

## Project closing report NKFIH-124396

Research on non-cognitive skills and their impact on schooling and labour market outcomes has been gaining pace in the last couple of decades. Of the many approaches to measuring non-cognitive skills measuring individual preferences is a widely used tool. In this project we measured the time-, social-, risk-, and competitive preferences of secondary school students and adults using in-class laboratory experimental tasks (students), representative surveys (Hungarian adults), and online experiments (American adults). Using mainly these data we have published three Q1, one Q2, and one Q3 international publications as well as a Hungarian A paper and a chapter in an edited volume. We have also published our dataset in an international outlet (*Data in Brief*).

### Data collections

In the initial research proposal, we promised a series of in-class experiments and a representative survey of the Hungarian students.

While we have achieved significant milestones – collected data on over 1000 students' economic preferences in in-class **laboratory experiments** – we also needed to modify our initial goals due to the Covid pandemic. Besides our main goal to measure a portfolio of economic preferences of students, we have also aimed to identify social heterogeneity in these preferences. By 2019 march – when the pandemic hit – we visited 10 schools and collected data on 1108 students in 52 classes (reaching our initial goal), however, the socioeconomic distribution of students in these 52 classes does not represent the student population well. We have only a few students with parents lower than secondary level education. Moreover, because we could not continue our in-class experiments after the schools opened again, this data is unfortunately not adequate to address the socio-economic heterogeneity in preferences. Nevertheless, this comparatively large dataset is still useful for analysis in many other dimensions (see Horn, Kiss, and Lénárd 2022a summarized below).

The proposed representative survey of the Hungarian student population was also cancelled – due to the unresponsiveness of the Education Authority – however we have joined two waves of **representative surveys** of the Tárki Omnibus Surveys, which give way to the analysis of the preferences of the adult population (see Horn and Kiss 2020, 2022; Khayouti, Kiss, and Horn 2021 summarized below).

Since we could not continue our incentivized experiments in Hungarian secondary schools – schools become even less responsive than before (Lénárd, Horn, and Kiss 2020) due to the pandemic – we have opted to do **incentivized surveys online**. This data collection needed a lot of time to program and adapt to the online environment, but by the end of the project we have managed to collect the necessary data, and the first results are expected to be published by the end of the 2023 summer (see in detail below).

### Scientific results

Before we started collecting data in classes we contacted schools to approve our request. Instead of just sending out e-mails to schools we have randomized this correspondence to detect whether schools are sensitive to recent political messages. *During this experiment, we detect a significant negative effect of mentioning 'gender' as a research topic in conducting academic research in Hungary.* Using a randomized information treatment involving a comprehensive sample of Hungarian education

providers we find that they are less willing to cooperate in gender-related research compared to research without this specification. Our results also indicate that this negative sentiment is clearly against gender and not against any topic covering social inequalities in general (Lénárd et al. 2020).

Our main publication in this project, which uses the laboratory experimental dataset we have collected in classes, is the “Gender Differences in Preferences of Adolescents” paper in the *Journal of Economic Behavior & Organization* (Horn et al. 2022a). In this study, *we estimate unadjusted and adjusted gender gaps in time preference, risk attitudes, altruism, trust, trustworthiness, cooperation, and competitiveness* using data on 1088 high school students from 53 classes. These data, collected by running incentivized experiments in Hungarian classrooms, are linked to an administrative data source on the students’ standardized test scores, grades and family background. After taking into account class fixed effects, we find that females are significantly more altruistic, but are less present biased, less risk tolerant, less trusting, less trustworthy, and less competitive than males. At the same time, we do not observe significant gender differences in patience, time inconsistency and cooperation at the 5% significance level. We also show that most of these initial gender differences do not change even if we control for age, family background, cognitive skills and school grades in a regression framework. We risk over-control when we include the time spent on each task as well as the other preference domains in our regressions, but the gender gap remains significant in social preferences (altruism, trust and trustworthiness), present bias and competition.

We first published the detailed research documentation of the experiments during the lockdown (Horn, Kiss, and Lénárd 2020), and then also published in a peer-reviewed data journal (Horn, Kiss, and Lénárd 2022b). *The dataset is now available for research for everyone.*

While we were writing the above paper we had to summarize a lot of earlier literature on gender differences in preferences. This we have published as a short review in the Hungarian Labour Market edited volume (Drucker, Horn, and Kiss 2019).

Using the representative surveys that we collected on time preferences on a representative sample of the Hungarian adult population in a non-incentivized way, *we investigate how patience and present bias associate with important life outcomes* in five domains: i) educational attainment, ii) unemployment, iii) income and wealth, iv) financial decisions and difficulties, and v) health. Based on the literature, we formulate the broad hypotheses that patience relates positively, while present bias associates negatively with positive outcomes in the domains under study. With the exception of unemployment, we document a consistent and often significant positive relationship between patience and the corresponding domain, with the strongest associations in educational attainment, wealth and financial decisions. We find that present bias associates significantly with saving decisions and financial difficulties (Horn and Kiss 2020).

Using the same dataset we have examined *how competition and cooperation relate to each other on an individual level, and how they are related to education*. On the one hand, we found that competition and cooperation are positively and significantly correlated, even if we take into account the respondent's age, gender, type of settlement and region of residence. On the other hand, we found that competition and cooperation are non-linearly related to education. Starting from low values of competition and cooperation, initially, a higher degree of competition and cooperation is associated with more years spent in education, but the rate of this increase decreases at increasingly higher levels of competition and cooperation. Furthermore, the highest values of cooperation and competition are associated with lower levels of education (Khayouti et al. 2021).

The third paper that uses these representative data looks *at the association between time preferences (patience) and the number of children of the respondent*. In recent years public and political debate

suggested that individuals with children value the future more. We attempt to substantiate the debate, and we use a representative survey to investigate if the number of children (or simply having children) is indeed associated with a higher valuation of the future, which we proxy with an aspect of time preferences, and patience. We find that, in general, there is no correlation between having children and patience, though for young women with below-median income, there is some weak evidence in line with the conjecture. We also show some evidence that it is not having children that matters, but marital status. More precisely, single women are less patient than other, non-single women (Horn and Kiss 2022).

The questions in our representative Hungarian surveys come from the Global Preference Survey (GPS) (Falk et al. 2018). As this internationally comparable data is available for research we have also used this to test one of the hypotheses that have come up during our project. Since trust correlates with economic development and in turn economic development associates with political regime, *we hypothesized that there may be a relationship between trust and political regime*. Without looking for any casual inference, we investigated if trust aggregated on the country level correlates with the country's political regime. Specifically, we are interested in whether trust correlates positively with the level of democracy in cross-sectional observations. We analyse data on trust from 76 countries using the Global Preference Survey and investigate the correlations with five separate democracy indices (Polity2, Economist Intelligence Unit's Index of Democracy, Freedom House, MaxRange and Unified Democracy Score). We do not find any significant association, with or without taking into account other factors (e.g., regional location, economic development, geographic conditions, culture) as well. Trust does not correlate with cornerstones of democracy either, measured by five components of the EIU index. A robustness check using an alternative measure of trust from the World Values Survey reaches the same results. The present study supersedes the working paper version (Khayouti, Kiss, and Horn 2020a).

Using the same GPS database *we also test if the political regime of a country associates with the patience of the citizens*. Recent findings indicate that i) more democratic countries tend to have higher growth, and ii) patience correlates positively with economic development, suggesting a potential link between the political regime and patience. We document a positive association between the level of democracy and patience for most of the political regime indices that we use, even after controlling for region, economic development, geographical conditions, and culture. We report some evidence that political participation is behind our findings (Khayouti, Kiss, and Horn 2020b). This paper has not been published in a peer-reviewed journal (yet).

### **Unfinished business**

There are various unfinished manuscripts and initial ideas that we are planning to finish shortly. For instance, Tünder Lénárd – our assistant in the project and now a PhD student at SOFI in Stockholm is presenting a study on Competition, confidence and gender at an upcoming workshop in Madrid. In this paper, we use our experimental in-class data to assess how confidence mediates and moderates the gender gap in competition. We measure confidence as overplacement of own performance in a real effort task and distinguish between overconfident, realistic, and underconfident students based on if their believed performance exceeds, equals to, or is less than their actual performance, respectively. Our data show, in line with previous studies, that confidence is an important mediator of the gender gap. Our moderation analysis, however, uncovers that there is no gender difference in competitiveness in the over- and underconfident subgroups, while we find a significant gender gap among those who evaluate their performance realistically. This finding is robust across all specifications and contradicts

previous theories about the higher confidence of men driving the relationship of confidence and the gender gap in competition

Just recently we have also presented ideas to an international audience – using the same in-class data – on how response time in experiments associate with economic preferences, and how this portfolio of economic preferences might be used to classify respondents.

### *Online experiments*

Since we could not continue our in-class experiments due to Covid we needed to change the platform (from offline to online) and also our focus group (from in-class to those, who we can reach online). In the last couple of months – after programming the new experiment - we ran two experiments using the recruitment platform Prolific (prolific.co) and the oTree software (Chen, Schonger, and Wickens 2016).

The first experiment was a replication of Cox (2004). We used the paper's three-game (three treatments) design to separate trusting and reciprocating behaviour from altruism in a simple trust game. We ran the experiment between 30 January and 1 February 2023. We ran the games (three treatments) on three consecutive days. There were 88 participants in Treatment A, 80 in Treatment B, and 82 in Treatment C. Along with the results of Cox (2004), we found a significant difference between the sent amounts in Treatments A and B (51.4 points from 100 in A and 24.7 in B,  $p=0.001$ ), indicating that participants' sending behaviour is explained by both altruism and trust. In contrast to Cox (2004), however, we did not find a significant difference between the shares of the tripled amount sent back in Treatments A and C (0.41 in A and 0.36 in C,  $p=0.344$ ). This means that we did not find significant reciprocating behaviour besides simple altruism.

In the second experiment, we applied the three-game design to upstream reciprocity. We also ran the second experiment with participants from the United States on 27 March 2023. There were 159 participants in Treatment A, 153 in Treatment B and 159 in Treatment C. We ran all three treatments on the same day. We found no significant difference between the sent amounts of first players in Treatment A and B (26.9 in A and 24.5 in B,  $p=0.687$ ). This means that Players 1 do not expect Players 2 to send anything over to Players 3, or they do not factor in the implications of their decision to Player 2's subsequent choice. However, we find a significant difference between the shares of their endowment Players 2 send to Players 3 between Treatments A and C (0.18 in A and 0.11 in C,  $p=0.049$ ). This means that participants reciprocate the kind action they received towards another participant.

A public draft of this research will be available at the end of August 2023.

### **Summary**

All in all, we believe that this project contributed to a growth of a very promising field of study in Hungary. The number of high-quality international peer-reviewed publications is growing year by year. The published datasets allow international colleagues to join this research and contribute to the overall knowledge.

And last but not least our assistants throughout this project have all started promising international academic careers: Luca Drucker (our first assistant) finished her PhD at CEU last autumn and is likely to continue her career abroad. Tünde Lénárd (our second assistant) started a sociology PhD at SOFI in Stockholm. Sára Khayouti has started a behavioural economics PhD in Switzerland at the University of Zurich, while Éva Holb has started her PhD at Corvinus University.

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