Willingness to Compete: Family Matters

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This paper studies the role of family background in explaining differences in the willingness to compete in a cognitive task. By combining data from a lab experiment conducted with a fairly representative sample of adolescents in Norway and high-quality register data on family background, we show that family background is fundamental in two important ways. First, boys from low socioeconomic status families are less willing to compete than boys from better-off families, even when controlling for confidence, performance, risk preferences, time preferences, social preferences, and psychological traits. Second, family background is crucial for understanding the large gender difference in the willingness to compete. Girls are much less willing to compete than boys among children from better-off families, whereas we do not find any gender difference in willingness to compete among children from low socioeconomic status families. Our data suggest that the main explanation of the role of family background is that the father’s socioeconomic status is strongly associated with boys’ willingness to compete. We do not find any association between the willingness to compete for boys or girls and the mother’s socioeconomic status or other family characteristic that may potentially shape competition preferences, including parental equality and sibling rivalry.

Keywords: family background; socioeconomic status; lab experiment; competitiveness

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1. Introduction

A growing experimental literature has identified a significant gender difference in the willingness to compete. Females are typically more competition averse than males (Croson and Gneezy 2009, Niederle and Vesterlund 2011). This may potentially explain a wide range of real-world economic phenomena, including observed gender differences in educational and occupational choices, and brings a new dimension into the public debate on gender-equalizing policies (Bertrand 2011, Buser et al. 2014, Flory et al. 2015, Niederle 2016, Niederle and Vesterlund 2010, Zhang 2012). But why do males and females differ in their willingness to compete?

The novel contribution of the present paper is that we study how competition preferences relate to family background. We use a unique data set combining experimental data on the willingness to compete (in a strictly cognitive task) for a fairly representative sample of Norwegian adolescents in ninth grade (14–15 years old) with high-quality register data on parents’ income and education. We establish that family background is fundamental in two important ways. First, there is a strong socioeconomic gradient in competition preferences. As shown in the left panel of Figure 1, children from low socioeconomic status (SES) families are much less willing to compete than children from medium or high SES families, and this result holds even when controlling for confidence, performance, risk and time preferences, social preferences, and psychological traits. Second, family background is crucial for understanding the gender difference in competition preferences. As shown in the right panel of Figure 1, girls from well-off families are much less willing to compete than boys from well-off families, whereas we do not find a statistically significant gender difference in competitiveness preferences among children from low SES families. These results are also robust to the inclusion of our set of background variables.

Different mechanisms may explain an association between the socioeconomic status of the family and children’s willingness to compete. The family may shape competition preferences through role modeling and social norms, where the process of cultural
transmission may depend on the socioeconomic status of the family. Parents in low SES families may represent role models that do not encourage competition preferences in their children, and may hold gender-role social norms that are associated with boys being more competitive than girls. The cultural transmission may also interact with innate differences between boys and girls. It may, for example, be the case that females are less inclined to develop a willingness to compete and their competition preferences are therefore less affected by the family situation. Finally, an association between the socioeconomic status of the family and competition preferences may reflect that these preferences are highly heritable, where both low SES parents and low SES children may be characterized by being less willing to compete.

We show that the main explanation of competition preferences being strongly associated with family background in our study is a strong association between the father’s socioeconomic status and the competition preferences of the boys. As can be seen from the right panel of Figure 1, boys from low SES families are much less willing to compete than boys from medium and high SES families, and we find that this relationship is driven by the socioeconomic status of the father. We do not find a similar relationship between fathers and girls, and, more generally, the competition preferences of the girls appear not to be sensitive to family background. These findings are consistent with role modeling being important in shaping competition preferences, possibly interacting with innate gender differences in the willingness to compete. But our data limit the extent to which we can study this mechanism, since we do not have measures of the parents’ willingness to compete and the time they spend with their children. Furthermore, we cannot rule out that the observed association is produced by a latent variable influencing the willingness to compete of the father and the son. We do provide some evidence, however, suggesting that social norms in the family are not shaping competition preferences; we do not find any association between a measure of parental equality and the willingness to compete.

Our findings contribute to the growing literature on what shapes competition preferences and have implications for the discussion of which institutional arrangements to introduce in response to observed differences in the willingness to compete (Balafoutas and Sutter 2012). In a recent important study, Gneezy et al. (2009) provide evidence showing that the culture of a society plays an important role in shaping people’s willingness to compete. They find that the gender gap is reversed in the matrilineal culture of the Khasi in India, in which more females than males select into a competitive environment.2 In light

2 Booth and Nolen (2012) also provide evidence from the United Kingdom suggesting that socialization is an important driver of the gender gap in competitiveness. They find that girls from single-sex schools are more likely to compete in an experiment than girls from coeducational schools.
of this finding, they argue in favor of public policies targeting socialization and education early in life to eliminate the gender gap in competition preferences. An interesting aspect of the present study is that it is conducted in a Scandinavian country that for a long time has implemented gender-equalizing policies. In 2012, Norway ranked highest on the gender equality index of the United Nations, comprising measures of educational attainment, labor market participation, and health, which is consistent with our not observing any gender differences in the experimental data with respect to overconfidence, risk preferences, time preferences, and social preferences. Still, we find that females are substantially less willing to compete than males, which maps to the fact that the Scandinavian countries have very gender-segregated labor markets, both horizontally and vertically (Birkelund and Sandnes 2003). Consistent with competitiveness preferences being relevant for labor market choices, we find that children choosing to compete in the experiment are much more likely to find competitive (and typically high paid) occupations more attractive than children choosing not to compete \( (p < 0.01) \), as shown in Figure 2.

This paper unfolds as follows: §2 describes the sample and the data, whereas §3 gives an overview of the experimental design. Section 4 provides a descriptive analysis, where we break down the data by both gender and socioeconomic status of the family. In §5, we report the main analysis on what explains the willingness to compete, whereas §6 studies in more detail potential mechanisms in the family that may shape competition preferences. Section 7 discusses some implications for policy before offering concluding remarks. In Online Appendix A, we present the complete regression estimates and further robustness analysis.

### 2. Sample and Data

The participants were adolescents in ninth grade (14–15 years old), who were soon to make important choices about whether to pursue a vocational or academic track in high school. We randomly selected and invited 11 public middle schools in the Bergen municipality to take part in the experiment. The Bergen municipality, which includes the second largest city in Norway as well as less populated rural farming areas, is close to the national average with respect to the distribution of income, education, and occupation. At each school, we randomly selected two classes (in one school, three classes), and all the students in the selected classes received a personal invitation to participate in the experiment. Participation was voluntary, and both students and their parents had to consent to participation. The participation rate was high; 523 out of 602 invited students took part in the experiment (87%). Hence, the selected sample is fairly representative for adolescents in this age group in Norway.

In collaboration with Statistics Norway, we matched the data from the experiment to Norwegian register data, which is a high-quality, linked, national

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4 See also the paper by Cárdenas et al. (2012), who find a larger gender difference in competitiveness in cognitive tasks (a math task and a word task) in a highly gender-equal Scandinavian country, Sweden, than in a much less gender-equal Latin American country, Colombia. On the other hand, it should be noted that Dreber et al. (2014), who also study reaction to competition in several different tasks (running, skipping rope, and dancing), do not find a gender difference among children in Sweden. We consider the willingness to compete only in a strictly cognitive task, and it remains an open question whether our results extend to other competition environments.  
5 There were 31 public middle schools in Bergen in 2011 and 3,014 students in ninth grade. For practical reasons, we restricted ourselves to the 23 schools that had at least 50 students in ninth grade. Among these schools, we did a random selection of schools based on probabilities proportional to the number of students in ninth grade. Almost all children attend public schools in Norway (97.2%). Privately run schools are also to a large degree funded by the municipal authorities, and need to demonstrate an alternative pedagogical or religious background to qualify for funding. Student achievement, as measured by the Programme for International Student Assessment test, is marginally (but not statistically significantly) better in private versus public schools in Norway (Dronkers and Robert 2008, Table 3).
there is a larger share of mothers than fathers with some college education, which reflects the long history of gender-equalizing policies in Norway. At the same time, we also observe that the mothers have significantly lower incomes than the fathers, consistent with lower female labor market participation and the fact that Norway has very gender-segregated labor markets (Birkelund and Sandnes 2003).

3. Experimental Design

We conducted 10 experimental sessions at the Norwegian School of Economics, where each session lasted for approximately two hours and used a Web-based interface. All students received a show-up fee of NOK 50 (approximately USD 8) in addition to what they earned in the lab experiment. The participants were not given any feedback on the different incentivized parts of the experiment until the end of the session. They were then given an overview of the outcomes and paid the sum of what they had earned in each part. The average total payment from the experiment was NOK 361. The experiment was double blind, i.e., neither participants nor experimenters could associate decisions with particular participants.\(^7\)

The experimental session consisted of two parts: an incentivized part and a nonincentivized part. In the incentivized part, we measured competition preferences, social preferences, risk preferences, time preferences, and the participants’ knowledge of the labor market. In the nonincentivized part, we collected data on psychological traits using the Big Five Inventory (John et al. 1991, Benet-Martínez and John 1998); time use; family and individual background characteristics; the participants’ subjective evaluation of subjects at school, occupations, and job characteristics; fairness views; and their general knowledge of society.\(^8\) We did not randomize the order of the different parts, and thus we cannot rule out order effects. The complete set of instructions is provided in Online Appendix B. In the following we focus on the behavioral games used to measure preferences.

In measuring competition preferences, we largely followed the approach of Niederle and Vesterlund

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\(^6\) We do not have data on whether the parents are divorced or whether they both live with the children.

\(^7\) Special care was taken so that the payment procedure ensured participant–experimenter anonymity. At the end of the experiment, the computer assigned a payment code to each of the participants, and a group of assistants, who were not present in the lab during the experiment, prepared envelopes containing the payments corresponding to each payment code. The assistants also made sure that it was impossible to identify the amount of money by simply looking at the envelope. After bringing the envelopes to the lab, the assistants immediately left, and the envelopes were handed out in accordance with the payment codes. A similar procedure was implemented for payments from the time preference decisions.

\(^8\) Heckman (2011) and Becker et al. (2012) show that economic preferences and psychological personality measures are complementary in explaining life outcomes and behavior.
preferences, but our results are not sensitive to alternative measures of these preferences. Finally, to measure social preferences, we conducted a version of a real effort dictator game (Cappelen et al. 2010). First, we asked all participants to work on a counting task in which they earned a fixed sum of money plus a bonus that depended on their performance relative to that of the others. We then matched each participant with another participant with the same performance record and asked them to decide how they would distribute the sum of the fixed payments between themselves and the other participant. The share given to the other participant provides us with a measure of their level of selfishness. To measure whether the participants had an egalitarian or a meritocratic fairness view, we followed the impartial spectator approach of Cappelen et al. (2013). Specifically, we asked all participants to decide as impartial spectators how the bonus earned by two other participants should be distributed, where they could choose between an equal division (egalitarian fairness view) or a division in proportion to the productivity of the two participants (meritocratic fairness view).

4. Descriptive Statistics

In this section we provide an overview of gender and socioeconomic differences in our sample.

4.1. Gender Differences

We find a large gender difference in the willingness to compete in the present experiment. As shown in Table 2, boys are much more likely than girls to choose competition (51.6% versus 32.2%).

We also find a gender difference in performance in the first round, where boys score higher than girls (11.0 versus 9.8 correct answers). But as shown in the upper left panel of Figure 3, the gender difference in the willingness to compete applies to almost all performance levels. Similarly, we observe from the upper right panel of Figure 3 that the gender difference in competitiveness also applies to almost all confidence levels.

The gender difference in willingness to compete is particularly striking when we compare it to the absence of gender differences in overconfidence,
social preferences, time preferences, and risk preferences in our sample, as reported in Table 2. Females are often found to be less overconfident (Niederer and Vesterlund 2007), more risk averse (Croson and Gneezy 2009), and more generous (Engel 2011) than males, but these gender patterns do not apply to Norwegian adolescents. This may reflect that Norway is a highly gender-equal society, which makes it even more intriguing to observe large gender differences in competition preferences.

On the Big Five personality measures, we observe that the girls score higher on all dimensions, but the differences are only statistically significant for extraversion and neuroticism. Overall, the observed gender differences in personality are in line with what has been documented in other studies (Schmitt et al. 2008), where it also has been shown that adolescence is a key period in the development of individual personality (Soto et al. 2011).

Finally, we observe that there are no gender differences in family background, which means that girls are not more likely to grow up in families with low socioeconomic status. This is consistent with there not being a gender preference with respect to children, which is as expected in a gender equal society.

### 4.2. Socioeconomic Differences

In this subsection, we consider differences between children across socioeconomic backgrounds, where we focus on the differences between children from low socioeconomic families and the rest of the children. Our main definition of a low SES family is that the family is in the bottom fifth of both the education and income distributions. The rest of the participants are defined to be from medium and high SES families. The p-values refer to the Pearson's chi-squared test for the indicator variables and to t-tests of equality with unequal variances for all the other variables.
measured as the sum of the years of education of the father and the mother.\footnote{Out of 483 participants, 31 are in the bottom fifth of the national income distribution; our results are robust to focusing on this smaller group. A cutoff at the 24.7 percentile in the national income distribution would give the same group of low SES participants as we apply in the present analysis.} According to this definition, 8.1% of the participants are from low SES families (39 out of 483 participants). In the further analysis, we also consider different cutoff levels, education and income separately, and the socioeconomic background of mothers and fathers separately.

We focus on the bottom fifth of the education distribution since this captures a distinct group of families where one parent has no more than compulsory schooling and the other parent has no more than high school. In a highly educated society, such a family clearly has a low educational background. Some parents with only compulsory education have done well in terms of income, however, and thus we also impose the restriction that the families are in the bottom fifth of the income distribution. Correspondingly, we define a high SES family as a family that is in the top fifth of both the income and education distributions. According to this definition, 16% of the participants are from high SES families (79 out of 483 participants).

From Table 3, we observe that there is a significant socioeconomic gradient in the willingness to compete, where low SES children are much less likely than medium and high SES children to choose competition (23.1% versus 43.9%). The low SES children perform, as expected, significantly worse than the medium and high SES children on the task (8.4 versus 10.6 correct answers), whereas we do not find a statistically significant difference between the socioeconomic groups in overconfidence. The socioeconomic gradient in the willingness to compete is persistent across performance and confidence levels, as shown in the bottom panels of Figure 3.

On the other experimental measures, we observe, in particular, that the low SES children are much more likely than the medium and high SES children to choose an egalitarian (and not a meritocratic) division of the bonus as an impartial spectator (51.3% versus 24.8%). The low SES children also give away a smaller share in the dictator game and are less patient, but these differences are not statistically significant.\footnote{These findings may clearly differ across cultures. Bauer et al. (2014), for example, find in a study conducted in the Czech Republic that children of parents with low education are more spiteful, more selfish, and less altruistic. See also the paper by Khadjavi and Nicklisch (2014), who report from a field study that looks at how the willingness to compete among preschool children in Germany is related to the ambitions and preferences of their parents.}

We do not observe any difference in risk preferences between the socioeconomic groups.

On the personality measures, we observe that the low SES children score lower on openness, extraversion, and agreeableness and higher on neuroticism, but only the difference in agreeableness is statistically

### Table 3: Overview of Differences by SES

<table>
<thead>
<tr>
<th>Variables pertaining to the competition game</th>
<th>M/H SES</th>
<th>Low SES</th>
<th>Std. dev. M/H SES</th>
<th>Low SES</th>
<th>p-value (Equal means)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compete</td>
<td>0.441</td>
<td>0.205</td>
<td>0.497</td>
<td>0.409</td>
<td>0.004</td>
</tr>
<tr>
<td>Performance</td>
<td>10.61</td>
<td>8.18</td>
<td>4.707</td>
<td>4.430</td>
<td>0.002</td>
</tr>
<tr>
<td>Confidence</td>
<td>55.92</td>
<td>43.21</td>
<td>17.63</td>
<td>17.45</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Overconfidence</td>
<td>0.653</td>
<td>3.333</td>
<td>27.790</td>
<td>29.140</td>
<td>0.583</td>
</tr>
<tr>
<td>Other experimental measures</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk</td>
<td>3.646</td>
<td>3.615</td>
<td>2.171</td>
<td>2.602</td>
<td>0.943</td>
</tr>
<tr>
<td>Patience</td>
<td>4.196</td>
<td>3.667</td>
<td>2.018</td>
<td>2.004</td>
<td>0.121</td>
</tr>
<tr>
<td>Egalitarian</td>
<td>0.245</td>
<td>0.538</td>
<td>0.431</td>
<td>0.505</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Selfish</td>
<td>0.311</td>
<td>0.283</td>
<td>0.236</td>
<td>0.246</td>
<td>0.505</td>
</tr>
<tr>
<td>Personality</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Openness</td>
<td>0.337</td>
<td>0.255</td>
<td>0.415</td>
<td>0.478</td>
<td>0.309</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>0.456</td>
<td>0.403</td>
<td>0.468</td>
<td>0.485</td>
<td>0.516</td>
</tr>
<tr>
<td>Extraversion</td>
<td>0.418</td>
<td>0.357</td>
<td>0.392</td>
<td>0.406</td>
<td>0.373</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>0.746</td>
<td>0.600</td>
<td>0.372</td>
<td>0.433</td>
<td>0.047</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>−0.480</td>
<td>−0.367</td>
<td>0.450</td>
<td>0.535</td>
<td>0.207</td>
</tr>
<tr>
<td>Background</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Father education (years)</td>
<td>14.42</td>
<td>10.87</td>
<td>2.743</td>
<td>1.455</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Mother education (years)</td>
<td>14.46</td>
<td>11.00</td>
<td>2.648</td>
<td>1.376</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Father average income (1,000s)</td>
<td>570</td>
<td>285</td>
<td>348</td>
<td>89.4</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Mother average income (1,000s)</td>
<td>332</td>
<td>210</td>
<td>153</td>
<td>64.9</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Notes. The table reports the variables by SES (medium/high (M/H) and low) for the restricted sample of 483 participants for which we have data on family background. All variables are as described in Table 2.
significant. Finally, by definition, there are large differences between the socioeconomic groups in family background variables. The father’s income is, on average, twice as high for the medium and high SES children; the mother’s income is, on average, 54% higher. The parents in the medium and high SES families also have, on average, 3.5 more years of education than parents in low SES families.

5. Explaining Willingness to Compete

In this section, we study in more detail how gender and socioeconomic background are associated with the participants’ willingness to compete.

Table 4, which reports from a linear probability regression, confirms that there is a highly statistically significant gender difference in the competition choice.\(^{17}\) This gender difference in competitiveness is robust to controlling for performance and confidence, other experimental variables, psychological variables, and family background.\(^ {18}\) The estimated effect of gender on the competition choice is lower when including the performance variable (13.8 percentage points versus 19.4 percentage points), which is as expected given the gender difference in performance, but not sensitive to the inclusion of the other variables. In all specifications, the gender effect is highly significant, and thus our study clearly demonstrates that even in a gender equal society, girls are more averse to competition than boys.

Table 5, however, shows that family background is also closely linked to the competition choice. Low SES children are much less willing to compete than medium and high SES children, the estimated difference without any controls being 23.6 percentage points. We observe that this partly works through the low SES children performing worse on the task; controlling for performance reduces the estimated effect of low SES to 17.9 percentage points. The inclusion of the other variables reduces the estimated effect somewhat more, but even when including all background variables, we observe that the estimated low SES effect on the competition choice is as large as the estimated gender effect reported in column (5) in Table 4.

In Table 6, we consider whether family background affects boys and girls differently in their competition...
choice by introducing an interaction variable between family background and gender. We observe that there is a large and highly significant negative effect on the willingness to compete for boys coming from low SES families, but no such effect for girls. The estimated effect of low SES for boys is 26.6 percentage points and highly statistically significant, whereas the estimated effect for girls is 2.4 percentage points and not statistically significant. From the estimated interaction term, we observe that the difference in how family background affects boys and girls is statistically significant.

In Figure 4, we show that the estimated socioeconomic gradients for boys and girls are largely robust to the cutoff level used in the definition of low SES; for all cutoff levels we find a large negative effect of low SES on the boys and a negligible effect on the girls. In Online Appendix A, we report further robustness checks. First, we show that our results are robust to using a probit specification (see Tables A9–A11). Second, we show that the results are robust to the inclusion of indicator variables for medium SES and high SES (see Table A12) and to the estimation of a linear model where the low SES dummy is replaced.

### Table 4: Effect of Gender on Willingness to Compete

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>-0.194***</td>
<td>-0.168***</td>
<td>-0.142***</td>
<td>-0.139***</td>
<td>-0.135***</td>
<td>-0.138***</td>
</tr>
<tr>
<td></td>
<td>(0.044)</td>
<td>(0.044)</td>
<td>(0.044)</td>
<td>(0.043)</td>
<td>(0.044)</td>
<td>(0.044)</td>
</tr>
<tr>
<td>Performance</td>
<td>0.023***</td>
<td>0.043***</td>
<td>0.040***</td>
<td>0.036***</td>
<td>0.035***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.004)</td>
<td>(0.006)</td>
<td>(0.006)</td>
<td>(0.006)</td>
<td>(0.006)</td>
<td></td>
</tr>
<tr>
<td>Overconfidence</td>
<td>0.005***</td>
<td>0.004***</td>
<td>0.004***</td>
<td>0.004***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Included controls
- Experimental variables: No
- Big Five personality: No
- Low SES: No
- Observations: 483
- R²: 0.039

Notes: The table reports regressions of the indicator value compete (taking the value one if the participant chose to compete) on a set of explanatory variables. *Female* is an indicator variable taking the value one if the participant is a female. *Performance* is the number of correct answers on the addition task in the first round. *Overconfidence* is the difference between *performance* (here defined as the percentage of participants in the session that performed worse than the participant) and *confidence* (defined as the percentage of participants in the session that the participant believed performed worse than himself or herself). Experimental variables includes *risk*, *patience*, *selfish*, and *egalitarian* (see Table 2 for definitions). *Big Five personality* includes *openness*, *conscientiousness*, *extraversion*, *agreeableness*, and *neuroticism*. Low SES is an indicator variable taking the value one if the participant is from a low SES family, that is, if the family is in the bottom fifth of both the education and income distributions. Robust standard errors are in parentheses.

***p < 0.01.

### Table 5: Effect of Low SES on Willingness to Compete

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low SES</td>
<td>-0.236***</td>
<td>-0.179**</td>
<td>-0.140**</td>
<td>-0.120*</td>
<td>-0.125*</td>
<td>-0.135*</td>
</tr>
<tr>
<td></td>
<td>(0.069)</td>
<td>(0.070)</td>
<td>(0.067)</td>
<td>(0.068)</td>
<td>(0.067)</td>
<td>(0.070)</td>
</tr>
<tr>
<td>Performance</td>
<td>0.024***</td>
<td>0.045***</td>
<td>0.043***</td>
<td>0.038***</td>
<td>0.035***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.004)</td>
<td>(0.006)</td>
<td>(0.006)</td>
<td>(0.006)</td>
<td>(0.006)</td>
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</tr>
<tr>
<td>Overconfidence</td>
<td>0.005***</td>
<td>0.005***</td>
<td>0.004***</td>
<td>0.004***</td>
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<tr>
<td></td>
<td>(0.001)</td>
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</tbody>
</table>

Included controls
- Experimental variable: No
- Big Five personality: No
- Female: No
- Observations: 483
- R²: 0.017

Notes: The table reports regressions of the indicator value compete (taking the value one if the participant chose to compete) on a set of explanatory variables. *Low SES* is an indicator variable taking the value one if the participant is from a low SES family, that is, if the family is in the bottom fifth of both the education and income distributions. Standard errors are in parentheses. *Low SES* is an indicator variable taking the value one if the participant is from a low SES family, that is, if the family is in the bottom fifth of both the education and income distributions. Standard errors are in parentheses. *Low SES* is an indicator variable taking the value one if the participant is from a low SES family, that is, if the family is in the bottom fifth of both the education and income distributions. Standard errors are in parentheses. *Low SES* is an indicator variable taking the value one if the participant is from a low SES family, that is, if the family is in the bottom fifth of both the education and income distributions. Standard errors are in parentheses. *Low SES* is an indicator variable taking the value one if the participant is from a low SES family, that is, if the family is in the bottom fifth of both the education and income distributions. Standard errors are in parentheses.

* p < 0.1; ** p < 0.05; *** p < 0.01.
by the family’s total years of education or total income (see Table A13).\textsuperscript{19}

We note that the gender interaction term is not statistically significant when we use cutoff levels above 25\% or the linear model, which shows that the differential gender effect of socioeconomic background is mainly driven by the families in the bottom fifth of the distribution. Accordingly, we observe that the gender interaction term is highly significant for low SES and insignificant for high SES in Table A12.

To summarize, we find that both gender and family background are important factors for understanding competition preferences, and, in particular, that family background is strongly negatively associated with a willingness to compete for boys.

6. Family Mechanisms

We now turn to a study of mechanisms in the family that may potentially shape competitiveness preferences. We do this by running the same type of regression as reported in our main specification in column (5) in Table 6, but where in some specifications we consider alternative definitions of low SES and in others we replace the low SES dummy with other family variables of interest.

First, we consider the relative importance of the socioeconomic status of the father and the mother, to see whether there is evidence in the data of same-gender role modeling (Bussey and Bandura 1984). Is it the case that low SES fathers make boys less willing to compete, whereas low SES mothers make girls less willing to compete? In columns (2) and (3) in Table 7, we report separate regressions for low SES being defined by one of the parent’s education and income. We observe from column (2) that having a low SES father has a huge negative effect on boys’ willingness to compete, but no statistically significant effect on girls. We do not find the same-sex pattern for the mothers, however, as seen from column (3). In fact, the pattern for low SES mothers is the same as for low SES fathers, but the estimated effects are smaller and not statistically significant. Thus, it appears that our finding of low SES family background being detrimental for willingness to compete is primarily driven by the negative effect of the fathers on the boys.\textsuperscript{20}

Second, to study further whether our results are driven by social norms in the family, we study the association between parental equality and competition preferences. Parental equality typically comes with more liberal gender-role attitudes (Myers and Booth 2002, Pope and Sydnor 2010, ...
Bertrand et al. (2015), and it seems plausible to assume that traditional gender roles are associated with boys being more competitive than girls. We might therefore expect the gender gap in competitiveness to be narrower in families with greater parental equality. There is, however, no evidence of this mechanism in our data, as shown in columns (4) and (5) in Table 7. We here proxy equality between parents with the relative income difference between fathers and mothers (column (4)) and the absolute difference in years of education (column (5)), but for neither specification do we see any effect on the willingness to compete for girls or boys.21

Finally, we consider whether the number of siblings or birth order has an impact on the competition preferences.Sibling rivalry has been extensively studied both in animal and human behavior, where the basic idea is that siblings are competitors for parents’ resources (Black et al. 2005, Downey 2001). One might therefore expect that children with more siblings are more used to competition, and thus also more willing to enter into competitive environments. For the same reason, one might expect that the firstborn is less competitive, since the firstborn typically is less exposed to competition from siblings.22 As shown in columns (6) and (7) in Table 7, our estimates are in the expected direction both for boys and girls. More siblings make you more competitive (column (6)) and being the firstborn makes you less competitive (column (7)), but the effects are relatively small and not statistically significant.

To summarize, our analysis suggests that the father’s socioeconomic status is the most important family mechanism in shaping competition preferences among boys.23 One possible explanation for this finding is the combination of two forces: medium and high SES fathers spend more developmentally effective time with their children than low SES fathers (Guryan et al. 2008, Rege and Solli 2013); and fathers serve a distinct parenting role (Kalil et al. 2011). Fathers typically engage with their children in more competitive activities, like sports, and also spend more time with their sons than their daughters (Lundberg 2005, Baker and Milligan 2013), and the fact that medium and high SES boys are particularly exposed to the competitive cultures of these activities may make them more attracted to competition also later in life.24

21 In Table A15 in Online Appendix A, we provide descriptive statistics on the family variables used in Table 7. Furthermore, in Table A16 in Online Appendix A, we report the results for a specification where the proxy for parental equality is a dummy for whether the mother earns more than the father or for whether the mother has more education than the father. It has been shown in other studies that the social norm “a man should earn more than his wife” is crucial for understanding important labor market and family outcomes (Bertrand et al. 2015), but we do not find any evidence of this mechanism shaping the competition preferences of the children.

22 Recent evidence from China suggests that the role of siblings in shaping competitiveness preferences is potentially of great importance. Cameron et al. (2013) find that the one-child policy had a detrimental effect on individuals’ competition preferences. We only have 15 children with no siblings and thus are not able to distinguish between the effect of being the firstborn and being an only child.

23 We also show in Table A17 in Online Appendix A that the father’s socioeconomic status does not affect the performance, risk, or confidence of the boys and girls in a way that can explain our findings.

24 There is also evidence showing that parents in general engage differently with sons and daughters, for example, by reading more to the daughters (Bertrand and Pan 2013). This is consistent with our finding the same low SES pattern, although weaker, for mothers.
The fact that we find much weaker evidence of the mother’s socioeconomic status shaping the competition preferences of the girls may also reflect a gene–environment interaction. In particular, it may be the case that innate differences in competition preferences are allowed to develop more in the medium and high SES families, in which children face more opportunities (Schmitt et al. 2008). Consequently, girls may be less responsive to medium and high SES fathers being more competitive because girls are biologically less inclined to compete than boys. Another possibility is that willingness to compete is, like many other personality traits, highly heritable and prevalent among males. The observed association between the father’s SES and the willingness to compete of the son may then be produced by the latent variable influencing the willingness to compete of both the father and the son.

7. Conclusion
We have shown that family matters for competition preferences in a strictly cognitive task. In particular, we find that boys with low SES fathers are much less willing to compete than boys with high SES fathers. We do not find a similar pattern for girls, and as a consequence we find that gender differences in competitiveness are sensitive to family background; there is no gender difference in competitiveness among children from low SES families, but a large and significant gender difference among children from medium and high SES families. An interesting avenue for future research would be to test the generality of these findings, by varying the cultural context, the stakes involved, and the nature of the competitive task. In particular, it might be the case that the observed effect of low SES is driven by the fact that we use a cognitive task, and thus it is important to study the socioeconomic gradient in competition preferences also in other environments.

Our results shed light on the ongoing debate on the role of nature versus nurture in explaining gender differences in competition preferences. The strong association between the father’s socioeconomic status and
the competition preferences of boys is consistent with the gender gap reflecting a socialization process, and in this respect we complement the study by Gneezy et al. (2009) by showing that the family is a crucial part of the nurture process. But our study also shows that a gender gap in competition preferences does not necessarily reflect a lack of female empowerment, consistent with the finding in Schmitt et al. (2008) that gender differences in personality traits (Big Five) are greater in prosperous, healthy, and egalitarian cultures. This may partly reflect a gene–environment interaction, where the biological development of boys is more susceptible to a stressful environment than that of girls (Schmitt et al. 2008). Thus, it may be the case that innate differences in competitiveness inclinations between boys and girls are attenuated by growing up in a low socioeconomic family environment, but emerge for more well-off children facing greater opportunities. Thus, from a policy perspective, it is crucial to identify whether a gender gap in competitiveness reflects a lack of female empowerment or innate biological differences, where the latter would make it more challenging to justify policies aiming at promoting stronger competition preferences among females. To shed further light on this issue, it would be interesting for future research to collect data on competition preferences and various personality traits of both parents and their children.

The present paper also speaks to the literature in labor economics that has documented that there is a strong intergenerational correlation in income and educational attainment between fathers and sons (Bowles and Gintis 2002), and to recent work arguing that father presence appears to be crucial for this asso-

References


26 See also the growing literature on the role of noncognitive abilities on labor market outcomes and social behavior (Heckman et al. 2006).

27 There may certainly be other effects of gender equality working in the opposite direction, including a change in the father’s role.

Special Supplemental Material

Supplemental material to this paper is available at http://dx.doi.org/10.1287/mnsc.2015.2244.

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