests several avenues of new research. When extrapolating the results from this study, it is important to consider the extent to which the results are context-dependent. This study was conducted in Norway, one of the most gender-equal countries in the world. Would parents from less gender-equal societies act differently?

Finally, the experimental paradigm introduced in this experiment may apply to the study of a wide range of questions in the domain of parent–child interaction, where experimental data are generally scarce. For example, how would parents make choices in the domain of social preferences for their children? Would parents make time-inconsistent choices for their children? Are parents generally aware of the biases in their children, and if so, are parents willing to intervene when they believe they are making an error? Parents are influential for children's long-term outcomes, and thus, it is of great importance that we gain a better understanding of how parents make choices for their children.

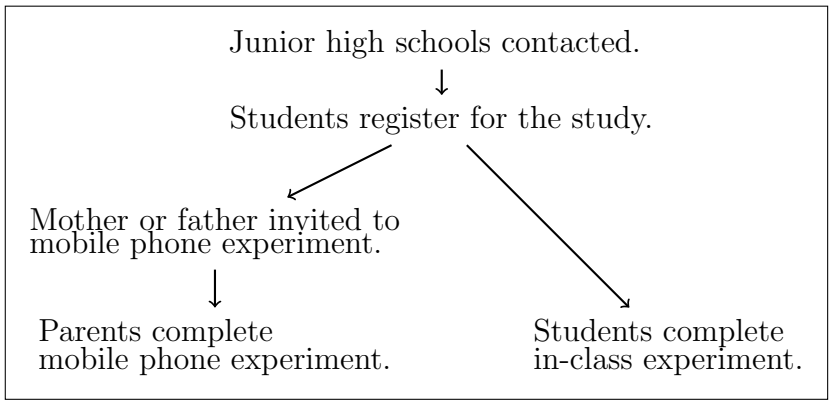
Figure 1.1: Map of participating and non-participating schools



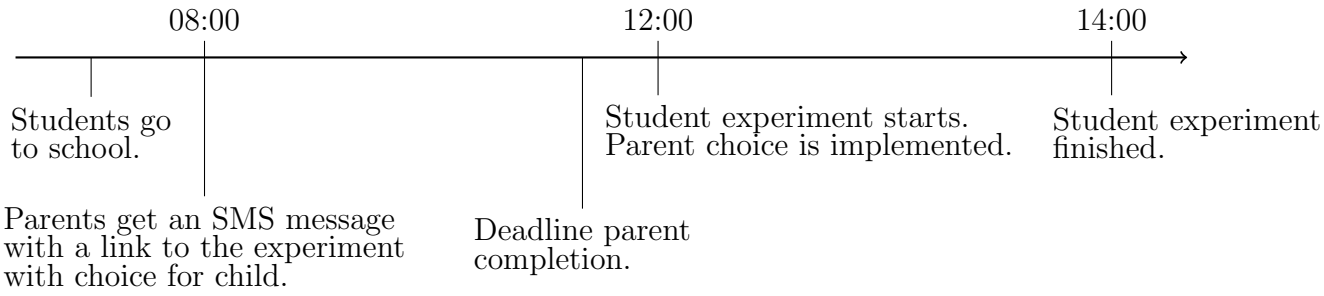
Note: All schools with at least 25 eligible students and within 2 hours' driving distance from Bergen, Norway were invited to participate in the study. Large red markers indicate the 17 participating schools (including two pilot schools). Small blue markers indicate the 19 non-participating schools. The green rectangle in the upper-right corner indicates the location of Bergen.

Figure 1.2: Study design

(a) Recruitment of participants



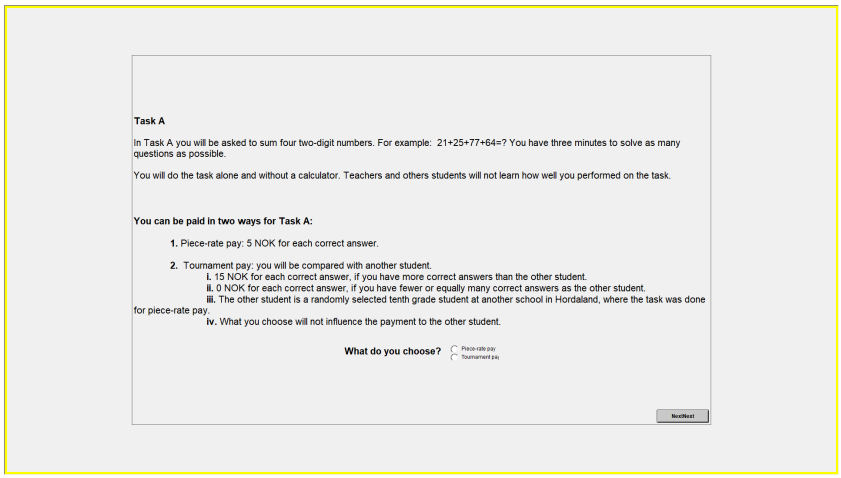
(b) Timeline of experiment



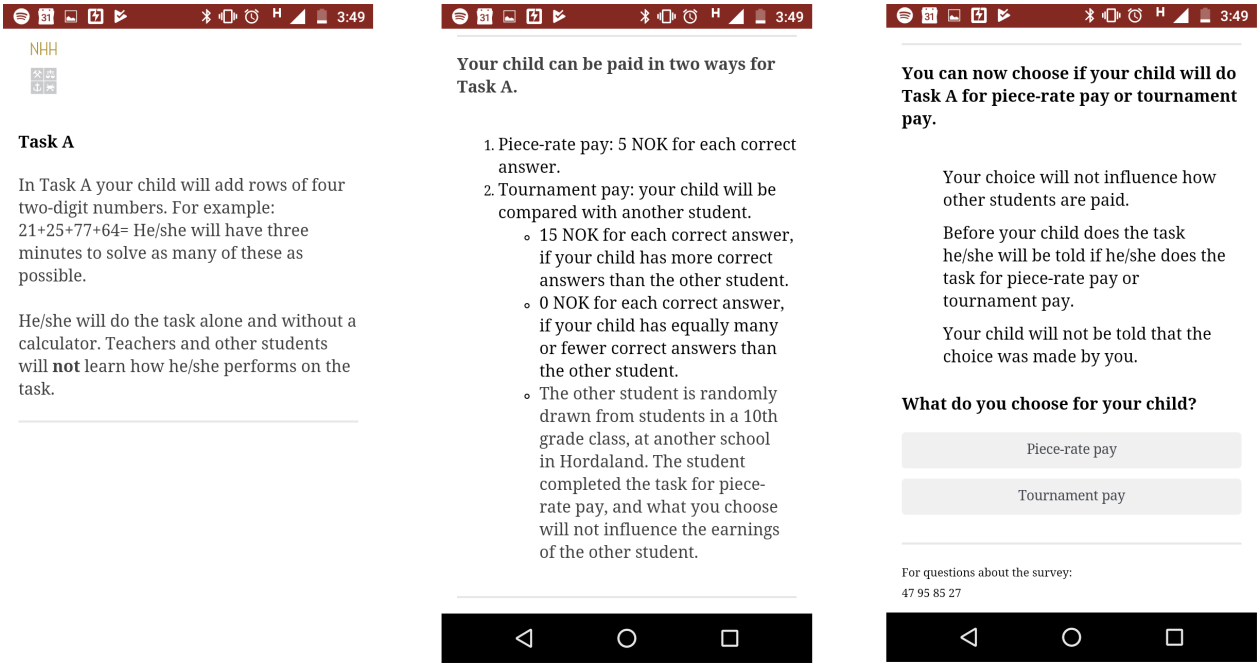
Note: Panel a) shows the recruitment process. In total, 910 children participated in the student experiment (81% participation rate), and 770 parents participated in the parent experiment (82% participation rate); thus, 740 parent–child pairs completed the experiment. Panel b) shows the implementation of the experiment, which occurred on different days for each participating school. The parent experiment started after children had left for school to mitigate opportunities for communication between parents and children. The child experiment started after the midday lunch break, typically at noon.

Figure 1.3: Screenshots from experiments (English translations)

(a) Child experiment

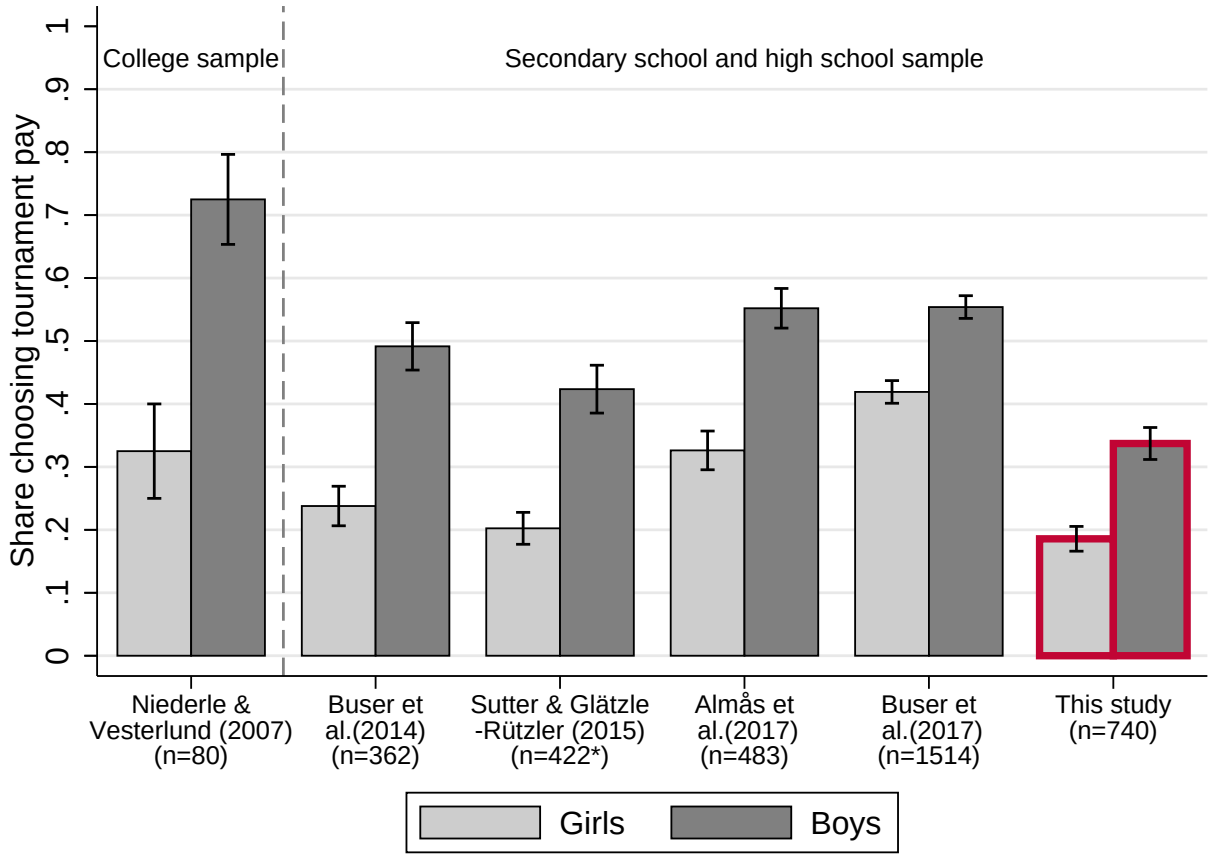


(b) Parent experiment



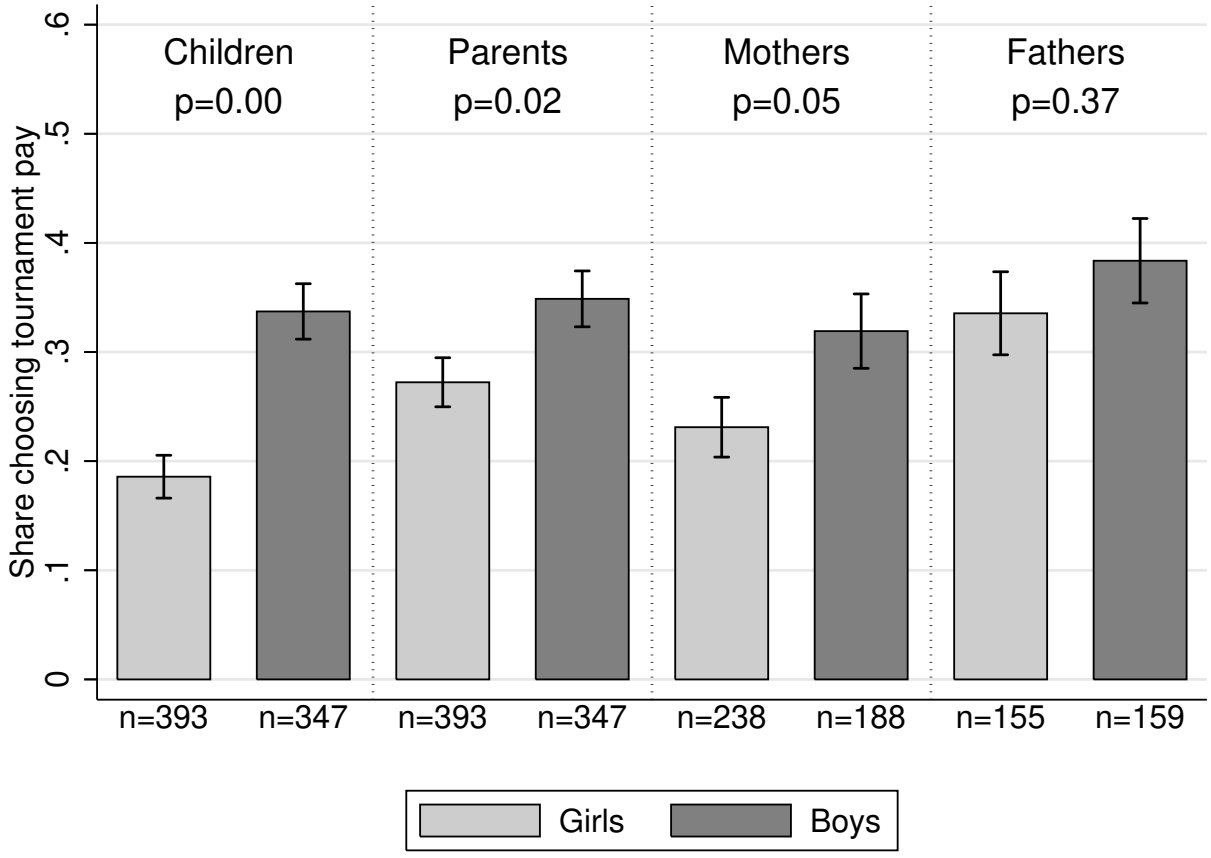
Note: The screenshots show the child's and parent's choice of piece-rate or tournament pay for the child. The child then does the task, first with their own pay choice, and second with their parent's choice. The child experiment was coded in z-Tree (Fischbacher (2007)), and the parent experiment was coded in Qualtrics (Qualtrics (2013)).

Figure 1.4: Gender differences in competitiveness on math task



Note: The figure shows gender differences in competitiveness for studies that employ a comparable measure of competitiveness and have an adolescent sample, with the exception of Niederle and Vesterlund (2007), who uses a sample of university students. Buser et al. (2014) is from experiments on ninth-grade students in Amsterdam, Netherlands. Sutter and Glätzle-Rützler (2015) studies competitiveness among children aged 9–18 years in Tyrol, Austria. The figure here shows competitiveness choices only for adolescent children (age 13–18 years). The full sample includes 1,570 respondents. Almås et al. (2015) studies competitiveness among ninth-grade students in Bergen, Norway. Buser et al. (2017b) studies competitiveness among ninth-grade students in the canton of Bern, Switzerland. This study was conducted in Bergen, Norway on a sample of 10th-grade students. Bars indicate 95 percent confidence intervals.

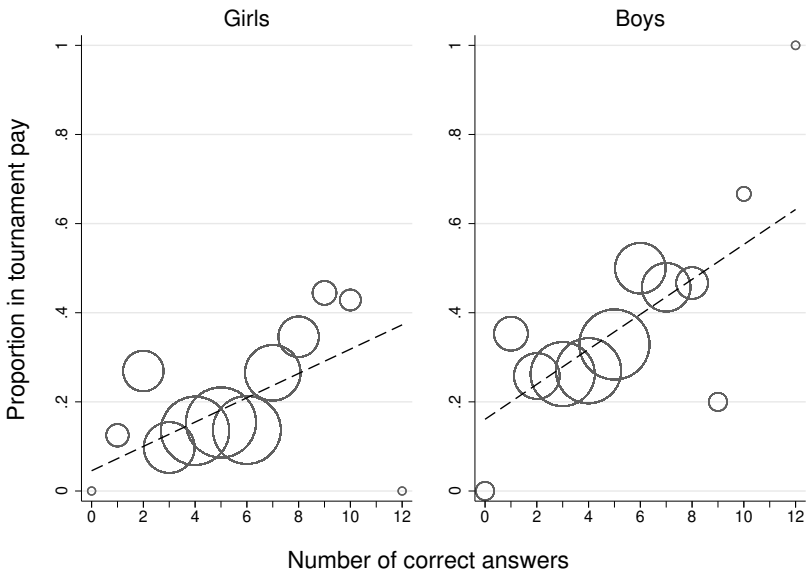
Figure 1.5: Tournament choices for children



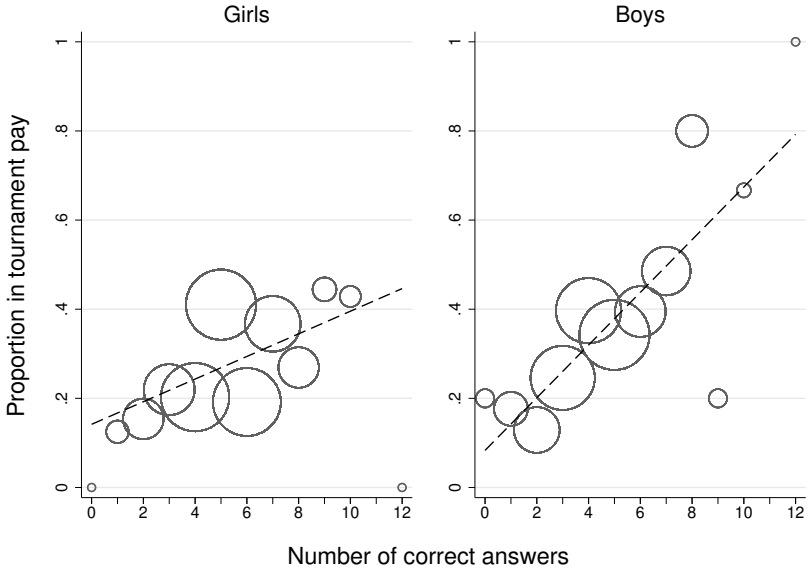
Note: The error bars indicate robust standard errors. The gender difference in children's choices compared with the gender difference in parents' choices is significant, with a p-value of 0.07, using robust standard errors clustered at the parent–child level. The gender difference in mothers' choices compared with that in fathers' choices is not statistically significant (p=0.567).

Figure 1.6: Heterogeneity: tournament choice and performance

(a) Children's tournament choice for self



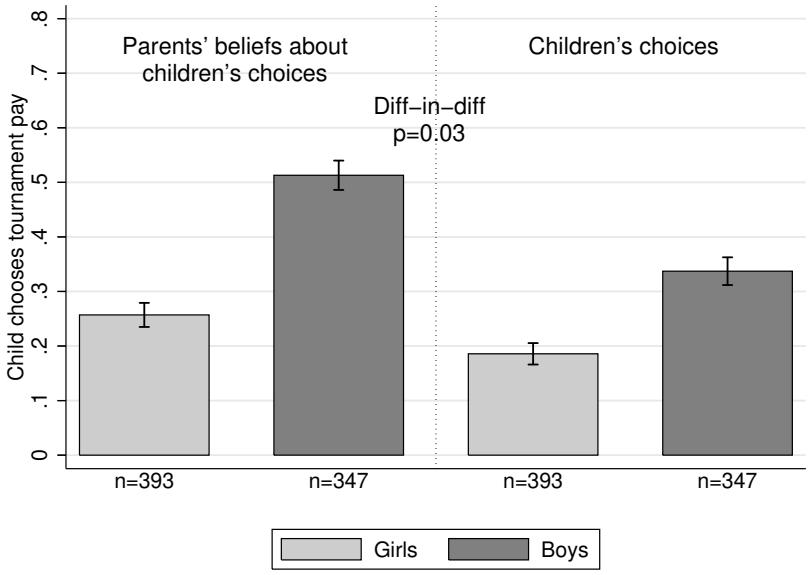
(b) Parents' tournament choice for their children



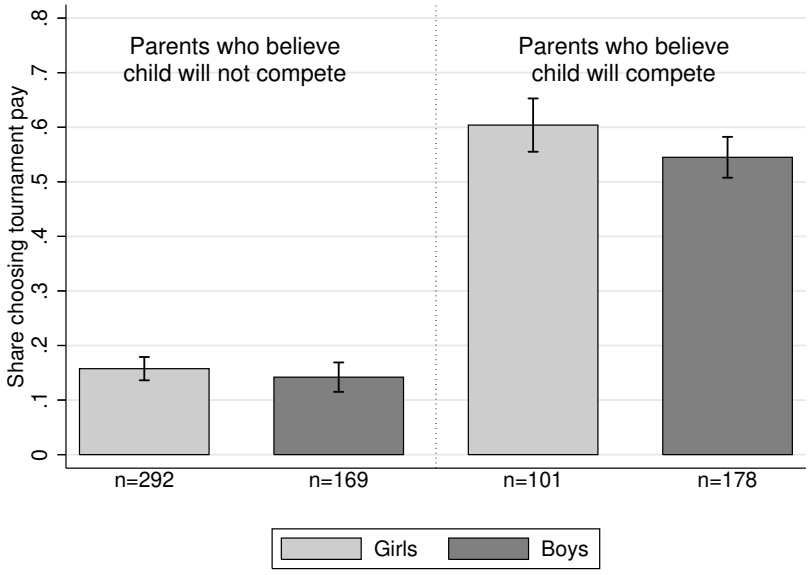
Note: Number of correct answers is from round three, where all children did the task for the same pay scheme. For children, both girls' and boys' choices correlate positively with tournament entry, and I cannot reject that the correlations are the same. For parents' choice, the correlation for boys is significantly stronger than that for girls ($p < 0.05$).

Figure 1.7: Mechanism: beliefs about choices

(a) Parents' beliefs versus children's choices



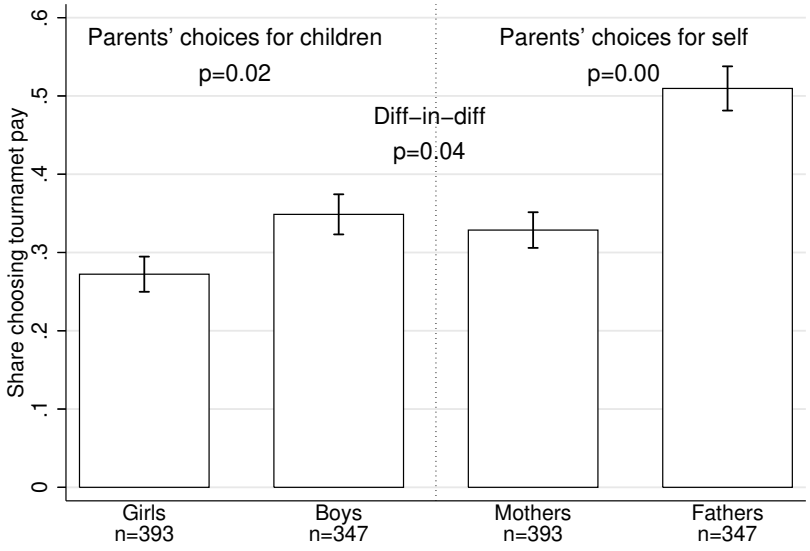
(b) Parents' choices conditional on beliefs



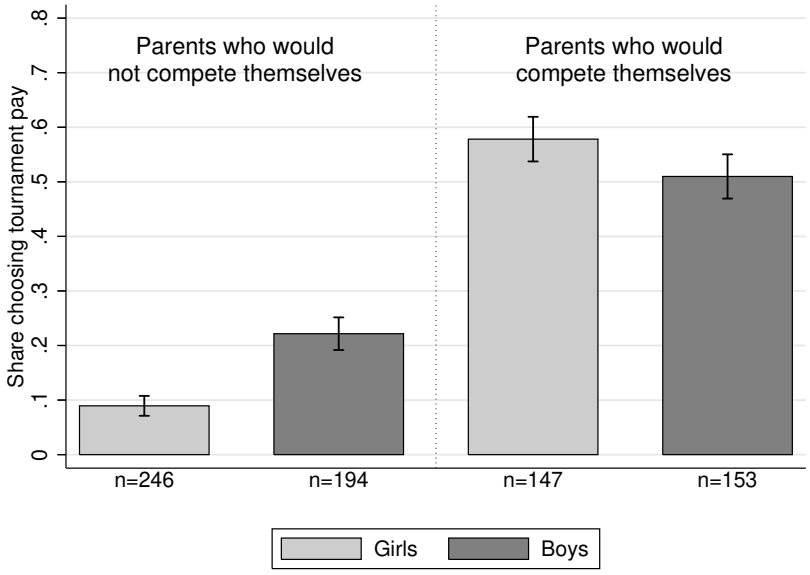
Note: The error bars indicate robust standard errors. Parents' beliefs are binary, and the elicitation was incentivized.

Figure 1.8: Mechanism: parents' own preferences

(a) Parents' choices for self



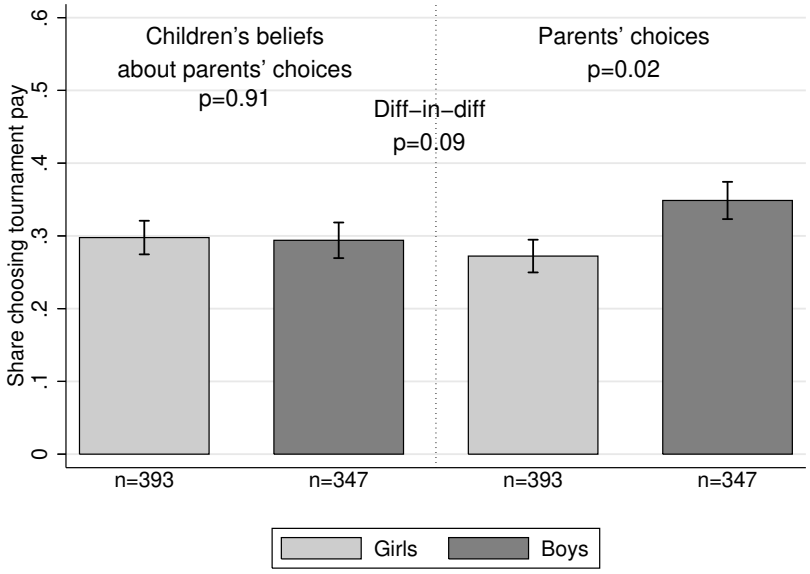
(b) Parents' choices conditional on preferences for self



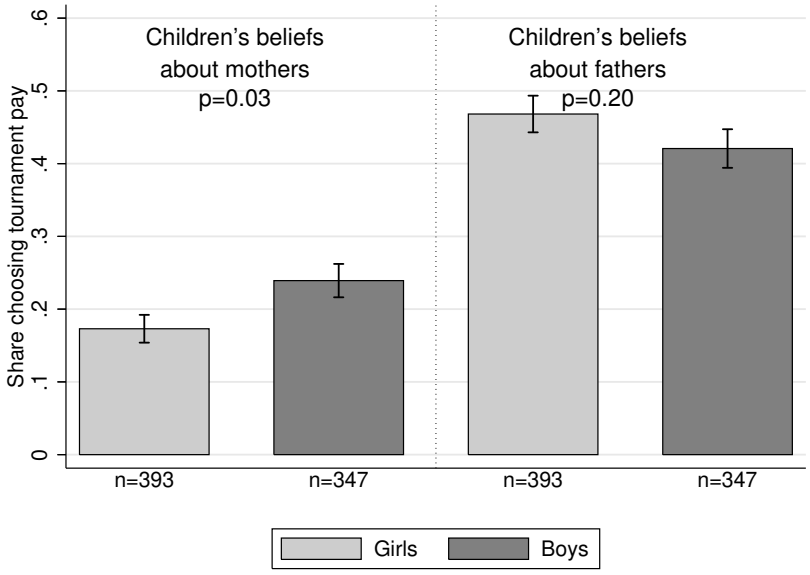
Note: Error bars indicate robust standard errors. Parents' own competitiveness choices are not incentivized.

Figure 1.9: Children's beliefs about parents' choices

(a) Beliefs versus actual choices



(b) Beliefs by parent gender



Note: Error bars indicate robust standard errors. Beliefs are binary, and the elicitation was not incentivized.

Table 1.1: Descriptive statistics

Panel A: School characteristics

	National average		Non-participating		Participating schools	
	Boys	Girls	Boys	Girls	Boys	Girls
Mathematics	3.5	3.7	3.5	3.8	3.6	3.7
Norwegian Bokmål	3.5	4.2	3.5	4.2	3.6	4.2
Norwegian Nynorsk	3.4	4.0	3.4	4.0	3.4	4.0
Norwegian oral	4.0	4.6	4.0	4.6	4.1	4.5
English written	3.7	4.2	4.0	3.8	3.9	4.2
English oral	4.1	4.4	4.1	4.5	4.2	4.5

Panel B: Participant characteristics

	Scale	**Boys**	**Girls**	***p*-value**
Parent female	dummy	0.54	0.60	0.08
Parents live together	dummy	0.69	0.72	0.37
Parents are married	dummy	0.61	0.65	0.35
Parent age	years	46.36	46.95	0.14
Biological parent	dummy	0.95	0.95	0.91
Family speaks foreign language	dummy	0.15	0.14	0.65
Child has brothers	dummy	0.70	0.68	0.55
Child has sisters	dummy	0.74	0.67	0.06
Number of observations		347	393	

Note: Panel A shows the average grades for 10th-grade students for school year 2016/2017, split by child gender. Grades are given on a scale from 1 (lowest) to 6 (highest). Columns 1 and 2 show schools that participated in either the pilot study or the main sample. Columns 2 and 3 show schools that were invited to participate, but did not. Columns 5 and 6 show the national average. Panel B: Column 1 shows the characteristics of boys and parents of boys, column 2 shows the characteristics of girls and parents of girls, and column 3 shows the p-value of the difference using robust standard errors.

Table 1.2: Overview of experimental outcomes

Children

	Scale	Boys	Girls	*p*
Competitiveness				
Tournament entry	dummy	0.34	0.19	0.00
Optimal tournament entry	dummy	0.49	0.61	0.00
Certainty about choice	0-10 (most certain)	5.82	5.37	0.02
Self-assessment: willing to compete	0-10 (most willing)	7.36	6.61	0.00
Performance				
Performance (common pay scheme)	# correct answers	4.50	5.14	0.00
Belief about relative performance	0 - 10 (best)	0.61	0.53	0.00
Risk preferences				
Risk taking lottery choice	1 - 5 (highest risk)	2.65	2.15	0.00
Risk taking self-assessment	0 - 10 (seek risk)	5.73	5.11	0.00
Beliefs about parents				
Mother will choose tournament for child	dummy	0.24	0.17	0.03
Father will choose tournament for child	dummy	0.42	0.46	0.20
General attitudes				
Important to be competitive for success	0 - 10 (important)	6.69	6.10	0.00
Important to be successful to be happy	0 - 10 (important)	6.24	5.73	0.00
Lack of female CEO's is problematic	0 - 10 (important)	4.07	6.36	0.00
Number of observations		347	393	

Parents

	Scale	Boys	Girls	*p*
Competitiveness for child				
Tournament entry (all parents)	dummy	0.35	0.27	0.02
Tournament entry (mothers, n=426)	dummy	0.32	0.23	0.05
Tournament entry (fathers, n=314)	dummy	0.38	0.34	0.38
Competitiveness for self				
Tournament entry (all parents)	dummy	0.44	0.37	0.07
Tournament entry (mothers, n=426)	dummy	0.35	0.31	0.38
Tournament entry (fathers, n=314)	dummy	0.55	0.47	0.18
Belief about child				
Child enters tournament	dummy	0.51	0.26	0.00
Child's relative performance	0 - 10 (best)	6.55	6.70	0.24
Risk preferences over child outcomes				
Risk taking lottery choice	1 - 5 (highest risk)	2.18	2.20	0.83
Risk taking self-assessment	0 - 10 (seek risk)	5.39	5.46	0.65
General attitudes				
Important to be competitive for success	0 - 10 (important)	6.39	6.51	0.34
Important to be successful to be happy	0 - 10 (important)	6.40	6.49	0.50
Lack of female CEO's is problematic	0 - 10 (important)	5.67	6.20	0.00
Number of observations		347	393	

Note: Column 3 indicates p-values of the differences between boys and girls using robust standard errors. Optimal tournament entry for children is defined as the pay scheme that has the highest expected earnings.

Table 1.3: Traditional mechanisms for tournament choices for children

Panel A: Children

Dependent variable:	**Child chooses tournament pay**					
	(1)	(2)	(3)	(4)	Boys	Girls
Female (child)	-0.151***	-0.173***	-0.123***	-0.088***		
	(0.032)	(0.032)	(0.033)	(0.032)		
Number of correct answers (child)		0.033***	0.014	0.011	0.012	0.013
		(0.008)	(0.009)	(0.009)	(0.013)	(0.011)
Belief probability of winning (child)			0.047***	0.042***	0.042***	0.043***
			(0.009)	(0.008)	(0.013)	(0.011)
Risk taking lottey choice (child)				0.053***	0.091***	-0.005
				(0.013)	(0.017)	(0.018)
Risk taking self-assessment (child)				0.017**	0.011	0.024**
				(0.007)	(0.011)	(0.010)
Observations	740	740	740	740	347	393
R-squared	0.030	0.052	0.089	0.128	0.153	0.077

Panel B: Parents

Dependent variable:	**Parent chooses tournament pay for child**					
	(1)	(2)	(3)	(4)	Boys	Girls
Female (child)	-0.076**	-0.089***	-0.101***	-0.105***		
	(0.034)	(0.032)	(0.033)	(0.032)		
Number of correct answers (child)		0.079***	0.072***	0.058***	0.066***	0.048***
		(0.009)	(0.009)	(0.009)	(0.013)	(0.014)
Belief probability of winning of child (parent)			0.021**	0.024***	0.035***	0.015
			(0.009)	(0.008)	(0.012)	(0.011)
Risk taking lottey choice for child (parent)				0.038***	0.054**	0.030
				(0.014)	(0.021)	(0.019)
Risk taking self-assessment for child (parent)				0.044***	0.022*	0.064***
				(0.008)	(0.011)	(0.010)
Observations	740	740	740	740	347	393
R-squared	0.007	0.102	0.109	0.167	0.180	0.165

Note: The regressions include a constant term that is not shown in the tables. The p-values are constructed using robust standard errors.

Table 1.4: Parents' choices: new mechanisms

Dependent variable:	**Parent chooses tournament pay for child**					
	(1)	(2)	(3)	(4)	Boys	Girls
Female (child)	-0.105**	-0.078**	-0.060*	0.011		
	(0.032)	(0.030)	(0.031)	(0.030)		
Parent chooses tournament for self		0.332***	0.327***	0.268***	0.183***	0.359***
		(0.034)	(0.034)	(0.034)	(0.048)	(0.047)
Child's tournament choice for self			0.109***	0.096***	0.095*	0.088*
			(0.038)	(0.036)	(0.050)	(0.050)
Parent belief about child's tournament choice				0.280***	0.282***	0.257***
				(0.036)	(0.048)	(0.052)
Controls from Table 2B	Yes	Yes	Yes	Yes	Yes	Yes
Observations	740	740	740	740	347	393
R-squared	0.167	0.278	0.288	0.359	0.320	0.425

Note: All regressions in the table include controls from Table 3B, column 4; child performance, parent belief about the probability of winning, parent risk attitudes, and a constant term. The p-values are constructed using robust standard errors.

Table 1.5: Mechanisms for tournament choices: structural analysis

Panel A: Children

Model:	**Loss aversion**	**Risk neutral**	**CRRA**
	(1)	(2)	(3)
Implied taste for competing in USD:			
For girls:	-5.94***	-7.23***	-9.98***
	(0.46)	(0.651)	(1.77)
For boys:	-4.19***	-5.62***	-1.96***
	(0.52)	(0.75)	(0.53)
Observations	740	740	740
Log Likelihood	-378.87	-384.31	-377.83

Panel B: Parents

Model:	**Loss aversion**	**Risk neutral**	**CRRA**
	(1)	(2)	(3)
Weight on altruisms relative to paternalism	0.59***	0.59***	0.60***
	(0.03)	(0.03)	(1.776)
Implied taste for competing in USD:			
For girls:	-5.63***	-7.00***	-3.35***
	(0.86)	(1.19)	(1.05)
For boys:	-4.78***	-5.84***	-2.24***
	(0.58)	(0.74)	(0.61)
Observations	740	740	740
Log Likelihood	-358.07	-360.43	-352.00

Note: Panel A) shows estimates of gender-specific taste for competition among children. The estimates come from a probit model, where risk preferences, ability, and beliefs about the probability of winning are calibrated based on experimental outcomes. Panel B) shows estimates of mechanisms for parents' choices for their children. The estimates come from a probit model, where beliefs about children's preferences, risk preferences, ability, and beliefs about the probability of winning are calibrated based on experimental outcomes.

Table 1.6: Children's choices and parents' preferences

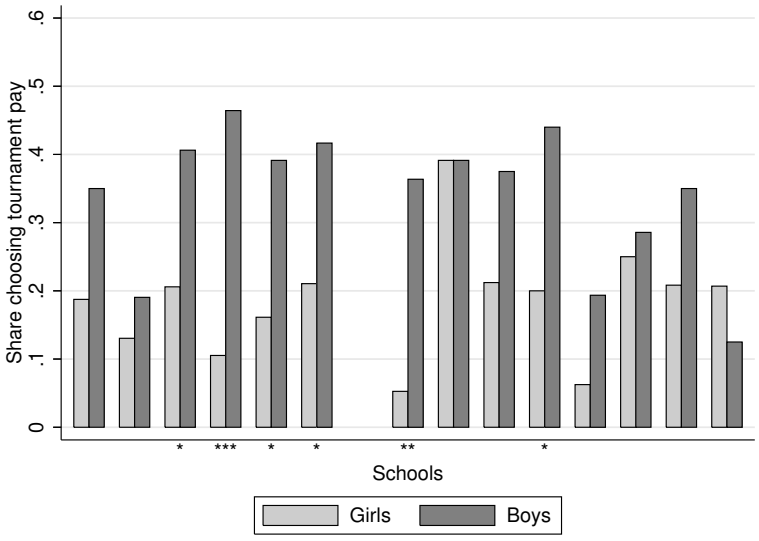
Dependent variable:	**Child chooses tournament pay**					
	(1)	(2)	(3)	(4)	Boys	Girls
Female (child)	-0.088***	-0.086***	-0.081**	-0.082**		
	(0.032)	(0.033)	(0.032)	(0.032)		
Parent chooses tournament for self		0.051	0.002	-0.005	-0.002	0.005
		(0.032)	(0.035)	(0.035)	(0.051)	(0.047)
Parent chooses tournament for child			0.133***	0.118***	0.123**	0.100*
			(0.039)	(0.039)	(0.057)	(0.055)
Child believes mother will choose tournament for child				0.115***	0.081	0.145**
				(0.041)	(0.058)	(0.058)
Child believes father will choose tournament for child				0.051*	0.060	0.042
				(0.031)	(0.050)	(0.038)
Observations	740	740	740	740	347	393
R-squared	0.128	0.131	0.146	0.161	0.177	0.121

Note: All regressions in the table include controls from Table 3A, column 4; child performance, child belief about the probability of winning, child risk attitudes, and a constant term. The p-values are constructed using robust standard errors.

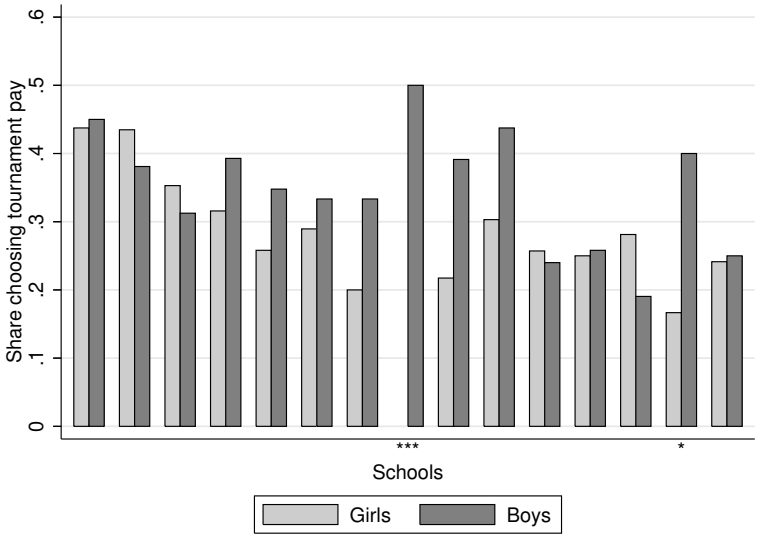
1.9 Additional figures and tables

Figure 1.10: Proportion competing by school

(a) Children's choices



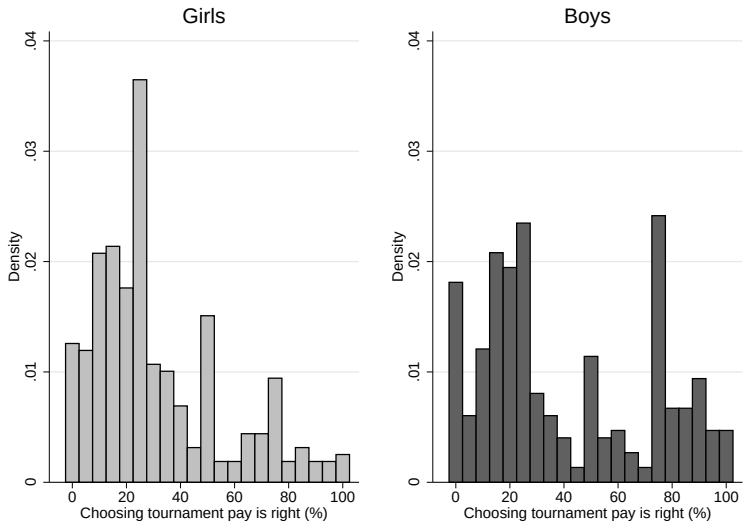
(b) Parents' choices



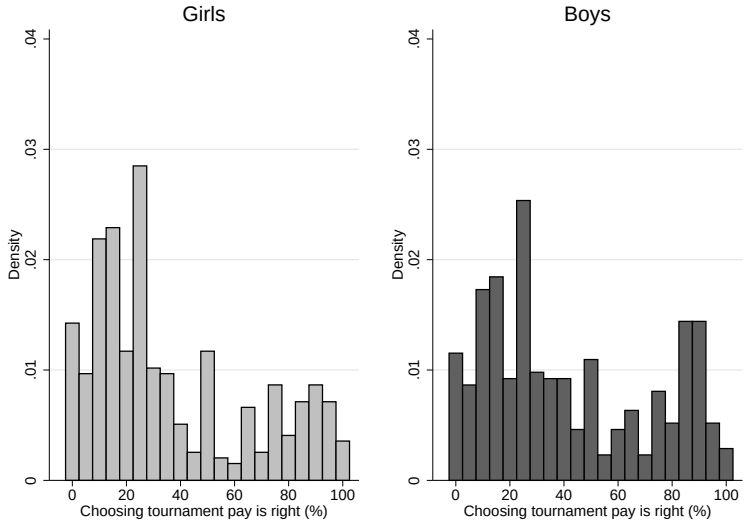
Note: Panel a) shows the proportion of boys choosing to compete at each school. Note, for one school, no children choose to compete ($N = 14$). Panel b) shows the proportion of parents who choose to let their boys and girls compete at each school. The schools in panels a) and b) are shown in the same order. The stars on the x-axis indicate whether the difference between boys and girls in a school is significant, with * for $p < 0.1$, ** for $p < 0.05$, and *** for $p < 0.01$. The average number of observations per school is 50.

Figure 1.11: Certainty about choices

(a) Children's degree of certainty about their own choices



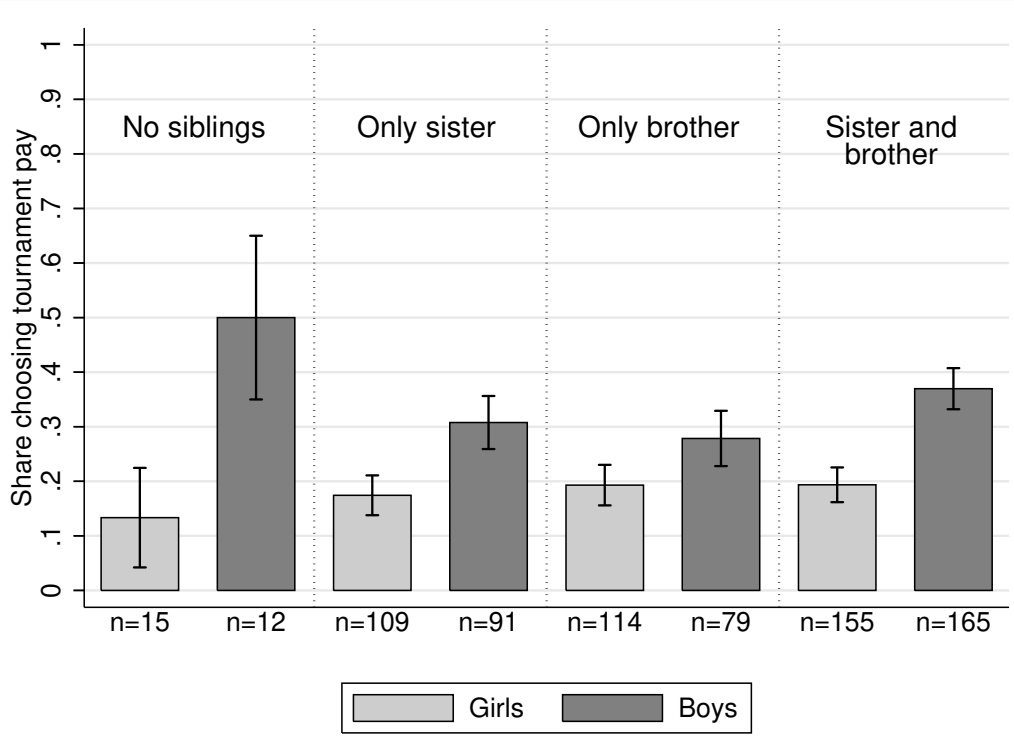
(b) Parents' degree of certainty about their choices for their children



Note: Panel a) After children chose piece-rate or tournament pay, they were asked how certain they were that the choice was "right" for them. Panel b) After parents chose piece-rate or tournament pay for their child, they were asked how certain they were that the choice was "right" for their child.

Figure 1.12: Heterogeneity by gender of siblings

(a) Children's own choices



(b) Parents' choices for children

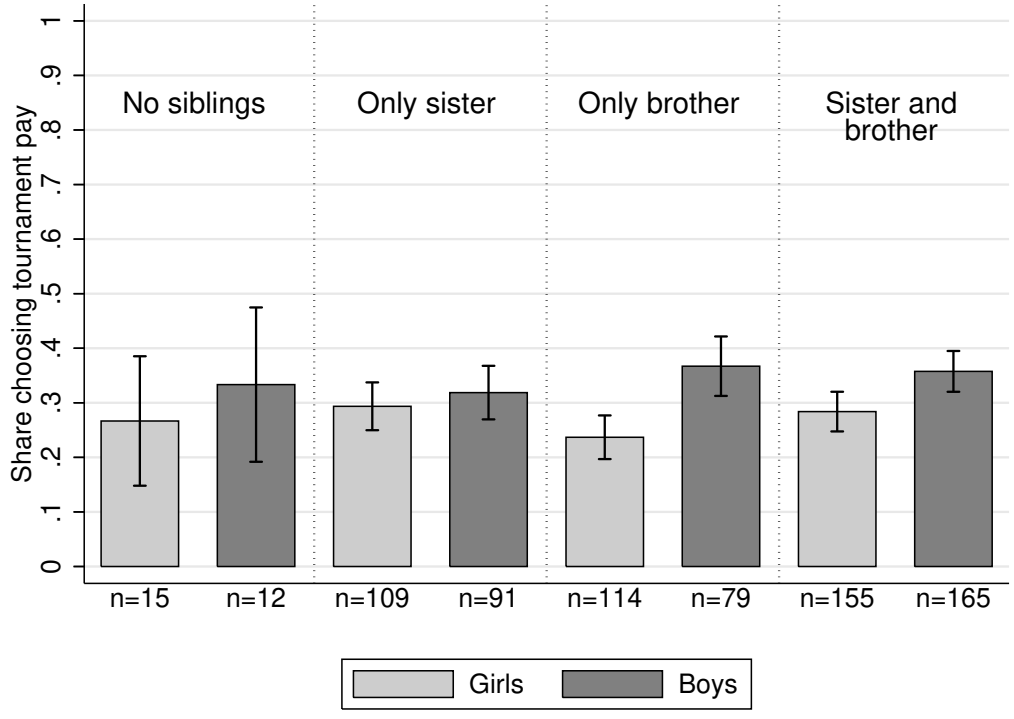
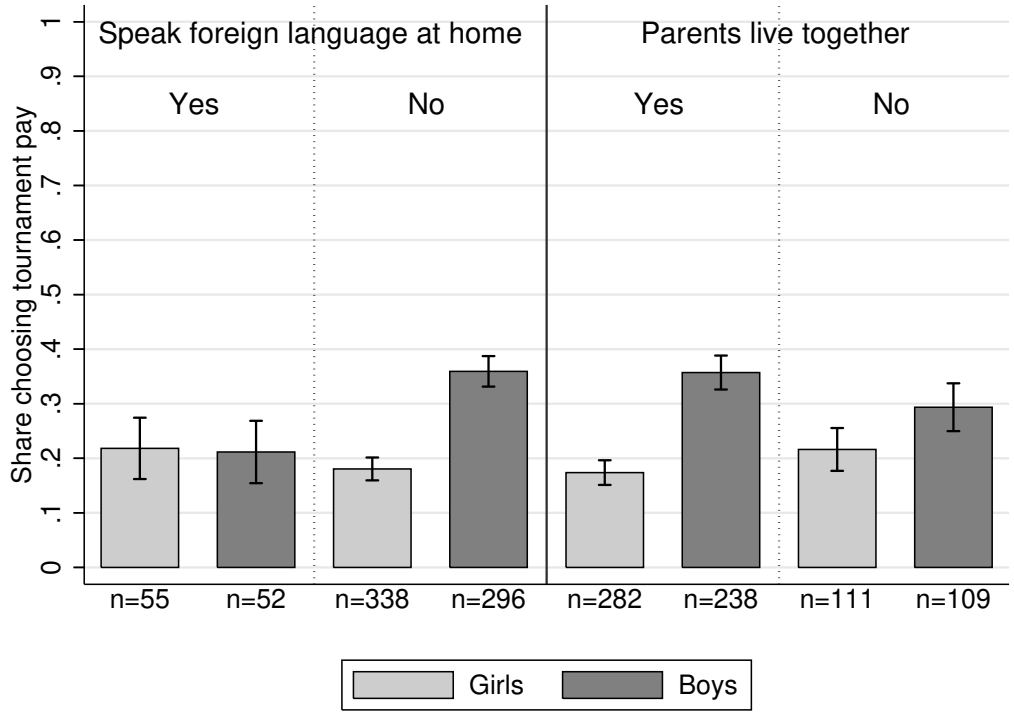


Figure 1.13: Heterogeneity by family characteristics

(a) Children's own choices



(b) Parents' choices for children

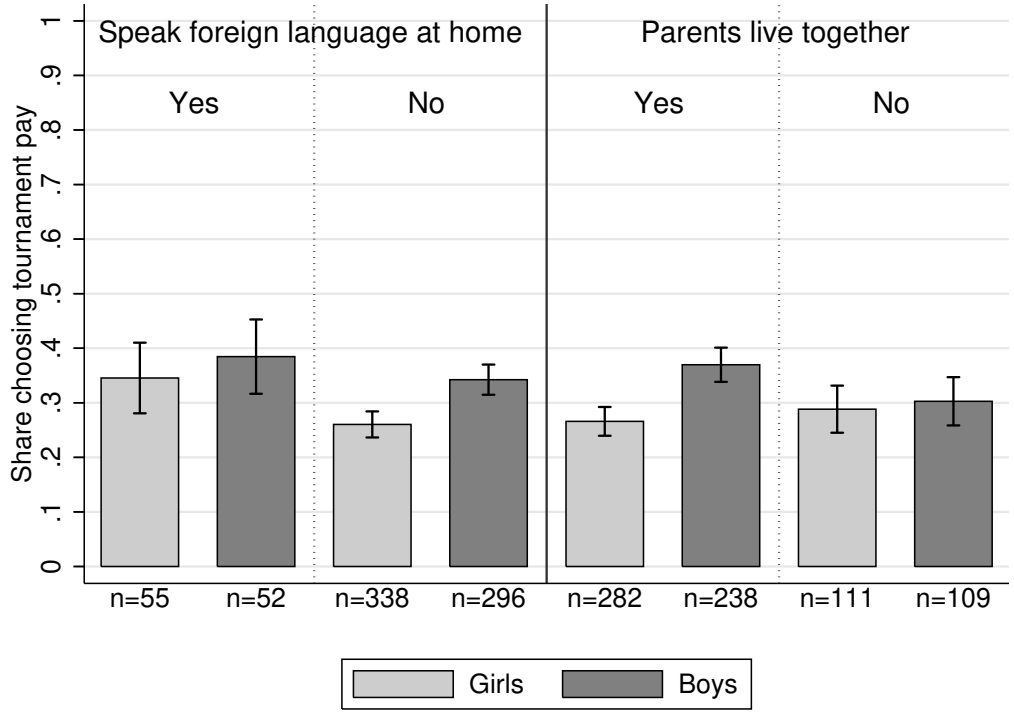
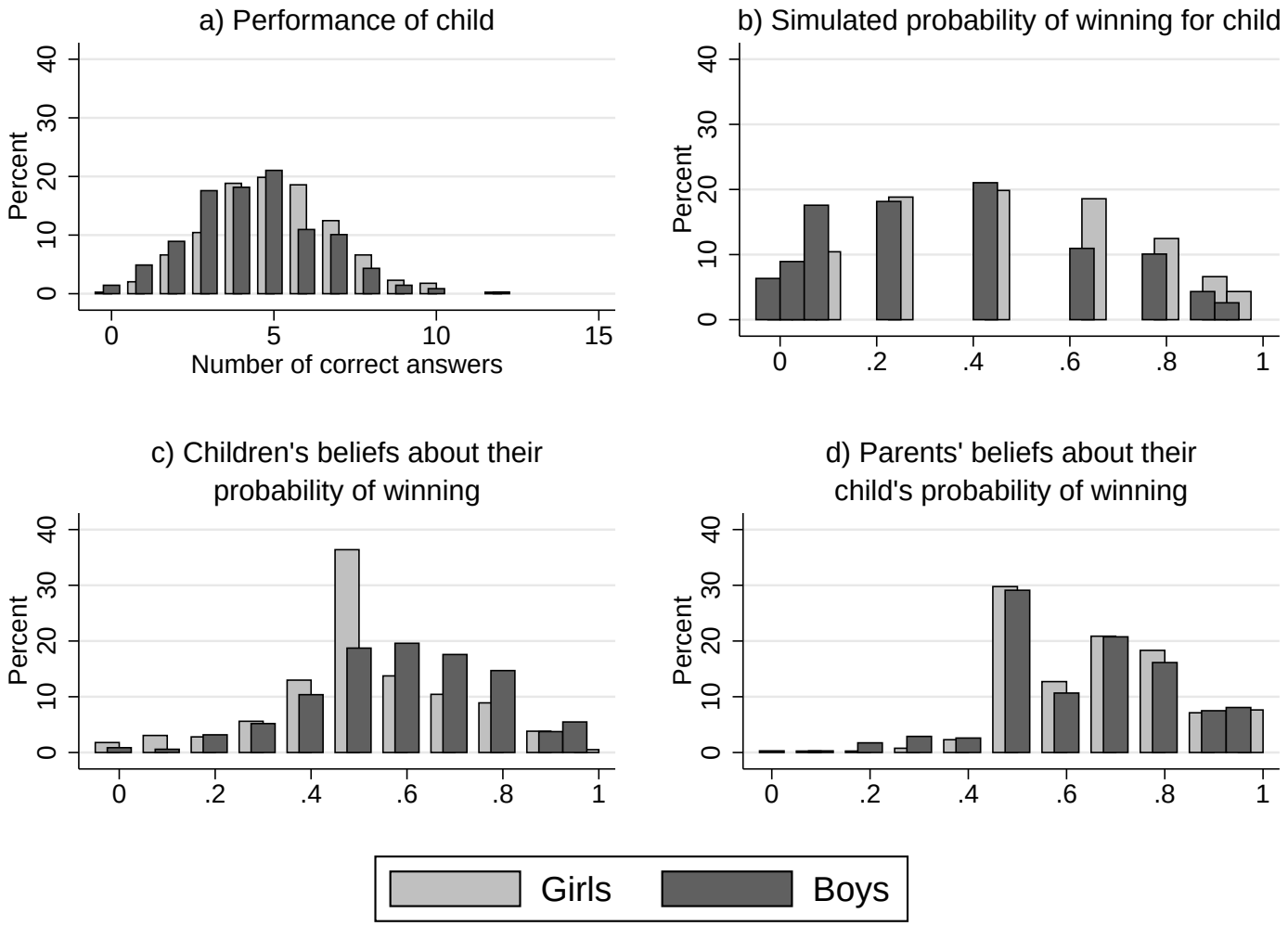
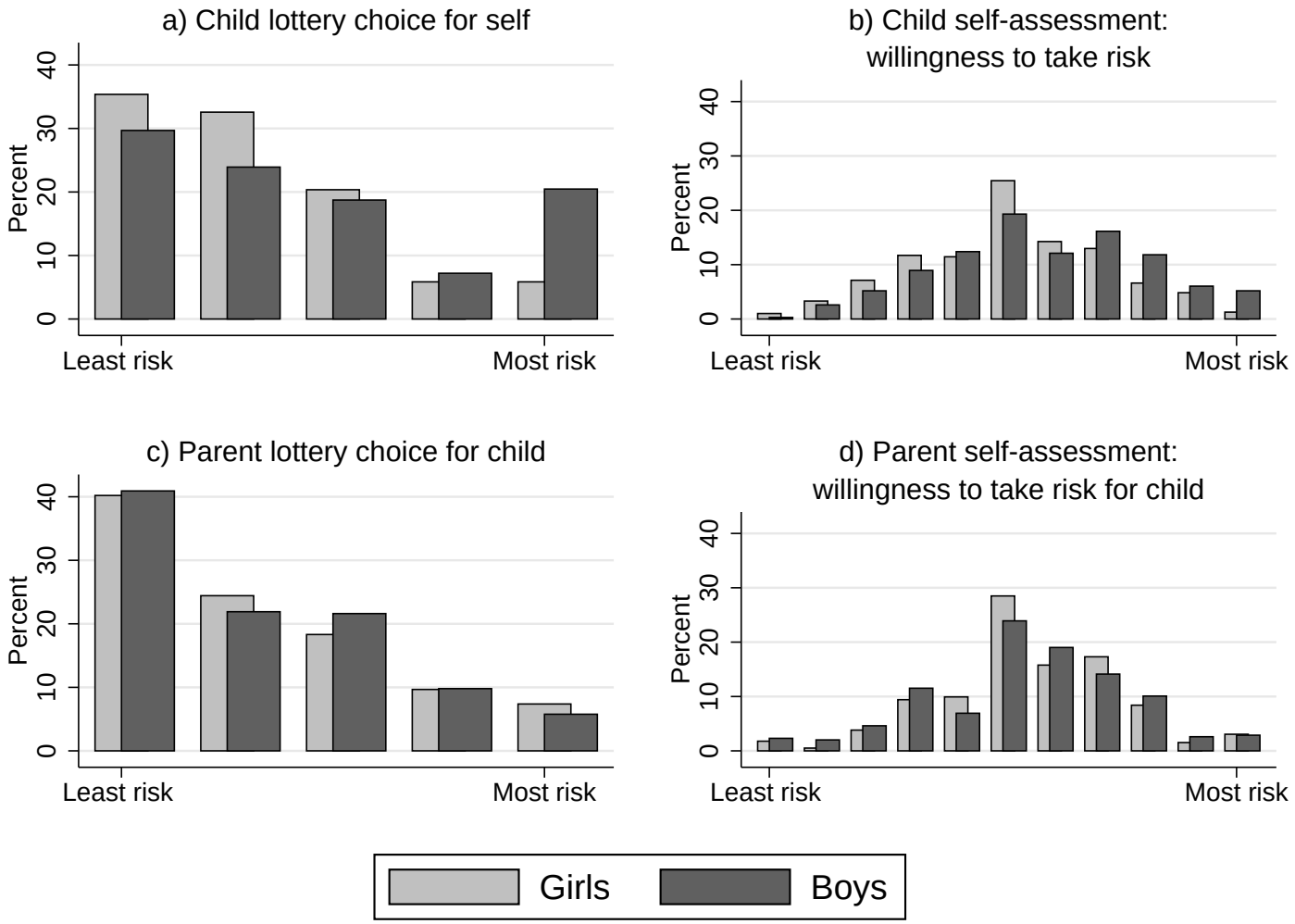


Figure 1.14: Mechanisms: performance, probability of winning, and beliefs



Note: Panel a) shows the performance of children on the task. Girls outperformed boys ($p < 0.00$). Panel b) shows the simulated probability of winning, estimated by drawing 1,000 randomly selected opponents with replacements. Girls had a higher chance of winning ($p < 0.00$). Panel c) shows children's beliefs about their chance of winning. Boys had higher beliefs than girls ($p < 0.00$). Panel d) shows parents' beliefs about their child's chance of winning the tournament. Parents had the same beliefs for boys and girls.

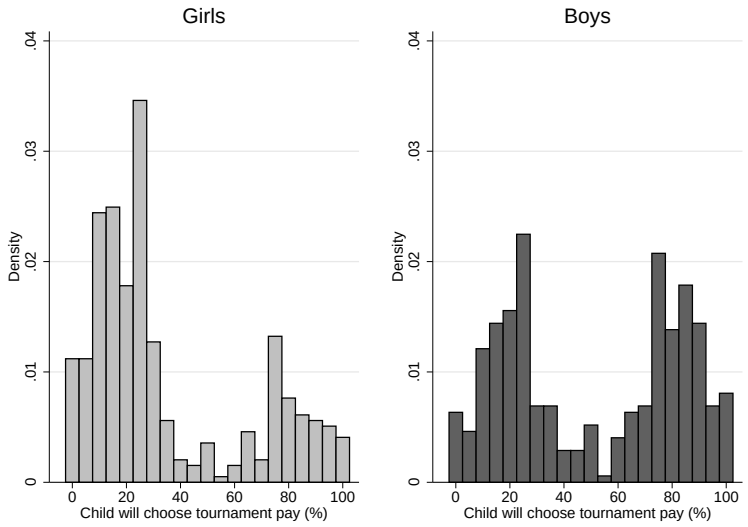
Figure 1.15: Mechanisms: risk taking



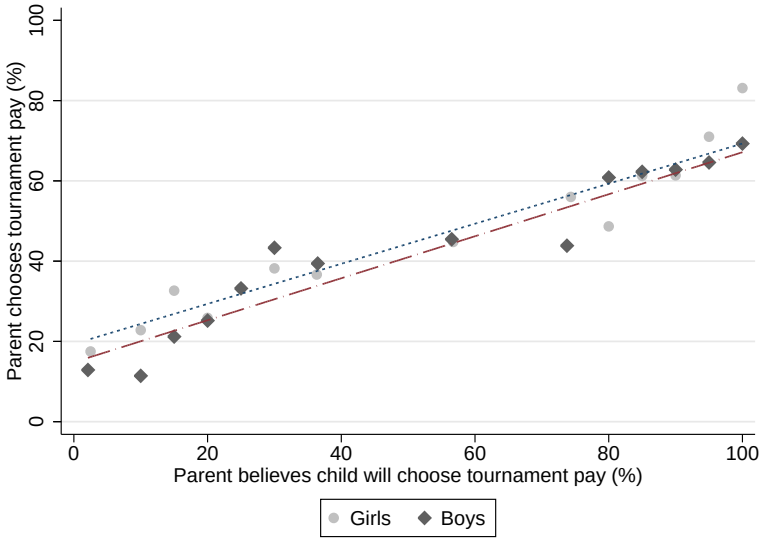
Note: Panel a) shows children's choice of a risky lottery, with the methodology adapted from (Eckel and Grossman (2002)). Boys take more risks ($p < 0.00$). Panel b) shows children's self-assessment of their willingness to take risks, with the methodology adapted from (Dohmen et al. (2011b)). Boys take more risks ($p < 0.00$). Panel c) shows parents' choice of risky lottery for their children. Parents do not choose differently for boys and girls. Panel d) shows parents' self-assessment of their willingness to take risks for their child. There is no difference between boys and girls.

Figure 1.16: Parents' probabilistic beliefs

(a) Parents' beliefs



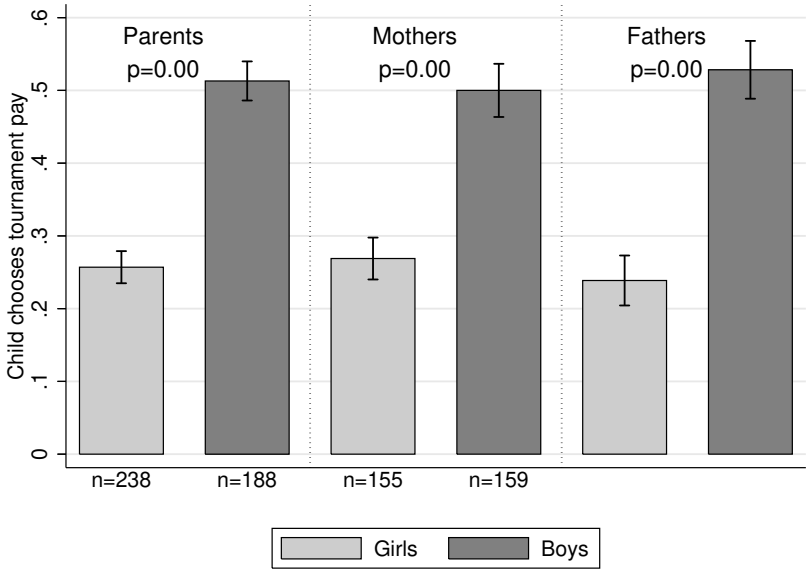
(b) Correlation between beliefs and certainty in parents' choices



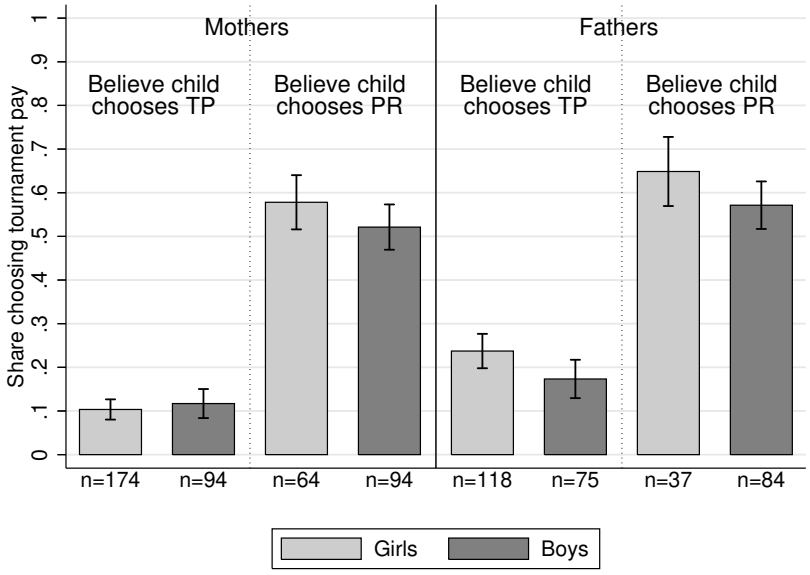
Note: Panel a) After parents are asked if they believe their child will choose piece-rate or tournament pay, they were asked how certain they were that their belief is correct. Panel a) shows the distribution of answers. Panel b) shows the relationship between parents' beliefs and their certainty in their choices for their children.

Figure 1.17: Beliefs and choices: mothers versus fathers

(a) Parents' beliefs versus children's choices



(b) Parents' choices conditional on beliefs



Note: The error bars indicate robust standard errors. Parents' beliefs are binary, and the elicitation was incentivized.

Table 1.7: Correlations between choices, beliefs, and attitudes

	All	Boys & Fathers	Boys & Mothers	Girls & Fathers	Boys & Mothers
Competitiveness					
Child's choice self & parent's choice self	0.10***	0.09	0.07	0.21***	0.05
Child's choice self & parent's choice child	0.21***	0.20**	0.24***	0.22***	0.15**
Child's choice self & parent's belief about choice child &	0.15***	0.08	0.13*	0.12	0.10
Child's choice self & child's belief parent's choice child	0.19***	0.21***	0.21***	0.24***	0.17**
Parent's choice child & parent's belief choice child	0.43***	0.41***	0.43***	0.37***	0.49***
Parent's choice child & child's belief parent's choice	0.18***	0.11	0.10	0.22***	0.22***
Probability of winning the tournament					
Child's belief & child's probability of winning	0.36***	0.49***	0.50***	0.25***	0.38***
Parents' belief & child's probability of winning	0.32***	0.33***	0.37***	0.24***	0.30***
Overconfidence child & overconfidence parent	0.69***	0.70***	0.68***	0.70***	0.68***
Risk preferences					
Risk taking lottery choice for child (child & parent)	0.03	0.08	0.00	0.05	0.05
Risk taking self-assessment for child (child & parent)	-0.02	-0.19**	0.06	0.08	0.00
General attitudes					
Important to be competitive for success (child & parent)	0.05	0.13	0.05	0.12	-0.05
Important to be successful to be happy (child & parent)	0.09**	0.08	0.07	0.09	0.13**
Lack of female CEO's is problematic (child & parent)	0.15***	0.10	-0.05	0.16**	0.20***
Number of observations	740	159	188	155	238

Note: Overconfidence is defined as the difference between the belief about the child's probability of winning the tournament and the child's actual probability of winning the tournament (obtained from a simulation with 1,000 random draws of opponents).

Table 1.8: Peer effects: correlations in competition choices within class

	All	Boys	Girls
Children			
Child's choice self & share of children competing	0.09**	0.09*	0.08*
Child's choice self & share of boys compting	0.05	0.03	0.06
Child's choice self & share of girls competing	0.08**	0.10*	0.06
Parents			
Parent's choice child & share of parents choosing competition for their child	-0.01	-0.02	-0.01
Parent's choice child & share of parents choosing competition for boys	-0.02	-0.07	0.04
Parent's choice child & share of parents choosing competition for girls	0.00	0.06	-0.05
Parents and children			
Child's choice child & share of parents choosing competition for their child	-0.07*	-0.04	-0.09*
Parent's choice child & share of children competing	-0.05	-0.01	-0.10**
Number of observations	740	347	393

Note: The table shows correlations between individual behavior and the leave-one-out mean in the class. There are 43 classes (across 15 schools) in the sample.

1.10 Results from pre-analysis plan

I present here the pre-specified analysis. The pre-analysis plan for the paper is available at the AEA RCT Registry under the title "How Do Parents Make Choices? Competitiveness and Gender".

Table 1.9: Balance table

	Scale	**Boys**	**Girls**	***p*-value**
Mother participated	dummy	0.54	0.60	0.08
Parent age	years	46.36	46.95	0.14
Parent participating is biological parent	dummy	0.95	0.95	0.91
Important to be competitive for success	0 - 10 (important)	6.39	6.51	0.34
Important to be successful to be happy	0 - 10 (important)	6.40	6.49	0.50
Lack of female CEOs is problematic	0 - 10 (important)	5.67	6.20	0.00
Number of observations		347	393	

Note: The table shows the pre-specified balance table in section 4.1. P-values are constructed using robust standard errors.

Table 1.10: Research question 1: Do boys choose tournament pay more often than girls?

Dependent variable:	**Child chooses tournament pay for self**		
	(1)	(2)	(3)
Female (child)	-0.151***	-0.088***	-0.092***
	(0.032)	(0.032)	(0.033)
Number of correct answers (child)		0.011	0.011
		(0.009)	(0.009)
Belief probability of winning (child)		0.042***	0.044***
		(0.008)	(0.008)
Risk taking lottery choice (child)		0.053***	0.051***
		(0.013)	(0.013)
Risk taking self-assessment (child)		0.017**	0.016**
		(0.007)	(0.007)
Constant	0.337***	-0.205***	-0.287***
	(0.025)	(0.067)	(0.090)
School fixed effects	No	No	Yes
Observations	740	740	740
R-squared	0.030	0.128	0.158

Note: The table shows the pre-specified analysis in section 4.2 of the pre-analysis plan. The dependent variable is a dummy taking the value of 1 if the child chooses tournament pay. All specifications use robust standard errors.

Table 1.11: Research question 2: Do parents choose tournament pay more often for boys than for girls?

Dependent variable:	**Parent chooses tournament pay for child**			
	(1)	(2)	(3)	(4)
Female (child)	-0.076**	-0.071**	-0.063*	-0.040
	(0.034)	(0.034)	(0.034)	(0.054)
Female (parent)		-0.085**	-0.084**	-0.063
		(0.035)	(0.035)	(0.053)
Female (child) X Female				-0.040
				(0.070)
Constant	0.349***	0.175	0.183	0.174
	(0.026)	(0.160)	(0.176)	(0.177)
School fixed effects	No	No	Yes	Yes
Demographic controls	No	Yes	Yes	Yes
Observations	740	740	740	740
R-squared	0.007	0.021	0.035	0.036

Note: The table shows the pre-specified analysis in section 4.3 — for research question 2 — of the pre-analysis plan. The dependent variable is a dummy taking the value of 1 if the parent chooses tournament pay for their child. The demographic controls include variables for Age (parent), Biologically related to child (parent), and Foreign (parent). All specifications use robust standard errors.

Table 1.12: Research question 3: What explains parents' choices?

Dependent variable:	**Parent chooses tournament pay for child**					
	(1)	(2)	Boys	Girls	Fathers	Mothers
Female (child)	0.006	0.017			0.024	0.020
	(0.029)	(0.029)			(0.046)	(0.038)
Belief probability of winning of child (parent)	0.052***	0.050***	0.062***	0.039***	0.061***	0.036***
	(0.008)	(0.008)	(0.011)	(0.011)	(0.013)	(0.010)
Risk taking self-assessment for child (parent)	0.014	0.012	0.033*	-0.005	-0.002	0.024
	(0.012)	(0.012)	(0.018)	(0.015)	(0.019)	(0.015)
Risk taking self-assessment for child (parent)	0.021***	0.022***	0.006	0.040***	0.040***	0.007
	(0.007)	(0.007)	(0.011)	(0.009)	(0.012)	(0.009)
Believes child would choose tournament for self (parent)	0.288***	0.295***	0.291***	0.271***	0.220***	0.363***
	(0.036)	(0.036)	(0.051)	(0.053)	(0.059)	(0.046)
Chooses tournament for self (parent)	0.275***	0.277***	0.213***	0.354***	0.301***	0.247***
	(0.034)	(0.034)	(0.050)	(0.048)	(0.054)	(0.045)
Constant	-0.408***	-0.463***	-0.571***	-0.406**	-0.603***	-0.332*
	(0.057)	(0.138)	(0.197)	(0.199)	(0.210)	(0.191)
School fixed effects	No	Yes	Yes	Yes	Yes	Yes
Demographic controls	No	Yes	Yes	Yes	Yes	Yes
Observations	740	740	347	393	314	426
R-squared	0.348	0.360	0.332	0.440	0.389	0.361

Note: The table shows the pre-specified analysis in section 4.3 — for research question 3 — of the pre-analysis plan. The dependent variable is a dummy taking the value of 1 if the parent chooses tournament pay for their child. The demographic controls include variables for Age (parent), Biologically related to child (parent), and Foreign (parent). All specifications use robust standard errors.

Table 1.13: Research question 4: Is the gender difference in selection into tournament pay larger when parents choose?

Dependent variable:	**Child works for tournament pay**			
	(1)	(2)	Father	Mother
Female (child)	-0.151***	-0.145***	-0.116**	-0.168***
	(0.032)	(0.032)	(0.049)	(0.043)
Parent decides	0.012	0.012	0.075	-0.043
	(0.036)	(0.036)	(0.053)	(0.049)
Parent decides for girl	0.075	0.075	0.073	0.089
	(0.047)	(0.047)	(0.073)	(0.062)
Parent is a mother		-0.038		
		(0.024)		
Constant	0.337***	0.345***	0.332*	0.314*
	(0.025)	(0.127)	(0.188)	(0.169)
School fixed effects	No	Yes	Yes	Yes
Demographic controls	No	Yes	Yes	Yes
Observations	1480	1480	628	852
R-squared	0.021	0.038	0.054	0.040

Note: The table shows the pre-specified analysis in section 4.4.1 of the pre-analysis plan. The dependent variable is a dummy taking the value of 1 if the child chooses tournament pay. The demographic controls include variables for Age (parent), Biologically related to child (parent), and Foreign (parent). All specifications use robust standard errors.

Table 1.14: Research question 5: Do parents disagree more with boys or with girls?

Dependent variable:	**Parent and child choose differently for child**		
	(1)	(2)	(3)
Female (child)	-0.056	-0.016	0.003
	(0.034)	(0.034)	(0.045)
Child chooses to compete		0.279***	0.278***
		(0.042)	(0.042)
Female (child) X Female (parent)			-0.030
			(0.046)
Constant	0.352***	0.158	0.169
	(0.026)	(0.176)	(0.177)
School fixed effects	No	Yes	Yes
Demographic controls	No	Yes	Yes
Observations	740	740	740
R-squared	0.004	0.078	0.078

Note: The table shows the pre-specified analysis in section 4.4.2 of the pre-analysis plan. The dependent variable is a dummy taking the value of 1 if the child and parent choose differently. The demographic controls include variables for Age (parent), Biologically related to child (parent), and Foreign (parent). All specifications use robust standard errors.

Table 1.15: Secondary research question: children's earnings in the experiment

Dependent variable:	**Realized in earnings**		**Lost earnings**	
	Child is decisionmaker	Parent is decisionmaker	Child is decisionmaker	Parent is decisionmaker
Girls	31.08	31.92	16.10	15.26
	(1.22)	(1.23)	(1.16)	(1.17)
Boys	28.37	29.27	9.21	8.30
	(1.38)	(1.46)	(0.97)	(0.89)
Observations	740	740	740	740
R-squared	0.591	0.587	0.291	0.274

Note: The table shows boys' and girls' realized earnings in the experiment, and children's lost earnings (the difference between the earnings of the choice that would maximize expected earnings and the realized earnings). This exploration of children's earnings in the experiment was specified in 4.2. and 4.4.1. Robust standard errors are reported in brackets.

Table 1.16: Exploratory research question: accuracy of parents' beliefs

Dependent variable:	**Parent has the correct belief about child's preferences**			
	(1)	(2)	(3)	(4)
Female (child)	0.142***	0.142***	0.140***	0.123***
	(0.036)	(0.036)	(0.036)	(0.035)
Female (parent)		0.005	0.006	-0.006
		(0.036)	(0.036)	(0.035)
Parent certainty in belief			0.005	0.002
			(0.008)	(0.008)
Parent and child have different preferences				-0.255***
				(0.036)
Constant	0.548***	0.545***	0.516***	0.653***
	(0.027)	(0.033)	(0.058)	(0.061)
Observations	740	740	740	740
R-squared	0.021	0.021	0.022	0.088

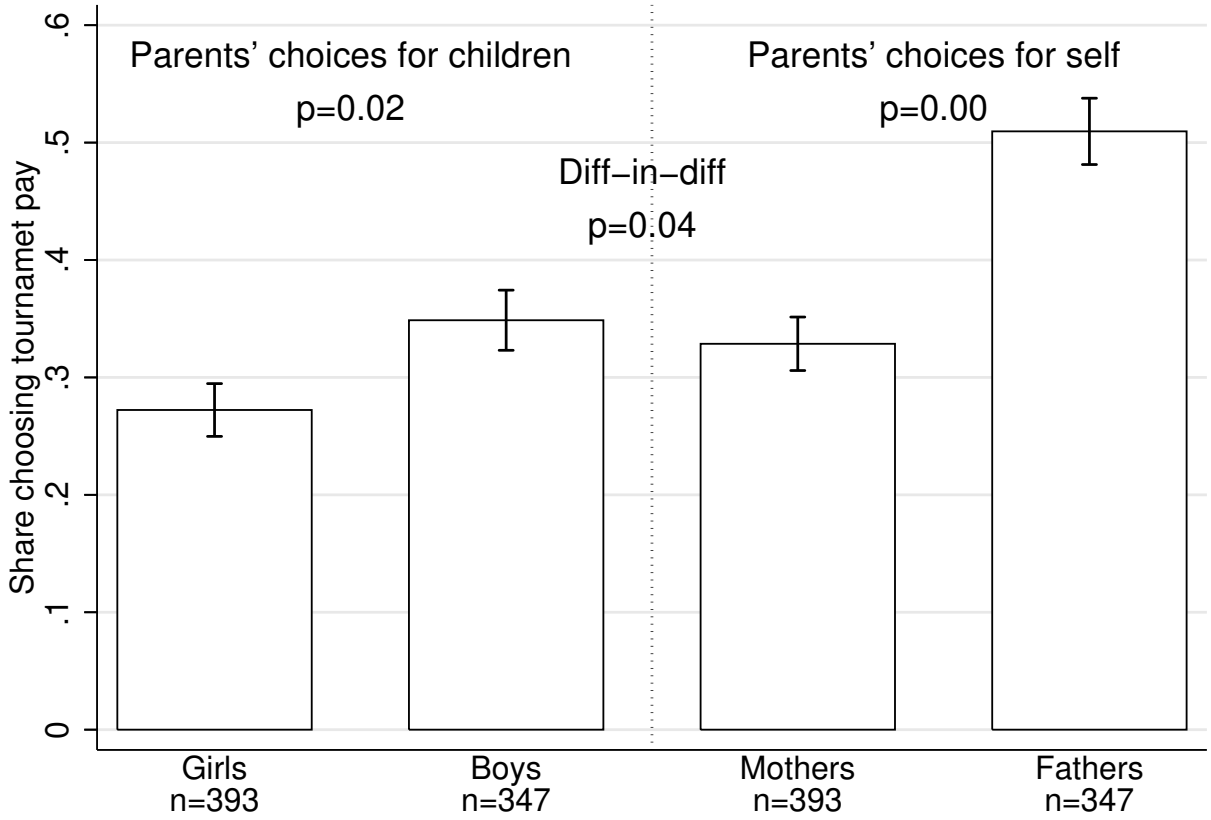
Note: The table shows the pre-specified analysis in section 4.5 of the pre-analysis plan where I pre-specify to explore the accuracy of parents' beliefs about their children. The dependent variable is a dummy taking the value of 1 if the parent answers correctly whether their child will choose piece-rate or tournament pay. Parental certainty is elicited on a scale from 0 to 10 for how certain the parent is that their guess is correct. The difference between parent and child preferences is a dummy variable taking the value of 1 if the parent's choice is different from their child's. All specifications use robust standard errors.

Table 1.17: Exploratory research question: correlation in preferences

Dependent variable:	**Child chooses tournament pay for self**				
	All	Boys	Girls	Fathers	Mothers
Parent chooses	0.090***	0.063	0.094**	0.131***	0.066
tournamanet pay for self	(0.033)	(0.051)	(0.042)	(0.048)	(0.047)
Constant	0.220***	0.309***	0.150***	0.182***	0.241***
	(0.020)	(0.033)	(0.023)	(0.031)	(0.025)
Observations	740	347	393	314	426
R-squared	0.010	0.004	0.014	0.023	0.005

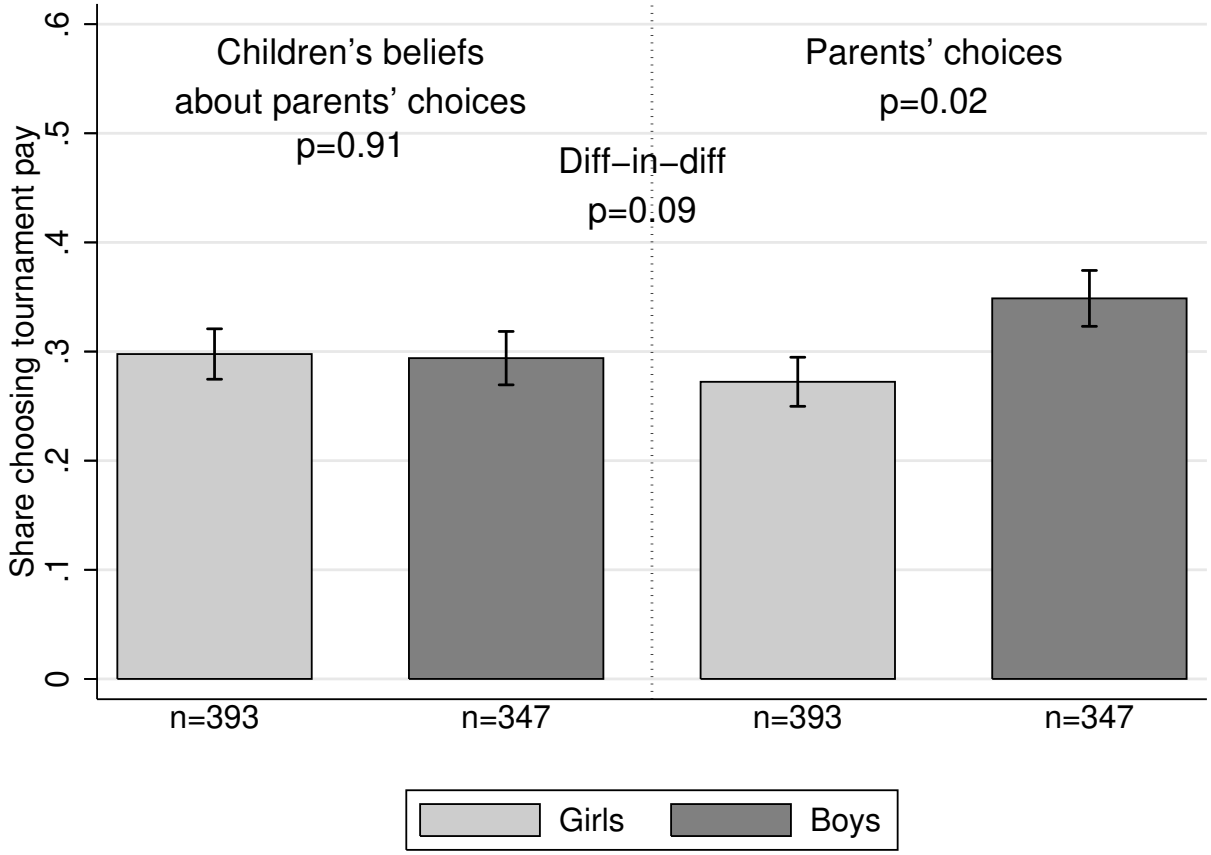
Note: The table shows the pre-specified analysis in section 4.5 of the pre-analysis plan where I pre-specify to explore the correlation in preferences between parents and children. The dependent variable is a dummy taking the value of 1 if the child chooses tournament pay. The explanatory variable is a dummy taking the value of 1 if the parent chooses tournament pay for self. All specifications use robust standard errors.

Figure 1.18: Exploratory research question: parents' choices for children versus parents' choices for self



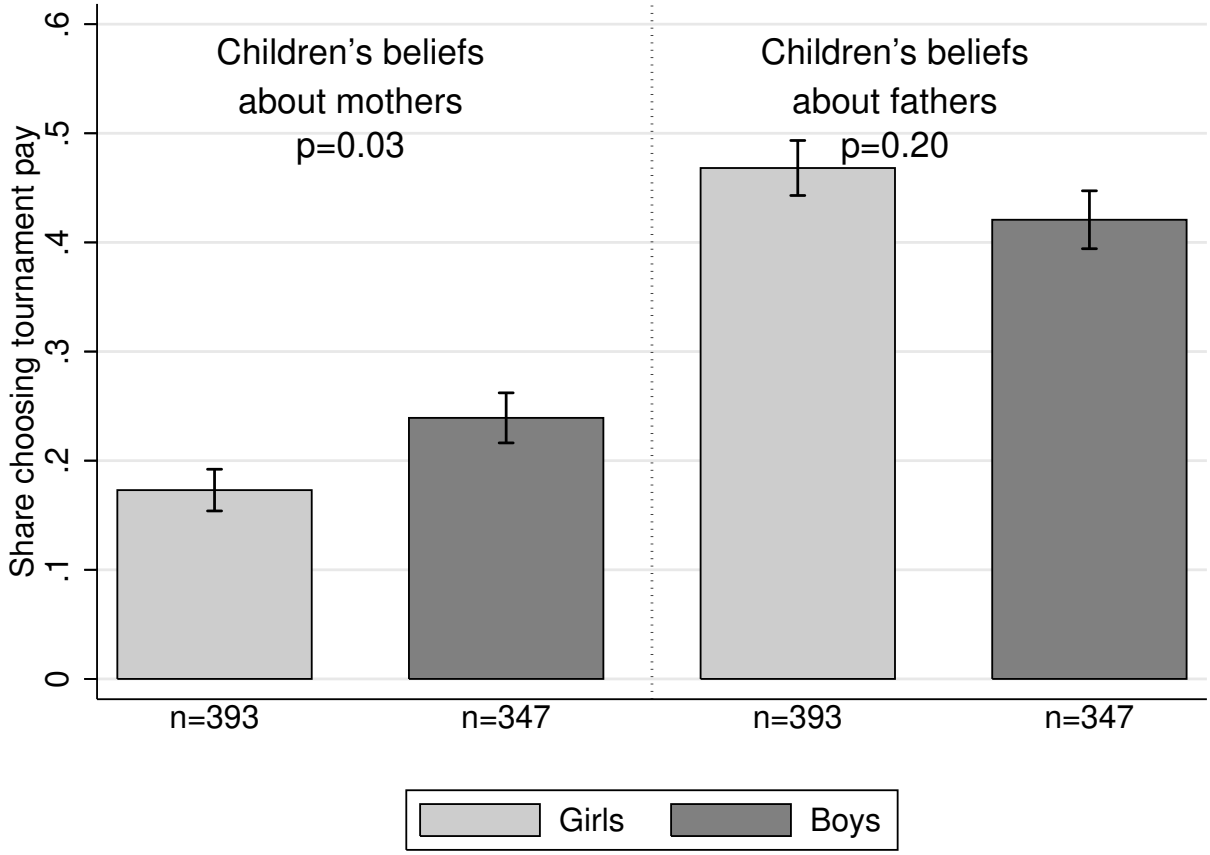
Note: The figure shows the pre-specified analysis in section 4.5 of the pre-analysis plan where I pre-specify to explore the gender difference in mothers' and fathers' choices for self, and the difference-in-difference with parents' choices for girls and boys. P-values are constructed using robust standard errors.

Figure 1.19: Exploratory research question: children's beliefs about parents' choices for them versus parents' choices for children



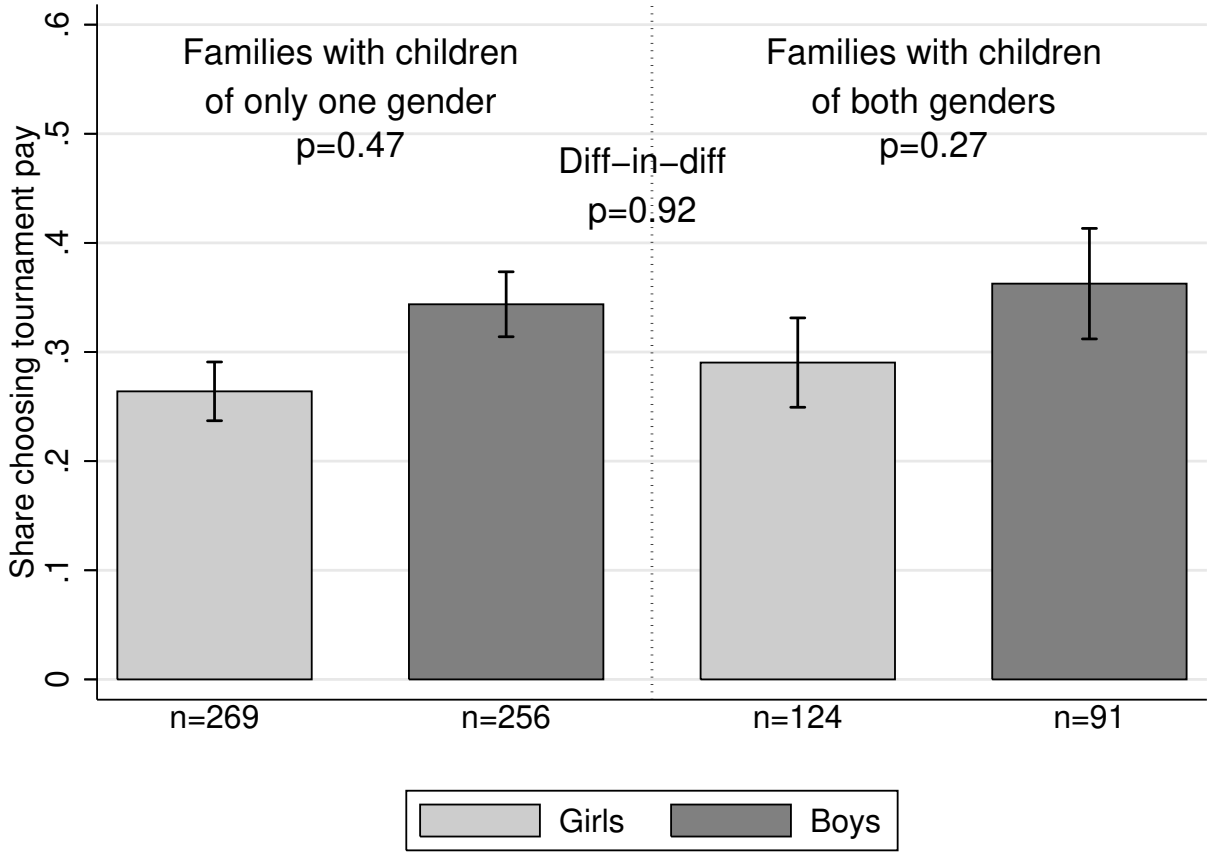
Note: The figure shows the pre-specified analysis in section 4.5 of the pre-analysis plan where I pre-specify to explore children's beliefs about parents' choices for them, and the difference-in-difference with parents' choices for children. I show only children's beliefs about the parent who made the choice for them in the experiment. P-values are constructed using robust standard errors.

Figure 1.20: Exploratory research question: children's beliefs about their mothers' and fathers' choices for them



Note: The figure shows the pre-specified analysis in section 4.5 of the pre-analysis plan where I pre-specify to explore children's beliefs about their mothers' and fathers' choices for them. P-values are constructed using robust standard errors.

Figure 1.21: Robustness check: families with both sons and daughters



Note: The figure shows the pre-specified analysis in section 4.1 of the pre-analysis plan where I pre-specify to test the effect on parents' choices of having children of both genders. P-values are constructed using robust standard errors.

Chapter 2

The Determinants of Competitiveness Preferences: Family Versus Peers

2.1 Introduction

A large literature documents a significant gender difference in the willingness to compete. In particular, men are more willing to compete than women, even in domains where there are no gender differences in ability (see Kagel and Roth (2016) for a review). The gender difference in willingness to compete is important, as it may explain the observed gender differences in terms of education and labor market outcomes (Buser et al. (2014)).

What shapes competitiveness preferences? In this paper, I aim to shed light on this question by studying the correlation of competitiveness preferences within i) family (parents and children), and ii) within peer groups (high- school classes).

I study the correlation in preferences in two lab-in-the-field experiments on parents and children, ran across 15 high schools in Norway. In the experiments, I elicit competitiveness preferences from parents and children, as well as parents' beliefs about children's preferences. The experiments also study parents' competitiveness choices for their children which is the main focus in Tungodden (2019).

I document a significant gender differences in competitiveness among children and parents; in both samples males compete more than females. I then study correlation in preferences between parents and children. I find a positive correlation in preferences, which exists for both mothers and fathers, and for both sons and daughters. The highest correlation is between fathers and daughters.

Are parents aware of the correlation in preferences? I use data on parents' beliefs about their children's preferences to study parents' perceptions about the correlations in preferences. Parents' beliefs correlate positively with parents' preferences, and the correlation is significantly higher than the correlation in actual preferences of parents and children. This suggests that parents' beliefs about their children's preferences are biased towards their own preferences.

Finally, I consider the correlation in competitiveness preferences within social networks. Across 43 different high school classes, I document a positive correlation in preferences among students. However, students' preferences do not correlate with the preferences of their

classmates's parents. As such, it appears that peers and parents both have an independent impact on the formation of preferences.

In all, the set of findings shed new light on the role of the family and the social environment in transmission of preferences. Previous literature have studied correlation in preferences in the domains of time, social, risk, and trust (Dohmen et al. (2011a), Zumbuehl et al. (2013), Houser et al. (2016), Brenøe and Epper (2019), Chowdhury et al. (2019)). To the best of my knowledge, this is the first paper to study the correlation of preferences in the domain of competitiveness.

2.2 Experimental design

The experimental design builds on (Niederle and Vesterlund (2007)), which has been used in numerous papers to measure competitiveness (see Kagel and Roth (2016) for a review).

I run two experiments; one for children and one for parents. Children participate in an experiment at their local school.[1]. To measure competitiveness children will work on a real effort task: sum together sets of four two-digit numbers. For example: 74+42+34+21? Children have three minutes to solve as many questions as possible, and can choose between two ways of getting paid.

1. Piece-rate pay: receive 5 NOK for each correct answer.

2. Tournament pay: receive 15 NOK for each correct answer, if you outperform an opponent. Otherwise, receive 0 NOK. The opponent is a randomly selected student from another school where the task was done only for piece-rate pay.

The measure of competitiveness is whether the child chooses to compete or not. I also elicit a number of supplementary controls, including children's belief about their performance on the task and risk attitudes.

Parents take part in the study through a mobile phone experiment.[2] In the experiment, parents receive a description of the experiment their child is taking part in at the school. In particular, parents receive a description of the math task and the two pay schemes the child can choose between. To measure parents' competitiveness, I ask parents whether they would choose piece-rate pay or tournament pay for themselves if the were taking part in the experiment their child is taking part in. This question is not incentivized.

2.3 Sample description

The experiments was conducted in-and-around Bergen, Norway in Spring 2017. Bergen is the second largest city in Norway, and the area is representative of the country in terms of distribution of income and education. Norway is among the most gender equal countries in the world, but also has pronounced gender differences in education outcomes, the labor market, and willingness to compete (Birkelund and Sandnes (2003), Almås et al. (2015)).

[1]The experiment is programmed in Ztree(Fischbacher (2007))

[2]The experiment was coded in Qualtrics (2013)

38 junior high schools were invited to take part of in the study, and 17 schools agreed to participate. Of these, 2 schools took part in a pilot study, while the remaining 15 constitute to the main sample. At each school I invited 10th grade students to participate in the study. For students, the participation rate was 81 percent. For each student(child), I randomly invited either the mother or the father to participate.[3] For invited parents, the participation rate was 82 percent. In all, 921 children and 776 parents completed the experiment. In the analysis I focus on 740 parents and 740 children were both the parent and the child completed the experiment.

In table 2.1 I show descriptive statistics for the study participants. For parents, 58 percent are female. This is consistent with the fact that children who live with only one parent are more likely to live with their mother than their father. In, 95 percent of the cases, the parent and the child are biologically related to each other, and in 96 percent of the cases the parent and child live in the same household. The share of parents who are married and live together with their partner are 63 percent and 70 percent, respectively. The average age for parents is 46.

Children are 53 percent female (I cannot reject that participation rates are the same for male and female children). 70 percent of children report having a sister and 69 percent report having a brother. Since children are all in 10th grade, and there is no grade skipping in the Norwegian schools system, all children are either 15 or 16 years old.

2.4 Results

2.4.1 Correlations in preferences between parents and children

Figure 2.1 shows the competitiveness choices of parents and children, split by gender. Parents are more willing to compete than their children ($p < 0.01$). On average, children compete 26 percent of the time and parents compete 41 percent of the time.

There are robust gender difference in willingness to compete both among parents and children. For children difference is 15 percent ($p < 0.01$), as 19 percent of girls compete, and 34 percent of boys compete. For parents, the difference is 18 percent ($p < 0.01$), as mothers compete 33 percent of the time, and fathers compete 51 percent of them time.

In table 2.2A I show the distribution of competition choices within family. For 46 percent of families, both the parent and the child choose not to compete. While only for 13 percent of families, both the parent and the child want to compete. When parents and children disagree, in the majority of the cases parents wants to compete while children does not want to compete. For 28 percent of families parents choose to compete and children choose not compete. In contrast, only in 13 percent of families is the child willing to compete while when the parent does not want to compete.

Table 2.2A also suggest that there is a positive correlation in the choices of parents and children, as in the majority of families the choices of parents and children are the same (59 percent). In table 2.2B I study the correlations in preferences in more detail. The correlation between parents' and children's choices is 0.10 and significantly different from 0

[3]If the invited parent could not participate the other was invited in their place. In all, 18 percent of parents who participate in the study were not originally invited.

($p < 0.01$). Furthermore, I break down the correlations by child gender and parent gender. The correlation is twice as a high for girls as for boys (0.12 versus 0.12). And the correlation for fathers is twice as large as for mothers (0.15 versus 0.07). The highest correlation is for daughters and fathers (0.21). [4]

2.4.2 Beliefs about correlation in preferences

What do parents believe is the correlation between their preferences and their children's preferences? To study this question I elicit parents' beliefs about whether their child will choose to compete or not. The question is incentivized.

Figure 2.2 shows parents' beliefs about their children's choices next to children's actual choices. On average, parents' overestimate the share of children who will compete; 38 percent of parents' believe their child will compete, compared to 30 percent of children who actually choose to compete (the difference is significant $p < 0.01$). Separating parent's beliefs by child gender, parents' believe 25 percent of girls will compete and 51 percent of boys. In contrast, 18 percent of girls, and 34 percent of boys actually compete. As such, parents overestimate both the share of girls competing, and the share of boys competing.

Table 2.3A shows the distribution of parents' choices and parents' beliefs about children's choices; 43 percent of parents will not compete and believe that their child will also not compete. 19 percent of parents will not compete and believe that their child will compete. 16 percent of parents will compete and believes their child will not compete. And 22 percent of parents will compete and believe that their child will also compete.

Table 2.3A also suggests that there is a correlation in parents' choices and their beliefs about what their child will choose as 65 percent of parents believe that their child will choose the same as them. In table 2.3B I show the correlations between parents' choices and their beliefs about what their children will choose. For all combinations of sons, daughters, fathers, and mothers I significant positive correlations. The correlation is higher for fathers' beliefs and choices, than for mothers' beliefs and choices. And both for mothers and for fathers the correlation is higher for daughters than for sons.

Compared to the correlation in choices between parents and children, the correlation in parents' choices and parents' beliefs is significantly larger (0.10 versus 0.27 $p < 0.01$.) This suggest that parents appear to have biased beliefs about their children's preferences in the direction of their own preferences.

Figure 2.3 illustrates the difference in between the correlation in choices and the correlation in preferences. For all combinations of sons, daughters, fathers, and mothers, parents appear to overestimate how close children's preferences are to their own preferences.

[4]Table 2.6 studies heterogeneity in correlations between children and parents. There is a positive correlation both when consider the sample of parents above and below the median age (which is 46 years old). The correlation is larger for pairs of parents and children where the parent is not married (0.18 versus 0.06), and where parents does not live together with their partner. Moreover, I see no difference in the correlation of preferences when the child has a brother or sister.In table 2.7 I study correlations in attitudes between parents and children. I document a positive correlation in attitudes towards i) whether it is important to be competitive to be successful (not significantly different from 0.) ii) Whether it is important to be successful to be happy ($p < 0.02$), and iii) whether the lack of female CEO's is problematic ($p < 0.01$).

2.4.3 Correlation of preferences within school class

In this section I study correlation in preferences within school class for parents and children. In all 43 classes across 15 different high schools participate in the experiment. I focus on peer effects within the class, rather than within the school, because in the Norwegian schools system, students in different classes typically do not share any subjects (with the exception of foreign languages). As such students in within a class, interact much more frequently with each other than with other students in the school.

Table 2.4 shows the correlation in choices within a class. For children, there is positive correlation between children's own willingness to compete and the share of other students in the class who compete (0.09, $p < 0.03$). The correlation is positive both for boys and for girls. 2.4 illustrates the positive correlation in choices.

In table 2.4 I also study the correlation between children's choice and the share of their classmates parents who chooses to compete. There is no correlation between the choices of parents and children. This is also the case when considering parents' choices and the share of children who compete in the class (excluding the child of the parent), and when looking at the correlation between the parent's choice and that of other parents in the class.

In table 2.5 I test the relative influence of peers' (classmates) and parents' preferences in predicting children's preferences. Column 1 show the regression of children's choice of competition on the parents' choice to compete. Parents' choice costively predicts their child's choice, and the regression coefficient is 0.09 ($p < 0.01$). In column 2 I regress the child's choice on the share of class mates competing. The coefficient is positive, and 3 times as a large as the coefficient on whether the parent competes (0.31, $p < 0.04$). In column 3, I regress children's choice about whether to compete or not including both the control for whether the parent competes and the control for share of classmates competing. Notably, the coefficients do not change from column 1 and 2. This finding is consistent with the results from table 2.4 where I show that there is no correlation between parents' choices and the choices for the classmates of their children.

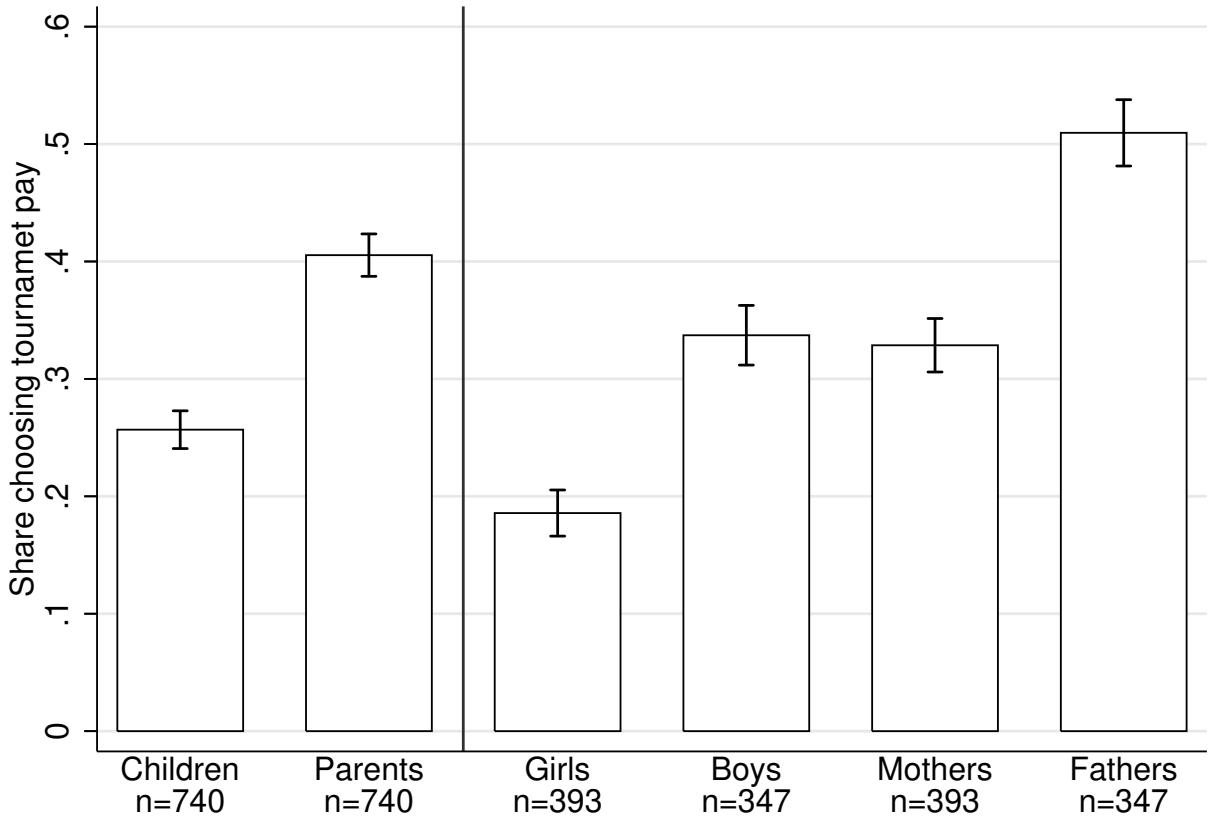
2.5 Conclusion

Using data from a large scale lab=in-the field experiment in Norway, this paper studies the correlation in competitiveness preferences within i) families, and ii) social networks.

The paper highlights four findings. First there is a positive correlation in preferences between parents and children. Second, parents overstate the strength of the correlation in preferences. Third, there is a positive correlation between students in a class. Fourth, there is no correlation between the a child's classmates preferences, that of there their parents.

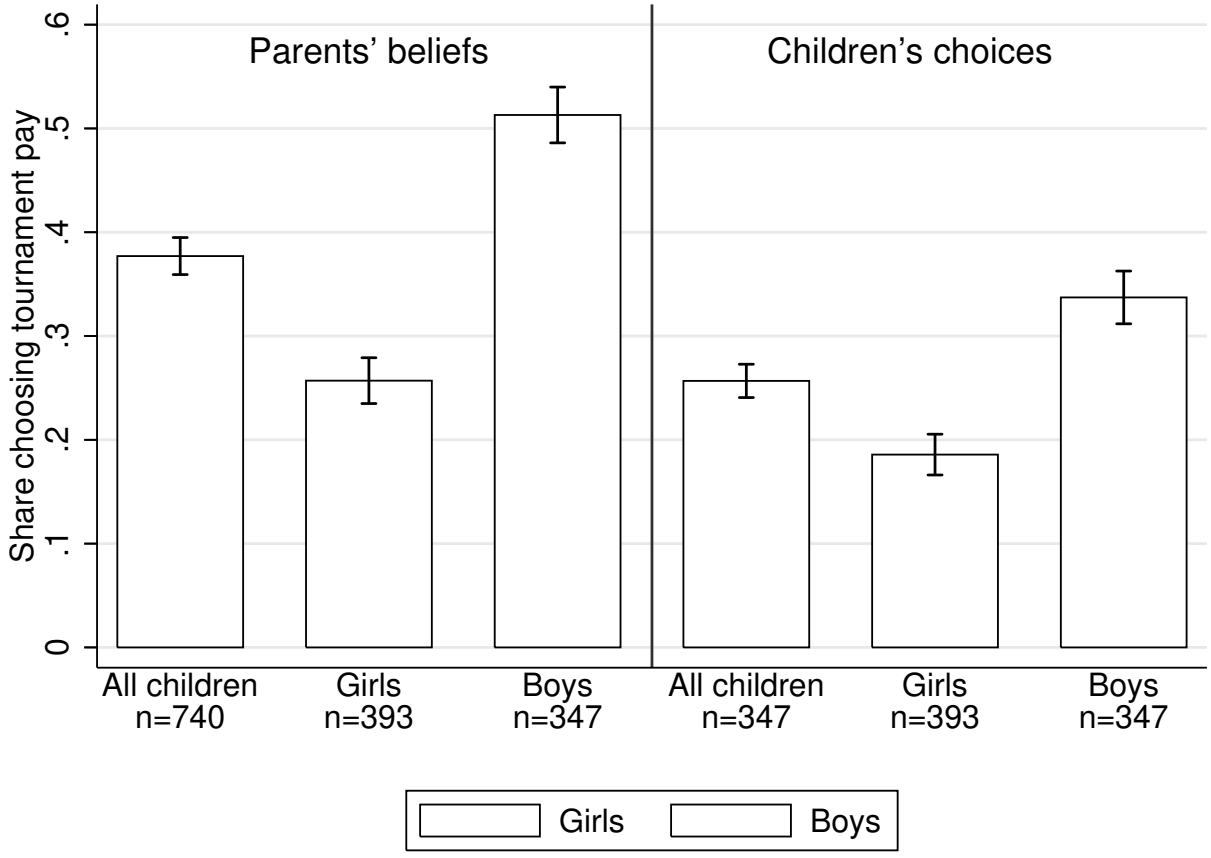
One of the more robust findings in behavioral economics, is that men are more willing to compete than women. Furthermore, the willingness to compete has been linked to important real world outcomes in the domains of education and the labor market. The findings in this paper suggest that the family and peer groups play an important role in shaping competitive preferences, and potentially also in generating differences in preferences between males and females.

Figure 2.1: Share competing



Note: The figure shows the share of boys, girls, mothers, and fathers choosing to compete. The error bars indicate robust standard errors.

Figure 2.2: Parents' beliefs children's choices

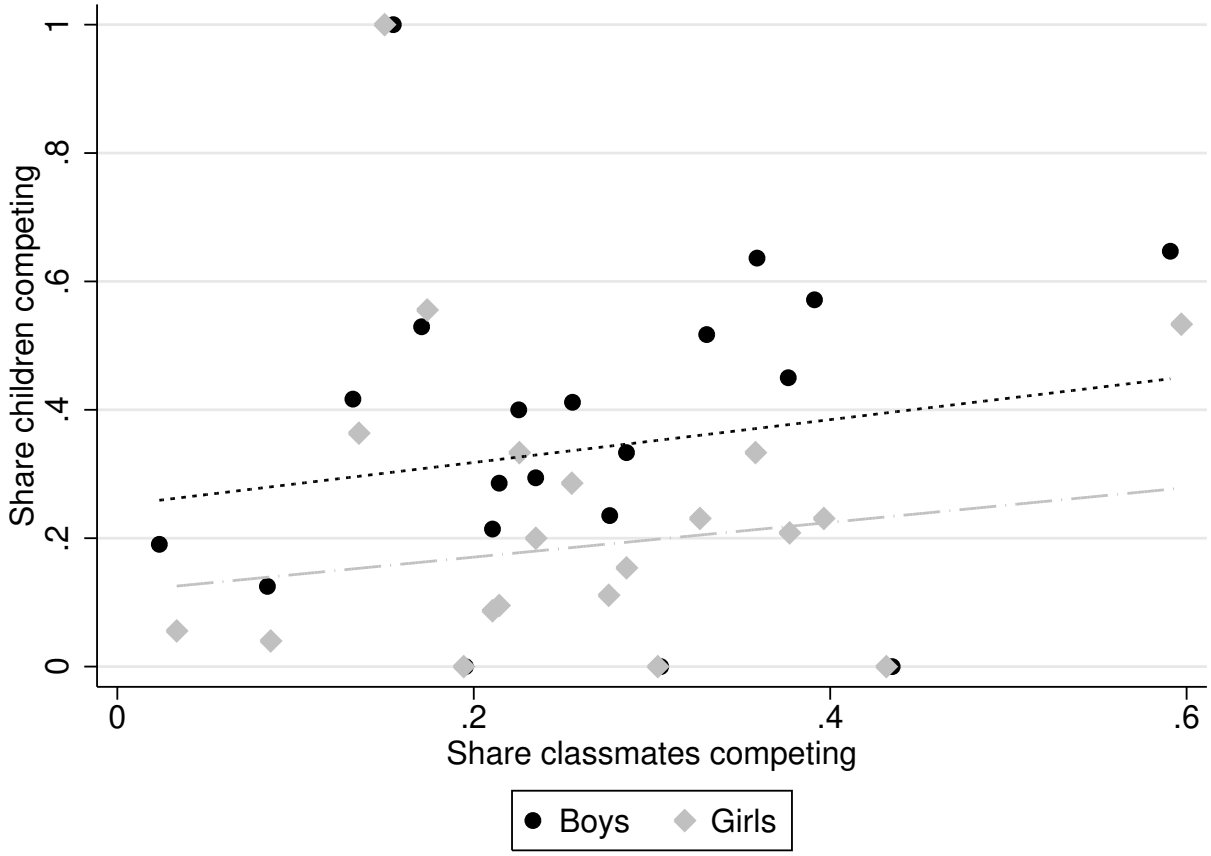


Note: The figure shows the share of boys, girls, mothers, and fathers choosing to compete. The error bars indicate robust standard errors.

Figure 2.3: Correlation in choices vs. beliefs about correlation in choices

Note: The figure shows 1) the share of children competing, conditional on their parents' preferences for competing. And 2) the share of parents' believing their child will compete conditional on parents' preferences for competing.

Figure 2.4: Correlation in choices within school class



Note: The figure shows a backscatter between children's to compete, and the share of other students in the class competing.

Table 2.1: Descriptive statistics of parents (n=740) and children (n=740)

	Mean
Parent gender (0=male, 1=female)	0.58
Parent biologically related to child (0=no, 1=yes)	0.95
Parent lives in same household as child (0=no, 1=yes)	0.96
Parents of child are married (0=no, 1=yes)	0.63
Parents of child live together (0=no, 1=yes)	0.70
Gender child (0=male, 1=female)	0.53
Child has a sister (0=no, 1=yes)	0.70
Child has a brother (0=no, 1=yes)	0.69

Table 2.2: Choices of parents and children

A) Distribution of choices within family

	Child: not compete	Child: compete
Parent not compete	46%	13%
Parent: compete	28%	13%

B) Correlation in choices

	All	**Boys**	**Girls**
All parents	0.10***	0.06	0.12**
	(n=740)	(n=347)	(n=393)
Fathers only	0.15***	0.09	0.21***
	(n=314)	(n=159)	(n=155)
Mothers only	0.07	0.07	0.05
	(n=426)	(n=188)	(n=238)

Note: The regressions include a constant term which is not shown in tables. The p-values are constructed using robust standard errors.

Table 2.3: Choices of parents and parents' beliefs about children's choices

A) Distribution of choices and beliefs within family

	Child: not compete	Child: compete
Parent not compete	43%	16%
Parent: compete	19%	22%

B) Correlation in choices and beliefs

	All	**Boys**	**Girls**
All parents	0.27***	0.20***	0.32**
	(n=740)	(n=347)	(n=393)
Fathers only	0.33***	0.28***	0.38***
	(n=314)	(n=159)	(n=155)
Mothers only	0.22***	0.13*	0.29***
	(n=426)	(n=188)	(n=238)

Note: The regressions include a constant term which is not shown in tables. The p-values are constructed using robust standard errors.

Table 2.4: Peer effects within class

	Share of children in class competing	**Share of parents of children in class who compete**
All children	0.09*	0.01
	(n=740)	(n=740)
Boys	0.09*	0.00
	(n=347)	(n=347)
Girls	0.08*	0.04
	(n=393)	(n=393)
All parents	0.01	-0.05
	(n=740)	(n=740)
Fathers	0.07	-0.04
	(n=314)	(n=314)
Mothers	-0.06	-0.04
	(n=426)	(n=426)

Note: *** p< 0.01, ** p< 0.05, * p< 0.1

Table 2.5: Children's choices: peers versus parents

Dependent variable:	**Child chooses to compete**		
	(1)	(2)	(3)
Parent competes	0.09***		0.09***
	(0.03)		(0.03)
Sharre classmates competing		0.31**	0.30**
		(0.13)	(0.13)
N	740	740	740

Note: *** p< 0.01, ** p< 0.05, * p< 0.1

Table 2.6: Heterogeneity: correlation of competitiveness choices of children and parents

	Yes	**No**
Parent age above median	0.08	0.13***
	(n=368)	(n=372)
Parents of child are married	0.06	0.18***
	(n=468)	(n=272)
Parents of child live together	0.05	0.22***
	(n=520)	(n=220)
Child has a sister	0.09**	0.13*
	(n=520)	(n=220)
Child has a brother	0.11**	0.09
	(n=513)	(n=227)

Note: *** p< 0.01, ** p< 0.05, * p< 0.1

Table 2.7: Correlation in attitudes

	All	Boys & Fathers	Boys & Mothers	Girls & Fathers	Boys & Mothers
Important to be competitive for success	0.05	0.13	0.05	0.12	-0.05
Important to be successful to be happy	0.09**	0.08	0.07	0.09	0.13**
Lack of female CEO's is problematic	0.15***	0.10	-0.05	0.16**	0.20***
Number of observations	740	159	188	155	238

Note: *** p< 0.01, ** p< 0.05, * p< 0.1

Chapter 3

Development and Gender Differences in Competitiveness (with Edward Miguel)

3.1 Introduction

There is a large robust gender difference in the willingness to compete; women compete less than men (see Kagel and Roth (2016) for a review). The gender gap has been documented across the globe, including in developing countries such as China, India, Kenya, Malawi, and Tanzania (Gneezy et al. (2009), Zhang (2013), Flory et al. (2018)). The observed gender difference in willingness to compete is important, as it may explain the observed gender differences in education and labor market outcomes (Buser et al. (2014), Flory et al. (2015)).

We study how parents competition choices for their children in a large sample of Kenyan parents and children (aged 6-8). Throughout childhood parents make important choices which may shape childrens long-term outcomes and preferences (Heckman et al. (2006), Sacerdote (2007), Fagereng et al. (2018)). What role do parents play in contributing to the observed differences in willingness to compete between boys and girls?

To study parents competition choices for their children, we implement incentivized large-scale lab-in-the-field experiments on parents and children during the fourth round of the Kenya Life Panel Survey (KLPS-4). The experiments are designed to study parental decision-making in the domain of competition, and to study parents' and children's children's willingness to compete.

KLPS is a longitudinal data collection on individuals who participated in a randomized primary school deworming intervention and a randomized merit scholarship program for girls in Western Kenya. A subset of these individuals also participated in a later randomized vocational training and cash grant intervention. In future projects, we take advantage of previously implemented randomized control trials on the KLPS sample to study the causal impact of higher human capital and financial interventions on parents choices for their children, and gender differences in parents and childrens preferences for competition.

In this paper we present *preliminary* findings from the lab-in-the-field experiments on

1591 parents and 579 children.[1] We highlight three key findings: first, in the sample of parents, we replicate the finding in the literature that men are more likely than women to compete. The gender difference is robust to controlling for performance on the task, belief about relative performance, and risk preferences.

Second, in the sample of children, there is no evidence that boys are more competitive than girls. In fact, girls are five percent more likely to compete than boys, but this difference is not significant.

Third, when parents are asked to choose if their child should compete or not, there is a significant gender difference in choices; parents choose more competition for boys than for girls. We study mechanisms for parents' competition choices. Importantly, the difference in choices for boys and girls, is not explained by parents' beliefs about their children's preferences.

The paper contributes to the literature aiming to understand the determinants of gender-specific competitiveness preferences. Previous studies have explored the role of societal influences (Gneezy et al. (2009), Booth and Nolen (2012), Shurchkov (2012), Andersen et al. (2013), Buser et al. (2017a)), as well as biological differences (Hoffman and Gneezy (2010), Apicella et al. (2011), Buser (2012), Wozniak et al. (2014), Sutter and Glätzle-Rützler (2015)). This paper adds to this literature by studying how parents' competitiveness choices for young children. The paper closest to this study is Tungodden (2019), which studies parents choices for their adolescent children in the domain of competition in Norway. The study differs from Tungodden (2019) by studying parents choices i) for younger children, ii) in a lower-income country with greater gender inequality, and iii) in a larger sample.

The paper is organized as follows. Section 2 presents the study design. Section presents the results. And section 4 concludes.

3.2 Study the design

This section describes the i) the Kenyan Life Panel Survey (KLPS) data collection, ii) the lab-in-the-field experiments implemented on parents and children in the KLPS, and iii) the sample in this study.

3.2.1 The Kenya Life Panel Survey

In a longitudinal data collection effort known as the Kenya Life Panel Survey (KLPS), information has been collected in up to four rounds from individuals who participated in a randomized primary school deworming intervention (1998-2003) and a randomized merit scholarship program for girls (2000-2001). A subset of these individuals also participated in a later randomized vocational training and cash grant intervention (2009-2014).

The current data collection round, KLPS-4, includes the same sample of individuals that participated in the deworming program as Baird et al. (2011), which used the second

[1]Data collection is currently ongoing and we will update the analysis as more data is being collected. A pre-analysis plan for this research project was submitted to the AEA RCT Registry on May 11th 2019. And the analysis in the paper follows the pre-specified analysis, unless otherwise specified.

(KLPS-2) survey round. KLPS-4 also includes individuals from the merit scholarship program that participated in the vocational training and cash grant intervention. The KLPS-4 data collection also creates a new dataset — KLPS-Kids — for a sample of children of the original health, training, and grant program participants, which can be linked with the KLPS longitudinal dataset.

The KLPS-Kids modules are designed to capture information on the biological children of KLPS respondents aged 2.5-8.5 years old as of the date of launch of the KLPS-4 I Module survey wave. For the purposes of the KLPS-Kids activity, we define two age groups: preschool aged children (aged 3 years to 5 years 11 months old, or 36-71 months old) and school-aged children (aged 6 years to 8 years 11 months old, or 72-107 months old); only the school-aged children participate in the lab-in-the-field experiments. Up to one eligible child per age group is selected per parent for inclusion in sample. In cases in which the adult has more than two children within an age group, children to be interviewed are randomly selected.

In what follows, we refer to the original KLPS respondents as parents, and their selected 6-8-year-old child as children. We note that in our definition of parents, we also include the adult respondents who do not have a 6-8-year-old child participating in the study.

3.2.2 The lab-in-the-field experiments

The design of the experiments build on the growing literature in behavioral economics for how to study gender differences in competitiveness (Niederle and Vesterlund (2007), Kagel and Roth (2016)), as well as Tungodden (2019) which studies parents competition choices for their children in Norway. The module elicits the three key incentivized outcomes:

1. *Parents competitiveness for self.* Parents are asked to throw a sandbag into a circle which is three meters away. The parent will get 5 throws and can choose between two ways of getting paid for the task: 1) 20 Kenyan Shillings ($0.20), regardless of the number of hits; or 2) 40 Kenyan Shillings if the parent can perform as least as well as another adult which completed the task earlier. (Note, this question was asked to all the original KLPS respondents, regardless of whether they had a 6-8-year-old child participating in the study.)

2. *Children's competitiveness for self.* Children will be asked to throw the sandbag in the circle from 2 meters away and can earn stars for their performance. The stars can be exchanged for school supplies such as pencils, erasers and color crayons. Children can choose to do the task for: 1) one star, regardless of the number of hits; or 2) two stars if the child can perform as least as well as another child which completed the task earlier.

3. *Parents competitiveness for their children.* After making the choice of their own pay scheme, parents with a child selected for the KLPS-Kids activity will be informed that this child will also do a related task. The parent is then given a description of the two available pay schemes for the child and is asked to choose one of them. The child will repeat the task for their parent's choice of pay scheme. (Note, this question was

incentivized, as the parents choice had real consequences for their child. As such, the question was only implemented for parents with a 6-8-year-old child in the study.)

In addition to these outcomes, we elicit several measures to the study mechanisms for competitiveness choices. These outcomes include parents belief about their own ability, parents risk preferences, parents beliefs about childrens competitiveness choices, childrens risk preferences, and childrens belief about their own ability.

3.2.3 Sample

We have two types of subjects: the parents and the children. A key component of the data analysis is to compare parents' choices for boys to parents' choices for girls. The comparison can be viewed as a descriptive documentation of the difference in how parents make choices of boys and girls. However, the comparison also has a causal interpretation; the effect of child gender on parents' choices. The causal interpretation relies on the assumption that parents choosing for boys are identical to parents choosing for girls. To test the extent to which this assumption is true, we pre-specify to present a balance table with a list four variables by child gender; 1) Parent membership in deworming treatment (groups 1 and 2) and control (group 3), directly and interacted with gender, 2) indicator for received either vocational training vouchers or cash grants (or both), 3) age of parent at date of data collection, and 4) parent gender.

At the time of this analysis we only have data on the latter two variables; parent age on gender. On these two variables there does not appear to be any significant differences between parents of girls and parents of boys. The mean age of parents are 32.2 for boys, and 32.4 for girls. The p-value on the difference is 0.36. For parent gender, 65 percent of parents of boys are mothers, and 62 percent of parents of girls are mothers. The p-value on the difference is 0.41.

3.3 Results

In this section we on present results on i) parents' competitiveness choices for self, ii) children's competitiveness choices for self, iii) parents' competitiveness choice for their children. A pre-analysis plan for this study is available at the AEA RCT Registry. This analysis follows the pre-analysis plan, however, at this stage of the data-collection not all variables are available yet. As more data becomes available we will update the analysis accordingly.

3.3.1 Parents

In all we collect experimental data on 1591 parents, 699 men and 892 women. Table 3.1a provides an overview of the key experimental outcomes that we elicit from parents. In all 59 percent of parents choose to compete. We find a significant gender difference; 55 percent mothers compete compared to 63 percent of fathers ($p < 0.01$). The finding that men compete more than women is in line with previous findings in the literature (Kagel and Roth (2016)).

In Table 3.2 we study mechanisms which can explain the gender difference in parents' choices. Column one shows for references the ordinary least square regression of a whether the parent choose to compete on parent gender. In column two, we add a control for parents performance in the task from the practice round. There is a significant gender difference, fathers on average have 2.67 hits and mothers have 2.51 ($p < 0.01$). Parents performance positively correlates with choosing to compete. Adding this control reduces the coefficient on parent gender from -0.083 to -0.074, but it is still significant ($p < 0.01$).

In column three we a control for parents' belief about their relative performance which is elicited from a 5 points scale. Fathers are more optimistic about their relative performance than mother ($p < 0.01$), and beliefs positively predict tournament entry. Adding this control reduces the coefficient on parent gender from -0.083 to -0.069, but it is still significant ($p < 0.01$).

In column four we add a measure of parents' risk-taking. We find no gender difference in willingness to risk, and this variable does not predict tournament entry. We only have this measure for 859 subject. As such, adding this control, we reduce to the sample by almost 50 percent. Also in this sample there is a robust gender difference in willingness to compete (0.118, $p < 0.01$).

In column five and six we run the regression from column four by gender. Column seven reports the p-value on the difference between the coefficients in column five and six, from a regression where we interact each variable with gender of the parent. There appears to be no significant gender difference in which mechanisms explains willingness to compete.

3.3.2 Children

Table 3.1b provides an overview of the key experimental outcomes that we elicit from children. In all, we have data on 579 children, 271 boys and 263 girls.

In all 58 percent of children choose to compete, compared to 59 percent of parents. In contrast to the parent sample, there is no evidence in the child sample that boys are more willing to compete than girls. In fact, we find that girls compete more than boys, but the difference is not significant (55 vs. 60. $p < 0.20$).

In 3.3 we study mechanisms for children's choices. This table is parallel to table 3.2 where we studied mechanisms for parents' choices.

Column one shows for reference the regression of children's choice to compete on child gender. Girls compete 5 percentage points more than boys, but this difference is not significant. In column two we add controls for performance on the task. Girls on average have 2.72 hits, while boys have 2.63 ($p < 0.40$). Performance positively predicts tournament entry. In column three we add beliefs about relative performance which is elicited in the same way in which we elicit beliefs about relative performance from parents. On a scale from 1-5 both boys and girls report their belief about their ability to be 3.81. Children's beliefs do not predict choosing to compte. In column four we include a control a willingness to take risk elicited on a five points scale. Higher willingness to take risk predicts choosing to compete. Boys are significantly more willing to take risk than girls ($p < 0.06$). In all, including controls for number of hits, beliefs about relative performance, and willingness to take risk, changes the coefficient on female from 0.052 to 0.044.

In column four and five we run the specification from column four separately for boys and girls. Column seven reports the p-value on the difference between the coefficients in column five and six, from a regression where we interact each variable with gender of the child. Performance and risk-taking only predict girls competition choices and not boys competition choices. However, this difference is not significant, as reported in column seven.

3.3.3 Parents for children

Table 3.1b provides an overview of the key experimental outcomes that we elicit from parents about their children. We here focus on the sample of participants where we have experimental data on both parents and children.

In all 59 percent of parents choose for their children to compete. Furthermore there is a significant gender difference in parents' choices for their children; parents choose for 62 percent of boys to compete, and 55 percent of girls ($p < 0.09$). This is in stark contrast to children's own choices where more girls competed than boys.

In Table 3.2 we study mechanisms for parents' choices for their children. In addition to child gender, we see that parents' choices for their children are positively predicted by i) parents' beliefs about their child's ability, ii) whether the parents themselves compete, iii) if the parent believes competition is important, and iii) parents' belief about their child's own choice to compete or not. On the other hand, parents' choices are not predicted by i) child performance and ii) parents' willingness to take risk. However, even after controlling for all these explanatory variables the coefficient on child gender barley changes from -0.072 in column one to -0.061 in column seven.

In Table 3.5 we study correlations between children's choices and parents' choices. In Table 3.6 and Table 3.7 we study heterogeneity by child age and parent gender.

3.4 Conclusion

This paper reports *preliminary* findings from an experiment on Kenyan parents and children, which studies parents' choices for their children in the domain of competition, and parents' competitiveness choices and children's competitiveness choices.

We report three main findings. First, there is a significant gender difference in parents' competitiveness choices'; fathers compete more than mothers. Second, for children, girls compete more than boys, but the difference is not significant. Third, when parents' make choices for their children, they choose to let more boys compete than girls compete.

We interpret the findings as supporting a theory of the world where parents are important in shaping gender differences among children; as parents choose to implement a gender difference among children, while there is no gender difference among children themselves.

We emphasise that results presented in this paper are only preliminary, and we will update the results as more data is being a collected. The data analysis follows a pre-analysis plan which is posted to the AEA RCT Registry.

Table 3.1: Overview outcomes

a) Parents

	Scale	All	Fathers	Mothers	*p*
Chooses to compete	dummy	0.59	0.63	0.55	0.00
Risk-taking	1-33 (seek risk)	10.47	10.34	10.56	0.77
Number of hits on task	number of hits	2.58	2.67	2.51	0.01
Belief about relative ability	1-5 (much better)	4.37	4.46	4.30	0.01
Important to be competitive for success	1-10 (important)	8.44	0.86	0.84	0.88
Number of observations			699	892	

b) Children

	Scale	All	Boys	Girls	*p*
Chooses to compete	dummy	0.58	0.55	0.60	0.20
Risk-taking	1-5 (seek risk)	3.44	3.54	3.34	0.06
Number of hits on task	number of hits	2.67	2.63	2.72	0.40
Belief about relative ability	1-5 (much better)	3.81	3.81	3.81	0.95
Number of observations			271	263	

c) Parents for children

	Scale	All	Boys	Girls	*p*
Chooses to let child compete	dummy	0.59	0.62	0.55	0.09
Believes child will chooses to compete	dummy	0.64	0.64	0.61	0.43
Acts paternalistically for child	number of hits	0.28	0.29	0.27	0.62
Belief about relative ability	1-5 (much better)	3.81	3.81	3.81	0.95
Number of observations			271	263	

Note: *** p< 0.01, ** p< 0.05, * p< 0.1

Table 3.2: Parents: gender differences in willingness to compete

Dependent variable:	**Parent chooses to compete**						
	(1)	(2)	(3)	(4)	Fathers	Mothers	p
Mother	-0.083***	-0.074***	-0.069***	-0.118***			
	(0.025)	(0.024)	(0.025)	(0.034)			
Parent number of hits		0.064***	0.061***	0.047***	0.033*	0.058***	0.35
		(0.010)	(0.010)	(0.013)	(0.019)	(0.018)	
Parent belief about relative ability			0.049***	0.052***	0.050*	0.052**	0.96
			(0.014)	(0.017)	(0.027)	(0.021)	
Parent risk-taking				0.001	0.002	-0.000	0.56
				(0.001)	(0.002)	(0.002)	
Observations	1591	1591	1585	859	360	499	
R-squared	0.007	0.032	0.041	0.046	0.020	0.036	

Note: *** p< 0.01, ** p< 0.05, * p< 0.1

Table 3.3: Children: gender differences in willingness to compete

Dependent variable:	**Child chooses to compete**						
	(1)	(2)	(3)	(4)	Boys	Girls	*p*
Child is a girl	0.052	0.048	0.042	0.044			
	(0.041)	(0.041)	(0.042)	(0.042)			
Child number of hits		0.047***	0.043**	0.032*	0.013	0.055**	0.21
		(0.016)	(0.017)	(0.017)	(0.024)	(0.024)	
Child belief about relative ability			0.016	0.011	-0.014	0.038	0.23
			(0.021)	(0.021)	(0.029)	(0.030)	
Child risk-taking				0.049***	0.029	0.063***	0.33
				(0.017)	(0.027)	(0.023)	
Observations	579	579	558	534	271	263	
R-squared	0.003	0.017	0.016	0.027	0.006	0.064	

Note: *** p< 0.01, ** p< 0.05, * p< 0.1

Table 3.4: Parents for children: gender differences in willingness to compete

Dependent variable:	**Parent chooses to for child to compete**						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Child is a girl	-0.072*	-0.072*	-0.071*	-0.084**	-0.081**	-0.061*	-0.061
	(0.042)	(0.042)	(0.042)	(0.040)	(0.040)	(0.037)	(0.052)
Child number of hits		0.010	0.011	0.014	0.015	0.016	0.009
		(0.017)	(0.017)	(0.016)	(0.016)	(0.015)	(0.022)
Parent belief about child relative ability			0.083**	0.072**	0.073**	0.058*	0.059
			(0.035)	(0.033)	(0.034)	(0.031)	(0.039)
Parent competes				0.313***	0.302***	0.237***	0.239***
				(0.041)	(0.042)	(0.041)	(0.056)
Parent believes competition important					0.015*	0.012	0.021**
					(0.008)	(0.008)	(0.011)
Parent believes child would compete						0.374***	0.340***
						(0.042)	(0.057)
Parent risk-taking							0.003
							(0.002)
Observations	543	542	538	538	538	537	296
R-squared	0.005	0.006	0.017	0.114	0.120	0.253	0.240

Note: *** p< 0.01, ** p< 0.05, * p< 0.1

Table 3.5: Correlations in competition choices and risk-taking

	All	**Boys**	**Girls**
Child's choice self & parent's choice self	0.04	0.07	0.02
Child's choice self & parent's choice child	0.00	-0.03	0.04
Child's choice self & parent's belief about child's choice	0.01	0.03*	-0.01
Parent's choice child & parent's belief about child's choice	0.42***	0.39***	0.46***
Child's risk-taking & parent's risk-taking	-0.08	-0.06	-0.09

Note: *** p< 0.01, ** p< 0.05, * p< 0.1

Table 3.6: Hetrogeneity by child age

	All	Boys	Girls	*p*
Child chooses to compete				
6-year old (n=193)	0.53	0.49	0.55	0.37
7-year old (n=205)	0.58	0.55	0.60	0.49
8-year old (n=174)	0.62	0.59	0.65	0.44
Parent chooses to let child compete				
6-year old (n=174)	0.56	0.57	0.55	0.77
7-year old (n=194)	0.59	0.65	0.53	0.08
8-year old (n=167)	0.60	0.64	0.57	0.34
Parent believes child will compete				
6-year old (n=174)	0.60	0.65	0.56	0.24
7-year old (n=194)	0.60	0.59	0.61	0.82
8-year old (n=167)	0.67	0.69	0.65	0.66
Parent act paternalistically for child				
6-year old (n=174)	0.29	0.28	0.31	0.70
7-year old (n=193)	0.25	0.27	0.24	0.60
8-year old (n=167)	0.28	0.30	0.26	0.54

Table 3.7: Hetrogeneity by parent gender

	All	Boys	Girls	*p*
Chooses to let child compete				
Father (n=192)	0.61	0.65	0.57	0.24
Mother (n=349)	0.58	0.61	0.54	0.20
Parent believes child will compete				
Father (n=193)	0.66	0.64	0.68	0.54
Mother (n=349)	0.60	0.64	0.56	0.14
Parent act paternalistically for child				
Father	0.25	0.27	0.23	0.48
Mother	0.29	0.29	0.29	0.94

Bibliography

Almås, Ingvild, Alexander W Cappelen, Kjell G Salvanes, Erik Ø Sørensen, and Bertil Tungodden, "Willingness to compete: Family matters," *Management Science*, 2015.

Ambuehl, Sandro, Douglas B. Bernheim, and Axel Ockenfels, "Projective Paternalism," 2019.

Andersen, Steffen, Seda Ertac, Uri Gneezy, John A List, and Sandra Maximiano, "Gender, competitiveness, and socialization at a young age: Evidence from a matrilineal and a patriarchal society," *Review of Economics and Statistics*, 2013, *95* (4), 1438–1443.

Apicella, Coren L, Anna Dreber, Peter B Gray, Moshe Hoffman, Anthony C Little, and Benjamin C Campbell, "Androgens and competitiveness in men.," *Journal of Neuroscience, Psychology, and Economics*, 2011, *4* (1), 54.

Araujo, Felipe A, Erin Carbone, Lynn Conell-Price, Marli W Dunietz, Ania Jaroszewicz, Rachel Landsman, Diego Lamé, Lise Vesterlund, Stephanie W Wang, and Alistair J Wilson, "The slider task: an example of restricted inference on incentive effects," *Journal of the Economic Science Association*, 2016, *2* (1), 1–12.

Baird, Sarah, Joan Hamory Hicks, Michael Kremer, and Edward Miguel, "Worms at work: long-run impacts of child health gains," *Berkeley: University of California at Berkeley*, 2011.

Becker, Gary S and Nigel Tomes, "An equilibrium theory of the distribution of income and intergenerational mobility," *Journal of Political Economy*, 1979, *87* (6), 1153–1189.

Birkelund, Gunn Elisabeth and Toril Sandnes, "Paradoxes of welfare states and equal opportunities: Gender and managerial power in Norway and the USA," *Comparative Social Research*, 2003, *21*, 203–242.

Bisin, Alberto and Thierry Verdier, "The economics of cultural transmission and the dynamics of preferences," *Journal of Economic theory*, 2001, *97* (2), 298–319.

Booth, Alison and Patrick Nolen, "Choosing to compete: How different are girls and boys?," *Journal of Economic Behavior & Organization*, 2012, *81* (2), 542–555.

Brenøe, Anne Ardila and Thomas Epper, "Parenting Values Moderate the Intergenerational Transmission of Time Preferences," 2019.

Buser, Thomas, "The impact of the menstrual cycle and hormonal contraceptives on competitiveness," *Journal of Economic Behavior & Organization*, 2012, *83* (1), 1–10.

_ , "The impact of losing in a competition on the willingness to seek further challenges," *Management Science*, 2016, *62* (12), 3439–3449.

_ **, Eva Ranehill, and Roel van Veldhuizen**, "Gender differences in willingness to compete: The role of public observability," 2017.

_ **, Muriel Niederle, and Hessel Oosterbeek**, "Gender, Competitiveness, and Career Choices," *Quarterly Journal of Economics*, 2014, *129* (3).

_ **, Noemi Peter, and Stefan C Wolter**, "Gender, competitiveness, and study choices in high school: Evidence from Switzerland," *American Economic Review*, 2017, *107* (5), 125–30.

_ **,** _ **, and** _ , "Gender, willingness to compete and career choices along the whole ability distribution," 2017.

Cassar, Alessandra, Feven Wordofa, and Y Jane Zhang, "Competing for the benefit of offspring eliminates the gender gap in competitiveness," *Proceedings of the National Academy of Sciences*, 2016, *113* (19), 5201–5205.

Chowdhury, Shyamal, Matthias Sutter, and Klaus Zimmermann, "Economic preferences across generations: Identifying family clusters from a large-scale experiment," 2019.

DellaVigna, Stefano, John A List, Ulrike Malmendier, and Gautam Rao, "Estimating social preferences and gift exchange at work," Technical Report, National Bureau of Economic Research 2016.

Doepke, Matthias and Fabrizio Zilibotti, "Parenting with style: Altruism and paternalism in intergenerational preference transmission," *Econometrica*, 2017, *85* (5), 1331–1371.

Dohmen, Thomas, Armin Falk, David Huffman, and Uwe Sunde, "The intergenerational transmission of risk and trust attitudes," *The Review of Economic Studies*, 2011, p. rdr027.

_ , _ , _ , _ **, Jürgen Schupp, and Gert G Wagner**, "Individual risk attitudes: Measurement, determinants, and behavioral consequences," *Journal of the European Economic Association*, 2011, *9* (3), 522–550.

Eckel, Catherine C and Philip J Grossman, "Sex differences and statistical stereotyping in attitudes toward financial risk," *Evolution and Human Behavior*, 2002, *23* (4), 281–295.

Fagereng, Andreas, Magne Mogstad, and Marte Ronning, "Why do wealthy parents have wealthy children?," *University of Chicago, Becker Friedman Institute for Economics Working Paper*, 2018, (2019-22).

Fischbacher, Urs, "z-Tree: Zurich toolbox for ready-made economic experiments," *Experimental Economics*, 2007, *10* (2), 171–178.

Flory, Jeffrey A, Andreas Leibbrandt, and John A List, "Do competitive work places deter female workers? A large-scale natural field experiment on gender differences in job-entry decisions," *The Review of Economic Studies*, 2015, *82* (1), 122–155.

_ , Uri Gneezy, Kenneth L Leonard, and John A List, "Gender, age, and competition: A disappearing gap?," *Journal of Economic Behavior & Organization*, 2018, *150*, 256–276.

Gneezy, Uri, Kenneth L Leonard, and John A List, "Gender differences in competition: Evidence from a matrilineal and a patriarchal society," *Econometrica*, 2009, *77* (5), 1637–1664.

_ , Muriel Niederle, and Aldo Rustichini, "Performance in competitive environments: Gender differences," *The Quarterly Journal of Economics*, 2003, *118* (3), 1049–1074.

Heckman, James J, Jora Stixrud, and Sergio Urzua, "The effects of cognitive and noncognitive abilities on labor market outcomes and social behavior," *Journal of Labor economics*, 2006, *24* (3), 411–482.

Hoffman, Moshe and Uri Gneezy, "Left Handed Women are More Competitive than Right Handed Men: On the Biological Basis of Gender Differences in Competitiveness," *Work. Pap., Univ. Calif., San Diego*, 2010.

Houser, Daniel, John A List, Marco Piovesan, Anya Samek, and Joachim Winter, "Dishonesty: From parents to children," *European Economic Review*, 2016, *82*, 242–254.

Ifcher, John and Homa Zarghamee, "Pricing competition: a new laboratory measure of gender differences in the willingness to compete," *Experimental Economics*, 2016, *19* (3), 642–662.

Kagel, John H and Alvin E Roth, *The Handbook of Experimental Economics*, Vol. 2, Princeton university press, 2016.

Khadjavi, Menusch and Andreas Nicklisch, "Parents ambitions and childrens competitiveness," *Journal of Economic Psychology*, 2018, *67*, 87–102.

Kőszegi, Botond and Matthew Rabin, "A model of reference-dependent preferences," *The Quarterly Journal of Economics*, 2006, *121* (4), 1133–1165.

Niederle, Muriel and Lise Vesterlund, "Do women shy away from competition? Do men compete too much?," *Quarterly Journal of Economics*, 2007, pp. 1067–1101.

Qualtrics, I, "Qualtrics. com," *Provo, UT, USA*, 2013.

Sacerdote, Bruce, "How large are the effects from changes in family environment? A study of Korean American adoptees," *The Quarterly Journal of Economics*, 2007, pp. 119–157.

Shurchkov, Olga, "Under pressure: gender differences in output quality and quantity under competition and time constraints," *Journal of the European Economic Association*, 2012, *10* (5), 1189–1213.

Sutter, Matthias and Daniela Glätzle-Rützler, "Gender differences in the willingness to compete emerge early in life and persist," *Management Science*, 2015, *61* (10), 2339–23354.

Tungodden, Jonas, "When parents decide: Gender differences in competitiveness," 2019.

van Veldhuizen, Roel, "Gender differences in tournament choices: Risk preferences, overconfidence or competitiveness?," Technical Report, Discussion Paper 2018.

Wozniak, David, William T Harbaugh, and Ulrich Mayr, "The menstrual cycle and performance feedback alter gender differences in competitive choices," *Journal of Labor Economics*, 2014, *32* (1), 161–198.

Yariv, Leeat, Ben Gillen, and Erik Snowberg, "Experimenting with Measurement Error: Techniques with Applications to the Caltech Cohort Study," 2018.

Zhang, Y Jane, "Can experimental economics explain competitive behavior outside the lab?," *Available at SSRN 2292929*, 2013.

Zumbuehl, Maria, Thomas J Dohmen, and Gerard A Pfann, "Parental investment and the intergenerational transmission of economic preferences and attitudes," 2013.