

”When Parents Decide: Gender Differences in Competitiveness”

Pre-Analysis Plan Amendment

Jonas Tungodden and Alexander Willén *

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I Introduction

This is an amendment to the pre-analysis plan which was registered at the AEA RCT registry on August 12th, 2017. The reason for this amendment is that we are collecting additional data for our study. Specifically, we will match the experimental data from the study with administrative data from Statistics Norway. This will provide us with detailed information on the children’s education, as well as on the parents’ income and education. As of June 24, 2021, we have not yet been granted access to this data.

When writing the original pre-analysis plan, we discussed the possibility of merging administrative data to our experimental data. In Section 4.6 of the original pre-analysis plan, we described the main goals of the administrative data analysis as follows:

1. *Explore how parents’ and children’s choices predict children’s educational outcomes. Prior research have documented that children’s competitiveness choices are an important predictor of educational choices Zhang (2013), Buser et al. (2014). This will be the first study to explore the role of parents’ competitiveness choices for their children.*
2. *Explore heterogeneity in parent’s and children’ choices along socioeconomic status. Prior research finds that socioeconomic status is an important predictor for gender differences in competitiveness Almås et al. (2015).*

*Tungodden – Sirius XM and Pandora (e-mail: jonas.tungodden@gmail.com), Willén – Department of Economics, Norwegian School of Economics (e-mail: alexander.willen@nhh.no).

The goal of the administrative data analysis has not changed since we wrote the original pre-analysis plan. In this document, we elaborate on the planned analysis in greater detail. We first describe how we will use the new administrative data to explore the association between competition choices and children’s education choices. Next, we discuss strategies for exploring heterogeneity along the socioeconomic dimension. Finally, we discuss a few minor other use cases for the administrative data.

We emphasize that we may carry out additional analyses beyond what is included in this document. This document should therefore not be considered fully comprehensive or exhaustive.

II Competition choices and education choices

Prior research has found a strong association between children’s preferences for competition and early education choices (Almås et al. (2016), Buser et al. (2014), Buser et al. (2020), Buser et al. (2017)). We add to this literature by studying the role of parents’ competition choices for their children’s education outcomes, and by assessing the relative importance of parents’ and children’s competition choices for predicting the children’s education outcomes.

The previous literature has largely focused on the association between competition choices and the choice of high school track. For example, the study closest to ours in terms of sample and context is Almås et al. (2016), which studies competition preferences in Norway. The paper establishes a strong association between competition choices and choosing the academic track in high school.

Building on prior literature, our primary outcome measure will be an indicator variable specifying whether the child chooses to attend the main academic track in high school: specialization in general studies. In our exploratory analysis - which may feature in the main paper or in an appendix - we will study two additional educational outcomes: i) the propensity to select advanced mathematics and science classes in high school, and ii) the dropout rate from the main academic track in high school.

We now describe the empirical strategy we will use to evaluate these outcomes.

II.I Children’s choices and educational outcomes

We begin by examining the association between children’s competition choices and children’s education choices. We estimate the following equation:

$$y_i = \alpha_0 + \alpha_1 g_i + \beta_1 c_i + \mathbf{A}^T \mathbf{X}_i + s_{k(i)} + \epsilon_i \quad (1)$$

where i refers to child-parent pair i . The variables are defined as follows:

- y_i — An educational outcome of the child in child-parent pair i .
- g_i — An indicator taking the value of one if the child in child-parent pair i is female.
- c_i — An indicator taking the value of one if the child in child-parent pair i chose to compete in the experiment.
- \mathbf{X}_i — A vector of demographic controls. We will present the analysis with and without these controls. The demographic controls include parent gender (in experiment), an indicator for parental college education, and household income.
- $s_{k(i)}$ — School fixed effects.
- ϵ_i — The error term. The above specification will use robust standard errors.

The main coefficient of interest is β_1 . The value of this coefficient will inform us about the association between the children’s competition choices and their education choices.

A secondary coefficient of interest is α_1 . This coefficient will provide us with information about the gender difference in education choices. We will compare the coefficient on α_1 to that of the gender difference in a specification that does not include the competition measure. We are interested in seeing the extent to which the inclusion of the competition measure can explain the gender difference in education choices.

To disentangle the relationship between competitiveness and education choices we will add controls for mechanisms. This exercise will mirror our experimental analysis, where we also decompose the competitiveness choices into mechanisms guided by our conceptual framework. In this exercise, we will add controls for the number of tasks that the child solved (proxy for ability), the child’s belief about his/her own probability of winning the tournament, the risk preferences of the child - quantitative measure, and the risk preferences of the child - qualitative measure. To obtain a more nuanced measure of child ability, we will also add data on children’s grades prior to the experiment.

II.II Parents’ choices and educational outcomes

To examine the association between parents’ competition choices for children and children’s education choices, we will use the following specification:

$$y_i = \alpha_0 + \alpha_1 g_i + \beta_2 C_i + \mathbf{A}^T \mathbf{X}_i + s_{k(i)} + \epsilon_i \quad (2)$$

The coefficient C_i indicates the parent’s competitiveness choice for his/her child in the experiment. All other variables are defined as in Equation 1. We run this regression with and without the controls specified in \mathbf{X}_i .

The main coefficient of interest in Equation 2 is β_2 . This coefficient informs us of the association between parents’ competitiveness choices for their children and the children’s education choices.

A secondary coefficient of interest is α_1 . This coefficient provides us with information about the gender difference in choices. We will compare the magnitude of this coefficient to the gender difference in a specification without the competition measure. We are interested in seeing the extent to which the inclusion of the competition measure can explain the gender difference in education choices.

To examine the association between parental competitiveness choices for their children and the children’s education choices in greater detail, we will add controls for mechanisms. This exercise will mirror our experimental analysis, where we also decompose the competitiveness choices into mechanisms guided by our theoretical framework. In this exercise, we will add controls for parents’ beliefs about children’s competition choices, and parents’ own preference for competition. To disentangle the mechanisms behind the association between competition choices and education choices even further, we will also estimate a specification that incorporate controls for the number of tasks that the child solved, parental belief about the child’s probability of winning the tournament, parent risk preferences -quantitative measure, and parent risk preferences -qualitative measure. Lastly, to get a more nuanced measure of child ability, we will also add data on children’s grades prior to the experiment.

II.III Horse-race for predicting education outcomes: children and parents’ competition choices

After having explored the association between children’s competition choices and their education choices, and parents’ competition choices for children and children’s education choices, we will explore the relative importance of parents’ and children’s competition choices in predicting education choices. Our estimating equation will be:

$$y_i = \alpha_0 + \alpha_1 g_i + \beta_1 c_i + \beta_2 C_i + \mathbf{A}^T \mathbf{X}_i + s_{k(i)} + \epsilon_i \quad (3)$$

All variables are defined as above. We run this regression with and without the demographic controls specified in \mathbf{X}_i . The key coefficients in Equation 3 will be β_1 and β_2 . We will focus

on how these coefficients differ from the competition coefficients in Equations 1 and 2 where we considered children's and parents' choices in isolation. We will also be evaluating the joint significance of β_1 and β_2 to identify the combined impact of parents' competitiveness choices and children's competitiveness choices on children's education outcomes.

A secondary coefficient of interest is α_1 which informs us about the gender difference in choices. We will compare the magnitude of the α_1 effect to the gender difference in a specification without the competition measures. We are interested in seeing the extent to which the inclusion of the competition measures can explain the gender difference in education choices.

II.IV Gender heterogeneity

As an exploratory analysis, we will explore if there is a differential impact of competition choices by child gender as well as parent gender. First, we will for Equations 1, 2, and 3 include interactions with child gender and competition choices. For Equation 3, this includes interactions of child gender with both child and parent competition choices. We are interested in the individual significance of the coefficient estimates as well as their joint significance. Second, we will for Equations 2 and 3 include interactions with parent gender and parent competition choices. These results may feature in an Appendix or in the main paper.

III The role of socioeconomic status

Almås et al. (2015) reveal a strong correlation between the gender gap in competitiveness and socioeconomic status. We want to build on these findings and study the interaction between socioeconomic status and gender differences in competition.

To test for heterogeneity on the socioeconomic dimension, we will classify children above and below median household income. We will then test for gender difference in competition above and below median household income.

III.I Heterogeneity in children's choices by socioeconomic status

We first aim to replicate the analysis in Almås et al. (2015), examining if gender difference in competition are larger for children with a high socioeconomic background. To explore this question, we estimate the following equation:

$$c_i = \alpha_0 + \alpha_1 g_i + \alpha_2 I_i + \alpha_3 (g_i * I_i) + s_{k(i)} + \epsilon_i \quad (4)$$

where I_i is an indicator variable equal to 1 if household income is above median. All other variables are defined as above.

Our main coefficients of interest are α_2 and α_3 . These coefficients inform us about the correlation between socioeconomic background and competition choices. We also note that we may perform an exploratory analysis on the mechanisms behind these results, and on the implications of those findings.

III.II Heterogeneity in parent’s choices for children by socioeconomic status

To understand if the gender gap in parents’ choices have a socioeconomic gradient, we run the following specification:

$$C_i = \alpha_0 + \alpha_1 g_i + \alpha_2 I_i + \alpha_3 (g_i * I_i) + s_{k(i)} + \epsilon_i \quad (5)$$

All variables are defined as above.

Our main coefficients of interest are α_2 and α_3 which tell us about the correlation between socioeconomic background and parent competition choices. We also note that we may perform an exploratory analysis on the mechanisms behind these results, and on the implications of those findings.

IV Additional use cases

Below we list some additional uses cases we anticipate with the administrative data:

- When analyzing children’s competition choices and parents’ competition choices, we will use children’s grades prior to the experiment to create and control for a more nuanced measure of child ability than just the number of completed tasks.

- We will create summary statistics of the administrative data we collect and compare our sample to the national average.
- For all our tables we will add a column with demographic controls which include an indicator for parent college education as well as household income.

References

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