When Parents Decide: Gender Differences in Competitiveness

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Abstract

Parents make important choices for their children in many areas of life, yet the empirical literature on this topic is scarce. We study parents' competitiveness choices for their children by combining two large-scale artefactual field experiments with high-quality longitudinal administrative data. We document three main sets of findings. First, parents choose more competition for their sons than daughters. Second, this gender difference can largely be explained by parents' beliefs about their children's competitiveness preferences. Third, parents' choices predict children's later-in-life educational outcomes. Taken together, these findings provide novel evidence on the role of parents in shaping children's long-term outcomes.

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1 Introduction

Parents play a crucial role in their children's lives and make a large number of choices – both large and small – that may have a lasting impact on their development. What courses and extracurricular activities should they pursue? Which schools should they apply to? Which careers should they focus on? How parents make such choices can have substantial implications for their children's human capital development and labor market trajectory, and likely represent an important channel through which differences in child outcomes emerge. However, the difficulty associated with linking variation in parents' decision-making to child outcomes has prevented a careful analysis on this topic. The empirical literature in economics on parents' choices for their children is therefore limited.

In this paper, we provide the first experimental evidence in the economics literature on parents' choices, examining how parents make competitiveness choices for their children. We are motivated to study parents' competitiveness choices for two reasons. First, competitiveness appears to be a decisive element in many important choices. In particular, prior research has suggested a link between individual competitiveness choices and education as well as early labor market outcomes (Buser et al. (2014), Flory et al. (2015), Almås et al. (2016b), Buser et al. (2021c)). Second, competitiveness may help explain the existence of gender gaps in these outcomes, as a robust literature has found that girls are much less willing to compete than boys (Niederle and Vesterlund (2007), Kagel and Roth (2020)). However, when young adolescents make educational and early career choices, parents play a fundamental role in the decision-making process. As such, it is likely that parents' competitiveness choices also have a major impact on the children's development. Shedding light on this question will not only help us disentangle the mechanisms underlying children's educational choices, but it will also help us better understand how differences in education and early career outcomes between boys and girls may emerge.

To study how parents make competitiveness choices for their children, we construct a unique data set that combines two large-scale artefactual field experiments with rich high-quality longitudinal administrative data. This data set enables us to elicit parents' competitiveness choices for their children, study mechanisms explaining parents' choices, and test the importance of parents' choices for children's long-term education outcomes.

The experimental data encompass 1,480 subjects from 15 different schools, and build on the canonical Niederle and Vesterlund (2007) approach of measuring competitiveness. The novelty of our experimental design is to have parents make choices for their children. Specifically, children perform a real-effort task, and parents are asked to choose whether the child should be paid based on a non-competitive or a competitive incentive scheme. This choice serves as a measure of parents' willingness to put children in a competitive environment. We also measure children's own competitiveness choices, as well as parents' own competitiveness choices and their beliefs about children's competitiveness choices.

We link the experimental participants to the national register databases of Norway, which allows us to follow these participants over time and collect high-quality longitudinal administrative data on both children and parents. For children, we have data on their education history, as well as their education choices up to three years after the conclusion of the experiments. For parents, the administrative data include both their income and education history.

The unique data set that we generate allows us to study three novel questions with important policy implications: How do parents make competitiveness choices? What explains parents' choices? Do parents' choices predict important long-term education outcomes for children? It should be noted that the analysis in the paper is based on a publicly available pre-analysis plan.[1] When the analysis deviates from that in the pre-analysis plan, we explicitly state this in the paper.

We provide three sets of key results. First, we show that parents are significantly more likely to choose competition for sons than daughters, displaying a gender bias of 28 percent. This gender bias is in the same direction as that which has been identified for children's own choices in the prior literature.

Second, to explain parents' choices, we construct a conceptual model in which parents make a tradeoff between choosing what the child wants (child perspective) and their desire to impose their own preferences on their children (parent perspective). We show that both perspectives are important for explaining parents' competitiveness choices for their children, but in different ways. Specifically, while the child perspective is crucial for explaining the gender bias in parents' choices, the parent perspective contributes to a narrowing of the gender gap.

Third, we demonstrate that parents' competitiveness choices predict important educational outcomes after the experiments were concluded. The educational choice we focus on is whether the child pursues an academic track in high school, a choice that determines access to higher education, has substantial implications for labor market outcomes, and has been linked to competition preferences through a number of prior studies (Buser et al. (2014), Almås et al. (2016a)). We find a large, robust effect of parents' choices which persist when controlling for parents' background characteristics and children's own competitiveness. Our findings suggest that parents' competitiveness choices for their children are even more important than children's own competitiveness choices in terms of understanding gender differences in education outcomes. The magnitude of the effect we identify is substantial, and considerably larger than conventional education and family interventions that have been examined in the existing literature (e.g., Krueger and Whitmore (2001), Dahl and Lochner (2012)).

We also identify important heterogeneity across parent gender related to all three research questions. The gender gap in choices is similar for mothers and fathers, but mothers are significantly less likely to choose competition for their children. While both the child perspective and the parent perspective are important for mothers' and fathers' choices, the reason mothers choose less competition can be explained by the parent perspective; mothers themselves prefer competing much less than fathers and they impose these preferences on their children. Finally, we find that the association between parents' choices and children's education outcomes loads entirely on fathers.

This paper contributes to the existing literature in several important ways. First, we provide novel evidence on a new channel through which parents exert influence over children, and the effect that this has on key education outcomes. This advances and complements the large and impressive literature on the importance of parents, which includes both empirical and theoretical work (Becker and Tomes (1979), Autor et al. (2019), Fagereng et al. (2021)).

[1]The pre-analysis plan can be found at https://www.socialscienceregistry.org/trials/2344.

In addition, by constructing a conceptual model to disentangle the reasons underlying parents' decisions, the paper helps develop the growing literature on parenting and parenting style (Bisin and Verdier (2001), Doepke and Zilibotti (2017)). Finally, we also contribute to a series of important papers studying the principal-agent problem for parents and their children, where parents make sub-optimal choices due to incorrect beliefs (Bergman (2021), Dizon-Ross (2019)). In our paper, we document significant information gaps in the beliefs parents have about their children, both in terms of their children's willingness to compete as well as in terms of their children's ability. We also show that the beliefs parents hold are highly predictive of the choices they make in the experiment and for later child education choices. Providing information treatments similar to those in Bergman (2021) and Dizon-Ross (2019) may therefore help reduce parents' overconfidence in their children and better calibrate parents' competitiveness choices for their children

Second, we contribute to a recent literature showing that experimentally-measured preferences and beliefs are predictive of adolescents' later-in-life education and career choices (Wiswall and Zafar (2015, 2018, 2021)). For example, Wiswall and Zafar (2018) find that almost a quarter of the gender gap in earnings at the start of the career can be explained by stated preferences for job amenities, demonstrating the promise of using stated preferences to better understand later-in-life outcomes. We contribute to this excellent literature by being the first to use incentivized parents' choices to predict children's later-in-life education choices. We show that going from a non-competitive to a competitive parent is as important for predicting academic high school track as an increase in GPA equivalent to 50 percent of a standard deviation. Moreover, we show that parents' competitiveness choices represent a stronger predictor for children's later-in-life education outcomes than children's own experimentally-measured competitiveness choices. Our findings have important implications for this literature: parents are important for explaining children's outcomes, and failing to take the parents into account can lead to incorrect conclusions about the role of children's own preferences and beliefs.

Third, the paper builds on the large literature on gender differences in labor market outcomes to uncover a new mechanism through which gender differences in important outcomes may arise (for an overview, see Altonji and Blank (1999), Marianne (2011), Olivetti and Petrongolo (2016), Blau and Kahn (2017)). The main focus of this literature has been on differences in human capital, experience, occupation, and discrimination. However, as these conventional explanations have largely been ruled out (e.g., Hyde (2005), Ceci et al. (2014), Card and Payne (2021)), increasing attention has been placed on alternative mechanisms. This includes the role of parenthood and child penalties (e.g., Kleven et al. (2019)), the effect of mentors and role models (e.g., Riise et al. (2020)), differences in bargaining ability (e.g., Card et al. (2013)), and difference in the willingness to compete (e.g., Niederle and Vesterlund (2007)). We contribute to this literature by providing the first evidence on a previously overlooked obstacle to achieving gender wage parity: gender difference in parents' competitiveness choices for their children.

Fourth, we advance the competitiveness literature by providing the first evidence on how parents make competitiveness choices for children. The existing competitiveness literature has focused on how children make choices for themselves, and has documented a robust gender difference in the willingness to compete. Specifically, boys are more competitive than girls (Niederle and Vesterlund (2007)). We extend this literature by considering parents,

and show that parents also have a gender bias, choosing significantly more competition for sons than daughters. Another suggestive finding in this literature is that individual competitiveness choices can predict education choices (Buser et al. (2014), Almås et al. (2016a), Buser et al. (2017b)). We build on this literature and reveal that this association also exists for parents, even when controlling for children's own choices. This has important implications for understanding the mechanisms underlying children's educational choices, and for helping us better understand how gender differences in education and early career outcomes can be reduced.

Fifth, our paper also speaks to the origin of gender difference in competition. 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. (2021b)), as well as biological differences (Apicella et al. (2011), Buser (2012), Wozniak et al. (2014), Sutter and Glätzle-Rützler (2015), Buser et al. (2021a)). 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) study willingness to compete when the payoff from competition is given to the child. Our paper adds to this impressive literature by studying how parents' competitiveness choices relate to gender differences in children's own choices. More broadly, the paper relates to the literature on the 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. (2012), Zumbuehl et al. (2021), Houser et al. (2016), Brenøe and Epper (2019), Chowdhury et al. (2020)). This paper sheds light on the transmission of competitiveness preferences from parents to children.

Finally, our paper is at the forefront of papers in the economics literature studying how parents make experimental choices for their children. The literature on this is scarce. Houser et al. (2016) is among the first papers to study the parent and child interaction in experiments, documenting how parents' willingness to act dishonestly depends on the presence of children. To the best of our knowledge, our study is the first to examine how parents make incentivized choices for their children in an experimental setting. Three more recent studies build on our design to further examine how parents make real choices for their children: Kiessling et al. (2021) study how parents make choices in the domain of time for their children in Pakistan, Sund (2020) uses our study design to explore the extent to which Norwegian parents are willing to cheat to benefit their children, and Miguel et al. (2019) study parents' competitiveness choices for their children in Kenya. Thus, we see the current study as opening up a new avenue of research on a number of questions which are ripe for exploration in experiment and field studies.

The results from this analysis have important policy implications. Specifically, most parents want the best for their children, and to ensure that the children are making the right choices they actively engage in their children's lives. Therefore, parents are oftentimes the biggest influential factor in the education and early career development of a child. However, if parents' competitiveness choices for their children are subject to a gender bias, then this represents a previously overlooked obstacle to ensuring gender equality at an early age. If so, it shows that the previously documented gender bias in competitiveness preferences cannot be ameliorated through the home environment, but that targeted interventions at school may be a more appropriate solution to eliminating this issue.

The rest of this paper is organized as follows. In Section 2, we provide institutional back-

ground, introduce our experimental design and discuss the administrative data. In Section 3, we study how parents make competitiveness choices for their children and how parents' choices compare to children's own competitiveness choices. In section 4, we explore mechanisms for parents' choices. In section 5, we examine if parents' choices predict important education outcomes for children. In section 6, we perform two extensions, examining i) effect differences between mothers and fathers, and ii) intergenerational correlations in preferences between parents and children. In Section 7, we summarize our findings and discuss policy implications.

2 Study design

2.1 Institutional background

In this section, we present background information and provide institutional details surrounding our study.

Country setting. Our project is implemented in Norway, a country that is frequently considered a success story in terms of combating gender differences in important education and labor market outcomes. Several aggregate statistics support this view, with Norway being ranked first on the Human Development Index (Baumann (2021)) and third on the Global Gender Equality Index (Sharma et al. (2021)).

However, several differences between men and women remain. First, the labor markets are highly gender segregated and there is a non-negligible and persistent wage difference between men and women (Nilsen (2020)). Second, while girls outperform boys in terms of educational attainment, there is a large gap in the type of degrees that they pursue. Specifically, males are more likely to pursue STEM degrees and degrees associated with higher financial returns (Benavot et al. (2016)). Third, there are important differences in how boys and girls make choices, and these differences have been linked to gender gaps in educational and labor market outcomes. For example, it has been demonstrated that boys display a higher willingness to compete than girls, and that this helps explain some of the gender gaps in educational outcomes (Almås et al. (2016b)).

Conducting our study in Norway is therefore particularity interesting, helping us to understand if gender differences in how parents make choices for their children can explain some of the gender differences in educational choices and why societies—even those committed to equality—struggle to close the gaps.

Education system. The Norwegian school system consists of 10 years of compulsory school starting the year children turn 6. The curriculum is set by the central government, and more than 95 percent of all children attend public institutions. Following the successful completion of compulsory school, every child has the right to attend 3-4 years of high school. Although high school is voluntary, more than 95 percent of each cohort choose to enroll.[2] Education is free at all levels.

[2]However, only around 80 percent of each cohort end up with a high school diploma five years after having begun high school.

High school consists of two different tracks: an academic track that provides students with direct access to higher education, and a vocational track which results in a trade or journeyman's certificate. The vocational track does not directly grant the student access to higher education. Approximately 50 percent of all students in Norway choose to enroll in the vocational track. The two tracks are further subdivided into different subtracks. With respect to the academic subtracks, students can choose between Sports and Physical Education; Art, Design and Architecture; Media and Communication; Music, Dance and Drama; and Specialization in General Studies. As discussed in the pre-analysis plan, we focus on the Specialization in General Studies subtrack - the largest and most prestigious of the academic subtracks. Throughout the paper, we will refer to the Specialization in General Studies subtrack as the academic track.

In terms of content and perception, the academic track is considered most prestigious. It has the highest GPA admissions threshold, has a higher math and science intensity, and the average peer ability is significantly higher. In addition, the academic track is highly correlated with obtaining post-secondary education, occupation quality, and later-in-life earnings. Taken together, the academic track is therefore considered more competitive than the vocational track, something which is supported by findings in the competitiveness literature (e.g., Buser et al. (2014), Almås et al. (2016a)).[3]

Students apply to high school through a centralized system based on the grades obtained in 10th grade. Students are allowed to choose whichever program they are interested in, and the application consists of ranking programs and schools in the county of residence. If the number of applications exceeds program capacity, students are assigned based on compulsory school grades. We study children in the last year of middle school, right before they are about to make this choice.

2.2 The experiment

In this section, we present and discuss the experimental design, the recruitment process, and how the experiments were implemented.

Recruitment of participants. To recruit participants, we contacted all middle schools within a 2-hour driving distance of Bergen, the second largest city in Norway.[4] We informed the schools that we would like to run a 1-hour experiment on their 10th grade students, that we would pay the students based on the choices they make in the experiment, and that the students' parents would be invited to participate in a related experiment.[5] We further informed the schools that the goal of the study was to improve our understanding of the determinants of adolescents' educational decisions.

Out of the 38 schools that we contacted, 17 gave us permission to run the experiment, two of which participated in the pilot study. Appendix Figure A1 shows the locations of

[3]In addition, there are a few studies demonstrating that women who drop out of math-intense college majors and engineering display a low tolerance for competition (e.g., Felder and Henriques (1995) and Goodman (2002)).

[4]Bergen is close to the national average with respect to the distribution of income, education, and occupation, see Almås et al. (2016b).

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

the participating and non-participating schools. There is no systematic difference in the geographic distribution of participating and non-participating schools. Panel A of Table 1 also shows that the average grades among students at participating schools are very similar to the average grades among students at non-participating schools, and very comparable to the national average.

At each school, we randomly selected three classes, and all individuals in those classes received an invitation to participate in the experiment.[6] The participation rate for children was 81 percent, with 921 students taking part in the experiment.[7] For each participating student, we randomly invited either the mother or the father to participate in an online experiment.[8] We informed the parents that their choice to participate would not influence whether their child could participate. In total, 776 parents participated (82 percent of the invited parents). Figure 1a illustrates the recruitment process. Note that participation was voluntary and both students and their parents had to consent to participate. In the main analysis, we focus on the sample where both the parent and child participated.

Implementation. Experiments were run in March and April of 2017. Because the parent was asked to make a real choice for the child, the parent experiment was designed to finish before the child experiment began. To prevent the parent and the child from influencing each other's choices, we further designed the experiments in a way that minimized parents' and children's ability to communicate with one another.

In terms of implementation, the parent and the child completed their experiment on the same day. At 08:00 — after the children had left their homes for school — the parents 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 1b provides the timeline of the experiment.[9]

The children participated in the child experiment at their schools. The child experiment started after the lunch break and lasted for approximately 30 to 45 minutes. The child experiment was computer-based (programmed in z-Tree (Fischbacher (2007)). 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 parent was instructed not to tell the child about his/her involvement in the experiment (until after the child had completed the experiment).

[6] We 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 were invited to participate.

[7] Students had to get permission from parents to consent. The 19% non-participation rate can be decomposed into i) students who were missing on the day of the experiment (sickness, being late etc.) and ii) students who failed to get permission from their parents to participate. We unfortunately do not have a systematic way to distinguish between these two reasons for not attending. We acknowledge that this is a limitation of the study.

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

[9] 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.

Classes participated in the experiment sequentially, and we cooperated with teachers to prevent communication between children who had participated and children who had not yet participated. However, it should be noted that we cannot control what subjects reveal or do not reveal after the experiment ended. As such, we can therefore not guarantee that the relative performance of students was unknown after the experiment. This is similar to all lab experiments. However, we do not believe that this has an impact on our results. This belief is based on Buser et al. (2021b), which explicitly studies the question of public observability in the context of competitiveness. In this paper, the authors experimentally vary the degree to which choices and outcomes are publicly observable. In a large-scale lab experiment the authors conclude that public observability does not alter the magnitude of the gender gap in willingness to compete in an economically or statistically significant way.

Experimental design: child experiment. All children received a show-up fee of 100 NOK, in addition to what they earned in the experiment.[10] The experiment consisted of a real task, namely adding sets of four two-digit numbers for 3 minutes. The child was given the option to perform this task for non-competitive or competitive incentive scheme. The non-competitive pay would provide the child a fixed rate of 5 NOK per correct answer. The competitive pay would provide 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 non-competitive pay). The child was asked to perform this task three times. In round one, the child was asked to independently choose an incentive scheme. In round two, the child was asked to perform the task based on the parent's choice of incentive scheme. The child was *not* told that the parent had decided the incentive scheme for round two. In round three, all children did the task for the same incentive scheme, enabling us to obtain a common measure of performance.[11] An important feature of our experimental design was that the children's choice could not be influenced by their parents' choice for them. We accomplished this by having children make their choice prior to learning what they would do in later rounds.

After completing the three rounds, we elicited beliefs about the probability of winning the competition, attitudes towards risk-taking, and beliefs about how their mother and father would choose for them between non-competitive and competitive pay.

Our motivation for using the sum of digits task is based on the seminal paper by Niederle and Vesterlund (2007), and the subsequent literature, which uses this task to measure gender differences in competitiveness among children. Using the same task to measure parents' choices for children allows us to compare and contrast our results with the previous literature. In addition, by comparing our results on gender differences among children to those obtained in the previous literature in other contexts and settings, we are able to speak to the likely generalizability of our findings across different contexts. Having said that, it is important to note that gender differences in competitiveness may be larger (or smaller) depending on which task is chosen. For example, if gender differences are due to sexual competition (e.g.,

[10] 100 NOK is approximately 12 USD.

[11] Specifically, in the third round, the payment for each correct answer was a ticket in a lottery where the child could win an iPhone. 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.

the Bateman hypothesis, Bateman (1948)), then using the 4x2 sum of digits task to measure competitiveness may understate gender differences. An interesting avenue for future research is therefore to explore to what extent the findings on gender differences in competitiveness vary depending on task chosen. Buser et al. (2021c) has begun some interesting work in this area, comparing the competitiveness results using two different measures. The first measure is incentivized and is an adaptation of the setup of the original Niederle-Vesterlund experiment such that it can be administered online. The second measure is an unincentivized survey question inspired by the work of Dohmen et al. (2011) and Falk et al. (2018) on other economic preferences. The competitiveness results are relatively stable across these two measures, suggesting that there is a certain external relevance of the measure that we use.

Experimental design: parent experiment. At the start of the experiment, the parent 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 non-competitive and competitive 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 had been chosen by the parent. Parents' competitiveness choices were not incentivized.

Having chosen the incentive scheme for their children, the parents were then told that the children would be asked to make the same choice for themselves. The parent was asked what they thought the child would choose. The belief elicitation was incentivized with tickets to a lottery where the parent could win an iPad. As with the child, we also elicited the parent's preference for competing for themselves, the parent's belief about the child's relative performance, and the parent's attitudes towards risk-taking for the child.

Appendix Figure A2 shows screenshots from the experiment. Complete instructions for the parent and child are found in the Appendix, and Appendix Table A1 provides summary statistics of the key experimental outcomes.

2.3 Administrative data

In collaboration with Statistics Norway, we match the data from the experiment to the Norwegian administrative data universe. This section provides information on the matching algorithm, the data, and the analysis we undertake with these data.

The matching algorithm. To link the experimental data to the Norwegian administrative data, we provide Statistics Norway with a set of pre-specified identification variables (the name of the child who participated in the child experiment, which school the child attended during the experiment, the birth year of the child, and the name of the child's parent who participated in the parent experiment). Statistics Norway utilizes this information to locate the experiment participants in the administrative data universe and to collect education and labor market information on these individuals. Statistics Norway then anonomyzes the data and sends it back to us for analysis. The matching algorithm successfully links 89 percent of the participants to the administrative data.

The data. The administrative data provide us with detailed information both on the children participating in the child experiment and on the parents participating in the parent experiment. We have access to data up until 2020, three full years after the experiment was conducted. With respect to the children participating in the child experiment, we have information on their final grade point average (GPA) in high school, if they pursued high school following the completion of middle school, all courses they took and the grades they received in those courses in high school, and if they completed the high school degree in time. In terms of parent outcomes, we have detailed information on the highest level of education attained and annual earnings (market wage plus government transfers).

The analysis. The goal of the administrative data analysis is to examine if the competitiveness choices of parents and children can predict the children's educational outcomes. Prior research has suggested that children's competitiveness choices are an important predictor of educational choices later in life, focusing on the choice of choosing high school programs. This analysis matters for understanding the generalizability of the experimental results and to what extent they extend to real high-stakes decisions that have a long-term impacts on individuals.

2.4 Sample and data

Panel B of Table 1 provides descriptive statistics of the sample for our study. It should be noted that we restrict our main sample to participants for which both the parent and the child completed the entire experiment (740 parents and 740 children).[12] However, the results are robust to using the entire sample.

On average, parents are 46 years old, 63 percent are married, 71 percent live together with the child, 95 percent are biologically related to the child, and 15 percent speak a foreign language at home. The parents of sons and daughters do not differ significantly along any of these dimensions.

More mothers than fathers participate 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, we randomized which of the parents (with contact information) would be invited to participate in the study. At this stage, fathers are no less likely than mothers to accept the invitation to participate. Mothers are marginally more likely to participate for daughters than for sons; 54 percent of parents for boys are mothers, and 60 percent of parents for girls are mothers ($p = 0.08$).

In terms of the children, they are all in 10th grade, 15 years old, 54 percent are female, and boys and girls are equally likely to have a brother, but boys are more likely to have a sister ($p = 0.06$).

Finally, child-parent pairs with sons and daughters appear similar when it comes to indicators of socioeconomic status (joint parent income) and education (at least one parent

[12]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.

having obtained some college education).

3 Competitiveness choices

In this section, we examine how parents make competitiveness choices for their children, and whether they make different choices for sons and daughters. Our focus on differential effects across child gender is motivated by the robust finding in the existing literature on children's own competitiveness choices. Specifically, the prior literature has established that boys are substantially more competitive than girls, and we are interested in understanding if this gender gap persists when choices are delegated to parents. This provides valuable insights on the potential role of a child's home environment in reinforcing, or reducing, gender differences in important child outcomes. We first consider parents' choices in isolation, before comparing parents' choices to children's choices.

3.1 Parents' competitiveness choices for their children

In the parent experiment, parents are asked if they would like their child to perform a real-effort task for a non-competitive or competitive incentive scheme. We use this choice as a measure of the parents' willingness to expose the child to competition. This competitiveness measure builds on the canonical Niederle and Vesterlund (2007) approach of identifying competitiveness. The novelty of our experimental design is to have parents make choices for their child – something that has not been done before.

It is important to note that the choice is incentivized, because the child will have to do the task for the payment scheme chosen by the parent. Therefore, the parent's choice impacts both the potential earnings of the child, as well as the actual experience the child will have in the experiment (performing the task for a competitive or non-competitive pay). We also note that the parent is informed that the child will not be told that the parent made the choice. Thus, the parent's choice should not be influenced by how they think the child will perceive that choice.

Our main result on how parents make competitiveness choices for their children is shown in Panel A of Figure 2, where we report the share of parents choosing competition for their son and daughter. We find that there is a large and significant gender difference in the choices that parents make for their children. Specifically, 35 percent of parents choose competition for their sons, while only 27 percent of parents choose competition for their daughters ($p < 0.03$). In other words, parents are 28 percent more likely to choose competition for a son than for a daughter. This is an important finding, demonstrating that the gender gap in child choices which has been identified in the prior literature also extends to situations in which parents are making the choices for their children. It is worth noting that when we ask children what choices they believe parents will make for them, they themselves believe there will be no gender differences (Appendix Figure A3). Thus, this finding appears to be unexpected from the children' perspective.

Having established that parents make more competitive choices for sons than daughters, we ask if this finding is robust to controlling for parents' beliefs about children's probability of winning the competition and risk preferences. This question relates to an active debate in

the competitiveness literature on whether competitiveness is separate from these two factors (Niederle and Vesterlund (2007), Gillen et al. (2019), van Veldhuizen (2021)).

In Panel A of Table 2 we test if the finding is robust to controlling for parents' beliefs about children's probability of winning the competition and risk preferences. Column 1 shows the result from regressing parents' competitiveness choice for their child on a dummy for whether the child is a daughter (for comparison purposes). Column 2 shows the results from an expanded version of the same model in which we add two controls for parents' beliefs about children's probability of winning the competition. The two controls we include are children's performance in round 3 (when all children worked for a common incentive scheme), and parents' stated beliefs about their child's relative ability.[13] Both of the controls are positively correlated with parents' competitiveness choices, and the magnitude of the coefficient on daughter increases from -0.076 to -0.101. This is due to daughters performing better on the task, and parents being more confident in the ability of their daughters; two factors which are positively correlated with choosing competition.[14]

Having concluded that parents' beliefs about children's probability of winning the competition is unlikely to explain the gender difference in choices (in fact the gender gap increases when we add controls to capture this factor), we next consider if risk preference can explain the gender difference. In column 3, we add two experimentally-elicited controls for parents' risk preferences over their children's outcomes. The first is a hypothetical choice between five lotteries with different levels of risk and expected payoff for the child (an adaption from Eckel and Grossman (2002)). The second is a self-assessment of the willingness to take risk for the child (adapted from Dohmen et al. (2011). We see that risk willingness for child is positively correlated with choosing competition, but the inclusion of the risk controls does not change the coefficient on daughter (as there is no significant difference in parents' risk willingness for sons and daughters). We study the lack of a gender difference in willingness to take risk further in Appendix Figure A5, which shows the distribution of answers by gender. The results from this exercise suggest that the risk choices that parents make for sons and daughters appear identical.[15]

Finally, in column 4, we demonstrate the gender difference in parents' competitiveness choices also is robust to including school fixed effects, session (classroom) fixed effects, and a number of demographic controls (parents' education, income, and gender).

The rich set of background data available on participants suggests an opportunity for an

[13]One concern with our measure of children's performance, is that it might have been impacted by the incentive scheme children had in the two earlier rounds. We show that this is unlikely to be the case. For a sub-sample of children where the incentive scheme in round 2 was chosen randomly we see no impact on performance in round 2 or 3 (Appendix Table A2).

[14]With respect to parents being more confident in their daughters, Appendix Figure A4 shows the full distribution of parents' beliefs about their children's ability. We also note here that an interesting finding is that parents' beliefs about their children's relative ability are poorly calibrated (less than 2.5 percent of parents believed that their child had a less than a 50 percent chance of winning the competition). With respect to daughters outperforming sons we show in Appendix Table A3 that daughters outperform sons on all three rounds in the experiment. Furthermore, Appendix Table A4 show that these results are robust to including more flexible controls for parents' beliefs about children's probability of winning the competition.

[15]Rather than controlling for parents' beliefs about children's probability of winning the competition and risk preferences in levels, we can take advantage of the large sample size and control for these factors non-parametrically by including dummies for each possible level of each variable. Our results are robust to this adjustment (Appendix Table A5.)

extensive study of heterogeneous treatment effects based on demographics. To this end, in Appendix Table A6, we explore heterogenous treatment effects across immigrant status, single parent status, ability, and socioeconomic status. We note that this analysis is speculative and that we have limited statistical power to conduct this analysis. Hence, the results should be interpreted with caution. Furthermore, we present two types of p-values – standard p-values and false discovery rate q-values. For calculating q-values we follow Benjamini and Hochberg (1995). While some of the traditional p-values are significant at conventional levels, none of the differences across subgroups are significant when considering false discovery rate q-values.

3.2 Comparing parents' and children's choices

Having established that parents choose more competition for sons than for daughters, we proceed to compare parents' competitiveness choices for their children with the children's own competitiveness choices. This comparison is enabled by our experimental design in which we conduct two artefactual field experiments – one that identifies the parents' competitiveness choices for their children and one that identifies the children's own competitiveness choices. We take several steps to make these experiments comparable. First, the information that parents and children receive before participating in the experiments is identical. Thus, it is not the case that one party is better informed than the other. Second, both parents and children are told that their choice will be kept anonymous from the other party. This is important, as it means that the choices will not be influenced by how they think the other party would perceive the choice. Third, neither the parent nor the child is aware that the other will make a competitiveness choice as well.

Our result on how children make competitiveness choices for themselves is shown in Panel B of Figure 2, which provides the share of sons and daughters choosing to compete. There is a large and significant gender difference in the choices that children make for themselves. Specifically, 34 percent of sons choose to compete, while only 19 percent of daughters choose to compete ($p < 0.01$).

Our result on gender differences in children's own competitiveness choices is consistent with the existing literature on children's choices (and individual competitiveness choices among adults more generally). To illustrate this in greater detail, Appendix Figure A7 compares our finding to previous results in the literature. The figure includes the competitiveness choices from the first study on gender differences competitiveness choices as well as results from studies on gender differences in children's own competitiveness choices that have used the same measure of competitiveness and studied children of the same age range. This partial meta-analysis highlights the robustness of the gender difference in children's own competitiveness; in all studies, boys choose to compete more than girls. The similarity of our results with those in the existing literature is encouraging, as it provides a way for us to validate the sample and competitiveness measure that we use. The similarity of our results and the existing literature is particularly interesting given the fact that the prior studies have been conducted in different countries, with differently aged children, with slightly different financial incentives, and where gender cultures and questions of equality are fundamentally different. This comparison with the previous literature also provides some suggestive support for the generalizability and external validity of our parent results to these other countries

and settings; if our child results replicate in these other settings, it is plausible to assume that the parent results would as well.

We next perform a robustness analysis of the gender gap in children's choices, using a comparable set of controls as that which we used to study the robustness of parents' choices. Column 1 in Panel B of Table 2 shows — for ease of interpretation — the results obtained from regressing a dummy variable for whether the child competes on a dummy for whether the child is a daughter or son. In column 2, we include two controls for children's beliefs about their probability of winning the competition; i) the number of correct answers and ii) an elicited measure of the child's belief about their relative ability. The elicited measure of child's belief is intended to mirror the measure of the parent's belief. Despite having lower performance, sons are significantly more confident than daughters, and only the elicited belief measure significantly correlates with choosing competition. Adding these measures slightly reduces the coefficient on daughter from -0.151 to -0.123. Similar to the exercise we performed for parents, we also do axillary analysis for children to study further the role of beliefs about probability of winning the competition (featured in Appendix Table A4 Panel B). We note that adding more flexible controls does not impact the results in a statistically significant way.

We next turn to risk preferences in column 3, where we add two controls for children's risk preferences. These measures are intended to mirror the measures we used for parents in Panel A. While parents were not more risk willing for sons than daughters, sons are significantly more risk willing than daughters. Controlling for risk preferences changes the magnitude of the coefficient on the daughter dummy from -0.123 to -0.088. Finally, in column 4 we add a number of demographic controls; this has no significant impact on the magnitude of the coefficient on the daughter dummy.

Comparing our results on parents' choices to our results on children's choices, we find that parents on average choose the same amount of competition for sons as sons choose for themselves, while parents are significantly more likely to choose competition for daughters than daughters choose for themselves ($p < 0.01$). Because parents choose more competition for daughters, the gender gap in parents' choices is marginally smaller than then gender gap in children's choices ($p < 0.08$). However, when controlling for beliefs about the chance of winning the competition and risk preferences, the gender gap in parents' choices is larger (columns 3 and 4 in Panel A of Table 2 compared to columns 3 and 4 in Panel B of Table 2).[16]

Whose choice generates the highest financial payoff for the child? Comparing the financial payoff associated with children's and parents' choices, we find small differences.[17] On average, too few children choose to compete relative to what would maximize their expected earnings: 49 percent of sons and 62 percent of daughters had higher expected payoffs under competition, while only 34 percent of sons and 19 percent of daughters chose to compete. If children chose optimally (in terms of expected earnings), sons could increase their profits by

[16]Rather than controlling for performance, risk preferences and beliefs in levels, we can take advantage of the large sample size and control for beliefs about probability of winning the competition and risk preferences non-parametrically by including dummies for each possible level of each variable. Our results are robust to this adjustment (Appendix Table A5).

[17]To estimate expected earnings, we used performance in round three and drew 1,000 competitors with replacements.

33 percent, and daughters by 52 percent (this difference is statistically significantly different from zero, with $p < 0.01$). When parents make choices for sons and daughters, earnings remain the same as when children choose for themselves. This is surprising, especially with respect to daughters, as too few entered the competition (relative to what would maximize their expected financial payoff), and parents entered about 50 percent more daughters into the competition. However, this can be explained by the fact that parents do not increase the proportion of daughters who would see the largest earnings increase from competition. In other words, they enter the wrong daughters (from a financial returns perspective) into the competition.[18]

The fact that earnings are not close to being optimized, suggests that factors other than earnings may be driving parents' and children's choices. We discuss this in much more detail in Section 4, in which we have incorporated a conceptual model with the goal of better understanding the drivers underlying parents' choices and what causes parents to make different choices for daughters and sons. One of the findings from that section is that parents' choices closely follow their beliefs about what children want, regardless of child ability. While speculative, we believe this is main explanation for why parents do not improve earnings.[19]

How correlated are parents' choices with their children's choices? The results suggest that there may be a strong divergence in choices depending on whether the child makes the choice or if it is delegated to the parent. We find that parents' and children's choices have a positive correlation of about 0.20 ($p < 0.01$). This correlation is slightly larger for sons than daughters (0.18 vs 0.22). While the correlation is positive, this also indicates that there is a significant amount of divergence in choices. In total, we see that in 32% of child-parent pairs, the parent and the child choose differently. This implies that who makes the choice – the parent or the child – has a large impact on the eventual outcome. If competitiveness choices are correlated with important education and early career choices – something that we explore in Section 5 – this alludes to a new channel through which gender differences in outcomes may emerge.

4 Mechanisms for parents' competitiveness choices

In this section, we aim to understand the drivers underlying parents' choices and what causes parents to make different choices for daughters and sons. We begin by introducing a conceptual framework for parents' choices. We then analyze parents' choices within this framework. We end the section by discussing what mechanisms main explain parents' beliefs which is the key drive for gender differences in parents' choices. We note that this section

[18]It is possible that certain groups of children exist for whom parents make better or worse decision from a financial perspective. However, in our data parents seem to act consistently across a wide set of characteristics. Specifically, we do not find any significant interactions between mothers, fathers, sons, and daughters, and we do not see any interaction effect with ability of the child for either gender. These results are shown in Appendix Table A7.

[19]In Appendix Table A8 we explore if parents are more responsive to sons' chance of winning the competition (rather than daughters' chance) and to what extent this might be able to partly explain the lack of increase in earnings when parents make choices (rather than children). While we find some suggestive evidence that it is the case, the results are not strong enough to conclude conclusively.

deviates slightly from our pre-analysis plan.[20]

4.1 Conceptual framework

We model parents' choices as a tradeoff between two perspectives. The first factor is Beckerian altruism; the parent's desire to maximize their child's utility. We name this factor the *child perspective*. The second factor is the parent's desire to impose their own preferences on their child. We name this factor the *parent perspective*.

An alternative interpretation of our model, is that the parent perspective represents some benefit to the child that is not captured by the child's own utility function. For example, a competitive parent may believe that there are long-term gains associated with behaving competitively, and that these gains are not fully taken into account in the child's utility function. While we prefer the interpretation where parents receive direct utility from their child acting similar to themselves, we emphasize that the conceptual framework could easily be adjusted to align with the latter interpretation rather than the former.

To model the tradeoff between the child perspective and the parent perspective, let V_{pc} represent parent p's utility function when making choices for child c. We denote the child perspective $\hat{U}_{pc}$, and define it as the parent's belief about their child's utility. We denote the parent perspective Q_{pc}, and define it as a function which is maximized when the action the parent makes for the child is equal to the action the parent would make for themselves in the same situation.[21] Finally, we introduce a set of weight parameters, α_{pc} and $1-\alpha_{pc}$. We let these represent the relative weights the parent places on the child perspective and the parent perspective. The parent's utility function when making a choice for the child is

$$\mathbf{V}_{pc} = \alpha_{pc}\hat{U}_{pc} + (1-\alpha_{pc})Q_{pc} \tag{1}$$

Consider a parent choosing if the child should compete (C) or not compete (NC). The parent compares the expected utility from having their child compete to the expected utility from having their child not compete. This decision problem can be expressed as follows:

$$\alpha_{pc}(\hat{U}_{pc}(C) - \hat{U}_{pc}(NC)) + (1-\alpha_{pc})(Q_{pc}(C) - Q_{pc}(NC)) \tag{2}$$

Provided that Equation (2) returns a positive value, the parent would choose to expose the child to competition. To study how this framework can lead to different choices for sons and daughters, we allow α, U_{pc}, and Q_{pc}, to vary across sons (s) and daughters (d). This framework allows parents to make differential choices for sons and daughters due to three reasons:

[20] In our pre-analysis plan the key outcomes which we intended to apply to study parents' choices, are the same as we ended up using. However, the conceptual model and the framing of the findings were not specified in the pre-analysis plan.

[21] In our setting, this function can either take the value of 1 (if the action the parent makes for the child is equal to the action the parent would make for themselves) or 0 (if the action the parent makes for the child is equal to the action the parent would make for themselves). However, there are several instances in which choices are non-binary (e.g., how much time to invest in a particular activity), and we therefore prefer to use this more general notation rather than an indicator function.

1. *Child perspective*: parents believe that the son's utility will be different in competition ($\hat{U}_{pc,s}(C) - \hat{U}_{pc,s}(NC) \neq \hat{U}_{pc,d}(C) - \hat{U}_{pc,d}(NC)$).

2. *Parent perspective*: parents of sons have different preference for competition for themselves than parents of daughters ($Q_{pc,s} \neq Q_{pc,d}$).

3. *Relative weight on the two perspectives*: parents are more or less likely to impose their own preferences on sons than on daughters ($\alpha_{p,s} \neq \alpha_{p,d}$).

4.2 Empirical analysis

We now empirically examine parents' choices in the framework we have outlined. To do so, we elicit measures from parents that we can use as proxies for the child perspective and the parent perspective. For the child perspective, we measure incentivized parents' beliefs about children's competitiveness choices. For the parent perspective, we measure parents' preferences for competing for themselves (not incentivized). We first present raw data on the measures separately, after which we use a regression framework to test their relative importance in explaining parents' choices for sons and daughters.

Child perspective. To obtain data on the child perspective, we elicit an incentivized belief from parents about whether their child will compete. In Panel A of Figure 3, we show parents' beliefs about whether the child will compete, separately for sons and daughters. The figure reveals that the child perspective is associated with a substantial gender component. Specifically, parents are much more likely to believe that sons will compete than that daughters will compete (51% versus 25%, $p < 0.01$). Comparing parents' beliefs to children's own choices, we note that parents strongly overstate the gender gap in competitiveness. While the perceived gap based on parents' beliefs is 26 percentage points, the actual gender gap is only 15 percentage points. The gender gap in beliefs is also much larger than the gender gap in parents' actual choices, which is 8 percentage points.

In our conceptual framework, the large gender difference in the child perspective pulls in the direction of a large gender difference in choices for sons and daughters (to the extent that parents place weight on the child perspective). With $\alpha = 1$, the gender gap in parents' choices would be 26 percentage points, when in reality it is 8 percentage points.

Parent perspective. To obtain data on the parent perspective – parents' own attitudes towards competition – we ask parents if they themselves would choose competition if they participated in a competition experiment themselves. This choice was not incentivized due to time and implementation constrains. The choice was made at the end of the experiment after we had elicited choices for children and beliefs about children's choices.

In panel B of Figure 3, we show parents' competitiveness choices for themselves stratified by whether they have a daughter or a son. The figure shows a small gender difference, with parents of sons being marginally more competitive than parents of daughters ($p < 0.07$). In our conceptual framework, the gender difference in the parent perspective would also pull in the direction of parents making different choices for sons and daughters, but to a much lesser extent than the child perspective. Another interesting result is that parents on average

are more competitive than their children (40 percent versus 25 percent). This effect would pull in the direction of parents making more competitive choices for their children than their children would choose for themselves.

Estimating importance for choices. Having presented data on the child perspective and the parent perspective, we proceed to examine the impact of the child perspective and the parent perspective for parents' choices for their children. These results are shown in Table 3. To provide a reference point and facilitate the interpretation of our results, we begin by showing results from a regression of parents' choices on whether the child is a daughter (column 1). We see that parents choose significantly less competition for daughters.

In column 2, we control for the child perspective – parents' beliefs about what their child will choose. The results reveal that parents' beliefs are positively correlated with competitiveness choices, and including this control completely eliminates the difference in choices for sons and daughters. In fact, conditional on beliefs about what their children prefer, parents are more likely to choose competition for their daughters than their sons (although this difference is not statistically significant).[22]

In column 3, we add a control for the parent perspective – the parent's competitiveness choice for self. Both the child perspective and the parent perspective are strongly predictive of the parents' competitiveness choice for the child. However, the coefficient on daughter does not change significantly (as expected since the difference in parent perspective between sons and daughters is economically small).

To study whether the assigned weight (α) is different for sons and daughters, we stratify beliefs and preferences by child gender in columns 4 and 5. These specifications are most similar to our conceptual framework, where we allow for the weight on child perspective and parent perspective to differ for sons and daughters. While both perspectives are important for both sons and daughters, the analysis suggests a key difference in how parents make choices for daughters and sons. For daughters, the relative weight on the child perspective is smaller, and the relative weight on the parent perspective is larger. If we take our conceptual model literally, this implies that the α is 0.43 for daughters and 0.62 for sons.

In cases in which the parent's belief about the child's preference aligns with the parent's own preference, it is not possible to disentangle the extent to which the ultimate choice made by the parent is driven by the parent's belief about the child's preference (the child perspective), or the parent's own preference (the parent perspective). In Appendix Table A9, we restrict the extent of this problem by taking advantage of our non-binary measure of parents' beliefs. This allows us to explore a situation in which perfect alignment of parents' beliefs and own preferences occurs much less frequently. Specifically, only in 5 percent of cases do parents' own preferences and beliefs about the children's preferences perfectly align on the continuous scale. We note that the results are unchanged when using the non-binary

[22]How do our findings shed light on parents' willingness to act paternalistically? We note that a significant share of parents choose differently for their children than what the children would choose for themselves. In particular, 26% of parents choose the opposite of what they believe their children would do. However, this is an imperfect measure of parents' willingness to act paternalistically, as we cannot observe paternalism for parents who want to choose the same as they believe their child would choose. As such, the 26 % of parents acting paternalistically may be considered as a lower bound of the total share of parents willing to make paternalistic choices.

measure of child perspective rather than the binary measure.

Taken together, this section reveals that both the child perspective and the parent perspective play a significant role in parents' competitiveness choices for their children. The results also demonstrate that there are important differences across the genders of the children. Specifically, parents believe that sons are much more willing to compete than daughters, and beliefs about children's preferences are an important determinant of their choices. In fact, because parents overestimate the willingness of sons to enter into competition, this mechanism pulls in the direction of an even larger gender gap in competition entry when parents make choices for children compared to when children make choices for themselves. A counteracting force, however, is that parents place more weight on their own preferences when making choices for daughters, and parents are more competitive than children. Therefore, the increased weight on parents' preferences when making choices for daughters pulls in the direction of making more competitive choices for daughters, and thus contributes to reducing the gender gap in parents' choices.

4.3 What explains parents' beliefs?

Our data reveal that parents have very different beliefs about the competitiveness preferences of sons and daughters. In addition, our conceptual model shows that these beliefs represent the main mechanism underlying the gender gap in parents' choices. Understanding parents' beliefs about children's competitiveness preferences is therefore of great independent value.

To better understand why parents have different beliefs about the competition preferences of sons and daughters, we follow the existing literature on competitiveness. This literature has focused on explaining differences in competitiveness choices through differences in i) beliefs about the probability of winning the competition, ii) risk preferences, and iii) taste for competition (Niederle and Vesterlund (2007), van Veldhuizen (2021), Gillen et al. (2019)). The purpose of this exercise is to understand which of these factors can help explain why parents have different beliefs about the competition preferences of sons and daughters.

With respect to beliefs about the probability of winning the competition, we elicit three relevant measures: parents' beliefs about their child's relative performance, children's beliefs about their own relative performance, and an unbiased measure of children's performance on the task. In column 2 of Table 4, we test to what extent these measures can explain the gender difference in parents' beliefs. While all three measures are positively correlated with parents believing that their children will choose competition, none of them can explain the gender difference in beliefs.

Having concluded that beliefs about the probability of winning the competition are unlikely to explain the gender differences in parents' beliefs, we turn to risk preferences. The idea is that earnings in competition are more uncertain than in non-competition, and that differences in risk preferences therefore may drive some of the observed gender difference in parents' beliefs. We elicit four measures of risk preferences, two from children and two from parents. In column 3 of Table 4, we add these controls to our model. While all measures of risk preferences are positively correlated with parents' beliefs (with the exception of one of the parents' measures), they are unable to explain the gender difference in parents' beliefs about children's competitiveness preferences.

The inability of beliefs about probability of winning the competition and risk preferences to explain the gender difference in parents' beliefs about children's competitiveness preferences, suggests that beliefs about children's taste for competition is the main driver of the gender difference in parents' beliefs. This is a novel finding of great independent value. First, if policymakers are interested in closing the documented gender gap in parents' competitiveness choices for their children, information campaigns that serve to update parents' beliefs should focus on competition preferences (rather than beliefs about ability and risk preferences). Second, this finding may assist in hypothesizing how parents' beliefs may change when the underlying characteristics of the environment change. For example, we may imagine that gender gaps in beliefs are smaller in situations where earnings and risk play a larger role. However, we are cautious in making this inference, because as earnings and risk preferences become more important, it is possible that taste for competition also becomes more important. Consider for example the choice of attending the academic track in high school, a key educational career choice which we explore in Section 5. The earnings and risk implications associated with this choice are significantly larger than those associated with the competitiveness choice in our lab experiment. However, the impact on taste for competition might also be much larger as children will be exposed to the environment for a significantly longer period of time. We believe that an interesting avenue for future research is to better understand if these beliefs are stable across contexts.

5 Competitiveness choices and educational outcomes

To what extent do the experimental results generalize, and help us better understand outcomes of children in the real world? To study this question, we match our experimental data with administrative data from Statistics Norway. This provides us with detailed information on the children's education, as well as on the parents' income and education. We begin by examining the relationship between parents' competitiveness choices for their children and the children's educational choices. We then run a horse-race between parents' competitiveness choices for their children, and the children's competitiveness choices for themselves. This allows us to explore to what extent parents' choices matter once we have taken the children's own choices into account.

5.1 Academic high school track

The outcome we focus on in this part of the analysis is whether the child chooses to pursue an academic high school track. As noted in Section 2, the academic track contains the most advanced math and science courses, is the only track that grants direct access to colleges and universities, and is associated with greater financial return. To illustrate this point in greater detail, Appendix Table A10 provides descriptive statistics on the educational attainment and performance on individuals who select academic versus non-academic high school tracks. The table reveals that the academic track is associated with higher quality peers as well as with higher college attendance - in particular in STEM.

The descriptive statistics in Appendix Table A10 allude to the academic track being more competitive than the vocational track. This is consistent with the existing literature, which

has provided strong evidence of competition as an important predictor for these types of educational choices. For example, Goodman (2002) demonstrates that those who drop out of math-intensive college majors and engineering have a lower tolerance for competition, and Almås et al. (2016a) demonstrate that children's own competitiveness choices are important for predicting if children will choose the competitive academic high school track.

5.2 Parents' choices and children's education

Table 5 provides estimates of the relationship between parents' competitiveness choices for their children and the probability that the children enroll in the competitive academic high school track. We begin by examining the correlation between parents' competitiveness choice and the child's high school choice, controlling only for school fixed effects. The result from this exercise is provided in column 1, demonstrating that there is a statistically significant and economically meaningful (6.7 percentage points) association between parents' competitiveness choices for their children and the probability that their children select into the academic high school track.

In column 2, we add a rich set of demographic controls (parents' income, education, and gender). While the magnitude of the estimated association between parents' competitiveness choices for their children and the children's high school choice declines slightly, it remains robust to this model adjustment.

The magnitude of the association between parents' competitiveness choices for their children and the probability that the children enroll in the competitive academic high school track is large and economically meaningful. To better understand the size of the identified association, consider one of the strongest predictors for children's likelihood of enrolling in the academic high school track: children's final GPA in middle school (grade 10). The association between parents' competitiveness choice and the educational choice of the child that we identify is approximately as important as half of a standard deviation change in middle school GPA.[23] The magnitude of this GPA effect is much greater than that which has been estimated from other family and school interventions. For example, Dahl and Lochner (2012) find that a $1,000 increase in family income raise test scores by 6 percent of a standard deviation, and Krueger and Whitmore (2001) find that assignment to a small class (13-17 students) as opposed to a regular class (22-25 students) increases student achievement by 20 percent of a standard deviation. This highlights the importance of better understanding how – and why – parents make choices for children.

That the lab results translate into effects on important education choices that have long-term consequences for the children's future careers is an important finding of independent interest. It suggests that parents are not only willing to exercise a gentle nudge in the case of a choice involving 15 NOK in a low-stakes setting, but that they are also willing to do so in the case of a high-stakes high school choice that have long-lasting effects on their children.[24]

[23] We obtain this result by estimating the relationship between academic high school track and 10th grade GPA using the Norwegian administrative data.

[24] The match rate between the experimental data and the administrative data is 89 percent, such that we can access administrative data on 650 individuals from the experiment. However, only 455 of these individuals have a high school diploma and detailed information on which high school program they were enrolled in. To ensure that this is not biasing our results, we impute high school program among those who

Taken together, this section reveals that parents' competitiveness choices are strongly correlated with one of the most important educational choices that children can make in Norway: selection into the competitive academic track that grants children direct access to higher education upon completion. This is an important set of findings, providing novel insights into how differences in child outcomes may arise.

5.3 Horse-race for predicting education outcomes: children and parents' competitiveness choices

Having explored the association between parents' competitiveness choices for children and children's education choices, we ask how robust this result is to the inclusion of the children's own competitiveness choices. The idea behind this exercise is twofold. First, to examine whether parents' competitiveness choices have a value in predicting children's educational outcomes that is independent of the child's own competitiveness choice. Second, to explore the relative importance of parents' and children's competitiveness choices in predicting education choices.

Table 5 shows the results obtained from regressing children's own competitiveness choices and parents' competitiveness choices on the high school choice of children simultaneously, both with and without demographic controls (columns 5 and 6). The results reveal a strong positive correlation between parents' competitiveness choices and children's high school choices. Interestingly, there appears to be no meaningful relationship between the child's own competitiveness choice and high school choice.

To examine the relative importance of parents and children in more detail, we deviate slightly from the pre-analysis plan and reestimate the horse-race but include the elicited parent and child controls discussed in Section 3: confidence (parent), confidence (child), risk (parent), and risk (child). These outcomes are interesting to compare, because we elicit comparable outcomes from children and parents. Specifically, for confidence we ask both parent and child to guess the child's relative ability on the competition task. For risk, we ask parent and child about their willingness to take risk over outcomes for the child. The results when including these controls are shown without demographic controls in column 7 of Table 5, and with demographic controls in column 8 of Table 5. Interestingly, the elicited measures from the parent are consistently correlated with the child's high school choice, while the child measures are not. This reinforces the idea that parents play an important role in children's human capital choices.

The lack of an association between child competitiveness choices and child education choices in the horse-race regressions suggests that children's competitiveness choices may not matter for predicting children's high school choices, or just that children's competitiveness choices do not matter once we account for parents' competitiveness choices. To examine this in detail, we also estimate the relationship between child competitiveness choices and child

have not finished high school. We do so by taking advantage of the fact that we can observe all high school courses that each student has ever taken, and that the academic track we are interested in includes a couple of courses that are unlikely to be taken in other high school programs. While there is some measurement error associated with this imputation approach which could attenuate our results (bias towards zero), the finding of a strong association between parents' competitiveness choices for their children and children's education choices is robust to focusing only on those for which we have high school diploma information.

high school choices without controlling for parents' competitiveness choices. The results are shown in columns 3 and 4 of Table 5. The results from this exercise provide little support for a significant association between child competitiveness choices and child high school choices. However, the standard errors are relatively large, and we cannot reject effects of magnitudes similar to those that have been found in previous work (e.g., Almås et al. (2016a)).

6 Extensions

In this section we do two extension. First, we study differences in parents' choices by mothers and fathers. Second, we shed light on the intergenerational transmission of preferences from parents to children, by studying correlation in preferences of children and parents.

6.1 Mothers and fathers

Previous research has found that mothers and fathers differ in how they interact and invest in children (Sayer et al. (2004), Godoy et al. (2006)). In this section, we ask if this differential behavior extends to the domain of competition as well. This exploration is enabled by our research design, where we randomized if mothers or fathers were invited to take part in our study. While we had full control over which parent was invited to take part in the study, we do see that slightly more mothers than fathers participate. However, our results are robust to restricting in our sample only to those parents who were originally invited.[25]

We discuss differences between mothers and fathers with respect to the three main research questions asked in this study: 1) Are there differences in mothers' and fathers' competitiveness choices for children? 2) What explains potential differences in mothers' and fathers' competitiveness choices for children? 3) Do mothers' or fathers' competitiveness choices for children best predict education outcomes for children? We analyze each of these questions in turn.

Are there differences in mothers' and fathers' competitiveness choices for children? In Panel A of Figure 4, we show mothers' and fathers' choices for their children. We notice a key difference in the choices made by mothers and fathers; mothers are much less likely to choose competition for their children (27% vs 36%, $p < 0.01$). The magnitude of this difference in effect size is relatively substantial, and suggests that mothers are less willing to expose their children to competition compared to fathers.

To explore this identified difference in mothers' and fathers' competitiveness choices for children in more detail, we stratify the sample further and examine mothers and fathers separately by child gender. The results from this exercise are shown in Appendix Figure A9. The figure demonstrates that the gender gap in parents' competitiveness choices exists for both mothers and fathers. However, it is only significant for mothers. The difference-in-difference between mothers and fathers is not significant.

[25] This robustness analysis is found in A11 and A12.

What explains potential differences in mothers' and fathers' competitiveness choices for children? Having shown that mothers are much less likely to choose competition for their child, we take a step back and ask why this is the case. To address this question, we turn to the conceptual model introduced in Section 4. This conceptual model offers three potential reasons for why we may see different choices by mothers and fathers: child perspective, parent perspective, and the relative weight that parents assign to these two factors.

Panels B and C of Figure 4 show data on the child and parent perspective. With respect to the child perspective, the figure demonstrates that mothers and fathers have almost identical beliefs about their children's choices. Specifically, 37% percent of mothers and 39% of fathers believe that their children will chose competition for themselves.

With respect to the parent perspective, we find that mothers are much less competitive than fathers. Specifically, 33% of mothers choose to compete compared to 50% of fathers, and this difference is highly statistically significant with $p < 0.01$.

In terms of our conceptual framework, the raw data suggest that the child perspective is unlikely to explain why mothers choose less competition for their children than fathers, while the parent perspective may be able to do so. In Table 6, we formally test if the two perspectives matter differently for mothers and fathers when making choices for their children. In column 1, we show result from regressing the child and parent perspective on the mothers' competitiveness choice. In column 2, we show results from regressing the child and parent perspective on the fathers' competitiveness choice. The results reveal that, for both mothers and fathers, both the child perspective and parent perspective are important predictors of their choices. However, the child perspective is more important when mothers make choices than when fathers make choices.

Taken together, we see that mothers make less competitive choices than fathers. We then examine why mothers and fathers make differential choices through the use of our conceptual framework. We find that the differences in choices between mothers and fathers can primarily be explained by the parent perspective - mothers themselves compete considerably less than fathers.

Do mothers' or fathers' competitiveness choices for children best predict education outcomes for children? In Table 7, we study the association between parents' competitiveness choices and their children's education choices stratified by the gender of the parent.

In columns 1 and 4, we show the correlation between mothers' and fathers' competitiveness choice and the child's high school choice, controlling only for school fixed effects. In columns 2 and 5, we add a rich set of demographic controls (parents' education and income). In columns 3 and 6, we additionally incorporate the children's own competitiveness choices.

Looking across the columns of Table 7, the association between parents' competitiveness choices and child education choices is driven exclusively by fathers. Specifically, while the coefficient on parents' competitiveness choice is large (ranging from 0.124 to 0.130) and statistically significant (p-value ranging from 0.011 to 0.016) for fathers, it is close to zero (coefficient ranging from 0.005 to 0.015) and not statistically significant (p-value ranging from 0.764 to 0.917) for mothers. The inclusion of demographic controls and children's own

competitiveness choices do not affect the results in a meaningful way. This is an important finding, as it suggests that fathers' preferences matter more for children's outcomes. This is consistent with previous studies, finding that mothers may care more for their children, but fathers are more likely to decide on choices (Björkman Nyqvist and Jayachandran (2017)).

6.2 Intergenerational transmission of preferences

An interesting question of independent value that this paper is able to address is that of the intergenerational transmission of competition preferences. Specifically, understanding to what extent the gender gap in child choices is an artefact of the gender gap in parent choices is important not only for the interpretation of our results, but also for the broader literature on understanding how preferences and beliefs are passed down from parent to child.

To this end, column 1 of Table 8 studies the correlation between children's competitiveness and parents' competitiveness (for themselves). Panel A column 1 shows a linear regression of child's competitiveness choice on parent's competitiveness choice for self. The result reveals that parents who choose to compete have children who are 9 percentage points more likely to compete.

The observed correlation in competitiveness preferences may partly be explained by intergenerational correlations in risk preferences and ability. To explore this in greater detail, we add controls for children's performance on the task (proxy for children's ability), parents' educational attainment and income (proxies for parents' ability), two measures of children's risk preferences, and two measures of how parents make risk choices for children. The result from this exercise is shown in column 2 of Table 8. Including these controls reduces the intergenerational correlation in competitiveness by 50 percent, and is no longer significantly different from zero. This finding suggests that at least part of the intergenerational correlation in competitiveness can be explained by correlation in risk preferences and ability.

Having examined the overall parent-child correlation in competitiveness choices, we next ask if the correlation in preferences is stronger for a specific pair of fathers, mothers, sons, and daughters. These results are shown in columns 3 to 6 of Table 8. We observe the highest correlation between fathers and daughters, demonstrating that daughters who have a father that chooses to compete are 16 percentage points more likely to compete themselves. However, we cannot reject the null hypothesis that the correlation for all pairs are the same. This conclusion also holds when controlling for risk preferences and ability. One interpretation of the results from this exercise, is that they reject a "role model theory" for why gender differences in competition preferences emerge, where daughters take after less competitive mothers, and sons take after more competitive fathers. However, it should be noted that this is only a correlational exercise, and hence should be interpreted as such.

In Appendix Table A13 we study correlations in choices, beliefs, and attitudes of parents and children. We observe strong correlations across all these domains.

7 Discussion and conclusion

Parents make important choices for their children in many areas of life, and likely represent a key factor in explaining children's outcomes. Yet, there is scarce evidence on how parents

make choices for children, what drives these choices, and if those choices predict children's long-term outcomes. This set of questions might be particularly relevant in the domain of competition, where the literature consistently finds that boys are more competitive than girls, and that differences in competitiveness may help explain gender differences in education and labor market outcomes. However, when young adolescents make education and early career choices, parents play a fundamental role in the decision-making process. How parents make choices for their children can therefore have substantial implications for their children's human capital development and labor market trajectory, and likely represents an important channel through which differences in child outcomes emerge.

This paper combines two large-scale artefactual field experiments with high-quality longitudinal administrative data to study parents' choices in the domain of competition. The unique data set that we generate allows us to study three novel questions with important policy implications: How do parents make competitiveness choices? What explains parents' choices? Do parents' choices predict important long-term education outcomes for children? It should be noted that the analysis in the paper is based on a publicly available pre-analysis plan.

We provide three sets of key results. First, we reveal that parents are much more likely to choose competition for sons than for daughters, displaying a gender bias of 28 percent. Second, we construct a conceptual model and demonstrate that parents' choices are primarily explained through a tradeoff between maximizing the child's utility (child perspective) and imposing their own preferences on the child (parent perspective). While the child perspective is crucial for explaining the gender bias in parents' choices, the parent perspective contributes to a narrowing of the gender gap. Third, we establish that parents' competitiveness choices predict important educational outcomes three years after the experiments were concluded, and that this result is robust to controlling for parents' background characteristics and children's own competitiveness. The magnitude of the effect we identify is substantial, and larger than many education and family interventions that have been examined in the existing literature.

Taken together, we believe that our results on parents' choices have important policy implications and open up new avenues for future research. First, the analysis reveals that parents' choices represent an important channel through which parents impact children's long-term outcomes. A more comprehensive understanding of parents' choices is therefore imperative for expanding our understanding of how inequalities and inefficiencies in child outcomes emerge. Second, the results show that parents are not gender neutral, and that this translates into parents making differential choices for sons and daughters. Policies aimed at closing the gender gaps would therefore benefit from focusing on parents and the choices they make for their children. Third, the paper establishes that competitiveness gaps may be reinforced by parents, and that individual competitiveness preferences may be shaped – to some extent – by the choices their parents make.

In contextualizing our findings and considering how the results may generalize to other settings, it is important to consider where the experiments were conducted, what study population was being used, and the type of experiment that was used to identify the choice parents make for their children (List (2020)).

In terms of geographic setting, the study was conducted in Norway, which ranks as one of the most gender equal countries in the world, and it is difficult to speculate how we

would expect these results to change across different cultures and countries. For example, in countries with more traditional gender roles or more heterogeneity in gender roles, parents' choices for children may be very different. Furthermore, in countries where the family is less democratic, there may again be very different results and different implications. Nevertheless, we believe that the general pattern of our results is relevant to a large number of countries and settings. Norway is still far from gender equal, and shares a significant number of character traits with other OECD countries (including gender gaps in children's own willingness to compete).

With respect to sample selection, the study focuses on 10th grade students (and their parents); an intentional choice that allows us to study the relationship between parents' competitiveness choices and the children's important education choice between academic and vocational track. We believe that it would be very interesting for future research to understand how parents make choices for younger children as well, and whether similar differences can be observed in situations where children are younger and perhaps more vulnerable.

Finally, regarding the type of experiment used to identify parents' choices for children, the study relied on artefactual field experiments, enabling us to isolate how parents make different choices for sons and daughters, elicit preferences and beliefs to study mechanisms for choices, and relate to the existing competitiveness literature which primarily is lab focused. We also show that this lab choice is predictive of a real life choice: which track to pursue in high school. An interesting question for future research is to study settings where the choice parameters are different from those in our setting - stakes, naturalness, length of task, and type of task. We encourage research in all these domains.

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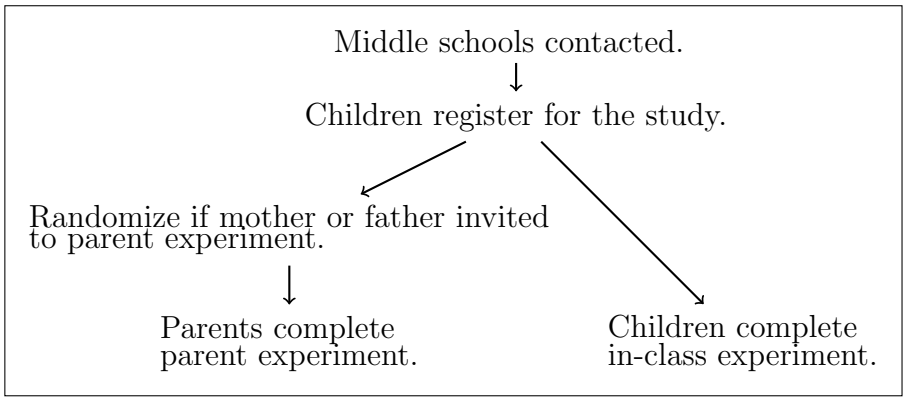
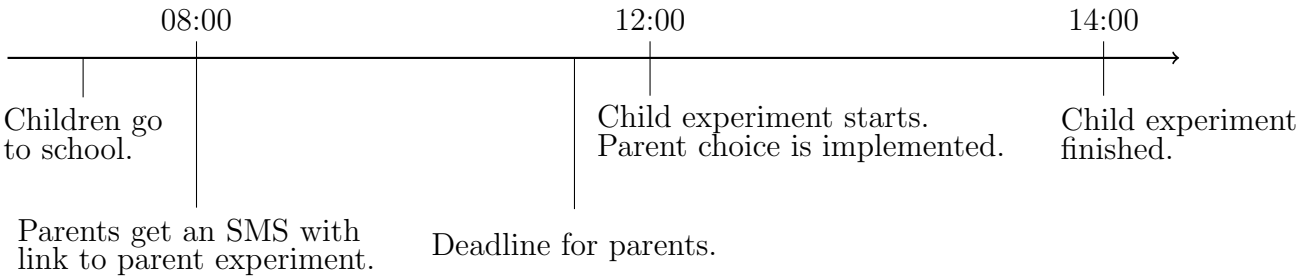
Figures and tables

Figure 1: Experimental design

(a) Recruitment of participants

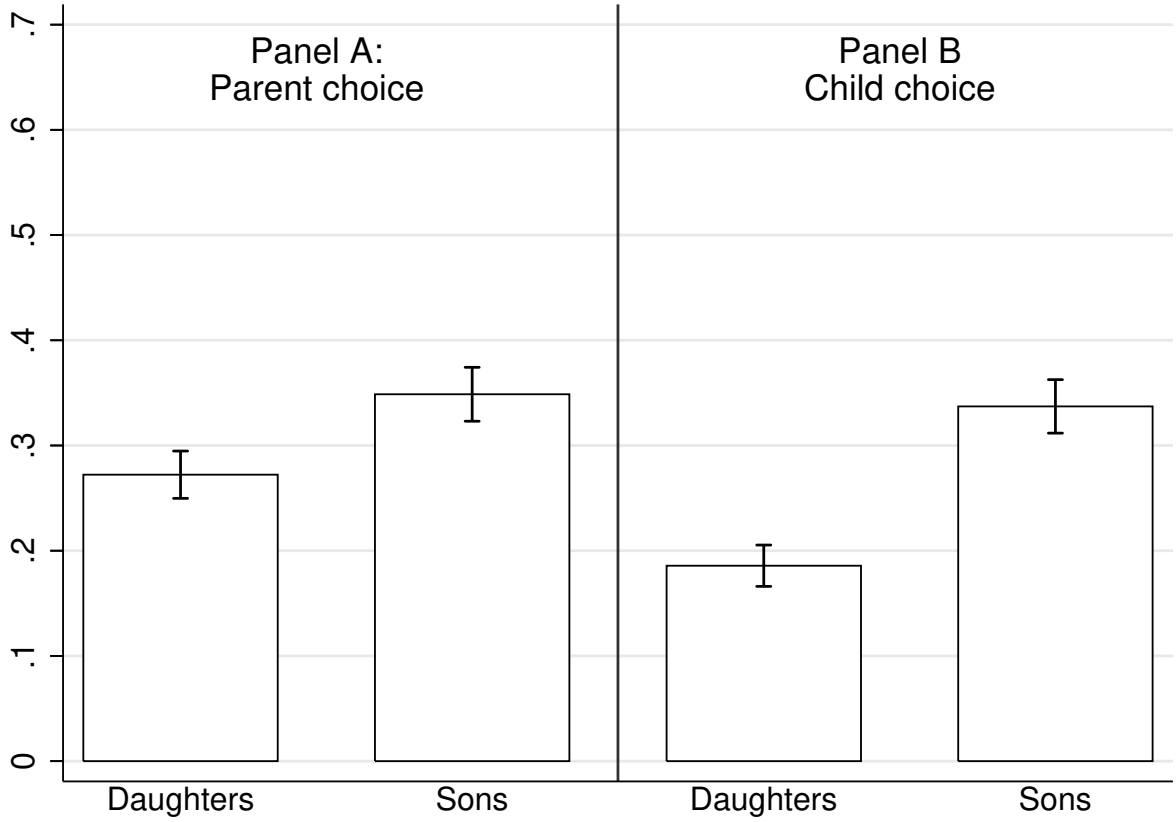


(b) Timeline of experiment



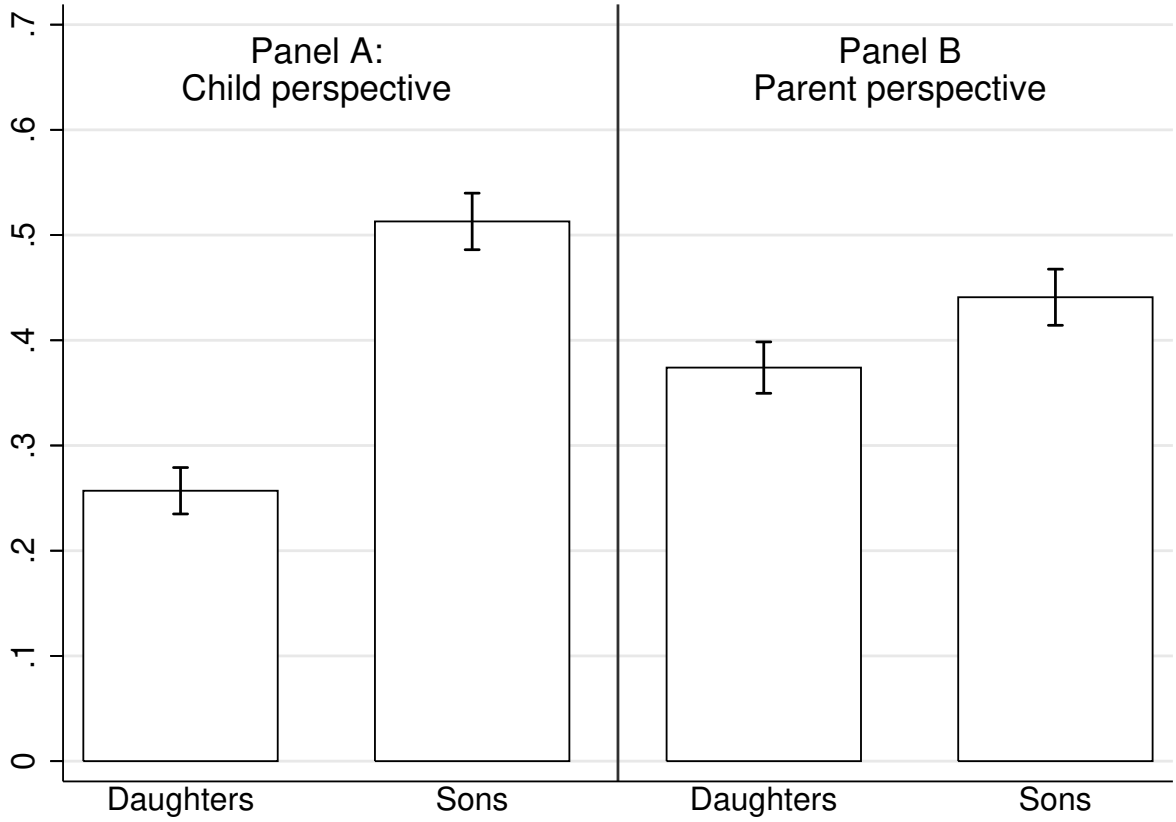
Notes: Panel a) shows the recruitment process. In total, 910 children participated in the child experiment (81% participation rate), and 770 parents participated in the parent experiment (82% participation rate); thus, 740 parent–child pairs completed the experiment. Panel b) shows the implementation 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 2: Competitiveness choices



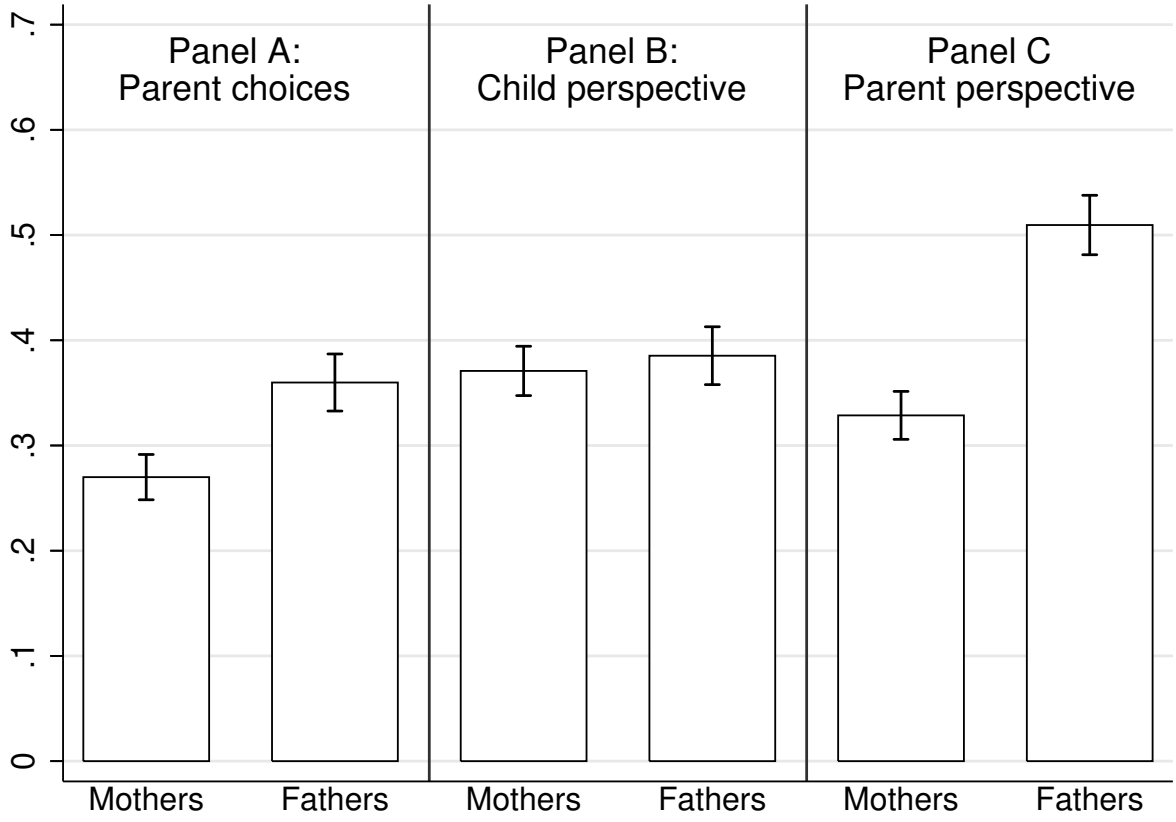
Notes: Panel A shows the share of parents who chose competition for their daughters and sons. Panel B shows the share of daughters and sons who chose competition for themselves. The error bars indicate robust standard errors. The gender difference in children's choices compared with the gender difference in parents' choices is marginally significant, with a p-value of 0.07, using robust standard errors clustered at the parent–child level.

Figure 3: Mechanisms explaining parents' choices



Notes: As a proxy variable for the child perspective, Panel A shows the share of parents who believed their child will choose to compete. As a proxy variable for the parent perspective, Panel B shows the share of parents who chose to compete for themselves, split by whether the parent had a son or daughter participating in the experiment. The error bars indicate robust standard errors.

Figure 4: Mothers and fathers



Notes: Panel A shows mothers' and fathers' competitiveness choices for their children. As a proxy variable for the child perspective, Panel A shows the share of parents who believed their child will choose to compete. As a proxy variable for the parent perspective, Panel B shows the share of parents who chose to compete for themselves. The error bars indicate robust standard errors.

Table 1: Descriptive statistics

Panel A: School characteristics

	National Average		*Non-participating School*		*Participating Schools*	
	Boys	*Girls*	*Boys*	*Girls*	*Boys*	*Girls*
Mathematics	3.5	3.7	3.5	3.8	3.6	3.7
Norwegian Bokmal	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: Child-parent pair characteristics

	Scale	Sons	Daughters	P-value
Parent female	Dummy	0.54	0.61	0.08
Parents live together	Dummy	0.69	0.72	0.35
Parents are married	Dummy	0.61	0.65	0.33
Parent age	Years	46.34	46.95	0.13
Biological parent	Dummy	0.95	0.95	0.92
Family speaks foreign language	Dummy	0.15	0.14	0.70
Child has brothers	Dummy	0.70	0.68	0.58
Child has sisters	Dummy	0.74	0.67	0.05
Parent income	NOK	1,273,111	1,306,875	0.46
Parent college	Dummy	0.73	0.72	0.78

Notes: Panel A shows the average grades in the final year of middle school (grade 10). The grades range from 1 (worst) to 6 (best) with a standard deviation of ≈ 1. Panel B tests for differences in parent-child pairs where a daughter or son participated in the experiment.

Table 2: Main outcomes

Panel A: Parents				
Dependent variable:	*Parent chooses competition for child*			
	(1)	(2)	(3)	(4)
Daughter	-0.076**	-0.101***	-0.105***	-0.097***
	(0.034)	(0.033)	(0.032)	(0.034)
Number correct answers (child)		0.021**	0.025***	0.026***
		(0.009)	(0.008)	(0.009)
Confidence (parent)		0.072***	0.058***	0.059***
		(0.009)	(0.009)	(0.010)
Risk 1 (parent)			0.039***	0.034**
			(0.014)	(0.015)
Risk 2 (parent)			0.044***	0.043***
			(0.064)	(0.008)
Demographic controls				x
Observations	740	740	740	647
Panel B: Children				
Dependent variable:	*Child chooses competition for self*			
	(1)	(2)	(3)	(4)
Daughter	-0.151***	-0.123***	-0.088***	-0.091***
	(0.032)	(0.033)	(0.033)	(0.035)
Number correct answers (child)		0.014	0.011	0.014
		(0.009)	(0.009)	(0.009)
Confidence (child)		0.047***	0.042***	0.043***
		(0.009)	(0.008)	(0.009)
Risk 1 (child)			0.053***	0.051***
			(0.013)	(0.013)
Risk 2 (child)			0.017**	0.019**
			(0.007)	(0.008)
Demographic controls				x
Observations	740	740	740	647

Notes: The regressions include a constant term that is not shown in the table. Demographic controls include parent income, parent gender, and whether parent is college educated. Robust standard errors are given in parenthesis. (*$p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

Table 3: Testing for differences in weight on the two perspectives

	(1)	*(2)*	*(3)*	*(4)*	*(5)*
Daughter	-0.076**	0.032	0.031		
	(0.034)	(0.032)	(0.030)		
Child perspective		0.423***	0.340***	0.360***	0.306***
		(0.035)	(0.036)	(0.047)	(0.053)
Parent perspective			0.309***	0.215***	0.402***
			(0.034)	(0.049)	(0.048)
Observations	740	740	740	347	393
Sample				Only sons	Only daughters

Notes: All regressions include a constant term that is not shown in the table. Robust standard errors are given in parenthesis. (*$p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

Table 4: Explaining the gender difference in parents' beliefs

Dependent variable:	*Parent believes child will choose competition*			
	(1)	(2)	(3)	(4)
Daughter	-0.256***	-0.259***	-0.237***	-0.207***
	(0.035)	(0.036)	(0.036)	(0.039)
Probability of winning competition controls		x	x	x
Risk controls			x	x
Demographic controls				x
Observations	740	740	740	647

Notes: Probability of winning competition controls include parents' beliefs about their child's relative performance, children's beliefs about their own relative performance, and children's performance on the task. Risk controls include two measures of how children make risk choices, and two measures of how parents make risk choices for their children. Demographic controls include controls for parent gender, income, and whether they are college educated. Robust standard errors are given in parenthesis. (*$p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

Table 5: Competitiveness and academic high school track

	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
Parent choice	0.067**	0.066*			0.076**	0.075**	0.080**	0.079**
	(0.034)	(0.034)			(0.035)	(0.035)	(0.037)	(0.037)
Child choice			-0.026	-0.027	-0.044	-0.044	-0.047	-0.046
			(0.047)	(0.040)	(0.041)	(0.041)	(0.042)	(0.043)
Confidence (parent)							0.022**	0.022**
							(0.011)	(0.011)
Confidence (child)							0.000	-0.000
							(0.009)	(0.009)
Risk 1 (parent)							-0.062***	-0.063***
							(0.015)	(0.016)
Risk 1 (child)							0.007	0.007
							(0.014)	(0.014)
Risk 2 (parent)							0.007	0.007
							(0.009)	(0.009)
Risk 2 (child)							-0.007	-0.007
							(0.008)	(0.008)
Demographics		x		x		x		x
P-value (parent choice)	0.049	0.055			0.029	0.033	0.031	0.035
Observations	626	626	626	626	626	626	626	626

Notes: All regressions include a constant term that is not shown in the table. Robust standard errors are given in parenthesis. (*$p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

Table 6: Testing for differences in relative weight on two perspectives by parent gender

	Mothers	*Fathers*
Child perspective	0.379***	0.262***
	(0.045)	(0.057)
Parent perspective	0.268***	0.354***
	(0.045)	(0.053)
Observations	426	314

Notes: All regressions include a constant term that is not shown in the table. Robust standard errors are given in parenthesis. (*$p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

Table 7: Competitiveness and academic high school track by parent gender

	Mothers			*Fathers*		
Parent choice	0.012	0.005	0.015	0.130**	0.124**	0.129**
	(0.049)	(0.048)	(0.048)	(0.051)	(0.051)	(0.053)
Child choice			-0.047			-0.026
			(0.056)			(0.065)
Demographic controls		x	x		x	x
P-value (parent choice)	0.805	0.917	0.764	0.011	0.016	0.016
Observations	361	361	361	265	265	265

Notes: All regressions include a constant term that is not shown in the table. Robust standard errors are given in parenthesis. (*$p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

Table 8: Intergenerational transmission of competitiveness

Panel A: without controls					
Dependent variable:	*Child chooses competition for self*				
	(1)	*(2)*	*(3)*	*(4)*	*(5)*
Parent chooses for self	0.090***	0.081	0.164**	0.073	0.045
	(0.033)	(0.073)	(0.063)	(0.075)	(0.056)
Observations	740	159	155	188	238
Parent:	All	Father	Father	Mother	Mother
Child:	All	Son	Daughter	Son	Daughter
Panel B: controlling for earnings potential and risk preferences					
Dependent variable:	*Child chooses competition for self*				
	(1)	*(2)*	*(3)*	*(4)*	*(5)*
Parent chooses competition for self	0.051	0.044	0.151**	0.037	-0.016
	(0.037)	(0.075)	(0.067)	(0.084)	(0.061)
Observations	647	137	137	165	208
Parent:	All	Father	Father	Mother	Mother
Child:	All	Son	Daughter	Son	Daughter

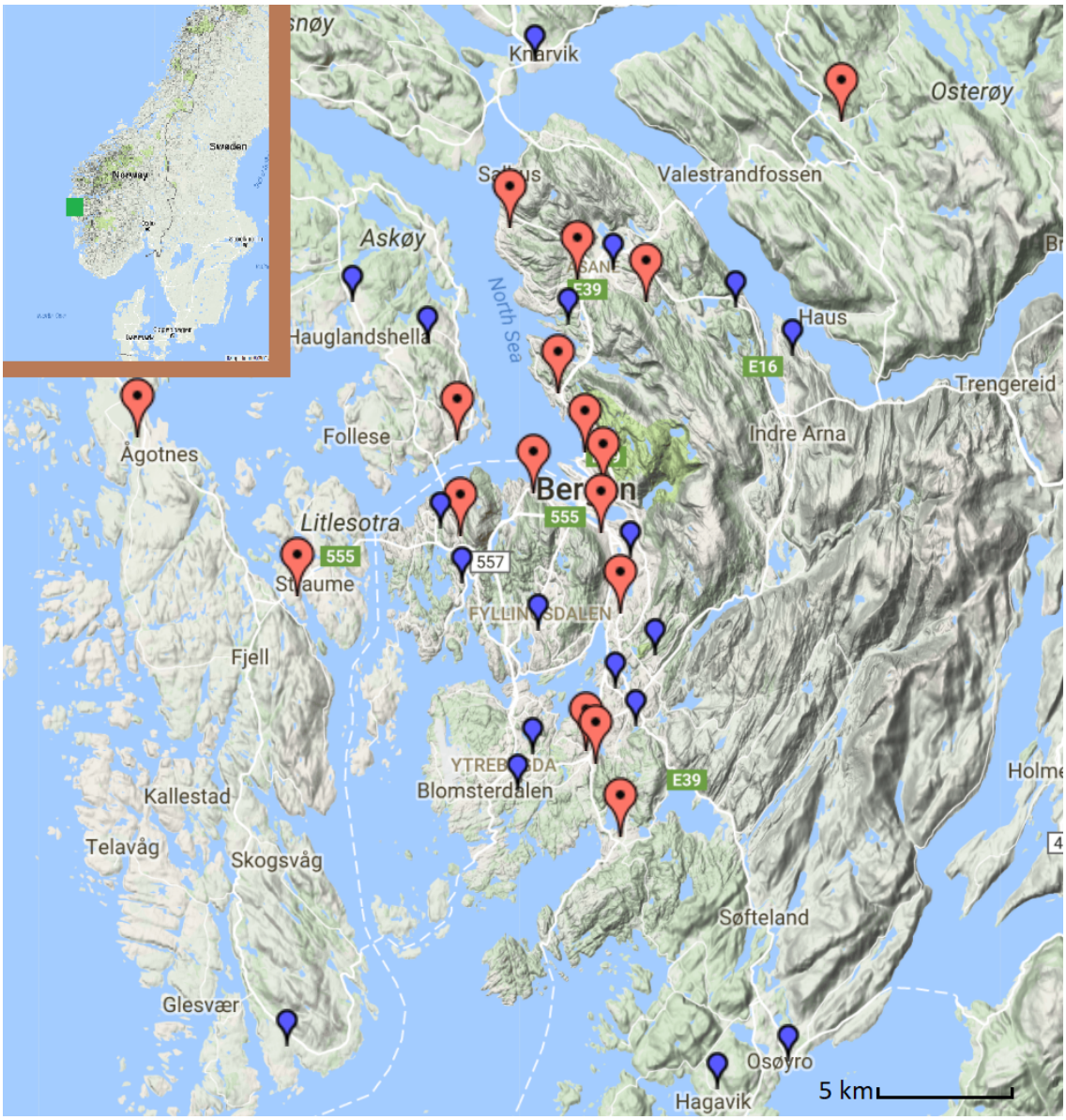
Notes: Panel A shows regression of child's competitiveness choice on parent's competitiveness choice. All regressions include a constant term that is not shown in the table. Robust standard errors are given in parenthesis. Panel B includes two controls for child risk preferences, two controls for parent risk preferences (how parent make risk choices for the child), child's performance on the task, and two proxy measure for parents' ability on the task (education and income). The difference in correlation coefficients is not significant across different pairings of mothers, fathers, daughters, and sons. (*$p < 0.1$, ** $p < 0.05$, *** $p < 0.01$)

Appendix

Appendix A features supplementary figures and tables. Appendix B includes experiment instructions from the parent and child experiment. The pre-analysis plans for the experimental analysis and the administrative data analysis are available here. Additional results from the pre-analysis plan can be found here.

Appendix A: Supplementary figures and tables

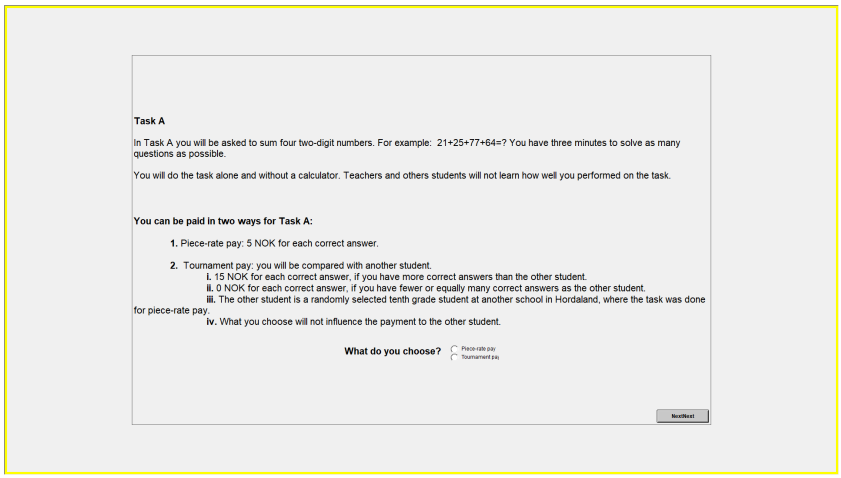
Figure A1: Map of participating and non-participating schools



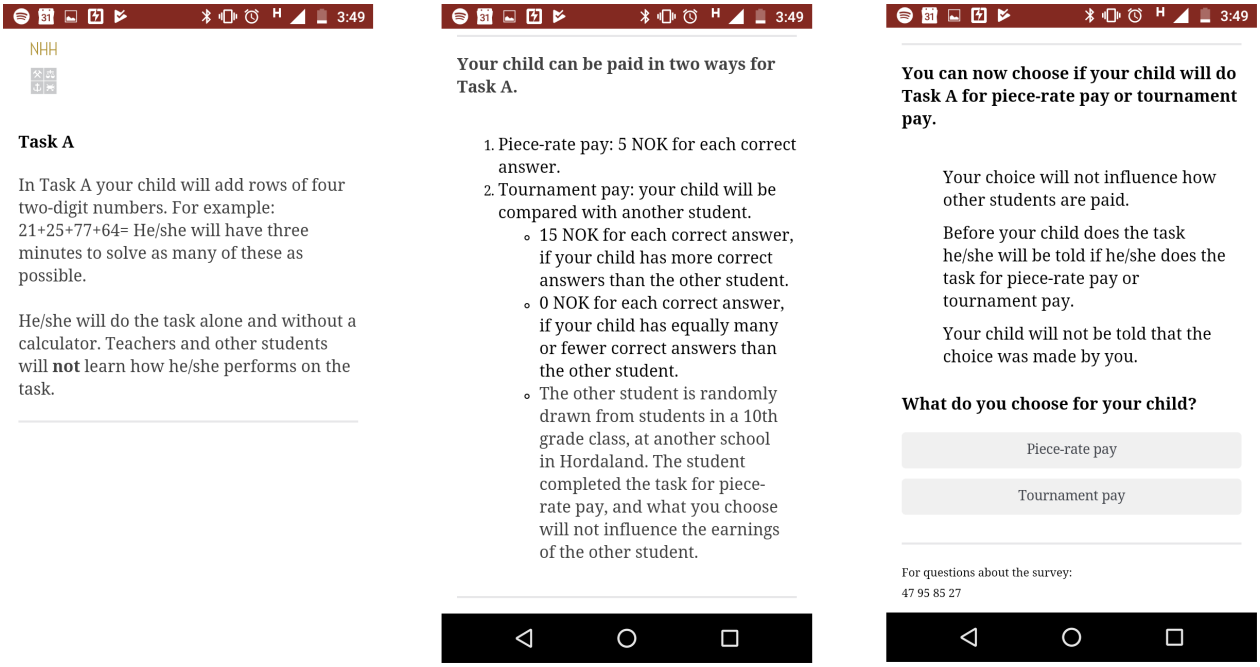
Notes: All middle schools with at least 25 eligible students and within 2 hours' driving distance of Bergen, Norway were invited to participate in the study. Large red markers indicate the 17 participating schools (including two pilot schools). Small blue markers indicate the 19 non-participating schools.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

Figure A2: Screenshots from experiments (English translations)

(a) Child experiment

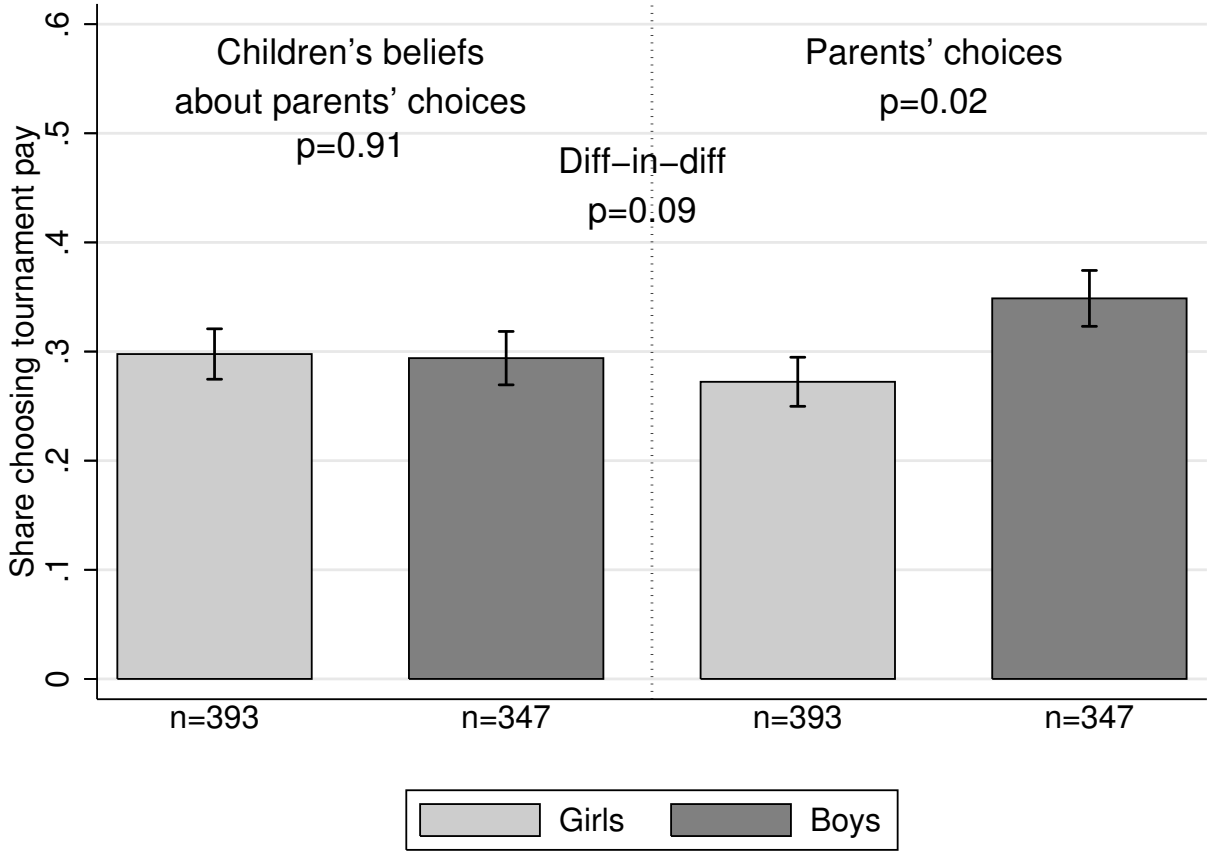


(b) Parent experiment



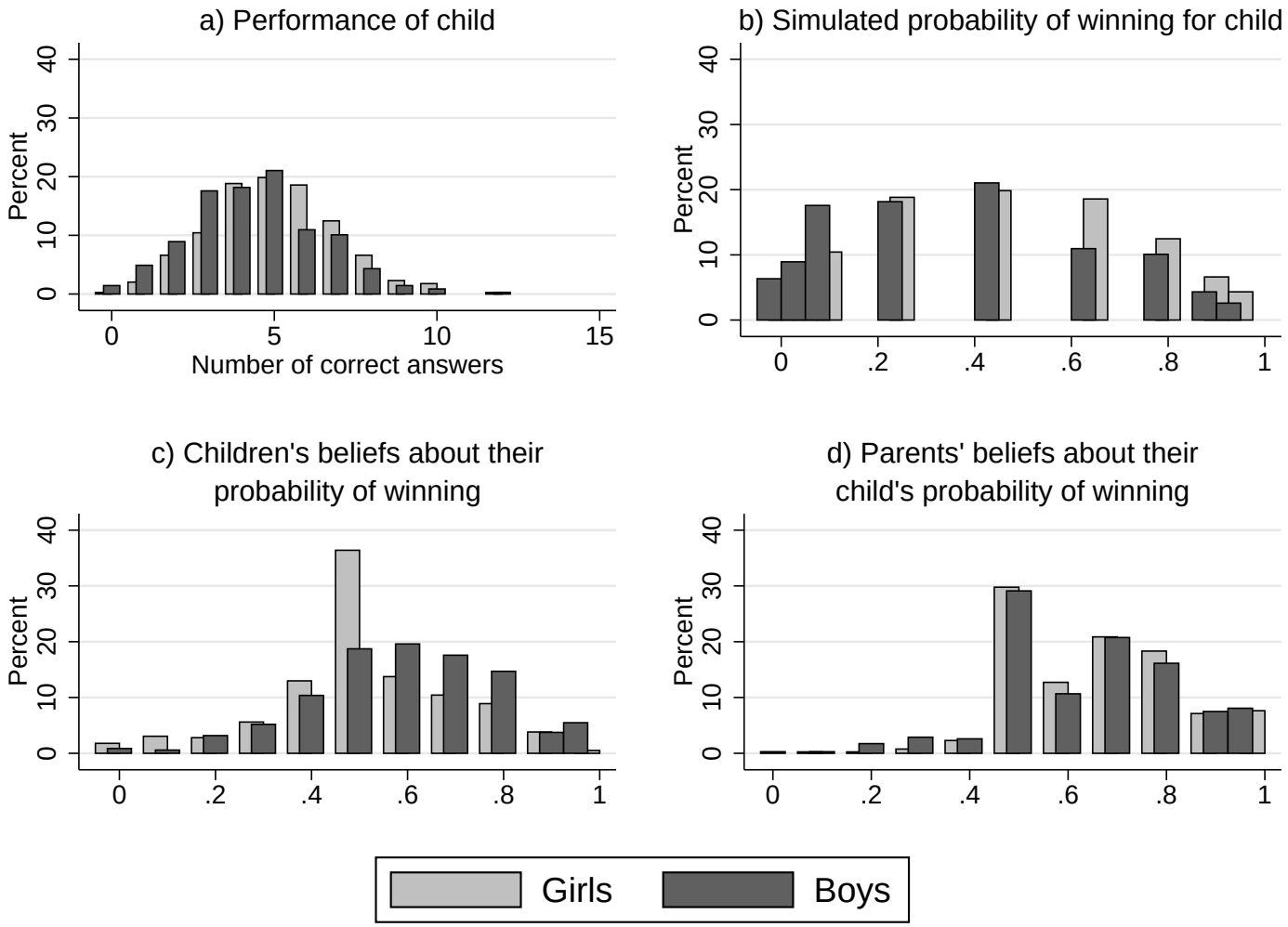
Notes: The screenshots show the child's and parent's choice of non-competitive (piece-rate) or competitive (tournament pay) for the child. The child then does the task, first with their own pay choice, and second with their parent's choice. The child experiment was coded in z-Tree (Fischbacher (2007)),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

Figure A3: Children's beliefs about parents' choices for them versus parents' choices for children



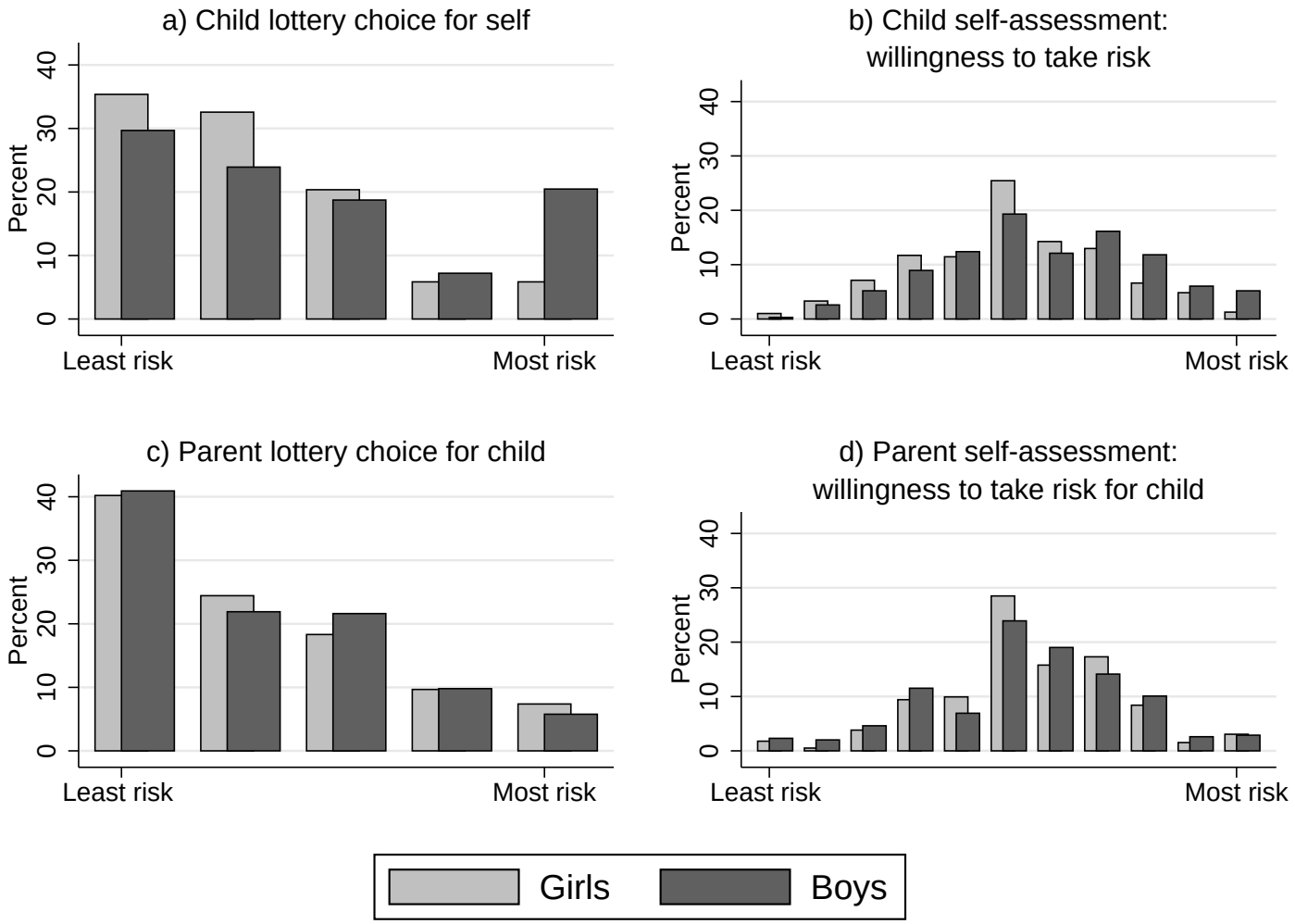
Notes: The figure shows children's beliefs about parents' choices for them, and the difference-in-difference with parents' choices for children. We focus here on children's beliefs about the parent who made the choice for them in the experiment. P-values are constructed using robust standard errors.

Figure A4: Mechanisms: performance, probability of winning, and beliefs



Notes: 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 competition. Parents had the same beliefs for sons and daughters.

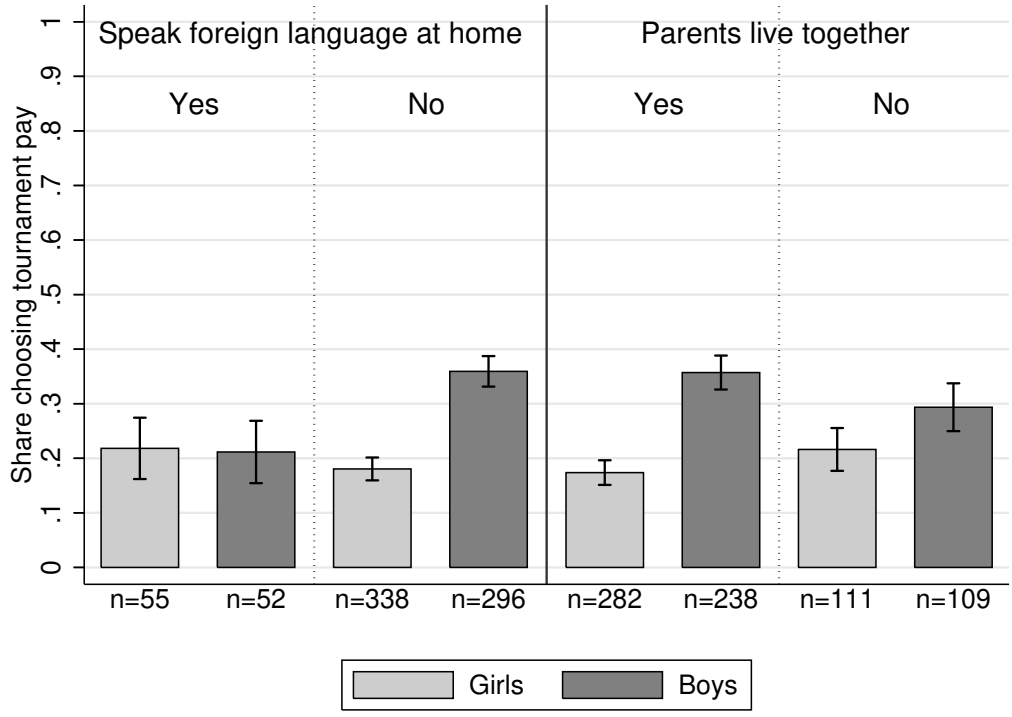
Figure A5: Mechanisms: risk taking



Notes: 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. (2011)). 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 A6: Heterogeneity by family characteristics

(a) Children's own choices



(b) Parents' choices for children

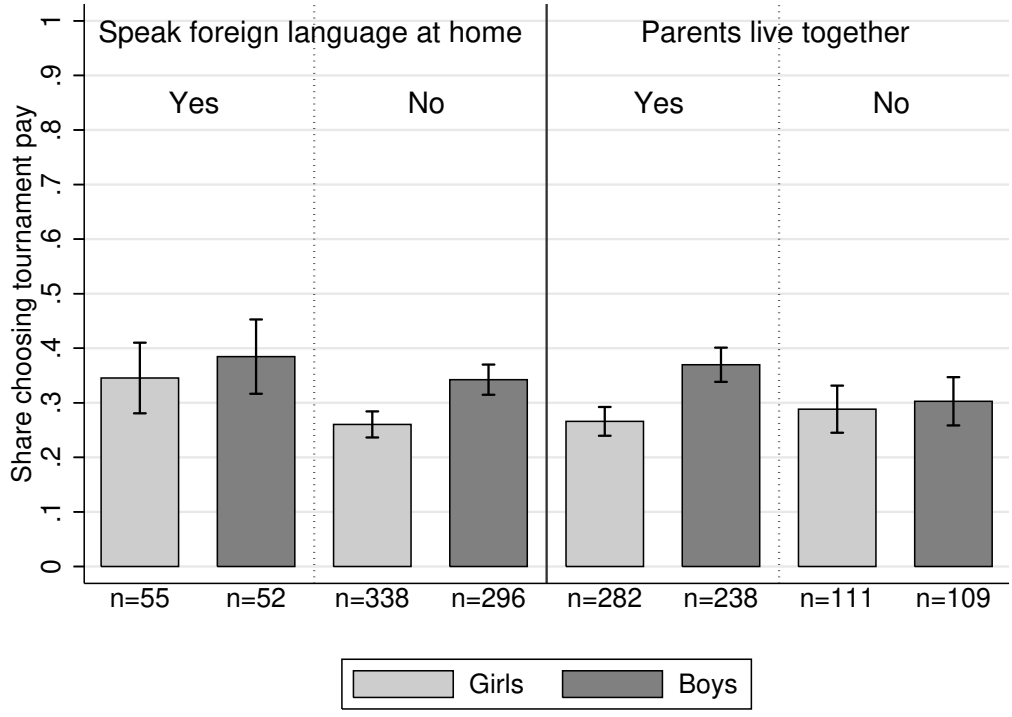
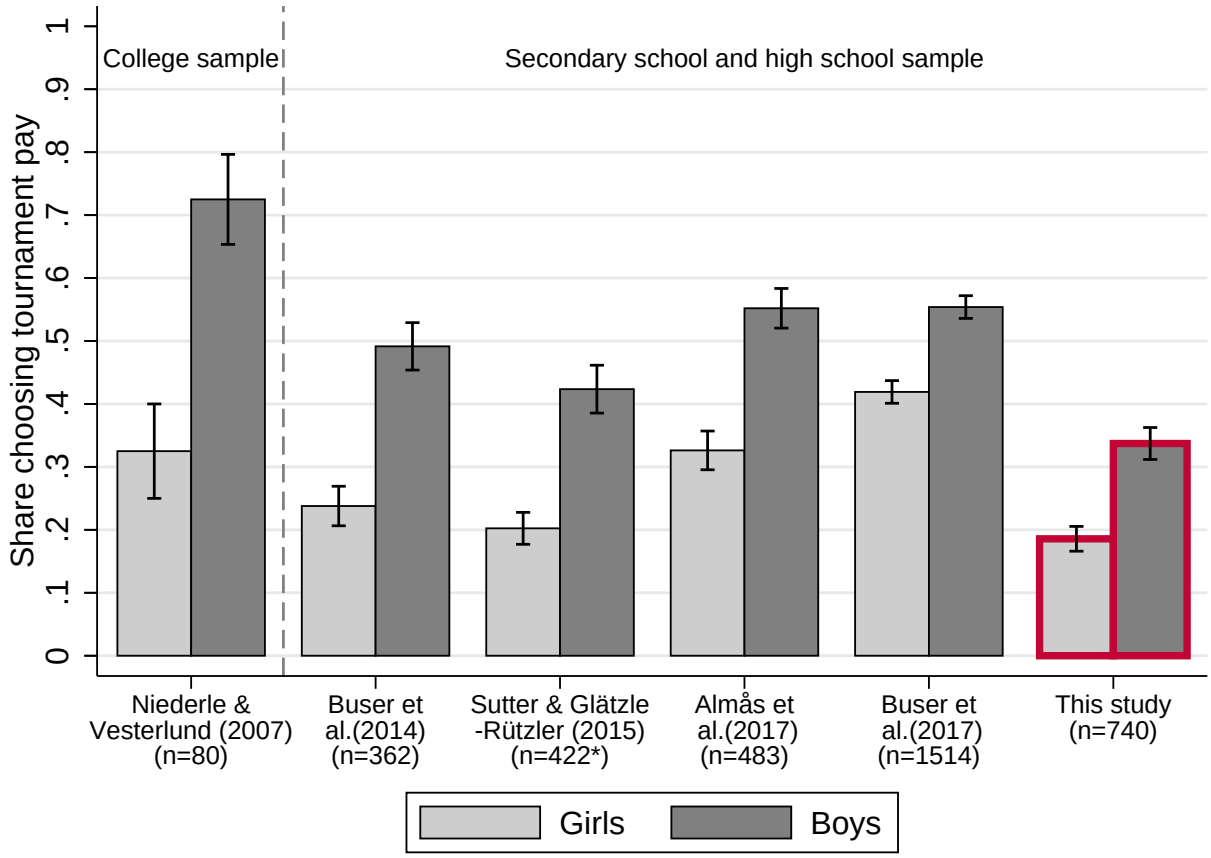
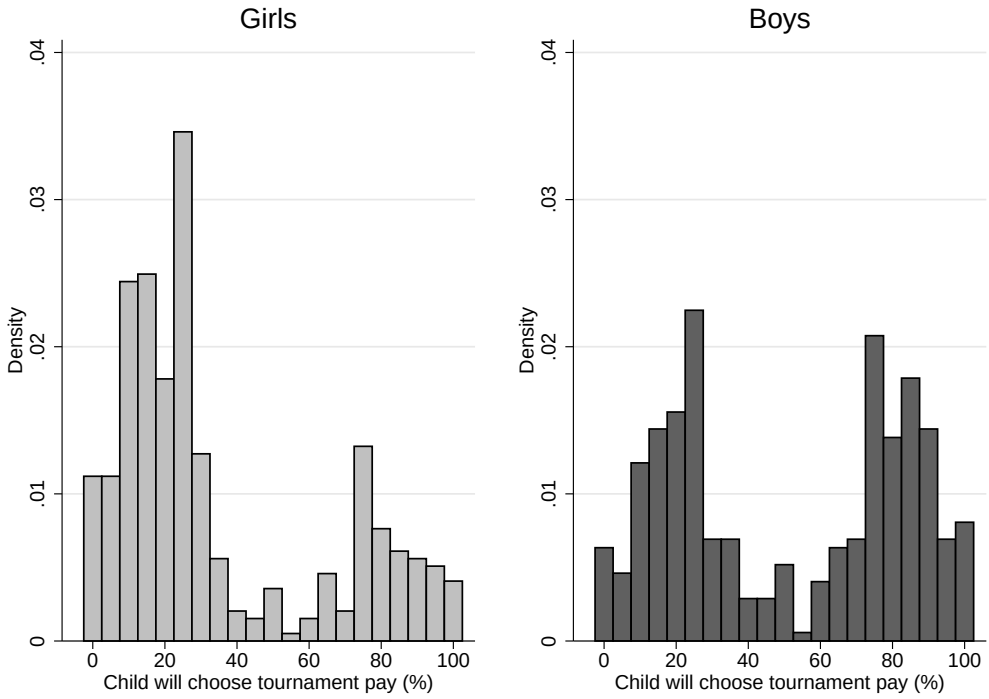


Figure A7: Gender differences in competitiveness on math task



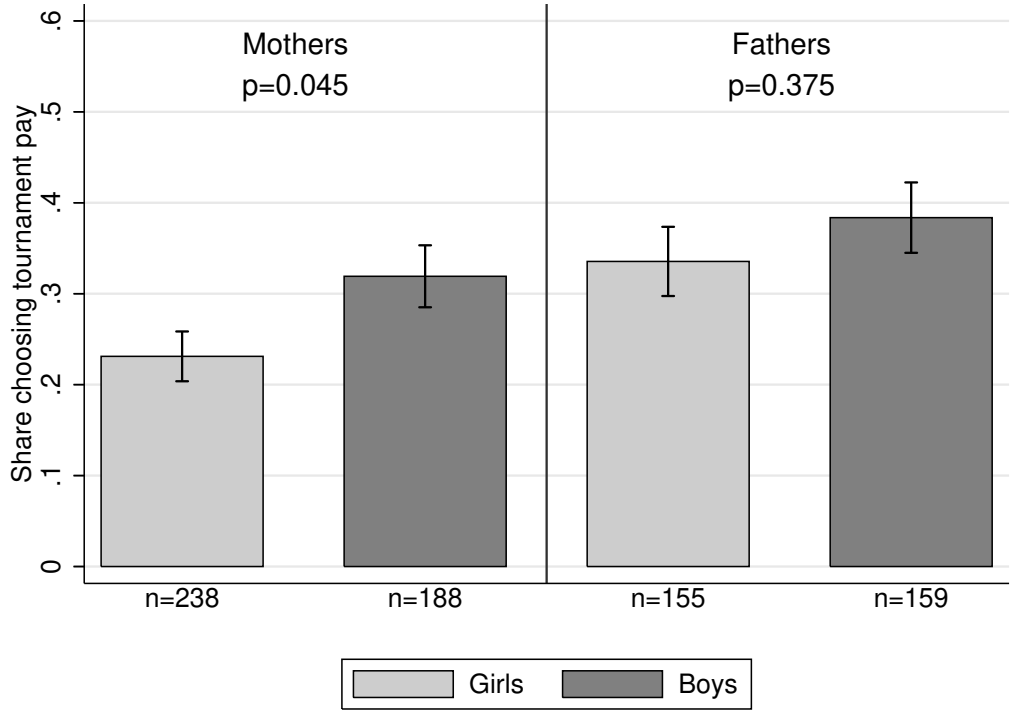
Notes: The figure shows gender differences in competitiveness for studies that employ a comparable measure of competitiveness and have an adolescent sample, with the exception of Niederle and Vesterlund (2007), who uses a sample of university students. Buser et al. (2014) is from experiments on ninth-grade students in Amsterdam, Netherlands. Sutter and Glätzle-Rützler (2015) study 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. (2016b) study competitiveness among ninth-grade students in Bergen, Norway. Buser et al. (2017a) study 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 standard errors.

Figure A8: Parents' probabilistic beliefs



Notes: After parents are asked if they believe their child will choose to compete, they were asked how certain they were that their belief is correct. This figure shows the distribution of answers.

Figure A9: Parents' competitiveness choices for children by parent gender



Notes: Robust standard errors are used for p-values.

Table A1: 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	

Notes: 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 A2: Random incentive scheme

	Tasks solved round 3	Tasks solved round 2
Competition round 2	-0.324	-0.324
	(0.295)	(0.295)
Constant	5.088***	5.088***
	(0.456)	(0.456)
Observations	173	173

Notes: The performance in round 3 may have been influenced by children's choice of pay scheme in round 1 and parents' choice of pay scheme in round 2. Here we partly test for the concern that round 2 pay scheme influenced round 3 performance. Our experiment included 173 children who participated without their parents taking part. For these children, we randomized if competition was implemented in round 2. We see that for these children incentive scheme in round 2 did not predict performance in round 2 or 3. All regressions include a constant term that is not shown in the table. Robust standard errors are given in parenthesis. (*$p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

Table A3: Gender difference in number of tasks solved

	Round 1	Round 2	Round 3
Daughter	0.612***	0.765***	0.650***
	(0.147)	(0.148)	(0.146)
Observations	740	740	740

Notes: The table shows an OLS regression of number of tasks solved on a dummy for whether the child is a daughter and a constant (suppressed). All regressions include a constant term that is not shown in the table. Robust standard errors are given in parenthesis. (*$p <$ 0.1, ** $p < 0.05$, *** $p < 0.01$).

Table A4: Additional controls for ability to solve the 4x2 sum of digits task

Panel A: Parent choice					
	(1)	(2)	(3)	(4)	(5)
Daughter	-0.076**	-0.104***	-0.099***	-0.102***	-0.094**
	(0.034)	(0.034)	(0.034)	(0.036)	(0.039)
Ability controls	None	Points3	Flexible Points3	Flexible Points 1-3	Flexible Points 1-3 and GPA
Observations	740	740	740	740	648
Panel B: Child choice					
	(1)	(2)	(3)	(4)	(5)
Daughter	-0.151***	-0.173***	-0.173***	-0.181***	-0.185***
	(0.032)	(0.032)	(0.033)	(0.033)	(0.036)
Ability controls	None	Points3	Flexible Points3	Flexible Points 1-3	Flexible Points 1-3 and GPA
Observations	740	740	740	740	648

Notes: The regressions include a constant term that is not shown in the table. Points3 refers to performance in round 3. Points 1-3 refers to performance in all rounds 1, 2, and 3. Flexible means that a fully interacted dummy model was used for each level of performance. GPA is from grade 10 and rounded to nearest full integer. All regressions include a constant term that is not shown in the table. Robust standard errors are given in parenthesis. (*$p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

Table A5: Gender difference in competitiveness choices with flexible controls for beliefs about probability of winning competition and risk preferences

	Parent choice	Parent choice	Child choice	Child choice
Daughter	-0.092***	-0.091**	-0.084**	-0.089**
	(0.035)	(0.036)	(0.037)	(0.037)
Demographic controls		x		x
Observations	648	647	648	647

Notes: Parent choice includes flexible controls with dummy for each level for number of correct answers (child), confidence (parent), risk 1 (parent), risk 2 (parent), and 10th grade point average. Child choice includes flexible controls for number of correct answers (child), confidence (child), risk 1 (child), risk 2 (child), and 10th grade point average. All regressions include a constant term that is not shown in the table. Robust standard errors are given in parenthesis. (*$p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

Table A6: Heterogeneity in gender difference in competitiveness

Panel A: Parent choice								
	Foreign	Native	Live together	Single parent	Low SES	High SES	Low ability	High ability
Daughter	-0.053	-0.103***	-0.132***	-0.028	-0.100**	-0.076	-0.036	-0.193***
	(0.109)	(0.037)	(0.042)	(0.064)	(0.047)	(0.052)	(0.041)	(0.065)
P-value on difference	p=0.616		p=0.079		p=0.839		p=0.042	
FDR adjusted q-value	p=0.812		p=0.143		p=0.839		p=0.143	
Observations	100	547	457	190	367	280	416	231
Panel B: Child choice								
	Foreign	Native	Live together	Single parent	Low SES	High SES	Low ability	High ability
Daughter	0.041	-0.107***	-0.131***	-0.020	-0.045	-0.135**	-0.064	-0.116*
	(0.084)	(0.039)	(0.043)	(0.065)	(0.046)	(0.056)	(0.041)	(0.070)
P-value on difference	p=0.236		p=0.049		p=0.255		p=0.535	
FDR adjusted q-value	p=0.340		p=0.196		p=0.340		p=0.535	
Observations	100	547	457	190	367	280	416	231

Notes: Panel A shows heterogeneity for the parent's competitiveness choice for child. Panel B shows heterogeneity for the child's own competitiveness choice. In both panels, the regressions include a constant term that is not shown in the table. All regressions use robust standard errors. We show two sets of p-values for the difference on the Daughter coefficient between the related two stratified regression. The first, is traditional p-values using robust standard errors. The second is q-values following Benjamini and Hochberg (1995). We adjust q-values for the subgroup of outcomes within the each of the panels. (*$p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

Table A7: Earnings from task

	(1)	(2)	(3)	(4)	(5)	
Panel A: Gender interactions						
Parent makes choice	0.875	0.053	0.540	1.919	1.317	
	(0.632)	(1.118)	(1.198)	(1.500)	(1.247)	
Parent gender	All	Mother	Mother	Father	Father	
Child gender	All	Son	Daughter	Son	Daughter	
Observations	1480	376	476	318	310	
Panel B: Ability on task interactions						
Parent makes choice	1.636	-0.086	1.566	-0.319	1.737	0.112
	(1.116)	(0.238)	(1.400)	(0.336)	(1.838)	(0.335)
Ability	High	Low	High	Low	High	Low
Child gender	All	All	Daughter	Daughter	Son	Son
Observations	826	654	486	300	340	354

Notes: The table tests if there are subgroups where earnings on the task are larger when the parent decides (rather than the child). The coefficient on "Parent" gives the earnings differential for the child between when the parent and the child decides. We do not see any significant interactions neither in Panel A or Panel B. Ability high and low is defined as scoring above or below average on the task in round 3. All regressions include a constant term that is not shown in the table. Robust standard errors clustered by child-parent pair are given in parenthesis. (*$p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

Table A8: Parents' competitiveness choice for child and child's probability of winning the competition

	(1)	(2)	(3)	(4)	(5)	(6)
Number of correct answers (child)	0.057***	0.026**			0.035***	0.015**
	(0.012)	(0.010)			(0.009)	(0.008)
Confidence (parent)			0.080***	0.053***	0.066***	0.048***
			(0.008)	(0.009)	(0.009)	(0.010)
# Answers significantly different	Yes (p=0.50)				No (p=0.241)	
Confidence significantly different			No (p=0.121)		No (p=0.318)	
Observations	347	393	694	786	694	786

Notes: All regressions include a constant term that is not shown in the table. Robust standard errors are given in parenthesis. (*$p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

Table A9: Testing for differences in relative weight on two perspectives using non-binary measure of child perspective

	(1)	(2)	(3)	(4)
Daughter	0.039	0.037		
	(0.031)	(0.029)		
Child perspective (non-binary measure)	0.674***	0.544***	0.616***	0.454***
	(0.050)	(0.052)	(0.070)	(0.075)
Parent perspective		0.301***	0.198***	0.404***
		(0.034)	(0.049)	(0.048)
Observations	740	740	347	393
Sample			Only sons	Only daughters

Notes: All regressions include a constant term that is not shown in the table. Robust standard errors are given in parenthesis. (*$p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

Table A10: Descriptive statistics on academic track versus vocational track

	Academic	Not academic
10th grade GPA	4.57	4.01
College	0.87	0.52
College STEM	0.17	0.06

Notes: 10th grade GPA is on a scale from 1 (worst) to 6 (best) with a standard deviation of ≈ 1.

Table A11: Testing for differences in relative weight on the two perspectives (mother and father, robustness on reduced sample)

	Mothers	*Fathers*
Child perspective	0.388***	0.281***
	(0.043)	(0.053)
Parent perspective	0.263***	0.360***
	(0.045)	(0.052)
Observations	335	269

Notes: We here replicate the analysis from Table 6 for the sub-sample of parent-child pairs where the originally invited parent participated in the experiment. The robustness analysis replicates our main results. All regressions include a constant term that is not shown in the table. Robust standard errors are given in parenthesis. (*$p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

Table A12: Parent gender and child education outcome (mother and father, robustness on reduced sample)

	Mothers			*Fathers*		
Parent choice	0.043	0.037	0.036	0.146***	0.141***	0.136**
	(0.053)	(0.052)	(0.052)	(0.052)	(0.053)	(0.056)
Child choice			0.004			0.026
			(0.061)			(0.067)
Demographic controls		x	x		x	x
P-value (parent choice)	0.409	0.479	0.949	0.006	0.008	0.015
Observations	288	288	288	227	227	227

Notes: We here replicate the analysis from Table 7 for the sub-sample of parent-child pairs where the originally invited parent participated in the experiment. The robustness analysis replicates our main results. All regressions include a constant term that is not shown in the table. Robust standard errors are given in parenthesis. (*$p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

Table A13: Correlations in choices, beliefs, and attitudes

	All	Boys & Fathers	Boys & Mothers	Girls & Fathers	Girls & Mothers
Competitiveness					
Child's choice self & parent's choices self	0.10***	0.09	0.07	0.21***	0.05
Child's choice self & parent's choices 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

Notes: Overconfidence is defined as the difference between the belief about the child's probability of winning the competition and the child's actual probability of winning the competition (obtained from a simulation with 1,000 random draws of opponents). ((*$p < 0.1$, ** $p < 0.05$, *** $p < 0.01$).

Appendix B: Experimental instructions

Parent experiment

The instructions have been translated from Norwegian. For original instructions in Norwegian, email jonas.tungodden@gmail.com. Notes are in italic.

Welcome!

Thank you for participating! This survey takes about 5 minutes and is related to the experiment your child and his/her classmates will take part in later today.

We ask that you complete the survey alone, and that you do not talk with your child about the survey (until after he/she has finished the experiment). This is very important for our research.

If you need help with the survey or have other questions, you can contact us on the telephone number listed at the bottom of every page.

Below follows a consent form for participating in this research project. Click on the arrow to accept it and start the survey.

Consent to participate in research

Participation in research is completely voluntary and you are free to stop taking part in the project at any time. If you agree to participate we ask you to complete the following survey. Your answers will be linked with de-identified data on education and income from Statistics Norway. That data is de-identified means that all information which can identify you has been replaced with a key code which refers to a different file which contains personal information. As with all research, there is a chance that confidentiality could be compromised; however, we are taking precautions to minimize this risk. The file with personal information will be stored on a server with two factor identification in an encrypted file. No researchers will have access to this file, and if the results from the study is published or presented, no personal information will be used.

If you have any questions about this research, please feel free to contact us, either by phone 47 95 85 27 or jonast@berkeley.edu.

For questions about the survey:

47 95 85 27

Page break

The experiment

In the experiment your child will do two tasks: Task A and Task B. He/she will be paid for **one** of the tasks. When the experiment is finished, we will randomly select if he/she is paid for Task A or Task B.

The total payment your child will earn, includes what he/she earns on the task which is selected for payment, in addition to 100 NOK as show-up compensation.

For questions about the survey:

47 95 85 27

Page break

Task A

In Task A your child will add rows of four two-digit numbers. For example: 21+25+77+64 =? He/she will have three minutes to solve as many of these as possible.

He/she will do the task alone and without a calculator. Teachers and other students will **not** learn how he/she performs on the task.

Your child can be paid in two ways for Task A.

1. Piece-rate pay: 5 NOK for each correct answer.
2. Tournament pay: your child will be compared with another student.
    - 15 NOK for each correct answer, if your child has more correct answers than the other student.
    - 0 NOK for each correct answer, if your child has equally many or fewer correct answers than the other student.
    - The other student is randomly drawn from students in a 10th grade class, at another school in Hordaland. The student completed the task for piece-rate pay, and what you choose will not influence the earnings of the other student.

You can now choose if your child will do Task A for piece-rate pay or tournament pay.

- Your choice will not influence how other students are paid.
- Before your child does the task he/she will be told if he/she does the task for piece-rate pay or tournament pay.
- He/she child will not be told that the choice was made by you.

What do you choose for your child?

Piece-rate pay Tournament pay

For questions about the survey:

47 95 85 27

Page break

How certain were you in your choice?

- 0 = very uncertain. I could just as well have chosen piece-rate pay *(tournament pay — if parent chose piece-rate pay).*
- 10 = completely certain. I could never have chosen piece-rate pay *(tournament pay — if parent chose piece-rate pay).*

0 1 2 3 4 5 6 7 8 9 10

Not uncertain Very certain

For questions about the survey:

47 95 85 27

Page break

Task B.

Task B is identical to Task A, but for Task B your child will choose if he/she works for piece-rate pay or tournament pay.

We will now ask you what you think your child will choose.

- Your child will make his/her choice before learning what he/she will do in Task A.
- Your child will not be told your answer.

Win an iPad Air 2 by guessing correctly.

As a thank you gift for participating in the survey, three parents will win an iPad. You get one ticket to the iPad lottery for completing the survey. You get three extra tickets to the lottery if you guess correctly what your child will choose.

Will your child choose piece-rate pay or tournament pay?

Piece-rate pay Tournament pay

For questions about the survey:

47 95 85 27

Page break

How certain were you in your answer?

- 0 = very uncertain. My child could just as well have chosen piece-rate pay *(tournament pay — if parent guessed piece-rate pay).*
- 10 = completely certain. My child could never have chosen piece-rate pay *(tournament pay — if parent guessed piece-rate pay).*

0 1 2 3 4 5 6 7 8 9 10

Not uncertain Very certain

For questions about the survey:

47 95 85 27

Page break

How well do you think your child will perform on the task relative to other students in Hordaland?

- 0 = among the 10% worst on the task.
- 50 = in the middle.
- 100 = among the 10% best on the task.

0 1 2 3 4 5 6 7 8 9 10
Poorly Very well

For questions about the survey:

47 95 85 27

Page break

Would you choose piece-rate pay or tournament pay for yourself?
(If you participated in the experiment together with other parents from the class.)

Piece-rate pay Tournament pay

If you could give your child one of the following bonuses as an extra payment in the experiment: which would you choose? (This is a hypothetical question, meaning, the bonus will not actually be paid to you child.)

- 200 NOK
- 350 NOK with 50% probability, 50 NOK with 50% probability
- 400 NOK with 50% probability, 100 NOK with 50% probability
- 500 NOK with 50% probability, 50 NOK with 50% probability
- 600 NOK with 50% probability, 0 NOK with 50 % probability

When you make a choice for your child (the one participating in the experiment), are you generally willing to take risk, if there also is a possibility for a gain?

0 1 2 3 4 5 6 7 8 9 10
Not willing Very willing

Do you think it is important to be competitive in order to be successful in today's society?

0 1 2 3 4 5 6 7 8 9 10
Not important Very important

How important do you think it is to be successful in order to be happy?

0 1 2 3 4 5 6 7 8 9 10
Not important Very important

84% of Norwegian stock based companies have male CEOs. To what degree do you think this is a problem for our society?

0 1 2 3 4 5 6 7 8 9 10
Not a problem Very big problem

Are you the biological father or mother of the child in the experiment?

Yes No

Do you live in the same house as the child in the experiment?

Yes No

What is your age?

_____

For questions about the survey:

47 95 85 27

Page break

Thank you for your participation!

Your participation is very important for our research project and we are very thankful for your time.

We hope that you can help us further by not talking to your child about the survey, until he/she has finished the experiment.

We will contact the winners of iPad Air 2 after we have completed the survey at all the schools participating in the research project.

Please contact us at 47 95 85 27 or jonast@berkeley.edu, if you have any questions related to the survey or the research project.

Child experiment

The instructions have been translated from Norwegian. For original instructions in Norwegian, email jonas.tungodden@gmail.com. Notes are in italic.

Welcome to the experiment!

Thank you for participating! The experiment takes about 30 minutes.

Enter you experiment code and press "next" to start the experiment.

Page break

The experiment

In the experiment you will do two tasks: Task A and Task B. You will be paid for **one** of the tasks. When the experiment is finished, we will randomly select if you are paid for Task A or Task B.

The total payment you will earn includes what you earn on the task which is selected for payment, in addition to 100 NOK as show-up compensation.

Page break

Task A.

In Task A you will be asked to sum four two-digit numbers. For example: 21+25+77+64=? You have three minutes to solve as many questions as possible. You will do the task alone and without a calculator. Teachers and others students will not learn how well you performed on the task.

You can be paid in two ways for Task A.

1. Piece-rate pay: 5 NOK for each correct answer.
2. Tournament pay: you will be compared with another student.
    - 15 NOK for each correct answer, if you have more correct answers than the other student.
    - 0 NOK for each correct answer, if you have fewer or equally many correct answers as the other student.
    - The other student is a randomly selected tenth grade student at another school in Hordaland, where the task was done for piece-rate pay. What you choose will not influence the payment to the other student.

What do you choose?

Piece-rate pay Tournament pay

Page break

How certain were you in your choice?

- 0 = very uncertain. I could just as well have chosen piece-rate pay *(tournament pay — if the child chose piece-rate pay).*
- 10 = very certain. I could never have chosen piece-rate pay *(tournament pay — if the child chose piece-rate pay).*

0 1 2 3 4 5 6 7 8 9 10
Not uncertain Very certain

Page break

Task A will start when you press "Next". You will then have 3 minutes to solve the questions.

Page break

Time left: 180

$$73 + 58 + 90 + 23 = ?$$

Next question

Page break

You are now finished with Task A.

Press "Next" to go to Task B.

Page break

Task B is identical to Task A, but in Task B you will not get to decide for yourself if you will do the task for piece-rate pay or tournament pay. Instead, the choice will be made either by a random draw or by another participant in the research project.

Page break

The following text was shown if piece-rate pay was chosen by the parent (or by random draw, in the case were the parent failed to answer the parent experiment in time):

You will do Task B for piece-rate pay. That means you will get 5 NOK for each correct answer.

Press "Next" to start Task B. You will then have 3 minutes to solve the questions.

The following text was shown if tournament pay was chosen by the parent (or by random draw, in the case were the parent failed to answer the parent experiment in time):

You will do Task B for tournament pay. That means:

- 15 NOK for each correct answer, if you have more correct answers than the other student.
- 0 NOK for each correct answer, if you have fewer or equally many correct answers as the other student.
- The other student is a randomly selected tenth grade student at another school in Hordaland, where the task was done for piece-rate pay. What you choose will not influence the payment to the other student.

Press "Next" to start Task B. You will then have 3 minutes to solve the questions.

Page break

Time left: 180

$$43 + 68 + 86 + 15 = ?$$

Next question

Page break

You have now completed Task A and Task B.

You will now do a Bonus Task. The Bonus Task is the same as Task A and Task B, but you now have the opportunity to earn tickets to an iPhone lottery.

Three iPhone 7 Plus will be won by students who are participating at this experiment or the same experiment at other schools. All students participating in the experiment receive 1 ticket to the iPhone lottery. You will also receive one extra ticket for each correct answer in the Bonus Task.

Press "Next" to start the Bonus Task. You will then have 3 minutes to solve the questions.

Page break

Time left: 180

$$54 + 12 + 36 + 64 = ?$$

Next question

Page break

You are now finished with all the tasks.

Page break

How well do you think you performed on the task relative to other students in Hordaland?

- 0 = among the 10% worst on the task.
- 50 = in the middle.
- 100 = among the 10% best on the task.

0 1 2 3 4 5 6 7 8 9 10

Poorly Very well

Page break

If you could get one of the following bonuses as an extra payment in the experiment: which would you choose? (This is a hypothetical question, meaning, the bonus will not actually be paid to you).

- 200 NOK
- 350 NOK with 50% probability, 50 NOK with 50% probability
- 400 NOK with 50% probability, 100 NOK with 50% probability
- 500 NOK with 50% probability, 50 NOK with 50% probability
- 600 NOK with 50% probability, 0 NOK with 50 % probability

Page break

How do you think about yourself? Are you are person who is generally willing to take risk, or do you try to avoid risk. Answer on a scale from 0 to 10, where 0 means "not willing to take risk at all", and 10 means "very willing to take risk".

0 1 2 3 4 5 6 7 8 9 10

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".

0 1 2 3 4 5 6 7 8 9 10

Page break

Do you think it is important to be competitive in order to be successful in today's society?

0 1 2 3 4 5 6 7 8 9 10
Not important Very important

How important do you think it is to be successful in order to be happy?

0 1 2 3 4 5 6 7 8 9 10
Not important Very important

84% of Norwegian stock based companies have male CEOs. To what degree do you think this is a problem for our society?

0 1 2 3 4 5 6 7 8 9 10
Not a problem Very big problem

Page break

What job do you want when you grow up?

_____

Page break

If your **mother** were to choose between piece-rate pay and tournament pay for you, what do you think she would choose?

Piece-rate pay Tournament pay

If your **father** were to choose between piece-rate pay and tournament pay for you, what do you think he would choose?

Piece-rate pay Tournament pay

Page break

Do your parents live together?

Yes No

Are your parents married to each other?

Yes No

Page break

How many older sisters do you have? _____

How many younger sisters do you have? _____

How many older brothers do you have?_____

How many younger brothers do you have? _____

Page break

On a scale from 1 to 6, indicate how accurately does the following statements describe your parents. Where 1 = "does not at all describe my parents" and 6 ="very well describes my parents".

- My parents take my wishes into consideration before they ask me to do something.
  1 2 3 4 5 6
- My parents encourage me to speak my mind even if they disagree.
  1 2 3 4 5 6

- My parents punish me by taking privileges away from me (e.g., TV, games, visiting friends).
  1 2 3 4 5 6
- My parents criticize me when my behavior does not meet their expectations.
  1 2 3 4 5 6
- My parents do not care about my behavior.
  1 2 3 4 5 6

Page break

Your gender:

- Male
- Female

Do you speak another language than Norwegian at home?

- Yes.
- No.

Page break

We now draw if you will be paid for Task A or Task B.
Please wait.

Page break

Payment.

On Task A you had ? correct answers.
On Task B you had ? correct answers.
On the bonus task you had ? correct answers.

The task which will determine your payment is ?.

On the task you earned ? NOK. In addition you get 100 NOK a show-up payment. In total you have earned ?.

We will contact the winners of the iPhone lottery in May, after we have completed the experiment at all the schools that participated in the research project.