

Breitkopf, Laura; Chowdhury, Shyamal K.; Priyam, Shambhavi; Schildberg-Hörisch, Hannah; Sutter, Matthias

## Working Paper

# Do economic preferences of children predict behavior?

DICE Discussion Paper, No. 342

### Provided in Cooperation with:

Düsseldorf Institute for Competition Economics (DICE), Heinrich Heine University Düsseldorf

*Suggested Citation:* Breitkopf, Laura; Chowdhury, Shyamal K.; Priyam, Shambhavi; Schildberg-Hörisch, Hannah; Sutter, Matthias (2020) : Do economic preferences of children predict behavior?, DICE Discussion Paper, No. 342, ISBN 978-3-86304-341-4, Heinrich Heine University Düsseldorf, Düsseldorf Institute for Competition Economics (DICE), Düsseldorf

This Version is available at:

<https://hdl.handle.net/10419/219989>

#### Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

#### Terms of use:

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*

# DISCUSSION PAPER

NO 342

## **Do Economic Preferences of Children Predict Behavior?**

**Laura Breitkopf  
Shyamal Chowdhury  
Shambhavi Priyam  
Hannah Schildberg-Hörisch  
Matthias Sutter**

June 2020

## IMPRINT

### DICE DISCUSSION PAPER

**Published by:**

Heinrich-Heine-University Düsseldorf,  
Düsseldorf Institute for Competition Economics (DICE),  
Universitätsstraße 1, 40225 Düsseldorf, Germany  
[www.dice.hhu.de](http://www.dice.hhu.de)

**Editor:**

Prof. Dr. Hans-Theo Normann  
Düsseldorf Institute for Competition Economics (DICE)  
Tel +49 (0) 211-81-15125, E-Mail [normann@dice.hhu.de](mailto:normann@dice.hhu.de)

All rights reserved. Düsseldorf, Germany 2020.

ISSN 2190-9938 (online) / ISBN 978-3-86304-341-4

The working papers published in the series constitute work in progress circulated to stimulate discussion and critical comments. Views expressed represent exclusively the authors' own opinions and do not necessarily reflect those of the editor.

# Do Economic Preferences of Children Predict Behavior?

Evidence from Sibling Comparisons

Laura Breitkopf<sup>\*</sup>    Shyamal Chowdhury<sup>†,‡</sup>    Shambhavi Priyam<sup>§</sup>  
Hannah Schildberg-Hörisch<sup>\*,‡</sup>    Matthias Sutter<sup>§,¶</sup>

June 2020

## Abstract

Economic theory and empirical evidence establish that economic preferences predict behavior and life outcomes for children, adolescents, and adults. In this paper, we use novel data on 4,282 siblings aged 6 to 16 that combine incentivized measures of time, risk, and social preferences with comprehensive information on child behavior and family environment. Using standard cross-sectional specifications, our results confirm the predictive power of children's preferences for behavior. However, when estimating household fixed effects models that allow controlling for all characteristics that are shared by siblings, this predictive power largely vanishes. We discuss implications for research on children's preferences and behavior.

**Keywords:** time preferences, risk preferences, social preferences, experiments with children, origins of preferences, human capital, behavior, household fixed effects, siblings

**JEL classification:** C91, D01, J13

---

<sup>\*</sup>Heinrich Heine University Düsseldorf (DICE), Germany

<sup>†</sup>University of Sydney, Australia

<sup>‡</sup>IZA Institute of Labor Economics, Bonn, Germany

<sup>§</sup>Max Planck Institute for Research on Collective Goods, Bonn & University of Cologne, Germany

<sup>¶</sup>University of Innsbruck, Austria & CESifo, Munich, Germany

We thank Lukas Kiessling and Daniel Kamhöfer as well as participants of the M-BEPS 2019 for helpful comments and discussion. Financial support by the German Research Foundation (Deutsche Forschungsgemeinschaft, DFG) through grant SCHI-1377/1-1, project number 392529304, is gratefully acknowledged. We declare no competing financial interests. IRB approval (Heinrich Heine University Düsseldorf) was granted under study number 6212. Corresponding author: Laura Breitkopf ([breitkopf@dice.hhu.de](mailto:breitkopf@dice.hhu.de)).

# 1 Introduction

Preferences are a key concept in economic theory and empirical research largely supports their predictive power for major life outcomes and behaviors. While the corresponding evidence is comprehensive for adults,<sup>1</sup> much less is known about their relevance for the behavior of children and adolescents. In childhood and adolescence, preferences emerge before they become more stable in adulthood (Heckman, 2007; Schildberg-Hörisch, 2018). Recently, our understanding of the formation of preferences in childhood and their measurement in incentivized experiments have made significant progress (see, e.g., Heckman, 2007; Sutter et al., 2013; Doepke and Zilibotti, 2017; Alan and Ertac, 2018; Kosse et al., 2020; Cappelen et al., nd; Falk et al., nd). We are thus now ready to move forward and to start investigating the link between children's and adolescents' preferences and behavior.

First evidence points to a relation between economic preferences of children and adolescents and how they act. Impatience is associated with drinking and smoking behavior, health outcomes like a higher body mass index, a lower propensity to save, and worse school performance (Castillo et al., 2011, 2019; Sutter et al., 2013). Risk averse teenagers are less likely to be overweight (Sutter et al., 2013), behave better at school, and are more likely to complete high school (Castillo et al., 2018). Importantly, such associations tend to persist as measures of economic preferences in childhood or adolescence have also been shown to predict adult outcomes (Borghans et al., 2008; Golsteyn et al., 2014).<sup>2</sup> However, it is not yet clear how ro-

---

<sup>1</sup>Time preferences are linked to criminal behavior, educational attainment, occupational success, income, wealth, and health outcomes (see, e.g., Fuchs, 1982; Bickel et al., 1999; Kirby et al., 1999; Ventura, 2003; Kirby and Petry, 2004; DellaVigna and Paserman, 2005; Eckel et al., 2005; Chabris et al., 2008; Golsteyn et al., 2014; Cadena and Keys, 2015; Åkerlund et al., 2016; Dohmen et al., 2018). Risk preferences are associated with labor market success, health outcomes, investment decisions, addictive behaviors, and migration (Barsky et al., 1997; Hong et al., 2004; Bonin et al., 2007; Anderson and Mellor, 2008; Kimball et al., 2008; Jaeger et al., 2010; Dohmen and Falk, 2011; Dohmen et al., 2011; Von Gaudecker et al., 2011; Becker et al., 2012; Dawson and Henley, 2015; Hsieh et al., 2017). Social preferences are related to cooperative behaviors, e.g., at the work place, donations, repayment of loans, and management of common pool resources (Karlan, 2005; Dohmen et al., 2009; Rustagi et al., 2010; Carpenter and Seki, 2011; Becker et al., 2012; Burks et al., 2016; Deming, 2017).

<sup>2</sup>A related literature on childhood temperament in psychology documents that childhood temperament does not only predict functioning in childhood, but that early childhood differences in temperament are also systematically related to a broad range of adult outcomes, possibly due to the existence of some continuity in

bust these associations are and what exactly they reflect, especially given the still malleable and emerging nature of children's preferences.

This paper contributes to a better understanding of the link between children's and adolescents' preferences and their behaviors and goes beyond previous evidence in several respects. First, we jointly elicit time preferences, risk preferences, and social preferences in incentivized experiments. This is relevant as decisions typically involve more than one preference dimension. For example, addictive behaviors such as smoking, drinking or gambling involve risk considerations, but also a trade-off between immediate and delayed gratification (Ida and Goto, 2009; Sutter et al., 2013). Moreover, our novel data cover more than 4,200 children and their parents and combine comprehensive measures of preferences with wide-ranging information on child outcomes, behaviors, and household environment. Children and adolescents in our sample are between the ages 6 and 16, so we cover early elementary school age up to the end of adolescence. This unique data set allows us to study within a unified framework whether preferences at a young age translate into observable behavior for many outcome dimensions at once.

The most exceptional feature of our data is that we elicit preferences and behaviors of 2,141 pairs of siblings. What sets our paper apart from previous studies is our estimation of household fixed effects specifications that control for all characteristics of household environment shared by siblings. We hence take a large step forward towards a causal interpretation of the link between child preferences and behavior. Many facets of household environment may be important for both preference formation and field behavior, among them socio-economic status (Dohmen et al., 2012; Kosse and Pfeiffer, 2012; Bauer et al., 2014; Almås et al., 2016; Brenøe and Epper, 2019; Falk et al., nd), family structure (Detlefsen et al., 2018), parents' economic preferences (Bisin and Verdier, 2000; Dohmen et al., 2012; Kosse and Pfeiffer, 2012; Bauer et al., 2014; Almås et al., 2016; Alan et al., 2017; Campos-Vazquez, 2018; Chowdhury et al., 2018; Brenøe and Epper, 2019; Falk et al., nd), parenting style, parental time, monetary temperament development from early childhood to early adulthood (Caspi, 2000; Caspi et al., 2003; Moffitt et al., 2011).

and further investments in their children (Cunha and Heckman, 2007; Guryan et al., 2008; Heckman, 2008; Heckman and Mosso, 2014; Doyle et al., 2017; Cobb-Clark et al., 2019; Falk et al., nd), parental values and religiosity (see, e.g., Brañas-Garza et al., 2014), genetic contributions (e.g., Cesarini et al., 2009; Zyphur et al., 2009), and exposure to stress at the household level (e.g., Starcke and Brand, 2012; Buchanan and Preston, 2014; Haushofer and Fehr, 2014; Ceccato et al., 2018).

It is plausible to assume that siblings share these household characteristics to a very large extent. At the same time, comprehensive and precise measurement of many of these characteristics is difficult in quantitative surveys. Therefore, including household fixed effects which control for all characteristics that are constant across siblings is an effective mean to remove spurious correlations when estimating the predictive power of preferences for behavior. Comparing analyses without and with such fixed effects allows us to develop a deeper understanding of what drives children's behaviors.

In a first step of our analysis, we use cross-sectional regression models comparable to those applied in previous work. Our results confirm and add to our knowledge on the predictive power of child preferences for outcomes and behaviors. For example, we find that time consistent children study harder. Risk averse children engage in fewer risky behaviors but have lower mental health. We are the first to provide evidence on the predictive power of children's social preferences and observe that egalitarian and selfish children behave more prosocially than spiteful ones, for whom behavioral problems are most pronounced. In the outcome dimension, our results extend the predictive power of child preferences to domains such as mental health and behavioral problems that have not been studied before.

In a second step, we move beyond previous research by adding household fixed effects to our specifications to effectively control for all family-invariant characteristics. As a result, the previously demonstrated predictive power of children's preferences largely dissolves. These strong repercussions alter the interpretation of established findings and suggest that child and teenage preferences can predict behavior since they largely reflect household environment that

maps into both the formation of preferences and child behavior.

Finally, we further exploit our rich data to add information on a family's socio-economic status, family structure, religion, parental preferences and IQ, and parenting style as explicit control variables in the baseline specifications that do not use household fixed effects. When adding these extensive control variables to replicate household environment, the predictive power of preferences for behavior attenuates, yet to a much weaker extent compared to household fixed effects models. This suggestive evidence underlines how difficult it is to precisely measure household environment in a comprehensive manner.

Our findings have important implications. First, they inform the debate on how (much) children's preferences are related to their field behaviors (Castillo et al., 2011, 2018, 2019; Sutter et al., 2013). This debate is only in its infancy and we contribute with novel data on more than 4,200 children that are exceptionally broad both with respect to preference and outcome measures.

Moreover, our results emphasize the importance of family and household environment for the formation of preferences (see, e.g., Doepke and Zilibotti, 2017; Kosse et al., 2020; Falk et al., nd). They thus relate to the literature on skill formation (see, e.g., Cunha and Heckman, 2007) that highlights childhood as a critical and sensitive period for the formation of personality traits and preferences.

Taking a broader perspective, our findings raise the fundamental question what experimental measures of childhood preferences ultimately capture. They suggest that measures of children's and adolescents' preferences largely reflect household environment. In our view, this does not imply that concept and measurement of these preferences are redundant. Quite in contrast, our results underline that children's and adolescents' preferences are a valuable tool for the prediction of child behavior and outcomes. If children's preferences can predict outcomes precisely because they reflect manifold household characteristics that are hard to quantify comprehensively, they can thus be considered highly useful. Obviously, our findings also emphasize the importance of abstaining from causal claims in such endeavors.

The remainder of the paper is structured as follows. Section 2 discusses sampling and data. Hypotheses are outlined in section 3. Section 4 illustrates our empirical strategy and section 5 presents results. We discuss implications of our findings and conclude in section 6.

## 2 Data

Data collection took place in rural areas in Bangladesh. With around 161 million inhabitants, Bangladesh is the world's eighth most populous country. 63 percent of the population are living in rural areas.<sup>3</sup> In the last two decades, Bangladesh has made notable progress in reducing poverty and cut down the percentage of people living below the income poverty line of USD 1.90 a day to 14.8 percent.<sup>4</sup> Sustained economic growth has enabled Bangladesh to reach lower middle-income status in 2015 according to the World Bank classification (second lowest out of four categories: GNI per capita between USD 1,026 and USD 3,995).<sup>5</sup>

### 2.1 Sampling procedure and data collection

Data were collected in the four rural districts Netrokona, Sunamganj, Chandpur and Gopalganj from March to May 2018 with the help of a local, specialized survey firm. These districts represent four of the eight administrative divisions of the country. In the course of a previous survey that was conducted in 2014 and 2016, nine sub-districts were chosen based on the availability of NGOs willing to collaborate. 150 villages were randomly drawn from the nine sub-districts. In each of those 150 villages, a primary school got selected and from the selected school, 20 students were chosen across grades 2 to 5 using a simple random sampling proce-

---

<sup>3</sup>Data from 2018. See United Nations Human Development Report: <http://hdr.undp.org/en/countries/profiles/BGD>. Accessed May 7, 2020.

<sup>4</sup>In international prices. Data from 2016. See World Bank country profile: <https://data.worldbank.org/country/bangladesh>. Accessed May 7, 2020.

<sup>5</sup>See World Bank country overview: <https://www.worldbank.org/en/country/bangladesh/overview>. Accessed May 7, 2020.

ture in 2018.<sup>6</sup> We surveyed the 3,000 new households of these students from 2018 onwards, along with 1,001 households already sampled and interviewed in 2014/16 (see Chowdhury et al., 2014, 2018). Section A in the appendix contains further details on the sampling.

The aim of our data collection was to establish a large sample of families in which we measure both children's and parents' skills as comprehensively as possible. We therefore elicited economic preferences (time, risk, and social preferences), personality traits, and cognitive skills via paper-and-pencil interviewing for up to four household members (one or two children aged 6 to 16 and their parents). In particular, we were able to elicit preferences for children from 3,769 households. In 1,556 households, only one child participated in the experiments. In 2,213 households, two children participated of which 4,282 are siblings. In sum, this creates a novel data set that comprehensively measures preferences of entire families. This exceptional feature of our data enables us to estimate household fixed effect specifications and hence control for all household characteristics that are shared by siblings.

We complement this extraordinarily rich data on skills of whole families with a questionnaire that mothers answered about their children and a general household survey. We used computer-assisted personal interviews (CAPI) to collect quantitative survey data during the household survey. The comprehensive, structured questionnaire covered socio-demographics, income, expenditures, employment, land ownership, credits and savings, assets, health, and shocks. It was answered by either the household head or his/her spouse (whoever was the most knowledgeable person for the respective part). The mother questionnaire, a paper-and-pencil interview, covered information on parenting style.<sup>7</sup> Moreover, mothers assessed their children's strengths and difficulties as well as personality traits (for children up to age 13).

---

<sup>6</sup>Typically, there was one school per village, and five students per grade were sampled randomly from class lists. For more details see section A.2 in the appendix.

<sup>7</sup>For a detailed description of the parenting styles measure as well as a complete list of items, see section D in the appendix.

## 2.2 Experiments: Time, risk, and social preferences

Children participated in a sequence of experiments designed to measure the three core dimensions of economic preferences: time, risk, and social preferences. Experimentally elicited preference measures have important advantages. On top of being incentivized, they are constructed from revealed preferences in well-defined and controlled contexts. This gives them a readily-interpretable metric and allows for a straightforward comparison across individuals.

To elicit preferences, we relied on well-established measurement tools that, in the case of time and risk preferences, have been used in developing countries before. We still carefully pre-tested all items in our context and adapted them to the children's ages. We used standardized control questions to verify that participating children understood the instructions.<sup>8</sup>

The order of the experiments was randomly determined by rolling a die. Children were able to earn money or stars which were transformed into money after the experiments using age-specific exchange rates (proportional to pocket money). Each child (and adult) received one star as a show-up fee. All experiments took place in one-on-one settings in the families' homes and the interviewers ensured that members from the same household could not influence each other's decisions. Detailed instructions can be found in section J in the appendix.

**Time preferences for children** In order to measure time preferences we followed a simple choice list approach, used by, e.g., Bauer et al. (2012) in a similar form for adults in rural India. Each child had to make six choices which consisted of trade-offs between smaller, sooner and larger, later rewards (see Table 1). The six choices were grouped in three choice sets, each consisting of two choices with the same time horizon. The early payment took place either tomorrow (choice sets 1 and 2) or in a month (choice set 3), the later payment in three weeks (choice set 1), three months (choice set 2), or four months (choice set 3), respectively. The choice sets were ordered randomly.

---

<sup>8</sup>Out of the 5,982 children, 661 (438) [222] did not fully understand the rules of the games that we used to measure time (risk) [social] preferences after possibly repeated explanations by the interviewer. Excluding those observations does not qualitatively change our results (see the corresponding regression results in section I.3 in the appendix).

For our analysis, we use the total number of patient choices (variable *patience*) as well as a dummy variable *time consistent*. The variable *patience* is a simple count of the larger, but later reward choices among all six choices and ranges from 0 to 6. Children are classified as time consistent if they make identical choices for choice sets 2 and 3 with the same three-month delay, implying that their current and future discount rates are equal, and time inconsistent otherwise.

**Table 1:** Time preferences experiments for children

<b>Choice Set 1</b>	2 stars tomorrow	vs.	3 stars in 3 weeks
	2 stars tomorrow	vs.	4 stars in 3 weeks
<b>Choice Set 2</b>	2 stars tomorrow	vs.	3 stars in 3 months
	2 stars tomorrow	vs.	4 stars in 3 months
<b>Choice Set 3</b>	2 stars in 1 month	vs.	3 stars in 4 months
	2 stars in 1 month	vs.	4 stars in 4 months

The preference distributions for our estimation sample can be found in the appendix (section B). Figure B.1 displays the distribution of the number of patient choices. About a third of children never made a patient choice. The majority of children (64 percent) behaved in a time consistent manner.

Our findings on time consistency are in line with comparable previous findings among children. Alan and Ertac (2018) observe about half of the children in their sample to make time consistent choices in a convex time budget task.<sup>9</sup> Regarding patience, results for our sample are hard to compare to previous studies due to different interest rates. As in Sutter et al. (2013), who elicit time preferences for 10- to 18-year-old Austrian children using choice lists, our children are, on average, impatient. Falk et al. (nd), in contrast, observe more patient choices among their samples of German primary school children. They measure patience by letting children decide how much of their initial endowment they want to put in a piggy bank paying out the double amount one week after the experiment. About a third of children save

<sup>9</sup>As with our definition, time inconsistency includes both present- and future-biased preferences.

all their coins in the piggy bank. In another study by Alan and Ertac (2018), children aged 9 to 10 years in Turkey also display substantially more patience (measured by multiple choice list as well as a convex time budget task).<sup>10</sup>

**Risk preferences for children** For the elicitation of risk preferences we applied a setup originally designed by Binswanger (1980) and widely used in developing countries, e.g., by Bauer et al. (2012) in India. Each child had to choose one out of six gambles that yielded either a high or a low payoff with equal probability (see Table 2). The low payoff was decreasing and the high payoff was increasing for each successive gamble. In gambles 1 to 5, the expected value increased jointly with the variance, and in gamble 6 the variance increases in comparison to gamble 5, meaning that choices of higher gamble numbers were associated with a higher willingness to take risks.

For our analysis, we use a dummy (dummy variable *risk averse*) for being risk averse (choosing one of the first four gambles) in contrast to being (close to) risk neutral or risk seeking in case of choosing gamble number 5 or 6.<sup>11</sup>

**Table 2:** Risk preferences experiments for children (example for age 10 to 11)

Age 10 to 11	Low amount (50% chance)	High amount (50% chance)	
Gamble 1	25	25	} <i>risk averse</i>
Gamble 2	22	48	
Gamble 3	20	60	
Gamble 4	15	75	
Gamble 5	5	95	} <i>risk neutral</i>
Gamble 6	0	100	} <i>risk seeking</i>

Figure B.3 in the appendix shows that 42 percent of children in our estimation sample are risk averse. The other 58 percent are evenly distributed across being risk neutral and seeking.

<sup>10</sup>For a recent overview of economic behavior and experimental economics results of children and adolescents, especially with respect to the influence of age and gender, see Sutter et al., 2019.

<sup>11</sup>As a robustness check, we provide estimation results using different presentations of our risk measure in the appendix (section I.1). Overall, results remain similar.

This distribution closely resembles what Castillo (2020) finds when eliciting risk preferences in a similar manner among 8-year-old Peruvian children and what Falk et al. (nd) find among 7- to 9-year-old German children (using a different risk preferences game, however). In line with age trends in risk attitudes (Sutter et al., 2019), our sample children are much less risk averse than samples of high school students and young adults from the US (see Ball et al., 2010, and Eckel et al., 2012, who use experimental setups similar to ours).

**Social preferences for children** We followed an experimental protocol inspired by Fehr et al. (2008) which got extended by Bauer et al. (2014) to assess social preferences. Children had to make four randomly ordered allocation choices dividing stars between themselves ( $x$ ) and another child ( $y$ ) of the same gender and roughly the same age, but unknown and unrelated (see Table 3). In each of the four choices ( $x,y$ ), one option was always the allocation (1,1), while the alternative allocation was designed to classify different social preference types. From the four choices, one can create four mutually exclusive social preference types: Children are classified as egalitarian if they always minimize the difference in payoffs for themselves and the recipient. They are categorized as altruistic if they maximize the recipient’s payoff in all four choices and as spiteful if they always minimize the recipient’s payoff. Children are classified as selfish if they maximize their own payoff in the first and the fourth choice (the payoff of the decision maker is the same in both options in the other two choices). Children who do not follow any of these patterns are subsumed in a residual category.

For our analysis, we use the four dummy variables *egalitarian*, *altruistic*, *selfish* and *mixed* with “mixed” being the residual category and “spiteful” being the (extreme) base category.

Figure B.5 in the appendix displays the distribution of social preferences for our estimation sample. A large fraction (37 percent) of children is categorized as being selfish. Still nearly a fifth are egalitarian whereas only 7 to 8 percent are either spiteful or altruistic. Nearly 30 percent of children fall into the residual category “mixed”.<sup>12</sup>

---

<sup>12</sup>Yet, note that the four social preference types account for more than 70 percent of subjects although those four types are based on only 6 out of 16 (38 percent) choice patterns.

**Table 3:** Social preferences experiments for children

(a) Games			
<b>Costly prosocial game</b>	1 star for me 1 star for the other child (1,1)	vs.	2 stars for me 0 stars for the other child (2,0)
<b>Costless prosocial game</b>	1 star for me 1 star for the other child (1,1)	vs.	1 star for me 0 stars for the other child (1,0)
<b>Costless envy game</b>	1 star for me 1 star for the other child (1,1)	vs.	1 star for me 2 stars for the other child (1,2)
<b>Costly envy game</b>	1 star for me 1 star for the other child (1,1)	vs.	2 stars for me 3 stars for the other child (2,3)

(b) Classification of children based on games				
	Costly prosocial game (1,1) vs. (2,0)	Costless prosocial game (1,1) vs. (1,0)	Costless envy game (1,1) vs. (1,2)	Costly envy game (1,1) vs. (2,3)
Egalitarian	(1,1)	(1,1)	(1,1)	(1,1)
Altruistic	(1,1)	(1,1)	(1,2)	(2,3)
Spiteful	(2,0)	(1,0)	(1,1)	(1,1)
Selfish	(2,0)	(1,1) or (1,0)	(1,1) or (1,2)	(2,3)

The observed pattern is similar to what Bauer et al. (2014) find among 4- to 12-year-old Czech children (only the fractions of altruistic and egalitarian children are reversed). Comparisons across different types of social preferences games, however, are difficult.

**Preference measures for adults** While children’s preferences are at the core of our analysis, we additionally measured parents’ preferences to grasp children’s everyday household environment as comprehensively as possible. Elicitation of preferences for adults followed similar or identical protocols as for children. Details and instructions can be found in the appendix (sections C and J).

## 2.3 IQ

For children and adults, we elicited one measure of crystallized and one of fluid IQ, which together form overall IQ (Cattell, 1971). We measured fluid IQ using the matrix test of the well-established Wechsler Intelligence Scale for Children (WISC-IV) or the Wechsler Adult Intelligence Scale (WAIS-IV), respectively (Wechsler, 2003). For crystallized IQ, we used the vocabulary test for children and the corresponding word meaning test for adults that are both subtests of the respective Wechsler Intelligence Scales, adapted to the specific context of Bangladesh.<sup>13</sup> IQ is normalized to a mean of zero and standard deviation of one across our final estimation sibling sample or their parents, respectively.

## 2.4 Child behavior and outcome variables

For adults, preferences have been shown to predict key life outcomes such as educational attainment, labor market success, cooperative behaviors, health status and health-related behaviors as well as life satisfaction (see footnote 1). Due to their young age, it is, however, not feasible to use the exactly same outcomes for children and adolescents as it is typically done for adults. We therefore decided to collect related and equally multifaceted information on child outcomes and behaviors, spanning attitudes and conduct related to education, risk taking, prosocial behavior as well as emotional and behavioral syndroms that have been shown to be highly predictive of later adult outcomes (Layard et al., 2019; Clark and Lepinteur, 2019). To further diversify our measurement approach, some of the child outcomes are reported by children themselves, others by their mothers.

**Study attitude** To measure study attitude that should positively relate to educational success in the long run, children rated the following statement on a five-point Likert scale: “By

---

<sup>13</sup>We worked with local academics with expertise in the adaptation and use of WISC version IV. In particular, Salim Hossain of the Department of Psychology, Dhaka University, and his team have adapted both WISC and WAIS.

working very hard, one can succeed at each area in life, for example at school or at work.”<sup>14</sup> The variable is normalized to a mean of zero and standard deviation of one across our final estimation sibling sample.

**Risky behaviors** Children answered 16 questions related to behaviors considered to be risky in Bangladesh, e.g., “Do you jump from tree/bridge to river or canal?” or “Do you often get into physical fights?”. Section E.1 in the appendix contains the list of all items regarding risky behaviors. The set of questions was developed in focus group discussions with respondents similar to our respondents. The questions were also pre-tested in villages similar to our study villages. Using standard questions from western countries is often not appropriate or meaningful. We did include, for example, the question “Do you smoke?” as a frequently used measure of risk taking behavior, but almost 100 percent of children and adolescents answered “no”. Drinking alcohol, another popular indicator for risk seeking behavior, is forbidden due to religious reasons. For our analysis, we use the fraction of questions related to engaging in risky behaviors answered with “yes”, conditional on being answered. Risky behaviors are closely related to health status. For example, Eaton et al. (2012) monitor six categories of health-risk behaviors among youth and young adults including behaviors that contribute to unintentional injuries and violence or substance abuse. Sutter et al. (2013) document a link between risk attitudes and obesity.

**Prosociality** We use the prosociality subscale of the well-established and widely used Strength and Difficulties Questionnaire (SDQ) to measure the extent to which children behave prosocially, i.e., interact with others in a positive and cooperative way. Mothers rated five items related to their children’s prosocial behavior on a three-point scale such as “Considerate of other people’s feelings” or “Shares readily with other children (treats, toys, pencils, etc.)”. For a complete list of the prosociality items see section E.2 in the appendix. Answers are combined with equal weighting into one scale. The variable is normalized to a mean of

---

<sup>14</sup>Item from locus of control questionnaire (Rotter, 1966)

zero and standard deviation of one across our final estimation sibling sample.

**Behavioral difficulties** Moreover, we make use of the SDQ score of the Strengths and Difficulties Questionnaire (SDQ). The SDQ score captures emotional and behavioral difficulties and was originally developed by psychologists as a brief screening tool for mental health problems.<sup>15</sup> In recent times, economists have frequently used the SDQ (Gupta and Simonsen, 2010; Flèche, 2017; Kühnle and Oberfichtner, 2017; Briole et al., nd; Cornelissen and Dustmann, 2019; Attanasio et al., nd). Its predictive power for child psychiatric disorders (known to be interfering with social and educational development)<sup>16</sup> as well as adult outcomes such as educational attainment, unemployment, mental health and life satisfaction (Layard et al., 2019; Clark and Lepinteur, 2019) makes it a valuable outcome dimension.

The SDQ score comprises the four subscores “emotional symptoms”, “peer problems”, “hyperactivity” and “conduct problems” and was elicited asking mothers about their children. For each subscore, mothers rated five items on a three-point scale. Questions are referring to whether children are easily worried, often nervous or unhappy, how well they are socially embedded, how well children can concentrate, and whether they tend to have temper tantrums, lie, cheat, or steal (see section E.3 in the appendix for a complete list of items). Answers are combined with equal weighting into the subscores. Following Goodman et al. (2010), for low-risk samples the full SDQ score can be split into two broader dimensions, grouping the emotional and peer items into an “internalizing” subscale to measure emotional health, and the hyperactivity and conduct items into an “externalizing” subscale which is referring to behaviors. As Briole et al. (nd), we are following this approach to allow for a more differentiated

---

<sup>15</sup>Its reliability and validity has been examined and confirmed in a number of studies across Europe, Asia, Australia, and South America (see, e.g., Hoosen et al., 2018, for an extensive overview). Bangladesh received special attention as data collected in its capital city Dhaka have played a particularly important role in documenting that the SDQ can be purposefully applied and interpreted in different cultural settings. Its inventor conducted multiple tests to explore the suitability of the questionnaire as a cheap and effective method for detecting child psychiatric problems in the developing world (Goodman et al., 2000; Mullick and Goodman, 2001).

<sup>16</sup>Academic achievement is among the most thoroughly studied repercussions of mental health problems (McLeod et al., 2012). Rethon et al. (2009), e.g., conduct a longitudinal study in Great Britain, suggesting that psychological distress as measured by the SDQ is associated with educational achievement. Minkkinen et al. (2016) examine a similar setup in Finland.

mapping of preferences into behavioral problems and mental health.<sup>17</sup>

Like prosociality, the variables are normalized to a mean of zero and standard deviation of one across our final regression sibling sample. Note that higher values indicate more emotional or behavioral problems and hence a more negative outcome.

## 2.5 Sample characteristics

Table 4 displays basic descriptives and household characteristics for the children sample that participated in the experiments to elicit time, risk, and social preferences. The number of observations differs across variables depending on the survey part and availability of household members to be interviewed. Since a large number of households was sampled via primary schools, mean age of child participants is 10 years and more than 95 percent are able to read and write. The sample is well-balanced in terms of gender with only slightly more girls than boys.

**Table 4:** Sample descriptives—Whole experimental sample (5,982 children from 3,769 households), including children from sibling sample households (4,282 children from 2,141 households) and other households (1,700 children from 1,628 households)

	Mean	Std. dev.	Min	Max	Obs.
<b>Age</b>	10.30	2.64	6	16	5,982
<b>Age father</b>	43.50	8.19	19	85	5,606
<b>Age mother</b>	36.27	6.26	16	70	5,681
<b>No. of siblings</b>	2.51	1.46	0	10	5,982
<b>Homestead area (sqm)</b>	392.42	404.52	4	4,400	5,968
<b>Literacy</b>	95.49% are able to read and write				5,982
<b>Gender</b>	52.14% are girls and 47.86% boys				5,982
<b>Religion</b>	82.22% are muslim households				5,968
<b>Grandparents</b>	In 19.98% of households at least one grandparent is living with the family				5,982
<b>Electricity</b>	91.79% of households do have an electricity connection				5,968

As we are exploiting variation between siblings when running household fixed effects regressions, we are restricting our sample for the main analyses to households with two siblings

<sup>17</sup>Estimation results for the full SDQ score as an outcome variable are displayed in the appendix (Table I.9 in section I.2).

who have participated in the experiments (“sibling sample”). In order to show that this selection does not limit representativeness of our sample, we compare our sibling sample (4,282 observations) to the overall sample containing all experimental children (5,982 observations) by simple t-tests. Table 5 confirms that the sibling sample does not significantly differ from the whole experimental children sample in observables. The only two significant differences in age and number of siblings are intuitive and small: Using only households with at least two children aged 6 to 16 slightly increases the number of children in the household, compared to households where only one child aged 6 to 16 could be found (or was available for experiments). Also, children in households with at least two kids aged 6 to 16 are about 1.5 months older on average. In what we coin single child households,<sup>18</sup> only one child aged 6 to 16 could be found, potentially with siblings being either younger than 6 or older than 16.

### 3 Hypotheses

Reflecting the three core dimensions of economic preferences, our hypotheses link time, risk, and social preferences and outcomes in childhood and adolescence. We thus analyze whether our experimental preference measures for children and adolescents are significant predictors of contemporaneous outcomes, i.e., of field behavior already at an early stage in life. In the following, we state our main hypotheses, each of them followed by a brief discussion of the relevant literature that backs up the hypothesis.

**Hypothesis 1.** More patient and time consistent children are more diligent and have a better study attitude.

In a wide range of studies from many disciplines, researchers have established an association between non-cognitive skills and academic outcomes for adults (Bowles and Gintis,

---

<sup>18</sup>Households with only one child participating in the experiments form 92 percent of the non-sibling sample households. The rest are households with two experimental children who are not siblings, for whom family relations are not clearly identifiable, or for whom not their parents but some other household members participated in the experiments.

**Table 5:** Comparison sibling sample (two siblings aged 6 to 16 in household) with whole sample (all children aged 6 to 16 participating in experiments) by t-tests

	Mean sib sample	Std. dev.	Obs. sib sample	Obs. whole sample	Diff. <sup>§</sup>	Std. error
<b>Preferences</b>						
patience	2.204	2.073	4,280	5,980	-0.011	0.042
time consistent	0.635	0.482	4,280	5,980	0.007	0.010
risk averse	0.418	0.493	4,282	5,982	0.002	0.010
egalitarian	0.188	0.390	4,281	5,981	0.001	0.008
altruistic	0.078	0.267	4,281	5,981	-0.002	0.005
selfish	0.369	0.482	4,281	5,981	0.006	0.010
spiteful	0.068	0.252	4,281	5,981	-0.001	0.005
mixed	0.298	0.458	4,281	5,981	-0.005	0.009
<b>Cognitive skills</b>						
IQ <sup>†</sup>	0.001	1.018	4,282	5,982	-0.001	0.020
<b>Gender &amp; age</b>						
female <sup>‡</sup>	0.516	0.500	4,282	5,982	0.005	0.010
age	10.422	2.651	4,282	5,982	-0.123**	0.053
<b>Outcomes</b>						
study attitude	4.418	0.796	4,282	5,982	0.016	0.016
risky behaviors	0.192	0.163	2,552	3,419	-0.003	0.004
prosociality	6.451	2.291	4,176	5,786	0.029	0.046
SDQ internalizing subscale	5.557	2.772	4,176	5,786	0.021	0.057
SDQ externalizing subscale	6.035	3.298	4,176	5,786	-0.086	0.067
SDQ full score	11.591	5.256	4,176	5,786	-0.066	0.107
<b>HH environment</b>						
logincome <sup>††</sup>	11.473	1.960	2,139	3,756	0.077	0.053
father literacy <sup>‡</sup>	0.538	0.499	4,156	5,606	0.013	0.010
mother literacy <sup>‡</sup>	0.636	0.481	4,194	5,681	0.011	0.010
number of siblings	2.657	1.411	4,282	5,982	-0.144***	0.029
father age	43.548	7.625	4,156	5,606	-0.046	0.161
mother age	36.232	5.588	4,194	5,681	0.034	0.120
senior in household <sup>‡,††</sup>	0.200	0.400	2,141	3,769	-0.000	0.011
homestead area (in sqm) <sup>††</sup>	385.075	392.835	2,141	3,759	6.774	10.776
electricity <sup>‡,††</sup>	0.914	0.280	2,141	3,759	0.005	0.008
muslim <sup>‡,††</sup>	0.822	0.383	2,141	3,759	-0.000	0.010

**Notes:** Significance at \* p<0.10, \*\* p<0.05, \*\*\* p<0.01. <sup>§</sup>Difference = mean(whole sample)–mean(sib sample), i.e., positive values indicate a higher mean for the whole sample. For a detailed description of the measures for preferences, IQ, and outcomes see sections 2.2-2.4. <sup>†</sup>IQ here is standardized to a mean of zero and standard deviation of one across the whole children sample. <sup>‡</sup>Female as well as father literacy, mother literacy, senior in household, electricity and muslim are dummy variables. <sup>††</sup>Comparison at household-level. A comprehensive list of variables and descriptives can be found in section F in the appendix.

2002; Farkas, 2003; Heckman et al., 2006; Lleras, 2008). Patience and self-control have attracted particular attention regarding educational outcomes. Golsteyn et al. (2014), for example, link adolescent time preferences to school performance. Castillo et al. (2019) show that higher discount rates go hand in hand with a lower probability of graduating from high school. Further indirect links have been established with children's time preferences being related to future disciplinary referrals (Castillo et al., 2011; Alan and Ertac, 2018) which in turn predict high school graduation (Rumberger, 1995; Alexander et al., 1997).

**Hypothesis 2.** More risk averse children engage in fewer risky behaviors.

It is straightforward to assume that more risk averse children are more likely to refrain from risky behaviors. There is not much empirical evidence, however, linking children's risk preferences and their actual field behavior. Sutter et al. (2013) show that for Austrian adolescents risk aversion is connected to health behavior (body mass index) but do not find a significant association of risk attitude and smoking, alcohol consumption, saving behavior or conduct at school. Using data on 8th graders from the US, Castillo et al. (2018) find that more risk averse children are less likely to have future disciplinary referrals and more likely to complete high school.

**Hypothesis 3.** Compared to spiteful children, egalitarian, altruistic, and selfish children behave more prosocially.

It is also intuitive to hypothesize that children who exhibit less antisocial preferences than spiteful ones behave more prosocially in their everyday life. We are not aware, however, of any empirical evidence linking experimentally elicited other-regarding preferences of children and adolescents and their field behavior. For adults, social preferences have been shown to be predictive of prosocial behaviors and outcomes such as donating, volunteering time, assisting strangers, helping friends and relatives, or family structure (Falk et al., 2018).

**Hypothesis 4.** All economic preferences have predictive power for behavioral difficulties. More patient and time consistent children exhibit less behavioral

difficulties measured by the SDQ externalizing subscale. More risk averse children have fewer conduct problems picked up by the externalizing subscale but more emotional problems captured by the internalizing subscale. Compared to spiteful individuals, egalitarian, altruistic, and selfish children also exhibit less behavioral difficulties both with respect to the internalizing and externalizing dimension of the SDQ.

Regarding behavioral difficulties, different preferences are likely to affect distinct dimensions of the SDQ as represented by the two subscales, internalizing and externalizing behavior, possibly differently. Since more patient and time consistent individuals are known to possess higher self-control, we expect them to have fewer difficulties (Moffitt et al., 2011). This could presumably be driven by the externalizing subscale, with children exhibiting less hyperactivity, suffering less from hot tempers and making less myopic decisions such as cheating or stealing. Studies linking impatience to criminal behavior or poor school conduct (e.g., Castillo et al., 2011; Åkerlund et al., 2016) support this notion. For risk preferences, expectations are ambiguous. Following the idea that risk averse individuals are less likely to get into conflict with rules and other children (as the study by Castillo et al., 2018, suggests), they should also score lower on the externalizing subscale of the SDQ, i.e., display less behavioral problems. However, risk aversion might also go hand in hand with emotional symptoms (being worried, nervous, easily losing confidence, easily being scared), leading to higher values on the internalizing subscale. Finally, we expect more prosocial individuals to exhibit less difficulties, both with respect to the internalizing and externalizing dimension of the SDQ. Peer problems (being solitary, not being liked, being picked on or bullied) and conduct problems (being disobedient, fighting with or bullying other children, lying, cheating or stealing) are both less likely for more egalitarian, altruistic or selfish children than for spiteful ones.

## 4 Empirical strategy

Analyses are conducted by estimating the following OLS regression model:

$$y_{ij} = \beta_0 + \beta_P P_{ij} + \beta_C C_{ij} + \beta_X X_{ij} + \phi_j + \varepsilon_{ij} \quad (1)$$

where  $y_{ij}$  is the outcome of individual  $i$  in family  $j$  (study attitude, risky behaviors, prosociality or emotional and behavioral difficulties),  $P_{ij}$  is the vector of time, risk, and social preferences,  $C_{ij}$  captures cognitive skills, i.e., IQ,  $X_{ij}$  is a vector of control variables (gender, age, age squared) and  $\varepsilon_{ij}$  is the error term.  $\phi_j$  are household or family fixed effects that we include in our main specifications but omit in the baseline specifications. Furthermore, in some specifications we replace household or family fixed effects  $\phi_j$  by a vector of household environment variables  $H_j$  that comprises household socio-demographics (number of siblings, income, parents' age and literacy, whether the household has an electricity connection, whether a senior (grandparent) is living in the household, whether it is a muslim household), parents' preferences (time, risk, and social preferences, analogous to children's preferences), parents' IQ and parenting styles (six dimensions: emotional warmth, inconsistent parenting, monitoring, negative communication, psychological control, strict control). For all specifications, standard errors are clustered at village level.

In a first step, we follow previous work and run regressions of child outcomes on preferences as well as IQ, gender, age, and age squared to establish the predictive power of children's preferences for their behavior.

We then go beyond existing work by including household fixed effects in our specifications, exploiting that our exceptionally rich data encompass measures of preferences and outcomes of more than 2,100 pairs of siblings. Importantly, including household fixed effects allows for controlling for all characteristics of a household that are constant across siblings.<sup>19</sup>

---

<sup>19</sup>Usually, fixed effects estimation is used in the context of panel data. Yet, instead of thinking about individuals over time and controlling for time-invariant, unobserved factors, we are considering individuals in families. Sibling (or twin) studies (i.e., sibling or family fixed effects approaches) have been used regularly in social sci-

Examples range from all socio-demographic characteristics, household composition, parental preferences, IQ, education, attitude towards their children to shared worries, challenges, daily routines, local environment, and genetic influences to name just a few. It seems plausible to assume that the vast majority of unobserved factors influencing both the formation of preferences as well as behavior are constant within families, i.e., are household-invariant.<sup>20</sup> Compared to traditional OLS regression models, the inclusion of household fixed effects is a big step forward towards a more credible causal identification strategy since they eliminate manifold sources of omitted variable bias normally present in analyses in cross-sectional settings. Even if controlling for a wide range of child and household characteristics in traditional OLS models, many unobservable factors such as genetics or family environment presumably influence both the (formation of) children's preferences as well as their behavior (that is, they are correlated with included regressors and at the same time determine the outcome variable). Clearly, the resulting endogeneity does not allow to make causal claims.

Importantly, estimating household fixed effects specifications requires sufficiently strong variation of preferences and behavior within sibling pairs to be able to identify any effects of interest. Table G.5 in the appendix documents that this variation is given. Correlations of preferences among siblings are throughout positive, but moderate in size. This is conceivable given well-documented age trends and gender differences in preferences (see, e.g., Sutter

---

ences and medicine as well as in education, labor and health economics when estimating, for example, effects of schooling on health (e.g., Fujiwara and Kawachi, 2009; Lundborg, 2013; Madsen et al., 2014; Amin et al., 2015), effects of physical and mental health on human capital accumulation and labor market outcomes (e.g., Currie and Stabile, 2006; Currie et al., 2010; Fletcher, 2013, 2014), effects of parental employment on children's educational attainment (e.g., Schildberg-Hörisch, 2011) or economic returns to schooling (e.g., Sandewall et al., 2014). With more studies from different fields applying sibling designs, advantages and limitations of the approach have been discussed in greater detail in the last decade (see, e.g., Donovan and Susser, 2011; Gilman and Loucks, 2014; Boardman and Fletcher, 2015).

<sup>20</sup>The applied household fixed effects models cannot control for unobserved confounders that possibly vary across siblings such as peer or teacher effects, different cultural expectations (e.g., regarding gender roles) or if parents treat and educate their children differently. The literature on sibling differences has identified several factors associated with the concordance or discordance of outcomes among children who are raised in the same household (see, e.g., Gilman and Loucks, 2014). One of them is birth order since, for example, first born children tend to go to school longer. Detlefsen et al. (2018) show that birth order is also an important factor for risk, time, and trust preferences. Controlling for birth order in our regressions does not change our results (and the variable's coefficient is mostly insignificant).

et al., 2019), but also commonly observed differences in preferences across siblings (see, e.g., Detlefsen et al., 2018).

## 5 Results

This section presents the results of our analysis regarding the link between child preferences and the five outcome variables study attitude, risky behaviors, prosociality, and SDQ (split into an internalizing and externalizing subscale for emotional and behavioral problems). Using OLS regressions, we first examine the predictive power of child preferences. We then proceed to showing that this predictive power does not sustain when controlling for all household-invariant characteristics. In a final step, we present suggestive evidence that controlling for an extensive set of measurable facets of household environment leads to similar but not as pronounced attenuation tendencies in the predictive power of children’s preferences for outcomes.

### 5.1 The link between child preferences and outcomes

Our main analysis includes two sets of estimates, i.e., two specifications for each outcome variable under study: “Standard” or “baseline” and the household fixed effects specifications.

**Standard specifications** Results of the standard specifications are displayed in Columns (1) and (4) of Table 6 and (1), (4), and (7) of Table 7. They contain OLS regressions of the five outcomes on our key explanatory variables: time, risk, and social preferences.<sup>21</sup> Additionally, we are controlling for cognitive skills (IQ) as well as basic exogenous variables that are unrelated to household environment (gender and age; including age squared to allow for varying functional forms).<sup>22</sup>

---

<sup>21</sup>Coefficients of main explanatory variables of interest for each outcome (cf. section 3 on hypotheses) are printed in bold.

<sup>22</sup>Starting from our sibling sample, the estimation samples are further restricted to households in which all included variables are available for both siblings to make regressions comparable across specifications. Running

In the standard specifications, preferences have significant predictive power. In particular, risk preferences map into risky behaviors, prosociality as well as emotional health and social preferences map into prosociality, study attitude as well as emotional and behavioral difficulties.<sup>23</sup> Tests of joint significance for preference coefficients confirm this. The somewhat weaker results for study attitude and time preferences may be due to the fact that our data only contain study attitude instead of a more direct measure of educational attainment that is usually found to be connected with patience.<sup>24</sup>

Being risk averse instead of risk neutral or risk seeking comes along with a 2 percentage points reduction in the fraction of risky behaviors children engage in which corresponds to an about 10 percent reduction of the mean. Thus, risk aversion as measured by our experimental procedures is accompanied by lower risk taking behavior in everyday life. This adds to the rather scarce and mixed empirical evidence linking children's risk preferences and behaviors. Castillo et al. (2018) find risk averse teenagers to behave better at school whereas Sutter et al. (2013) cannot establish a link between risk aversion and risky behaviors such as smoking, alcohol consumption, or conduct at school. In our data, also, risk averse children score significantly higher on the internalizing SDQ score (a 0.07 standard deviations increase) than risk neutral or risk seeking children, and thus show more emotional struggles. Besides providing novel results on the relation between preferences and emotional and behavioral problems, we are the first to connect social preferences and field behavior of children and adolescents. Being egalitarian as opposed to spiteful (the omitted base category in our social preferences classification) is associated with a 0.22 standard deviations higher prosociality score. Being selfish instead of spiteful still increases prosociality by 0.16 standard deviations. In a similar vein,

---

regressions including household fixed effects, households with one of the children missing relevant information (singleton households) are automatically dropped. For study attitude, this applies to 3 households, for risky behaviors to 8 households, and both for prosociality and SDQ to 55 households.

<sup>23</sup>Running (ordered) logit and probit regressions for suitable outcome representations such as using raw scores for study attitude, prosociality, and SDQ as well as SDQ categories leads to similar results.

<sup>24</sup>Adolescents' time preferences have been linked to school performance with more patient teenagers having higher educational attainments (Golsteyn et al., 2014) and being more likely to graduate from high school (Castillo et al., 2019).

egalitarian children exhibit 0.26 and 0.33 standard deviations lower SDQ scores in the internalizing and externalizing dimension, i.e., fewer emotional and behavioral problems, than spiteful children. Selfish instead of spiteful children have 0.28 and 0.27 standard deviations lower internalizing and externalizing SDQ scores. Results for being altruistic contrary to being spiteful show similar tendencies, yet without being statistically significant. This might be due to the fact that the group of children classified as altruists is comparably small. Only 8 percent of children fall into the category “altruistic”, whereas 19 percent are “egalitarian” and 37 percent are “selfish”.

Most results are in line with our hypotheses. Risk and social preferences map into their respective outcome counterparts, risky behaviors and prosociality. Social preferences also seem predictive of behavioral difficulties. Splitting the SDQ into its internalizing and externalizing subdimensions, being risk averse is associated with more emotional problems in terms of being fearful or easily worried, but not with better conduct. Interestingly, time consistency is related to better emotional health as measured by the internalizing subscale.

Moreover, IQ is predictive of all outcome measures and higher IQ scores are associated with more favorable outcomes throughout. Based on a highly standardized test, the Wechsler Intelligence Scale for Children is known to capture cognitive skills in different cultural contexts—always being a strong indicator for a variety of outcomes such as school performance (Reynolds et al., 2010; Almlund et al., 2011) or later adult life outcomes (Strenze, 2007; Borghans et al., 2008; Golsteyn et al., 2014).

In sum, in the standard specifications child preferences have predictive power for a broad range of outcomes. Our results thus extend the scarce existing results on the link between children’s preferences and outcomes to a much broader set of outcomes than those studied previously, using a large sample of children that covers elementary school age to late adolescence. Since we comprehensively measure all three main domains of economic preferences, we are the first to add evidence regarding the predictive power of children’s social preferences. They turn out to be associated with manifold outcome dimensions that range from study

attitudes and behavioral problems to measures of mental health and prosociality.

**Household fixed effects specifications** Next we present the estimations with household fixed effects. Once we start controlling for all household-invariant characteristics, the previously demonstrated predictive power of children's preferences for their outcomes and behaviors largely vanishes. Columns (2) and (5) in Table 6 and columns (2), (5), and (8) in Table 7 display results from regressions that include household fixed effects. Adding household fixed effects leads to strongly reduced coefficients (in absolute terms) and significance for all preference measures. This pattern is very stable as it holds for all three preference dimensions and across all outcomes, independent of whether they are child- or mother-reported. The coefficients of cognitive skills are much smaller in size, too, even though still significant. These trends also hold when looking at the joint significance of groups of preferences via F-tests, i.e., whether time or social preferences are jointly predictive of study attitude and prosociality, respectively, and whether all preference dimensions are jointly significant when regressing SDQ dimensions on the explanatory variables. An exception is that social preferences remain jointly marginally significant in predicting children's prosociality.

Overall, introducing household fixed effects into our models, the predictive power of preferences dissolves substantially. This suggests that the estimates on the link between preference measures for children and their outcomes largely reflect their joint correlation with household environment characteristics. The strong reaction of estimated coefficients to the inclusion of household fixed effects points towards omitted variable bias. Once we include household fixed effects, measures of child preferences no longer seem to contain enough independent and systematic variation to contribute significantly to explaining child outcomes and behavior.<sup>25</sup>

---

<sup>25</sup>In regressions of child preferences on household fixed effects, the fixed effects explain about 55 to 70 percent of the variation in preferences, depending on the preference dimension under consideration.

**Table 6:** Adding household fixed effects (HH FE) vs. household environment variables (HH env) to regressions of child outcomes on preferences—Study attitude and risky behaviors

	STUDY ATTITUDE <sup>†</sup>			RISKY BEHAVIORS <sup>†</sup>		
	(1) Baseline	(2) HH FE	(3) HH env	(4) Baseline	(5) HH FE	(6) HH env
<b>Preferences<sup>†</sup></b>						
patience	<b>-0.009</b> ( <b>0.008</b> )	<b>0.005</b> ( <b>0.010</b> )	<b>0.000</b> ( <b>0.008</b> )	0.005** (0.002)	0.003 (0.003)	0.004 (0.002)
time consistent	<b>0.064*</b> ( <b>0.034</b> )	<b>0.009</b> ( <b>0.044</b> )	<b>0.053</b> ( <b>0.035</b> )	0.008 (0.009)	0.027*** (0.008)	0.012 (0.009)
risk averse	0.052* (0.031)	0.002 (0.035)	0.043 (0.030)	<b>-0.020**</b> ( <b>0.009</b> )	<b>-0.002</b> ( <b>0.008</b> )	<b>-0.019**</b> ( <b>0.009</b> )
egalitarian	0.328*** (0.076)	0.196** (0.083)	0.253*** (0.076)	-0.040** (0.020)	-0.038 (0.023)	-0.021 (0.021)
altruistic	0.248*** (0.095)	0.159* (0.094)	0.180** (0.091)	-0.024 (0.023)	-0.004 (0.024)	-0.005 (0.023)
selfish	0.251*** (0.074)	0.140* (0.083)	0.156** (0.075)	-0.014 (0.018)	-0.014 (0.020)	0.003 (0.019)
mixed	0.258*** (0.076)	0.213** (0.084)	0.190** (0.075)	-0.026 (0.020)	-0.020 (0.020)	-0.008 (0.020)
<i>p</i> -value joint significance						
time preferences	0.085	0.879	0.330	0.079	0.006	0.153
social preferences	0.001	0.094	0.015	0.187	0.289	0.409
all preferences	0.001	0.321	0.019	0.009	0.038	0.092
<b>Cognitive skills<sup>†</sup></b>						
IQ	0.140*** (0.024)	0.073** (0.035)	0.101*** (0.027)	-0.032*** (0.006)	-0.009 (0.007)	-0.016** (0.006)
<b>Control variables: Gender &amp; age<sup>‡</sup></b>						
female	0.016 (0.030)	0.046 (0.032)	0.013 (0.030)	-0.136*** (0.008)	-0.143*** (0.008)	-0.144*** (0.008)
age	0.024 (0.042)	0.078 (0.047)	0.042 (0.044)	0.067** (0.029)	-0.004 (0.028)	0.045 (0.030)
age squared	-0.000 (0.002)	-0.002 (0.002)	-0.001 (0.002)	-0.003*** (0.001)	-0.000 (0.001)	-0.002* (0.001)
<b>Household environment<sup>††</sup></b>						
household fixed effects	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>
socio-demographics	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>
<i>p</i> -value joint significance			0.065			0.120
parents' preferences	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>
<i>p</i> -value joint significance			0.005			0.030
parents' IQ	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>
<i>p</i> -value joint significance			0.016			0.001
parenting styles	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>
<i>p</i> -value joint significance			0.000			0.000
<b>Constant</b>						
constant	-0.551** (0.249)	-0.799*** (0.274)	-0.320 (0.363)	-0.082 (0.180)	0.341* (0.176)	0.197 (0.207)
Observations	4,276	4,276	4,006	1,354	1,354	1,238
<i>R</i> <sup>2</sup>	0.042	0.692	0.073	0.238	0.834	0.342
adj. <i>R</i> <sup>2</sup>	0.039	0.382	0.062	0.232	0.663	0.318
<i>F</i>	16.130	10.018	9.077	44.675	36.422	16.419

**Notes:** Standard errors (in parentheses) are clustered at village level for all specifications. <sup>†</sup>Study attitude, risky behaviors, preferences, and cognitive skills measures are defined as described in sections 2.2-2.4. Study attitude and IQ are normalized to a mean of zero and standard deviation of one across our final estimation sibling sample. <sup>‡</sup>Female is an indicator for being a girl, age is measured in years. <sup>††</sup>Household (HH) socio-demographics comprise the number of siblings in HH, HH income, parents' age and literacy, whether the HH has an electricity connection, whether a senior is living in the HH, and religion; parents' preferences and IQ comprise variables analogous to children's measures (see sections 2.2 and 2.3); parenting styles comprise the six dimensions emotional warmth, inconsistent parenting, monitoring (intensity), negative communication, psychological control, and strict control as described in appendix section D. All columns display OLS regressions, specifications in columns (2) and (5) include household fixed effects. Coefficients of main explanatory variables of interest for each outcome (cf. section 3 on hypotheses) are printed in bold. Significance at \**p* < 0.10, \*\**p* < 0.05, \*\*\**p* < 0.01.

**Table 7:** Adding household fixed effects (HH FE) vs. household environment variables (HH env) to regressions of child outcomes on preferences—Prosociality and SDQ internalizing (emotional symptoms & peer problems) and externalizing (hyperactivity & conduct problems) subscales

	PROSOCIALITY <sup>†</sup>			SDQ INTERNALIZING SCALE <sup>†</sup>			SDQ EXTERNALIZING SCALE <sup>†</sup>		
	(1) Baseline	(2) HH FE	(3) HH env	(4) Baseline	(5) HH FE	(6) HH env	(7) Baseline	(8) HH FE	(9) HH env
<b>Preferences<sup>†</sup></b>									
patience	0.018* (0.010)	-0.012 (0.008)	0.025** (0.010)	0.003 (0.010)	-0.007 (0.008)	-0.012 (0.009)	<b>0.012</b> <b>(0.010)</b>	<b>0.017*</b> <b>(0.010)</b>	<b>-0.003</b> <b>(0.009)</b>
time consistent	-0.002 (0.037)	-0.006 (0.030)	-0.012 (0.034)	-0.103*** (0.038)	-0.017 (0.032)	-0.101*** (0.034)	<b>0.007</b> <b>(0.033)</b>	<b>0.056</b> <b>(0.035)</b>	<b>0.008</b> <b>(0.030)</b>
risk averse	0.135*** (0.032)	0.036 (0.027)	0.093*** (0.028)	<b>0.066**</b> <b>(0.033)</b>	<b>-0.008</b> <b>(0.030)</b>	<b>0.056*</b> <b>(0.029)</b>	<b>-0.010</b> <b>(0.030)</b>	<b>0.042</b> <b>(0.032)</b>	<b>0.007</b> <b>(0.030)</b>
egalitarian	<b>0.221***</b> <b>(0.072)</b>	<b>0.101</b> <b>(0.068)</b>	<b>0.202***</b> <b>(0.070)</b>	<b>-0.255***</b> <b>(0.080)</b>	<b>-0.015</b> <b>(0.065)</b>	<b>-0.170**</b> <b>(0.075)</b>	<b>-0.329***</b> <b>(0.079)</b>	<b>-0.148</b> <b>(0.090)</b>	<b>-0.221***</b> <b>(0.076)</b>
altruistic	<b>0.098</b> <b>(0.082)</b>	<b>0.015</b> <b>(0.075)</b>	<b>0.027</b> <b>(0.074)</b>	<b>-0.141</b> <b>(0.102)</b>	<b>-0.001</b> <b>(0.075)</b>	<b>-0.060</b> <b>(0.086)</b>	<b>-0.130</b> <b>(0.101)</b>	<b>-0.125</b> <b>(0.089)</b>	<b>-0.024</b> <b>(0.080)</b>
selfish	<b>0.156**</b> <b>(0.068)</b>	<b>0.121**</b> <b>(0.057)</b>	<b>0.099</b> <b>(0.061)</b>	<b>-0.279***</b> <b>(0.083)</b>	<b>-0.009</b> <b>(0.060)</b>	<b>-0.162**</b> <b>(0.069)</b>	<b>-0.269***</b> <b>(0.079)</b>	<b>-0.148*</b> <b>(0.076)</b>	<b>-0.115*</b> <b>(0.065)</b>
mixed	0.121* (0.069)	0.074 (0.058)	0.093 (0.066)	-0.154* (0.084)	0.034 (0.060)	-0.091 (0.070)	-0.241*** (0.077)	-0.175** (0.077)	-0.144** (0.066)
<i>p</i> -value joint significance									
time preferences	0.195	0.357	0.037	0.021	0.646	0.009	0.541	0.117	0.895
social preferences	0.023	0.055	0.024	0.001	0.741	0.029	0.000	0.273	0.022
all preferences	0.000	0.054	0.000	0.000	0.868	0.001	0.002	0.093	0.109
<b>Cognitive skills<sup>†</sup></b>									
IQ	0.219*** (0.025)	0.072*** (0.023)	0.091*** (0.024)	-0.190*** (0.027)	-0.038 (0.027)	-0.099*** (0.028)	-0.211*** (0.024)	-0.092*** (0.031)	-0.115*** (0.023)
<b>Control variables: Gender &amp; age<sup>†</sup></b>									
female	0.096*** (0.028)	0.164*** (0.027)	0.076*** (0.027)	0.019 (0.031)	-0.021 (0.026)	0.024 (0.028)	-0.224*** (0.030)	-0.299*** (0.031)	-0.213*** (0.029)
age	0.066 (0.048)	0.129*** (0.035)	0.080* (0.045)	0.110** (0.046)	0.048 (0.037)	0.065 (0.042)	0.066 (0.048)	0.034 (0.044)	0.047 (0.047)
age squared	-0.002 (0.002)	-0.004*** (0.002)	-0.002 (0.002)	-0.005** (0.002)	-0.003* (0.002)	-0.003* (0.002)	-0.004* (0.002)	-0.004* (0.002)	-0.004* (0.002)
<b>Household environment<sup>††</sup></b>									
household fixed effects	✗	✓	✗	✗	✓	✗	✗	✓	✗
socio-demographics	✗	✗	✓	✗	✗	✓	✗	✗	✓
<i>p</i> -value joint significance			0.276			0.043			0.216
parents' preferences	✗	✗	✓	✗	✗	✓	✗	✗	✓
<i>p</i> -value joint significance			0.001			0.005			0.009
parents' IQ	✗	✗	✓	✗	✗	✓	✗	✗	✓
<i>p</i> -value joint significance			0.000			0.367			0.125
parenting styles	✗	✗	✓	✗	✗	✓	✗	✗	✓
<i>p</i> -value joint significance			0.000			0.000			0.000
<b>Constant</b>									
constant	-0.705*** (0.267)	-1.014*** (0.202)	-0.961*** (0.324)	-0.382 (0.251)	-0.146 (0.215)	-0.306 (0.311)	0.098 (0.266)	0.258 (0.261)	0.365 (0.343)
Observations	4,118	4,118	3,896	4,118	4,118	3,896	4,118	4,118	3,896
<i>R</i> <sup>2</sup>	0.067	0.839	0.211	0.041	0.821	0.233	0.080	0.767	0.219
adj. <i>R</i> <sup>2</sup>	0.065	0.676	0.202	0.039	0.641	0.224	0.077	0.532	0.210
<i>F</i>	25.402	19.392	17.409	10.052	2.372	10.861	30.693	25.556	19.225

**Notes:** Standard errors (in parentheses) are clustered at village level for all specifications. <sup>†</sup>Prosociality, SDQ internalizing and externalizing subscales, preferences, and cognitive skills measures are defined as described in sections 2.2-2.4. Prosociality, SDQ subscales, and IQ are normalized to a mean of zero and standard deviation of one across our final estimation sibling sample. <sup>††</sup>Female is an indicator for being a girl, age is measured in years. <sup>†††</sup>Household (HH) socio-demographics comprise the number of siblings in HH, HH income, parents' age and literacy, whether the HH has an electricity connection, whether a senior is living in the HH, and religion; parents' preferences and IQ comprise variables analogous to children's measures (see sections 2.2 and 2.3); parenting styles comprise the six dimensions emotional warmth, inconsistent parenting, monitoring (intensity), negative communication, psychological control, and strict control as described in appendix section D. All columns display OLS regressions, specifications in columns (2), (5) and (8) include household fixed effects. Coefficients of main explanatory variables of interest for each outcome (cf. section 3 on hypotheses) are printed in bold. Significance at \**p* < 0.10, \*\**p* < 0.05, \*\*\**p* < 0.01.

## 5.2 Replicating household environment

Exploiting our comprehensive data set, we proceed by presenting suggestive evidence that this source of bias cannot be removed by controlling for measurable household environment facets. This is true despite the fact that we are able to include exceptionally broad measures of household environment that are designed to capture social facets and interactions beyond economic setups. Including them in the standard specifications moves coefficients in the same direction as including household fixed effects, yet to a much smaller extent, which indicates that many household-invariant characteristics are still missing.

Tables 6 and 7, again, display comparisons of three regression specifications for all five outcome measures of interest. Columns (1) and (4) in Table 6 and columns (1), (4), and (7) in Table 7 contain the sparse regressions of child outcomes on preferences and IQ as well as gender and age. Specifications in columns (3) and (6) (and (9)) extend these regressions adding control variables for family structure, socio-economic status, living conditions, religion, parental preferences<sup>26</sup> and IQ as well as parenting styles. Reduced numbers of observations in columns (3) and (6) (and (9)) compared to baseline and household fixed effects specifications are due to missing values in single control variables added to describe household environment.<sup>27</sup>

For study attitude, including household environment variables renders the coefficient of time consistency slightly smaller and insignificant. However, adding fixed effects reduces the coefficient to nearly one tenth of its original size. Looking at risky behaviors, adding the full set of control variables hardly makes a difference, but adding household fixed ef-

---

<sup>26</sup>Within our sibling sample (4,282 observations), we do not have complete parental preferences for all children. For 76 percent of children (3,266 observations) both father and mother participated in the experiments. For 1 percent (40 observations) only the father participated, for 22 percent (956 observations) only the mother participated. The latter cases reflect the fact that often the father is away for work while the mother as the main caretaker is at home (cf. footnote 30). In order to not lose those observations, we applied the missing-indicator method: Adding an indicator for the missing father values and setting the respective missing values to zero. We are aware that this might introduce (additional) bias into our estimations (see, e.g., Groenwold et al., 2012). However, replicating household environment is merely suggestive evidence and facing the trade-off between a loss of data and precision and some more uncertainty regarding results, we decided to increase statistical power.

<sup>27</sup>Results remain similar if reducing the sample to the observations included in the household environment specifications in all estimations, i.e., baseline and household fixed effects specifications.

fects downsizes the coefficient to basically zero. In the prosociality specifications, all social preferences measures' coefficients decrease in size when adding household environment variables as controls as well as when adding household fixed effects. Yet, focusing for example on egalitarianism as a strong predictor of prosociality, controlling for a limited set of household facets only marginally changes the dummy variable's predictive power, whereas only looking at within-household variation cuts the coefficient in half and renders it insignificant. Effects for emotional and behavioral problems (SDQ) are even more clear-cut and joint significances of groups of preferences support the observation that family fixed effects are much more thoroughly controlling for household environment than even a comprehensive set of household control variables.

Table H.6 in the appendix (section H) displays estimations with all coefficients. Note that across all outcome measures, parenting styles are highly predictive, often much more than socio-demographics or parental IQ and preferences. Depending on the outcome measure, a change in a single parenting style dimension by one standard deviation can have an impact three times as high as a one standard deviation change in child IQ.<sup>28</sup> Assuming that household environment shapes a child's personality and behavior, it is plausible that parenting styles, i.e., the atmosphere and direct reactions to attitudes and actions, are of great importance for children's and adolescents' behavior. A child's socio-economic status (his or her parents' income and education) is mostly insignificant for behavioral difficulties and only marginally affects study attitude and risky behaviors. Parental IQ does not predict a child's degree of behavioral difficulties, but the parents' social preferences do. The father's IQ has an effect similar to the child's IQ on his or her study attitude, risky behaviors, and prosociality, a mother's IQ is only predictive of the latter. Maternal preferences are predictive of a child's prosociality, yet the father's preferences are not. A mother's risk aversion is related to her child's risky behaviors just as much as the child's own risk attitude.

---

<sup>28</sup>For example, a one standard deviation increase in emotional warmth increases a child's emotional health by nearly 0.2 standard deviations (SDQ internalizing subscale). Increasing psychological control by one standard deviation reduces emotional health by 0.33 standard deviations. A one standard deviation higher IQ, as a comparison, increases emotional health by 0.1 standard deviations.

## 6 Conclusion

This study provides several important insights for a better understanding of the relation between preferences and behavior of children and adolescents. Using standard cross-sectional specifications, we first confirm and extend previous findings that establish the predictive power of children's preferences for their behavior and outcomes. We thereby rely on novel data on more than 4,200 children, covering the whole age range from elementary school age to the end of adolescence. Our data encompass incentivized experimental measures of time, risk, and social preferences as well as manifold outcome measures. In contrast to earlier studies, this allows for a comprehensive investigation of the link between all key preference dimensions and various major child outcomes within a unified framework. Our findings confirm that children's time preferences predict educational outcomes and risk preferences risky behaviors. In addition, we provide first evidence on the predictive power of children's social preferences. In particular, we find that non-spiteful children behave in a more prosocial manner and display fewer behavioral problems, both with regard to internalizing and externalizing behaviors.

We proceed by exploiting another exceptional feature of our data, the fact that we have data on more than 2,000 pairs of siblings. For the first time, this allows analyzing the link between preferences and outcomes in household fixed effects models that control for all household-invariant characteristics that are shared by siblings. In the household fixed effects specifications, the explanatory power of childhood preferences largely vanishes. Our comprehensive perspective reveals that this attenuation tendency affects time, risk, and social preferences to a similarly strong extent. Importantly, this finding suggests that measures of preferences in childhood and adolescence largely reflect household environment. In a final step, we show that explicitly controlling for an extensive set of household characteristics instead of including household fixed effects leads to similar, yet much weaker attenuation tendencies for the estimated link between childhood preferences and outcomes.

Our findings hold broad significance. Previous research has shown that household en-

vironment matters for both preference formation (Delaney and Doyle, 2012; Bauer et al., 2014; Angerer et al., 2015; Alan et al., 2017; Doepke and Zilibotti, 2017; Cobb-Clark et al., 2019; Kosse et al., 2020; Falk et al., nd) and child outcomes (Currie, 2001; Bradley and Corwyn, 2002; Case et al., 2002; Currie and Moretti, 2003; Ruhm and Waldfogel, 2012; Aizer and Currie, 2014; Heckman and Mosso, 2014). In that sense, our results that the predictive power of childhood preferences decreases when thoroughly controlling for household characteristics in the fixed effects specifications are no surprise. Remarkable, however, is the extent: The predictive power of childhood preferences dissolves almost entirely, indicating that there is not enough variation in preference measures left for explaining child outcomes when controlling for environment that is shared by siblings in the most comprehensive possible manner. This may seem surprising given the recent evidence that also social environment beyond the family plays a significant role in shaping children’s preferences.<sup>29</sup> In our sample consisting of children in rural villages in Bangladesh, social environment—e.g., school and teachers, peers, village characteristics—might be shared by siblings to an even stronger degree than in other, e.g., more urban, contexts.

More generally, our findings on the importance of household and family environment for the formation of preferences relates to previous evidence on the malleability of preferences in childhood. Interestingly, comparing how much the predictive power of child preferences and IQ reduces when controlling for household fixed effects shows that estimated effects sizes of children’s IQ decrease to a much smaller extent than those of their preferences. Moreover, in contrast to preferences, IQ remains a significant predictor of child outcomes even in the fixed effects specifications. This finding is akin to the literature showing that non-cognitive traits are more easily malleable than cognitive traits in response to early childhood environment (see, e.g., Heckman et al., 2010, 2013, although these papers do not focus specifically on the development of economic preferences). Our findings thus relate to the literature on skill

---

<sup>29</sup>For recent contributions, see Alan and Ertac (2018) for a school-based intervention that boosted patience, Kosse et al. (2020) for the effect of an out-of-school mentoring program and Cappelen et al. (nd) for the effect of early education on social preferences. Rodríguez-Planas (2012) and Kautz et al. (2014) provide overviews on mentoring programs and childhood interventions and their impact on children’s non-cognitive skills.

formation (see, e.g., Cunha and Heckman, 2007) that highlights childhood as a critical and sensitive period for the formation of personality traits and preferences. We also contribute to the growing body of research trying to disentangle determinants and consequences of differences in preferences and alters the interpretation of existing empirical literature. Knowing that family environment is connected to both children's preferences and behaviors underlines findings such as the importance of socio-economic status (Falk et al., nd) regarding children's skills and contributes to the debate on how (much) children's preferences are related to their field behaviors (Castillo et al., 2011, 2018, 2019; Sutter et al., 2013).

Taking a broader perspective, our findings raise the fundamental question what experimental measures of childhood preferences ultimately capture. They suggest that measures of children's and adolescents' preferences largely reflect household environment that is shared by siblings. Does this make childhood preferences a dispensable concept and recent advances in their measurement (Sutter et al., 2013, 2019) redundant? Our results highlight that household environment is very influential in shaping children's life, in both its preference and outcome dimensions. This underlines the need to include household environment in investigations that aim at a better understanding of child outcomes and behavior. However, household environment is extremely hard to measure rigorously in quantitative surveys. Likely, a lot of input and values from parents and family surrounding is conveyed between the lines and hence difficult to quantify. This makes childhood preferences a valuable tool for the prediction of child behavior and outcomes. If children's preferences have predictive power precisely because they reflect manifold household characteristics, as our results suggest, they can be considered helpful in predicting child outcomes. Prediction is conducive, e.g., when exploring new contexts or identifying children at risk. Obviously, our findings also highlight the importance of abstaining from causal claims when using measures of child preferences to predict child behavior or outcomes.

In contrast to the malleable and still emerging preferences of children and adolescents, adult preferences are assumed to be largely stable (Schildberg-Hörisch, 2018) and less respon-

sive to family and social environment. It would thus be interesting to investigate in future research to which extent the predictive power of adult preferences for life outcomes decreases when controlling for household and social environment in a similarly comprehensive manner.

## 7 Bibliography

- Aizer, A. and Currie, J. (2014). The Intergenerational Transmission of Inequality: Maternal Disadvantage and Health at Birth. *Science*, 344(6186):856–861.
- Åkerlund, D., Golsteyn, B. H., Grönqvist, H., and Lindahl, L. (2016). Time Discounting and Criminal Behavior. *Proceedings of the National Academy of Sciences*, 113(22):6160–6165.
- Alan, S., Baydar, N., Boneva, T., Crossley, T. F., and Ertac, S. (2017). Transmission of Risk Preferences from Mothers to Daughters. *Journal of Economic Behavior & Organization*, 134:60–77.
- Alan, S. and Ertac, S. (2018). Fostering Patience in the Classroom: Results from Randomized Educational Intervention. *Journal of Political Economy*, 126(5):1865–1911.
- Alexander, K. L., Entwisle, D. R., and Horsey, C. S. (1997). From First Grade Forward: Early Foundations of High School Dropout. *Sociology of Education*, 70(2):87–107.
- Almås, I., Cappelen, A. W., Salvanes, K. G., Sørensen, E. Ø., and Tungodden, B. (2016). Willingness to Compete: Family Matters. *Management Science*, 62(8):2149–2162.
- Almlund, M., Duckworth, A. L., Heckman, J. J., and Kautz, T. D. (2011). Personality Psychology and Economics. In Hanushek, E. A., Machin, S., and Woessmann, L., editors, *Handbook of the Economics of Education*, volume 4, pages 1–181. Elsevier.
- Amin, V., Behrman, J. R., and Kohler, H.-P. (2015). Schooling Has Smaller or Insignificant Effects on Adult Health in the US than Suggested by Cross-Sectional Associations: New Estimates Using Relatively Large Samples of Identical Twins. *Social Science & Medicine*, 127:181–189.
- Anderson, L. R. and Mellor, J. M. (2008). Predicting Health Behaviors With an Experimental Measure of Risk Preference. *Journal of Health Economics*, 27(5):1260–1274.
- Angerer, S., Glätzle-Rützler, D., Lergetporer, P., and Sutter, M. (2015). Donations, Risk Attitudes and Time Preferences: A Study on Altruism in Primary School Children. *Journal of Economic Behavior & Organization*, 115:67–74.
- Attanasio, O., Blundell, R., Conti, G., and Mason, G. (n.d.). Inequality in Socio-Emotional Skills: A Cross-Cohort Comparison. *Journal of Public Economics*.
- Ball, S., Eckel, C. C., and Heracleous, M. (2010). Risk Aversion and Physical Prowess: Prediction, Choice and Bias. *Journal of Risk and Uncertainty*, 41(3):167–193.
- Barsky, R. B., Juster, F. T., Kimball, M. S., and Shapiro, M. D. (1997). Preference Parameters and Behavioral Heterogeneity: An Experimental Approach in the Health and Retirement Study. *Quarterly Journal of Economics*, 112(2):537–579.

- Bauer, M., Chytilová, J., and Morduch, J. (2012). Behavioral Foundations of Microcredit: Experimental and Survey Evidence from Rural India. *American Economic Review*, 102(2):1118–1139.
- Bauer, M., Chytilová, J., and Pertold-Gebicka, B. (2014). Parental Background and Other-Regarding Preferences in Children. *Experimental Economics*, 17(1):24–46.
- Becker, A., Deckers, T., Dohmen, T., Falk, A., and Kosse, F. (2012). The Relationship Between Economic Preferences and Psychological Personality Measures. *Annual Review of Economics*, 4:453–478.
- Bickel, W. K., Odum, A. L., and Madden, G. J. (1999). Impulsivity and Cigarette Smoking: Delay Discounting in Current, Never, and Ex-Smokers. *Psychopharmacology*, 146(4):447–454.
- Binswanger, H. P. (1980). Attitudes Toward Risk: Experimental Measurement in Rural India. *American Journal of Agricultural Economics*, 62(3):395–407.
- Bisin, A. and Verdier, T. (2000). “Beyond the Melting Pot”: Cultural Transmission, Marriage, and the Evolution of Ethnic and Religious Traits. *Quarterly Journal of Economics*, 115(3):955–988.
- Boardman, J. D. and Fletcher, J. M. (2015). To Cause or Not to Cause? That is the Question, but Identical Twins Might Not Have All of the Answers. *Social Science & Medicine*, 127:198–200.
- Bonin, H., Dohmen, T., Falk, A., Huffman, D., and Sunde, U. (2007). Cross-Sectional Earnings Risk and Occupational Sorting: The Role of Risk Attitudes. *Labour Economics*, 14(6):926–937.
- Borghans, L., ter Weel, B., and Weinberg, B. A. (2008). Interpersonal Styles and Labor Market Outcomes. *The Journal of Human Resources*, 43(4):815–858.
- Bowles, S. and Gintis, H. (2002). Schooling in Capitalist America Revisited. *Sociology of Education*, 75(1):1–18.
- Brañas-Garza, P., Espín, A. M., and Neuman, S. (2014). Religious Pro-Sociality? Experimental Evidence from a Sample of 766 Spaniards. *PLoS ONE*, 9(8):e104685.
- Bradley, R. H. and Corwyn, R. F. (2002). Socioeconomic Status and Child Development. *Annual Review of Psychology*, 53:371–399.
- Brenøe, A. A. and Epper, T. (2019). Parenting Values Moderate the Intergenerational Transmission of Time Preferences. IZA Discussion Paper No. 12710.

- Briole, S., Le Forner, H., and Lepinteur, A. (n.d.). Child's Socio-Emotional Skills: Is There a Quantity-Quality Trade-off? *Labour Economics*.
- Buchanan, T. W. and Preston, S. D. (2014). Stress Leads to Prosocial Action in Immediate Need Situations. *Frontiers in Behavioral Neuroscience*, 8(5):1–6.
- Burks, S. V., Nosenzo, D., Anderson, J. E., Bombyk, M., Ganzhorn, D., Götte, L., and Rustichini, A. (2016). Lab Measures of Other-Regarding Preferences Can Predict Some Related On-the-Job Behavior: Evidence from a Large Scale Field Experiment. IZA Discussion Paper No. 9767.
- Cadena, B. C. and Keys, B. J. (2015). Human Capital and the Lifetime Costs of Impatience. *American Economic Journal: Economic Policy*, 7(3):126–153.
- Campos-Vazquez, R. M. (2018). Intergenerational Persistence of Skills and Socioeconomic Status. *Journal of Family and Economic Issues*, 39(3):509–523.
- Cappelen, A., List, J., Samek, A., and Tungodden, B. (n.d.). The Effect of Early-Childhood Education on Social Preferences. *Journal of Political Economy*.
- Carpenter, J. and Seki, E. (2011). Do Social Preferences Increase Productivity? Field Experimental Evidence from Fishermen in Toyama Bay. *Economic Inquiry*, 49(2):612–630.
- Case, A., Lubotsky, D., and Paxson, C. (2002). Economic Status and Health in Childhood: The Origins of the Gradient. *American Economic Review*, 92(5):1308–1334.
- Caspi, A. (2000). The Child is Father of the Man: Personality Continuities from Childhood to Adulthood. *Journal of Personality and Social Psychology*, 78(1):158–172.
- Caspi, A., Harrington, H., Milne, B., Amell, J. W., Theodore, R. F., and Moffitt, T. E. (2003). Children's Behavioral Styles at Age 3 Are Linked to their Adult Personality Traits at Age 26. *Journal of Personality*, 71(4):495–514.
- Castillo, M. (2020). Negative Childhood Experiences and Risk Aversion: Evidence from Children Exposed to Domestic Violence. IZA Discussion Paper No. 13320.
- Castillo, M., Ferraro, P. J., Jordan, J. L., and Petrie, R. (2011). The Today and Tomorrow of Kids: Time Preferences and Educational Outcomes of Children. *Journal of Public Economics*, 95(11–12):1377–1385.
- Castillo, M., Jordan, J. L., and Petrie, R. (2018). Children's Rationality, Risk Attitudes and Field Behavior. *European Economic Review*, 102:62–81.
- Castillo, M., Jordan, J. L., and Petrie, R. (2019). Discount Rates of Children and High School Graduation. *Economic Journal*, 129(619):1153–1181.

- Cattell, R. B. (1971). *Abilities: Their Structure, Growth, and Action*. Boston: Houghton Mifflin.
- Ceccato, S., Kettner, S. E., Kudielka, B. M., Schwierien, C., and Voss, A. (2018). Social Preferences under Chronic Stress. *PLoS ONE*, 13(7):e0199528.
- Cesarini, D., Dawes, C. T., Johannesson, M., Lichtenstein, P., and Wallace, B. (2009). Genetic Variation in Preferences for Giving and Risk Taking. *Quarterly Journal of Economics*, 124(2):809–842.
- Chabris, C. F., Laibson, D., Morris, C. L., Schuldt, J. P., and Taubinsky, D. (2008). Individual Laboratory-Measured Discount Rates Predict Field Behavior. *Journal of Risk and Uncertainty*, 37(2/3):237–269.
- Chowdhury, S., Guiteras, R. P., and Zimmermann, K. F. (2014). Labor Supply and Productivity in Times of Environmental Shocks: The Case of Arsenic Contamination in Bangladesh. Mimeo.
- Chowdhury, S., Sutter, M., and Zimmermann, K. F. (2018). Evaluating Intergenerational Persistence of Economic Preferences: A Large Scale Experiment with Families in Bangladesh. IZA Discussion Paper No. 11337.
- Clark, A. E. and Lepinteur, A. (2019). The Causes and Consequences of Early-Adult Unemployment: Evidence from Cohort Data. *Journal of Economic Behavior & Organization*, 166:107–124.
- Cobb-Clark, D. A., Salamanca, N., and Zhu, A. (2019). Parenting Style as an Investment in Human Development. *Journal of Population Economics*, 32(4):1315–1352.
- Cornelissen, T. and Dustmann, C. (2019). Early School Exposure, Test Scores, and Noncognitive Outcomes. *American Economic Journal: Economic Policy*, 11(2):35–63.
- Cunha, F. and Heckman, J. J. (2007). The Technology of Skill Formation. *American Economic Review*, 97(2):31–47.
- Currie, J. (2001). Early Childhood Education Programs. *Journal of Economic Perspectives*, 15(2):213–238.
- Currie, J. and Moretti, E. (2003). Mother’s Education and the Intergenerational Transmission of Human Capital: Evidence from College Openings. *Quarterly Journal of Economics*, 118(4):1495–1532.
- Currie, J. and Stabile, M. (2006). Child Mental Health and Human Capital Accumulation: The Case of ADHD. *Journal of Health Economics*, 25(6):1094–1118.

- Currie, J., Stabile, M., Manivong, P., and Roos, L. L. (2010). Child Health and Young Adult Outcomes. *Journal of Human Resources*, 45(3):517–548.
- Dawson, C. and Henley, A. (2015). Gender, Risk, and Venture Creation Intentions. *Journal of Small Business Management*, 53(2):501–515.
- Delaney, L. and Doyle, O. (2012). Socioeconomic Differences in Early Childhood Time Preferences. *Journal of Economic Psychology*, 33(1):237–247.
- DellaVigna, S. and Paserman, M. D. (2005). Job Search and Impatience. *Journal of Labor Economics*, 23(3):527–588.
- Deming, D. J. (2017). The Growing Importance of Social Skills in the Labor Market. *Quarterly Journal of Economics*, 132(4):1593–1640.
- Detlefsen, L., Friedl, A., Lima de Miranda, K., Schmidt, U., and Sutter, M. (2018). Are Economic Preferences Shaped by the Family Context? The Impact of Birth Order and Siblings' Sex Composition on Economic Preferences. IZA Discussion Paper No. 11949.
- Doepke, M. and Zilibotti, F. (2017). Parenting With Style: Altruism and Paternalism in Intergenerational Preference Transmission. *Econometrica*, 85(5):1331–1371.
- Dohmen, T., Enke, B., Falk, A., Huffman, D., and Sunde, U. (2018). Patience and Comparative Development. Working Paper.
- Dohmen, T. and Falk, A. (2011). Performance Pay and Multi-Dimensional Sorting: Productivity, Preferences and Gender. *American Economic Review*, 101(2):556–590.
- Dohmen, T., Falk, A., Huffman, D., and Sunde, U. (2009). Homo Reciprocans: Survey Evidence on Behavioural Outcomes. *Economic Journal*, 119(536):592–612.
- Dohmen, T., Falk, A., Huffman, D., and Sunde, U. (2012). The Intergenerational Transmission of Risk and Trust Attitudes. *Review of Economic Studies*, 79:645–677.
- Dohmen, T., Falk, A., Huffman, D., Sunde, U., Schupp, J., and Wagner, G. G. (2011). Individual Risk Attitudes: Measurement, Determinants, and Behavioral Consequences. *Journal of the European Economic Association*, 9(3):522–550.
- Donovan, S. J. and Susser, E. (2011). Commentary: Advent of Sibling Designs. *International Journal of Epidemiology*, 40(2):345–349.
- Doyle, O., Harmon, C., Heckman, J. J., Logue, C., and Moon, S. H. (2017). Early Skill Formation and the Efficiency of Parental Investment: A Randomized Controlled Trial of Home Visiting. *Labour Economics*, 45:40–58.

- Eaton, D. K., Kann, L., Kinchen, S., Shanklin, S., Flint, K. H., Hawkins, J., Harris, W. A., Lowry, R., McManus, T., Chyen, D., Whittle, L., Lim, C., and Wechsler, H. (2012). Youth Risk Behavior Surveillance—United States, 2011. *Morbidity and Mortality Weekly Report: Surveillance Summaries*, 61(4):1–162.
- Eckel, C., Johnson, C., and Montmarquette, C. (2005). Saving Decisions of the Working Poor: Short- and Long-Term Horizons. In Harrison, G. W., Carpenter, J., and List, J. A., editors, *Field Experiments in Economics (Research in Experimental Economics)*, volume 10, pages 219–260. Emerald Group Publishing Limited.
- Eckel, C. C., Grossman, P. J., Johnson, C. A., de Oliveira, A. C., Rojas, C., and Wilson, R. K. (2012). School Environment and Risk Preferences: Experimental Evidence. *Journal of Risk and Uncertainty*, 45(3):265–292.
- Falk, A., Becker, A., Dohmen, T., Enke, B., Huffman, D., and Sunde, U. (2018). Global Evidence on Economic Preferences. *Quarterly Journal of Economics*, 133(4):1645–1692.
- Falk, A., Kosse, F., Pinger, P. R., Schildberg-Hörisch, H., and Deckers, T. (n.d.). Socio-Economic Status and Inequalities in Children’s IQ and Economic Preferences. *Journal of Political Economy*.
- Farkas, G. (2003). Cognitive Skills and Noncognitive Traits and Behaviors in Stratification Processes. *Annual Review of Sociology*, 29:541–562.
- Fehr, E., Bernhard, H., and Rockenbach, B. (2008). Egalitarianism in Young Children. *Nature*, 454(7208):1079–1083.
- Flèche, S. (2017). Teacher Quality, Test Scores and Non-Cognitive Skills: Evidence from Primary School Teachers in the UK. CEP Discussion Paper No 1472.
- Fletcher, J. M. (2013). Adolescent Depression and Adult Labor Market Outcomes. *Southern Economic Journal*, 80(1):26–49.
- Fletcher, J. M. (2014). The Effects of Childhood ADHD on Adult Labor Market Outcomes. *Health Economics*, 23(2):159–181.
- Fuchs, V. R. (1982). Time Preference and Health: An Exploratory Study. In Fuchs, V. R., editor, *Economic Aspects of Health*, pages 93–120. University of Chicago Press, Chicago.
- Fujiwara, T. and Kawachi, I. (2009). Is Education Causally Related to Better Health? A Twin Fixed-Effect Study in the USA. *International Journal of Epidemiology*, 38(5):1310–1322.
- Gilman, S. E. and Loucks, E. B. (2014). Another Casualty of Sibling Fixed-Effects Analysis of Education and Health: An Informative Null, or Null Information? *Social Science & Medicine*, 118:191–193.

- Golsteyn, B. H., Grönqvist, H., and Lindahl, L. (2014). Adolescent Time Preferences Predict Lifetime Outcomes. *Economic Journal*, 124(580):F739–F761.
- Goodman, A., Lamping, D. L., and Ploubidis, G. B. (2010). When to Use Broader Internalising and Externalising Subscales Instead of the Hypothesised Five Subscales on the Strengths and Difficulties Questionnaire (SDQ): Data from British Parents, Teachers and Children. *Journal of Abnormal Child Psychology*, 38(8):1179–1191.
- Goodman, R., Renfrew, D., and Mullick, M. S. (2000). Predicting Type of Psychiatric Disorder from Strengths and Difficulties Questionnaire (SDQ) Scores in Child Mental Health Clinics in London and Dhaka. *European Child & Adolescent Psychiatry*, 9(2):129–134.
- Groenwold, R. H., White, I. R., Donders, A. R. T., Carpenter, J. R., Altman, D. G., and Moons, K. G. (2012). Missing Covariate Data in Clinical Research: When and When Not to Use the Missing-Indicator Method for Analysis. *Canadian Medical Association Journal*, 184(11):1265–1269.
- Gupta, N. D. and Simonsen, M. (2010). Non-Cognitive Child Outcomes and Universal High Quality Child Care. *Journal of Public Economics*, 94(1-2):30–43.
- Guryan, J., Hurst, E., and Kearney, M. (2008). Parental Education and Parental Time with Children. *Journal of Economic Perspectives*, 22(3):23–46.
- Haushofer, J. and Fehr, E. (2014). On the psychology of poverty. *Science*, 344(6186):862–867.
- Heckman, J., Stixrud, J., and Urzua, S. (2006). The Effects of Cognitive and Noncognitive Abilities on Labor Market Outcomes and Social Behavior. *Journal of Labor Economics*, 24(3):411–482.
- Heckman, J. J. (2007). The Economics, Technology, and Neuroscience of Human Capability Formation. *Proceedings of the National Academy of Sciences*, 104(33):13250–13255.
- Heckman, J. J. (2008). Schools, Skills, and Synapses. *Economic Inquiry*, 46(3):289–324.
- Heckman, J. J., Moon, S. H., Pinto, R., Savelyev, P. A., and Yavitz, A. (2010). The Rate of Return to the HighScope Perry Preschool Program. *Journal of Public Economics*, 94(1–2):114–128.
- Heckman, J. J. and Mosso, S. (2014). The Economics of Human Development and Social Mobility. *Annual Review of Economics*, 6:689–733.
- Heckman, J. J., Pinto, R., and Savelyev, P. (2013). Understanding the Mechanisms Through Which an Influential Early Childhood Program Boosted Adult Outcomes. *American Economic Review*, 103(6):2052–86.

- Hong, H., Kubik, J. D., and Stein, J. C. (2004). Social Interaction and Stock-Market Participation. *Journal of Finance*, 59(1):137–163.
- Hoosen, N., Davids, E. L., de Vries, P. J., and Shung-King, M. (2018). The Strengths and Difficulties Questionnaire (SDQ) in Africa: A Scoping Review of its Application and Validation. *Child and Adolescent Psychiatry and Mental Health*, 12(6).
- Hsieh, C., Parker, S. C., and van Praag, C. M. (2017). Risk, Balanced Skills and Entrepreneurship. *Small Business Economics*, 48(2):287–302.
- Ida, T. and Goto, R. (2009). Simultaneous Measurement of Time and Risk Preferences: Stated Preference Discrete Choice Modeling Analysis Depending on Smoking Behavior. *International Economic Review*, 50(4):1169–1182.
- Jaeger, D. A., Dohmen, T., Falk, A., Huffman, D., Sunde, U., and Bonin, H. (2010). Direct Evidence on Risk Attitudes and Migration. *Review of Economics and Statistics*, 92(3):684–689.
- Karlan, D. S. (2005). Using Experimental Economics to Measure Social Capital and Predict Financial Decisions. *American Economic Review*, 95(5):1688–1699.
- Kautz, T. D., Heckman, J. J., Diris, R., ter Weel, B., and Borghans, L. (2014). Fostering and Measuring Skills: Improving Cognitive and Non-Cognitive Skills to Promote Lifetime Success. OECD Education Working Paper No. 110.
- Kühnle, D. and Oberfichtner, M. (2017). Does Early Child Care Attendance Influence Children’s Cognitive and Non-Cognitive Skill Development? IZA Discussion Papers No. 10661.
- Kimball, M. S., Sahm, C. R., and Shapiro, M. D. (2008). Imputing Risk Tolerance from Survey Responses. *Journal of the American Statistical Association*, 103(483):1028–1038.
- Kirby, K. N. and Petry, N. M. (2004). Heroin and Cocaine Abusers Have Higher Discount Rates for Delayed Rewards Than Alcoholics or Non-Drug-Using Controls. *Addiction*, 99(4):461–471.
- Kirby, K. N., Petry, N. M., and Bickel, W. K. (1999). Heroin Addicts Have Higher Discount Rates for Delayed Rewards Than Non-Drug-Using Controls. *Journal of Experimental Psychology: General*, 128(1):78–87.
- Kosse, F., Deckers, T., Pinger, P. R., Schildberg-Hörisch, H., and Falk, A. (2020). The Formation of Prosociality: Causal Evidence on the Role of Social Environment. *Journal of Political Economy*, 128(2):434–467.

- Kosse, F. and Pfeiffer, F. (2012). Impatience Among Preschool Children and Their Mothers. *Economics Letters*, 115(3):493–495.
- Layard, R., Clark, A. E., Cornaglia, F., Powdthavee, N., and Vernoit, J. (2019). What Predicts a Successful Life? A Life-Course Model of Well-Being. *Economic Journal*, 124(580):F720–F738.
- Lleras, C. (2008). Do Skills and Behaviors in High School Matter? The Contribution of Noncognitive Factors in Explaining Differences in Educational Attainment and Earnings. *Social Science Research*, 37(3):888–902.
- Lundborg, P. (2013). The Health Returns to Schooling—What Can we Learn from Twins? *Journal of Population Economics*, 26(2):673–701.
- Madsen, M., Andersen, P. K., Gerster, M., Andersen, A.-M. N., Christensen, K., and Osler, M. (2014). Are the Educational Differences in Incidence of Cardiovascular Disease Explained by Underlying Familial Factors? A Twin Study. *Social Science & Medicine*, 118:182–190.
- McLeod, J. D., Uemura, R., and Rohrman, S. (2012). Adolescent Mental Health, Behavior Problems, and Academic Achievement. *Journal of Health and Social Behavior*, 53(4):482–497.
- Minkkinen, J. L., Lindfors, P., and Rimpelä, A. H. (2016). Psychosocial Health and Academic Performance—A Multilevel Longitudinal Study. *European Journal of Public Health*, 26(Supplement 1):ckw166–043.
- Moffitt, T. E., Arseneault, L., Belsky, D., Dickson, N., Hancox, R. J., Harrington, H. L., Houts, R., Poulton, R., Roberts, B. W., Ross, S., Sears, M. R., Thomson, W. M., and Caspi, A. (2011). A Gradient of Childhood Self-Control Predicts Health, Wealth, and Public Safety. *Proceedings of the National Academy of Sciences*, 108(7):2693–2698.
- Mullick, M. S. and Goodman, R. (2001). Questionnaire Screening for Mental Health Problems in Bangladeshi Children: A Preliminary Study. *Social Psychiatry and Psychiatric Epidemiology*, 36(2):94–99.
- Reynolds, A. J., Temple, J. A., and Ou, S.-R. (2010). Preschool Education, Educational Attainment, and Crime Prevention: Contributions of Cognitive and Non-Cognitive Skills. *Children and Youth Services Review*, 32(8):1054–1063.
- Rodríguez-Planas, N. (2012). Mentoring, Educational Services, and Incentives to Learn: What Do We Know about Them? *Evaluation and Program Planning*, 35(4):481–490.

- Rothson, C., Head, J., Clark, C., Klineberg, E., Cattell, V., and Stansfeld, S. (2009). The Impact of Psychological Distress on the Educational Achievement of Adolescents at the End of Compulsory Education. *Social Psychiatry and Psychiatric Epidemiology*, 44(5):421–427.
- Rotter, J. B. (1966). Generalized Expectancies for Internal Versus External Control of Reinforcement. *Psychological Monographs: General and Applied*, 80(1):1–28.
- Ruhm, C. J. and Waldfogel, J. (2012). Long-Term Effects of Early Childhood Care and Education. *Nordic Economic Policy Review*, 1:23–51.
- Rumberger, R. W. (1995). Dropping Out of Middle School: A Multilevel Analysis of Students and Schools. *American Educational Research Journal*, 32(3):583–625.
- Rustagi, D., Engel, S., and Kosfeld, M. (2010). Conditional Cooperation and Costly Monitoring Explain Success in Forest Commons Management. *Science*, 330(6006):961–965.
- Sandewall, Ö., Cesarini, D., and Johannesson, M. (2014). The Co-Twin Methodology and Returns to Schooling—Testing a Critical Assumption. *Labour Economics*, 26:1–10.
- Schildberg-Hörisch, H. (2011). Does Parental Employment Affect Children’s Educational Attainment? *Economics of Education Review*, 30(6):1456–1467.
- Schildberg-Hörisch, H. (2018). Are Risk Preferences Stable? *Journal of Economic Perspectives*, 32(2):135–54.
- Starcke, K. and Brand, M. (2012). Decision Making Under Stress: A Selective Review. *Neuroscience & Biobehavioral Reviews*, 36(4):1228–1248.
- Strenze, T. (2007). Intelligence and Socioeconomic Success: A Meta-Analytic Review of Longitudinal Research. *Intelligence*, 35(5):401–426.
- Sutter, M., Kocher, M. G., Glätzle-Rützler, D., and Trautmann, S. T. (2013). Impatience and Uncertainty: Experimental Decisions Predict Adolescents’ Field Behavior. *American Economic Review*, 103(1):510–531.
- Sutter, M., Zoller, C., and Glätzle-Rützler, D. (2019). Economic Behavior of Children and Adolescents—A First Survey of Experimental Economics Results. *European Economic Review*, 111:98–121.
- Thönnissen, C., Wilhelm, B., Alt, P., Greischel, H., and Walper, S. (2019). Manual of the German Family Panel: Scales and Instruments Manual (Waves 1 to 10), Release 10.0. Report, Panel Analysis of Intimate Relationships and Family Dynamics.

- Ventura, L. (2003). Direct Measures of Time Preferences. *Economic and Social Review*, 34(3):293–310.
- Von Gaudecker, H.-M., van Soest, A., and Wengström, E. (2011). Heterogeneity in Risky Choice Behavior in a Broad Population. *American Economic Review*, 101(2):664–694.
- Wechsler, D. (2003). *The Wechsler Intelligence Scale for Children: Fourth Edition*. London: Pearson.
- Zyphur, M. J., Narayanan, J., Arvey, R. D., and Alexander, G. J. (2009). The Genetics of Economic Risk Preferences. *Journal of Behavioral Decision Making*, 22(4):367–377.

# Online Appendix

## A Sampling

### A.1 Covered households

**2014/16** In 2014, 4,500 randomly drawn households from the 150 selected villages were surveyed (general household survey). Among those 4,500 households, 1,500 were randomly selected for further data collection regarding cognitive and non-cognitive skills (i.e., experimental measures of time, risk, and social preferences, survey measures of personality traits as well as IQ tests) in 2014 and 2016. Out of these 1,500 households, 1,001 had children aged 6 to 16 years. These households were chosen to be re-interviewed from 2018 onwards.

In the original survey, four members were selected for the elicitation of cognitive and non-cognitive skills from each of the 1,001 survey households: The household heads and their spouses as well as children aged 6 to 16. The lower age bound was set to ensure that children are able to understand the survey questions and all experiments. If there were two or less children aged 6 to 16 in a household, all children were interviewed. Otherwise, only the youngest and the oldest child in the respective age range were interviewed.

**2018** Due to the sampling procedure via local schools, each household added in 2018 had at least one child at primary school age. If there was more than one child aged 6 to 16 years, a second child was randomly selected for the experimental survey. Additionally, two adults, typically mother and father of the selected children, from each of the newly sampled households took part in the data collection.<sup>30</sup>

In 2018, as before, we elicited preferences using experiments, personality traits applying validated scales, and IQ relying on well-established tests. Additionally, we collected anthropometric data besides the general household survey.

**Total** 93 percent (928 out of 1,001) households from 2014/16 were successfully re-interviewed in 2018. Some of the remaining households had migrated, some refused to cooperate and some were unavailable. In total, we interviewed  $928+3,000+7=3,935$  households in 2018 (see Table A.1).

---

<sup>30</sup>From all children aged 6 to 16 who participated in the experiments, both mother and father of the chosen child participated in the experiments in 73 percent of cases. Only the mother participated in 22 percent of cases, only the father in 1 percent of cases. Other constellations comprise grandparents or other relatives taking part in the experiments in case parents were not available. Typically, if only the mother participated, fathers were living and working abroad or outside the study area to earn the family's living. Cf. footnote 26.

**Table A.1:** Total study sample size 2018

District	Subdistrict	Number of Villages	Targeted Sample		Sample Covered		Additional (Split HH)
			2014/16	2018	2014/16	2018	
Netrokona	Kalmakanda	17	116	340	98	340	0
	Durgapur	11	75	220	70	220	0
	Atpara	14	141	280	131	280	0
	Mohanganj	19	88	380	80	380	0
Chandpur	Kachua	16	103	320	99	320	3
	Hajiganj	18	117	360	110	360	2
Sunamganj	Sunamganj Sadar	11	97	220	87	220	0
	Dakkhin Sunamganj	3	34	60	33	60	0
Gopalganj	Gopalganj Sadar	16	79	320	76	320	0
	Muksudpur	13	60	260	56	260	0
	Kotwalipara	12	91	240	88	240	2
<b>Total</b>		<b>150</b>	<b>1,001</b>	<b>3,000</b>	<b>928</b>	<b>3,000</b>	<b>7</b>

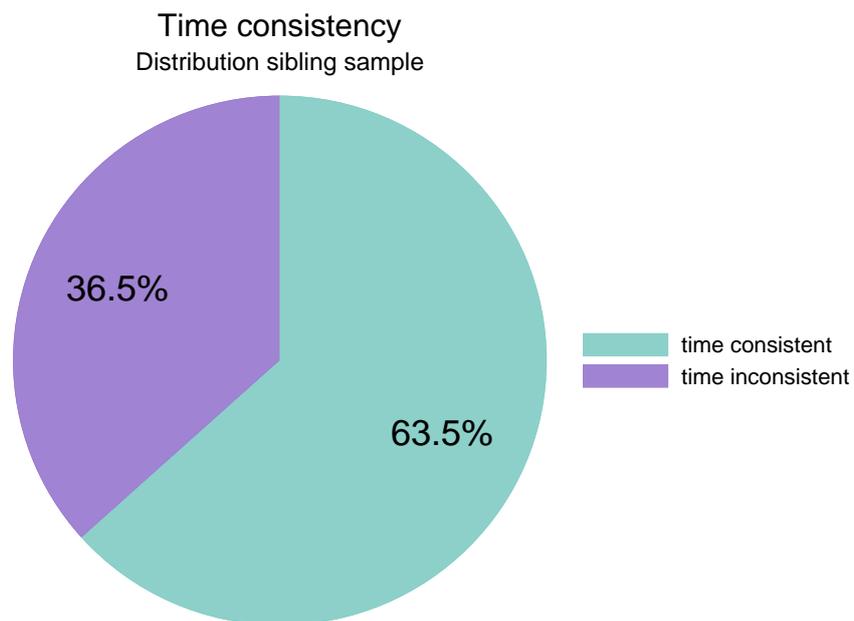
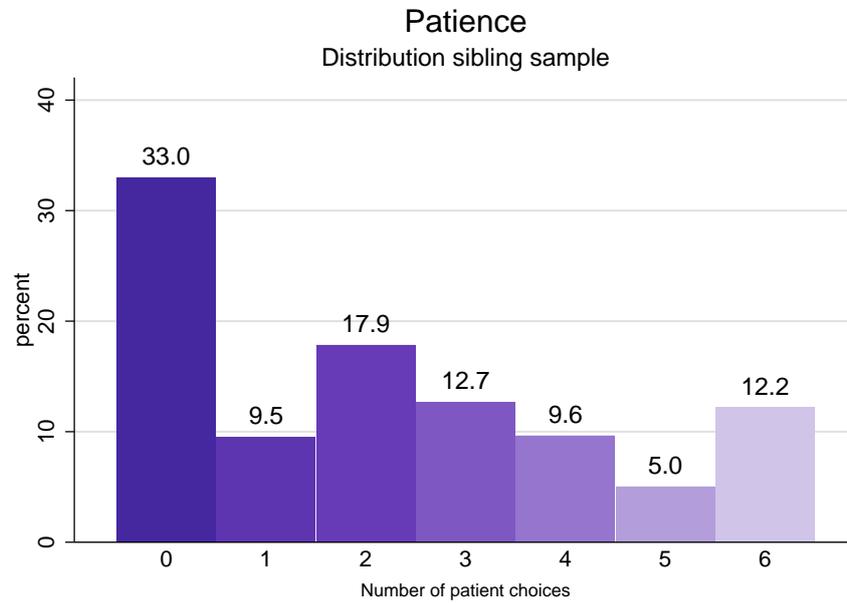
**Note:** Split households are cases in which a member of a sample household founded or joined a new household.

## A.2 2018 sampling procedure via primary schools

**Selection of primary schools** In 2018, the given 150 villages were visited and a primary school suitable for the selection of school-going children was chosen. However, a 1:1 village-school matching was not always possible, leading to a lower number of sample schools than villages. Some villages do not have their own primary school such that children attend a school in a neighboring village. Hence, some schools serve multiple villages. In these cases, the school the children from the original sample village attend got selected. In other cases, villages have multiple schools. Here, the school with the majority of students from the village and situated at the village center was selected. This resulted in a selection of 135 primary schools forming the basis for the following sampling procedure.

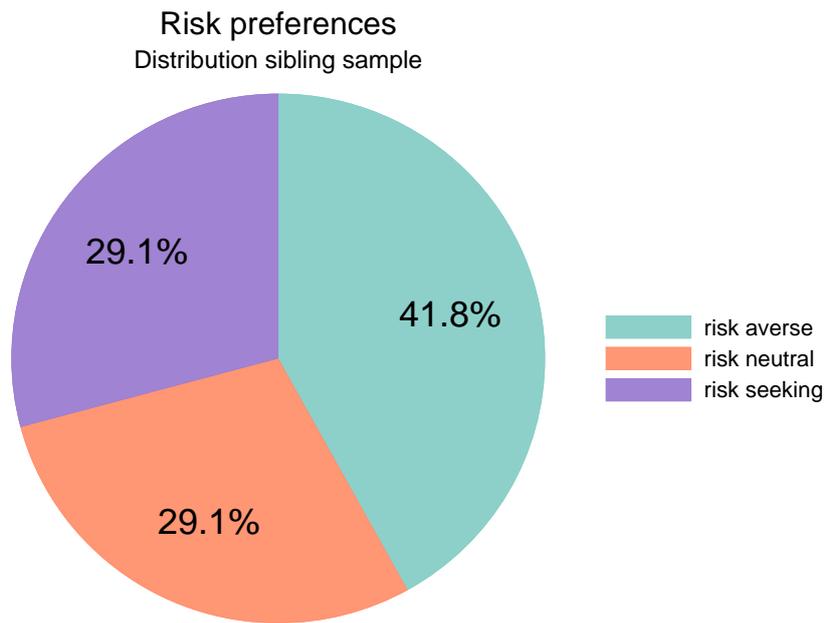
**Sampling procedure** Taking the 135 selected schools as a starting point, in general five students from each of the grades 2 to 5 (i.e., 20 students in total) were selected. If from any grade there couldn't be found five students from the connected sample villages, they got replaced by students from neighboring villages (leading to a higher number of villages than originally selected, with 53 additional villages but always only few children from those villages). If still there couldn't be found enough students from a particular grade, the remaining children got selected from other grades.

## B Distributions of preferences



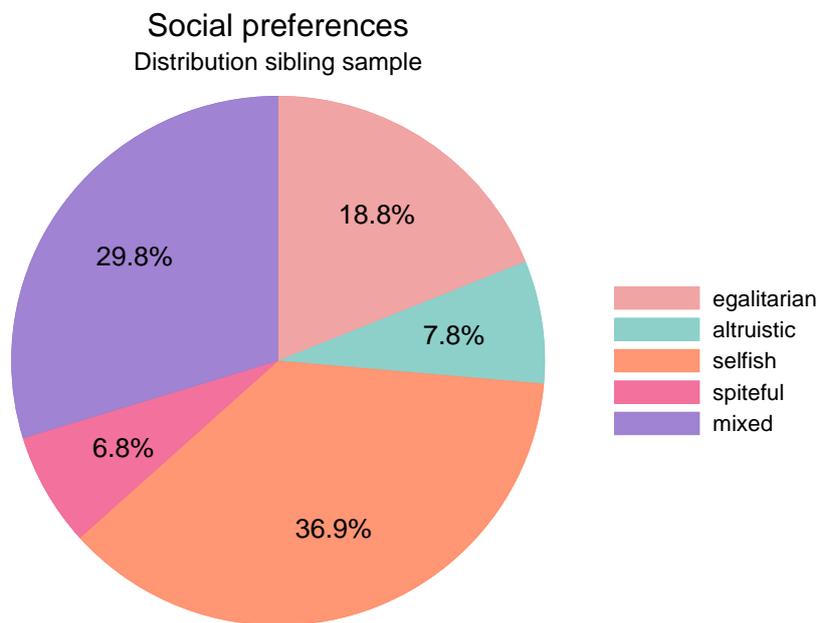
**Figure B.1:** Time preferences

In our sibling sample (4,282 children) we have 4,280 observations for time preferences.



**Figure B.3:** Risk preferences

In our sibling sample (4,282 children) we have 4,282 observations for risk preferences.



**Figure B.5:** Social preferences

In our sibling sample (4,282 children) we have 4,280 observations for social preferences.

## C Preference measures for adults

For the elicitation of time preferences, adults had to make 18 choices (three choice sets with six choices each) between smaller, sooner and larger, later rewards. All choice sets had three-month time horizons with different starting points: “Tomorrow”, “After 1 month”, “After 1 year”. Within each choice set, participants had to choose between two options, A and B, with increasing annual interest rates (see Table C.2). For our analysis, we also use the total number of patient choices which is a simple count of the larger, but later reward in all 18 choices (variable *patience* ranging from 0 to 18) as well as a dummy indicating whether adults are time consistent (dummy *time consistent*). In order to match the child data, adults making identical choices for sets 1 and 2—the two choice sets with three-month delay starting tomorrow and in one month—are classified as time consistent.

**Table C.2:** Time preferences experiments for adults

Payoff Alternative	Payment Option A (pays amount below)	Payment Option B (pays amount below)	Annual Interest Rate	Choice: A or B?
Set 1:	<b>Tomorrow</b>	<b>After 3 Months</b>	in %	
OR Set 2:	<b>After 1 Month</b>	<b>After 4 Months</b>		
OR Set 3:	<b>After 1 Year</b>	<b>After 1 Year 3 Months</b>		
1	100	105	20	
2	100	110	40	
3	100	120	80	
4	100	125	100	
5	100	150	200	
6	100	200	400	

Regarding risk preferences we applied the same setup as for children and only adjusted the absolute amounts of money to be paid out (higher amounts than the age-specific payments for children). In our analysis, we again use a dummy for being risk averse (i.e., choosing one of the first four gambles, dummy *risk averse*).

Social preferences were also elicited in the same way for children and adults, except for the conversion rate of stars into Taka (Bangladeshi currency). In our regression specifications, we use the four dummy variables introduced above, *egalitarian*, *altruistic*, *selfish* and *mixed* with “mixed” being the residual category and “spiteful” as base category.

## D Parenting styles

Mothers were rating 18 items on a five-point scale, stating the frequency of different actions when raising their children (“Never” to “Very frequently”). The questionnaire was answered once for each household, so values are identical for siblings. These items are combined into six scales (in general three items per scale), indicating for each mother how much parenting style is characterized by emotional warmth, inconsistent parenting, monitoring, negative communication, psychological control and strict control.

*Emotional warmth* encompassed the degree of affirmative attention and care in parenting. *Inconsistent parenting* points to inconsistencies in parents’ behavior when bringing up their children. *Monitoring* refers to how well parents are informed about activities and social contacts of their children. *Negative communication* indicates the degree of negative behavior of parents towards their children. *Psychological control* assesses parents’ negative intrusive thoughts, feelings, and behavior towards their children with parents potentially building up psychological pressure. *Strict control* encompasses how rigorously and harshly parents interact with their children. For an overview and a detailed description of the parenting style measures, see Thönnissen et al. (2019) and the references therein.

The variables are normalized to a mean of zero and standard deviation of one across our final regression sibling sample. Mothers from 2,120 of these 2,141 sibling households have answered items on parenting styles.

### Emotional warmth

1. I use words and gestures to show my child that I love him/her.
2. I comfort my child when he/she feels sad.
3. I praise my child.

### Inconsistent parenting

1. I threaten my child with punishment, but don’t actually follow through with it.
2. I reduce punishments or lift them ahead of time.
3. It is hard for me to be consistent in my childrearing.<sup>31</sup>

### Monitoring

1. I talk to my child about things he/she has done, seen, or experienced when he/she was out.
2. When my child is outside the home, I know exactly where he/she is.
3. I try to actively influence my child’s circle of friends.

---

<sup>31</sup>Due to a translation issue, the dimension “inconsistent parenting” is reduced to item number 3: “It is hard for me to be consistent in my childrearing.” Translation of the other two items into Bengali did not properly convey the true meaning.

**Negative communication**

1. I criticize my child.
2. I shout at my child when he/she did something wrong.
3. I scold my child when I am angry at him/her.

**Psychological control**

1. I feel that my child is ungrateful because he/she disobeys.
2. I stop talking to my child for a while when he/she did something wrong.
3. I am disappointed and sad when my child misbehaves.

**Strict control**

1. I punish my child when he/she was disobedient.
2. I tend to be strict with my child.
3. I make it clear to my child that he/she should not oppose orders and decisions.

## **E Details on outcome measures**

### **E.1 Risky behaviors**

16 yes/no-questions referring to behaviors considered as risky in Bangladesh. The items were developed in cooperation with locals from villages similar to our sample villages.

1. Do you smoke?
2. Do you eat pan/jorda/supari?
3. Do you gamble/bet/play lottery?
4. Do you play on road with car tires?
5. Do you jump from tree/bridge/saqo/troller to river or canal?
6. Do you run behind the motorbike/car/trolley?
7. Do you play danguli?
8. Do you get up in the tree or your house roof?
9. Do you play dive in pond/river?
10. Do you bring flowers or fruits without permission from someone else's garden?
11. Do you play somersault?
12. Do you blow fire-works?
13. Do you play ha-du-du?
14. Do you use marijuana/ganja/hashish?
15. Do you drive a car/motorbike?
16. Do you often get into physical fights?

### **E.2 Prosociality score**

Subscore of the Strengths and Difficulties Questionnaire (SDQ). Mothers were rating five items related to prosocial behavior on a three-point scale ("Not true", "Somewhat true", "Certainly true"): My child...

1. Is considerate of other people's feelings
2. Shares readily with other children (treats, toys, pencils, etc.)
3. Is helpful if someone is hurt, upset or feeling ill
4. Is kind to younger children
5. Often volunteers to help others (parents, teachers, children)

### **E.3 SDQ score**

The full SDQ (Strengths and Difficulties Questionnaire) score comprises the four subscores “emotional symptoms”, “peer problems”, “hyperactivity” and “conduct problems” and is elicited asking mothers about their children. For each subscale, mothers were rating five items on a three-point scale (“Not true”, “Somewhat true”, “Certainly true”). Items for emotional symptoms and peer problems can be grouped into an internalizing subscale, items for hyperactivity and behavioral/conduct problems into an externalizing subscale.

#### **Emotional symptoms** My child...

1. Often complains of headaches, stomach-ache or sickness
2. Has many worries, often seems worried
3. Is often unhappy, down-hearted or tearful
4. Is nervous or clingy in new situations, easily loses confidence
5. Has many fears, is easily scared

#### **Peer problems** My child...

1. Is rather solitary, tends to play alone
2. Has at least one good friend (*reversed*)
3. Is generally liked by other children (*reversed*)
4. Is picked on or bullied by other children
5. Gets on better with adults than with other children

#### **Hyperactivity** My child...

1. Is restless, overactive, cannot stay still for long
2. Is constantly fidgeting or squirming
3. Is easily distracted, concentration wanders
4. Thinks things out before acting (*reversed*)
5. Sees tasks through to the end, good attention span (*reversed*)

#### **Conduct problems** My child...

1. Often has temper tantrums or hot tempers
2. Is generally obedient, usually does what adults request (*reversed*)
3. Often fights with other children or bullies them
4. Often lies or cheats
5. Steals from home, school or elsewhere

## F Additional summary statistics

**Table F.3:** Summary statistics for sibling sample

	Mean or %	Std. dev.	Min	Max	Obs.
<b>Preferences</b>					
patience	2.204	2.073	0	6	4,280
time consistent	63.458		0	1	4,280
risk averse	41.826		0	1	4,282
egalitarian	18.757		0	1	4,281
altruistic	7.755		0	1	4,281
selfish	3.686		0	1	4,281
spiteful	6.797		0	1	4,281
mixed	29.829		0	1	4,281
<b>Cognitive skills</b>					
IQ <sup>†</sup>	0	1	-2.915	4.748	4,282
<b>Gender &amp; age</b>					
female	51.635		0	1	4,282
age	10.422	2.651	6	16	4,282
<b>Outcomes</b>					
study attitude					
score	4.418	0.796	1	5	4,282
standardized <sup>†</sup>	0	1	-4.296	0.731	4,282
risky behaviors	0.192	0.163	0	0.813	2,552
prosociality					
score	6.451	2.291	0	10	4,176
standardized <sup>†</sup>	0	1	-2.816	1.549	4,176
SDQ internalizing subscale					
score	5.557	2.772	0	17	4,176
standardized <sup>†</sup>	0	1	-2.004	4.128	4,176
SDQ externalizing subscale					
score	6.035	3.298	0	19	4,176
standardized <sup>†</sup>	0	1	-1.830	3.931	4,176
SDQ full score					
score	11.59	5.256	1	32	4,176
standardized <sup>†</sup>	0	1	-2.015	3.883	4,176
<b>Household environment</b>					
logincome	11.473	1.960	0	16.146	4,278
father literacy	53.802		0	1	4,156
mother literacy	63.615		0	1	4,194
number of siblings	2.657	1.411	0	10	4,282
father age	43.548	7.625	19	84	4,156
mother age	36.232	5.588	20	64	4,194
senior in household	20.037		0	1	4,282
homestead area (in sqm)	385.075	392.789	4	3,840	4,282
electricity	91.406		0	1	4,282
muslim	82.205		0	1	4,282

**Notes:** <sup>†</sup>Reference group for standardization to a mean of zero and standard deviation of one is the sibling sample.

**Table F.4:** Summary statistics for sibling sample, continued

	Mean or %	Std. dev.	Min	Max	Obs.
<b>Parents' preferences</b>					
father patience	5.511	6.006	0	18	3,306
father time consistent	66.364		0	1	3,306
father risk averse	40.931		0	1	3,308
father egalitarian	18.803		0	1	3,308
father altruistic	7.074		0	1	3,308
father selfish	40.326		0	1	3,308
father spiteful	4.595		0	1	3,308
father mixed	29.303		0	1	3,308
mother patience	5.441	5.802	0	18	4,222
mother time consistent	62.245		0	1	4,222
mother risk averse	43.913		0	1	4,222
mother egalitarian	19.943		0	1	4,222
mother altruistic	7.627		0	1	4,222
mother selfish	36.570		0	1	4,222
mother spiteful	5.306		0	1	4,222
mother mixed	30.554		0	1	4,222
<b>Parents' IQ<sup>†</sup></b>					
father IQ	0.054	0.996	-2.579	5.082	3,308
mother IQ	-0.042	1.001	-3.261	5.110	4,222
<b>Parenting styles<sup>†</sup></b>					
style emotional warmth	0	1	-3.079	2.372	4,240
style incons. parenting	0	1	-1.772	1.923	4,240
style monitoring	0	1	-2.821	3.206	4,240
style neg. communication	0	1	-2.433	4.017	4,240
style psych. control	0	1	-1.727	4.227	4,240
style strict control	0	1	-2.257	3.597	4,240

**Notes:** <sup>†</sup>Reference groups for standardization to a mean of zero and standard deviation of one are the sibling sample and the sample of these siblings' parents, respectively. Note that standardization for fathers' and mothers' IQ measures is done jointly.

## G Correlations between siblings

**Table G.5:** Correlations between siblings

	Correlation coefficient	Significance level	Observations
<b>Preferences</b>			
patience	0.393	0.000	2,139
time consistent	0.179	0.000	2,139
risk averse	0.145	0.000	2,141
egalitarian	0.318	0.000	2,140
altruistic	0.099	0.000	2,140
selfish	0.240	0.000	2,140
spiteful	0.141	0.000	2,140
mixed	0.147	0.000	2,140
<b>Cognitive skills</b>			
IQ	0.562	0.000	2,141
<b>Outcomes</b>			
study attitude	0.374	0.000	2,141
risky behaviors	0.484	0.000	678
prosociality	0.661	0.000	2,062
SDQ internalizing subscale	0.641	0.000	2,062
SDQ externalizing subscale	0.497	0.000	2,062
SDQ full score	0.660	0.000	2,062

**Note:** Tabulated is Pearson's correlation coefficient. Comparison of children in estimation sibling sample (4,282 children or 2,141 pairs of siblings).

## H Adding household environment variables

Table H.6 displays estimation results of household environment specifications for regressions of study attitude, risky behaviors, prosociality, and SDQ internalizing and externalizing subscales on preferences. Household environment variables are shared by siblings. The regression sample is our sibling sample (4,282 children). In a first step, the number of observations is reduced due to missing values for outcomes or preferences for at least one sibling in the household (cf. footnote 22: including household fixed effects in regressions, singleton households are automatically dropped). Compared to baseline and household fixed effects specifications, the numbers of observations further decline when adding control variables that are missing for some households as questions were not answered or answered incorrectly.

**Table notes** <sup>†</sup>Study attitude, risky behaviors, prosociality, as well as SDQ internalizing and externalizing subscales are defined as described in section 2.4. Children's preferences and cognitive skills measures are defined as described in sections 2.2 and 2.3. Prosociality, SDQ subscales, IQ, and parenting style scales are normalized to a mean of zero and standard deviation of one across our final estimation sibling sample. <sup>‡</sup>Female is an indicator for being a girl, age is measured in years. <sup>††</sup>Household income is log transformed. Negative income values (if, for example, costs in agricultural businesses such as labor or feedings costs, have been higher than income) are set to zero and an indicator variable that equals one if income is positive is added. Parents' literacy is measured by indicator variables for being able to read and write. Electricity, senior in household and muslim are also indicator variables for a working electricity connection, whether a grandparent is living in the household and whether it is a muslim household. <sup>†††</sup>Parents' preferences are defined analogously to children's preferences and are described in appendix section C. Within our sibling sample (4,282 observations), we do not have complete parental preferences for all children. For 22 percent (956 observations) only the mother participated. Applying the missing-indicator method, an indicator is added for availability of father values and missing values are set to zero (cf. footnote 26). <sup>¶</sup>Parents' IQ is measured as described in section 2.3. Reference group for the normalization to a mean of zero and standard deviation of one are our sibling sample's parents. Standardization for fathers' and mothers' IQ measures is done jointly. <sup>§</sup>Parenting styles comprise the six dimensions emotional warmth, inconsistent parenting, monitoring (intensity), negative communication, psychological control, and strict control as described in appendix section D.

**Table H.6:** Adding household environment variables to regressions of child outcomes on preferences

	(1)	(2)	(3)	(4)	(5)
	STUDY ATTITUDE <sup>†</sup>	RISKY BEHAVIORS <sup>†</sup>	PROSOCIALITY <sup>†</sup>	SDQ INTERN <sup>†</sup>	SDQ EXTERN <sup>†</sup>
<b>Preferences<sup>†</sup></b>					
patience	0.000	0.004	0.025**	-0.012	-0.003
time consistent	0.053	0.012	-0.012	-0.101***	0.008
risk averse	0.043	-0.019**	0.093***	0.056*	0.007
egalitarian	0.253***	-0.021	0.202***	-0.170**	-0.221***
altruistic	0.180**	-0.005	0.027	-0.060	-0.024
selfish	0.156**	0.003	0.099	-0.162**	-0.115*
mixed	0.190**	-0.008	0.093	-0.091	-0.144**
<b>Cognitive skills<sup>†</sup></b>					
IQ	0.101***	-0.016**	0.091***	-0.099***	-0.115***
<b>Gender &amp; age<sup>†</sup></b>					
female	0.013	-0.144***	0.076***	0.024	-0.213***
age	0.042	0.045	0.080*	0.065	0.047
age squared	-0.001	-0.002*	-0.002	-0.003*	-0.004*
<b>Household environment</b>					
socio-demographics <sup>††</sup>					
logincome	-0.015	-0.012**	0.001	0.017	-0.009
dummy income positive	-0.127	0.072	-0.087	-0.068	0.156
father literacy	-0.077**	-0.003	0.026	-0.036	-0.079*
mother literacy	-0.021	-0.020**	-0.075*	-0.016	0.034
number of siblings	-0.012	0.002	0.020	0.031**	0.008
father age	0.003	-0.000	-0.003	-0.005	0.003
mother age	-0.005	-0.001	-0.002	0.004	-0.005
electricity connection	-0.033	-0.014	-0.076	0.020	0.111
senior in household	-0.014	0.002	0.104**	0.072*	-0.003
muslim	0.043	-0.011	0.065	0.024	-0.106*
parents' preferences <sup>††</sup>					
dummy father available	-0.108	0.024	-0.075	0.167	0.082
father: patience	-0.001	-0.000	0.003	-0.001	0.006
father: time consistent	-0.022	-0.024*	0.048	0.004	0.037
father: risk averse	-0.024	0.002	-0.066	0.025	-0.024
father: egalitarian	0.153	-0.012	0.147	-0.173*	-0.260**
father: altruistic	0.129	-0.054*	0.119	-0.037	-0.112
father: selfish	0.127	-0.028	0.081	-0.098	-0.188*
father: mixed	0.160	-0.010	0.074	-0.074	-0.221**
mother: patience	0.006*	0.001	0.001	0.001	0.004
mother: time consistent	0.064	-0.005	0.085**	-0.001	0.026
mother: risk averse	-0.045	-0.021**	0.112***	0.053	-0.046
mother: egalitarian	0.164**	-0.004	0.296***	-0.214**	-0.270***
mother: altruistic	0.074	-0.016	0.388***	-0.035	-0.125
mother: selfish	0.096	-0.020	0.189**	-0.118	-0.176**
mother: mixed	-0.035	0.011	0.177*	0.014	-0.098
parents' IQ <sup>¶</sup>					
father: IQ	0.070***	-0.022***	0.084***	-0.017	-0.037
mother: IQ	0.023	0.001	0.064***	0.034	-0.018
parenting styles <sup>†,§</sup>					
emotional warmth	0.062***	0.004	0.216***	-0.196***	-0.154***
inconsistent parenting	0.022	0.010	-0.007	0.007	-0.002
monitoring	0.031	-0.011*	0.161***	0.002	-0.047**
negative communication	-0.063***	0.027***	-0.040*	0.078***	0.091***
psychological control	-0.080***	0.015**	-0.123***	0.329***	0.250***
strict control	0.051**	-0.012*	0.037	0.058**	0.043*
<b>Constant</b>					
constant	-0.320	0.197	-0.961***	-0.306	0.365
Observations	4,006	1,238	3,896	3,896	3,896
$R^2$	0.073	0.342	0.211	0.233	0.219
adj. $R^2$	0.062	0.318	0.202	0.224	0.210
$F$	9.077	16.419	17.409	10.861	19.225

**Notes:** Standard errors are clustered at village level for all specifications. For table notes with detailed information on coefficients, see above (section H). Significance at \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

## **I Robustness checks**

### **I.1 Using a different measure to capture risk preferences**

Tables I.7 and I.8 display regression results when using a more differentiated measure to capture risk preferences. The risk preferences game is introduced in section 2.2. Here, the dummy variable for being risk averse (*risk averse*: choosing one of the first four gambles) is replaced by two dummy variables for being risk neutral (*risk neutral*: choosing gamble 5) or risk seeking (*risk seeking*: choosing gamble 6). Being risk averse becomes the omitted base category.

### **I.2 Using full SDQ score**

Table I.9 displays regression results using the full SDQ score as an outcome variable instead of splitting it into its internalizing and externalizing subscales. As subscales address dimensions linked to different groups of preferences, using the full SDQ score obscures apparent relations between child preferences and behavior.

### **I.3 Dropping children who did not understand the games**

Tables I.10 and I.11 display regression results when reducing the estimation sample to siblings who did understand all preferences games. Understanding of games is controlled by interviewers asking children in between (four times for the time preferences game, once for the risk preferences game, and once for the social preferences game) to repeat explanations. Each time, the interviewer notes down whether the child understood the game after the first, second or third explanation or whether it did not understand the game at this point.

A child is indicated as having understood a game if it answers each of the control questions correctly at least after three explanations given by the interviewer. Out of the 5,982 children, 661 (438) [222] did not fully understand the rules of the games that we used to measure time (risk) [social] preferences after possibly repeated explanations by the interviewer. 5,073 out of these 5,982 children understood all games. For our sibling sample, out of the 4,282 children, 484 (330) [165] did not fully understand the rules of the games to measure time (risk) [social] preferences. 3,610 of these 4,282 children understood all games.

Note that the numbers of observations in the regression tables are lower. As for our main regressions, starting from our sibling sample, the estimation samples are restricted to households in which all included variables are available for both siblings and here also to households in which both siblings have understood all games to make regressions comparable across specifications. Running regressions including household fixed effects, households with one of the children missing relevant information (singleton households) are automatically dropped.

**Table I.7:** Using a more differentiated risk measure in regressions of child outcomes on preferences—Study attitude and risky behaviors

	STUDY ATTITUDE <sup>†</sup>			RISKY BEHAVIORS <sup>†</sup>		
	(1) Baseline	(2) HH FE	(3) HH env	(4) Baseline	(5) HH FE	(6) HH env
<b>Preferences<sup>†</sup></b>						
patience	<b>-0.008</b> (0.008)	<b>0.005</b> (0.010)	<b>0.000</b> (0.008)	0.006** (0.002)	0.003 (0.003)	0.004* (0.002)
time consistent	<b>0.065*</b> (0.034)	<b>0.008</b> (0.044)	<b>0.053</b> (0.035)	0.009 (0.009)	0.027*** (0.008)	0.013 (0.009)
risk neutral	-0.042 (0.040)	-0.011 (0.044)	-0.035 (0.039)	<b>0.027***</b> (0.009)	<b>0.005</b> (0.009)	<b>0.023**</b> (0.010)
risk seeking	-0.063* (0.035)	0.008 (0.042)	-0.050 (0.034)	<b>0.011</b> (0.012)	<b>-0.002</b> (0.009)	<b>0.015</b> (0.011)
egalitarian	0.327*** (0.077)	0.196** (0.083)	0.253*** (0.076)	-0.041** (0.020)	-0.038 (0.023)	-0.022 (0.021)
altruistic	0.248*** (0.095)	0.160* (0.094)	0.180** (0.091)	-0.024 (0.022)	-0.004 (0.024)	-0.005 (0.023)
selfish	0.251*** (0.074)	0.140* (0.083)	0.156** (0.074)	-0.014 (0.018)	-0.014 (0.020)	0.003 (0.019)
mixed	0.258*** (0.076)	0.213** (0.084)	0.190** (0.075)	-0.027 (0.019)	-0.021 (0.020)	-0.008 (0.020)
<b>Cognitive skills<sup>†</sup></b>						
IQ	0.140*** (0.024)	0.073** (0.035)	0.101*** (0.027)	-0.032*** (0.006)	-0.009 (0.007)	-0.016** (0.006)
<b>Control variables: Gender &amp; age<sup>‡</sup></b>						
female	0.016 (0.030)	0.046 (0.032)	0.013 (0.030)	-0.136*** (0.008)	-0.143*** (0.008)	-0.144*** (0.008)
age	0.023 (0.042)	0.077 (0.047)	0.041 (0.044)	0.065** (0.029)	-0.005 (0.028)	0.045 (0.030)
age squared	0.000 (0.002)	-0.002 (0.002)	-0.001 (0.002)	-0.003** (0.001)	-0.000 (0.001)	-0.002* (0.001)
<b>Household environment<sup>††</sup></b>						
household fixed effects	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>
socio-demographics	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>
parents' preferences	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>
parents' IQ	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>
parenting styles	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>
<b>Constant</b>						
	-0.496** (0.249)	-0.795*** (0.273)	-0.276 (0.362)	-0.094 (0.182)	0.342* (0.174)	0.178 (0.209)
Observations	4,276	4,276	4,006	1,354	1,354	1,238
$R^2$	0.042	0.692	0.073	0.239	0.834	0.342
adj. $R^2$	0.039	0.381	0.062	0.233	0.663	0.318
$F$	14.800	9.184	8.955	41.900	34.020	16.357

**Notes:** Standard errors (in parentheses) are clustered at village level for all specifications. <sup>†</sup>Study attitude, risky behaviors, preferences, and cognitive skills measures are defined as described in sections 2.2-2.4. Instead of an indicator variable for being risk averse, two indicator variables for being risk neutral (choosing risk gamble no. 5) or risk seeking (choosing risk gamble no. 6) are included. Study attitude and IQ are normalized to a mean of zero and standard deviation of one across our final estimation sibling sample. <sup>‡</sup>Female is an indicator for being a girl, age is measured in years. <sup>††</sup>Household (HH) socio-demographics comprise the number of siblings in HH, HH income, parents' age and literacy, whether the HH has an electricity connection, whether a senior is living in the HH, and religion; parents' preferences and IQ comprise variables analogous to children's measures (see sections 2.2 and 2.3); parenting styles comprise the six dimensions emotional warmth, inconsistent parenting, monitoring (intensity), negative communication, psychological control, and strict control as described in appendix section D. All columns display OLS regressions, specifications in columns (2) and (5) include household fixed effects. Coefficients of main explanatory variables of interest for each outcome (cf. section 3 on hypotheses) are printed in bold. Significance at \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

**Table I.8:** Using a more differentiated risk measure in regressions of child outcomes on preferences—Prosociality and SDQ internalizing (emotional symptoms & peer problems) and externalizing (hyperactivity & conduct problems) subscales

	PROSOCIALITY <sup>†</sup>			SDQ INTERNALIZING SCALE <sup>†</sup>			SDQ EXTERNALIZING SCALE <sup>†</sup>		
	(1) Baseline	(2) HH FE	(3) HH env	(4) Baseline	(5) HH FE	(6) HH env	(7) Baseline	(8) HH FE	(9) HH env
<b>Preferences<sup>†</sup></b>									
patience	0.018* (0.010)	-0.012 (0.008)	0.025** (0.010)	0.003 (0.010)	-0.007 (0.008)	-0.012 (0.009)	<b>0.011</b> <b>(0.010)</b>	<b>0.017*</b> <b>(0.010)</b>	<b>-0.003</b> <b>(0.009)</b>
time consistent	-0.000 (0.037)	-0.004 (0.030)	-0.009 (0.034)	-0.102*** (0.038)	-0.016 (0.032)	-0.101*** (0.035)	<b>0.006</b> <b>(0.033)</b>	<b>0.056</b> <b>(0.036)</b>	<b>0.007</b> <b>(0.030)</b>
risk neutral	-0.114*** (0.036)	-0.005 (0.029)	-0.063** (0.032)	<b>-0.051</b> <b>(0.039)</b>	<b>0.018</b> <b>(0.036)</b>	<b>-0.056*</b> <b>(0.034)</b>	<b>0.004</b> <b>(0.035)</b>	<b>-0.035</b> <b>(0.038)</b>	<b>-0.022</b> <b>(0.036)</b>
risk seeking	-0.155*** (0.043)	-0.071** (0.036)	-0.122*** (0.038)	<b>-0.080**</b> <b>(0.039)</b>	<b>-0.003</b> <b>(0.035)</b>	<b>-0.056</b> <b>(0.034)</b>	<b>0.017</b> <b>(0.039)</b>	<b>-0.051</b> <b>(0.038)</b>	<b>0.007</b> <b>(0.036)</b>
egalitarian	<b>0.221***</b> <b>(0.072)</b>	<b>0.100</b> <b>(0.068)</b>	<b>0.200***</b> <b>(0.070)</b>	<b>-0.255***</b> <b>(0.080)</b>	<b>-0.015</b> <b>(0.065)</b>	<b>-0.170**</b> <b>(0.075)</b>	<b>-0.329***</b> <b>(0.079)</b>	<b>-0.148*</b> <b>(0.090)</b>	<b>-0.220***</b> <b>(0.076)</b>
altruistic	<b>0.098</b> <b>(0.082)</b>	<b>0.014</b> <b>(0.075)</b>	<b>0.027</b> <b>(0.074)</b>	<b>-0.141</b> <b>(0.102)</b>	<b>-0.001</b> <b>(0.075)</b>	<b>-0.060</b> <b>(0.086)</b>	<b>-0.130</b> <b>(0.101)</b>	<b>-0.126</b> <b>(0.089)</b>	<b>-0.024</b> <b>(0.080)</b>
selfish	<b>0.156**</b> <b>(0.068)</b>	<b>0.120**</b> <b>(0.056)</b>	<b>0.099</b> <b>(0.061)</b>	<b>-0.279***</b> <b>(0.083)</b>	<b>-0.009</b> <b>(0.060)</b>	<b>-0.162**</b> <b>(0.069)</b>	<b>-0.269***</b> <b>(0.079)</b>	<b>-0.148*</b> <b>(0.076)</b>	<b>-0.115*</b> <b>(0.065)</b>
mixed	0.122* (0.069)	0.071 (0.058)	0.093 (0.066)	-0.153* (0.084)	0.033 (0.060)	-0.091 (0.070)	-0.242*** (0.078)	-0.176** (0.077)	-0.144** (0.066)
<b>Cognitive skills<sup>†</sup></b>									
IQ	0.219*** (0.025)	0.072*** (0.023)	0.090*** (0.024)	-0.190*** (0.027)	-0.038 (0.027)	-0.099*** (0.028)	-0.211*** (0.024)	-0.092*** (0.031)	-0.115*** (0.023)
<b>Control variables: Gender &amp; age<sup>‡</sup></b>									
female	0.096*** (0.029)	0.163*** (0.027)	0.075*** (0.027)	0.019 (0.031)	-0.022 (0.026)	0.024 (0.028)	-0.224*** (0.030)	-0.299*** (0.031)	-0.212*** (0.029)
age	0.065 (0.047)	0.131*** (0.035)	0.079* (0.045)	0.110** (0.046)	0.049 (0.037)	0.065 (0.043)	0.067 (0.048)	0.035 (0.044)	0.047 (0.047)
age squared	-0.002 (0.002)	-0.004*** (0.002)	-0.002 (0.002)	-0.005** (0.002)	-0.003* (0.002)	-0.003* (0.002)	-0.004* (0.002)	-0.004* (0.002)	-0.004* (0.002)
<b>Household environment<sup>††</sup></b>									
household fixed effects	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>
socio-demographics	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>
parents' preferences	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>
parents' IQ	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>
parenting styles	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>
<b>Constant</b>									
constant	-0.565** (0.264)	-0.984*** (0.202)	-0.865*** (0.321)	-0.313 (0.252)	-0.157 (0.214)	-0.250 (0.311)	0.086 (0.265)	0.298 (0.263)	0.371 (0.339)
Observations	4,118	4,118	3,896	4,118	4,118	3,896	4,118	4,118	3,896
$R^2$	0.068	0.839	0.211	0.042	0.821	0.233	0.080	0.767	0.219
adj. $R^2$	0.065	0.677	0.202	0.039	0.640	0.224	0.077	0.531	0.210
$F$	23.223	18.027	17.524	10.072	2.233	10.715	28.257	23.373	21.438

**Notes:** Standard errors (in parentheses) are clustered at village level for all specifications. <sup>†</sup>Prosociality, SDQ internalizing and externalizing subscales, preferences, and cognitive skills measures are defined as described in sections 2.2-2.4. Instead of an indicator variable for being risk averse, two indicator variables for being risk neutral (choosing risk gamble no. 5) or risk seeking (choosing risk gamble no. 6) are included. Prosociality, SDQ subscales, and IQ are normalized to a mean of zero and standard deviation of one across our final estimation sibling sample. <sup>‡</sup>Female is an indicator for being a girl, age is measured in years. <sup>††</sup>Household (HH) socio-demographics comprise the number of siblings in HH, HH income, parents' age and literacy, whether the HH has an electricity connection, whether a senior is living in the HH, and religion; parents' preferences and IQ comprise variables analogous to children's measures (see sections 2.2 and 2.3); parenting styles comprise the six dimensions emotional warmth, inconsistent parenting, monitoring (intensity), negative communication, psychological control, and strict control as described in appendix section D. All columns display OLS regressions, specifications in columns (2), (5) and (8) include household fixed effects. Coefficients of main explanatory variables of interest for each outcome (cf. section 3 on hypotheses) are printed in bold. Significance at \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

**Table I.9:** Adding household fixed effects (HH FE) vs. household environment variables (HH env) to regressions of child outcomes on preferences—SDQ full score and SDQ internalizing (emotional symptoms & peer problems) and externalizing (hyperactivity & conduct problems) subscales

	SDQ FULL SCORE <sup>†</sup>			SDQ INTERNALIZING SCALE <sup>†</sup>			SDQ EXTERNALIZING SCALE <sup>†</sup>		
	(1) Baseline	(2) HH FE	(3) HH env	(4) Baseline	(5) HH FE	(6) HH env	(7) Baseline	(8) HH FE	(9) HH env
<b>Preferences<sup>†</sup></b>									
patience	0.009 (0.011)	0.007 (0.008)	-0.009 (0.009)	0.003 (0.010)	-0.007 (0.008)	-0.012 (0.009)	0.012 (0.010)	0.017* (0.010)	-0.003 (0.009)
time consistent	-0.050 (0.035)	0.026 (0.030)	-0.048 (0.030)	-0.103*** (0.038)	-0.017 (0.032)	-0.101*** (0.034)	0.007 (0.033)	0.056 (0.035)	0.008 (0.030)
risk averse	0.028 (0.031)	0.022 (0.028)	0.034 (0.029)	0.066** (0.033)	-0.008 (0.030)	0.056* (0.029)	-0.010 (0.030)	0.042 (0.032)	0.007 (0.030)
egalitarian	-0.341*** (0.082)	-0.101 (0.072)	-0.228*** (0.074)	-0.255*** (0.080)	-0.015 (0.065)	-0.170** (0.075)	-0.329*** (0.079)	-0.148 (0.090)	-0.221*** (0.076)
altruistic	-0.156 (0.108)	-0.079 (0.074)	-0.047 (0.082)	-0.141 (0.102)	-0.001 (0.075)	-0.060 (0.086)	-0.130 (0.101)	-0.125 (0.089)	-0.024 (0.080)
selfish	-0.316*** (0.086)	-0.097 (0.063)	-0.158** (0.064)	-0.279*** (0.083)	-0.009 (0.060)	-0.162** (0.069)	-0.269*** (0.079)	-0.148* (0.076)	-0.115* (0.065)
mixed	-0.233*** (0.086)	-0.092 (0.063)	-0.139** (0.068)	-0.154* (0.084)	0.034 (0.060)	-0.091 (0.070)	-0.241*** (0.077)	-0.175** (0.077)	-0.144** (0.066)
<b>Cognitive skills<sup>†</sup></b>									
IQ	-0.232*** (0.027)	-0.078*** (0.026)	-0.125*** (0.025)	-0.190*** (0.027)	-0.038 (0.027)	-0.099*** (0.028)	-0.211*** (0.024)	-0.092*** (0.031)	-0.115*** (0.023)
<b>Control variables: Gender &amp; age<sup>†</sup></b>									
female	-0.131*** (0.030)	-0.199*** (0.024)	-0.121*** (0.027)	0.019 (0.031)	-0.021 (0.026)	0.024 (0.028)	-0.224*** (0.030)	-0.299*** (0.031)	-0.213*** (0.029)
age	0.100** (0.047)	0.047 (0.038)	0.064 (0.044)	0.110** (0.046)	0.048 (0.037)	0.065 (0.042)	0.066 (0.048)	0.034 (0.044)	0.047 (0.047)
age squared	-0.005** (0.002)	-0.004** (0.002)	-0.004** (0.002)	-0.005** (0.002)	-0.003* (0.002)	-0.003* (0.002)	-0.004* (0.002)	-0.004* (0.002)	-0.004* (0.002)
<b>Household environment<sup>††</sup></b>									
household fixed effects	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>
socio-demographics	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>
parents' preferences	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>
parents' IQ	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>
parenting styles	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>
<b>Constant</b>									
constant	-0.140 (0.257)	0.084 (0.220)	0.068 (0.328)	-0.382 (0.251)	-0.146 (0.215)	-0.306 (0.311)	0.098 (0.266)	0.258 (0.261)	0.365 (0.343)
Observations	4,118	4,118	3,896	4,118	4,118	3,896	4,118	4,118	3,896
$R^2$	0.073	0.838	0.282	0.041	0.821	0.233	0.080	0.767	0.219
adj. $R^2$	0.071	0.674	0.274	0.039	0.641	0.224	0.077	0.532	0.210
$F$	22.820	20.209	15.319	10.052	2.372	10.861	30.693	25.556	19.225

**Notes:** Standard errors (in parentheses) are clustered at village level for all specifications. <sup>†</sup>SDQ full score, SDQ internalizing and externalizing subscales, preferences, and cognitive skills measures are defined as described in sections 2.2-2.4. SDQ full score, SDQ subscales, and IQ are normalized to a mean of zero and standard deviation of one across our final estimation sibling sample. <sup>‡</sup>Female is an indicator for being a girl, age is measured in years. <sup>††</sup>Household (HH) socio-demographics comprise number of siblings in HH, HH income, parents' age and literacy, whether the HH has an electricity connection, whether a senior is living in the HH, and religion; parents' preferences and IQ comprise variables analogous to children's measures (see sections 2.2 and 2.3); parenting styles comprise the six dimensions emotional warmth, inconsistent parenting, monitoring (intensity), negative communication, psychological control, and strict control as described in appendix section D. All columns display OLS regressions, specifications in columns (2), (5) and (8) include household fixed effects. Coefficients of main explanatory variables of interest for each outcome (cf. section 3 on hypotheses) are printed in bold. Significance at \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

**Table I.10:** Regressions of child outcomes on preferences dropping children who did not understand all experiments—Study attitude and risky behaviors (adding household fixed effects (HH FE) vs. household environment variables (HH env))

	STUDY ATTITUDE <sup>†</sup>			RISKY BEHAVIORS <sup>†</sup>		
	(1) Baseline	(2) HH FE	(3) HH env	(4) Baseline	(5) HH FE	(6) HH env
<b>Preferences<sup>†</sup></b>						
patience	<b>-0.007</b> (0.008)	<b>-0.002</b> (0.011)	<b>-0.004</b> (0.009)	0.007** (0.003)	0.002 (0.003)	0.005 (0.003)
time consistent	<b>0.104***</b> (0.038)	<b>0.019</b> (0.048)	<b>0.068*</b> (0.038)	0.007 (0.009)	0.031*** (0.010)	0.012 (0.008)
risk averse	0.035 (0.032)	0.009 (0.039)	0.035 (0.032)	<b>-0.019*</b> (0.010)	<b>0.001</b> (0.009)	<b>-0.014</b> (0.011)
egalitarian	0.288*** (0.080)	0.152* (0.090)	0.158** (0.080)	-0.045** (0.022)	-0.040 (0.026)	-0.021 (0.022)
altruistic	0.243** (0.106)	0.171 (0.106)	0.110 (0.104)	-0.036 (0.025)	-0.018 (0.028)	-0.017 (0.026)
selfish	0.292*** (0.084)	0.119 (0.087)	0.150* (0.081)	-0.018 (0.020)	-0.016 (0.023)	0.005 (0.019)
mixed	0.256*** (0.082)	0.223** (0.087)	0.150* (0.080)	-0.033 (0.021)	-0.018 (0.022)	-0.012 (0.020)
<b>Cognitive skills<sup>†</sup></b>						
IQ	0.166*** (0.024)	0.079** (0.037)	0.132*** (0.027)	-0.034*** (0.006)	-0.003 (0.008)	-0.019*** (0.007)
<b>Control variables: Gender &amp; age<sup>‡</sup></b>						
female	0.008 (0.033)	0.035 (0.038)	0.016 (0.034)	-0.142*** (0.008)	-0.137*** (0.009)	-0.146*** (0.009)
age	-0.003 (0.048)	0.060 (0.050)	0.019 (0.050)	0.064** (0.030)	-0.009 (0.031)	0.049 (0.031)
age squared	0.001 (0.002)	-0.001 (0.002)	0.000 (0.002)	-0.003** (0.001)	-0.000 (0.001)	-0.002* (0.001)
<b>Household environment<sup>††</sup></b>						
household fixed effects	X	✓	X	X	✓	X
socio-demographics	X	X	✓	X	X	✓
parents' preferences	X	X	✓	X	X	✓
parents' IQ	X	X	✓	X	X	✓
parenting styles	X	X	✓	X	X	✓
<b>Constant</b>						
constant	-0.360 (0.280)	-0.619** (0.284)	-0.217 (0.409)	-0.069 (0.188)	0.365* (0.195)	0.096 (0.212)
Observations	3,312	3,312	3,094	1,086	1,086	992
$R^2$	0.049	0.682	0.087	0.261	0.827	0.373
adj. $R^2$	0.046	0.360	0.074	0.254	0.648	0.344
$F$	14.163	7.858	8.750	41.978	26.429	19.149

**Notes:** Standard errors (in parentheses) are clustered at village level for all specifications. <sup>†</sup>Study attitude, risky behaviors, preferences, and cognitive skills measures are defined as described in sections 2.2-2.4. Study attitude and IQ are normalized to a mean of zero and standard deviation of one across the whole sibling sample. <sup>‡</sup>Female is an indicator for being a girl, age is measured in years. <sup>††</sup>Household (HH) socio-demographics comprise the number of siblings in HH, HH income, parents' age and literacy, whether the HH has an electricity connection, whether a senior is living in the HH, and religion; parents' preferences and IQ comprise variables analogous to children's measures (see sections 2.2 and 2.3); parenting styles comprise the six dimensions emotional warmth, inconsistent parenting, monitoring (intensity), negative communication, psychological control, and strict control as described in appendix section D. All columns display OLS regressions, specifications in columns (2) and (5) include household fixed effects. Coefficients of main explanatory variables of interest for each outcome (cf. section 3 on hypotheses) are printed in bold. Significance at \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

**Table I.11:** Regressions of child outcomes on preferences dropping children who did not understand all experiments—Prosociality and SDQ internalizing (emotional symptoms & peer problems) and externalizing (hyperactivity & conduct problems) subscales (adding household fixed effects (HH FE) vs. household environment variables (HH env))

	PROSOCIALITY <sup>†</sup>			SDQ INTERNALIZING SCALE <sup>†</sup>			SDQ EXTERNALIZING SCALE <sup>†</sup>		
	(1) Baseline	(2) HH FE	(3) HH env	(4) Baseline	(5) HH FE	(6) HH env	(7) Baseline	(8) HH FE	(9) HH env
<b>Preferences<sup>†</sup></b>									
patience	0.026** (0.012)	-0.009 (0.009)	0.030*** (0.011)	0.005 (0.011)	-0.005 (0.010)	-0.010 (0.010)	<b>0.023*</b> (0.012)	<b>0.025**</b> (0.011)	<b>0.005</b> (0.011)
time consistent	0.003 (0.043)	0.024 (0.033)	-0.012 (0.040)	-0.106** (0.044)	-0.022 (0.039)	-0.090** (0.041)	<b>-0.013</b> (0.038)	<b>0.040</b> (0.040)	<b>-0.013</b> (0.035)
risk averse	0.132*** (0.038)	0.026 (0.028)	0.105*** (0.034)	<b>0.068*</b> (0.039)	<b>-0.011</b> (0.031)	<b>0.047</b> (0.033)	<b>0.014</b> (0.035)	<b>0.025</b> (0.037)	<b>0.024</b> (0.034)
egalitarian	<b>0.270***</b> (0.084)	<b>0.118</b> (0.073)	<b>0.237***</b> (0.084)	<b>-0.328***</b> (0.089)	<b>0.051</b> (0.072)	<b>-0.185**</b> (0.079)	<b>-0.437***</b> (0.085)	<b>-0.197**</b> (0.097)	<b>-0.285***</b> (0.083)
altruistic	<b>0.140</b> (0.094)	<b>0.042</b> (0.086)	<b>0.077</b> (0.090)	<b>-0.187</b> (0.118)	<b>0.071</b> (0.089)	<b>-0.052</b> (0.093)	<b>-0.195*</b> (0.113)	<b>-0.134</b> (0.099)	<b>-0.058</b> (0.088)
selfish	<b>0.240***</b> (0.082)	<b>0.107*</b> (0.059)	<b>0.156**</b> (0.075)	<b>-0.345***</b> (0.094)	<b>0.081</b> (0.063)	<b>-0.135*</b> (0.072)	<b>-0.375***</b> (0.086)	<b>-0.147*</b> (0.079)	<b>-0.160**</b> (0.070)
mixed	0.148* (0.081)	0.088 (0.063)	0.104 (0.079)	-0.197** (0.095)	0.114* (0.068)	-0.063 (0.073)	-0.336*** (0.086)	-0.192** (0.083)	-0.198*** (0.073)
<b>Cognitive skills<sup>††</sup></b>									
IQ	0.195*** (0.030)	0.058** (0.026)	0.073** (0.028)	-0.202*** (0.031)	-0.034 (0.031)	-0.082** (0.033)	-0.199*** (0.027)	-0.107*** (0.033)	-0.093*** (0.026)
<b>Control variables: Gender &amp; age<sup>‡</sup></b>									
female	0.123*** (0.033)	0.155*** (0.030)	0.110*** (0.031)	0.007 (0.037)	-0.037 (0.029)	-0.004 (0.034)	-0.236*** (0.036)	-0.298*** (0.035)	-0.232*** (0.034)
age	0.010 (0.052)	0.096** (0.039)	0.027 (0.050)	0.135** (0.055)	0.068 (0.044)	0.074 (0.052)	0.100* (0.055)	0.082 (0.050)	0.081 (0.054)
age squared	0.000 (0.002)	-0.003* (0.002)	0.001 (0.002)	-0.006** (0.003)	-0.003* (0.002)	-0.004 (0.002)	-0.005** (0.002)	-0.005** (0.002)	-0.005** (0.002)
<b>Household environment<sup>††</sup></b>									
household fixed effects	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>
socio-demographics	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>
parents' preferences	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>
parents' IQ	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>
parenting styles	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>	<b>X</b>	<b>X</b>	<b>✓</b>
<b>Constant</b>									
constant	-0.476 (0.291)	-0.835*** (0.225)	-0.696** (0.339)	-0.451 (0.306)	-0.326 (0.250)	-0.481 (0.374)	0.015 (0.304)	0.009 (0.285)	0.028 (0.383)
Observations	3,190	3,190	3,008	3,190	3,190	3,008	3,190	3,190	3,008
$R^2$	0.058	0.848	0.205	0.046	0.835	0.268	0.083	0.774	0.236
adj. $R^2$	0.055	0.693	0.193	0.043	0.667	0.257	0.080	0.545	0.225
$F$	15.332	12.946	11.478	9.257	1.508	11.173	23.090	20.354	16.298

**Notes:** Standard errors (in parentheses) are clustered at village level for all specifications. <sup>†</sup>Prosociality, SDQ internalizing and externalizing subscales, preferences, and cognitive skills measures are defined as described in sections 2.2-2.4. Prosociality, SDQ subscales, and IQ are normalized to a mean of zero and standard deviation of one across the whole sibling sample. <sup>‡</sup>Female is an indicator for being a girl, age is measured in years. <sup>††</sup>Household (HH) socio-demographics comprise the number of siblings in HH, HH income, parents' age and literacy, whether the HH has an electricity connection, whether a senior is living in the HH, and religion; parents' preferences and IQ comprise variables analogous to children's measures (see sections 2.2 and 2.3); parenting styles comprise the six dimensions emotional warmth, inconsistent parenting, monitoring (intensity), negative communication, psychological control, and strict control as described in appendix section D. All columns display OLS regressions, specifications in columns (2), (5) and (8) include household fixed effects. Coefficients of main explanatory variables of interest for each outcome (cf. section 3 on hypotheses) are printed in bold. Significance at \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

## J Experimental instructions

### J.1 Experimental questionnaire for children

#### General setting

- ◇ **Age:** Children aged 6 to 16 will participate in a sequence of three experiments:
  - a. Time preferences
  - b. Risk preferences
  - c. Social preferences
- ◇ **Order:** The order of the experiments will be randomly determined by the administrators, which is explained at the beginning of the experiments.
- ◇ **Incentive:** Each child will receive a token (a star) as a show-up fee, which s/he will be able to convert into money at the end of the experiments. In addition, children can earn money during the experiment as all experiments are incentivized. However, for each child, only one of the experiments will be paid out. Which experiment will be paid will be determined through a lottery that will be explained soon.
- ◇ **Exchange rate for incentives:** The exchange rate between stars and money will be age-specific and will be communicated at the beginning of the experiment. The conversion table is included here.
- ◇ **Venue:** The experiments will take place in children's home; a male administrator will deal with boys and a female administrator will deal with girls.
- ◇ **Instructions:** All enumerators/instructors must memorize the instructions and explain the game to the child. While they will not read the text word by word, they will stick closely to the wording of the experimental instructions. In addition, the explanation will involve control questions to check for understanding.
- ◇ **Timing:** Members who belong to the same household will sit simultaneously in separate parallel sessions. It is an important task of the interviewer to ensure that the decisions of a household member truly reflect his/her own decision only and that other household members do not try to influence the decisions, e.g. place them back to back or in separate rooms.
- ◇ **Control questions that check children's understanding:** Children's understanding of the rules of the various experiments will be documented.

## General instructions

My name is ... Today I have prepared three games for you. In these games, you can earn money. Before we start, I will explain the rules of our games. How much money you will earn depends mainly on your decisions. At the end, only one of the games will be paid. Which game will be paid will be determined randomly after playing all three games. You will roll a die to determine which of the three games gets paid. The rolled number will determine whether the first, second, or third game will be paid for. Each game is equally likely to be paid.

It is important that you understand the rules of all our games and play each of them carefully because each of them could be the one that is paid. Please listen carefully now. I will frequently stop during my explanation and allow you to ask questions. Therefore, please interrupt me anytime in case you have a question.

**Are you okay so far?** *Leave time for questions and answer them privately.*

1. Determine the sequence by rolling a die, and write the sequence in which experiments are conducted:



- 1 = risk, time, social
- 2 = risk, social, time
- 3 = time, risk, social
- 4 = time, social, risk
- 5 = social, time, risk
- 6 = social, risk, time

## Time preferences

Let us start with this game. Before we start, let me explain the rules of our game. In this game you can earn stars, which you can convert into money. Each star is equal to Taka ... (*use the age appropriate exchange rate*). The more stars you earn, the more money you get. That's why it is important that you understand the rules of our game. Please interrupt me anytime in case you have a question.

**Are you okay so far?** *Leave time for questions and answer them privately.*

1. Determine the order of explanation by rolling a die (blue, green, yellow) and write it down:



- 1 = blue, green, yellow
- 2 = blue, yellow, green
- 3 = green, blue, yellow
- 4 = green, yellow, blue
- 5 = yellow, blue, green
- 6 = yellow, green, blue

*Within each part (color) the order is fixed, i.e. always use blue sheet 1 before blue sheet 2, green sheet 1 before green sheet 2, yellow sheet 1 before yellow sheet 2.*

The game works as follows:

The game consists of six parts. Two blue parts, two yellow parts and two green parts (*when mentioning the parts please point at the respective decision sheets*). In each part, you will need to make one decision. For example, in this green part you have to decide whether you prefer receiving 2 stars (*please point at the stars on the decision sheet*) tomorrow, in this case please tick THIS box (*point at the respective box*), or whether you prefer receiving 3 stars in 3 weeks, in that case please tick THAT box (*point at the respective box*). 3 weeks means 21 days and 21 nights. If you go for 2 stars tomorrow, you will get the money tomorrow. One of us will come to your home and deliver the money in an envelope with your name marked on it. If you wait, you will get money for 3 stars after 3 weeks. Again, one of us will come to your home and deliver the money in an envelope with your name marked on it.

In the second green part you have to decide whether you prefer receiving 2 stars (*please point at the stars on the decision sheet*) tomorrow, in this case please tick THIS box (*point at the respective box*), or whether you prefer receiving 4 stars in 3 weeks, in that case please tick THAT box (*point at the respective box*). If you go for 2 stars, you will get the money

tomorrow. One of us will come to your home and deliver the money in an envelope with your name marked on it. If you wait, you will get money for 4 stars after 3 weeks. Again, one of us will come to your home and deliver the money in an envelope with your name marked on it.

**Could you please repeat the rules of the game?** *If the child is unable to repeat, please explain the game again; the child has to be able to repeat the correct meaning of the game autonomously.*

2. Child understood the game after:

1 = first explanation, 2 = second explanation, 3 = third explanation, 4 = did not understand

The yellow parts are very similar to the green part. Here you see one of the decision sheets for the blue part. Again, 2 stars on the left-hand side, and 3 stars on the right-hand side. If you prefer receiving 2 stars tomorrow, you need to tick the left box. However, now if you prefer receiving 3 stars in 3 months, you need to tick the right box. 3 months means that about 90 days and nights will pass before you will get the money. On the second yellow sheet, again 2 stars on the left-hand side, and 4 stars on the right-hand side. If you prefer receiving 2 stars tomorrow, you need to tick the left box. However, now if you prefer receiving 4 stars in 3 months, you need to tick the right box. What do you think will happen if you tick THIS box? (*Please point at the box with the immediate (tomorrow) reward.*) What do you think will happen if you tick THAT box? (*Please point at the box with the delayed reward of 3 stars; the child has to answer the questions correctly, otherwise the experimenter has to repeat the explanation.*)

3. Child understood the game after:

1 = first explanation, 2 = second explanation, 3 = third explanation, 4 = did not understand

The blue parts are very similar to the green and yellow parts. Here you see the first decision sheet for the blue part. Again, 2 stars on the left-hand side, and 3 stars on the right-hand side. However, now the earlier payment takes place in 1 month, which means after 30 days and nights have passed. The later payment takes place in 4 months, which means after 120 days and nights have passed. If you decide to receive 2 stars, you need to wait 1 month, and if you decide to receive 3 stars, you need to wait 4 months. On the second blue sheet, again 2 stars on the left-hand side, and 4 stars on the right-hand side. If you prefer receiving 2 stars in 1 month, you need to tick the left box. However, if you prefer receiving 4 stars in 4 months, you need to tick the box on the right. What do you think will happen if you tick THIS box? (*Please point at the box with the reward in 1 month.*) What do you think will happen if you tick THAT box? (*Please point at the box with the delayed reward of 4 stars; the child has to answer the questions correctly, otherwise the experimenter has to repeat the explanation.*)

4. Child understood the game after:

1 = first explanation, 2 = second explanation, 3 = third explanation, 4 = did not understand

If this game is paid, only one of the six decisions counts. That means you will receive the stars for one of the six parts only. The decisions are numbered from 1 to 6. After your decisions, you will roll a die (*please demonstrate*). Assume that it shows number 5. Now decision sheet 5 (the first blue sheet) is played for real. If you have checked the box on the left-hand side, you will receive the money for 2 stars in one month. If you have checked the box on the right-hand side, you will receive money for 3 stars in 4 months. The other five sheets do not count in this case. However, you need to make a decision for each of the six sheets because you do not know yet which part will be drawn at the end of the game. Could you please repeat the last part? Will you receive the stars for all six sheets? Do you need to make a decision for each of the six sheets? If the child answers incorrectly the experimenter has to repeat the explanation of this part.

5. Child understood the game after:

1 = first explanation, 2 = second explanation, 3 = third explanation, 4 = did not understand

Please take your decision for each of the six sheets now (*place the decision sheets side by side on the table; the child should fill out the decision sheets from left to right*). Start with this part (*point at the first decision sheet (depending on the order of explanation)*) and continue with this part (*point at the second decision sheet*) and finally make your decision in this part (*point at the final decision sheet*). Take as much time as you need. In the meantime, I will turn around so that I do not disturb you. Just call me when you are done or have any questions.

**Decision sheet 1**  
(Green sheet 1)

<div data-bbox="343 526 694 622"></div> <p data-bbox="411 672 625 728">Tomorrow</p> <div data-bbox="478 817 555 891"><input type="checkbox"/></div>	<div data-bbox="893 526 1244 622"></div> <p data-bbox="992 672 1168 728">3 Weeks</p> <div data-bbox="1050 817 1126 891"><input type="checkbox"/></div>
--	--

**Decision sheet 2**  
(Green sheet 2)

<div data-bbox="347 539 692 636"></div> <p data-bbox="416 689 624 734">Tomorrow</p> <div data-bbox="483 826 558 902"><input type="checkbox"/></div>	<div data-bbox="898 539 1243 636"></div> <p data-bbox="999 689 1169 734">3 Weeks</p> <div data-bbox="1053 826 1128 902"><input type="checkbox"/></div>
--	--

**Decision sheet 3**  
(Yellow sheet 1)

<div data-bbox="336 533 683 629"></div> <p data-bbox="395 719 608 763">Tomorrow</p> <div data-bbox="461 815 539 891"><input type="checkbox"/></div>	<div data-bbox="901 533 1248 629"></div> <p data-bbox="979 719 1171 763">3 Months</p> <div data-bbox="1038 815 1117 891"><input type="checkbox"/></div>
--	---

**Decision sheet 4**  
(Yellow sheet 2)

<div data-bbox="343 555 691 651"></div> <p data-bbox="416 712 630 761">Tomorrow</p> <div data-bbox="488 810 564 887"><input type="checkbox"/></div>	<div data-bbox="906 555 1254 651"></div> <p data-bbox="991 712 1190 761">3 Months</p> <div data-bbox="1054 810 1131 887"><input type="checkbox"/></div>
--	---

**Decision sheet 5**  
(Blue sheet 1)

<div data-bbox="365 562 715 658"></div> <p data-bbox="459 719 625 763">1 Month</p> <div data-bbox="497 810 572 887"><input type="checkbox"/></div>	<div data-bbox="925 562 1275 658"></div> <p data-bbox="1008 719 1197 763">4 Months</p> <div data-bbox="1077 810 1152 887"><input type="checkbox"/></div>
---	---

**Decision sheet 6**  
(Blue sheet 2)

<div data-bbox="341 519 689 616"></div> <p data-bbox="443 696 614 741">1 Month</p> <input data-bbox="491 781 566 855" type="checkbox"/>	<div data-bbox="906 519 1254 616"></div> <p data-bbox="983 696 1174 741">4 Months</p> <input data-bbox="1040 781 1115 855" type="checkbox"/>
--	--

6. Decision taken on Green sheet 1:  1 = tomorrow, 2 = 3 weeks
7. Decision taken on Green sheet 2:  1 = tomorrow, 2 = 3 weeks
8. Decision taken on Yellow sheet 1:  1 = tomorrow, 2 = 3 months
9. Decision taken on Yellow sheet 2:  1 = tomorrow, 2 = 3 months
10. Decision taken on Blue sheet 1:  1 = 1 month, 2 = 4 months
11. Decision taken on Blue sheet 2:  1 = 1 month, 2 = 4 months

*Roll a die to determine which decision sheet would be paid if this game got selected for payoff in the end.*

## Risk preferences

Let us start with this game. Before we start, I will explain the rules of our game. Similar to other games, you can earn money in this game as well. How much money you will earn depends mainly on your decisions. That's why it is important that you understand the rules of our game. Please listen carefully now. I will frequently stop during my explanation and allow you to ask questions. Please interrupt me anytime in case you have a question.

**Are you okay so far?** *Leave time for questions and answer them privately.*

In this game, you need to select the gamble you would like to play from among six different gambles, which are listed below. You must select one and only one of these gambles.

If this game is selected for payment, you will have a 1-in-6 chance of receiving the money. The selection will be made by rolling a 6-sided die twice—first, you will roll the die to decide the gamble, and the second to decide the outcome of the particular gamble. For example, if you selected gamble number 4, then if the first roll of the die is 4, you would receive one of the payoffs of gamble number 4, which will be determined in the second roll. If the first roll of the die is not 4 and you have chosen gamble number 4, you would not receive any payments. Depending on the outcome of the first roll, the second roll would determine the outcome of the selected gamble. Each gamble has two possible outcomes—low and high. If 1, 2 or 3 is rolled, the outcome of the selected gamble is the low one, and if 4, 5 or 6 is rolled, the outcome of the gamble is the high one, and you would receive money accordingly.

Notice that the low outcome is decreasing and the high outcome is increasing for each successive gamble. For example, in the first gamble, both outcomes are identical. If you select it and then this number is rolled in the first roll, your payoff would be 25 (*please adjust for the appropriate age*) Taka. If on the other hand, you had selected gamble number 2, and if it is rolled on the first roll, your payoff could be 22 (*please adjust*) Taka or 48 (*please adjust*) Taka. In the second roll, if 1, 2 or 3 is rolled, you would receive 22 (*please adjust*) Taka, whereas if 4, 5 or 6 is rolled, you would receive 48 (*please adjust*) Taka.

*Ask the child to repeat the game.*

1. Child understood the game after:



1 = first explanation, 2 = second explanation, 3 = third explanation, 4 = did not understand

Before you select the actual gamble involving money, we will have a practice session with candies. There are two gambles from which you need to select one:

	Outcome	Payoff	Chances	Your Selection
<b>Gamble 1</b>	LOW	1	50%	
	HIGH	1	50%	
<b>Gamble 2</b>	LOW	0	50%	
	HIGH	2	50%	

Both gambles have two outcomes. The first gamble pays 1 candy in both states, while the second gamble pays no (0) candy in the low state and 2 candies in high state. Which gamble would you like to play? Once you make your selection, you will first roll the die to decide the gamble, and then again roll the die to decide the outcome of the particular gamble. For example, if you selected gamble number 2, then if the first roll of the die is 2, you would receive one of the payoffs of gamble number 2, which will be determined in the second die roll. In the second die roll, if 1, 2 or 3 is rolled, the outcome of the selected gamble is the low one, which is 0 in gamble number 2. That means, you will not receive any candy. However, if 4, 5 or 6 is rolled, the outcome of the gamble is the high one, and you will receive 2 candies. Let us start this now.

**Are you okay so far?** *Leave time for questions and answer them privately.*

2. Gamble number picked involving candies:

*Roll a die to determine whether gamble number 1 or gamble number 2 is payoff-relevant. If you have rolled a 1 or a 2, please roll the die a second time to determine whether the low or the high payoff is realized.*

3. Select the table with the appropriate age:



- 1 = age 6-7
- 2 = age 8-9
- 3 = age 10-11
- 4 = age 12-13
- 5 = age 14-15
- 6 = age 16

Table 1: Age 6-7

Mark the gamble you like best with an X in the last column "Your Selection"  
 (mark only one of the six gambles):

	Outcome	Payoff	Chances	Your Selection
<b>Gamble 1</b>	LOW	13	50%	
	HIGH	13	50%	
<b>Gamble 2</b>	LOW	11	50%	
	HIGH	24	50%	
<b>Gamble 3</b>	LOW	10	50%	
	HIGH	30	50%	
<b>Gamble 4</b>	LOW	8	50%	
	HIGH	38	50%	
<b>Gamble 5</b>	LOW	3	50%	
	HIGH	48	50%	
<b>Gamble 6</b>	LOW	0	50%	
	HIGH	50	50%	

Table 2: Age 8-9

Mark the gamble you like best with an X in the last column "Your selection"  
 (mark only one of the six gambles):

	Outcome	Payoff	Chances	Your Selection
<b>Gamble 1</b>	LOW	19	50%	
	HIGH	19	50%	
<b>Gamble 2</b>	LOW	17	50%	
	HIGH	36	50%	
<b>Gamble 3</b>	LOW	15	50%	
	HIGH	45	50%	
<b>Gamble 4</b>	LOW	11	50%	
	HIGH	56	50%	
<b>Gamble 5</b>	LOW	4	50%	
	HIGH	71	50%	
<b>Gamble 6</b>	LOW	0	50%	
	HIGH	75	50%	

Table 3: Age 10-11

Mark the gamble you like best with an X in the last column "Your selection"  
 (mark only one of the six gambles):

	Outcome	Payoff	Chances	Your Selection
<b>Gamble 1</b>	LOW	25	50%	
	HIGH	25	50%	
<b>Gamble 2</b>	LOW	22	50%	
	HIGH	48	50%	
<b>Gamble 3</b>	LOW	20	50%	
	HIGH	60	50%	
<b>Gamble 4</b>	LOW	15	50%	
	HIGH	75	50%	
<b>Gamble 5</b>	LOW	5	50%	
	HIGH	95	50%	
<b>Gamble 6</b>	LOW	0	50%	
	HIGH	100	50%	

Table 4: Age 12-13

Mark the gamble you like best with an X in the last column "Your selection"  
 (mark only one of the six gambles):

	Outcome	Payoff	Chances	Your Selection
<b>Gamble 1</b>	LOW	38	50%	
	HIGH	38	50%	
<b>Gamble 2</b>	LOW	33	50%	
	HIGH	72	50%	
<b>Gamble 3</b>	LOW	30	50%	
	HIGH	90	50%	
<b>Gamble 4</b>	LOW	23	50%	
	HIGH	113	50%	
<b>Gamble 5</b>	LOW	8	50%	
	HIGH	143	50%	
<b>Gamble 6</b>	LOW	0	50%	
	HIGH	150	50%	

Table 5: Age 14-15

Mark the gamble you like best with an X in the last column "Your selection"  
 (mark only one of the six gambles):

	Outcome	Payoff	Chances	Your Selection
<b>Gamble 1</b>	LOW	44	50%	
	HIGH	44	50%	
<b>Gamble 2</b>	LOW	39	50%	
	HIGH	84	50%	
<b>Gamble 3</b>	LOW	35	50%	
	HIGH	105	50%	
<b>Gamble 4</b>	LOW	26	50%	
	HIGH	131	50%	
<b>Gamble 5</b>	LOW	9	50%	
	HIGH	166	50%	
<b>Gamble 6</b>	LOW	0	50%	
	HIGH	175	50%	

Table 6: Age 16

Mark the gamble you like best with an X in the last column "Your selection"  
 (mark only one of the six gambles):

	Outcome	Payoff	Chances	Your Selection
<b>Gamble 1</b>	LOW	63	50%	
	HIGH	63	50%	
<b>Gamble 2</b>	LOW	55	50%	
	HIGH	120	50%	
<b>Gamble 3</b>	LOW	50	50%	
	HIGH	150	50%	
<b>Gamble 4</b>	LOW	38	50%	
	HIGH	188	50%	
<b>Gamble 5</b>	LOW	13	50%	
	HIGH	238	50%	
<b>Gamble 6</b>	LOW	0	50%	
	HIGH	250	50%	

4. Gamble number picked:

*Roll a die to determine whether gamble number 1 or gamble number 2 is payoff-relevant. If the outcome of the first die roll equals the gamble number picked (if 6. = 7.), please roll the die a second time to determine whether the low or the high payoff is realized.*

## Social preferences

In this game you can earn stars, which you can convert into money. Each star is equal to Taka ... (*use the age appropriate exchange rate*). The more stars you will earn, the more money you will get. That's why it is important that you understand the rules of our game. Please listen carefully now. I will frequently stop during my explanation and allow you to ask questions. Therefore, please interrupt me anytime in case you have a question.

**Are you okay so far?** *Leave time for questions and answer them privately.*

In this game you have to decide how to divide stars between yourself and another child similar to you but from a different village. You will never know who exactly the other child is and the other child will not get to know you. However, I will ensure that the other child does indeed receive the money that corresponds to the stars that you will give to him/her.

You will get four different decision sheets. You will need to decide how to divide stars between yourself and another child similar to you.

**Are you okay so far?** *Leave time for questions and answer them privately.*

There are two possible ways to allocate the stars: the option on the left-hand side and the option on the right-hand side.

Please look at the decision sheet. With option "left" you get 1 star and the child from another village gets 1 star. 1 star equals ... Taka (*depending on the age group*). With option "right" you get 2 stars and the child from another village gets 0 stars.

**Are you okay so far?** *Leave time for questions and answer them privately.*

Depending on which option you want to choose, you should check the box at the left- or the right-hand side. You can choose either option "left" or option "right". If you would like to divide the stars according to option "right", which box would you have to check? Right, the box at the "right" side.

How much would you earn and how much would the child from the other village with whom you are randomly matched earn in this case? Right, you would get ... Taka (*depending on the age group*) and the other child similar to you would get nothing.

1. Child understood the game after:

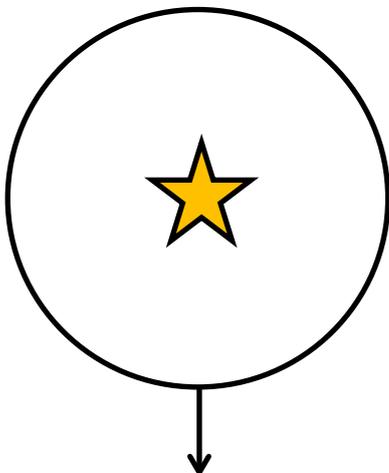
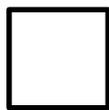
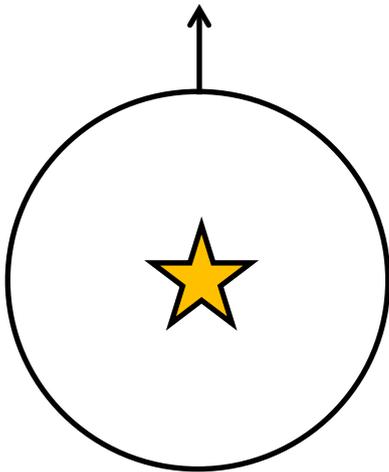
1 = first explanation, 2 = second explanation, 3 = third explanation, 4 = did not understand

**Are you okay so far?** *Leave time for questions and answer them privately.*

As I mentioned earlier, you will get four decision sheets. The decision sheets differ from each other in the amount of stars that can be divided between you and the other child. Please choose one of the two options for each decision sheet. At the end of the game, you will roll a die (*show the process*). Here the number you roll corresponds to the sheet you will get paid for, meaning if you roll 1, you get paid for decision sheet 1 etc. If this game is selected for payment, you and the other child will be paid according to the selected decision sheet. If you roll a 5 or 6, no decision sheet will be paid.

Decision sheet 1

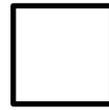
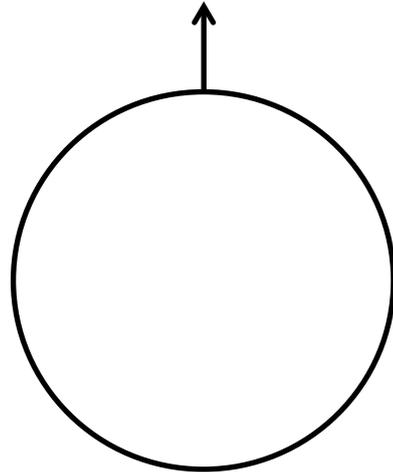
For the **other** child



For **me**

**LEFT**

For the **other** child

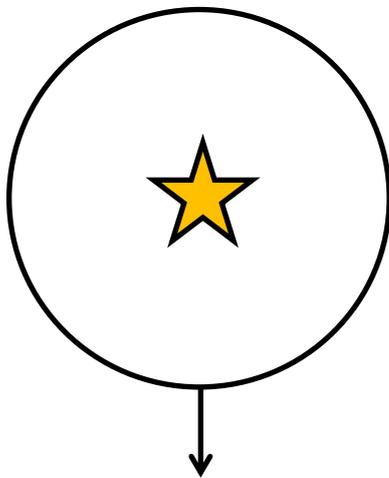
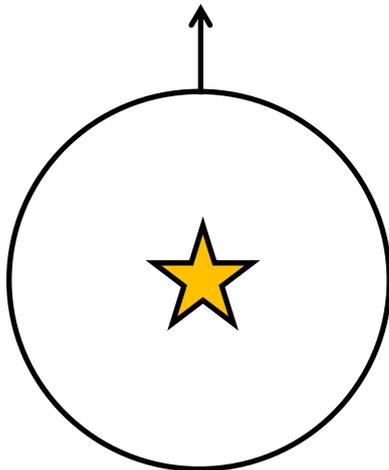


For **me**

**RIGHT**

Decision sheet 2

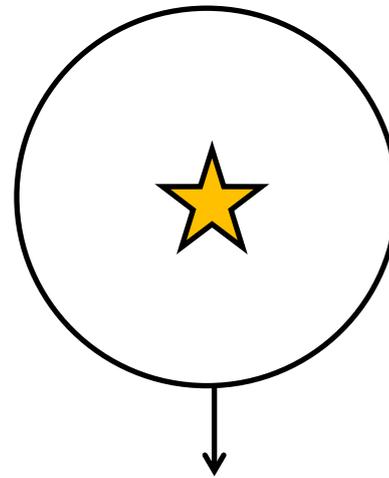
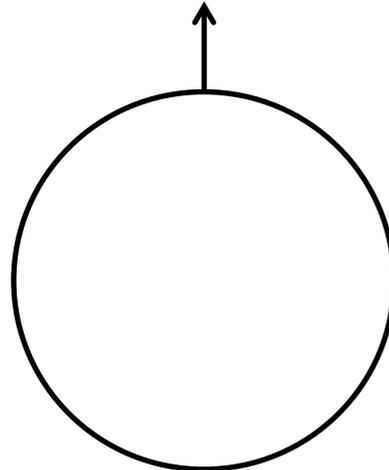
For the **other** child



For **me**

**LEFT**

For the **other** child

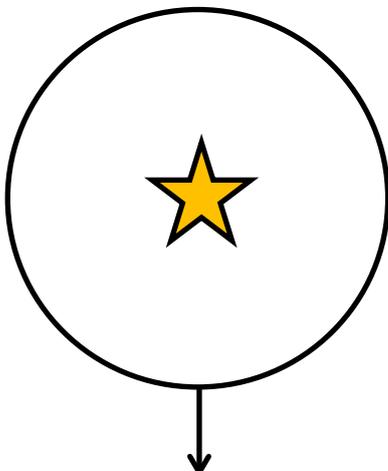
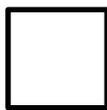
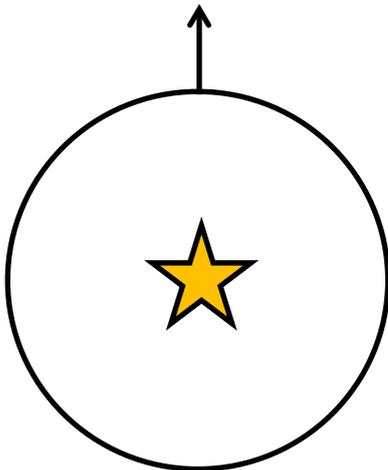


For **me**

**RIGHT**

Decision sheet 3

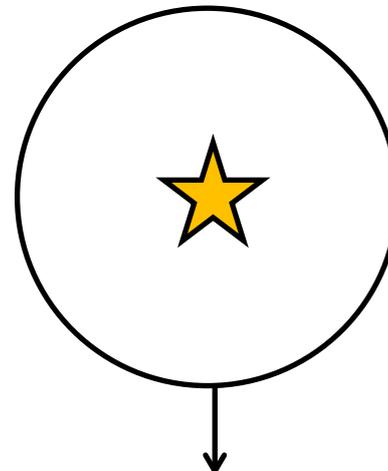
For the **other** child



For **me**

**LEFT**

For the **other** child

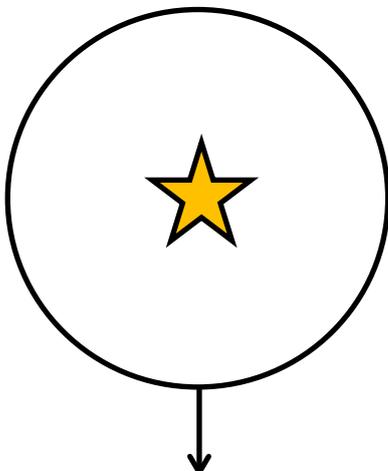
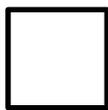
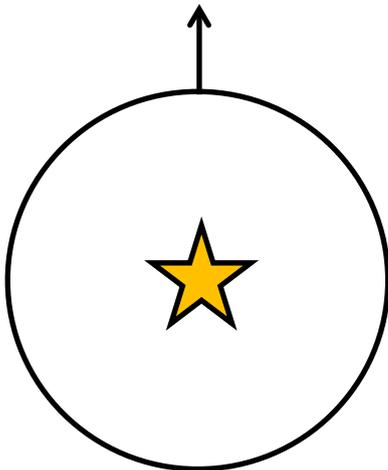


For **me**

**RIGHT**

Decision sheet 4

For the **other** child



For me

**LEFT**

For the **other** child



For me

**RIGHT**

2. Decision on first sheet:  1 = left, 2 = right
3. Decision on second sheet:  1 = left, 2 = right
4. Decision on third sheet:  1 = left, 2 = right
5. Decision on fourth sheet:  1 = left, 2 = rights

*Roll a die to determine which decision sheet would be paid if this game got selected for payoff in the end.*

## Risky behaviors (*children aged 10 to 16*)

Scale: 1 = yes, 2 = no

1. Do you smoke?
2. Do you eat pan/jorda/supari?
3. Do you gamble/bet/play lottery?
4. Do you play on road with car tires?
5. Do you jump from tree/bridge/saqo/trolley to river or canal?
6. Do you run behind the motorbike/car/trolley?
7. Do you play danguli?
8. Do you get up in the tree or your house roof?
9. Do you play dive in pond/river?
10. Do you bring flowers or fruits without permission from someone else's garden?
11. Do you play somersault?
12. Do you blow fire-works?
13. Do you play ha-du-du?
14. Do you use marijuana/ganja/hashish?
15. Do you drive a car/motorbike?
16. Do you often get into physical fights?

On top of the measures displayed, we elicited questionnaire measures for time, risk, and trust preferences as well as locus of control, self-control, Big 5, self-esteem, and happiness.

## J.2 Mothers about children questionnaire

### Strengths and Difficulties Questionnaire (*mothers about all children aged 6 to 16*)

Scale:

- 1 = not true
- 2 = somewhat true
- 3 = certainly true

My child...

1. ...is considerate of other people's feelings.
2. ...is restless, overactive, cannot stay still for long.
3. ...often complains of headaches, stomach-aches or sickness.
4. ...shares readily with other children (treats, toys, pencils, etc.).
5. ...often has temper tantrums or hot tempers.
6. ...is rather solitary, tends to play alone.
7. ...is generally obedient, usually does what adults request.
8. ...has many worries, often seems worried.
9. ...is helpful if someone is hurt, upset or feeling ill.
10. ...is constantly fidgeting or squirming.
11. ...has at least one good friends.
12. ...often fights with other children or bullies them.
13. ...is often unhappy, down-hearted or tearful.
14. ...is generally liked by other children.
15. ...is easily distracted, concentration wanders.
16. ...is nervous or clingy in new situations, easily loses confidence.
17. ...is kind to younger children.
18. ...often lies or cheats.
19. ...is picked on or bullied by other children.
20. ...often volunteers to help others (parents, teachers, other children).
21. ...thinks things out before acting.
22. ...steals from home, school or elsewhere.
23. ...gets on better with adults than with other children.
24. ...has many fears, is easily scared.
25. ...sees tasks through to the end, has good attention span.

## Parenting style

*(answered once for all children in the household)*

Scale:

- 1 = never
- 2 = seldom
- 3 = sometimes
- 4 = frequently
- 5 = very frequently

How often do the following things occur?

1. I use words and gestures to show my child that I love him/her.
2. I criticize my child.
3. I talk to my child about things he/she has done, seen, or experienced when he/she was out.
4. I punish my child when he/she was disobedient.
5. I threaten my child with punishment, but don't actually follow through with it.
6. When my child is outside the home, I know exactly where he/she is.
7. I tend to be strict with my child.
8. I comfort my child when he/she feels sad.
9. I shout at my child, when he/she did something wrong.
10. I feel that my child is ungrateful because he/she disobeys.
11. I stop talking to my child for a while when he/she did something wrong.
12. I make it clear to my child that he/she should not oppose orders and decisions.
13. I praise my child.
14. I scold my child when I am angry at him/her.
15. I try to actively influence my child's circle of friends.
16. I reduce punishments or lift them ahead of time.
17. I am disappointed and sad when my child misbehaves.
18. It is hard for me to be consistent in my childrearing.

On top of the measures displayed, mothers answered short questionnaires regarding self-control and Big 5 for younger children aged 6 to 13 and 6 to 11, respectively.

## J.3 Experimental questionnaire for adults: Preferences sections

### Time preferences

Let us start with this game. Before we start, let me explain the rules of our game. In this game you can earn money. That's why it is important that you understand the rules of our game. Please interrupt me anytime in case you have a question.

**Are you okay so far?** *Leave time for questions and answer them privately.*

1. Determine the order of explanation by rolling a die (blue, green, yellow) and write it down:



- 1 = choice set 1, choice set 2, choice set 3
- 2 = choice set 1, choice set 3, choice set 1
- 3 = choice set 2, choice set 3, choice set 1
- 4 = choice set 2, choice set 1, choice set 3
- 5 = choice set 3, choice set 1, choice set 2
- 6 = choice set 3, choice set 2, choice set 2

The game works as follows:

The game consists of three choice sets. There are six choices in each choice set. You need to make a choice between two payment options: Option A or Option B. In each choice set, there are six such decisions that you need to make. Each decision is a paired choice between Option A and Option B. You will be asked to make a choice between these two payment options in each decision row. For example, (*assuming the first choice set is being randomly picked first*) in the first row, you need to make a choice between payment Option A and payment Option B where payment Option A pays you Taka 100 tomorrow and Option B pays you Taka 105 after 3 months from today. In the second choice, Option A pays you Taka 100 tomorrow, and Option B pays you Taka 110 in 3 months. In the third choice, Option A pays you Taka 100 tomorrow, and Option B pays you Taka 120 in 3 months. Notice that Option A remains unchanged while Option B is increasing.

If you go for Taka 100 tomorrow, you will need to tick Option A. If selected, one of us will come to your home and to deliver the money in an envelope with your name marked on it. If you wait, you will get Taka 105 after 3 months. Again, one of us will come to your home and to deliver the money in an envelope with your name marked on it.

**Could you please repeat the rules of the game?** *If the respondent is unable to repeat, please explain the game again; the respondent has to be able to repeat the correct meaning of the game autonomously.*

2. Respondent understood the game after:

1 = first explanation, 2 = second explanation, 3 = third explanation, 4 = did not understand

The second choice set is very similar to the first choice set. However, Option A now pays in 1 month, and Option B pays in 4 months. If you go for Taka 100 in 1 month, you will need to tick Option A. If selected, one of us will come to your home and deliver the money in an envelope with your name marked on it. If you wait 4 months, you will get Taka 105 after 4 months. Again, one of us will come to your home and deliver the money in an envelope with your name marked on it.

**Could you please repeat the rules of the game?** *If the respondent is unable to repeat, please explain the game again; the respondent has to be able to repeat the correct meaning of the game autonomously.*

3. Respondent understood the game after:

1 = first explanation, 2 = second explanation, 3 = third explanation, 4 = did not understand

The third choice set is very similar to the second and first choice set. However, Option A now pays in 1 year, and Option B pays in 1 year and 3 months. If you go for Taka 100 in 1 year, you will need to tick Option A. If selected, one of us will come to your home and to deliver the money in an envelope with your name marked on it. If you wait 1 year 3 months, you will get Taka 105 after 1 year 3 months. Again, one of us will come to your home and to deliver the money in an envelope with your name marked on it.

If this game is paid, only one of the three choice sets counts. The selection will be made by rolling a 6-sided die twice – first to decide the set, and second to decide the choice. You will roll the die after your decisions (*please demonstrate*). In the first die roll, if 1, 2 or 3 is rolled, you will receive the money from the particular choice set, if 4, 5 or 6 is rolled, you will not receive any money. Depending on the outcome of the first die roll, the second die roll would determine the particular choice that you would be paid for. For example, if 3 is rolled in the second roll, you will receive the money from your decision concerning the third payoff alternative (*third row*) of the relevant choice set.

**Could you please repeat the rules of the game?** *If the respondent is unable to repeat, please explain the game again; the respondent has to be able to repeat the correct meaning of the game autonomously.*

4. Respondent understood the game after:



1 = first explanation, 2 = second explanation, 3 = third explanation, 4 = did not understand

Please take your decision for each of the choice sets now (*place the decision sheets side by side on the table*). Start with this part (*point at the first decision sheet (depending on the order of explanation)*) and continue with this part (*point at the second decision sheet*) and finally make your decision in this part (*point at the final decision sheet*). Take as much time as you need. In the meantime, I will turn around so that I do not disturb you. Just call me when you are done or have any questions.

*Roll a die to determine which decision sheet would be paid if this game got selected for payoff in the end.*

### Choice set 1

Payoff alternative	Payment Option A (pays amount below tomorrow)	Payment Option B (pays amount below after 3 months)	Annual interest rate in %	Preferred Payment Option (A or B)
1	100	105	20%	
2	100	110	40%	
3	100	120	80%	
4	100	125	100%	
5	100	150	200%	
6	100	200	400%	

### Choice set 2

Payoff alternative	Payment Option A (pays amount below after 1 month)	Payment Option B (pays amount below after 4 months)	Annual interest rate in %	Preferred Payment Option (A or B)
1	100	105	20%	
2	100	110	40%	
3	100	120	80%	
4	100	125	100%	
5	100	150	200%	
6	100	200	400%	

### Choice set 3

Payoff alternative	Payment Option A (pays amount below after 1 year)	Payment Option B (pays amount below after 1 year 3 months)	Annual interest rate in %	Preferred Payment Option (A or B)
1	100	105	20%	
2	100	110	40%	
3	100	120	80%	
4	100	125	100%	
5	100	150	200%	
6	100	200	400%	

## Risk preferences

Let us start with this game. Before we start, I will explain the rules of our game. Similar to the other games, you can earn money in this game as well. How much money you will earn depends mainly on your decisions. That's why it is important that you understand the rules of our game. Please listen carefully now. I will frequently stop during my explanation and allow you to ask questions. Therefore, please interrupt me anytime in case you have a question.

**Are you okay so far?** *Leave time for questions and answer them privately.*

In this game, you need to select the gamble you would like to play from among six different gambles, which are listed below. You must select one and only one of these gambles.

If this game is selected for payment, you will have a 1-in-6 chance of receiving the money. The selection will be made by rolling a 6-sided die twice—first, you will roll the die to decide the gamble, and the second to decide the outcome of the particular gamble. For example, if you selected gamble number 4, then if the first roll of the die is 4, you would receive one of the payoffs of gamble 4, which will be determined in the second roll. If the first roll of the die is not 4 and you have chosen gamble number 4, you would not receive any payments. Depending on the outcome of the first roll, the second roll would determine the outcome of the selected gamble. Each gamble has two possible outcomes—low and high. If 1, 2 or 3 is rolled, the outcome of the selected gamble is the low one, and if 4, 5 or 6 is rolled, the outcome of the gamble is the high one, and you would receive money accordingly.

Notice that the low outcome is decreasing and the high outcome is increasing for each successive gamble. For example, in the first gamble, both outcomes are identical. If you select it and then this number is rolled in the first roll, your payoff would be 125 Taka. If on the other hand, you had selected gamble number 2, and if it is rolled on the first roll, your payoff could be 110 Taka or 240 Taka. In the second roll, if 1, 2 or 3 is rolled, you would receive 110 Taka, whereas if 4, 5 or 6 is rolled, you would receive 240 Taka.

*Ask the respondent to repeat the game.*

1. Respondent understood the game after:

1 = first explanation, 2 = second explanation, 3 = third explanation, 4 = did not understand

Before you select the actual gamble involving money, we will have a practice session with candies. There are two gambles from which you need to select one:

	Outcome	Payoff	Chances	Your Selection
<b>Gamble 1</b>	LOW	1	50%	
	HIGH	1	50%	
<b>Gamble 2</b>	LOW	0	50%	
	HIGH	2	50%	

Both gambles have two outcomes. The first gamble pays 1 candy in both states, while the second gamble pays no (0) candy in the low state and 2 candies in high state. Which gamble would you like to play? Once you make your selection, you will first roll the die to decide the gamble, and then again roll the die to decide the outcome. For example, if you selected gamble number 2, then if the first roll of the die is 2, you would receive one of the payoffs of gamble number 2, which will be determined in the second die roll. In the second roll, if 1, 2 or 3 is rolled, the outcome of the selected gamble is the low one, which is 0 here. That means, you will not receive any candy. However, if 4, 5 or 6 is rolled, the outcome of the gamble is the high one, and you will receive 2 candies. Let us start this now.

**Are you okay so far?** *Leave time for questions and answer them privately.*

2. Gamble number picked involving candies:

*Roll a die to determine whether gamble number 1 or gamble number 2 is payoff-relevant. If you have rolled a 1 or a 2, please roll the die a second time to determine whether the low or the high payoff is realized.*

Mark the gamble you like best with an X in the last column "Your Selection"  
 (mark only one of the six gambles):

	<b>Outcome</b>	<b>Payoff</b>	<b>Chances</b>	<b>Your Selection</b>
<b>Gamble 1</b>	LOW	125	50%	
	HIGH	125	50%	
<b>Gamble 2</b>	LOW	110	50%	
	HIGH	240	50%	
<b>Gamble 3</b>	LOW	100	50%	
	HIGH	300	50%	
<b>Gamble 4</b>	LOW	75	50%	
	HIGH	375	50%	
<b>Gamble 5</b>	LOW	25	50%	
	HIGH	475	50%	
<b>Gamble 6</b>	LOW	0	50%	
	HIGH	500	50%	

3. Gamble number picked:

*Roll a die to determine whether gamble number 1 or gamble number 2 is payoff-relevant. If the outcome of the first die roll equals the gamble number picked (if 6. = 7.), please roll the die a second time to determine whether the low or the high payoff is realized.*

## Social preferences

In this game you can earn stars, which you can convert into money. Each star is equal to Taka 100. The more stars you will earn, the more money you will get. That's why it is important that you understand the rules of our game. Please listen carefully now. I will frequently stop during my explanation and allow you to ask questions. Therefore, please interrupt me anytime in case you have a question.

**Are you okay so far?** *Leave time for questions and answer them privately.*

In this game you have to decide how to divide stars between yourself and another person similar to you but from a different village. You will never know who exactly the other person is and the other person will not get to know you. However, I will ensure that the other person does indeed receive the money that corresponds to the stars that you will give to him/her.

You will get four different decision sheets. You will need to decide how to divide stars between yourself and this person similar to you.

**Are you okay so far?** *Leave time for questions and answer them privately.*

There are two possible ways to allocate the stars: the option on the left-hand side and the option on the right-hand side.

Please look at the decision sheet. With option "left" you get one star and the person from another village with whom you are randomly matched gets 1 star. One star equals 100 Taka. With option "right" you get 2 stars and the person from another village gets 0 stars.

**Are you okay so far?** *Leave time for questions and answer them privately.*

Depending on which option you want to choose, you should check the box at the left- or the right-hand side. You can choose either option "left" or option "right". If you would like to divide the stars according to option "right", which box would you have to check? Right, the box at the "right" side.

How much would you earn and how much would the person from the other village with you are randomly matched earn in this case? Right, you would get 100 Taka and the other person similar to you would get nothing.

1. Respondent understood the game after:



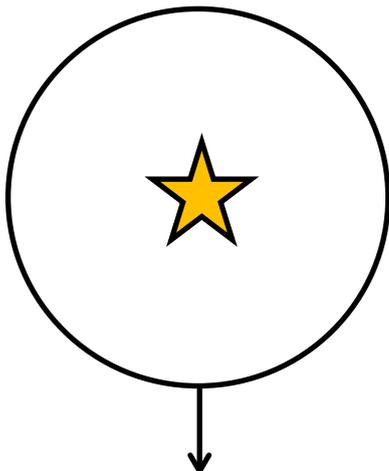
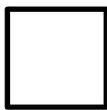
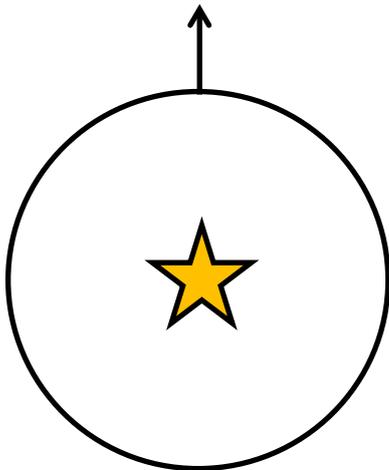
1 = first explanation, 2 = second explanation, 3 = third explanation, 4 = did not understand

**Are you okay so far?** *Leave time for questions and answer them privately.*

As I mentioned earlier, you will get four decision sheets. The decision sheets differ from each other in the amounts of stars that can be divided between you and the other person. Please choose one of the two options for each decision sheet. At the end of the game, you will roll a die to determine the decision sheet out of four (*show the process*). Here the number you roll corresponds to the sheet you will get paid for, meaning if you roll 1, you get paid for decision sheet 1. If this game is selected for payment, you and the other person will be paid according to the selected decision sheet. If you roll a 5 or 6, no decision sheet will be paid.

# Decision sheet 1

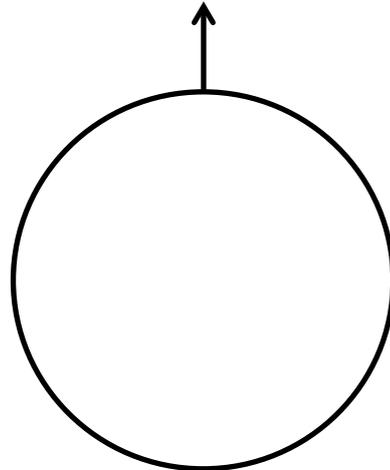
For the **other** person



For **me**

**LEFT**

For the **other** person

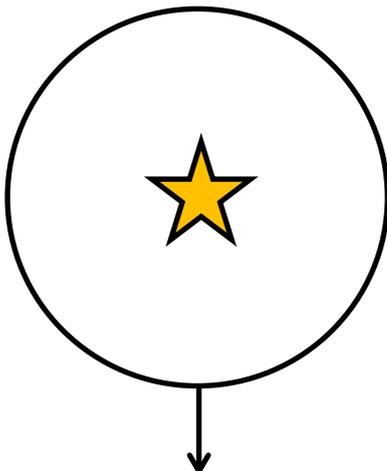
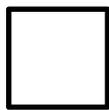
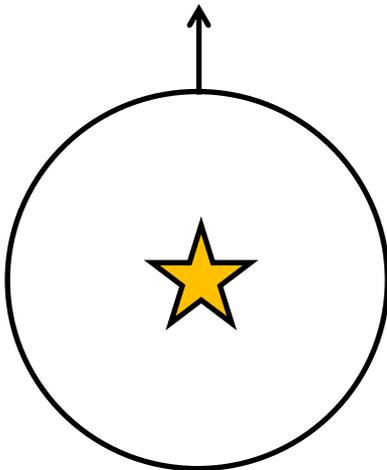


For **me**

**RIGHT**

Decision sheet 2

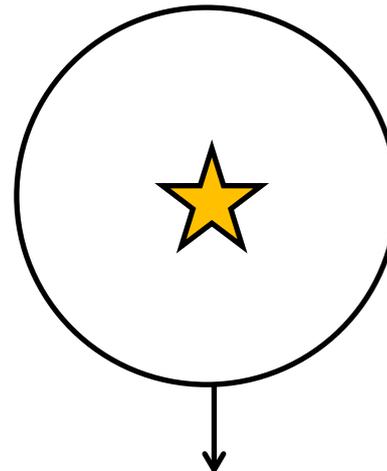
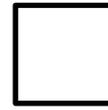
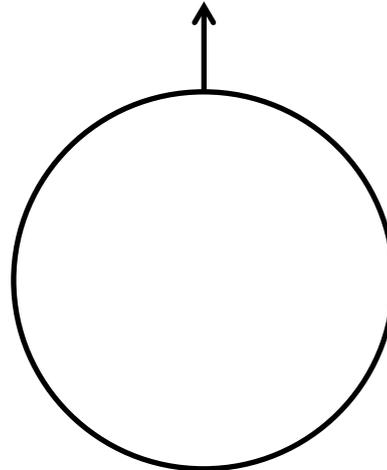
For the **other** person



For **me**

**LEFT**

For the **other** person

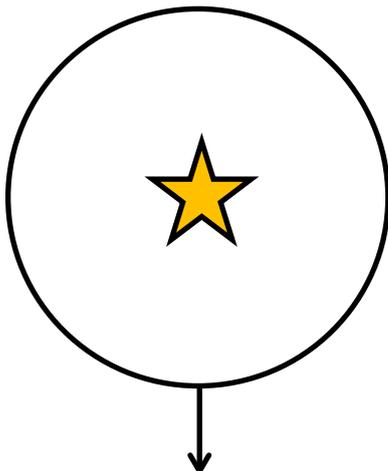
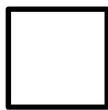
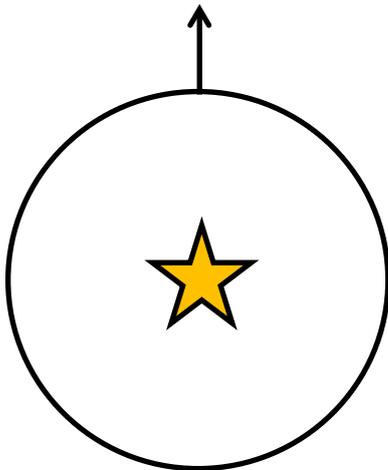


For **me**

**RIGHT**

Decision sheet 3

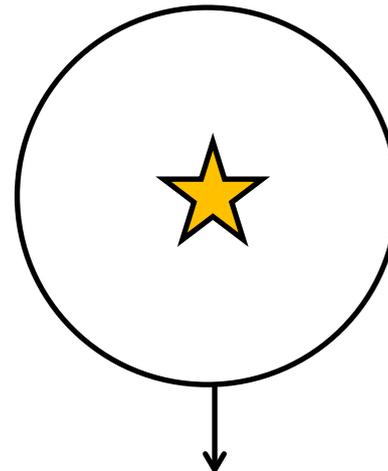
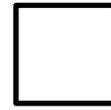
For the **other** person



For me

**LEFT**

For the **other** person

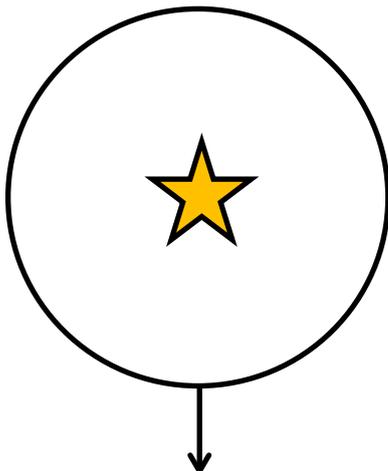
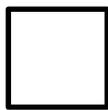
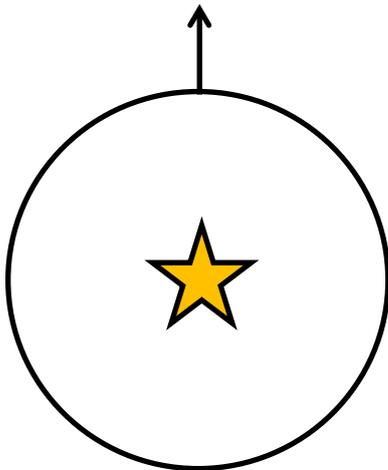


For me

**RIGHT**

Decision sheet 4

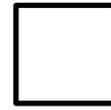
For the **other** person



For me

**LEFT**

For the **other** person



For me

**RIGHT**

2. Decision on first sheet:  1 = left, 2 = right
3. Decision on second sheet:  1 = left, 2 = right
4. Decision on third sheet:  1 = left, 2 = right
5. Decision on fourth sheet:  1 = left, 2 = rights

*Roll a die to determine which decision sheet would be paid if this game got selected for payoff in the end.*

## PREVIOUS DISCUSSION PAPERS

- 342 Breitkopf, Laura, Chowdhury, Shyamal, Priyam, Shambhavi, Schildberg-Hörisch, Hannah and Sutter, Matthias, Do Economic Preferences of Children Predict Behavior?, June 2020.
- 341 Westphal, Matthias, Kamhöfer, Daniel A. and Schmitz, Hendrik, Marginal College Wage Premiums under Selection into Employment, June 2020.
- 340 Gibbon, Alexandra J. and Schain, Jan Philip, Rising Markups, Common Ownership, and Technological Capacities, June 2020.
- 339 Falk, Armin, Kosse, Fabian, Schildberg-Hörisch, Hannah and Zimmermann, Florian, Self-Assessment: The Role of the Social Environment, May 2020.
- 338 Schildberg-Hörisch, Hannah, Trieu, Chi and Willrodt, Jana, Perceived Fairness and Consequences of Affirmative Action Policies, April 2020.
- 337 Avdic, Daniel, de New, Sonja C. and Kamhöfer, Daniel A., Economic Downturns and Mental Wellbeing, April 2020.
- 336 Dertwinkel-Kalt, Markus and Wey, Christian, Third-Degree Price Discrimination in Oligopoly When Markets Are Covered, April 2020.
- 335 Dertwinkel-Kalt, Markus and Köster, Mats, Attention to Online Sales: The Role of Brand Image Concerns, April 2020.
- 334 Fourberg, Niklas and Korff, Alex, Fiber vs. Vectoring: Limiting Technology Choices in Broadband Expansion, April 2020.
- 333 Dertwinkel-Kalt, Markus, Köster, Mats and Sutter, Matthias, To Buy or Not to Buy? Price Salience in an Online Shopping Field Experiment, April 2020.
- 332 Fischer, Christian, Optimal Payment Contracts in Trade Relationships, February 2020.
- 331 Becker, Raphael N. and Henkel, Marcel, The Role of Key Regions in Spatial Development, February 2020.
- 330 Rösner, Anja, Haucap, Justus and Heimeshoff, Ulrich, The Impact of Consumer Protection in the Digital Age: Evidence from the European Union, January 2020. Forthcoming in: International Journal of Industrial Organization.
- 329 Dertwinkel-Kalt, Markus and Wey, Christian, Multi-Product Bargaining, Bundling, and Buyer Power, December 2019. Published in: Economics Letters, 188 (2020), 108936.
- 328 Aghelmaleki, Hedieh, Bachmann, Ronald and Stiebale, Joel, The China Shock, Employment Protection, and European Jobs, December 2019.
- 327 Link, Thomas, Optimal Timing of Calling In Large-Denomination Banknotes under Natural Rate Uncertainty, November 2019.
- 326 Heiss, Florian, Hetzenecker, Stephan and Osterhaus, Maximilian, Nonparametric Estimation of the Random Coefficients Model: An Elastic Net Approach, September 2019.

- 325 Horst, Maximilian and Neyer, Ulrike, The Impact of Quantitative Easing on Bank Loan Supply and Monetary Policy Implementation in the Euro Area, September 2019. Published in: *Review of Economics*, 70 (2019), pp. 229-265.
- 324 Neyer, Ulrike and Stempel, Daniel, Macroeconomic Effects of Gender Discrimination, September 2019.
- 323 Stiebale, Joel and Szücs, Florian, Mergers and Market Power: Evidence from Rivals' Responses in European Markets, September 2019.
- 322 Henkel, Marcel, Seidel, Tobias and Suedekum, Jens, Fiscal Transfers in the Spatial Economy, September 2019.
- 321 Korff, Alex and Steffen, Nico, Economic Preferences and Trade Outcomes, August 2019.
- 320 Kohler, Wilhelm and Wrona, Jens, Trade in Tasks: Revisiting the Wage and Employment Effects of Offshoring, July 2019.
- 319 Cobb-Clark, Deborah A., Dahmann, Sarah C., Kamhöfer, Daniel A. and Schildberg-Hörisch, Hannah, Self-Control: Determinants, Life Outcomes and Intergenerational Implications, July 2019.
- 318 Jeitschko, Thomas D., Withers, John A., Dynamic Regulation Revisited: Signal Dampening, Experimentation and the Ratchet Effect, July 2019.
- 317 Jeitschko, Thomas D., Kim, Soo Jin and Yankelevich, Aleksandr, Zero-Rating and Vertical Content Foreclosure, July 2019.
- 316 Kamhöfer, Daniel A. und Westphal, Matthias, Fertility Effects of College Education: Evidence from the German Educational Expansion, July 2019.
- 315 Bodnar, Olivia, Fremerey, Melinda, Normann, Hans-Theo and Schad, Jannika, The Effects of Private Damage Claims on Cartel Stability: Experimental Evidence, June 2019.
- 314 Baumann, Florian and Rasch, Alexander, Injunctions Against False Advertising, October 2019 (First Version June 2019). Forthcoming in: *Canadian Journal of Economics*.
- 313 Hunold, Matthias and Muthers, Johannes, Spatial Competition and Price Discrimination with Capacity Constraints, May 2019 (First Version June 2017 under the title "Capacity Constraints, Price Discrimination, Inefficient Competition and Subcontracting"). Published in: *International Journal of Industrial Organization*, 67 (2019), 102524.
- 312 Creane, Anthony, Jeitschko, Thomas D. and Sim, Kyoungbo, Welfare Effects of Certification under Latent Adverse Selection, March 2019.
- 311 Bataille, Marc, Bodnar, Olivia, Alexander Steinmetz and Thorwarth, Susanne, Screening Instruments for Monitoring Market Power – The Return on Withholding Capacity Index (RWC), March 2019. Published in: *Energy Economics*, 81 (2019), pp. 227-237.
- 310 Dertwinkel-Kalt, Markus and Köster, Mats, Salience and Skewness Preferences, March 2019. Forthcoming in: *Journal of the European Economic Association*.
- 309 Hunold, Matthias and Schlütter, Frank, Vertical Financial Interest and Corporate Influence, February 2019.

- 308 Sabatino, Lorien and Sapi, Geza, Online Privacy and Market Structure: Theory and Evidence, February 2019.
- 307 Izhak, Olena, Extra Costs of Integrity: Pharmacy Markups and Generic Substitution in Finland, January 2019.
- 306 Herr, Annika and Normann, Hans-Theo, How Much Priority Bonus Should be Given to Registered Organ Donors? An Experimental Analysis, December 2018.  
Published in: Journal of Economic Behavior and Organization, 158 (2019), pp.367-378.
- 305 Egger, Hartmut and Fischer, Christian, Increasing Resistance to Globalization: The Role of Trade in Tasks, December 2018.  
Published in: European Economic Review, 126 (2020), 103446.
- 304 Dertwinkel-Kalt, Markus, Köster, Mats and Peiseler, Florian, Attention-Driven Demand for Bonus Contracts, October 2018.  
Published in: European Economic Review, 115 (2019), pp.1-24.
- 303 Bachmann, Ronald and Bechara, Peggy, The Importance of Two-Sided Heterogeneity for the Cyclicity of Labour Market Dynamics, October 2018.  
Forthcoming in: The Manchester School.
- 302 Hunold, Matthias, Hüschelrath, Kai, Laitenberger, Ulrich and Muthers, Johannes, Competition, Collusion and Spatial Sales Patterns – Theory and Evidence, September 2018.  
Forthcoming in: Journal of Industrial Economics.
- 301 Neyer, Ulrike and Sterzel, André, Preferential Treatment of Government Bonds in Liquidity Regulation – Implications for Bank Behaviour and Financial Stability, September 2018.
- 300 Hunold, Matthias, Kesler, Reinhold and Laitenberger, Ulrich, Hotel Rankings of Online Travel Agents, Channel Pricing and Consumer Protection, September 2018 (First Version February 2017).  
Forthcoming in: Marketing Science.
- 299 Odenkirchen, Johannes, Pricing Behavior in Partial Cartels, September 2018.
- 298 Mori, Tomoya and Wrona, Jens, Inter-city Trade, September 2018.
- 297 Rasch, Alexander, Thöne, Miriam and Wenzel, Tobias, Drip Pricing and its Regulation: Experimental Evidence, August 2018.  
Forthcoming in: Journal of Economic Behavior and Organization.
- 296 Fourberg, Niklas, Let's Lock Them in: Collusion under Consumer Switching Costs, August 2018.
- 295 Peiseler, Florian, Rasch, Alexander and Shekhar, Shiva, Private Information, Price Discrimination, and Collusion, August 2018.
- 294 Altmann, Steffen, Falk, Armin, Heidhues, Paul, Jayaraman, Rajshri and Teirlinck, Marrit, Defaults and Donations: Evidence from a Field Experiment, July 2018.  
Published in: Review of Economics and Statistics, 101 (2019), pp. 808-826.
- 293 Stiebale, Joel and Vencappa, Dev, Import Competition and Vertical Integration: Evidence from India, July 2018.
- 292 Bachmann, Ronald, Cim, Merve and Green, Colin, Long-run Patterns of Labour Market Polarisation: Evidence from German Micro Data, May 2018.  
Published in: British Journal of Industrial Relations, 57 (2019), pp. 350-376.
- 291 Chen, Si and Schildberg-Hörisch, Hannah, Looking at the Bright Side: The Motivation Value of Overconfidence, May 2018.  
Forthcoming in: European Economic Review.

- 290 Knauth, Florian and Wrona, Jens, There and Back Again: A Simple Theory of Planned Return Migration, May 2018.
- 289 Fonseca, Miguel A., Li, Yan and Normann, Hans-Theo, Why Factors Facilitating Collusion May Not Predict Cartel Occurrence – Experimental Evidence, May 2018. Published in: Southern Economic Journal, 85 (2018), pp. 255-275.
- 288 Benesch, Christine, Loretz, Simon, Stadelmann, David and Thomas, Tobias, Media Coverage and Immigration Worries: Econometric Evidence, April 2018. Published in: Journal of Economic Behavior & Organization, 160 (2019), pp. 52-67.
- 287 Dewenter, Ralf, Linder, Melissa and Thomas, Tobias, Can Media Drive the Electorate? The Impact of Media Coverage on Party Affiliation and Voting Intentions, April 2018. Published in: European Journal of Political Economy, 58 (2019), pp. 245-261.
- 286 Jeitschko, Thomas D., Kim, Soo Jin and Yankelevich, Aleksandr, A Cautionary Note on Using Hotelling Models in Platform Markets, April 2018.
- 285 Baye, Irina, Reiz, Tim and Sapi, Geza, Customer Recognition and Mobile Geo-Targeting, March 2018.
- 284 Schaefer, Maximilian, Sapi, Geza and Lorincz, Szabolcs, The Effect of Big Data on Recommendation Quality. The Example of Internet Search, March 2018.
- 283 Fischer, Christian and Normann, Hans-Theo, Collusion and Bargaining in Asymmetric Cournot Duopoly – An Experiment, October 2018 (First Version March 2018). Published in: European Economic Review, 111 (2019), pp.360-379.
- 282 Friese, Maria, Heimeshoff, Ulrich and Klein, Gordon, Property Rights and Transaction Costs – The Role of Ownership and Organization in German Public Service Provision, February 2018. Forthcoming in: International Journal of Industrial Organization.
- 281 Hunold, Matthias and Shekhar, Shiva, Supply Chain Innovations and Partial Ownership, February 2018.
- 280 Rickert, Dennis, Schain, Jan Philip and Stiebale, Joel, Local Market Structure and Consumer Prices: Evidence from a Retail Merger, January 2018.

Older discussion papers can be found online at:

<http://ideas.repec.org/s/zbw/dicedp.html>

**Heinrich-Heine-Universität Düsseldorf**

**Düsseldorfer Institut für  
Wettbewerbsökonomie (DICE)**

Universitätsstraße 1, 40225 Düsseldorf

ISSN 2190-992X (online)  
ISBN 978-3-86304-341-4