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Parental Paternalism and Patience*

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Abstract

We study whether and how parents interfere paternalistically in their children's intertemporal decision-making. Based on experiments with over 2,000 members of 610 families, we find that parents anticipate their children's present bias and aim to mitigate it. Using a novel method to measure parental interference, we show that more than half of all parents are willing to pay money to override their children's choices. Parental interference predicts more intensive parenting styles and a lower intergenerational transmission of patience. The latter is driven by interfering parents not transmitting their own present bias, but molding their children's preferences towards more time-consistent choices.

Keywords: Parental paternalism, Time preferences, Convex time budgets, Present bias, Intergenerational transmission, Parenting styles, Experiment
JEL-Codes: C90, D1, D91, D64, J13, J24, O12

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1 Introduction

Parents frequently make decisions for their children. They choose where their children grow up, which schools they attend, which friends they meet, or when their children do their homework. Not surprisingly, parents' choices for their children have consequences. For instance, growing up in a better neighborhood, attending schools of higher quality, or having contact with high-performing peers improves children's chances for better school performance, higher educational attainment, and higher earnings (e.g., Card and Krueger, 1992; Dobbie and Fryer, 2011; Chetty and Hendren, 2018). While parents may have best intentions, parents' and children's preferences may at times be at odds, thus creating conflicts. Prime examples include settings with delayed gratification where parents may focus on the long-term perspective, while children may focus on short-term outcomes, such as when deciding over studying and leisure activities. While this tension is well-acknowledged in theoretical models of parent-child interactions (e.g., Doepke and Zilibotti, 2017), empirical evidence on the degree of conflict and in particular parents' paternalistic interferences in children's choices remains scarce.

In this paper, we first study whether, to which extent, and for which reasons parents interfere with their children's intertemporal decision-making, and second, we investigate the dynamic implications of parental interference for the formation of children's preferences. We present a lab-in-the-field experiment because using observational data has limitations: many decisions are either rarely taken (as, e.g., in the context of school choice) or difficult to observe (e.g., daily choices between studying and leisure activities), and finally, it is often not clear whose preferences are actually implemented in the field. Our experimental design provides a controlled setup that avoids these limitations. In particular, it allows us to measure the degree and the motives of parents' paternalistic behavior and its implications for the transmission of preferences.

We report results from an experiment with 2,010 members of 610 families, including 1,120 parents and 990 children. We focus on intertemporal decision-making, because patience has been shown to be important for lifetime outcomes, most importantly with respect to human capital accumulation, savings, and health behavior (e.g., Chabris et al., 2008; Meier and Sprenger, 2010, 2012; Castillo et al., 2011; Sutter et al., 2013; Golsteyn, Grönqvist, and Lindahl, 2014; Cadena and Keys, 2015). While there is a growing literature on the formation and intergenerational transmission of time preferences (e.g., Kosse and Pfeiffer, 2012; Alan and Ertac, 2018; Andreoni et al., 2019; Brenøe and Epper, 2019; Samek et al., 2019; Chowdhury, Sutter, and Zimmermann, 2020; Falk et al., forthcoming), little is known about whether, how, and why parents are willing to interfere in their children's intertemporal choices, although these choices may have long-lasting consequences.

In our experiment, we first elicit both parents' and their children's time preferences in a series of intertemporal allocation tasks (using convex time budget sets introduced by Andreoni and Sprenger, 2012). The choices in these experimental tasks allow us to infer their quasi-hyperbolic discounting parameters (Laibson, 1997) for present bias (β) and long-run discounting (δ). Using the same setup, we then elicit parents' incentivized beliefs about their children's choices as well as the decisions parents would want to implement for their children. Yet, these paternalistic choices are not automatically implemented. Rather, we present a novel method that allows us to quantify parents' willingness to overrule their children's decisions: Parents can take costly investments to increase the probability with which their paternalistic choices are implemented, instead of letting children act upon their own choices.

The unique combination of eliciting (i) both parents' and children's time preferences, (ii) parents' beliefs over children's choices, (iii) parents' preferred choices for their children (what we call their paternalistic decisions in the following), and (iv) parents' willingness to pay for implementing their paternalistic decisions (referred to as willingness to interfere in the following) yields the following main results. We find a large degree of impatience among both children and their parents. On average, both allocate 67% of their endowment to a sooner rather than a later payment date. Moreover, both children and parents exhibit a sizable present bias (with a parameter estimate of $\beta = 0.81$). Parents anticipate their children's present bias correctly on average, and aim to reduce it in their paternalistic decisions by about 50%. More than half of all parents (55%) have a strictly positive willingness to pay for overruling their children's choices and implementing their paternalistic decisions. Parents who want to overrule their children's choices (a) attach a higher perceived importance to patience for success in life, (b) believe that they possess superior knowledge about what is good for their children, and (c) have parenting styles with higher degrees of warmth as well as control. The latter result provides the first evidence for a link between parenting styles and paternalism with respect to economic decision-making. We also find that parents with a positive willingness to interfere with their children's decisions implement significantly more patient decisions than parents who abstain from interfering.

While the results presented so far reflect a cross-sectional relationship, it seems natural to assume that if parents repeatedly interfere in their children's decision-making, this is likely to have dynamic consequences for the development of children's preferences. Therefore, our setup also allows us to investigate the link between parental interference and the formation as well as transmission of intertemporal preferences within families. In the aggregate, we find strong support for intergenerational transmission, but taking into account parents' willingness to interfere reveals a new aspect: The intergenerational transmission estimates are mainly driven by less paternalistic parents who do not spend any money to interfere with their children's decision-making, while the transmission of parental preferences to children's preferences is much weaker in families who have paternalistic parents (with a positive willingness to pay for overriding children's decisions). This means that we are able to uncover a hitherto overlooked determinant of the intergenerational transmission of patience, i.e., parental paternalism. Finally, we find that, even when controlling for their parents' time preferences, children of interfering parents are less present-biased than those of non-interfering parents — pointing to possible positive consequences of parental paternalism.

Taken together, our paper yields three main contributions: First, we show that parents anticipate their children's present bias and that they aim to mitigate it. Second, using a novel method to elicit parents' willingness to interfere, we show that more than 50% of all parents are willing to forego money to overrule their children's choices. Finally, we highlight that our measure of parental paternalism is related to parenting styles, is associated with lower degrees of present-bias in children, and has important implications for the intergenerational transmission of time preferences.

With these results, our study relates to several strands of literature. First, our paper is based on a long history of normative discussions on paternalism (Locke, 1764; Mill, 1869; Dworkin, 1972), which has gained increasing attention more recently in the form of debates on soft paternalism and nudging (Thaler and Sunstein, 2003; Camerer et al., 2003; Glaeser, 2006). We focus on a particular form of paternalism — parental paternalism — that is especially prevalent in the everyday lives of families around the world. Dworkin (1972, p. 77) argues that such parental interference is often justified by children's lack of capacities to make fully rational decisions, in particular in situations requiring the delay of gratification. According to him, it is thus a duty of parents to restrict their children's choice autonomy. We provide one of the first positive descriptions of parental paternalism by eliciting what decisions parents want their children to take and show that these paternalistic preferences are related to, but distinct from, parents' own preferences. In doing so, we therefore inform theoretical models that embed notions of paternalistic preferences or imperfect empathy in parents' utility functions, i.e., parents evaluate their children's utility using their own preferences or have utility over their children's actions (see, e.g., Bisin and Verdier, 2001; Lundberg, Romich, and Tsang, 2009; Doepke and Zilibotti, 2017; Seror, 2019).

Second, there is a small empirical literature examining parents' paternalistic behavior towards their children. For instance, there is evidence that imposing limits on children's leisure activities (Cosconati, 2012) and restricting children's choices of friends (Agostinelli et al., 2020) impacts human capital formation. Closely related to our study, Tungodden (2019) investigates parents' paternalistic preferences in the context of their children's competitiveness. He finds that parents reduce the gender gap in competitiveness by exposing daughters more often to competition than they would do themselves. While our study addresses, for the first time, parental paternalism in the domain of intertemporal decision-making, it also differs from Tungodden (2019) because we have a measure for parents' actual willingness to pay for overruling their children's decisions. The lack of such a measure makes it impossible to study how heterogeneity in parents' willingness to interfere with their children's choices interacts with the intergenerational transmission of preferences.

Third, from a methodological point of view, our study also relates to a recent laboratory experiment by Ambuehl, Bernheim, and Ockenfels (forthcoming), who examine paternalism in the context of time preferences.[1] Using a subject pool of university students, they analyze how subjects restrict the choice sets of others (i.e., strangers). The other subjects can still make their own choices, but from a potentially smaller set of options. Most importantly, our paper is different because we focus on parents and children from the same families, not strangers

[1] A few laboratory experiments investigate how subjects take intertemporal decisions for others with mixed evidence regarding whether decisions taken for others are less or more patient (e.g., Pronin, Olivola, and Kennedy, 2008; Shapiro, 2010; Albrecht et al., 2011; Koelle and Wenner, 2019; de Oliveira and Jacobson, 2020), while subjects seem to be able to anticipate others' present bias (Fedyk, 2018).

interacting with each other. Moreover, we add to the findings of Ambuehl, Bernheim, and Ockenfels (forthcoming) in several ways: First, we show that parents are even willing to forego money to act paternalistically. Second, and of particular importance in our family context, we can also link parents' paternalistic decisions to children's (unconstrained) choices, which allows us to characterize paternalistic preferences in more detail by relating them both to children's choices and parental beliefs about those choices. Third, by focusing on children and teenagers (in the age range from 6 to 16 years), we can study how paternalistic choices of parents relate to children's preferences during a formative period in their lives. Given that many economic preferences develop in this period (see the review of Sutter, Zoller, and Glätzle-Rützler, 2019) until they largely stabilize for adults (Schildberg-Hörisch, 2018), it is particularly important to study parental interference during childhood and adolescence and how it affects the intergenerational transmission of preferences.

Finally, our paper is related to studies on the formation and transmission of economic preferences from parents to their children, in particular with respect to time preferences (see, e.g., Kosse and Pfeiffer, 2012; Andreoni et al., 2019; Brenøe and Epper, 2019; Samek et al., 2019; Chowdhury, Sutter, and Zimmermann, 2020, as well as further studies summarized in Appendix Table G.1).[2] We contribute to this literature in terms of measurement, sample, and substance. First, we use the same established and incentivized instrument of time preferences for both parents and children, allowing us to distinguish the transmission of present bias (β) and long-run discounting (δ). Second, existing research — with the exception of Chowdhury, Sutter, and Zimmermann (2020) — stems mainly from Western, developed countries, while we study over 2,000 individuals from more than 600 families representative of the rural population in Bangladesh, the eighth-most populous country in the world, which in 2014 reached the lower-middle-income-country status.[3] Given that half of the world population lives in low- or lower-middle-income-countries,[4] there is a need for more scientific evidence about the intergenerational transmission of preferences from such poorer countries. Finally, we document that parents who are willing to interfere with their children's decisions seem to mold the preferences of their children to be less present-biased, but as a consequence transmit their own preferences less in comparison to their non-interfering counterparts. While this relation between parents' willingness to implement paternalistic decisions and the intergenerational transmission of time preferences is a novel finding of our paper, it relates to a recent paper by Brenøe and Epper (2019).[5] Employing survey measures of parenting styles and patience,

[2]Apart from studying the intergenerational transmission of time preferences, there is rich evidence on the transmission of economic preferences in other domains such as risk attitudes, social preferences, or trust (see, e.g., Kimball, Sahm, and Shapiro, 2009; Dohmen et al., 2012; Cipriani, Giuliano, and Jeanne, 2013; Alan et al., 2017; Chowdhury, Sutter, and Zimmermann, 2020; Sutter and Untertrifaller, 2020). Furthermore, several papers link parental characteristics (e.g., education or socioeconomic status) to children's economic preferences (e.g., Bauer, Chytilová, and Pertold-Gębicka, 2014; Almås et al., 2016; Falk et al., forthcoming).

[3]See, e.g., the CIA's World Factbook (https://www.cia.gov/library/publications/the-world-factbook/geos/bg.html, accessed on October 31, 2020).

[4]See, e.g., data by the World Bank (https://data.worldbank.org/?locations=XN-XM-1W, accessed on August 31, 2020).

[5]Two other studies investigate the relationship of parental involvement and the transmission of preferences, but focus on other preference domains. Alan et al. (2017) find that risk attitudes are only transmitted from

they show that the transmission of patience is stronger for parents who adopt authoritarian or permissive (i.e., less intensive parenting styles) rather than more involved authoritative parenting styles.

The rest of the paper is organized as follows: Section 2 presents our experimental design and describes our sample in more detail. Section 3 introduces a first set of results on parents' and their children's time preferences when making choices for themselves. Section 4 deals with parents' beliefs about their children's choices, and which paternalistic decisions they would like to implement. Section 5 analyzes parents' actual willingness to pay for overriding their children's decisions and which factors – in particular with respect to parenting styles – determine this willingness. Section 6 examines the interaction between parents' willingness to interfere and the intergenerational transmission of time preferences within families. Finally, Section 7 concludes the paper.

2 Experimental design and empirical strategy

We conducted experiments with 2,010 members of 610 families in rural Bangladesh to study whether and how parents act paternalistically towards their children in the context of intertemporal decision-making. In the following, we begin by introducing the convex time budget sets used to elicit children's and their parents' time preferences. We then present how parents could interfere in their children's decision-making and how decisions were implemented. Finally, we briefly describe our sample and outline our main specification for the analysis of time preferences.

2.1 Convex time budget sets

In the first part of the experiment, both children and their parents were asked to allocate stars, S, (our experimental currency) between two payment dates in a series of 12 convex time budget sets (CTBs). More specifically, given their utility function $U(S_t, S_{t+k}|\Theta)$, characterized by a vector of preference parameters Θ, subjects divided an endowment m between two payment dates t and $t+k$ with $k > 0$ according to the following future-budget constraint:

$$(1+r)S_t + S_{t+k} = m \tag{1}$$

Allocating stars to the earlier date t is costly in the sense that there is a gross interest rate of $1+r \geq 1$ that translates stars from the sooner date (t) to the later one ($t+k$, with $k > 0$).

Across convex time budgets, we vary the parameters governing the intertemporal decision problem as follows: The earlier payment date t is either today or in one month ($t \in$ {today, in one month}), while the delay k varies between one and two months ($k \in$ {one month, two months}). For each pair of payment dates $(t, t+k) \in$ {(today, in one month), (in one

mothers to their daughters if mothers' involvement in school and other activities is high. Similarly, Zumbuehl, Dohmen, and Pfann (forthcoming) show that parents' and their children's risk attitudes and trust become more similar for increasing parental involvement.

month, in two months), (today, in two months)}, we vary the relative prices or the gross interest rate between the two dates ($1 + r \in \{1, 1.33, 1.5, 2\}$) and choose the endowments $m \in \{8, 12\}$ such that we can construct five potential allocations with integer allocations. Table 1 summarizes the resulting 12 decision sheets.

By varying the features of the choice problem, we aim to recover the parameters describing the form of the utility function $U(\cdot)$. In Section 2.5, we show under which assumptions this allows us to recover preference parameters Θ.

Table 1. Overview of decision sheets

Decision Sheet	t	$t+k$	Endow-ment (m)	Gross int. rate ($1+r$)	Allocations (S_t, S_{t+k}) (1)	(2)	(3)	(4)	(5)
1	today	1 month	8	1.00	(8, 0)	(6, 2)	(4, 4)	(2, 6)	(0, 8)
2	today	1 month	12	1.33	(9, 0)	(6, 4)	(3, 8)	(2^*, 9)	(0, 12)
3	today	1 month	12	1.50	(8, 0)	(6, 3)	(4, 6)	(2, 9)	(0, 12)
4	today	1 month	8	2.00	(4, 0)	(3, 2)	(2, 4)	(1, 6)	(0, 8)
5	1 month	2 months	8	1.00	(8, 0)	(6, 2)	(4, 4)	(2, 6)	(0, 8)
6	1 month	2 months	12	1.33	(9, 0)	(6, 4)	(3, 8)	(2^*, 9)	(0, 12)
7	1 month	2 months	12	1.50	(8, 0)	(6, 3)	(4, 6)	(2, 9)	(0, 12)
8	1 month	2 months	8	2.00	(4, 0)	(3, 2)	(2, 4)	(1, 6)	(0, 8)
9	today	2 months	8	1.00	(8, 0)	(6, 2)	(4, 4)	(2, 6)	(0, 8)
10	today	2 months	12	1.33	(9, 0)	(6, 4)	(3, 8)	(2^*, 9)	(0, 12)
11	today	2 months	12	1.50	(8, 0)	(6, 3)	(4, 6)	(2, 9)	(0, 12)
12	today	2 months	8	2.00	(4, 0)	(3, 2)	(2, 4)	(1, 6)	(0, 8)

Notes: This table presents the five possible choices (from the set of allocations) for each decision sheet. Each decision sheet is characterized by an earlier (t) and later ($t + k$) payment date with $(t, t + k) \in$ {(today, in one month), (in one month, in two months), (today, in two months)}, an endowment (m), which equals the maximum number of stars in the later period, and one of four different gross interest rates ($1+r \in \{1, 1.33, 1.5, 2\}$). Possible allocations are chosen such that they result in integer allocations. The fourth option on the second, sixth, and tenth decision sheet (see * in the table) was displayed as two stars. In all our analyses, we will use the value of 2.25, as this corresponds to the linear budget line. Note that if a respondent preferred this option to the four other options, she will also prefer to get slightly more stars earlier, holding the later stars constant to the remaining options.

In designing the decision sheets, we paid particular attention to the setting and subjects we were working with, rural families in Bangladesh with non-negligible rates of illiteracy and children as young as six years. Hence, we developed a pen-and-paper version of the convex time budgets and restricted all resulting allocations to integers up to 12. Moreover, to minimize the potential of confusion among subjects, the order of both the different combinations of payment dates and the gross interest rates was fixed as shown in Table 1. In addition, we used different colors to illustrate different payment dates (as shown in Appendix Figure I.1) and used several examples as well as comprehension checks throughout the instructions (see Appendix I).

2.2 Parental beliefs, paternalistic decisions, and willingness to interfere

In a second part, parents had the opportunity to interfere with their children's decision-making. More specifically, parents were again presented with the 12 decision sheets, but had to indicate (i) their incentivized belief about each of their children's choices in the convex time budgets, and (ii) how they would choose for each of their children in each of the decision sheets. To incentivize parental beliefs, parents were paid one star if their belief regarding their children's decision in a randomly drawn choice was correct. Parents' paternalistic choices were implemented *a priori* with a 1/6 chance determined by the roll of a dice. Children were told in the instructions that their parents also took decisions for them, but that a roll of a dice would determine whether their own or their parents' decision would be implemented.

While these two measures allow us to learn about parents' beliefs and preferences for their children, they do not suffice to infer whether parents are willing to interfere actively with their children's decision-making. Hence, we implemented a novel behavioral measure that elicits parents' willingness to pay to increase the probability of overruling their children's choices, i.e., their willingness to interfere. More specifically, parents received an endowment of 100 Taka and could spend 10 Taka for each additional side of the dice they wanted to "buy", increasing the probability of overruling their children's choices by 1/6 for each 10 Taka spent. These monetary costs thus approximate potential effort costs or the costs of possible conflicts with their children. Note that parental beliefs, paternalistic decisions, and the willingness to interfere were elicited separately for each of up to two of their children taking part in the experiment. We matched parents and children only at the end of the experiment, as explained below.

2.3 Procedures and implementation details

In order to minimize communication among members of the family, they were interviewed simultaneously in separate rooms. The interviewers explained several examples and frequently stopped to ask comprehension questions. If subjects failed to answer these control questions correctly, the instructions were repeated up to three times.[6]

Ultimately, each subject was paid for only one randomly chosen decision in the experiment. More specifically, parents were either paid for one of their own decisions, or they were matched to one of their children. In the latter case, they were paid an endowment of 100 Taka less the amount they invested to interfere with their child's decision-making, plus one star if their belief about a randomly chosen decision of their child was correct. Children were paid either for one of their own decisions or — if parents overruled their choices — were paid according to one of their parents' paternalistic decisions. Appendix Table I.2 summarizes in detail how

[6]Appendix I presents the wording of the control questions in detail. Before taking any decisions, respondents had to answer five sets of similar control questions. While 24% of children (25% of parents) needed three attempts to answer the first set of control questions correctly, only 2% (parents: 4%) needed three explanations for the fifth set of questions. All decisions were taken only after all five sets of control questions had been answered correctly and after the subjects indicated that they did not have any further questions. For parents' beliefs and paternalistic decisions, 7% and 10% of parents needed three explanations to solve each of the two sets of additional control questions correctly. Eventually, all subjects were able to answer the control questions correctly.

we matched parents and children depending on the family structure and the roll of a dice, and which decision was paid out. In addition, each subject received a participation fee of one star. At the end of the experiment, all stars were converted to money based on age-specific exchange rates, calibrated to age-specific pocket money ranging from 4 to 15 Taka per star, and shown in Appendix Table I.1 (at the time of the experiment, 1 Taka corresponded to 0.012 USD). The stakes in our experiment were sizable. Each star for adults (worth 20 Taka) corresponds to approximately 4% of daily household income in our sample.

We conducted the experiment in February and early March 2020, before the first COVID-19 cases in Bangladesh were diagnosed. Originally, if subjects received money at a future date (one or two months after the experiment), we planned that an interviewer would come to their house at the pre-specified date to deliver the subjects' earnings in a sealed envelope with the corresponding name attached to it. Due to travel restrictions in response to Covid-19, we had to transfer the money on the pre-specified dates using bKash, the largest mobile financial services provider in Bangladesh. Importantly, since all households were part of an existing panel study, trust was high that future payments indeed were made. On average, each parent (child) earned 144 Taka (98 Taka) pooled over all three payment dates.

2.4 Sample description

We cooperated with ECONS, a local survey firm specialized in conducting household surveys and field experiments, and interviewed members of 610 families living in 34 rural villages. In particular, we interviewed both parents and up to two of their children aged between 6 and 16, resulting in a sample of 990 children and their 1,120 parents (512 fathers and 608 mothers).[7] As shown in Table 2, in 9% of households at least one of the parents has completed secondary school and the literacy rate is 66%. Average household income amounts to 180,284 Taka per year, corresponding to approximately 5,700 USD PPP. Almost half of all households have agricultural work as their main source of income.

These numbers are comparable to official statistics from the Household Income and Expenditure Survey conducted by the Bangladesh Bureau of Statistics (2017): The literacy rate in rural Bangladesh is 64%, 10% of adults have a secondary school leaving certificate, and the average household income is 177,621 Taka, stemming from agricultural income for 43% of households. Almost all children are enrolled in school, reflecting the national increase in primary school enrollment in recent years from 84.8% in 2010 to 93.5% in 2016. Our sample can therefore be considered as representative for the rural population in Bangladesh.

[7]The families of this study are a subsample of a larger panel study of approximately 4,000 families across 150 villages in Bangladesh. The ongoing panel study interviewed up to 30 families (mean: 23) from each village. We randomly sampled 34 of the villages and interviewed a subsample of about 80% of families in those villages that took part in the panel study. From each family, we always interviewed both parents as well as the youngest and oldest child between 6 an 16 years to get a broad age coverage. Note that for seven parents we are missing background information on their age, schooling, or occupation, reducing our sample slightly once we condition on these variables in subsequent regressions.

Table 2. Summary statistics

	Mean	Std. Dev.	N
A. Household characteristics			
Household size	5.32	1.53	609
Number of children	2.58	0.91	609
Number of interviewed children	1.62	0.49	610
Yearly household income (in Taka)	180,284	177,381	609
No electricity at home	0.06	0.24	610
Muslim	0.68	0.47	610
B. Parental characteristics			
Age of father	43.92	8.15	512
Age of mother	36.47	6.43	608
Father works in agriculture	0.45	0.50	512
Mother is a housewife	0.95	0.21	607
Secondary school certificate	0.09	0.29	1113
Literacy rate	0.66	0.47	1113
C. Child characteristics			
Child is female	0.50	0.50	990
Age of child	11.74	2.56	990
Enrolled in school	0.97	0.17	990

2.5 Main specification to estimate discounting parameters

In the following, we briefly describe our main specification as pre-registered with the AEA RCT registry as AEARCTR-0005313. In particular, we follow Andreoni and Sprenger (2012) and posit a time-separable, constant relative risk aversion (CRRA) utility function with quasi-hyperbolic β-δ-discounting (Laibson, 1997), and estimate this model using our experimental data from the convex time budget decisions. Therefore, our main outcome of interest is the amount of stars, S_t, allocated to the sooner payment date t rather than a later date $t+k$. More specifically, we begin with a utility function

$$U(S_t, S_{t+k}) = \frac{1}{\alpha}(S_t)^{\alpha} + \beta\delta^k \frac{1}{\alpha}(S_{t+k})^{\alpha} \tag{2}$$

with $\beta \geq 0$ being the present bias parameter, $\delta \geq 0$ the monthly long-run discounting parameter, and $\alpha < 1$ characterizing the curvature of the utility function. The future-value budget constraint is given by equation (1). Based on this, we define the share of stars allocated to the sooner date t expressed in stars at the later date as $s_{t,t+k} = (1+r)S_t/m$. Maximizing the utility function (2) subject to the budget constraint (1) yields an intertemporal demand for S_t given by:

$$S_t = \begin{cases} \frac{\left(\beta\delta^k(1+r)\right)^{\frac{1}{\alpha-1}}}{1+(1+r)\left(\beta\delta^k(1+r)\right)^{\frac{1}{\alpha-1}}} m & \text{if } t = 0 \\ \frac{\left(\delta^k(1+r)\right)^{\frac{1}{\alpha-1}}}{1+(1+r)\left(\delta^k(1+r)\right)^{\frac{1}{\alpha-1}}} m & \text{if } t > 0 \end{cases} \tag{3}$$

which we will estimate using non-linear least squares (NLS) using

$$\begin{aligned} S_t = & \frac{m\left(\beta\delta^k(1+r)\right)^{\frac{1}{\alpha-1}}}{1+(1+r)\left(\beta\delta^k(1+r)\right)^{\frac{1}{\alpha-1}}} \times \mathbb{1}\{t=0\} \\ & + \frac{m\left(\delta^k(1+r)\right)^{\frac{1}{\alpha-1}}}{1+(1+r)\left(\delta^k(1+r)\right)^{\frac{1}{\alpha-1}}} \times \mathbb{1}\{t>0\} + \epsilon_t. \end{aligned} \tag{4}$$

Here, ϵ_t is an error term clustered at the household level to account for correlations in the error terms among family members. Since we also adopt this specification when estimating preference parameters on an individual level, we pre-specified to use a NLS specification as our main specification. Nonetheless, we also present several robustness checks using different approaches, e.g., NLS allowing for background consumption, and a series of Tobit specifications taking into account censoring in the data. Appendix C.1 discusses these alternative estimation strategies. Our conclusions remain unaffected if we adopt these other specifications.

3 Intertemporal choices of children and their parents

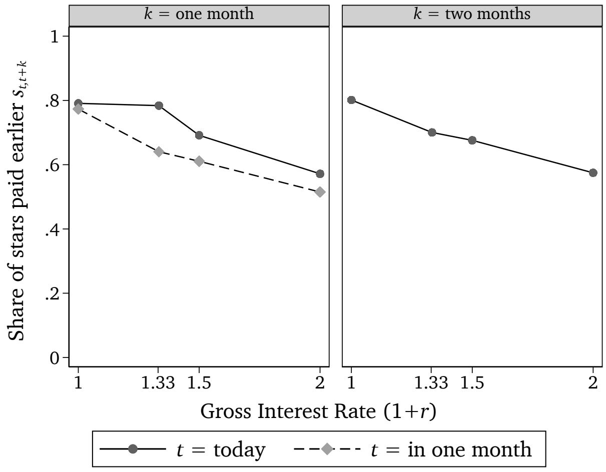
In this section, we present children's as well as parents' intertemporal choices measured in the convex time budgets. This allows us to quantify the time preferences of all members of a family, which will then serve as a basis for our further analyses of parents' paternalistic decisions and the intergenerational transmission of time preferences.

3.1 Descriptive evidence

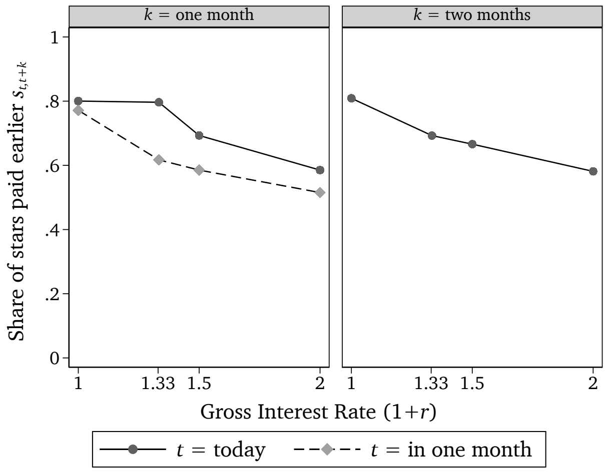
We begin by looking at the raw decisions for each of the experimental decision sheets. Figure 1 and Table 3 summarize the data for children and parents separately by presenting average allocations for each of the 12 decisions. Specifically, we document three patterns: First, both children and their parents allocate the majority of their endowment to the sooner payment date. In fact, average allocations to the sooner date range from 51% to 81% (mean: 68%), indicating a relatively high degree of impatience. Second, allocations to the sooner date decrease in the gross interest rate indicated by the negative slope in Figure 1. If sooner payments become relatively more expensive, both parents and children allocate less to the sooner date, consistent with the law of demand. Third, allocations to the sooner date are lower if we introduce a front-end delay, i.e., if the sooner date is in a month rather than today.

Figure 1. Allocations of stars in CTBs

(a) Children



(b) Parents



Notes: These figures present the average allocations to the earlier payment date for each decision sheet defined by an initial payment date t, a delay k, endowment m, and a gross interest rate $1 + r$. Figures 1a and 1b present the allocation decisions separately for children and parents. The left panels illustrate allocations for decisions in which the delay between the earlier and the later payment date is one month (today vs. in one month; in one month vs. in two months), whereas the right panels illustrate allocation decisions over two months (today vs. in two months).

This difference, illustrated by the two curves in the left panels of Figures 1a and 1b, indicates a sizable present bias in the aggregate. Column (4) of Table 3 shows that, on average, the gap induced by the front-end delay amounts to 7 percentage points for children and 10 percentage points for their parents and is highly significant (p-values < 0.01).[8]

[8] In Appendix Table A.1, we confirm these patterns using OLS and interval regressions. In Appendix B, we classify individual choices according to their time and delay consistency as well as the adherence to the law of demand. The distribution of choices closely mirrors the distributions reported for German adolescents in Lührmann, Serra-Garcia, and Winter (2018) and Sutter et al. (2020): 55% of choices appear to be time-consistent. Of the latter, present-biased choices are more likely than future-biased choices. Moreover, we find that about

Table 3. Aggregate choices for CTBs

Gross interest rate	Share of stars paid earlier $s_{t,t+k}$ (1) $t=0$ $k=1$	(2) $t=1$ $k=1$	(3) $t=0$ $k=2$	Test for present bias (4) Difference (1) − (2) (p-value)
A. Children's Choices (990 children; 11,880 choices)				
1.00	0.79	0.77	0.80	0.02
	(0.32)	(0.33)	(0.31)	(0.23)
1.33	0.78	0.64	0.70	0.14
	(0.35)	(0.42)	(0.39)	(0.00)
1.50	0.69	0.61	0.68	0.08
	(0.38)	(0.42)	(0.39)	(0.00)
2.00	0.57	0.51	0.57	0.06
	(0.42)	(0.43)	(0.42)	(0.00)
Overall	0.71	0.63	0.69	0.07
	(0.38)	(0.41)	(0.39)	(0.00)
B. Parents' Choices (1,120 parents; 13,440 choices)				
1.00	0.80	0.77	0.81	0.03
	(0.32)	(0.35)	(0.31)	(0.04)
1.33	0.80	0.62	0.69	0.18
	(0.35)	(0.44)	(0.40)	(0.00)
1.50	0.69	0.59	0.67	0.11
	(0.39)	(0.43)	(0.40)	(0.00)
2.00	0.59	0.52	0.58	0.07
	(0.43)	(0.44)	(0.43)	(0.00)
Overall	0.72	0.62	0.69	0.10
	(0.39)	(0.43)	(0.40)	(0.00)

Notes: Columns (1) through (3) present aggregate shares of stars allocated to the sooner payment, $s_{t,t+k}$, with standard deviations in parentheses. Column (4) presents tests for present bias using the differences between shares of sooner payments for choices in which the sooner payment is immediate with choices in which the sooner payment is in one month, holding the delay k constant, i.e., whether $s_{t=0,t+k=1} - s_{t=1,t+k=2} = 0$ with p-values from paired t-tests with 1,978 (parents: 2,238) degrees of freedom in parentheses. Positive values indicate present bias. Overall tests stem from a regression of shares of stars allocated to the sooner payment ($s_{t,t+k}$) on the date t with standard errors clustered at the household level. The test-statistic is a t-statistic of the null hypothesis of no effect of allocation timing.

3.2 Structural estimates for own decisions

How do these allocation decisions translate into structural parameters for present bias (β), time-consistent monthly discounting (δ), and CRRA-utility curvature (α)? Table 4 presents the corresponding parameter estimates for children, parents, as well as the pooled sample.

81-83% of choices are in line with the law of demand, with 41-45% of subjects displaying no monotonicity violations.

We estimate children's present bias as $\beta_{\text{children}} = 0.83$, whereas their parents display an even more pronounced present bias of $\beta_{\text{parents}} = 0.79$ (p-value of difference: 0.09).[9] The reverse pattern holds for long-run discounting. Children have a slightly more pronounced monthly discounting parameter $\delta_{\text{children}} = 0.71$ than their parents with $\delta_{\text{parents}} = 0.74$ (p-value of difference: 0.13). Finally, the CRRA-utility curvature is estimated to equal 0.45 and 0.47 for children and parents, respectively (p-value of difference: 0.55). Since we will use the utility curvature from the pooled sample for our individual-level analysis, column (4) presents results from the pooled sample, yielding similar estimates ($\beta_{\text{pooled}} = 0.81$, $\delta_{\text{pooled}} = 0.72$, and $\alpha_{\text{pooled}} = 0.46$).[10]

Table 4. Aggregate structural parameters

	(1) Children	(2) Parents	(3) p-value of diff.	(4) Pooled
Present bias β	0.83***	0.79***	0.09	0.81***
	(0.02)	(0.02)		(0.01)
Monthly δ	0.71***	0.74***	0.13	0.72***
	(0.02)	(0.01)		(0.01)
CRRA curvature α	0.45***	0.47***	0.55	0.46***
	(0.03)	(0.02)		(0.02)
Observations	11,880	13,440		25,320
Individuals	990	1,120		2,110
Households	610	610		610
R^2	0.77	0.76		0.77

Notes: This table presents non-linear least squares (NLS) estimates of the structural parameters of interest for children, parents, and the pooled sample. Standard errors in parentheses are clustered at the household level. *, **, and *** denote significance at the 0.10, 0.05, and 0.01 level.

[9]The magnitude of present bias is considerably larger than existing estimates in the literature. For example, a recent meta-analysis by Imai, Rutter, and Camerer (forthcoming), focusing mainly on studies conducted in developed countries, reports average present bias parameters of close to one for convex time budgets in the monetary domain. Yet, when restricting attention to other studies from similar populations, present bias parameters are closer to our estimates (in their appendix, Imai, Rutter, and Camerer, forthcoming, report an interquartile range of present bias estimates ranging from about 0.79 to 0.98 for studies conducted in Asia and other developing countries). Moreover, evidence on patience reported in Falk et al. (2018) shows that many countries in Asia and Africa appear to be less patient than Western developed countries.

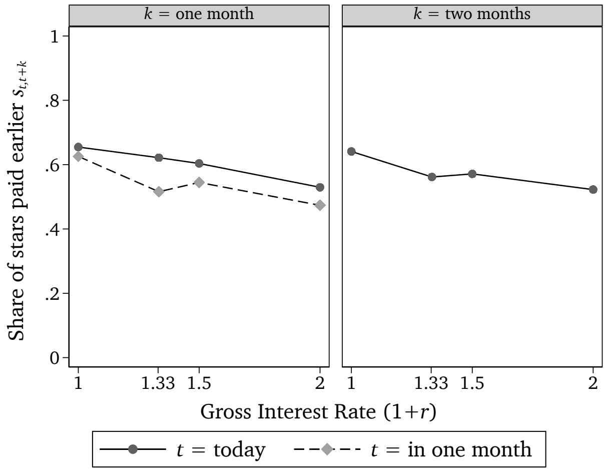
[10]In Appendix C, we present a series of alternative specifications allowing for background consumption and taking into account censoring of the choice data at corner solutions. In Appendix D, we take potential liquidity constraints and arbitrage into account. Across all specifications, we find a similar or even stronger degree of present bias (β = 0.61-0.88) as well as more pronounced long-run discounting (δ = 0.57-0.77) compared to the estimates presented in Table 4. Moreover, we study the heterogeneity of our estimates regarding parental and children's gender. We do not find any difference between the parameters of boys and girls or younger (6-11-year-old) and older (12-16-year-old) children. Yet, mothers' long-run discounting parameter is significantly larger than that of fathers (δ: 0.78 vs. 0.68, p-value of difference: $<$0.01) and mothers show a slightly stronger present bias (β: 0.77 vs. 0.81; p-value of difference: 0.21).

4 Parental beliefs about children's choices and paternalistic decisions

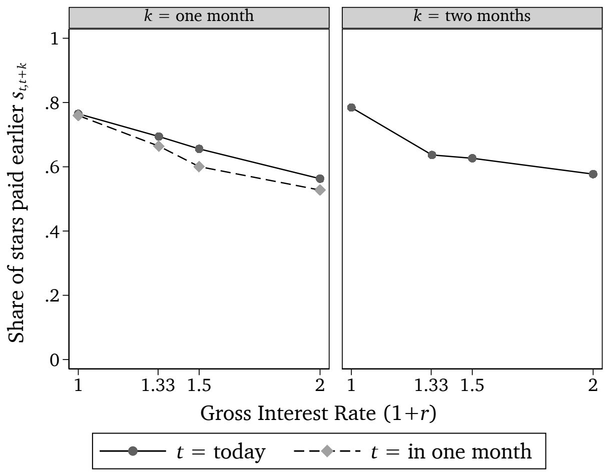
4.1 Descriptive evidence

Figure 2. Allocations of stars in CTBs: Parents' beliefs and paternalistic decisions

(a) Parents' Beliefs about Children's Choices



(b) Parents' Paternalistic Decisions



Notes: These figures present parents' beliefs about their children's allocation of stars (Figure 2a) and their subsequent paternalistic decisions for their children (Figure 2b) for each decision sheet defined by an initial payment date t, a delay k, endowment m, and a gross interest rate $1 + r$.

Figure 2 and Table 5 summarize parents' incentivized beliefs as well as their paternalistic decisions for their children. Parental beliefs follow the same qualitative pattern as children's actual choices. Specifically, parents believe that their children are present-biased (as they actually are) and intend to reduce the present bias, as is evident by comparing Figures 2a and 2b: the gap between the solid and dashed lines is smaller for paternalistic decisions (in Figure 2b) than it is for parental beliefs (in Figure 2a).

In fact, as shown in Table 5, parents believe their children allocate 6 percentage points more to the sooner payment date if it is today rather than in an identical decision with a front-end delay of one month. Yet, they implement decisions that reduce this gap to 3 percentage points, i.e., by 50%. Perhaps surprisingly, parents actually implement more impatient choices for their children compared to what they believe their children choose (across all decisions, parents allocate 66% of stars to the sooner date in their paternalistic decisions, and they expect their children to allocate 57% of stars to the sooner date). Yet, this seems to capture overoptimism regarding their children's patience, as parents believe their children to be more patient than they actually are. In fact, the average share of stars allocated to the sooner payment as part of the parents' paternalistic decisions is close to the children's average allocation of 68% of stars being allocated to the sooner date (as shown in Table 3).

4.2 Structural estimates

The descriptive patterns are confirmed by the structural estimates presented in Table 6, in which we present the results of non-linear least squares specifications to estimate time preference parameters and the utility curvature. In column (1), the average belief of parents about their children's present bias, $\beta_{\text{belief}} = 0.83$, coincides with the children's actual present bias ($\beta_{\text{children}} = 0.83$; see Table 4). However, in contrast to the children's actual time-consistent discounting, parents expect their children to be more patient than they actually are ($\delta_{\text{belief}} = 0.89$ vs. $\delta_{\text{children}} = 0.71$ for their actual choices). In addition, they expect their children to have a more pronounced utility curvature ($\alpha_{\text{belief}} = 0.29$ vs. $\alpha_{\text{children}} = 0.45$).

When it comes to parents' paternalistic decisions for their children, they implement less present-biased decisions ($\beta_{\text{paternalistic}} = 0.93$), but more impatient choices ($\delta_{\text{paternalistic}} = 0.71$) than they expect their children to make as shown in column (3) of Table 6. The latter coincides with children's actual discounting parameter. In sum, parents anticipate the present bias of their children correctly, indicating sophistication of parents about their children's self-control problems, and try to mitigate this present bias.

One might ask to what extent the different parameter estimates for beliefs and paternalistic decisions are driven by differences in the utility curvature. In order to compare the time preference parameters holding the utility curvature constant, we present additional specifications in columns (2) and (4) of Table 6. In these specifications, we impose a common utility curvature parameter of 0.46, corresponding to the estimate from the pooled sample for the children's and their parents' own decisions (cf. Table 4). Importantly, the estimated present bias and long-run discounting parameters remain quantitatively similar, which indicates that these patterns are not driven by differences in estimated utility curvature parameters.[11]

[11] We present splits by parental and child gender, as well as children's age in Appendix Tables E.1, and observe that these patterns are similar across all these splits.

Table 5. Aggregate beliefs and paternalistic choices for CTBs

Gross interest rate	Share of stars paid earlier $s_{t,t+k}$ (1) $t = 0$, $k = 1$	(2) $t = 1$, $k = 1$	(3) $t = 0$, $k = 2$	Test for present bias (4) Difference (1) − (2) (p-value)
A. Parental Beliefs about Children's Choices				
1.00	0.65	0.63	0.64	0.03
	(0.38)	(0.38)	(0.38)	(0.02)
1.33	0.62	0.52	0.56	0.11
	(0.40)	(0.40)	(0.40)	(0.00)
1.50	0.60	0.54	0.57	0.06
	(0.39)	(0.40)	(0.39)	(0.00)
2.00	0.53	0.47	0.52	0.06
	(0.40)	(0.41)	(0.40)	(0.00)
Overall	0.60	0.54	0.57	0.06
	(0.40)	(0.40)	(0.39)	(0.00)
B. Parents' Paternalistic Decisions				
1.00	0.76	0.76	0.78	0.01
	(0.34)	(0.35)	(0.32)	(0.64)
1.33	0.69	0.66	0.64	0.03
	(0.40)	(0.41)	(0.41)	(0.03)
1.50	0.66	0.60	0.63	0.06
	(0.39)	(0.42)	(0.40)	(0.00)
2.00	0.56	0.53	0.58	0.04
	(0.42)	(0.43)	(0.42)	(0.01)
Overall	0.67	0.64	0.66	0.03
	(0.40)	(0.41)	(0.40)	(0.00)

Notes: The table presents beliefs and paternalistic decisions of 1,120 parents for up to 2 of their children, resulting in 1,820 sets of 12 choices (21,821 and 21,831 choices in total, as 19 and 9 choices are missing, respectively). Columns (1) through (3) present aggregate shares of stars allocated to the sooner payment, $s_{t,t+k}$, with standard deviations in parentheses. Column (4) presents tests for present bias using the differences between shares of sooner payments for choices in which the sooner payment is immediate with choices in which the sooner payment is in one month holding the delay k constant, i.e., whether $s_{t=0,t+k=1} - s_{t=1,t+k=2} = 0$ with p-values from paired t-tests with 3,635 degrees of freedom in parentheses. Positive values indicate present bias. Overall tests stem from a regression of shares of stars allocated to the sooner payment ($s_{t,t+k}$) on the date t with standard errors clustered at the household level. The test statistic is a t-statistic of the null hypothesis of no effect of allocation timing.

4.3 Relationship of parental beliefs and paternalistic decisions

We have shown that parents believe their children to exhibit sizable present biases and implement rather time-consistent choices. This leads to two questions: First, how accurate are the parents' beliefs about their children's choices, and second, how do beliefs and parents' own decisions relate to the paternalistic decisions they make for their children? We explore

Table 6. Parental beliefs and paternalistic decisions: Structural parameters

	Beliefs		Paternalistic decisions	
	(1)	(2)	(3)	(4)
Present bias β	0.83***	0.86***	0.93***	0.94***
	(0.02)	(0.01)	(0.02)	(0.01)
Monthly δ	0.89***	0.87***	0.71***	0.72***
	(0.02)	(0.01)	(0.01)	(0.01)
CRRA curvature α	0.29***	0.46	0.42***	0.46
	(0.03)	(–)	(0.03)	(–)
Observations	21,821	21,821	21,831	21,831
Parent-child pairs	1,819	1,819	1,820	1,820
Households	610	610	610	610
R^2	0.69	0.69	0.74	0.74

Notes: This table presents non-linear least squares (NLS) estimates of the structural parameters of interest for parental beliefs in columns (1) and (2), as well as their paternalistic decisions in columns (3) and (4). Even-numbered columns impose the CRRA-utility curvature parameter α, using the estimate from the pooled sample to facilitate comparison of the time preference parameters. Standard errors in parentheses are clustered at the household level. *, **, and *** denote significance at the 0.10, 0.05, and 0.01 level.

these relationships in Appendix Table E.2, which yields the following findings: First, parental beliefs correlate significantly with their children's actual choices. It remains robust even when conditioning on a rich set of background variables and indicates that parents can predict their children's intertemporal decisions reasonably well.[12]

Second, we show that parents' paternalistic decisions are significantly related to both their own decisions and to their beliefs about their children's decisions, with the former having a regression coefficient that is twice as large as the latter's. Moreover, both measures and a rich set of background variables only capture a small part of the variation in paternalistic decisions. In particular, our data imply that, on average, parents implement more patient decisions for their children compared to their own choices. The share of their children's stars that parents allocate to the sooner date is smaller than the same share in their parents' allocations for themselves. Specifically, we observe that 76% of paternalistic choices are at least as patient as parents' own choices, with 27% of choices being strictly more patient. This suggests that parents' paternalistic decisions cannot be explained by these factors alone, but rather capture a distinct set of factors, e.g., parents may aim to "teach" their children some preferred behavior through their paternalistic decisions.

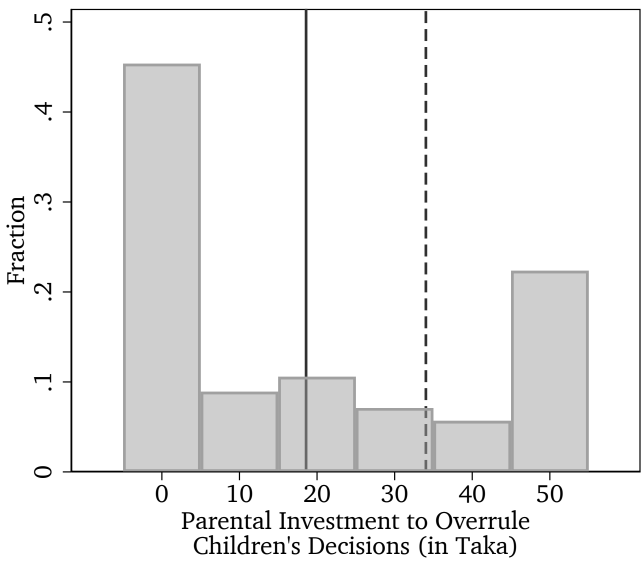
[12]We also observe that more patient parents, housewives, and richer households have more accurate beliefs as shown in Appendix Table E.3.

5 Parents' willingness to interfere and its determinants

While it is interesting to see what parents want to implement for their children, this does not tell us how committed parents are actually to interfere in their children's decision-making. To provide evidence on this, our experimental design featured an investment possibility for parents that increased the probability of parents' paternalistic decisions actually being implemented for their children. In particular, parents' paternalistic decisions were initially only implemented with a probability of 1/6, i.e., if a 6-sided dice rolled number 1. Yet, we gave parents an endowment of 100 Taka and they could spend 10 Taka for each additional side of the dice, thus increasing the probability of overriding their children's choices by 1/6 each. This measure therefore allows us to study parents' willingness to pay to interfere with their children's decision-making, which we also refer to as willingness to interfere.

Figure 3 illustrates how much parents were willing to spend to increase the probability of implementing their paternalistic decisions. While 45% of parents decided not to spend anything and keep the 100 Taka for themselves, a majority of 55% of parents decided to invest 34.0 Taka on average (approx. 7% of daily household income; unconditional mean investment: 18.6 Taka). Of those, the majority spent the maximum of 50 Taka that implemented their paternalistic decisions with certainty.[13]

Figure 3. Distribution of parents' investment to increase the probability of overriding their children's choices



Notes: This histogram presents the distribution of parents' investment to increase the probability of overriding their children's choices. The solid line indicates the mean investment of 18.6 Taka, whereas the dashed line indicates the mean investment conditional on investing (55% of parents; 34.0 Taka).

[13]We find that 52% of fathers and 57% of mothers are willing to forego some of their endowment to increase the probability of their decisions being implemented (t-test of difference: $p = 0.03$; see Appendix Figure F.1 for histograms). Unconditionally, they spend similar amounts (fathers: 19.2 Taka, mothers: 18.1, t-test of difference: $p = 0.26$), but the distributions differ by gender (Kolmogorov-Smirnov test of equal distributions: $p = 0.05$).

Thus, parents have a sizeable willingness to pay to overrule their children's choices. One key takeaway from this large willingness to pay is that parents' decisions to interfere with their children's decision-making cannot have a purely instrumental value. In fact, given the parents' beliefs and preferences, it is never optimal for them to invest to increase the probability of overriding their children's choices for monetary reasons only.[14]

This raises the question why parents actually have a positive willingness to pay. In the remainder of this section, we therefore explore this positive willingness to pay by studying its correlates, how it relates to more commonly investigated parenting behaviors, and whether there exists heterogeneity in paternalistic decisions with respect to this behavioral measure of paternalism.

Correlates and motives of parental interference. In Table 7, we examine the determinants of whether and how much parents invest in interfering with their children's choices. As explanatory variables we consider the parents' own allocations, their beliefs about their children's choices, and their paternalistic decisions for their children. Additionally, we consider the absolute difference between parents' paternalistic decisions and their beliefs about children's choices. This latter variable shall capture whether parents are more likely to invest money if they believe their child does not act in a way they want him or her to act. Column (1) of Table 7 reports OLS regressions with an indicator variable for whether a parent invested *any* money in interference, while column (2) presents a Tobit model of the amount invested (censored at zero and 50 Taka). We see in both columns that parents are more likely to invest any money and invest larger amounts if (a) parents allocate a smaller share to the sooner date (i.e., are more patient themselves), (b) parents believe their children are more patient, and (c) parents implement more patient allocations for their children in their paternalistic decisions. Only the difference between the latter and parents' beliefs does not matter for interference.

In Appendix Table F.1, we explore how sociodemographic characteristics are associated with parent's willingness to interfere. We find that parents are no more likely to interfere with boys than girls; nor do we observe differences by children's age. Parents with more resources are more likely to act paternalistically, as predicted by Lundberg, Romich, and Tsang (2009), but we also observe that mothers and families with "traditional" roles, i.e., families in which fathers work in agriculture and mothers are housewives, are more likely to interfere.

Furthermore, to understand better the underlying motives that parents use to justify their behavior, we elicited parents' agreement with ten statements capturing different motives on a scale from 1 ("I strongly disagree") to 5 ("I strongly agree") (see Appendix Table F.2 for

[14]To arrive at this conclusion, we make the simplifying assumption that parents gain utility from their children's choices as well as from the 100 Taka minus their amount invested to interfere with their children's decision-making. For every scenario, we then calculate the expected utility of not investing anything, $5/6 \times U_i\left(s_t^{\text{belief}} + E^*, s_{t+k}^{\text{belief}} | \Theta_i\right) + 1/6 \times U_i\left(s_t^{\text{pat.}} + E^*, s_{t+k}^{\text{pat}} | \Theta_i\right)$, taking into account that, with a 1/6 chance, parents' paternalistic decisions are still implemented, and the expected utility of investing I, $(5-0.1I)/6 \times U_i\left(s_t^{\text{belief}} + E^* - I^*, s_{t+k}^{\text{belief}} | \Theta_i\right) + (0.1I+1)/6 \times U_i\left(s_t^{\text{pat.}} + E^* - I^*, s_{t+k}^{\text{pat.}} | \Theta_i\right)$. Here, E denotes parents' endowment of 100 Taka, I is parents' willingness to pay to interfere (in steps of 10 Taka), and $(\cdot)^*$ denotes that a monetary amount is translated into stars, our experimental currency. We evaluate the utility function using individual parameter estimates $\Theta_i = (\beta_i, \delta_i, \alpha_i)$ that are estimated as described in Appendix H and average over the 12 scenarios.

Table 7. Correlates of parental interference

	$\mathbb{1}$\{Interfering\}	Investment
	(1)	(2)
Parents' share of stars paid earlier	-0.05***	-3.69*
	(0.02)	(2.18)
Parents' belief about share of stars paid earlier	-0.06***	-5.10**
	(0.02)	(2.50)
Parents' paternalistic decisions about share of stars paid earlier	-0.06***	-6.94***
	(0.02)	(2.37)
Abs. diff. between parental beliefs and paternalistic decisions	-0.01	-3.04
	(0.03)	(3.30)
Parental controls	Yes	Yes
Child controls	Yes	Yes
Household characteristics	Yes	Yes
Decision FEs	Yes	Yes
Mean of dependent variable	0.55	18.65
Observations	21,674	21,626
Households	609	609
(Pseudo-)R^2	0.04	0.01

Notes: This table explores potential determinants of parental interference. Column (1) presents OLS regressions of an indicator for whether a parent invests money to increase the likelihood of implementing his or her choice for their children on parents' own allocations, their beliefs and paternalistic decisions. Column (2) uses parents' investment to override their children's choices as the dependent variable and presents results from a Tobit specification with censoring at investments of 0 and 50 Taka. Control variables include age and gender of both the parent and the child, indicators for whether the parent can read and write, received a secondary school leaving certificate, the household being Muslim, access to electricity, whether the father works in agriculture, whether the mother is a housewife, and log household income. Standard errors in parentheses are clustered at the household level. *, **, and *** denote significance at the 0.10, 0.05, and 0.01 level.

the wording of statements and their estimated relationship to parental paternalism). Parents agree mostly with statements highlighting the importance of patience, children's obedience to their parents, and the classical paternalistic motive of superior knowledge. At the same time, children's perceived lack of understanding or parents' intentions to take away the money the children earn in the experiment have the lowest agreement. Moreover, the two items with the largest explanatory power for parental interference are "Patience is important to succeed in life" as well as "I know better what is good for my child than he or she does". These results suggest that parents acknowledge that patience is important, consistent with them aiming at reducing their children's present bias, and that parents believe to possess superior knowledge justifying their interventions. Thus, interfering with their children's decision-making not only restricts children's autonomy, but also seems to have educational and altruistic reasons (due to parents implementing "better" decisions and signalling to their child what the right choice is).

Implications of parental interference for structural estimates of paternalistic decisions. Parents therefore interfere with classical paternalistic motives and are more likely to interfere when they themselves are more patient or if they want their children to take more patient decisions. Therefore, an alternative way to look at parental interference is to study how the decisions parents make for their children differ by parents' willingness to interfere. To do so, we re-estimate the structural parameters using the NLS specification, but allow the parameters to differ by parents' willingness to interfere, both on the extensive margin (do parents invest money to increase the probability of overriding their children's decisions?) and on the intensive margin (how much do parents invest?).

Table 8. Heterogeneity in paternalistic choices by willingness to interfere

	(1) Present bias β	(2) Monthly discounting δ	(3) CRRA curvature α
A. Parameters			
Non-interfering parents	0.90***	0.68***	0.42***
	(0.02)	(0.02)	(0.04)
Interfering parents	0.96***	0.73***	0.43***
	(0.02)	(0.02)	(0.03)
B. Differences			
Extensive margin	0.06*	0.05**	0.01
	(0.03)	(0.03)	(0.05)
Intensive margin	-0.01	-0.03	-0.06**
	(0.02)	(0.02)	(0.03)
Share interfering	0.55		
Observations	21,783		
Parent-child pairs	1,816		
Parents	1,119		
Households	610		

Notes: This table presents non-linear least squares (NLS) estimates of the structural parameters of interest for non-interfering and interfering parents, as well as estimates of the extensive and intensive margin of interference. The extensive margin is defined as the difference between interfering and non-interfering parents evaluated at the mean investment of interfering parents. The intensive margin is defined as the change in parameters due to changes in the demeaned amount of investments among interfering parents only. Standard errors in parentheses are clustered at the household level. Share interfering denotes the share of parents that invested to increase the probability that their choices are implemented for the child under consideration. *, **, and *** denote significance at the 0.10, 0.05, and 0.01 level.

We present the results in Table 8 and find that interfering parents, i.e., those who invest money, implement decisions that exhibit less present bias ($\beta^{\text{interfering}}_{\text{paternalistic}} = 0.96$ vs. $\beta^{\text{non-interfering}}_{\text{paternalistic}} = 0.90$; $p = 0.05$) and less time-consistent discounting ($\delta^{\text{interfering}}_{\text{paternalistic}} = 0.73$ vs. $\delta^{\text{non-interfering}}_{\text{paternalistic}} =$

0.68; $p = 0.05$). The difference between interfering and non-interfering parents appears to be driven by the decision to invest rather than the level of investment.[15]

Parental interference and parenting styles. In our experiment, parental interference is a one-shot decision. Yet, it might capture parents' tendencies to engage in certain parenting practices. We therefore investigate the relationship of parental interference with more common measures of parenting. In particular, we focus on parenting styles capturing the mode of parent-child interactions.

In order to analyze how parenting styles are related to parental paternalism, we elicited parents' parenting styles using two established survey measures for the warmth (Perris et al., 1980) and control dimension of parenting styles (Schwarz et al., 1997), comprising three and four items, respectively.[16] In contrast to other studies, we elicited parenting styles separately for each child, as we also have separate measures of parents' willingness to interfere for both children. Moreover, our data indicates that the willingness to interfere is not fixed at the parent level, but varies across children. In fact, we observe that 22% of parents with two children interfere with the decision-making of only one of their children.

Table 9 shows that parental paternalism is significantly related with both the control and warmth dimension of parenting. In columns (1), (2), (4), and (5) we see that those parents who have a positive willingness to intervene score 0.37-0.39 standard deviations higher on both scales. This suggests that parental paternalism is related to authoritative parenting styles that are featured by high levels of both warmth as well as control. In columns (3) and (6), we include household fixed effects and thus identify the variation in parenting styles present within families (between parents and/or towards different children). The results show that the associations of parental paternalism and the control dimension of parenting remains stable, while the coefficient for warmth reduces by two thirds. Thus, the results indicate that our behavioral measure of parental interference predicts more intensive parenting styles, in particular for the control dimension.

Overall, we have seen in this section that parents interfere with their children's decision-making not for instrumental or monetary reasons, but to foster patience in their children.

[15]We de-mean the investments of parents who decide to invest money and estimate all parameters in a single NLS regression. The difference in parameters in panel A of Table 8 therefore corresponds to the difference at average investments as shown as the extensive margin difference. In Appendix Tables F.3 and F.4, we find that the extensive margin results — whether to invest at all — are driven by fathers, while the intensive margin results are driven by mothers. Furthermore, we do not observe any meaningful differences by children's gender.

[16]The warmth dimension corresponds to how responsive parents are to their children's needs, while the control dimension captures parents' strictness. These two dimensions span four distinct parenting styles (see, e.g., Maccoby and Martin, 1983): neglectful parenting with low levels of warmth and control; permissive parenting characterized by high levels of warmth, but low levels of control; authoritarian parenting with high control, but low warmth; and authoritative parenting featuring high levels of both warmth as well as control. Recently, these concepts have also been studied in the economics literature, e.g., Doepke and Zilibotti (2017) and Doepke, Sorrenti, and Zilibotti (2019) present theoretical models and cross-country evidence that the economic environment shapes parents' choices of parenting styles; Kiessling (2020) studies parents' perceptions about the returns to these parenting styles and highlights the predictive power of beliefs for parents' actual parenting styles; Cobb-Clark, Salamanca, and Zhu (2019) and Falk et al. (forthcoming) show that parenting styles foster the development of non-cognitive skills and economic preferences.

Table 9. Parents' willingness to interfere predicts parenting styles

	Control			Warmth		
	(1)	(2)	(3)	(4)	(5)	(6)
$\mathbb{1}\{\text{Interfering}\}$	0.39***	0.39***	0.37***	0.38***	0.37***	0.11*
	(0.06)	(0.05)	(0.07)	(0.05)	(0.05)	(0.06)
Parental and child controls	No	Yes	Yes	No	Yes	Yes
Household Characteristics	No	Yes	No	No	Yes	No
Household FEs	No	No	Yes	No	No	Yes
Share interfering	0.55	0.55	0.55	0.55	0.55	0.55
Parent-child-pairs	1,816	1,804	1,762	1,816	1,804	1,762
Households	608	607	565	608	607	565
R^2	0.04	0.16	0.54	0.04	0.08	0.58

Notes: This table presents regressions of standardized indices of two dimensions of parenting styles (control and warmth) on an indicator for whether a parent invests money to increase the likelihood of implementing their choices for their children. Control variables include age and gender of both the parent and the child, indicators for whether the parent can read and write, received a secondary school leaving certificate, the household being Muslim, access to electricity, whether the father works in agriculture, whether the mother is a housewife, and log household income. Standard errors in parentheses are clustered by households. *, **, and *** denote significance at the 0.10, 0.05, and 0.01 level.

Parents willing to interfere implement decisions for their children that exhibit close to no present bias. While these results only capture a cross-sectional relationship at one point in time, the result that they are predictive of parenting styles suggests that the willingness to interfere most likely also has dynamic implications. In particular, if parents interfere repeatedly with their children's decision-making, this presumably has consequences for the development of skills and preferences. In a final part of our analysis, we therefore study how our behavioral measure of parental interference relates to the formation and intergenerational transmission of patience.

6 Intergenerational transmission of patience and parental paternalism

Previous research has documented that factors related to nature (e.g., genetic transmission) as well as nurture (e.g., parental investments or parenting practices) are important to understand the formation and intergenerational correlations of preferences.[17] While we do not aim to — and cannot — decompose the intergenerational transmission of patience into different

[17] For instance, there is accumulating evidence that genetic factors help to explain the variation in time preferences, although the magnitude varies considerably across studies and settings, with heritability estimates ranging from 18 to 62% for measures of discounting, impulsivity, and self-control (Anokhin et al., 2011, 2015; Cesarini et al., 2012; Hübler, 2018). However, there is also rich evidence that parental investments and the family environment foster the development of skills (for overviews, see, e.g., Heckman and Mosso, 2014; Attanasio, 2015; Doepke, Sorrenti, and Zilibotti, 2019), which may also give rise to intergenerational correlations in preferences and skills.

causal mechanisms related to nature and nurture, we focus on a particular factor adding to the relevance of the nurture mechanism. Namely, we leverage data on parents' willingness to interfere with their children's decision-making to study how this measure moderates the intergenerational transmission of time preferences.

The aim of this section is threefold. First, we extend existing evidence on the intergenerational correlation of time preferences. Previous research summarized in Appendix Table G.1 mainly stems from developed Western countries and uses different instruments for parents and children. By contrast, we use rich data from a large sample of families in Bangladesh, and use identical, incentivized experiments for both parents and children to facilitate the comparison of their intertemporal choices. Second, we study whether and how parents' tendency to interfere in their children's decision-making moderates the transmission of preferences. Third, we consider not only raw choices and survey items to study intergenerational correlations, but lever structural estimates that allow us to distinguish the intergenerational transmission of present bias (β) and long-run discounting (δ).

6.1 Intergenerational transmission in intertemporal choices: Reduced-form results

We begin by correlating the share children allocated to the sooner payment date to their parents' choices for the respective decision in Table 10. Column (1) of Panel A shows that increasing the parents' share of stars paid earlier by 10 percentage points is associated with children allocating 1.4 percentage points more towards the sooner payment date. Controlling for characteristics of children, parents, and the household in column (2) or using a survey measure of time preferences in column (6) yields similar estimates.[18]

In columns (3) and (4) of Panel A, we additionally control for parameters characterizing each of the 12 decisions, or use fixed effects for each decision, which reduces the coefficient of interest to 0.09, while remaining statistically significant ($p < 0.01$ for both estimates). These coefficients are comparable to existing estimates in the literature, which finds modest correlations for well-powered studies (cf. Appendix Table G.1).

Our experimental design also allows us to study the role of paternalistic decisions in addition to parents' own decisions for the formation of children's intertemporal decisions. As a first step, we therefore enhance the previous specifications by including parents' paternalistic decisions as an additional regressor in column (5). While the coefficient of parents' own decisions decreases slightly, both the parents' own as well as their paternalistic decisions are significantly related to children's intertemporal decisions. An increase of 10 percentage points in either the parents' own or the paternalistic share allocated to the sooner date is associated with a 0.6-0.7 percentage point increase in children's own allocations to the earlier date. This

[18] Children were asked for their agreement to the statement "I am good at giving up something nice today (e.g., a reward) in order to get something even nicer in the future (e.g., a larger reward)" on a 5-point Likert scale, while parents were asked "How willing are you to give up something that is beneficial for you today in order to benefit more from that in the future?" on an 11-point Likert scale. We standardize both measures to have a mean of zero and a standard deviation of one.

Table 10. Intergenerational transmission of patience I

A. Pooled transmission estimates	Children's share of stars paid earlier					Survey measure of patience
	(1)	(2)	(3)	(4)	(5)	(6)
Parents' share of stars paid earlier	0.14***	0.14***	0.09***	0.09***	0.07***	
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	
Parents' paternalistic decisions about share of stars paid earlier					0.06***	
					(0.01)	
Parents' patience (survey measure)						0.13***
						(0.03)
Parental, child, and household controls	No	Yes	Yes	Yes	Yes	Yes
Decision parameters	No	No	Yes	No	No	No
Decision FEs	No	No	No	Yes	Yes	No
Observations	21,840	21,696	21,696	21,696	21,689	1,801
Households	610	609	609	609	609	608
R^2	0.02	0.04	0.08	0.08	0.08	0.04

B. Heterogeneity by parental interference	Children's share of stars paid earlier					
	(1) Non-int. parents	(2) Inter. parents	(3) p-value of diff.	(4) Non-int. parents	(5) Inter. parents	(6) p-value of diff.
Parents' share of stars paid earlier	0.10***	0.07***	0.02	0.09***	0.05***	0.04
	(0.01)	(0.01)		(0.01)	(0.01)	
Parents' paternalistic decisions about share of stars paid earlier				0.06***	0.07***	0.65
				(0.01)	(0.01)	
Parental, child, and household controls	Yes			Yes		
Decision FEs	Yes			Yes		
Observations	21,696			21,689		
Households	609			609		
R^2	0.08			0.08		

Notes: Columns (1)-(5) of Panel A relate children's share of stars allocated to the sooner payment date in each of the 12 decisions to parents' analogous decisions. Column (6) presents the intergenerational transmission of patience using standardized survey items of time preferences. Panel B presents heterogeneous transmission estimates by parents' willingness to interfere with their children's decision-making. Control variables include age and gender of both the parent and the child, indicators for whether the parent can read and write, received a secondary school leaving certificate, the household being Muslim, access to electricity, whether the father works in agriculture, whether the mother is a housewife, and log household income. Decision parameters refers to the five parameters that characterize the 12 decision sheets, whereas decision fixed effects (FE) refers to a set of indicators for each decision sheet. Standard errors in parentheses and clustered at the household. *, **, and *** denote significance at the 0.10, 0.05, and 0.01 level.

indicates that both parents' own preferences as well as their paternalistic preferences about their children's behavior are relevant for the formation of children's time preferences.

In Panel B of Table 10, we then study the heterogeneity of this intergenerational transmission by introducing our second new measure in the analysis: parents' willingness to pay to interfere with their children's decision-making. While we find that the transmission estimates are significant for both interfering and non-interfering parents, columns (1) through (3) show that the transmission is more pronounced for non-interfering parents (t-test of the difference yields a p-value of 0.02). As shown in columns (4)-(6), this also holds once we take parents' paternalistic preferences into account (p-value = 0.04).[19]

[19] In Appendix Table G.2, we replicate Table 10 using two-limit Tobit regressions to account for observations with shares of zero and one. The results are similar, both qualitatively and in terms of their significance. We also report

6.2 Intergenerational transmission of present bias and long-run discounting

The preceding analysis has shown that intertemporal decisions of parents and their children are correlated, and this transmission is stronger for non-interfering parents. This raises the question why we observe a weaker transmission for more involved parents. To study this question, we put some structure on the intertemporal decisions, allowing us to distinguish two dimensions in the intergenerational transmission of time preferences: Parents could transmit their present bias (β_i), their long-run discounting behavior (δ_i), or both. We therefore estimate the structural discounting parameters for present bias and long-run discounting for each individual separately.[20] Using these individual-specific estimates for present bias and long-run discounting, Table 11 relates children's preference parameters of present bias (Panel A) and time-consistent discounting (Panel B) to their parents' preference parameters. In order to account for the fact that the regressors are estimates themselves, we bootstrap standard errors with 1,000 repetitions.[21]

In Panel A of Table 11, we begin by analyzing the transmission of present bias. Columns (1) through (3) show that both parental present bias as well as parental long-run discounting are related to children's present bias, with the former having a more pronounced effect than the latter. We then turn to potential heterogeneous effects by parents' willingness to interfere in their children's decision-making. In Figure 4a, we present non-parametric estimates of children's present bias on their parents' present bias and differentiate between interfering and non-interfering parents. Interestingly, we find that children of interfering parents are consistently less present-biased, i.e., have present bias parameters closer to one. Yet, the intergenerational transmission of present bias seems to be driven entirely by non-interfering parents, while the relationship is flat for interfering parents.

In columns (4) and (5) of Table 11, we corroborate and quantify these findings in a regression framework. Children of interfering parents have present bias parameters β_i that are 0.09-0.16 points larger, corresponding to 13-24% of a standard deviation of children's present bias parameters. At the same time, the intergenerational correlation between the present bias of parents and children is dampened, reducing the estimated transmission estimates to

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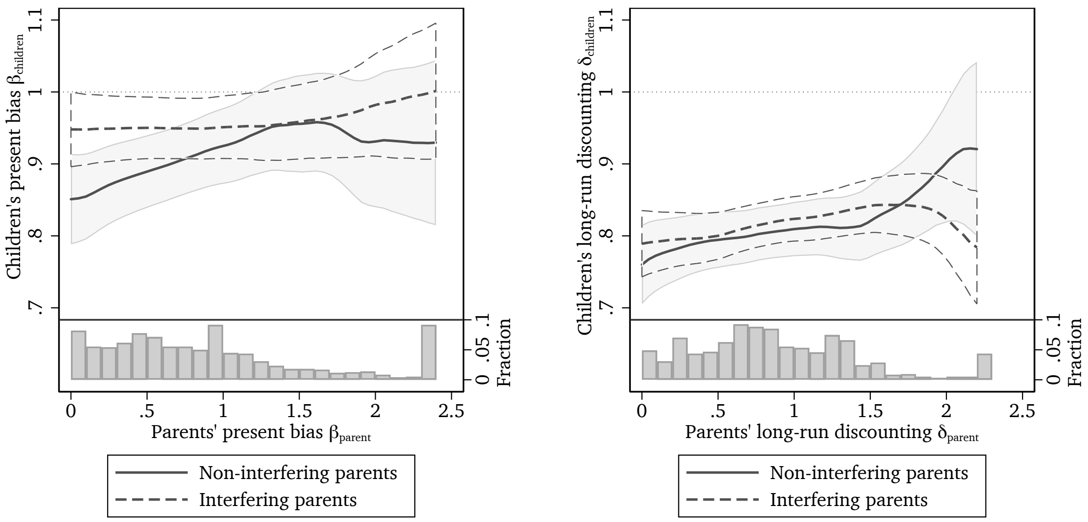
transmission estimates of intertemporal choices for several splits in Appendix Table G.3. The intergenerational correlation is similar for boys and girls, and from mothers and fathers to their children and independent of the age of the child.

[20]As pre-specified, we impose a common utility curvature similar to Augenblick, Niederle, and Sprenger (2015) and estimate each individual's β_i and δ_i using the non-linear least squares model specified in equation (4) with $\alpha_i = 0.46$, as explained in more detail in Appendix H. For our main specification, only 5 estimations do not converge, while we cannot estimate parameters for 294 respondents, who always allocated their whole endowment to the sooner date. We present the distribution of the resulting individual-level parameters in Appendix Figure H.1. We also present results using alternative assumptions to back out individual-level parameters. Specifically, we (i) allow the utility curvature to vary between families and impose the same curvature for all family members, (ii) estimate the curvature for each individual separately, and (iii) impute structural parameters for those who do not have any switching points, which prohibits the estimation of structural parameters. The results from these alternative specifications support our findings using our pre-registered specification that are reported in this section.

[21]To take outliers into account, we winsorize the individual estimates for present bias and long-run discounting at the 75th percentile plus 1.5 times the interquartile range following Imai, Rutter, and Camerer (forthcoming), and control for an indicator for whether the restriction is binding in all of our regressions. See Appendix H.1 for more details.

Figure 4. Intergenerational transmission of present bias and long-run discounting

(a) Present bias β_i **(b)** Long-run discounting δ_i



Notes: This figure presents the relationship of parents present bias (β_{parent}; Panel A) and long-run discounting parameters (δ_{parent}; Panel B) with their children's parameters (β_{children} and δ_{children}). The lower part of the figures present histograms of parents' parameters, while the upper part presents a locally weighted polynomial regression with an Epanechnikov kernel of children's parameters on their parents' parameters including 90% confidence intervals. Parameter estimates are bounded at the 25th percentile − 1.5 × interquartile range (never binding) and 75th percentile + 1.5 × interquartile range (binding for 8.4% and 3.3% of β_i and δ_i parameters).

0.03 and 0.05, which are not significantly different from zero (p-values of 0.30 and 0.24, respectively), although we lack power to reject that null hypothesis of no difference in the strength of the transmission between interfering and non-interfering parents (p-values of 0.19 and 0.11, respectively). Moreover, we observe that the role of interfering parents' long-run discounting is also less pronounced for their children's present bias.

Turning to the transmission patterns for long-run discounting in Panel B of Table 11, we observe that only parents' long-run discounting, but not their present bias, is related to children's long-run discounting. This contrasts with our results on children's present bias, which correlates with both parents' present bias and time-consistent discounting. When studying the transmission by parental interference in columns (4) and (5) as well as Figure 4b, we do not find similar pronounced differences between interfering and non-interfering parents as for the transmission of present bias.

Taken together, these results suggest that parents' willingness to interfere with their children's decision-making — which is related to the way parents raise their children — shapes intergenerational transmission processes. In particular, we find that the intergenerational correlation of time preferences of parents who are willing to override their children's decisions are significantly lower than their non-interfering counterparts. More specifically, we find that this is driven by the transmission of present bias: interfering parents have less present-biased children and they do not transmit their own present bias to their offspring. Thus, our re-

Table 11. Intergenerational transmission of patience II

A. Transmission of present bias (β)	Children's present bias β_{children}				
	(1)	(2)	(3)	(4)	(5)
Parental present bias β_{parent}	0.05*	0.06**	0.08**		
	(0.03)	(0.03)	(0.03)		
Parental monthly discounting δ_{parent}			0.07**		
			(0.04)		
$\mathbb{1}\{\text{Interfering}\}$				0.09**	0.16*
				(0.04)	(0.09)
$\mathbb{1}\{\text{Non-interfering}\} \times \beta_{\text{parent}}$				0.09**	0.13***
				(0.04)	(0.04)
$\mathbb{1}\{\text{Interfering}\} \times \beta_{\text{parent}}$				0.03	0.05
				(0.03)	(0.04)
$\mathbb{1}\{\text{Non-interfering}\} \times \delta_{\text{parent}}$					0.11**
					(0.05)
$\mathbb{1}\{\text{Interfering}\} \times \delta_{\text{parent}}$					0.05
					(0.04)
Parental, Child, and Household Controls	No	Yes	Yes	Yes	Yes
p-val. $\left(H_0: \mathbb{1}\{\text{Non-Int.}\} \times \beta_p = \mathbb{1}\{\text{Int.}\} \times \beta_p\right)$				0.19	0.11
p-val. $\left(H_0: \mathbb{1}\{\text{Non-Int.}\} \times \delta_p = \mathbb{1}\{\text{Int.}\} \times \delta_p\right)$					0.38
Parent-child pairs	1,371	1,362	1,362	1,362	1,362
Households	545	543	543	543	543
R^2	0.40	0.42	0.42	0.42	0.42
B. Transmission of long-run discounting (δ)	Children's montly discounting δ_{children}				
	(1)	(2)	(3)	(4)	(5)
Parental monthly discounting δ_{parent}	0.07***	0.07***	0.07**		
	(0.03)	(0.03)	(0.03)		
Parental present bias β_{parent}			0.02		
			(0.02)		
$\mathbb{1}\{\text{Interfering}\}$				0.05	0.09
				(0.05)	(0.08)
$\mathbb{1}\{\text{Non-interfering}\} \times \delta_{\text{parent}}$				0.08**	0.10**
				(0.04)	(0.04)
$\mathbb{1}\{\text{Interfering}\} \times \delta_{\text{parent}}$				0.06*	0.05
				(0.03)	(0.04)
$\mathbb{1}\{\text{Non-interfering}\} \times \beta_{\text{parent}}$					0.04
					(0.03)
$\mathbb{1}\{\text{Interfering}\} \times \beta_{\text{parent}}$					0.01
					(0.03)
Parental, Child, and Household Controls	No	Yes	Yes	Yes	Yes
p-val. $(H_0: \mathbb{1}\{\text{Non-int.}\} \times \delta_p = \mathbb{1}\{\text{Int.}\} \times \delta_p)$				0.61	0.41
p-val. $(H_0: \mathbb{1}\{\text{Non-int.}\} \times \beta_p = \mathbb{1}\{\text{Int.}\} \times \beta_p)$					0.48
Parent-child pairs	1,371	1,362	1,362	1,362	1,362
Households	545	543	543	543	543
R^2	0.18	0.20	0.20	0.20	0.20

Notes: This table presents linear regressions of children's discounting (present bias in the top panel, monthly discounting in the bottom panel) on their parents' preferences and an indicator for parental interference (i.e., whether parents invested money to increase the probability that their preferences are implemented). The sample comprises those parent-child pairs for which we can estimate preference parameters (see Footnote 21). All regressions include indicators equal to one if the structural parameters β or δ were winsorized at the 75th percentile+1.5×interquartile range, and zero otherwise. Control variables include age and gender of both the parent and the child, indicators for whether the parent can read and write, received a secondary school leaving certificate, the household being Muslim, access to electricity, whether the father works in agriculture, whether the mother is a housewife, and log household income. Bootstrapped standard errors with 1,000 repetitions in parentheses. *, **, and *** denote significance at the 0.10, 0.05, and 0.01 level.

sults are in line with Brenøe and Epper (2019), who find that parenting values moderate the intergenerational transmission of time preferences.

In addition, by allowing parental interference to (i) moderate the intergenerational transmission, and (ii) to have a direct effect on children's present bias, our findings also help to rationalize the seemingly contrasting results by Alan et al. (2017) and Zumbuehl, Dohmen, and Pfann (forthcoming), who show that the transmission of risk preferences and trust increases in parental involvement and results in more similar parent-child pairs. In particular, we also show that interfering parents have more patient children, suggesting that this particular form of parenting — which occurs more often among more patient parents as shown in Table 7 — potentially increases patience per se by reducing children's present bias. Thus, our results suggest that the channel giving rise to this intergenerational correlation in preferences may be due to parents molding their children's preferences through repeated interference with their decision-making, as suggested by theoretical models of parent-child interactions (Lizzeri and Siniscalchi, 2008; Doepke and Zilibotti, 2017; Seror, 2019). Ignoring these effects of parenting on children's preferences would therefore miss an important heterogeneity in the intergenerational transmission of patience.

7 Conclusion

This paper innovates in several respects. First, we introduce a novel measure of parents' paternalistic preferences. Recent theoretical models of parent-child interactions highlight the importance of paternalistic preferences (e.g., Doepke and Zilibotti, 2017) as well, but related empirical research is scarce. Applying our new measurement tool in a large-scale experiment with more than 2,000 family members, we provide a detailed characterization of parents' paternalistic preferences with regard to their children's intertemporal choices — a domain of economic preferences that has been shown to be particularly important for life outcomes (e.g., Chabris et al., 2008; Meier and Sprenger, 2010, 2012; Castillo et al., 2011; Sutter et al., 2013; Golsteyn, Grönqvist, and Lindahl, 2014; Cadena and Keys, 2015).

Second, our results underline that paternalism is both widespread among parents and highly consequential. Parents not only anticipate their children's present bias, but more than half of all parents are willing to forego money to interfere with their children's choices. This parental interference turns out to have important consequences for the formation of children's time preferences. Parents' paternalistic choices for their children reflect that parents strive to reduce their children's present bias. We show that paternalistic parents actually achieve this.

Third, looking at further dynamic implications of parental interference by examining the intergenerational transmission of patience, we have uncovered an important interaction effect of parental interference and this transmission. Parents who are more likely to interfere in their children's decision-making have a weaker transmission of their own intertemporal preferences onto their children than parents who are unlikely to interfere in their children's choices or do not interfere at all. This means that there is a hitherto overlooked heterogeneity in the intergenerational transmission of preferences. It is weaker in families with a relatively large degree of parental paternalism and interference in children's choices. These results suggest that parents can mold their children's preferences towards an ideal — in our context, towards time-consistent preferences — at the cost of raising children who resemble themselves less.

Finally, our data also allow for a comprehensive characterization of paternalistic parents. Parents with more resources are more likely to act paternalistically. The willingness to pay for paternalistic interference is also related to parents' own intertemporal preferences — more patient parents are more likely to interfere — and to parental beliefs about children's preferences — parents expecting their children to be relatively patient are more likely to interfere to reduce their present bias almost to zero. Importantly, paternalistic interference is closely associated with parenting styles as well. Parents with an authoritative parenting style who score relatively higher on warmth and control are more likely to interfere with their children's preferences. Jointly, these results suggest that those children benefit from parental paternalism by becoming less present-biased who are already better off to start with. They live in richer families with more patient parents, and their parents adopt more authoritarian parenting styles — all of which are associated with better child outcomes. Parental paternalism thus adds a further important dimension in which parental investments in their children differ by family background, possibly reinforcing vicious and virtuous cycles in the development of children's skills and preferences.

We think our work points towards several avenues for further research on parent-child interactions. For example, it would be interesting to examine whether our results on the extent and influence of parental paternalism extend into other prominent preference domains such as risk attitudes or social preferences. Their formation and intergenerational transmission has been extensively studied (see, e.g., Dohmen et al., 2012; Alan et al., 2017; Falk et al., forthcoming), yet without any consideration of parental paternalism so far. Accumulating evidence on parental paternalism across different domains and horizons would shed light onto the question of its stability across tasks and over time. Moreover, we document that parents are able to anticipate their children's present bias. While people are often (at least partly) naive about their time inconsistencies (Wong, 2008; Mandel et al., 2017; Augenblick and Rabin, 2019; Cobb-Clark et al., 2020) and show only low demand for commitment (e.g., Ashraf, Karlan, and Yin, 2006; Giné, Karlan, and Zinman, 2010; Augenblick, Niederle, and Sprenger, 2015), they are more sophisticated about biases by others (Fedyk, 2018; Ambuehl, Bernheim, and Ockenfels, forthcoming). Thus, from a methodological viewpoint it would be interesting to examine parents' (or others') demand for commitment for their children (affected parties). From a paternalistic perspective, such commitment devices would help affected parties to overcome self-control problems, even if they themselves are naive about their present bias.

References

Agostinelli, Francesco, Matthias Doepke, Giuseppe Sorrenti, and Fabrizio Zilibotti (2020). "It takes a Village: The Economics of Parenting with Neighborhood and Peer Effects". Working Paper.

Alan, Sule, Nazli Baydar, Teodora Boneva, Thomas F. Crossley, and Seda Ertac (2017). "Transmission of risk preferences from mothers to daughters". In: *Journal of Economic Behavior & Organization* 134, pp. 60–77.

Alan, Sule and Seda Ertac (2018). "Fostering Patience in the Classroom: Results from Randomized Educational Intervention". In: *Journal of Political Economy* 126.5, pp. 1865–1911.

Albrecht, Konstanze, Kirsten G. Volz, Matthias Sutter, David I. Laibson, and D. Yves von Cramon (2011). "What is for me is not for you: brain correlates of intertemporal choice for self and other". In: *SCAN – Social Cognitive and Affective Neuroscience* 6.2, pp. 218–225.

Almås, Ingvild, Alexander W. Cappelen, Kjell G. Salvanes, Erik Ø. Sørensen, and Bertil Tungodden (2016). "Willingness to Compete: Family Matters". In: *Management Science* 62.8, pp. 2149–2162.

Ambuehl, Sandro, B. Douglas Bernheim, and Axel Ockenfels (forthcoming). "What Motivates Paternalism? An Experimental Study". In: *American Economic Review*.

Andreoni, James, Michael Kuhn, John List, Anya Samek, Kevin Sokal, and Charles Sprenger (2019). "Toward an understanding of the development of time preferences: Evidence from field experiments". In: *Journal of Public Economics* 177.104039.

Andreoni, James and Charles Sprenger (2012). "Estimating Time Preferences from Convex Budgets". In: *American Economic Review* 102.7, pp. 3333–3356.

Anokhin, Andrey P., Simon Golosheykin, Julia D. Grant, and Andrew C. Heath (2011). "Heritability of Delay Discounting in Adolescence: A Longitudinal Twin Study". In: *Behavioral Genetics* 41.2, pp. 175–183.

Anokhin, Andrey P., Julia D. Grant, Richard C. Mulligan, and Andrew C. Heath (2015). "The Genetics of Impulsivity: Evidence for the Heritability of Delay Discounting". In: *Biological Psychiatry* 77.10, pp. 887–894.

Arrondel, Luc (2013). "Are "daddy's boys" just as rich as daddy? The transmission of values between generations". In: *Journal of Economic Inequality* 11.4, pp. 439–471.

Ashraf, Nava, Dean Karlan, and Wesley Yin (2006). "Tying Odysseus to the Mast: Evidence From a Commitment Savings Product in the Philippines". In: *Quarterly Journal of Economics* 121.2, pp. 635–672.

Attanasio, Orazio P. (2015). "The Determinants of Human Capital Formation during the Early Years of Life: Theory, Measurement, and Policies". In: *Journal of the European Economic Association* 13.6, pp. 949–997.

Augenblick, Ned, Muriel Niederle, and Charles Sprenger (2015). "Working over Time: Dynamic Inconsistency in Real Effort Tasks". In: *Quarterly Journal of Economics* 130.3, pp. 1067–1115.

Augenblick, Ned and Matthew Rabin (2019). “An Experiment on Time Preference and Misprediction in Unpleasant Tasks”. In: *Review of Economic Studies* 86.3, pp. 941–975.

Balakrishnan, Uttara, Johannes Haushofer, and Pamela Jakiela (2020). “How Soon Is Now? Evidence of Present Bias from Convex Time Budget Experiments”. In: *Experimental Economics* 23, pp. 294–321.

Bangladesh Bureau of Statistics (2017). *Preliminary Report on Household Income and Expenditure Survey 2016*.

Bartling, Björn, Ernst Fehr, Barbara Fischer, Fabian Kosse, Michel Maréchal, Friedhelm Pfeiffer, Daniel Schunk, Jürgen Schupp, C. Katharina Spieß, and Gert G. Wagner (2010). “Determinanten kindlicher Geduld – Ergebnisse einer Experimentalstudie im Haushaltskontext”. In: *Journal of Applied Social Science Studies (Schmollers Jahrbuch)* 130.3, pp. 297–323.

Bauer, Michal, Julie Chytilová, and Barbara Pertold-Gębicka (2014). “Parental background and other-regarding preferences in children”. In: *Experimental Economics* 17.1, pp. 24–46.

Bettinger, Eric and Robert Slonim (2007). “Patience among children”. In: *Journal of Public Economics* 91.1, pp. 343–363.

Bisin, Alberto and Thierry Verdier (2001). “The Economics of Cultural Transmission and the Dynamics of Preferences”. In: *Journal of Economic Theory* 97.2, pp. 298–319.

Brenøe, Anne Ardila and Thomas Epper (2019). “Parenting Values Moderate the Intergenerational Transmission of Time Preferences”. Working Paper.

Brown, Heather and Marjon van der Pol (2015). “Intergenerational transfer of time and risk preferences”. In: *Journal of Economic Psychology* 49, pp. 187–204.

Cadena, Brian C. and Benjamin J. Keys (2015). “Human Capital and the Lifetime Costs of Impatience”. In: *American Economic Journal: Economic Policy* 7.3, pp. 126–153.

Camerer, Colin F., Samuel Issacharoff, George F. Loewenstein, Ted O’Donoghue, and Matthew Rabin (2003). “Regulation for Conservatives: Behavioral Economics and the Case for ’Asymmetric Paternalism’”. In: *University of Pennsylvania Law Review* 151, pp. 1211–1254.

Card, David and Alan Krueger (1992). “Does School Quality Matter? Returns to Education and the Characteristics of Public Schools in the United States”. In: *Journal of Political Economy* 100.1, pp. 1–40.

Castillo, Marco, Paul J. Ferraro, Jeffrey L. Jordan, and Ragan Petrie (2011). “The today and tomorrow of kids: Time preferences and educational outcomes of children”. In: *Journal of Public Economics* 95.11, pp. 1377–1385.

Cesarini, David, Magnus Johannesson, Patrik K. E. Magnusson, and Björn Wallace (2012). “The Behavioral Genetics of Behavioral Anomalies”. In: *Management Science* 58.1, pp. 21–34.

Chabris, Christopher, David Laibson, Carrie Morris, Jonathon Schuldt, and Dmitry Taubinsky (2008). *Individual laboratory-measured discount rates predict field behavior*.

Chetty, Raj and Nathaniel Hendren (2018). “The Impacts of Neighborhoods on Intergenerational Mobility I: Childhood Exposure Effects”. In: *Quarterly Journal of Economics* 133.3, pp. 1107–1162.

Chowdhury, Shyamal, Matthias Sutter, and Klaus F. Zimmermann (2020). “Economic preferences across generations and family clusters: A large-scale experiment”. Working Paper.

Cipriani, Marco, Paola Giuliano, and Olivier Jeanne (2013). “Like mother like son? Experimental evidence on the transmission of values from parents to children”. In: *Journal of Economic Behavior & Organization* 90, pp. 100–111.

Cobb-Clark, Deborah, Sarah Dahmann, daniel Kamhöfer, and Hannah Schildberg-Hörisch (2020). “Sophistication and naiveté about present-bias: Empirical evidence”. Working Paper.

Cobb-Clark, Deborah A., Nicolás Salamanca, and Anna Zhu (2019). “Parenting style as an investment in human development”. In: *Journal of Population Economics* 32.4, pp. 1315–1352.

Coller, Maribeth and Melonie B. Williams (1999). “Eliciting individual Discount Rates”. In: *Experimental Economics* 2, pp. 107–127.

Cosconati, Marco (2012). “Parenting Style and the Development of Human Capital in Children”. Working Paper.

Cubitt, Robin P. and Daniel Read (2007). “Can intertemporal chocie experiments elicit time preferences for consumption?” In: *Experimental Economics* 10, pp. 369–389.

Dean, Mark and Anja Sautmann (forthcoming). “Credit Constraints and the Measurement of Time Preferences”. In: *Review of Economics and Statistics*.

Dobbie, Will and Jr. Fryer Roland G. (2011). “Are High-Quality Schools Enough to Increase Achievement among the Poor? Evidence from the Harlem Children’s Zone”. In: *American Economic Journal: Applied Economics* 3.3, pp. 158–187.

Doepke, Matthias, Giuseppe Sorrenti, and Fabrizio Zilibotti (2019). “The Economics of Parenting”. In: *Annual Review of Economics* 11.1, pp. 55–84.

Doepke, Matthias and Fabrizio Zilibotti (2017). “Parenting With Style: Altruism and Paternalism in Intergenerational Preference Transmission”. In: *Econometrica* 85.5, pp. 1331–1371.

Dohmen, Thomas, Armin Falk, David Huffman, and Uwe Sunde (2012). “The Intergenerational Transmission of Risk and Trust Attitudes”. In: *Review of Economic Studies* 79.2, pp. 645–677.

Dworkin, Gerald (1972). “Paternalism”. In: *The Monist* 56.1, pp. 64–84.

Falk, Armin, Anke Becker, Thomas Dohmen, Benjamin Enke, David Huffman, and Uwe Sunde (2018). “Global Evidence on Economic Preferences”. In: *Quarterly Journal of Economics* 133.4, pp. 1645–1692.

Falk, Armin, Fabian Kosse, Pia Pinger, Hannah Schildberg-Hörisch, and Thomas Deckers (forthcoming). “Socio-Economic Status and Inequalities in Children’s IQ and Economic Preferences”. In: *Journal of Political Economy*.

Fedyk, Anastassia (2018). “Asymmetric Naïveté: Beliefs about Self-Control”. Working Paper.

Gauly, Britta (2017). “The Intergenerational Transmission of Attitudes: Analyzing Time Preferences and Reciprocity”. In: *Journal of Family and Economic Issues* 38, pp. 293–312.

Giné, Xavier, Jessica Goldberg, Dan Silverman, and Dean Yang (2018). "Revising Commitments: Field Evidence on the Adjustment of Prior Choices". In: *Economic Journal* 128.608, pp. 159–188.

Giné, Xavier, Dean Karlan, and Jonathan Zinman (2010). "Put Your Money Where Your Butt Is: A Commitment Contract for Smoking Cessation". In: *American Economic Journal: Applied Economics* 2.4, pp. 213–235.

Glaeser, Edward L. (2006). "Paternalism and Psychology". In: *University of Chicago Law Review* 73.1, pp. 133–156.

Golsteyn, Bart H.H., Hans Grönqvist, and Lena Lindahl (2014). "Adolescent Time Preferences Predict Lifetime Outcomes". In: *Economic Journal* 124.580, F739–F761.

Halevy, Yoram (2015). "Time Consistency: Stationarity and Time Invariance". In: *Econometrica* 83.1, pp. 335–352.

Heckman, James J. and Stefano Mosso (2014). "The Economics of Human Development and Social Mobility". In: *Annual Review of Economics* 6.1, pp. 689–733.

Hübler, Philipp M.A. (2018). "Heritability of Time Preference: Evidence from German Twin Data". In: *Kyklos* 71.3, pp. 433–455.

Imai, Taisuke, Tom A. Rutter, and Colin F. Camerer (forthcoming). "Meta-Analysis of Present-Bias Estimation Using Convex Time Budgets". In: *Economic Journal*.

Kiessling, Lukas (2020). "How do Parents Perceive the Returns to Parenting Styles and Neighborhoods?" Working Paper.

Kimball, Miles S., Claudia R. Sahm, and Matthew D. Shapiro (2009). "Risk Preferences in the PSID: Individual Imputations and Family Covariation". In: *American Economic Review: Papers & Proceedings* 99.2, pp. 363–368.

Koelle, Felix and Lukas Wenner (2019). "Time-Inconsistent Generosity: Present Bias Across Individual and Social Contexts". In: Working Paper.

Kosse, Fabian and Friedhelm Pfeiffer (2012). "Impatience among preschool children and their mothers". In: *Economics Letters* 115.3, pp. 493–495.

— (2013). "Quasi-hyperbolic time preferences and their intergenerational transmission". In: *Applied Economics Letters* 20.10, pp. 983–986.

Laibson, David (1997). "Golden Eggs and Hyperbolic Discounting". In: *Quarterly Journal of Economics* 112.2, pp. 443–478.

Lizzeri, Alessandro and Marciano Siniscalchi (2008). "Parental Guidance and Supervised Learning". In: *Quarterly Journal of Economics* 123.3, pp. 1161–1195.

Locke, John (1764). *Two Treatises of Government*. Ed. by Thomas Hollis. London: A. Millar et al.

Lührmann, Melanie, Marta Serra-Garcia, and Joachim Winter (2018). "The Impact of Financial Education on Adolescents' Intertemporal Choices". In: *American Economic Journal: Economic Policy* 10.3, pp. 309–332.

Lundberg, Shelly, Jennier L. Romich, and Kwok Ping Tsang (2009). "Decision-making by children". In: *Review of Economics of the Household* 7, pp. 1–30.

Maccoby, Eleanor E. and John A. Martin (1983). “Socialization in the context of the family: Parent-child interaction”. In: *Handbook of Child Psychology*. Ed. by P. Mussen. Vol. 4. Wiley.

Mandel, Naomi, Maura L. Scott, Sunghoon Kim, and Rajiv K. Sinha (2017). “Strategies for improving self-control among naïve, sophisticated, and time-consistent consumers”. In: *Journal of Economic Psychology* 60, pp. 109–125.

Meier, Stephan and Charles Sprenger (2010). “Present-Biased Preferences and Credit Card Borrowing”. In: *American Economic Journal: Applied Economics* 2.1, pp. 193–210.

— (2012). “Time Discounting Predicts Creditworthiness”. In: *Psychological Science* 23.1, pp. 56–58.

Mill, John Stuart (1869). *On Liberty*. London: Longmans, Green, Reader, and Dyer.

Oliveira, Angela C.M. de and Sarah Jacobson (2020). “(Im)patience by Proxy: Making Intertemporal Decisions for Others”. Working Paper.

Perris, Carlo, Lars Jacobsson, Hakån Lindström, Lars von Knorring, and Hjördis Perris (1980). “Development of a new inventory for assessing memories of parental rearing behaviour”. In: *Acta Psychiatrica Scandinavica* 61.4, pp. 265–274.

Pronin, Emily, Christopher Y. Olivola, and Kathleen A. Kennedy (2008). “Doing Unto Future Selves As You Would Do Unto Others: Psychological Distance and Decision Making”. In: *Personality and Social Psychology Bulletin* 34.2, pp. 224–236.

Rabin, Matthew and Georg Weizsäcker (2009). “Narrow Bracketing and Dominated Choices”. In: *American Economic Review* 99.4, pp. 1508–1543.

Samek, Anya, Andre Gray, Ashlesha Datar, and Nancy Nicosia (2019). “Adolescent Time and Risk Preferences: Measurement, Determinants, and Field Consequences”. Working Paper.

Schildberg-Hörisch, Hannah (2018). “Are Risk Preferences Stable?” In: *Journal of Economic Perspectives* 32.2, pp. 135–154.

Schwarz, Beate, Sabine Walper, Mechthild Gödde, and Stephanie Jurasic (1997). “Dokumentation der Erhebungsinstrumente der 1. Haupterhebung (überarb. Version)”. Reports of the research group "Familienentwicklung nach der Trennung" (Vol. 14).

Seror, Avner (2019). “Human Development, Social Interactions, and Identity Formation”. Working Paper.

Shapiro, Jeremy (2010). “Discounting for You, Me, and We: Time Preferences in Groups and Pairs”. Working Paper.

Sutter, Matthias, Martin G. Kocher, Daniela Glätzle-Rützler, and Stefan T. Trautmann (2013). “Impatience and Uncertainty: Experimental Decisions Predict Adolescents’ Field Behavior”. In: *American Economic Review* 103.1, pp. 510–531.

Sutter, Matthias and Anna Untertrifaller (2020). “Children’s heterogeneity in cooperation and parental background: An experimental study”. In: *Journal of Economic Behavior & Organization* 171, pp. 286–296.

Sutter, Matthias, Michael Weyland, Anna Untertrifaller, and Manuel Froitzheim (2020). “Financial Literacy, Risk and Time Preferences: Results from a Randomized Educational Intervention”. Working Paper.

Sutter, Matthias, Claudia Zoller, and Daniela Glätzle-Rützler (2019). "Economic behavior of children and adolescents – A first survey of experimental economics results". In: *European Economic Review* 111, pp. 98–121.

Tangney, June P., Roy F. Baumeister, and Angie Luzio Boone (2004). "High Self-Control Predicts Good Adjustment, Less Pathology, Better Grades, and Interpersonal Success". In: *Journal of Personality* 72.2, pp. 271–324.

Thaler, Richard H. and Cass R. Sunstein (2003). "Libertarian Paternalism". In: *American Economic Review* 93.2, pp. 175–179.

Tungodden, Jonas (2019). "When Parents Decide: Gender Differences in Competitiveness". Working Paper.

Webley, Paul and Ellen K. Nyhus (2006). "Parents' influence on children's future orientation and saving". In: *Journal of Economic Psychology* 27.1, pp. 140–164.

Wong, Wei-Kang (2008). "How much time-inconsistency is there and does it matter? Evidence on self-awareness, size, and effects". In: *Journal of Economic Behavior & Organization* 68.3, pp. 645–656.

Zumbuehl, Maria, Thomas Dohmen, and Gerard Pfann (forthcoming). "Parental Involvement and the Intergenerational Transmission of Economic Preferences and Attitudes". In: *Economic Journal*.

Appendix — For Online Publication

A Reduced-form results on allocation decisions

Table A.1. Reduced-form results: Own decisions

	Share of stars paid earlier							
	Children				Parents			
	OLS		Int. Reg.		OLS		Int. Reg.	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\mathbb{1}\{t = \text{today}\}$	0.07***	0.07***	0.18***	0.18***	0.10***	0.10***	0.26***	0.26***
	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)
Delay k (in months)	-0.02***	-0.02***	-0.05***	-0.05***	-0.03***	-0.03***	-0.09***	-0.09***
	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)
Gross Interest Rate $(1 + r)$	-0.24***	-0.24***	-0.57***	-0.57***	-0.24***	-0.24***	-0.63***	-0.63***
	(0.01)	(0.01)	(0.04)	(0.04)	(0.01)	(0.01)	(0.04)	(0.04)
$\mathbb{1}\{\text{Endowment } (m) = 12 \text{ stars}\}$	-0.01	-0.01	-0.01	-0.01	-0.02***	-0.02***	-0.05***	-0.05***
	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)
Individual Characteristics	No	No	No	Yes	No	No	No	Yes
Household Characteristics	No	No	No	Yes	No	No	No	Yes
Individual FEs	No	Yes	No	No	No	Yes	No	No
Observations	11,880	11,880	11,880	11,856	13,440	13,440	13,440	13,428
Households	610	610	610	609	610	610	610	609
R^2/Pseudo-Log-Likelihood	0.05	0.26	-16000	-15000	0.05	0.24	-17000	-17000

Notes: This table presents reduced-form analyses of the share of stars allocated to the earlier payment date. Standard errors in parentheses are clustered by household. *, **, and *** denote significance at the 0.10, 0.05, and 0.01 level.

Table A.2. Reduced-form results: Parental beliefs and paternalistic decisions

	Share of stars paid earlier							
	Parental Belief about Child's Choices				Parents' Paternalistic Decisions			
	OLS		Int. Reg.		OLS		Int. Reg.	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\mathbb{1}\{t = \text{today}\}$	0.06***	0.06***	0.11***	0.11***	0.03***	0.03***	0.07***	0.07***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Delay k (in months)	-0.03***	-0.03***	-0.05***	-0.05***	-0.01**	-0.01**	-0.03**	-0.03**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Gross Interest Rate $(1 + r)$	-0.13***	-0.13***	-0.23***	-0.23***	-0.21***	-0.21***	-0.51***	-0.50***
	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.03)	(0.03)
$\mathbb{1}\{\text{Endowment } (m) = 12 \text{ stars}\}$	-0.02***	-0.02***	-0.01	-0.01	-0.03***	-0.03***	-0.07***	-0.07***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Individual Characteristics	No	No	No	Yes	No	No	No	Yes
Household Characteristics	No	No	No	Yes	No	No	No	Yes
Individual FEs	No	Yes	No	No	No	Yes	No	No
Observations	21,821	21,821	21,821	21,797	21,831	21,831	21,831	21,807
Households	610	610	610	609	610	610	610	609
R^2/Pseudo-Log-Likelihood	0.02	0.20	-33000	-33000	0.04	0.23	-29000	-29000

Notes: This table presents reduced-form analyses of the share of stars allocated to the earlier payment date. Standard errors in parentheses are clustered by household.*, **, and *** denote significance at the 0.10, 0.05, and 0.01 level.

B Classification of choices

B.1 Own decisions

In Table B.1, we classify the decisions of children and their parents into different discounting types. In Panel A, we classify decisions based on their time consistency. We define choices to be time-consistent if individuals allocate the same number of stars to the sooner payment for decisions in which the sooner payment is immediate compared to decisions with a delay of one month. If a respondent allocated more stars to the sooner payment for immediate payments, then we classify this decision as present-biased, while the converse holds for future-biased. Based on this classification, 55-57% of all choices reflect time consistency, about a quarter of all choices are present-biased, and the remainder of approximately 20% are classified as future-biased.

Panel B shows a classification of choices by delay sensitivity, which examines how increasing the delay from one to two months changes intertemporal allocations holding the sooner payment date fixed. About 30% of choices display positive discounting, i.e., increase the number of stars allocated to the sooner date when the delay increases, about half of the choices are consistent with zero discounting, and the remainder displays negative discounting, thus decreasing the star allocation to the sooner date for increasing delays. This distribution of types closely mirrors the distributions reported for German adolescents in Lührmann, Serra-Garcia, and Winter (2018) and Sutter et al. (2020).

As a last exercise, we calculate how consistent children's and parents' choices are and present the share of choices that adhere to the law of demand, i.e., whether allocations to the sooner payment date decrease as the gross interest rate increases. We find that 81-83% of choices are in line with the law of demand and 41-45% of all respondents do not display any monotonicity violation.[1] These numbers display considerably higher consistency than random choices (the latter implying consistency with the law of demand in 60% of all decisions). Interestingly, all of these classifications are quite similar across children and their parents.

B.2 Parental beliefs and paternalistic decisions

In Table B.2, we calculate analogous statistics for parents' beliefs about their children's choices and parents' paternalistic decisions. Parents believe that 28% and 24% of children's choices are present- and future-biased, respectively, and choose for their children in a way that the decisions are more time-consistent and show less monotonicity violations.

[1] To put these numbers into perspective, subjects in lab experiments reported in Balakrishnan, Haushofer, and Jakiela (2020) display a consistency index of 72% on average.

Table B.1. Time consistency, delay sensitivity, and choice consistency in intertemporal choices

	Proportion of choices	
	Children	Parents
A. Time consistency		
Present-biased	24.1%	23.8%
Time-consistent	55.0%	56.7%
Future-biased	20.9%	19.5%
B. Delay sensitivity		
Positive discounting	29.2%	29.6%
Zero discounting	51.8%	51.6%
Negative discounting	19.0%	18.9%
C. Adherence to law of demand		
Consistency index	81.0%	82.6%
No monotonicity violations	41.1%	44.8%
Simulations of random choices		
Consistency index	60.1%	
No monotonicity violations	4.8%	

Notes: Time-consistent choices are defined as choices that allocate the same share to sooner payments in decisions for today vs. in one month as in decisions for in one month vs. in two months, i.e., $s_{t=0,t+k=1} = s_{t=1,t+k=2}$. Present-biased choices allocate a larger share to the sooner payment date for choices with immediate consequences relative to those with consequences in one month ($s_{t=0,t+k=1} > s_{t=1,t+k=2}$). Future-biased choices allocate a smaller share to the sooner payment date for choices with immediate consequences ($s_{t=0,t+k=1} < s_{t=1,t+k=2}$). Zero discounting refers to those choices that are the same irrespective of the delay k in late payments, i.e., $s_{t=0,t+k=1} = s_{t=0,t+k=2}$. Positive discounting choices are choices that allocate a larger share to the sooner date when the delay increases, i.e., ($s_{t=0,t+k=1} > s_{t=0,t+k=2}$). Negative discounting refers to choices that allocate a smaller share to the sooner date with increasing delay ($s_{t=0,t+k=1} < s_{t=0,t+k=2}$). The choice consistency index measures the share of all choices that adhere to the law of demand, i.e., whether the allocation of sooner payments decreases as the gross interest rate increases. No monotonicity violation denotes the share of individuals with perfect choice consistency. In the last two rows of the table, we also present how those statistics looked like if respondents would choose one of the options at random.

Table B.2. Time consistency, delay sensitivity, and choice consistency in intertemporal beliefs

	Proportion of choices	
	Parental Beliefs	Paternalistic Choices
A. Time consistency		
Present-biased	28.4%	23.8%
Time-consistent	47.8%	54.1%
Future-biased	23.8%	22.1%
B. Delay sensitivity		
Positive discounting	32.4%	25.3%
Zero discounting	44.1%	52.4%
Negative discounting	23.5%	22.3%
C. Adherence to law of demand		
Consistency index	77.0%	81.3%
No monotonicity violations	23.7%	32.2%
Simulations of random choices		
Consistency index	60.0%	
No monotonicity violations	0.2%	

Notes: Time-consistent choices are defined as choices that allocate the same share to sooner payments in decisions for today vs. in one month as in decisions for in one month vs. in two months, i.e., $s_{t=0,t+k=1} = s_{t=1,t+k=2}$. Present-biased choices allocate a larger share to the sooner payment date for choices with immediate consequences relative to those with consequences in one month ($s_{t=0,t+k=1} > s_{t=1,t+k=2}$). Future-biased choices allocate a smaller share to the sooner payment date for choices with immediate consequences ($s_{t=0,t+k=1} < s_{t=1,t+k=2}$). Zero discounting refers to those choices that are the same irrespective of the delay k in late payments, i.e., $s_{t=0,t+k=1} = s_{t=0,t+k=2}$. Positive discounting choices are choices that allocate a larger share to the sooner date when the delay increases, i.e., ($s_{t=0,t+k=1} > s_{t=0,t+k=2}$). Negative discounting refers to choices that allocate a smaller share to the sooner date with increasing delay ($s_{t=0,t+k=1} < s_{t=0,t+k=2}$). The choice consistency index measures the share of all choices that adhere to the law of demand, i.e., whether the allocation of sooner payments decreases as the gross interest rate increases. No monotonicity violation denotes the share of individuals with perfect choice consistency. In the last two rows of the table, we also present how those statistics looked like if respondents would choose one of the options at random. Note that since parents choose for up to two children, this reduces the probability to make no monotonicity violations compared to Table B.1.

C Structural preference estimates for own decisions

C.1 Alternative specifications

In this section, we explore alternative specifications to estimate the structural discounting parameters.

NLS with background consumption. To allow for background consumption, we enrich the utility function as

$$U(S_t, S_{t+k}) = \frac{1}{\alpha}(S_t - \omega_1)^\alpha + \beta\delta^k \frac{1}{\alpha}(S_{t+k} - \omega_2)^\alpha \tag{5}$$

with β being the present bias parameter, δ the standard discounting parameter, and α characterizing the curvature of the utility function as before. The parameter ω is a Stone-Geary preference parameter that can be interpreted as the level of background consumption, which we set to *zero* in our main specification. The budget constraint is given by

$$(1+r)S_t + S_{t+k} = m \tag{6}$$

as before. Maximizing the modified utility function (5) subject to the budget constraint (6) yields:

$$S_t = \begin{cases} \frac{1}{1+(1+r)\left(\beta\delta^k(1+r)\right)^{\frac{1}{\alpha-1}}}\omega + \frac{\left(\beta\delta^k(1+r)\right)^{\frac{1}{\alpha-1}}}{1+(1+r)\left(\beta\delta^k(1+r)\right)^{\frac{1}{\alpha-1}}}(m-\omega) & \text{if } t=0 \\ \frac{1}{1+(1+r)\left(\delta^k(1+r)\right)^{\frac{1}{\alpha-1}}}\omega + \frac{\left(\delta^k(1+r)\right)^{\frac{1}{\alpha-1}}}{1+(1+r)\left(\delta^k(1+r)\right)^{\frac{1}{\alpha-1}}}(m-\omega) & \text{if } t>0 \end{cases} \tag{7}$$

which we estimate using non-linear least squares using

$$\begin{aligned} S_t = {} & \frac{\omega + (m-\omega)\left(\beta\delta^k(1+r)\right)^{\frac{1}{\alpha-1}}}{1+(1+r)\left(\beta\delta^k(1+r)\right)^{\frac{1}{\alpha-1}}} \times \mathbb{1}\{t=0\} \\ & + \frac{\omega + (m-\omega)\left(\delta^k(1+r)\right)^{\frac{1}{\alpha-1}}}{1+(1+r)\left(\delta^k(1+r)\right)^{\frac{1}{\alpha-1}}} \times \mathbb{1}\{t>0\} + \epsilon_t. \end{aligned} \tag{8}$$

As before, we cluster ϵ_t for each household.

Tobit-specification with CRRA-utility. To account for corner solutions in intertemporal decisions (i.e., when individuals allocate the full amount to either the earlier or the later payment date), we adopt a Tobit-specification allowing for censoring. We use the logarithm of the tangency condition implied by equations (6) and (7) to obtain:

$$\ln\left(\frac{S_t-\omega}{S_{t+k}-\omega}\right) = \begin{cases} \left(\frac{\ln(\beta)}{\alpha-1}\right) + \left(\frac{\ln(\delta)}{\alpha-1}\right)\times k + \left(\frac{1}{\alpha-1}\right)\times\ln(1+r) & \text{if } t=0 \\ \left(\frac{\ln(\delta)}{\alpha-1}\right)\times k + \left(\frac{1}{\alpha-1}\right)\times\ln(1+r) & \text{if } t>0 \end{cases} \tag{9}$$

$$= \left(\frac{\ln(\beta)}{\alpha-1}\right)\times \mathbb{1}\{t=0\} + \left(\frac{\ln(\delta)}{\alpha-1}\right)\times k + \left(\frac{1}{\alpha-1}\right)\times\ln(1+r) \tag{10}$$

This expression is linear and using two-limit Tobit maximum likelihood estimations, we can recover the structural parameters using non-linear combinations of the estimates and obtain standard errors using the Delta-method. Note, however, that we cannot estimate the background consumption parameter ω. We therefore experiment with two assumptions. First, we set ω to zero (or in fact to 0.01 as we need the left-hand side to be well-defined) mimicking our main NLS specification. Second, we impose the ω estimate from the NLS specification above.

Tobit specification with CARA-utility. Both the NLS as well as the Tobit-specifications above assume a CRRA-utility function. As an alternative, we assume a CARA utility function

$$U(S_t, S_{t+k}) = -\exp(-\rho S_t) - \beta\delta^k \exp(-\rho S_{t+k}) \tag{11}$$

with ρ being the constant absolute risk aversion coefficient. This yields the following marginal condition:

$$\exp(-\rho(S_t - S_{t+k})) = \begin{cases} \beta\delta^k(1+r) & \text{if } t=0 \\ \delta^k(1+r) & \text{if } t>0. \end{cases} \tag{12}$$

Rearranging yields

$$S_t - S_{t+k} = \left(\frac{\ln(\beta)}{-\rho}\right)\times \mathbb{1}\{t=0\} + \left(\frac{\ln(\delta)}{-\rho}\right)\times k + \left(\frac{1}{-\rho}\right)\times\ln(1+r). \tag{13}$$

Similar to the CRRA-specification, we apply two-limit Tobit maximum likelihood estimations and recover the structural parameters from non-linear combinations of the regression coefficients, and obtain standard errors using the Delta-method.

Table C.1 presents both the main NLS estimates without background consumption a well as the resulting NLS- and two limit Tobit-estimates of these alternative specifications separately for children, parents, and the pooled sample.

Table C.1. Aggregate structural parameters: Alternative specifications

	Children					Parents					Pooled				
	(1) NLS	(2) NLS	(3) Tobit	(4) Tobit	(5) Tobit	(6) NLS	(7) NLS	(8) Tobit	(9) Tobit	(10) Tobit	(11) NLS	(12) NLS	(13) Tobit	(14) Tobit	(15) Tobit
Present bias β	0.83***	0.88***	0.72***	0.61***	0.75***	0.79***	0.85***	0.66***	0.64***	0.69***	0.81***	0.86***	0.69***	0.63***	0.72***
	(0.02)	(0.01)	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)
Monthly δ	0.71***	0.68***	0.57***	0.75***	0.62***	0.74***	0.70***	0.58***	0.68***	0.64***	0.72***	0.69***	0.58***	0.71***	0.63***
	(0.02)	(0.01)	(0.03)	(0.03)	(0.02)	(0.01)	(0.01)	(0.03)	(0.03)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)
CRRA curvature α	0.45***	0.87***	0.89***	0.60***		0.47***	0.86***	0.90***	0.62***		0.46***	0.86***	0.90***	0.61***	
	(0.03)	(0.01)	(0.01)	(0.02)		(0.02)	(0.01)	(0.01)	(0.02)		(0.02)	(0.01)	(0.01)	(0.02)	
CARA curvature ρ					0.07***					0.06***					0.07***
					(0.01)					(0.00)					(0.00)
Background consumption ω		2.10***		2.10			2.05***		2.05			2.08***		2.08	
		(0.06)		(–)			(0.06)		(–)			(0.05)		(–)	
Observations	11,880	11,880	11,880	11,880	11,880	13,440	13,440	13,440	13,440	13,440	25,320	25,320	25,320	25,320	25,320
Individuals	990	990	990	990	990	1,120	1,120	1,120	1,120	1,120	2,110	2,110	2,110	2,110	2,110
Households	610	610	610	610	610	610	610	610	610	610	610	610	610	610	610
R^2/Log-Likelihood	.77	.77	-21181	-16084	-22084	.76	.76	-22723	-17643	-23630	.77	.77	-43925	-33747	-45735

Notes: This table presents non-linear least squares (NLS) and Tobit estimates of the structural parameters of interest for children, parents, and the pooled sample. Columns (1), (6), and (11) replicate the NLS-estimates from Table 4. Columns (2), (7), and (12) present NLS specifications allowing for background consumption. Columns (3), (8), and (13) present two-limit Tobit specifications without background consumption, columns (4), (9), and (14) impose a background consumption based on the NLS estimates, and columns (5), (10), and (15) present two-limit Tobit estimates using an alternative CARA-specification. Standard errors in parentheses are clustered by household. *, **, and *** denote significance at the 0.10, 0.05, and 0.01 level.

C.2 Heterogeneity

Table C.2 presents parameter estimates for splits by children's and parents' gender. There is limited evidence of heterogeneity. Mothers have higher time-consistent discounting parameters than fathers. Moreover, children are less present-biased but show somewhat more time-consistent discounting than their parents.

Table C.2. Heterogeneity in aggregate structural parameters

	A. Parental gender			B. Child gender		
	(1)	(2)	(3)	(4)	(5)	(6)
	Fathers	Mothers	*p*-value of difference	Boys	Girls	*p*-value of difference
Present bias β	0.81***	0.77***	0.21	0.85***	0.80***	0.16
	(0.02)	(0.02)		(0.02)	(0.02)	
Monthly discounting δ	0.68***	0.78***	0.00	0.70***	0.72***	0.57
	(0.02)	(0.02)		(0.02)	(0.02)	
CRRA curvature α	0.49***	0.46***	0.57	0.47***	0.43***	0.45
	(0.03)	(0.03)		(0.04)	(0.04)	
Observations	13,440			11,880		
Individuals	1,120			990		
Households	610			610		
R^2	.76			.77		

	C. Role in Family			D. Age of Child		
	(1)	(2)	(3)	(4)	(5)	(6)
	Parents	Children	*p*-value of difference	6-11 years	12-16 years	*p*-value of difference
Present bias β	0.79***	0.83***	0.09	0.84***	0.82***	0.68
	(0.02)	(0.02)		(0.03)	(0.02)	
Monthly discounting δ	0.74***	0.71***	0.13	0.70***	0.72***	0.53
	(0.01)	(0.02)		(0.02)	(0.02)	
CRRA curvature α	0.47***	0.45***	0.55	0.42***	0.48***	0.30
	(0.02)	(0.03)		(0.04)	(0.04)	
Observations	25,320			11,880		
Individuals	2,110			990		
Households	610			610		
R^2	.77			.77		

Notes: This table presents non-linear least squares (NLS) estimates of the structural parameters of interest for different splits of the data. Heterogeneities stem from fully interacted models. Standard errors in parentheses are clustered by household. *, **, and *** denote significance at the 0.10, 0.05, and 0.01 level. *p*-values are from *t*-tests of the difference in coefficients.

D Possible threats to the identification of time preferences

In our experiment, we deliberately asked subjects to allocate money — in the form of stars — over two payment dates in the context of convex time budget sets. We did so for several reasons. First and foremost, we wanted to have a well-established, state-of-the-art measurement that allows us to provide structural estimates in addition to descriptive evidence. Second, we required a task that was easy to administer in a rural field setting ruling out designs using real effort task as in Augenblick, Niederle, and Sprenger (2015) for logistic reasons. Second, we restricted the complexity of the decision tasks by providing a visual allocation task using a simple experimental currency (stars) such that children as young as 6 years and illiterate respondents can easily understand the task. Third, the task should not take long to minimize the time and attention burden of our respondents.

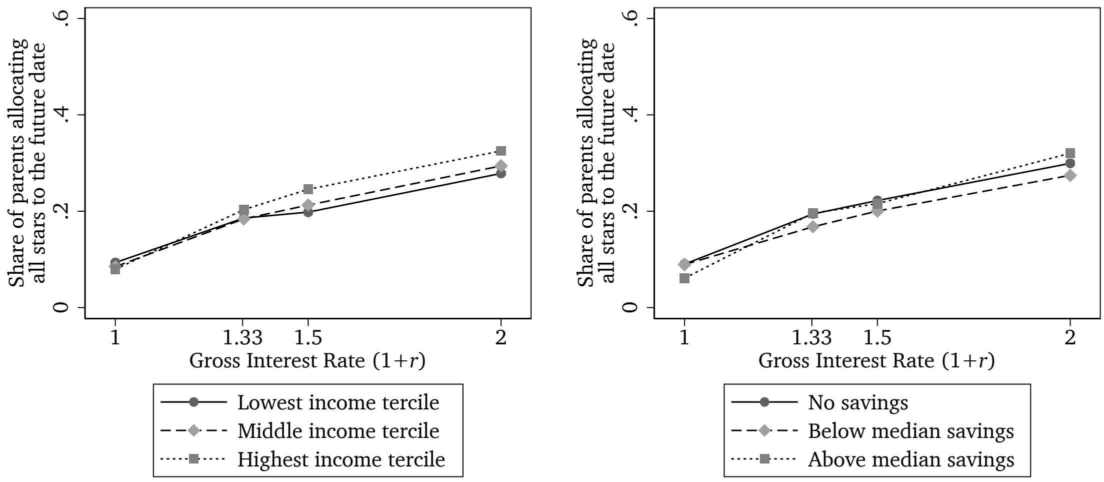
Yet, a recent debate involves the extent to which one can measure time preferences accurately, in particular using monetary payoffs. There potentially exists uncertainty whether payments will indeed be realized — which we minimize by embedding our experiment in a running panel study, in which subjects have already received delayed payments previously and should correspondingly have high trust in later payments being delivered as announced. One additional concern is whether intertemporal allocation tasks using monetary payments rather than actual consumption allow to measure time preferences (e.g., Dean and Sautmann, forthcoming). In particular, if subjects are forward-looking and incorporate the experimental payments into their broader consumption plan (i.e., they do not engage in narrow bracketing; e.g., Rabin and Weizsäcker, 2009), intertemporal allocation tasks using monetary payments may capture liquidity constraints and/or market interest rates (Coller and Williams, 1999; Cubitt and Read, 2007). Moreover, present bias, i.e., choice reversals when inducing a front-end delay in decisions, may be due to changes in the marginal utility of consumption (e.g., Halevy, 2015; Giné et al., 2018). In the following, we provide suggestive evidence that these alternative explanations are unlikely to drive the intertemporal decisions observed in this paper, and that these are hence likely to capture time preferences.

Arbitrage motives. If subjects integrate their experimental income in their consumption plan, their decisions may reflect potential liquidity constraints and/or market interest rates (Coller and Williams, 1999). Thus, subjects who are not liquidity constrained should take advantage of the high interest rates offered in our experiment (amounting to up to 100% over four weeks). In particular, those with sufficient liquidity should allocate their full endowment to the future date and engage in arbitrage.

We use two proxies of liquidity constraints: household income and savings. The idea is that those with higher household income and more savings are less likely to be liquidity constrained and could engage in arbitrage between experimental and market savings vehicles. In Figure D.1, we investigate whether less liquidity-constrained households indeed exploit the high interest rates as predicted by arbitrage motives. For this exercise, we focus on all parents as the financial decision-makers in the household. Inconsistent with arbitrage, we observe that even for the highest income tercile, only a third of parents' decisions allocate all stars to the later rather the sooner payment date (Figure D.1a). As an alternative proxy, we differentiate households by their savings (Figure D.1b). More specifically, we differentiate between households without any savings and those with below and above median savings (conditional on positive savings).[2] Again, we do not find evidence that households engage in arbitrage, even if they appear to have the resources to do so.

Figure D.1. Share of parental decisions consistent with arbitrage

(a) By income terciles **(b)** By savings



Notes: These figures show the share of parental decisions which allocate all stars to the later of the two payment dates. Figure D.1a differentiates these shares by household income terciles, whereas Figure D.1b differentiates by the amount of savings (no savings, below median savings, above median savings).

In addition, we present the raw allocation decisions in the convex time budgets in Figure D.2 and estimate the aggregate time preferences by income and savings. Figure D.2 suggests that the overall patterns are quite similar across the different subgroups. Table D.1 shows that while there is some heterogeneity in the extent of present bias by income tercile in columns (1) through (3), even those parents who do not seem to face liquidity constraints show significant present bias. For savings, we see a similar picture: Even if households report to have significant savings, they still exhibit a sizable present bias.

Changes in the marginal utility of consumption. If there are predictable changes in the marginal utility of consumption, this could give rise to choice reversals resulting in patterns similar to present bias. While we cannot directly test changes in the marginal utility since we lack measures of anticipation of future income flows, we lever that these changes should affect all household members similarly. This results in the prediction that the heterogeneity in allocations should be mainly between households rather than between spouses of a given household.

[2] 41% of households report to have positive savings. Conditional on having savings, median (mean) savings are 10,000 Taka (37,774 Taka) or two thirds of monthly household income (2.5 times monthly household income).

Table D.1. Heterogeneity of structural parameters by income tercile and availability of savings

	Household income			Savings		
	(1) Low	(2) Middle	(3) High	(4) No	(5) Low	(6) High
Present bias β	0.74***	0.80***	0.83***	0.77***	0.86***	0.84***
	(0.03)	(0.03)	(0.03)	(0.02)	(0.06)	(0.04)
Monthly δ	0.72***	0.72***	0.77***	0.74***	0.68***	0.77***
	(0.03)	(0.03)	(0.02)	(0.02)	(0.05)	(0.03)
CRRA curvature α	0.42***	0.44***	0.53***	0.47***	0.37***	0.54***
	(0.05)	(0.05)	(0.03)	(0.03)	(0.08)	(0.05)
p-value: H_0: $\beta = 1$:	0.00	0.00	0.00	0.00	0.01	0.00
Observations	4,488	4,476	4,464	9,756	1,836	1,848
Parents	374	373	372	813	153	154
Households	196	202	211	441	84	85
R^2	0.77	0.77	0.75	0.76	0.76	0.75

Notes: This table presents non-linear least squares (NLS) estimates of the structural parameters of interest for different splits of the data by income tercile in columns (1) through (3) and for those without savings in column (4), those with below and above median savings in columns (5) and (6). Standard errors in parentheses are clustered by household. *, **, and *** denote significance at the 0.10, 0.05, and 0.01 level.

In Table D.2, we decompose the variance in allocations in two components: variation occurring between different households and variation attributable to variation between spouses. We find that most of the variation (80-81%) occurs within households, whereas the between-household variance is quite small, indicating that constraints across households are quite unlikely to explain the patterns. These results are similar when we use the raw allocations or if we first residualize the shares using fixed effects for each of the 12 decision sheets, an indicator for the respondent's gender, and their interactions. Thus, liquidity constraints, predictable changes of marginal utility of consumption, and other effects affecting all household members are unlikely to explain the experimental choices.

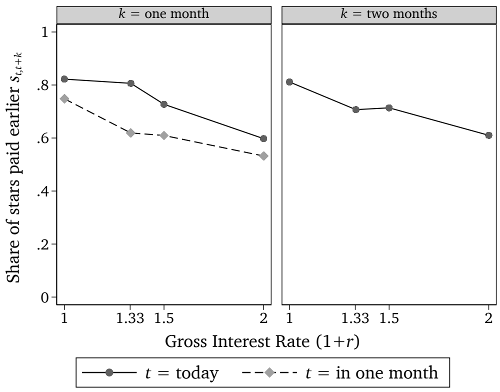
Table D.2. Variance decomposition of parents' allocation decisions

	Total variance	Within household variance	Between household variance
Raw allocations	0.16 *(100%)*	0.13 *(81%)*	0.03 *(19%)*
Residualized allocations	0.15 *(100%)*	0.12 *(80%)*	0.03 *(20%)*

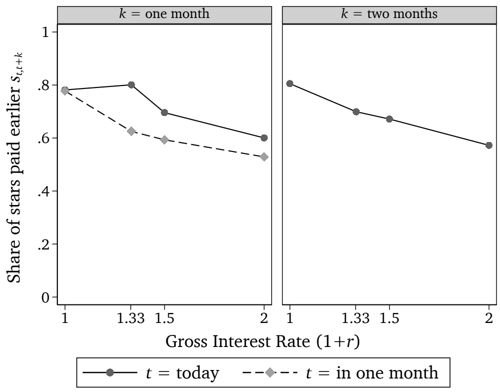
Notes: This table decomposes the total variance in parents' allocations (share of stars allocated to the sooner date) in their within- and between-household components. To do so, we regress the allocation decisions on household fixed effects and calculate the variance of the residuals (within household variance) and the explained variance (between household) variance. Numbers in parentheses express these variances as a share of the total variance in decisions. The first decomposition uses parents' raw allocations, while the second decomposition first residualizes the share of stars allocated to the sooner payment date with fixed effects for each of the 12 scenarios, an indicator for the parents' gender, and their interactions.

Figure D.2. Aggregate allocations of parents by income terciles and savings

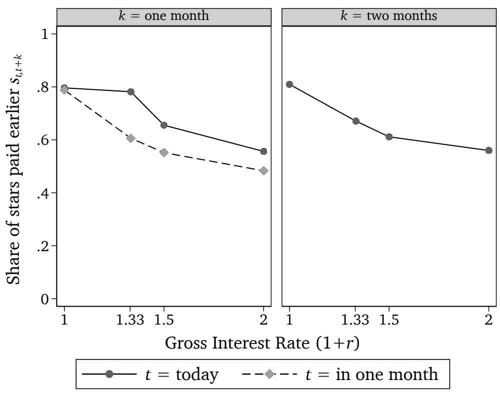
(a) Lowest income tercile



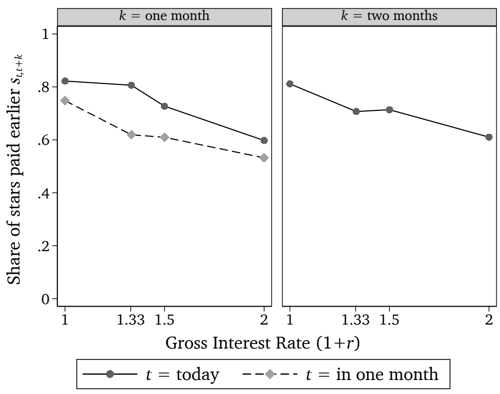
(b) Middle income tercile



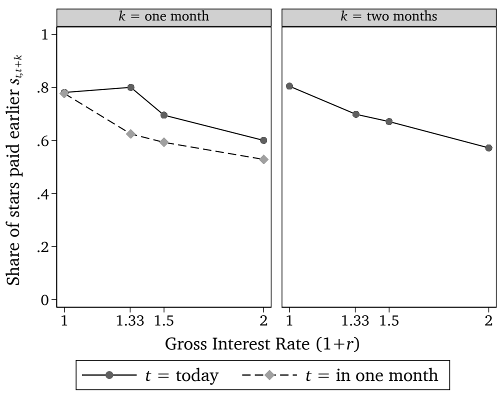
(c) Highest income tercile



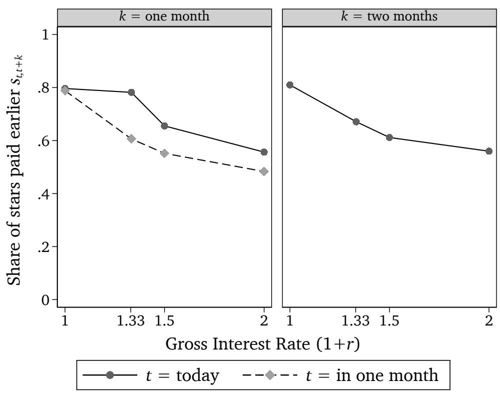
(d) No savings



(e) Below median savings



(f) Above median savings



Notes: These figures present the average allocations to the earlier payment date for each decision sheet defined by an initial payment date t, a delay k, endowment m, and a gross interest rate $1 + r$. Figures D.2a through D.2c present the allocation decisions separately for parents of different income terciles, whereas Figures D.2d through D.2f present the decisions for household with no savings, below, and above median savings. The left panels illustrate allocations for decisions in which the delay between the earlier and the later payment date is one month (today vs. in one month; in one month vs. in two months), whereas the right panels illustrate allocation decisions over two months (today vs. in two months).

Taken together, these patterns suggest that our convex time budget sets indeed allow us to recover respondents' time preferences. Neither arbitrage motives nor changes in the marginal utility of consumption seem to be sufficient to explain the intertemporal allocations in our experiment. Additionally, we note that both of these explanations are unlikely to hold for children that we excluded from the above analysis. Furthermore, we show in Appendix C.1 that even if we account for potential background consumption in the estimation of preference parameters, we still estimate a sizable present bias across all specifications.

E Additional results on parental beliefs and paternalistic choices

Table E.1. Parental beliefs and paternalistic choices: Sample splits

	(1) Fathers	(2) Mothers	(3) Boys	(4) Girls	(5) 6-11 years	(6) 12-16 years
A. Parental beliefs about children's choices						
Present bias β	0.85***	0.81***	0.83***	0.83***	0.79***	0.83***
	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)	(0.02)
Monthly δ	0.79***	0.98***	0.92***	0.88***	0.92***	0.89***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)
CRRA curvature α	0.34***	0.25***	0.31***	0.27***	0.27***	0.29***
	(0.04)	(0.04)	(0.05)	(0.05)	(0.05)	(0.03)
Observations	9,989	11,832	8,573	8,238	7,564	21,821
Parent-child pairs	833	986	715	687	631	1,819
Households	512	608	293	286	290	610
R^2	0.72	0.66	0.67	0.69	0.68	0.69
B. Parents' paternalistic choices						
Present bias β	0.95***	0.92***	0.94***	0.93***	0.95***	0.93***
	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)
Monthly δ	0.69***	0.73***	0.72***	0.69***	0.70***	0.71***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)
CRRA curvature α	0.48***	0.37***	0.46***	0.39***	0.45***	0.42***
	(0.03)	(0.04)	(0.03)	(0.04)	(0.03)	(0.03)
Observations	9,996	11,835	8,576	8,240	7,567	21,831
Parent-child pairs	833	987	715	687	631	1,820
Households	512	608	293	286	290	610
R^2	0.75	0.74	0.74	0.75	0.75	0.74

Notes: This table presents non-linear least squares (NLS) estimates of the structural parameters of interest for parental beliefs (Panel A) and parents paternalistic choices (Panel B). We present splits by parental gender in columns (1) and (2), children's gender in columns (3) and (4), as well as children's age in columns (5) and (6). Standard errors in parentheses are clustered by household. *, **, and *** denote significance at the 0.10, 0.05, and 0.01 level.

Table E.2. Relationship of parental beliefs, paternalistic decisions, and own decisions

	Share of stars paid earlier			
	Children		Pat. Dec.	
	(1)	(2)	(3)	(4)
Parents' belief about share of stars paid earlier	0.09***	0.06***	0.15***	0.13***
	(0.01)	(0.01)	(0.02)	(0.02)
Parents' share of stars paid earlier			0.30***	0.28***
			(0.01)	(0.01)
Parental, child, and household controls	No	Yes	No	Yes
Decision FEs	No	Yes	No	Yes
Mean of dependent variable	0.68	0.68	0.65	0.65
Observations	21,825	21,681	21,818	21,674
Households	610	609	610	609
R^2	0.01	0.07	0.13	0.16

Notes: This table investigates the relationship of parents' beliefs and paternalistic decisions. Control variables include age and gender of both the parent and the child, indicators for whether the parent can read and write, received a secondary school leaving certificate, the household being Muslim, access to electricity, whether the father works in agriculture, whether the mother is a housewife, and log household income. Decision fixed effects refers to a set of indicators for each decision sheet. Standard errors in parentheses are clustered at the household level. *, **, and *** denote significance at the 0.10, 0.05, and 0.01 level.

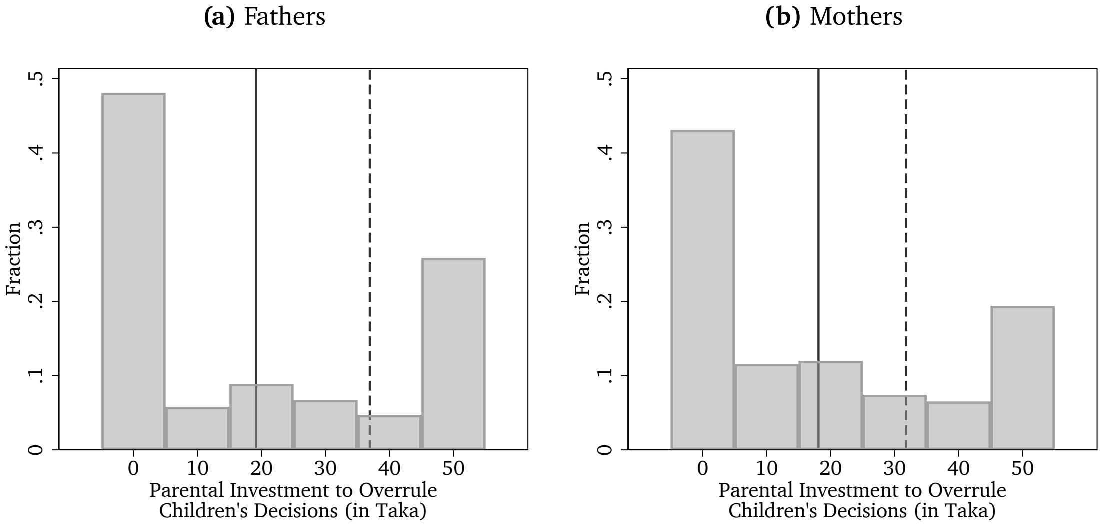
Table E.3. Associations of intertemporal allocations and sociodemographics with accuracy of parental beliefs

	Absolute diff. between parents' beliefs and children's actual share of stars paid earlier		
	(1)	(2)	(3)
Parents' share of stars paid earlier	-0.06***		-0.06***
	(0.01)		(0.01)
𝟙{Mother}		0.01	0.01
		(0.01)	(0.01)
𝟙{Girl}		-0.00	-0.00
		(0.01)	(0.01)
𝟙{Mother} × 𝟙{Girl}			-0.00
			(0.02)
Age of parent		-0.00**	-0.00**
		(0.00)	(0.00)
Age of child		0.00	0.00
		(0.00)	(0.00)
No. of household members		-0.00	-0.00
		(0.00)	(0.00)
𝟙{No electricity at home}		-0.01	-0.01
		(0.02)	(0.02)
log(Household income)		-0.01*	-0.01**
		(0.01)	(0.01)
𝟙{Muslim}		-0.01	-0.01
		(0.01)	(0.01)
𝟙{Mother is housewife}		-0.04**	-0.04**
		(0.02)	(0.02)
𝟙{Father works in agriculture}		0.01	0.01
		(0.01)	(0.01)
𝟙{Parent is literate}		-0.00	-0.00
		(0.01)	(0.01)
𝟙{Parent finished sec. school}		0.02	0.02
		(0.02)	(0.02)
District FEs	No	Yes	Yes
Observations	21,825	21,681	21,681
Households	610	609	609
R^2	0.00	0.00	0.01

Notes: This table presents regressions of the absolute difference between parental beliefs and child children's actual allocations on parents' intertemporal allocations and sociodemographic characteristics. Standard errors in parentheses are clustered by households. *, **, and *** denote significance at the 0.10, 0.05, and 0.01 level.

F Additional results on parental interference

Figure F.1. Distribution of parents' investment to increase the probability of overriding their children's choices: Split by parental gender



Notes: This histogram presents the distribution of fathers' (left panel; Figure F.1a) and mothers' (right panel; Figure F.1b) investment to increase the probability of overriding their children's choices. The solid line indicates the fathers' (mothers') mean investment of 19.2 Taka (18.1 Taka; paired t-test of difference: $p = 0.26$), whereas the dashed line indicates the mean investment conditional on investing (36.9 Taka for fathers, 31.2 Taka for mothers; paired t-test of difference: $p < 0.01$). Kolmogorov-Smirnov test of equal distributions: $p = 0.05$.

Table F.1. Associations of sociodemographics and parental interference

	$\mathbb{1}$\{Interfering\}		Investment	
	(1)	(2)	(3)	(4)
$\mathbb{1}$\{Mother\}	0.07**	0.04	2.13	-1.89
	(0.03)	(0.04)	(3.78)	(4.43)
$\mathbb{1}$\{Girl\}	0.00	-0.03	-0.28	-4.85
	(0.02)	(0.03)	(2.99)	(4.55)
$\mathbb{1}$\{Mother\} × $\mathbb{1}$\{Girl\}		0.07		8.31
		(0.04)		(5.58)
Age of parent	0.00	0.00	0.44	0.45
	(0.00)	(0.00)	(0.28)	(0.28)
Age of child	0.00	0.00	0.15	0.14
	(0.00)	(0.00)	(0.59)	(0.59)
No. of household members	-0.01	-0.01	-0.84	-0.85
	(0.01)	(0.01)	(1.22)	(1.22)
$\mathbb{1}$\{No electricity at home\}	0.09	0.09	12.39	12.34
	(0.06)	(0.06)	(8.29)	(8.30)
log(Household income)	0.06***	0.06***	7.90***	7.87***
	(0.02)	(0.02)	(2.27)	(2.27)
$\mathbb{1}$\{Muslim\}	0.05	0.05	8.24*	8.18*
	(0.04)	(0.04)	(4.58)	(4.58)
$\mathbb{1}$\{Mother is housewife\}	0.14*	0.14*	9.60	9.51
	(0.08)	(0.08)	(11.61)	(11.60)
$\mathbb{1}$\{Father works in agriculture\}	0.10***	0.10***	13.84***	13.83***
	(0.03)	(0.03)	(4.31)	(4.31)
$\mathbb{1}$\{Parent is literate\}	0.00	0.00	3.15	3.05
	(0.03)	(0.03)	(3.96)	(3.96)
$\mathbb{1}$\{Parent finished sec. school\}	-0.01	-0.01	1.01	0.98
	(0.05)	(0.05)	(7.41)	(7.39)
District FEs	Yes	Yes	Yes	Yes
Observations	1,808	1,808	1,804	1,804
Households	609	609	609	609
(Pseudo-)R^2	0.03	0.03	.01	.01

Notes: Columns (1) and (2) present regressions of an indicator for whether a parent invests money to increase the likelihood of implementing their choices for their children on sociodemographic characteristics. Columns (3) and (4) present analogous Tobit regessions of parents' investment. Standard errors in parentheses are clustered by households. *, **, and *** denote significance at the 0.10, 0.05, and 0.01 level.

Table F.2. Motives of paternalism

	Mean (1-5)	$\mathbb{1}$\{Interfering\} (1)	$\mathbb{1}$\{Interfering\} (2)
Patience is important to succeed in life	4.67	0.13***	0.15***
		(0.04)	(0.04)
Children should always obey to what their parents decide for them	4.53	0.02	0.02
		(0.02)	(0.02)
I expect my child to take a fair share of housework	4.52	0.02	0.03
		(0.03)	(0.03)
I know better what is good for my child than him-/herself	4.51	0.06***	0.06***
		(0.02)	(0.02)
I expect my child to contribute financially to the household	4.49	0.02	0.03
		(0.02)	(0.02)
My child typically acts the way I want him/her to act	4.24	0.00	-0.00
		(0.02)	(0.02)
I want my child to be like me when he/she is grown up	3.42	-0.00	-0.01
		(0.01)	(0.01)
My child does not think through when making a decision	2.60	-0.02	-0.02
		(0.01)	(0.01)
I plan to take away the money my child earned during the experiment	2.44	0.04***	0.02**
		(0.01)	(0.01)
My child does not pay enough attention to the rules of the game when making his/her decisions	2.41	-0.02	-0.02
		(0.01)	(0.01)
Parental, child, and household controls	No	No	Yes
Share interfering		0.55	0.55
Parent-child pairs		1,816	1,804
Parents		1120	1120
Households		610	609
R^2		0.07	0.10

Notes: This table presents regressions of an indicator for whether a parent invests money to increase the likelihood of implementing their choices for their children on several potential motives. Motives are elicited using 5-point Likert scales from strongly disagree (1) to strongly agree (5). Control variables include age and gender of both the parent and the child, indicators for whether the parent can read and write, received a secondary school leaving certificate, the household being Muslim, access to electricity, whether the father works in agriculture, whether the mother is a housewife, and log household income. Standard errors in parentheses are clustered at the household level. *, **, and *** denote significance at the 0.10, 0.05, and 0.01 level.

F.1 Heterogeneity in paternalistic choices by parental interference

Table F.3. Heterogeneity in paternalistic choices by parental interference and parental gender

	Fathers			Mothers		
	(1) Present bias β	(2) Monthly discounting δ	(3) CRRA curvature α	(4) Present bias β	(5) Monthly discounting δ	(6) CRRA curvature α
A. Parameters						
Non-interfering parents	0.89***	0.63***	0.41***	0.90***	0.72***	0.43***
	(0.03)	(0.03)	(0.05)	(0.03)	(0.03)	(0.05)
Interfering parents	0.99***	0.74***	0.54***	0.92***	0.72***	0.29***
	(0.03)	(0.02)	(0.04)	(0.03)	(0.03)	(0.06)
B. Differences						
Extensive margin	0.09**	0.10**	0.13**	0.02	-0.00	-0.14**
	(0.04)	(0.04)	(0.06)	(0.05)	(0.03)	(0.07)
Intensive margin	-0.01	-0.01	-0.07**	-0.03	-0.05**	-0.09*
	(0.03)	(0.02)	(0.03)	(0.03)	(0.02)	(0.05)
Share interfering	0.52			0.57		
Observations	9,984			11,799		
Parent-child pairs	832			984		
Parents	512			607		
Households	512			607		

Notes: This table presents non-linear least squares (NLS) estimates of the structural parameters of interest for non-interfering and interfering parents, as well as estimates of the extensive and intensive margin of parental interference*, separately for mothers and fathers*. Extensive margin is defined as the difference between interfering and non-interfering parents evaluated at the mean investment of interfering parents. The intensive margin is defined as the change in parameters due to changes in the standardized amount of investments among interfering parents only. Standard errors in parentheses are clustered by households. Share interfering denotes the share of parents that invested to increase the probability that their choices are implemented for the child under consideration. *, **, and *** denote significance at the 0.10, 0.05, and 0.01 level.

Table F.4. Heterogeneity in paternalistic choices by behavioral measure of parental interference and child gender

	Boys			Girls		
	(1) Present bias β	(2) Monthly discounting δ	(3) CRRA curvature α	(4) Present bias β	(5) Monthly discounting δ	(6) CRRA curvature α
A. Parameters						
Non-interfering parents	0.89***	0.70***	0.45***	0.89***	0.67***	0.42***
	(0.04)	(0.03)	(0.05)	(0.04)	(0.04)	(0.06)
Interfering parents	0.97***	0.74***	0.46***	0.97***	0.70***	0.38***
	(0.03)	(0.03)	(0.05)	(0.04)	(0.03)	(0.06)
B. Differences						
Extensive margin	0.09*	0.04	0.01	0.08	0.04	-0.04
	(0.05)	(0.04)	(0.07)	(0.05)	(0.05)	(0.08)
Intensive margin	-0.00	-0.04*	-0.06	-0.03	-0.01	-0.03
	(0.03)	(0.02)	(0.04)	(0.04)	(0.03)	(0.05)
Share interfering	0.55			0.58		
Observations	8,552			8,228		
Parent-child pairs	713			686		
Parents	537			521		
Households	293			286		

Notes: This table presents non-linear least squares (NLS) estimates of the structural parameters of interest for non-interfering and interfering parents, as well as estimates of the extensive and intensive margin of parental interference, *separately for boys and girls*. Extensive margin is defined as the difference between interfering and non-interfering parents evaluated at the mean investment of interfering parents. The intensive margin is defined as the change in parameters due to changes in the standardized amount of investments among interfering parents only. Standard errors in parentheses are clustered by households. Share interfering denotes the share of parents that invested to increase the probability that their choices are implemented for the child under consideration. *, **, and *** denote significance at the 0.10, 0.05, and 0.01 level.

G Additional intergenerational transmission results

Table G.1. Existing studies on the intergenerational transmission of time preferences

Authors (Year)	Country	Sample description	Instrument	Same for parents and children?	Incentivized?	Findings on intergenerational correlation of time preferences
Arrondel (2013)	France	241 children and their 199 parents from the French PATER survey	Index of 16 survey items capturing long-term concerns	Yes	No	Positive elasticity of 0.120 of children's patience with respect to parents' patience
Andreoni et al. (2019)	United States	272 children and parents from a low-income area	Delay gratification (children) and MPL (parents)	No	Yes	Positive, but insignificant correlation between children's and parents' time preferences
Bartling et al. (2010), Kosse and Pfeiffer (2012), Kosse and Pfeiffer (2013)	Germany	213 mother-child pairs from a pilot study in the German Socioeconomic Panel (SOEP)	Gratification delay task for children, MPL for mothers	No	Yes	1 SD increase of short-run reservation interest rate increases the probability of children being patient by 6-7% (Kosse and Pfeiffer, 2012; Bartling et al., 2010); a 1 SD increase in mothers' present bias is related to a 7.3% increase in the probability that the child delays gratification
Bettinger and Slonim (2007)	United States	191 children and at least one of their parents qualifying for free/reduced lunch programs	MPL of 12 binary choices between a fixed payment sooner or a varying payment later	Yes	Yes	Parents' patience has a marginal effect corresponding to a 6 percentage point (although insignificantly) increase in the probability of children making a patient decision
Brenøe and Epper (2019)	Denmark	3,101 children and 1,829 parents from the Danish Longitudinal Survey of Youth (DLSY)	Survey question eliciting preference for different earning trajectories	Yes	No	Intergenerational correlation of patience indicators of 0.071.
Brown and van der Pol (2015)	Australia	5,312 children and 5,303 parents from the Household Income Labour Dynamics of Australia (HILDA) study	Survey question on planning horizon	Yes	No	Marginal effects of an ordered probit model range between -0.01 and 0.05
Chowdhury, Sutter, and Zimmermann (2020)	Bangladesh	911 children and their parents from 544 households	Different MPLs for children and parents	No	Yes	1 SD increase in parents' number of patient choices is associated with a 0.091 SD increase in children's patient choices
Gauly (2017)	Germany	2,395 children from the German Socioeconomic Panel (SOEP) for whom both biological parents could be identified	Survey questions eliciting patience and impulsivity on 11-point-Likert scales	Yes	No	Intergenerational correlation in survey questions between 0.039 and 0.07 for patience and 0.021 and 0.052 for impulsivity
Samek et al. (2019)	United States	484 adolescents and 614 parents taking part in the Military Teenagers Environment Exercise and Nutrition Study (M-TEENS)	Identical MPL for children and parents	Yes	Yes	1 SD increase in parents' patience is related to a 0.38SD (0.11SD) increase in children's patience using a experimental measure (survey measure)
Webley and Nyhus (2006)	Netherlands	308 children aged 16-21 living with both of their 191 parents from the DNB Household Survey (DHS)	Index of agreement to 10 survey items capturing future orientation	Yes	No	Intergenerational correlation of future orientation is 0.28-0.31 between parents' future orientation on children's orientation
Present study	Bangladesh	990 children and both of their 1,120 parents from 610 households living in rural areas	CTBs allocating stars at different interest rates to future dates, additional survey measures	Yes	Yes	

Notes: This table summarizes existing studies on the intergenerational correlation in (proxies for) time preferences based on their sample, the instrument used to measure time preferences, and their findings. If several specifications were given in a study, we summarize results from regressions with a full set of control variables.

Table G.2. Intergenerational transmission of patience: Tobit regressions

A. Pooled transmission estimates	Children's share of stars paid earlier					Survey measure of patience
	(1)	(2)	(3)	(4)	(5)	(6)
Parents' share of stars paid earlier	0.46***	0.44***	0.29***	0.28***	0.22***	
	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)	
Parents' paternalistic decisions about share of stars paid earlier					0.20***	
					(0.04)	
Parents' patience (survey measure)						0.23***
						(0.05)
Parental, child, and household controls	No	Yes	Yes	Yes	Yes	Yes
Decision parameters	No	No	Yes	No	No	No
Decision FEs	No	No	No	Yes	Yes	No
Observations	21,840	21,696	21,696	21,696	21,689	1,801
Households	610	609	609	609	609	608
Pseudo-R^2	0.01	0.02	0.04	0.04	0.04	0.02

B. Heterogeneity by parental interference	Children's share of stars paid earlier					
	(1) Non-int. parents	(2) Inter. parents	(3) p-value of diff.	(4) Non-int. parents	(5) Inter. parents	(6) p-value of diff.
Parents' share of stars paid earlier	0.34***	0.23***	0.01	0.28***	0.17***	0.02
	(0.04)	(0.04)		(0.04)	(0.04)	
Parents' paternalistic decisions about share of stars paid earlier				0.19***	0.20***	0.84
				(0.05)	(0.04)	
Parental, child, and household controls	Yes			Yes		
Decision FEs	Yes			Yes		
Observations	21, 696			21, 689		
Households	609			609		
Pseudo-R^2	0.04			0.04		

Notes: This table presents tobit regressions of children's share of stars allocated to the earlier payment date to account for bounds at shares of zero and one. Columns (1)-(5) of Panel A relate children's share of stars allocated to the sooner payment date in each of the 12 decisions to parents' analogous decisions. Column (6) presents the intergenerational transmission of patience using standardized survey items of time preferences. Panel B presents heterogeneous transmission estimates by parents' willingness to interfere with their children's decision-making. Control variables include age and gender of both the parent and the child, indicators for whether the parent can read and write, received a secondary school leaving certificate, the household being Muslim, access to electricity, whether the father works in agriculture, whether the mother is a housewife, and log household income. Decision parameters refers to the five parameters that characterize the 12 decision sheets, whereas decision fixed effects refers to a set of indicators for each decision sheet. Standard errors in parentheses and clustered at the household. *, **, and *** denote significance at the 0.10, 0.05, and 0.01 level.

Table G.3. Transmission heterogeneity

	Child's share of stars paid earlier						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Parents' share sooner	0.09***						
	(0.01)						
A. Heterogeneity by child gender							
$\mathbb{1}\{$Boy$\}$ × Parents' share sooner		0.08***					
		(0.02)					
$\mathbb{1}\{$Girl$\}$ × Parents' share sooner		0.09***					
		(0.01)					
B. Heterogeneity by adult gender							
Father's share sooner			0.08***				
			(0.02)				
Mother's share sooner			0.10***				
			(0.01)				
C. Heterogeneity by gender match							
$\mathbb{1}\{$Different gender$\}$ × Parents' share sooner				0.08***			
				(0.01)			
$\mathbb{1}\{$Same gender$\}$ × Parents' share sooner				0.10***			
				(0.01)			
D. Heterogeneity by gender match II							
$\mathbb{1}\{$Boy$\}$ × Father's share sooner					0.08***		
					(0.02)		
$\mathbb{1}\{$Boy$\}$ × Mother's share sooner					0.09***		
					(0.02)		
$\mathbb{1}\{$Girl$\}$ × Father's share sooner					0.07***		
					(0.02)		
$\mathbb{1}\{$Girl$\}$ × Mother's share sooner					0.10***		
					(0.02)		
E. Heterogeneity by age of child							
$\mathbb{1}\{$6-11-year-old$\}$ × Parents' share sooner						0.09***	
						(0.02)	
$\mathbb{1}\{$12-16-year-old$\}$ × Parents' share sooner						0.08***	
						(0.01)	
F. Heterogeneity by parents' similarity							
$\mathbb{1}\{$Heterogeneous parents$\}$ × Parents' share sooner							0.05***
							(0.01)
$\mathbb{1}\{$Homogeneous Parents$\}$ × Parents' share sooner							0.08***
							(0.02)
$\mathbb{1}\{$Girl$\}$	-0.01	-0.02	-0.01	-0.01	-0.02	-0.01	-0.02
	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
$\mathbb{1}\{$Mother$\}$	-0.01	-0.01	-0.02	-0.01	-0.02	-0.01	-0.01
	(0.01)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)
$\mathbb{1}\{$Same gender$\}$				-0.01			
				(0.01)			
$\mathbb{1}\{$12-16-year-old$\}$						-0.00	
						(0.03)	
$\mathbb{1}\{$Homogeneous parents$\}$							-0.08***
							(0.02)
Parental, Child, and Household Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Decision FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
p-value (H_0: No heterogeneity)		0.70	0.27	0.24	0.29	0.71	0.17
p-value (H_0: No hetero. for boys)					0.55		
p-value (H_0: No hetero. for girls)					0.13		
Mean share sooner	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Observations	21,696	21,696	21,696	21,696	21,696	21,696	19,800
Households	609	609	609	609	609	609	510
R^2	0.08	0.08	0.08	0.08	0.08	0.08	0.08

Notes: This table presents heterogeneous transmission estimates. Control variables include age and gender of both the parent and the child, indicators for whether the parent can read and write, received a secondary school leaving certificate, the household being Muslim, access to electricity, whether the father works in agriculture, whether the mother is a housewife, and log household income. Standard errors clustered at the household level in parentheses. *, **, and *** denote significance at the 0.10, 0.05, and 0.01 level. Homogeneous parents is defined based on an indicator equal to one if the correlation between father's and mother's decisions in a family is larger than the median correlation and zero otherwise. For those without switching points, we set the correlation to zero.

H Estimation of individual parameters

In this Appendix, we briefly describe the estimation procedure of individual-level time preference parameters, as well as underlying assumptions, and validate the approach by studying the fit and predictive power of the recovered parameters.

H.1 Estimating individual-specific structural parameters

Each child and each parent were presented with 12 decisions that we can use to estimate the non-linear least squares model specified in equation (4). Since the number of observations is small, we make some simplifying assumption to ease the estimation. As pre-specified and following Augenblick, Niederle, and Sprenger (2015), we fix the CRRA-utility curvature parameter to the value estimated on the full sample ($\alpha_{\text{pooled}} = 0.46$), leaving us with only the present bias parameter β and the long-run discounting parameter δ to be estimated for each individual. We estimate these parameters using the NLS specification, since the small number of observations prohibits us from estimating Tobit-specifications.

Furthermore, we follow Imai, Rutter, and Camerer (forthcoming) and account for outliers as follows. We implement an upper bound at the 75th percentile plus 1.5 times the interquartile range (75th percentile−25th percentile) of the resulting distribution. This restriction binds for 8.4% and 3.3% of β_i and δ_i parameters, respectively. In principle, we also implement a lower bound at the 25th percentile minus 1.5 times the interquartile range, but this restriction is never binding. In all estimations using individual parameters, we include additional variables indicating whether a parameter was bounded. Moreover, we bootstrap standard errors using 1,000 repetitions to account for generated regressors.

Panel A of Table H.1 presents the distribution of parameter estimates and Figure H.1 presents the distribution graphically. Five out of 2110 estimates do not converge and 294 individuals always choose to allocate all their endowment to the sooner payment date prohibiting the estimation of parameters. Thus, we are able to estimate β_i and δ_i for 1811 individuals (86% of the sample). The median parameter estimates are 0.81 for present bias and 0.77 for monthly time-consistent discounting, similar to the aggregate estimates from the pooled sample.

H.2 Predictive power of individual-level parameters and in-sample fit

Given that we estimated the individual-level parameters on 12 observations only, a natural question is whether we are able to recover any meaningful variation. To assess this concern, we perform three exercises. First, Table H.2 relates the structural parameters to several other survey items. In columns (1) through (4), we observe that both present bias as well as time-consistent discounting parameters are associated with responses to survey questions targeted to elicit respondents' patience. Furthermore, present bias, but not monthly discounting, is related to having a savings account, as well as a self-reported scale on self-control and risk behaviors.

Table H.1. Distribution of individual structural parameters by specification

A. Restricted $\alpha_i = 0.46$				Percentiles				
Parameter	Obs.	Mean	SD	10%	25%	50%	75%	90%
Curvature (α)	1,811	0.46	0.00	0.46	0.46	0.46	0.46	0.46
Present bias (β)	1,811	0.93	0.68	0.16	0.44	0.81	1.22	2.17
Discount factor (δ)	1,811	0.84	0.51	0.23	0.48	0.77	1.17	1.48
Total observations	2,110	*(100%)*						
Converged estimates	1,811	*(86%)*						
No switching points	294	*(14%)*						
Not converged	5	*(0%)*						

B. Family-specific α_i				Percentiles				
Parameter	Obs.	Mean	SD	10%	25%	50%	75%	90%
Curvature (α)	1,802	0.47	0.34	-0.23	0.35	0.52	0.73	0.84
Present bias (β)	1,802	0.93	0.66	0.09	0.47	0.83	1.20	2.29
Discount factor (δ)	1,802	0.80	0.48	0.17	0.48	0.79	1.03	1.54
Total observations	2,110	*(100%)*						
Converged estimates	1,802	*(85%)*						
No switching points	294	*(14%)*						
Not converged	14	*(1%)*						

A. Unrestricted α_i				Percentiles				
Parameter	Obs.	Mean	SD	10%	25%	50%	75%	90%
Curvature (α)	1,244	0.53	0.55	-0.63	0.34	0.74	0.98	1.00
Present bias (β)	1,244	0.86	0.50	0.07	0.58	0.84	1.10	1.53
Discount factor (δ)	1,244	0.82	0.38	0.36	0.61	0.82	1.00	1.36
Total observations	2,110	*(100%)*						
Converged estimates	1,244	*(59%)*						
No switching points	294	*(14%)*						
Not converged	572	*(27%)*						

Notes: This table presents the distribution of structural parameters for three specifications: assuming restricted (common) utility curvature (Panel A), family-specific utility curvature (Panel B), and unrestricted utility curvature to the estimated parameter on the whole sample (Panel C). In addition, we present basic statistics about the number of converged estimates for each of the specifications.

Second, we study the in-sample fit of our estimates. To do this, we use the structural parameters for each individual and predict the share of stars allocated to the sooner payment. We then relate this predicted share to the actual share that we observe. Columns (1) and (2) of Table H.3 show that for both children and parents the predicted shares correlate strongly with the actual shares.

Table H.2. Predictive power of structural parameters

	Patience (std.)		Patience (std.)		$\mathbb{1}\{$Savings account$\}$	
	(1)	(2)	(3)	(4)	(5)	(6)
Present bias β	0.30***	0.32***	0.27***	0.28***	0.08***	0.07**
	(0.08)	(0.08)	(0.07)	(0.06)	(0.03)	(0.03)
Monthly discounting δ	0.47***	0.45***	0.35***	0.33***	0.05	0.05
	(0.09)	(0.09)	(0.09)	(0.08)	(0.04)	(0.04)
Parental Controls	No	No	No	Yes	No	Yes
Child Controls	No	Yes	No	No	No	No
Household Characteristics	No	Yes	No	Yes	No	Yes
Sample	Children	Children	Parents	Parents	Parents	Parents
Observations	873	871	933	927	938	932
Households	569	568	576	574	578	576
R^2	0.04	0.07	0.03	0.11	0.01	0.09

	Self control (std.)		Risk behaviors (std.)		Risk attitudes (std.)	
	(1)	(2)	(3)	(4)	(5)	(6)
Present bias β	0.12*	0.12*	-0.16**	-0.12*	-0.14**	-0.07
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.11)
Monthly discounting δ	-0.00	-0.00	0.03	-0.02	-0.09	0.12
	(0.09)	(0.09)	(0.09)	(0.08)	(0.09)	(0.13)
Parental Controls	No	Yes	No	Yes	No	Yes
Household Characteristics	No	Yes	No	Yes	No	Yes
Sample	Parents	Parents	Parents	Parents	Parents	Parents
Observations	860	855	860	855	860	855
Households	550	548	550	550	550	550
R^2	0.01	0.04	0.01	0.20	0.01	0.04

Notes: This table relates structural time preference parameters β_i and δ_i to several survey items. Patience measures stem from two survey questions: Children were asked for their agreement to the statement "I am good at giving up something nice today (e.g., a reward) in order to get something even nicer in the future (e.g., a larger reward)" on a 5-point Likert scale, while parents were asked "How willing are you to give up something that is beneficial for you today in order to benefit more from that in the future?" on a 11-point Likert scale. $\mathbb{1}\{$Savings account$\}$ is an indicator equal to one if the household has a savings account and zero otherwise. Self control is an index constructed as the mean response from items of the Tangney Self Control Scale (Tangney, Baumeister, and Boone, 2004). Risk behavior is an index constructed as the mean response from 16 items eliciting whether the respondent, e.g., smokes, gambles, uses drugs or gets into physical fights. Risk attitudes captures responses to the statement "I often take risks" on a 7-point Likert scale. All outcomes apart from the indicator for having a savings account are standardized to have a mean of zero and a standard deviation of one. Bootstrapped standard errors from 1,000 repetitions in parentheses. *, **, and *** denote significance at the 0.10, 0.05, and 0.01 level.

Finally, we use the predicted shares and replicate the reduced-form transmission results of Table 10. Column (3) of Table H.3 presents the original reduced-form results using actual shares for both children and parents, whereas column (4) presents estimates for those parents for whom we are able to estimate present bias and long-run discounting parameters. Columns (5) and (6) then replicate these regressions using parents' predicted shares and both parents'

Table H.3. In-sample fit of structural estimates and validation of transmission results

	Share of stars paid earlier					
	Children (actual)	Adults (actual)	Children (actual)	Children (actual)	Children (actual)	Children (pred.)
	(1)	(2)	(3)	(4)	(5)	(6)
Child's share of stars paid earlier (pred.)	0.87***					
	(0.02)					
Parents' share of stars paid earlier (pred.)		0.90***			0.14***	0.12***
		(0.01)			(0.01)	(0.01)
Parents' share of stars paid earlier (actual)			0.09***	0.07***		
			(0.01)	(0.01)		
Parental Controls	Yes	Yes	Yes	Yes	Yes	Yes
Child Controls	Yes	Yes	Yes	Yes	Yes	Yes
Household Characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Decision FEs	Yes	Yes	Yes	Yes	Yes	Yes
Mean share	0.64	0.62	0.68	0.66	0.66	0.65
Observations	10,428	11,184	21,696	18,204	18,204	16,344
Households	567	576	609	576	576	543
R^2	0.32	0.34	0.08	0.08	0.08	0.18

Notes: Columns (1) and (2) present the in-sample fit of the actual share of stars allocated to the earlier date and the predicted share based on individual structural parameters. Columns (3) through (6) replicate the reduced-form transmission results. More specifically, column (3) replicates column (4) of Table 10; column (4) presents the same specification on the subset of observations for which we can estimate structural time preference parameters; column (5) presents the transmission regression using parents' predicted shares, while column (6) also uses children's predicted shares (resulting in a further loss of some observations). All regressions using predicted shares include indicators equal to one if the structural parameters β or δ were winsorized at $Q_{0.75} + 1.5IQR$ and zero otherwise. Bootstrapped standard errors with 1,000 repetitions in parentheses. *, **, and *** denote significance at the 0.10, 0.05, and 0.01 level.

as well children's predicted shares. The estimates are qualitatively similar, although they differ slightly in magnitude.

Taken together, these results indicate that the recovered individual-level estimates capture meaningful variation that predicts relevant related behaviors.

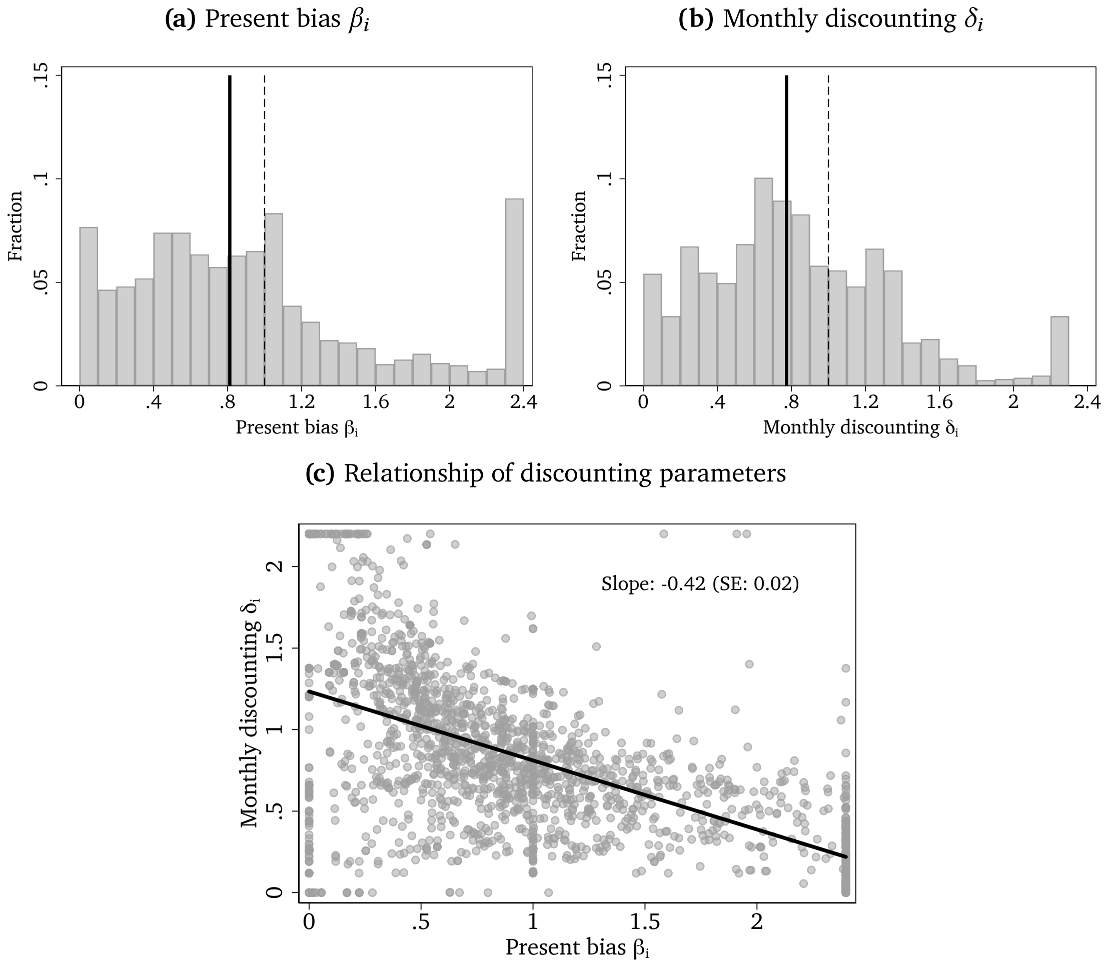
H.3 Alternative estimation strategies for individual-level parameters

As pre-specified, our main specification assumes a common utility curvature estimated on all individuals jointly (referred to as restricted α_i in the following Tables). Panel A of Table H.1 and Figure H.1 summarize the distribution of those individual parameters that we use in our main specifications in Section 6.2. Yet, one could think of alternative approaches of estimating individual-level discounting parameters. Here, we outline two alternative approaches that relax the common utility curvature assumption. First, we allow for a family-specific utility curvature. For this, we first estimate the model for each family separately and impose the estimated family-specific α_i parameters in the individual-level estimations of the two remaining parameters β_i and δ_i. Second, we estimate all three parameters (β_i, δ_i, and α_i) on an individual level.

Panels B and C of Table H.1 present summary statistics on each of the alternative estimation approaches and Figures H.2 and H.3 visualize the distribution of parameters. We observe that the distributions are similar to our main specification. For the family-specific curvatures, we lose 14 observations due to non-convergence. This number increases to 572 for individual-specific utility curvatures, corresponding to 27% of our sample. The reason for this is that these alternative approaches are more demanding for the data as they try to fit more parameters on the limited set of 12 observations. Our main specification therefore allows us to retain the largest sample.

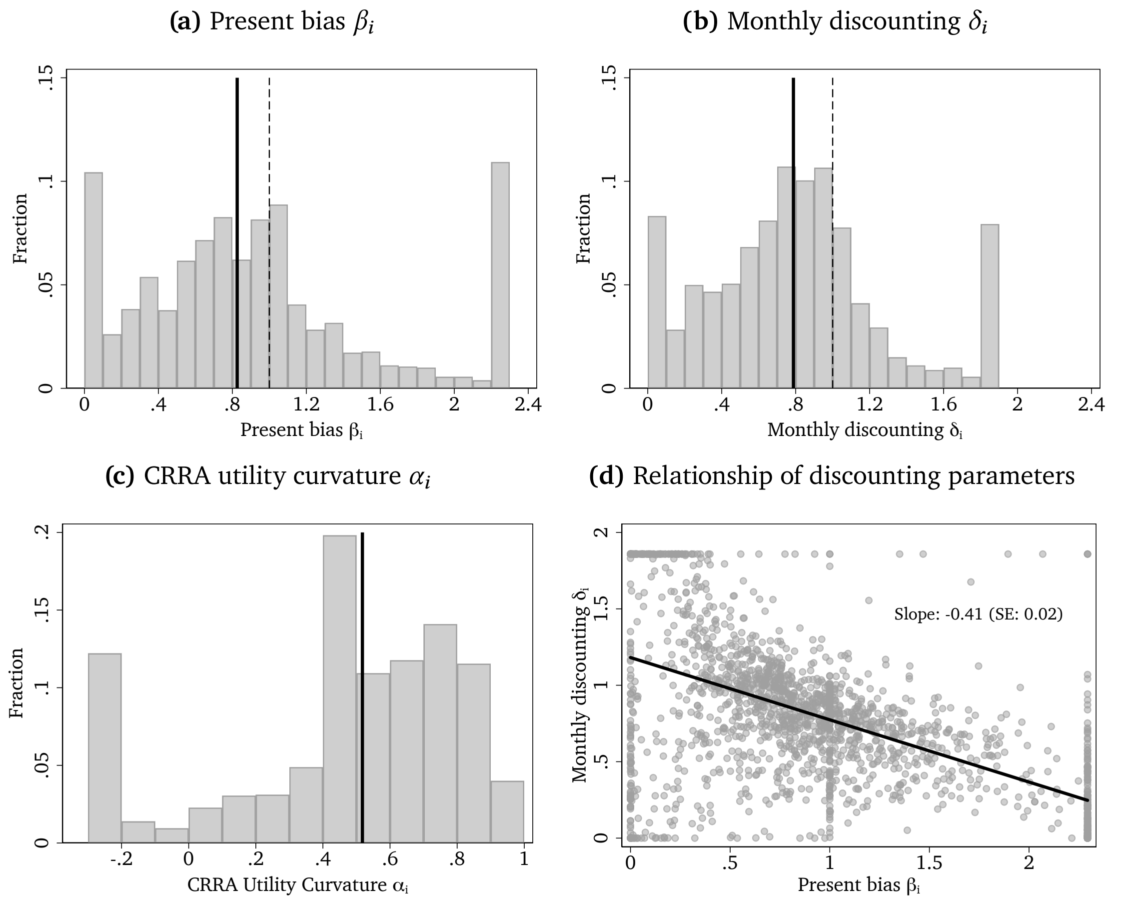
Furthermore, we show in Table H.4 that the individual-level estimates are highly correlated: Across different specification the correlation (rank correlation) is at least 0.72 (0.85) indicating that any potential bias introduced by our common utility assumption does not seem to be restrictive.

Figure H.1. Distribution of individual-level parameters: Common utility curvature



Notes: This figure presents the distribution of individual-level discounting parameters for present bias (β_i, Figure H.1a) and monthly discounting (δ_i, Figure H.1b), as well as their relationship (Figure H.1c) for the parents and their children. Solid lines indicate medians in Figures H.1a andH.1b and a linear fit in Figure H.1c. Parameter estimates are bounded at the 25th percentile – 1.5 × interquartile range (never binding) and 75th percentile + 1.5 × interquartile range (binding for 8.4% and 3.3% of β_i and δ_i parameters) to account for outliers.

Figure H.2. Distribution of individual-level parameters: Family-specific α



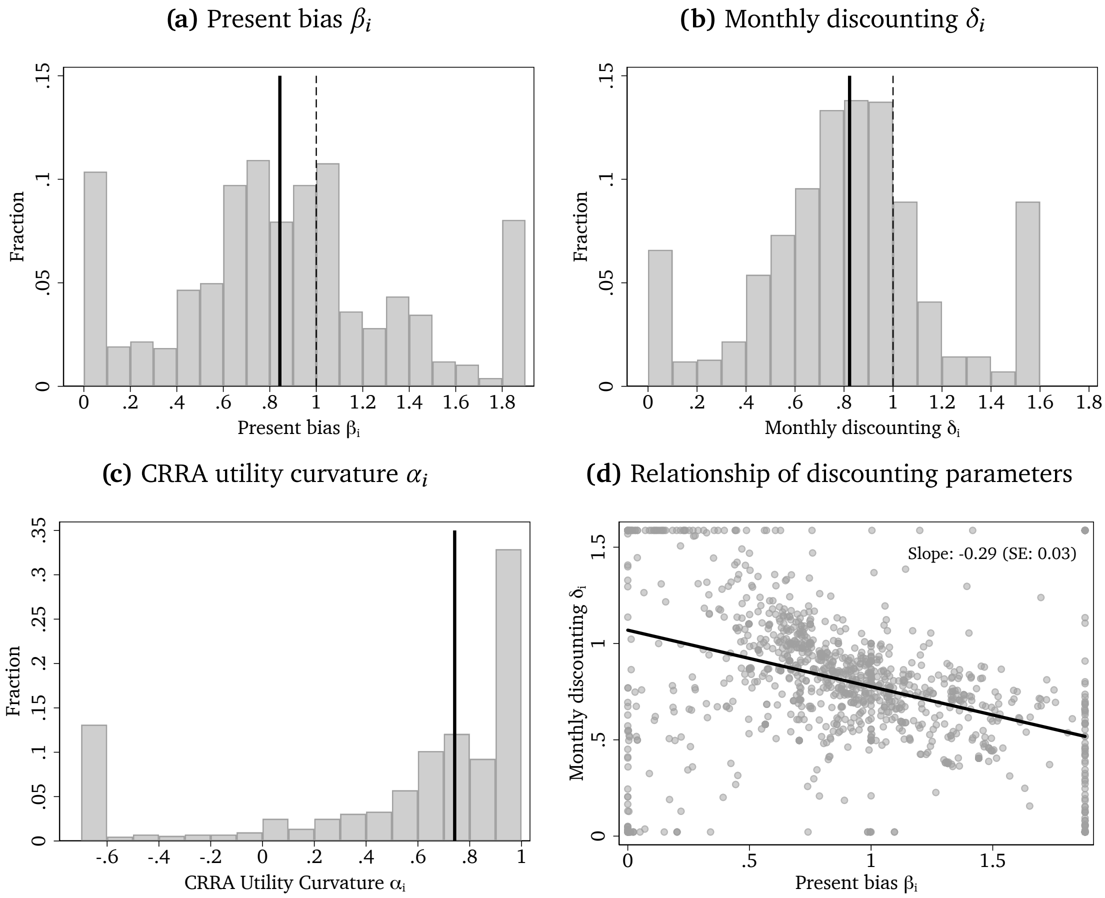
Notes: This figure presents the distribution of individual-level discounting parameters for present bias (β_i, Figure H.2a), monthly discounting (δ_i, Figure H.2b), CRRA utility curvature (α_i, Figure H.2c), as well as their relationship (Figure H.2d). Solid lines indicate medians in Figures H.2a through H.2c and a linear fit in Figure H.2d. Parameters are bounded at the 25th percentile − 1.5 × interquartile range (binding for 11.6% of all estimated curvature parameters) and 75th percentile + 1.5 × interquartile range (binding for 10.7% and 7.5% of the present bias and monthly discounting parameters, respectively) to account for outliers.

H.4 Intergenerational transmission using alternative specifications

Although we pre-specified to estimate intergenerational correlations under the common utility curvature assumption, we report a series of robustness checks for our main findings of Table 11 in Table H.5, where we employ different assumptions discussed above to estimate individual-specific parameters. First, columns (1) and (4) report results using unrestricted estimations, i.e., one in which we estimate the CRRA-utility curvature for every individual separately, but lose a sizable share of individuals due to non-convergence. Second, columns (2) and (5) report analogous estimates with family-specific utility curvature estimates.

Finally, in columns (3) and (6), we again impose a common utility curvature, but impute preference parameters for those individuals, who always choose to allocate all their endowment to either the earlier or the later date. Since these individuals do not have any variation in their choices, this prohibits us from estimating preference parameters for them. Instead, we

Figure H.3. Distribution of individual-level parameters: Unrestricted estimations



Notes: This figure presents the distribution of individual-level discounting parameters for present bias (β_i, Figure H.3a), monthly discounting (δ_i, Figure H.3b), CRRA utility curvature (α_i, Figure H.3c), as well as their relationship (Figure H.3d). Solid lines indicate medians in Figures H.3a through H.3c and a linear fit in Figure H.3d. Parameters are bounded at the 25th percentile − 1.5 × interquartile range (binding for 13.0% of all estimated curvature parameters) and 75th percentile + 1.5 × interquartile range (binding for 7.8%, 8.5% of the present bias and monthly discounting parameters, respectively) to account for outliers.

recover preferences for these individuals by introducing a trembling error. More specifically, we randomly induce a one star deviation in one of their decisions and average across different models. Adopting this procedure yields parameters of $\beta_{\text{imputed}} = 1.00$ and $\delta_{\text{imputed}} = 0.08$ if individuals always choose the sooner payment (285 of 294 individuals), and $\beta_{\text{imputed}} = 1.00$ and $\delta_{\text{imputed}} = 2.20$ if subjects always choose the later payment (9 individuals). While recovering preference parameters increases our sample, this procedure does not allow us to distinguish between two reasons for choosing always the same option. On the one hand, there may exist individuals who genuinely exhibit a high degree of impatience and thus allocate all stars to the sooner payment date. On the other hand, some individuals may not pay attention and/or are not interested in making these decisions and just use the first option presented to them.

The results from these alternative specifications are presented in Table H.5. In general, they support our previous findings, although the estimates are less precise.

Table H.4. Relationship between individual-level structural parameters

	Correlation			Rank Correlation		
	Unrestricted α_i	Family-specific α_i	Restricted α_i	Unrestricted α_i	Family-specific α_i	Restricted α_i
A. Present bias β_i						
Unrestricted α_i	1.00			1.00		
Family-specific α_i	0.78***	1.00		0.86***	1.00	
Restricted α_i	0.77***	0.90***	1.00	0.85***	0.92***	1.00
B. Monthly discounting δ_i						
Unrestricted α_i	1.00			1.00		
Family-specific α_i	0.75***	1.00		0.87***	1.00	
Restricted α_i	0.72***	0.88***	1.00	0.85***	0.94***	1.00

Notes: This table presents correlations and rank correlations of the individual structural parameters for present bias (β_i) and monthly discounting (δ_i) for three different estimation approaches: (1) estimations with unrestricted utility curvature α_i (i.e., we estimate α_i for each individual); (2) estimations with family-specific utility curvature (i.e., we estimate α for each household and restrict the individual parameters to this value); (3) estimations with common utility curvature for all individuals (i.e., we use the aggregate estimate of α=0.461 and restrict all individual utility curvature parameters to this value). Outliers are winsorized at the 25th percentile − 1.5 × interquartile range and 75th percentile + 1.5 × interquartile range). *, **, and *** denote significance at the 0.10, 0.05, and 0.01 level.

Table H.5. Robustness of the intergenerational transmission of patience

	Children's present bias $\beta_{children}$			Children's monthly discounting $\delta_{children}$		
	(1)	(2)	(3)	(4)	(5)	(6)
$\mathbb{1}$\{Interfering\}	0.13	0.19	0.07	0.07	-0.07	0.06
	(0.11)	(0.14)	(0.06)	(0.08)	(0.08)	(0.06)
$\mathbb{1}$\{Non-interfering\} × β_{parent}	0.10*	0.13**	0.09**	0.02	-0.03	0.03
	(0.06)	(0.06)	(0.04)	(0.04)	(0.03)	(0.03)
$\mathbb{1}$\{Interfering\} × β_{parent}	-0.01	0.03	0.05	-0.01	0.01	-0.00
	(0.05)	(0.05)	(0.03)	(0.04)	(0.03)	(0.03)
$\mathbb{1}$\{Non-interfering\} × δ_{parent}	0.03	0.12	0.06*	0.14***	0.08	0.06**
	(0.07)	(0.08)	(0.04)	(0.05)	(0.05)	(0.03)
$\mathbb{1}$\{Interfering\} × δ_{parent}	0.04	0.04	0.07**	0.08	0.13***	0.05
	(0.07)	(0.07)	(0.03)	(0.05)	(0.04)	(0.03)
Parental, Child, and Household Controls	Yes	Yes	Yes	Yes	Yes	Yes
Specification	Unrestricted α	Family-spec. α	α = 0.46 Imputed β, δ	Unrestricted α	Family-spec. α	α = 0.46 Imputed β, δ
Median preference parameter	0.87	0.86	0.94	0.81	0.76	0.68
Parent-child pairs	663	1,350	1,800	663	1,350	1,800
Households	353	541	608	353	541	608
R^2	0.38	0.03	0.47	0.40	0.37	0.40

Notes: This table presents several specifications similar to Table 11 for different estimation approaches of the structural parameters. Columns (1) and (4) present results for unrestricted estimations, i.e., for specifications in which we also estimate α for each individual rather than fixing it at 0.461. Columns (2) and (5) restrict the curvature α to be the same for all members of a household, while columns (3) and (6) impute individual structural parameters β_i and δ_i for respondents without switching points (i.e., who always chose the most impatient or the most patient choice). We impute their parameters by an approximation that averages over models that randomly introduce a deviation of one star in one of the decision. This results in parameters $\beta_{imputed}$ = 1.00 and $\delta_{imputed}$ = 0.08 for those always choosing the most impatient option (97% of those without a switching point; 294 individuals) and $\beta_{imputed}$ = 1.00 and $\delta_{imputed}$ = 2.20 (after winsorization) for those always choosing the most patient decision (3% of those without a switching point; 9 individuals). All regressions include indicators equal to one if the structural parameters β or δ were winsorized at $Q_{0.75} + 1.5IQR$ and zero otherwise. Bootstrapped standard errors with 1,000 repetitions in parentheses. *, **, and *** denote significance at the 0.10, 0.05, and 0.01 level.

I Convex time budget instrument and instructions

I.1 Age-specific exchange rates of stars to Taka

Table I.1 presents the age-specific exchange rates used in the experiment, which are calibrated to average amounts of pocket money for each age group. For adults, one star worth 20 Taka corresponds to approximately 4% of daily household income.

Table I.1. Exchange rate of stars to money

Age group	Exchange rate of 1 star in Taka
6-7 years	4
8-9 years	6
10-11 years	8
12-13 years	10
14-15 years	12
16-17 years	15
Adults	20

Notes: This table presents the exchange rate of stars (the experimental currency) into Taka (1 Taka = 0.012 USD) depending on the age of the respondent.

I.2 Convex time budget instrument

Figure I.1 illustrates how one the 12 different decision sheets looked like. The parameters for all decision sheets are presented in Table 1 and vary the sooner (today vs. in one month) as well as the later date (in one month or in two months), the gross interest rate (1.00, 1.33, 1.50, or 2.00), as well as the maximum amount of stars in the future.

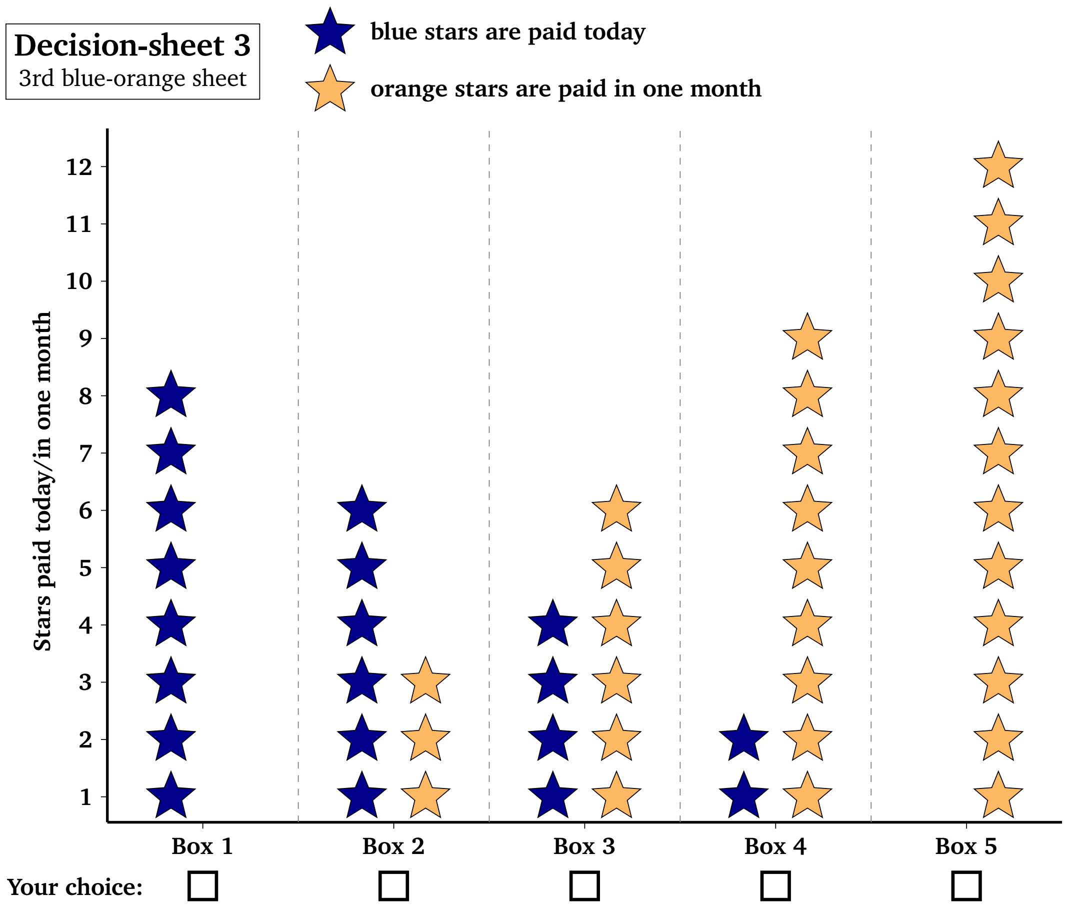
I.3 General instructions for parents

My name is [...]. Today I have prepared two 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 both games. It is important that you understand the rules of all our games and play 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.

For your participation in these games, you will receive one star that you can convert into money. Each star is equal to Taka 20.

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

Figure I.1. Example of one decision sheet



Notes: This figure illustrates one of the decision sheets used in the experiment corresponding to a gross interest rate of 1.5. Other decision sheets change the number of stars for each of the options as shown in Table 1 as well as the color of the stars to indicate different payout dates. Decision sheets to elicit parents' beliefs and their paternalistic decisions are similar with the only difference that the options at the bottom correspond to their belief ("Your belief about your child's choice") and the paternalistic decision ("Your choice for your child").

I.4 General instructions for children

My name is [...]. Today I have prepared a game for you. In this game, you can earn money. Before we start, I will explain the rules of our game. How much money you will earn depends mainly on your decisions. At the end, only one of your decisions will be paid. Which decision will be paid will be determined randomly by rolling a dice. It is important that you understand the rules of our game and play each decision 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.

For your participation in these games, you will receive one star that you can convert into money. Each star is equal to Taka [...] *(use age-appropriate exchange rate)*.

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

I.5 Instructions for own decisions (same for parents and children)

Before we start with the game, let me explain the rules. In this game you can earn stars, which you can convert into money. Each star is equal to Taka [...] *(use 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.

Do you have any questions at this point?

The game consists of three parts. A blue-orange part, a blue-green part, and an orange-green part. In each part, you will need to make four decisions. Thus, you will make 12 decisions in total. All decisions are about earning stars that will be exchanged into money. In particular, you will decide how many stars you earn at different points in time. There are stars of different colors. Each color pays you money at a different point in time. For each blue star, you will earn money today. For each orange star, you will receive money in one month.

(For children) That means, you need to wait for 30 days and 30 nights until you receive the money.

For every green star, you get money in two months.

(For children) Two months mean you have to wait for 60 days and 60 nights until you receive the money.

For each star that you earn, one of us will come to your home and deliver the money in an envelope with your name marked on it. For every blue star, you will receive money today. If you earn an orange star, you will get money for this star in one month. Finally, for every green star, you will get money in two months. Again, one of us will come to your home and deliver the money in an envelope with your name marked on it.

When do you receive money for each orange star? *(Correct answer: in one month/30 days)* When do you receive money for every blue star? *(Correct answer: today)* When do you get money for every green star? *(Correct answer: in two months/60 days)*

If the respondent answers incorrectly the interviewer has to repeat the explanation of this part.
Respondent understood the game after: [ ]
1 = first explanation, 2 = second explanation, 3 = third explanation, 4 = did not understand

In each decision, you choose between five different choices. As you decide for choices more towards the left side, the amount of stars paid out earlier increases and the amount of stars paid out later decreases. As you choose more towards the right side, the amount of stars paid out earlier decreases and the amount of stars paid out later increases. Choosing more towards the right side moves more stars from earlier paying stars to later paying stars.

Let us start with the blue-orange part *(point to the four decision-sheets corresponding to the blue-orange part)*. Here, you choose between receiving stars today *(point to blue stars on the first decision sheet)* and in one month *(point to orange stars on the first decision sheet)*. Let us look at your choices one by one. If you tick the first box *(point at the first box on the first decision-sheet)*, you are paid 9 blue stars today and no orange stars in one month. If you prefer to receive 6 blue stars today and 4 orange stars in one month, you tick the second box *(point at the second box on the first decision-sheet)*. If you tick the third box *(point at the third box on the first decision-sheet)*, you receive 3 blue stars today and 8 orange stars in one month. If you tick the fourth box *(point to fourth box on first decision sheet)*, you receive 2 blue stars today and 9 orange stars in one month. Finally, if you prefer to receive 0 blue stars today and 12 orange stars in one month, you tick this box *(point at fifth box on first decision-sheet)*.

How many blue and orange stars does you receive here *(point to box 2 on decision-sheet 1; correct answer: 6 blue stars and 4 orange stars)*? And when do you get them? *(Correct answer: blue stars: today, orange stars: in one month/30 days)*

If the respondent answers incorrectly the interviewer has to repeat the explanation of this part.
Respondent understood the game after: [ ]
1 = first explanation, 2 = second explanation, 3 = third explanation, 4 = did not understand

The second part, the blue-green part, is very similar to the blue-orange part. Here, you choose between receiving blue stars paying money today and green stars paying in two months. Let us look at one example *(point to first decision sheet of blue-green part/decision-sheet 5)*. If you choose this box *(point to second box on decision-sheet 5)*, you get 6 blue stars today and 4 green stars in two months. If you choose this box *(point to fourth box on decision-sheet 5)*, you get 2 blue stars today and 9 green stars in two months.

How many blue and green stars do you get if you choose this box *(point to third box on first decision-sheet)*? *(Correct answer: 3 blue stars and 8 green stars)* And when do you receive money for these stars? *(Correct answer: blue stars: today, green stars: in two months/60 days)*

If the respondent answers incorrectly the interviewer has to repeat the explanation of this part.
Respondent understood the game after: [ ]
1 = first explanation, 2 = second explanation, 3 = third explanation, 4 = did not understand

The third part, the orange-green part, is very similar to the other two parts. Here, you choose between receiving orange stars yielding money in one month and green stars paying in two months. Let us look at one example *(point to first decision sheet of orange-green part/decision-sheet 9)*. If you choose this box *(point to first box on decision-sheet 9)*, you get nine orange stars in one month and no green stars. If you choose this box *(point to third box on decision-sheet 9)*, you get 3 orange stars in one month and 8 green stars in two months.

How many orange and green stars do you get if you choose this box *(point to fourth box on decision-sheet 9)*? *(Correct answer: 2 orange stars and 9 green stars)* And when do you receive money for these stars? *(Correct answer: orange stars: in one month, green stars: in two months)*

If the respondent answers incorrectly the interviewer has to repeat the explanation of this part. Respondent understood the game after: [ ]
1 = first explanation, 2 = second explanation, 3 = third explanation, 4 = did not understand

Only one of your decisions counts and is paid out. I now explain how it is decided which decisions is the one that counts. After your decisions, you will roll a 12-sided dice *(please demonstrate)*. The number on the dice indicates which decision counts. If the dice shows the number 1, your decision from the first sheet *(point to first blue-orange decision sheet)* counts. If the dice shows the number 2, your decision from the second sheet *(point to second blue-orange decision sheet)* counts. If the dice shows the number 7, your decision from the seventh sheet *(point to decision sheet 7/third blue-green decision sheet)* count. Each number corresponds to one of the decision sheets.

Which decision sheet is chosen if the dice shows the number 10? *(Correct answer: decision sheet number 10/second orange-green decision sheet)*. What happens if the dice shows the number 8? *(Correct answer: decision sheet number 8/ fourth blue-green sheet is chosen for payment)*

If the respondent answers incorrectly the interviewer has to repeat the explanation of this part. Respondent understood the game after: [ ]
1 = first explanation, 2 = second explanation, 3 = third explanation, 4 = did not understand

Additional instructions for children: Your parents also made decisions for you. Whether your decisions or that of your parents count will be determined by a roll of a dice. I will tell you whether your or your parents' decision is implemented after we played the game.

Please take your decisions for each of the 12 sheets now *(place the decision sheets side by side on the table; the child/respondent should fill out the decision sheets from left to right)*. Start with this part *(point at the first decision-sheet with the blue-orange decisions)* and continue with this part *(point at the blue-green sheets)* and finally make your decision in this part *(point at the* *orange-green decision sheets)*. 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.

I.6 Instructions for parental beliefs and paternalistic decisions (only parents)

Repeat this part for up to two of the children taking part in the interviews and games. Indicate clearly to whom the decisions are referring to! If two children take part in the interviews and games, start with the older one.

Child 1: The child the instructions are referring to is [ ] a boy/[ ] a girl, it is [ ] years old, and is called [ ].

Your child *(repeat child's name)* will also participate in this game and make the same decisions as you do on his / her own. I now want to know what you will do if you can decide for your child and what you believe your child will choose. Similar to you, your child can earn stars, which can be converted into money. Each star your child receives is equal to Taka [...] *(use age-appropriate exchange rate)*. The more stars your child earns, the more money it gets. Similar to you, your child receives one star worth Taka [...] *(use age-appropriate exchange rate)* as a thank you for its participation. Please interrupt me anytime in case you have a question.

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

As before, the game consists of three parts. One part with decisions between blue and orange stars, one part with decisions between blue and green stars, and one part with decisions between orange and green stars. For each blue star, your child receives money today. One of us will come to your home and deliver the money in an envelope with your child's name marked on it. If your child has an orange star, it will get money for this star in one month, and for each green star in two months. Again, one of us will come to your home and deliver the money in an envelope with your child's name marked on it.

Questions?

Again, as you choose boxes more towards the left side *(point to first box on the first blue-orange decision sheet)*, the amount of stars paid out earlier *(that is, today or in one month depending on the decision sheet)* increases and the amount of stars paid out later *(in one month or in two months)* decreases. As you choose boxes more towards the right side, the amount of stars paid out earlier decreases and the amount of stars paid out later increases. Choosing boxes more towards the right side moves more stars from earlier paying stars to later paying stars.

For example, if you choose this box *(point to first box on decision sheet 1/the first blue-orange decision-sheet)*, your child receives 9 blue stars today and 0 stars in one month. If you instead choose this box *(point to the fourth box of decision-sheet 1)*, your child receives only 2 blue stars today, but 9 orange stars in one month.

How many blue and orange stars does your child receive here *(point to third box on the first decision-sheet; correct answer: 3 blue stars today and 8 orange stars in one month)*?

If the respondent answers incorrectly the interviewer has to repeat the explanation of this part.
Respondent understood the game after: [ ]
1 = first explanation, 2 = second explanation, 3 = third explanation, 4 = did not understand

After you have decided what you would do for your child, you will roll a dice *(please demonstrate using a 6-sided dice)*. Whether your decisions for your child or your child's own decisions will be implemented depends on your own choice and the number shown on the dice. I now explain how this works. For this part, you receive Taka 100. Now you can choose to spend some of these Taka 100 to buy additional numbers on a dice. If you decide not to spend any money, your choices will be implemented for your child if the dice shows a 1. If you spend Taka 10, your choices will be implemented for your child if the dice shows a 1 or 2. If you spend Taka 20, your choices will be implemented if the dice shows a 1, 2, or 3. For every additional Taka 10 you spend, an additional number on the dice will implement your choices. If you decide to spend Taka 50, all six numbers will implement your choices. The following table gives you an overview which numbers implement your choices depending on how much you spend.

How much you spend	How much you keep of the Taka 100	Numbers on the dice that implement your decisions
Taka 0	Taka 100	1
Taka 10	Taka 90	1, 2
Taka 20	Taka 80	1, 2, 3
Taka 30	Taka 70	1, 2, 3, 4
Taka 40	Taka 60	1, 2, 3, 4, 5
Taka 50	Taka 50	1, 2, 3, 4, 5, 6

If you spend Taka 20, which numbers implement your choices for your child? *(Correct answer: 1, 2, 3)*. How much would you keep of the amount you received for this game? *(Correct answer: Taka 80)*

If the respondent answers incorrectly the interviewer has to repeat the explanation of this part.
Respondent understood the game after: [ ]
1 = first explanation, 2 = second explanation, 3 = third explanation, 4 = did not understand

You are also asked to indicate what you think your child would choose for each of the decisions. After you made your choices, we will roll a dice to choose one of your child's decisions. If you indicated the choice of your child correctly, you receive another blue star worth Taka 20 that is paid out today.

Please take your decision for each of the 12 sheets now *(place the decision sheets side by side on the table; the respondent should fill out the decision sheets from left to right)*. Please also indicate what you think your child would choose for each of the decisions. Start with this part *(point at the first decision-sheet with the blue-orange decisions)* and continue with this part *(point at the blue-green sheets)* and finally make your decision in this part *(point at the orange-green decision sheets)*. 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.

Once the respondent is done filling out the 12 sheets, continue with the following question:

Of the Taka 100 you received for this game, how much do you want to spend to make it more likely that your choices are implemented for your child? Nothing, Taka 10, Taka 20, Taka 30, Taka 40, or Taka 50? [ ] *(please enter amount spend)*

I.7 Matching of parents and children and payoffs

As described in the discussion of the experimental design in Section 2, only one decision in the experiment is actually paid out as determined by the roll of a 12-sided dice. Moreover, we randomly match parents to children, who potentially override the decisions of their children. Table I.2 illustrates the matching depending on the family structure and the roll of a 6-sided dice.[3]

After the matching, a 12-sided dice determines the decision sheet that is used to determine the final payoffs.

[3]The matching procedure depends on the family structure, i.e., the number of parents and children taking part in the experiments, and on the roll of a 6-sided dice. Importantly, both situations in which a child's own decisions are implemented as well as those in which one of the parents has the possibility to override the child's choices are implemented with positive probabilities.

Table I.2. Random matching of parents and children

Dice roll	Mother	Father	Child 1	Child 2
A. Family of one parent and one child				
Dice roll	Mother/Father		Child 1	
1	Own choices		Own choices	
2	Own choices		Own choices	
3	Own choices		Own choices	
4	Choices for C1		M/F's choices for C1	
5	Choices for C1		M/F's choices for C1	
6	Choices for C1		M/F's choices for C1	
B. Family of two parents and one child				
Dice roll	Mother	Father	Child 1	
1	Own choices	Own choices	Own choices	
2	Own choices	Own choices	Own choices	
3	Choices for C1	Own choices	M's choices for C1	
4	Choices for C1	Own choices	M's choices for C1	
5	Own choices	Choices for C1	F's choices for C1	
6	Own choices	Choices for C1	F's choices for C1	
C. Family of one parent and two children				
Dice roll	Mother/Father		Child 1	Child 2
1	Own choices		Own choices	Own choices
2	Own choices		Own choices	Own choices
3	Choices for C1		M/F's choices for C1	Own choices
4	Choices for C1		M/F's choices for C1	Own choices
5	Choices for C2		Own choices	M/F's choices for C2
6	Choices for C2		Own choices	M/F's choices for C2
D. Family of two parents and two children				
Dice roll	Mother	Father	Child 1	Child 2
1	Own choices	Choices for C1	F's choices for C1	Own choices
2	Own choices	Choices for C2	Own choices	F's choices for C2
3	Choices for C1	Own choices	M's choices for C1	Own choices
4	Choices for C2	Own choices	Own choices	M's choices for C2
5	Choices for C1	Choices for C2	M's choices for C1	F's choices for C2
6	Choices for C2	Choices for C1	F's choices for C1	M's choices for C2

Notes: This table illustrates the within household randomization and matching depending on the household structure. "Own choices" means that one of the respondent's own CTB decisions are paid out. "Choices for C1/C2" means that parents receive an endowment of 100 Taka, can spend up 50 Taka to increase the chance that their decisions are implemented for the children, and receive 1 star worth 20 Taka if their belief about one randomly chosen decision of the child is correct. "M/F's choices for C1/C2" means that child 1 or 2's own choices may be overruled by the respective parent's paternalistic choices, and one randomly determined decision sheet is paid out. Child 1 always refers to the older of the two children taking part in the experiment (or the only child).