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Nurturing the future: How positive parenting is related to children's skills and well-being

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Nurturing the Future: How Positive Parenting is Related to Children's Skills and Well-being

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October 2024

Abstract

We study the relationship between parenting style and a broad range of children's skills and outcomes. Based on survey and experimental data from 5,580 children and their parents, we find that children exposed to positive parenting have higher IQs, are more altruistic, open to new experiences, conscientious, and agreeable, have a higher locus of control, self-control, and self-esteem, perform better in scholarly achievement tests, behave more prosocially in everyday life, and are more satisfied with their life. Positive parenting is negatively associated with children's neuroticism, patience, engagement in risky behaviors, and their emotional and behavioral problems.

Keywords: parenting style, child outcomes, economic preferences, personality traits, IQ
JEL classification: C91, D01, D10

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1. Introduction

Children are deeply influenced by how their parents raise them (Kaufmann et al. 2000; Doepke and Zilibotti 2019). Parental investments affect children's formation of cognitive and non-cognitive skills, which has long-term consequences for the life outcomes of children, including their education, health, and labor market success (Cunha, Heckman, and Schennach 2010; Francesconi and Heckman 2016; Cobb-Clark, Salamanca, and Zhu 2019). Parenting styles are a key dimension of parental investments. Positive parenting styles—i.e., parenting styles characterized by supportive or affirmative attention and care—have been shown to have positive associations with health and well-being (Ranson and Urichuk 2008; Davids, Roman, and Leach 2017; Chen et al. 2019), fewer risky behaviors (Borawski et al. 2003), and academic achievement (Dornbusch et al. 1987; Pinquart 2016; Pinquart and Kauser 2018). Negative parenting styles—i.e., parenting styles predominantly characterized by parents behaving harshly towards their children and exerting control over them—are negatively associated with children's behavior and outcomes (Doepke and Zilibotti 2017).

Existing work from different disciplines has typically studied the relationship between parenting styles and a single or a few child outcomes (Aunola and Nurmi 2004; 2005; Chen et al. 2019; Dallaire et al. 2006; Dooley and Stewart 2006; Dornbusch et al. 1987; Lohaus, Vierhaus, and Ball 2009), building evidence piece by piece rather than looking at large sets of outcomes simultaneously within a unified framework. Such a piecewise approach, however, may overlook the scope that parenting styles can have regarding children's development as a whole and across many different dimensions, including cognitive and non-cognitive skills, and behavioral outcomes.

In this paper, we present an encompassing approach in which we relate parenting style to a uniquely large set of skills and outcomes of children. While maintaining a broad perspective, this large set allows us in particular to study children's cognitive and non-cognitive skills, rather than narrowly focusing on children's behavioral outcomes (which we still consider along the way). Our insights on skills can help to better understand why parenting style is related to child outcomes, as these are shaped by children's skills (Cunha, Heckman, and Schennach 2010; Cunha and Heckman 2008). Therefore, we believe it's important to examine how parenting styles are linked to the skill formation of children. As an additional distinctive feature, our sample is from a lower-middle income, developing country, i.e., Bangladesh. Despite the majority of the world's population living in non-WEIRD (western, educated, industrial, rich, and democratic) countries, only very few studies on the implications of parenting style have been conducted in these areas. Providing evidence on the link between parenting style and skill formation of children in relatively poorer regions of the world is particularly relevant since enhanced skills may help escaping poverty.

We use data from surveys and incentivized experiments with 5,580 children, aged 6 to 16, and their parents in Bangladesh to examine the relationship between parenting style and a very broad range of cognitive and non-cognitive skills, including IQ, time, risk, and social preferences as well as personality traits (Big Five, locus of control, self-control, and self-esteem). Our measure of parenting style covers five different dimensions: emotional warmth, monitoring, negative communication, psychological control, and strict control (Thönnissen et al. 2017). Applying linear discriminant analysis (LDA) reduces these parenting style dimensions to a binary classification that relates well to what the literature recurrently refers to as positive and negative parenting (Dallaire et al. 2006; Rodriguez, Ferguson, and Gonzalez

2022; Rauh and Renée 2023).[1] What we consequently term "positive parenting" shows positive correlations with emotional warmth and monitoring, and negative correlations with negative communication, psychological control, and strict control. We then analyze associations of positive parenting with a wide range of children's cognitive and non-cognitive skills. For a comprehensive picture, we additionally link parenting style to children's performance in objective achievement tests, their engagement in risky and prosocial behaviors in everyday life, emotional and behavioral problems, and life satisfaction.

We find that children of parents characterized by positive parenting have higher IQs, are more open to new experiences, conscientious, and agreeable, feel more in control of their lives, have higher self-esteem and self-control, more pronounced social preferences (i.e., are more altruistic), perform better in achievement tests at school (in math and Bangla, the country's language), behave more prosocially in everyday life, and are more satisfied with their lives. By contrast, positive parenting is negatively associated with neuroticism, patience, children's engagement in risky behaviors, as well as their emotional and behavioral problems.

Before proceeding with the description of our data and presentation of results, it is important to note that—given our cross-sectional setting—we refrain from making causal claims. Given that socio-economic disadvantage has been identified as a key determinant of parenting style (Cobb-Clark, Salamanca, and Zhu 2019), we control for family income and parental literacy throughout our analyses. Still, we cannot rule out that further unobservable factors may drive both children's skill development as well as their parents' way of parenting. Moreover, not only do parents influence children, but children's behavior may also induce parents to adapt their parenting style. This suggests that the analysis of the impact of (likely endogenous) changes in parenting style on changes in child outcomes in panel data may not be suitable to address the possibility of reverse causality either. Nevertheless, our results complement evidence from randomized interventions targeting parenting style that, if successful, are able to induce exogenous changes in parenting style (e.g., Hart, Newell, and Olsen 2003; Gertler et al. 2014; Hackworth et al. 2017; van IJzendoorn et al. 2023; Carneiro et al. 2024). These studies typically consider a limited set of outcomes over a small age range, assessing measures of parenting style, parental behaviors, or home environment alongside selected child outcomes such as their cognitive skills, socio-emotional development, problem behaviors, school attainment, involvement in conflicts, or later-life earnings. With our encompassing measures of skills and outcomes across a broad variety of domains and throughout the decisive developmental period of childhood and adolescence, we provide exceptionally comprehensive evidence on the relevance of parenting for children's lives. Jointly with earlier findings, this gives a more complete picture of parenting as a key parameter in human capital development.

2. Data

In this study, we use data from incentivized experiments and surveys with 5,580 children, aged 6 to 16 years, and their parents from 3,499 families in Bangladesh. The data were collected in four different districts across four administrative divisions of Bangladesh between March and May 2018. The sample consists of families from 150 randomly selected villages, with most families being randomly drawn via local elementary schools' class lists in 2018. Our data collection aimed at establishing a large sample of families in which we measure whole families'

[1] There exist different taxonomies of parenting style. One traditional classification in developmental psychology is differentiating between permissive parenting, authoritarian parenting, and authoritative parenting (Baumrind 1966; Doepke, Sorrenti, and Zilibotti 2019). Our measure of parenting style better maps into a binary classification of positive versus negative or non-positive parenting.

skills as comprehensively as possible. We elicited cognitive skills, economic preferences (time, risk, and social preferences), and personality traits of up to four household members. Mothers were surveyed regarding their parenting style and answered questions about their children's behavior. The household head (usually the father) participated in a general household survey which, among other things, measured general socio-economic information about the household. Trained interviewers visited each household to collect the data, manually on paper for the experimental modules, and else using electronic data collection tools on mobile tablets. Children and their parents were interviewed individually and separately at their homes to ensure independent responses. Our sample consists of 2,081 households in which two (out of at least two) children got interviewed and 1,418 households with only one interviewed child. Appendix Table A1 provides summary statistics on our sample.

2.1. Outcome measures: skills and behaviors

In the following, we will briefly describe all outcome measures for children's cognitive and non-cognitive skills and behaviors that we use in our study. Appendix Table A2 presents further details and summarizes the scales (and corresponding references). For our analyses, all outcome measures are standardized to have a mean of zero and a standard deviation of one for all available observations.

Cognitive skills. To measure children's fluid and crystallized IQ, which together form overall IQ (Cattell 1971), we used the standard progressive matrices, digit span, symbol search, and word similarities tests of the well-established Wechsler Intelligence Scale for Children (WISC-IV, see Wechsler 2003). Where necessary, the tests got adapted to the specific context of Bangladesh by local academics. These components are standardized and enter the aggregate IQ measure with equal weight.

Economic preferences. To measure their time, risk, and social preferences, all children participated in incentivized experiments, either using monetary values (Bangladeshi Taka) or the experimental currency *stars*. At the end of the experiments, stars were also exchanged into money and all incentives were proportional to average weekly pocket money at a given age.

Our measure of patience is composed of (i) the number of patient choices out of six decisions between smaller, sooner and larger, later rewards in the time preferences game (Bauer, Chytilová, and Morduch 2012) and (ii) a survey question that asked children how willing they are to give up something nice today in order to get something even nicer in the future (Falk et al. 2018).

The risk-taking measure consists of (i) a child's incentivized choice of one out of six lotteries, where higher-numbered lotteries (1–6) have both higher expected payoffs and a higher variance of payoffs (Bauer, Chytilová, and Morduch 2012) and (ii) the degree of agreement to the statement "I often take risks" (Falk et al. 2018).

For measuring altruism, we rely on four dictator games in which children had to divide stars between themselves and another, unknown child (Bauer, Chytilová, and Pertold-Gebicka 2014) and calculate the share of stars a child has given away. In each of the four choices (x,y), with x being the number of stars children kept for themselves and y being the number of stars given to the other child, one option was the allocation (1,1), while the alternative allocation benefited children differently ($y > x$ in two cases and $y < x$ in two cases).

For time and risk preferences, we first standardize both components of the respective measure, then obtain the mean, and standardize the overall measure again. This synthesis of lab-in-the-field and survey assessments of skills results in measures that reflect the underlying

skills' multi-dimensional nature and comprehensively characterize individuals (Falk et al. 2018; Kosse et al. 2020). Moreover, our approach reduces measurement error and potential demand effects (Hertwig and Ortmann 2001). For social preferences, we only draw on the experimental component which, however, encompasses four different games.

Personality traits. For younger children up to age 9, the Big Five personality traits were measured using ten items on an eleven-point scale, on which mothers ranked their child in comparison to other children of their age (Weinert et al. 2007). Older children (age 10 to 16) assessed themselves on a battery of 16 questions with a scale from one to five (Gerlitz and Schupp 2005).

We elicited children's locus of control (Rotter 1966), the extent to which they feel being in control over the outcome of events in their life, by asking children to rate five items on a five-point scale. To elicit self-control levels for children aged 6 to 11, mothers answered eight items on impulsivity on a five-point scale (Tsukayama, Duckworth, and Kim 2013). Older children, aged 12 to 16, responded to a 13-item index on a five-point scale to measure their self-control (Tangney, Baumeister, and Boone 2004). Self-esteem was measured for children aged 9 to 16 using a four-point scale where children rated themselves on ten statements concerning how they view their qualities and self-worth (Rosenberg 1965). For children younger than 9 years, no self-esteem module was implemented.

To construct the personality indices for the Big Five traits, locus of control, self-control, and self-esteem, items of the respective scales were added and the resulting scores standardized across all available observations. If measures were elicited separately for different ages, each scale was first standardized within the younger or older age groups, then combined, and standardized again across all ages.

Behavioral outcomes. In order to elicit an objective measure of children's educational attainment, we conducted achievement tests in the primary schools of our sample at the end of the school year in 2019. The tests were developed in cooperation with local education professionals and assessed math and Bangla (the country's language) skills as covered by the national curriculum. Our achievement test measure is a composite score that spans both subjects, math and Bangla, which each contain two test components, a multiple-choice and a written-answers part. We first separately standardize the two subjects' total scores, take the average, and standardize the overall score again.

For children aged 10 to 16, we measured risky behaviors in everyday life by an index constructed from responses to how frequently a child takes risks in 16 situations that are characteristic for rural Bangladesh (e.g., "Do you jump from a tree/a bridge into a river or canal?" or "Do you often get into physical fights?"). The set of questions was developed in focus group discussions with respondents similar to our sample and pre-tested in villages similar to the villages in our sample.

We used the well-established Strengths and Difficulties Questionnaire (SDQ; R. Goodman 1997; R. Goodman, Renfrew, and Mullick 2000; A. Goodman, Lamping, and Ploubidis 2010; Briole, Le Forner, and Lepinteur 2020) to measure emotional and behavioral problems. The full SDQ score comprises four subscales which are further broken down into "internalizing" (indicating emotional and peer problems) and "externalizing" (indicating hyperactivity and conduct problems) behaviors. The SDQ also contains a stand-alone prosociality scale to measure the extent to which children interact with others in a cooperative way in their daily routine (R. Goodman 1997; R. Goodman, Renfrew, and Mullick 2000).

Happiness (or life satisfaction) was elicited by asking “How happy are you most of the time?” on a visual Likert scale with five smiley faces from “very unhappy” to “very happy” (Falk et al. 2018).

2.2. Parenting style measure

Mothers answered a survey module regarding their parenting style. They rated items such as “I use words and gestures to show my child that I love her/him,” “I talk to my child about things s/he has done, seen, or experienced when s/he was out,” or “I shout at my child when s/he did something wrong” on a five-point scale from “never” to “very frequently.” The appendix contains the complete list of items. The items are combined into five scales based on three items each indicating the degree to which mothers’ parenting style is characterized by emotional warmth, monitoring, negative communication, psychological control, and strict control (Thönnissen et al. 2017). According to official scale descriptions, emotional warmth and monitoring refer to the degrees of affirmative attention and care in parenting as well as to how well parents are informed about their child’s activities and social contacts. Negative communication, psychological control, and strict control assess parents’ negative intrusive thoughts, feelings, and behavior toward their child, and how much they employ harsh control and authoritarian behavior. Mothers rated the items at the family level, once for all their children. Children from the same household hence have identical values for parenting style.

2.3. Positive parenting categorization based on linear discriminant analysis (LDA)

Before we link parenting style to outcomes, we use linear discriminant analysis (LDA) for dimensionality reduction of the five scales. This leads to a binary classification of mother-child observations: while one group exhibits higher levels of emotional warmth and monitoring and lower levels of negative communication, psychological control, and strict control, the other group shows opposite behavior. Following these descriptions, we term our classification positive versus negative parenting.[2] We have a similar number of observations within each parenting category. Since linear discriminant analysis is rarely used in economics, we are providing more details about the method here in the main text rather than simply relegating it to an appendix.

LDA is a supervised learning model commonly applied to reduce dimensionality. In general, discriminant analysis is a classificatory technique (Fisher 1936) that is used to classify cases or observations into pre-existing groups based on similarities between that case and the other cases belonging to the respective group. As a supervised learning model, LDA is based on a priori knowledge about the classification being formed: class-labeled data are provided and the algorithm maximizes the difference between these classes. We use a median split in monthly household income as the supervising class since previous research has documented a link between parenting style and income and/or socio-economic status as a combination of income and parental education (Cobb-Clark, Salamanca, and Zhu 2019; Barrera et al. 2002; Lee et al. 2009; Ponnet et al. 2016). It seems plausible that high income allows parents to allocate more attention, material and cognitive resources to parenting with more and richer exchanges between parent and child, while low family income may be associated with

[2] In psychology, there is ongoing discussion whether and how much supportive-positive and harsh-negative parenting behavior may overlap and interact (Dallaire et al. 2006; Rodriguez, Ferguson, and Gonzalez 2022). With our approach, observations are classified as positive [negative] according to their tendency to show both high [low] levels of warm/supportive-positive parenting behavior and low [high] levels of harsh/coercive-negative parenting behavior.

increased parental stress or conflicts within the family, leading to negative parenting behaviors. Moreover, the family stress model emphasizes that economic hardship directly impacts parenting competency (Kim and Chung 2021).[3]

The goal of LDA is to classify observations as clearly as possible according to underlying groups. That is, we aim at classifying child observations based on the parenting style data according to whether they belong to a positive or a negative parenting group. LDA assumes that groups or classes are linearly separable and creates a multiple linear discriminant function (which represents hyperplanes in the feature space) to distinguish classes. If there are two classes, as in our setting, LDA draws one hyperplane and projects the data onto this hyperplane in such a way that the separation of the two classes is maximized by maximizing the ratio of the between-class variance and the within-class variance (Mohanty et al. 2013; Vaibhaw and Pattnaik 2020).[4]

The linear discriminant function that links the independent variables (parenting style dimensions) to the binary parenting style classification is given by:

$$D = \phi_1 x_1 + \phi_2 x_2 + \ldots + \phi_n x_n \qquad \text{(eq. 1)}$$

D is the discriminant score, ϕ_n are model coefficients, and x_n are the measurements of independent variables. Classification of observations is done based on their discriminant scores.

LDA searches for coefficients (i.e., linear combinations of parenting style dimensions or new data axes) that maximize the linear score function. This linear score function comprises the two simultaneous goals of LDA of maximizing the group differences (between-class scatter) and minimizing the variance (within-class scatter) for optimal separation. It is given by:

$$S(\phi) = \frac{(\phi' \mu_1 - \phi' \mu_2)^2}{\phi' \sum \phi} \qquad \text{(eq. 2)}$$

where

μ_1 = (parenting style data) means of the group with below-median income,
μ_2 = (parenting style data) means of the group with above-median income,
$\sum$ = pooled variance-covariance matrix,
ϕ' = transpose of ϕ (vector of model coefficients).

LDA uses the linear discriminant function to obtain the classification rule. It stratifies the sample units (mother-child pairs) into two classes that are clustered on different sides of the separating hyperplane. In the appendix (section LDA assumptions), we state the model assumptions of LDA and provide empirical tests to demonstrate that they are largely met by our data.

[3] A further rationale for using household income as the supervising variable is that household income has been linked to children's cognitive and non-cognitive skills as well as behavioral outcomes (Fletcher 2010; Noonan, Burns, and Violato 2018). However, income obviously does not capture all parental inputs (Anger and Schnitzlein 2017), calling for the investigation of further family characteristics such as parenting style.

[4] Principal component analysis (PCA) is another prominent dimensionality-reduction method that also aims at reducing the number of variables of a data set, while preserving as much information as possible. Contrary to LDA, PCA is an unsupervised linear transformation technique that ignores classes, i.e., it is a clustering method in contrast to a classification method. PCA has no discriminatory power and does not take into account whether a dataset represents features from one or more classes. Applying PCA, the interpretation of associations of principal components with outcome variables is not as clear-cut as with the LDA approach.

Table 1column (1) contains the unstandardized discriminant function coefficients for the LDA (ϕ, see equation 2). The structure matrix, displayed in column (2), is a transpose of the first column and gives the correlations between the values of the independent variables and those of the discriminant function. These correlations are like factor loadings in factor analysis. One can understand how to interpret a discriminant function by identifying the largest absolute correlation associated with it. Variables with higher values in the structure matrix play a more significant role in the discriminant function analysis. The last column gives pairwise correlations between the parenting style dimensions and the new classification.

Table 1: Canonical discriminant function coefficients, structure matrix, and pairwise correlations of parenting style classes and underlying dimensions

	(1)	(2)	(3)
	CDF coefficients	Structure matrix	Pairwise correlations
Emotional warmth	-0.101	-0.288	0.256
Monitoring	-0.670	-0.506	0.392
Negative communication	0.690	0.704	-0.565
Psychological control	0.277	0.424	-0.362
Strict control	0.086	0.331	-0.290
Constant	0.000		

NOTES: Table displays the unstandardized LDA canonical discriminant function (CDF) coefficients in column (1), the structure matrix in column (2), and the pairwise correlation coefficients between the parenting style dimensions and the new parenting style classification where 1 = positive parenting and 0 = negative parenting in column (3).

LDA successfully separates our data into two different categories that can be predicted by the five measured parenting style dimensions. This separation has a straightforward interpretation as positive versus negative or non-positive parenting, as is supported by the correlations displayed in Table 1: positive parenting is positively associated with emotional warmth and monitoring, and negatively associated with negative communication, psychological control, and strict control.

Table 2 shows how the LDA classification of positive and negative parenting relates to the income groups used as inputs for the LDA.[5] The LDA classification substantially deviates from the income classes and thus contains and uses information (from the parenting style dimensions) that go beyond the classification of families according to income.[6]

Table 2: Income categories and categorization based on LDA

	Classified

[5] In order to check model accuracy, we also created a random 80:20 data split to create training and testing data. We repeat the LDA over ten iterations and use a support-vector machine classifier to test model accuracy. The data is presented in the visual matrix in appendix Figure A2 which demonstrates that the model is able to correctly predict the binary parenting categories of observations with parenting style data only.

[6] This is also supported by a direct mapping of income into our outcome variables in appendix Table A8. This mapping is far less predictive, both in terms of effect sizes and significance, than the one in Table 3.

Income category	**0 (neg. parenting)**	**1 (pos. parenting)**	Total
0 (low)	1,460	1,330	2,790
	52.33%	47.67%	100%
1 (high)	1,249	1,541	2,790
	44.77%	55.23%	100%
Total	2,709	2,871	5,580
	48.55%	51.45%	100%

NOTES: The table shows a comparison of the median split by monthly income (table rows: p50 and above = 1, below = 0) and the split that results from the LDA classification (table columns) which is based on the five parenting style dimensions.

3. Empirical Strategy

We estimate the following OLS regressions model:

$$y_{if} = \alpha + \beta_P P_{if} + \phi_X X_{if} + \sigma_H H_f + \lambda_{if} + \varepsilon_{if} \text{ (eq. 3)}$$

where y_{if} is the outcome of child i in family f, P_{if} is the positive parenting style indicator variable, X_{if} is a vector of control variables (gender and number of siblings) and H_f is a vector of household socio-demographics (family income, literacy of father, literacy of mother). λ_{if} is a vector of district and age fixed effects and ε_{if} is the idiosyncratic error term. Standard errors are clustered at the village level. To correct for multiple hypothesis testing, we are implementing sharpened two-stage *q*-values.[7] Our main results refer to specifications in which children of all ages are pooled together. The sample is also split in younger and older children (aged 6 to 9 years and 10 to 16 years, respectively) to check for age-group specific effects. For this, outcomes are standardized separately for younger and older children.

4. Results

Table 3 displays our main results that rely on separate OLS regressions for each dependent variable listed in the left-most column on the binary, LDA-based indicator of positive parenting and control variables. The second column reports the estimated coefficients of positive parenting, the third column illustrates their relative effect sizes with a bar (blue for negative effects, green for positive effects). To account for multiple hypothesis testing, we not only show conventional standard errors in column (3) and significance levels illustrated by stars in column (1), but also false discovery rate adjusted *q*-values in column (5). The underlying full regression results are presented in the appendix, see Tables A9 to A13.

Table 3: Child outcomes and positive parenting for children aged 6 to 16

	(1)	(2)	(3)	(4)	(5)	(6)

[7] See Anderson (2008) for the application of adjusted *p*-values using False Discovery Rate (FDR) as per Benjamini, Krieger, and Yekutieli (2006). The FDR is the expected proportion of rejections that are type I errors (false rejections).

	positive parenting				
	Coefficient	SE	Adj. R^2	*q*-value	Obs.
Cognitive skills					
IQ	0.111***	(0.029)	0.397	0.001	5,580
Non-cognitive skills					
Economic preferences					
patience	-0.085**	(0.037)	0.003	0.011	4,964
risk-taking	-0.078**	(0.038)	0.020	0.015	5,167
altruism	0.073**	(0.033)	0.005	0.011	5,367
Personality traits					
Big Five openness	0.300***	(0.036)	0.049	0.001	5,517
Big Five conscientiousness	0.361***	(0.035)	0.059	0.001	5,517
Big Five extraversion	0.044	(0.030)	0.047	0.033	5,517
Big Five agreeableness	0.402***	(0.035)	0.056	0.001	5,517
Big Five neuroticism	-0.289***	(0.036)	0.035	0.001	5,517
locus of control	0.237***	(0.041)	0.042	0.001	5,580
self-control	0.445***	(0.045)	0.088	0.001	5,502
self-esteem	0.381***	(0.044)	0.124	0.001	3,970
Behavioral outcomes					
achievement test score	0.152**	(0.073)	0.160	0.015	682
risky behaviors	-0.200***	(0.040)	0.253	0.001	3,193
prosociality	0.398***	(0.043)	0.072	0.001	5,409
SDQ internalizing behavior	-0.437***	(0.047)	0.098	0.001	5,409
SDQ externalizing behavior	-0.495***	(0.045)	0.128	0.001	5,409
happiness	0.075**	(0.033)	0.028	0.011	5,580

NOTES: The table shows results for separate OLS regressions of child outcomes (stated in the left-most column, all standardized) on parenting style for children aged 6 to 16. Column (1) shows coefficients for the LDA-based, binary parenting style measure (1 = positive parenting, 0 = non-positive or negative parenting). Column (2) visualizes effect sizes. Column (3) shows conventional standard errors, column (4) the regressions' adjusted R^2, and column (6) the number of observations. To address multiple hypothesis testing, column (5) displays false discovery rate adjusted *q*-values. Control variables include gender, age fixed effects, number of siblings, monthly family income, literacy of father, literacy of mother, and district fixed effects. Standard errors are clustered at the village level. Significance at *p<0.10, **p<0.05, ***p<0.01.

4.1. Cognitive skills

Children raised with positive as opposed to negative parenting have significantly higher IQs, with an effect size of about 11 percent of a standard deviation ($p < 0.01$). Empirical evidence specifically linking parenting style and cognitive skills is scarce. However, our finding is in line with related work documenting, e.g., a positive relationship between children's cognitive skills and the time parents spend with their children on educational activities (Fiorini and Keane 2014). Our finding also relates to reported positive associations between parental involvement and academic achievement of children (Pinquart 2016). Splitting the sample into younger (6 to 9 years) and older (10 to 16 years) children reveals slightly larger effect sizes for younger than for older ages (16 compared to 11 percent of a standard deviation; see appendix Tables A6 and A7). This observation is consistent with younger ages being so-called sensitive periods for

the acquisition of cognitive skills (Cunha and Heckman 2008), during which returns to investments are particularly high (Cunha and Heckman 2007).

4.2. Non-cognitive skills

Economic preferences. We provide novel evidence that positive parenting is also associated with children's economic preferences. Children from families who adopt a positive parenting style are more altruistic (by 7 percent of a standard deviation, $p < 0.05$). Positive parenting is negatively related to children's risk-taking (8 percent of a standard deviation, $p < 0.05$) and patience (9 percent of a standard deviation, $p < 0.05$). The results on altruism and patience are stronger for older children, the results on risk-attitudes for younger ones (see appendix Tables A6 and A7). The finding on patience may seem surprising in comparison to WEIRD countries where more parental involvement is typically associated with a higher degree of patience in children (Falk et al. 2021). However, this result resembles evidence from an unrelated study from Bangladesh (Kiessling et al. 2021) on parental paternalism, where positive parenting has been found to be positively correlated with parental paternalism (measured by the extent to which parents interfere in the decision-making of their children). More paternalistic parents made fewer patient choices for their children and had less patient children, indirectly establishing the same negative link between positive parenting and children's patience as we find here.

Personality traits. Parenting style is connected with children's personality traits. Among the five dimensions captured by the Big Five, openness, conscientiousness, and agreeableness are all significantly positively associated with positive parenting (in the range of 30 to 40 percent of a standard deviation, $p < 0.01$), neuroticism has a negative relationship (in the order of 29 percent of a standard deviation, $p < 0.01$). Only for extraversion, we find no significant coefficient for parenting in the overall sample. Interestingly, this is driven by two offsetting, heterogeneous effects: the coefficient turns significantly negative if we only consider the sample of younger children (in appendix Table A6, $\beta = -0.279$, $p < 0.01$), and significantly positive for the sample of older children (appendix Table A7, $\beta = 0.276$, $p < 0.01$). Positive parenting is also significantly positively associated with children feeling more in control of their life (24 percent of a standard deviation, $p < 0.01$), as well as with children's self-control (45 percent of a standard deviation, $p < 0.01$) and self-esteem (38 percent of a standard deviation, $p < 0.01$).

4.3. Behavioral outcomes

Positive parenting is associated with better performance in objective achievement tests in primary school in math and Bangla, the country's language (15 percent of a standard deviation for a composite score of both subjects, $p < 0.05$). This goes well together with the positive relationship between parental involvement and children's academic achievement (Pinquart 2016) as well as with associations of respectful parenting with positive educational outcomes of youths (Cobb-Clark, Salamanca, and Zhu 2019).

Furthermore, risky behaviors are less often (20 percent of a standard deviation, $p < 0.01$) and prosocial behaviors (like helping others or sharing) are more frequently observed with positive parenting (40 percent of a standard deviation, $p < 0.01$). In a similar vein, respectful and monitoring parenting have been found to be related to fewer risky behaviors of youths (Cobb-Clark, Salamanca, and Zhu 2019).

Children raised with positive parenting styles have fewer emotional and behavioral problems, as measured by the Strength and Difficulties Questionnaire (SDQ) scores for internalizing and

externalizing behavior; positive parenting goes along with more than 44 to 50 percent of a standard deviation ($p < 0.01$) lower levels of problems; for related findings, see Fiorini and Keane (2014). Finally, positive parenting and children's happiness are positively associated (8 percent of a standard deviation, $p < 0.05$).

5. Conclusion

Parenting has been recognized as an essential contributor to the skills, health, and well-being of children (Cobb-Clark, Salamanca, and Zhu 2019; Doepke, Sorrenti, and Zilibotti 2019). Despite the existence of numerous drivers of the life outcomes of young people—among them their peers, teachers, and the neighborhood environment—the way children are raised and treated by their parents is key.

This study adds to the empirical evidence on the prime importance of parenting style for a wide range of children's skills and behaviors. Contrary to previous studies, we relate parenting to an extraordinarily broad range of outcomes at the same time to provide a particularly comprehensive perspective on the role of parenting. After condensing five different dimensions of parenting style through a linear discriminant analysis into a binary variable of positive parenting (that loads on emotional warmth and monitoring, but in the opposite direction on negative communication, psychological control, and strict control), we find persistent patterns. Positive parenting has significant associations with a plethora of cognitive and non-cognitive skills, as well as behavioral outcomes of children. All of these variables have been shown to influence children's later life outcomes as adults (Golsteyn, Grönqvist, and Lindahl 2014; Falk et al. 2018; Kosse and Tincani 2020). While the relationship between positive parenting and each of these variables individually may be considered to be of minor importance for a child's later life, the persistent pattern of positive parenting being related to so many skills and behavioral outcomes at once is very likely to leave a lasting imprint on a child's life. This makes our encompassing results so important. Furthermore, if skills cross-fertilize each other (Cunha and Heckman 2007), single effects may reinforce each other and therefore have an even larger joint effect in the longer run.

Given our cross-sectional setting, we abstain from making any causal claims. However, with our uniquely large set of skills and outcomes, we provide evidence that positive parenting is strongly linked to better skills and outcomes of children, suggesting that positive parenting can improve children's lives. If this was the case, this link may be particularly important in poorer countries (like Bangladesh), where material investments of parents are often scarce, but good parenting may still positively affect children's skill formation and emotional stability, which may ultimately help in fighting poverty.

Overall, our study results emphasize the deep connection between parenting style and the development of children across various ages. If parenting style enters the human capital production function as an input factor (Cobb-Clark, Salamanca, and Zhu 2019; Carneiro et al. 2024), this has immediate policy implications as parenting styles can be molded (Carneiro et al. 2024), e.g., for better health outcomes of children (Davids, Roman, and Leach 2017; Chen et al. 2019) or to improve their prosociality (Cappelen et al. 2020). In addition to addressing parenting style directly, our findings also stress the importance of parents for the development of their children more generally—an insight with obvious implications for labor market policies. Understanding that parenting is crucial for child development may provide a push for the formulation of labor market policies that reduce parental stress, for example, by allowing for flexible working hours or reducing the number of unplanned meetings. A reduction in stress

has been found to have positive effects on parenting style (Neece 2014; Parent et al. 2016) and may, through this channel, improve the development and life outcomes of children.

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Online Appendix A: Data

Table A1: Summary statistics

	Mean	SD	Min.	Max.	Obs.
Socio-economic characteristics					
female	0.517		0	1	5,580
age (in years)	10.292	2.631	6	16	5,580
number of siblings	2.503	1.446	0	10	5,580
monthly income (in Taka)	16,435	27,190	-140,053	856,575	5,580
father's literacy	0.551		0	1	5,580
mother's literacy	0.654		0	1	5,580
Cognitive skills					
IQ	0	1	-2.947	4.807	5,580
Non-cognitive skills					
Economic preferences					
patience	0	1	-1.995	1.975	4,964
risk-taking	0	1	-2.488	2.079	5,167
altruism	0	1	-2.589	1.539	5,367
Personality traits					
Big Five openness	0	1	-3.633	1.915	5,517
Big Five conscientiousness	0	1	-3.562	1.547	5,517
Big Five extraversion	0	1	-3.713	2.364	5,517
Big Five agreeableness	0	1	-3.959	1.942	5,517
Big Five neuroticism	0	1	-1.657	3.672	5,517
locus of control	0	1	-4.190	1.977	5,580
self-control	0	1	-4.179	2.292	5,502
self-esteem	0	1	-4.222	2.324	3,970
Behavioral outcomes					
achievement test score (math/Bangla)	0	1	-3.349	1.719	682
risky behaviors	0	1	-1.168	3.827	3,193
prosociality	0	1	-2.848	1.557	5,409
SDQ internalizing behavior	0	1	-1.992	4.103	5,409
SDQ externalizing behavior	0	1	-1.830	4.000	5,409
happiness	0	1	-5.230	0.669	5,580

NOTES: The table provides summary statistics for the sample of this study (children for whom parenting style variables, income information, and all control variables are available: N = 5,580). Total income values can be negative, if, for example, costs in agricultural businesses such as labor or feedings costs have been higher than income. Skills and behavioral outcomes are standardized to a mean of zero and standard deviation of one across available observations. Observations vary among variables due to measures being elicited for different age groups or from different sources (children themselves versus mothers about their children). For economic preferences, we drop children who did not understand the games after possibly repeated explanations by the interviewer, according to a set of control questions.

Table A2: Outcome measures

Outcome	Components	Scale	Resp.	Standardization	Source
IQ	fluid IQ and crystallized IQ	WISC-IV modified for local context	children	across all ages	Wechsler (2003)
patience	number of patient choices	out of 6 incentivized choices	children	standardized mean of two standardized components across all ages	Bauer, Chytilová, and Morduch (2012)
	question on time preferences	Likert-scale (5-point)	children		Falk et al. (2018), GPS, modified
risk-taking	choice of gamble	out of 6 incentivized gambles	children	standardized mean of two standardized components across all ages	Binswanger (1980); Bauer, Chytilová, and Morduch (2012)
	question on risk preferences	Likert-scale (5-point)	children		Falk et al. (2018), GPS, modified
altruism	share of stars given to other child	across 4 incentivized games	children	across all ages	Fehr, Bernhard, and Rockenbach (2008); Bauer, Chytilová, and Pertold-Gebicka (2014)
Big Five (age 6-9)	10-item questionnaire	Likert-scale (11-point)	mothers	first within age groups, then across all ages	Weinert et al. (2007)
Big Five (age 10-16)	16-item questionnaire	Likert-scale (5-point)	children		Gerlitz and Schupp (2005)
locus of control	5-item questionnaire	Likert-scale (5-point)	children	across all ages	Rotter (1966)
(composite) achievement test score (math/Bangla; grades 2-5)	composite score of multiple-choice and written-answer tests for the two subjects	30 points for math in total, 50 points for Bangla in total	children	standardized mean of two standardized subject scores across primary school age group	developed by local education professionals with respect to school curriculum
self-control (age 6-11)	8-item questionnaire	Likert-scale (5-point)	mothers	first within age groups, then across all ages	Tsukayama, Duckworth, and Kim (2013)
self-control (age 12-16)	13-item questionnaire	Likert-scale (5-point)	children		Tangney, Baumeister, and Boone (2004)
self-esteem (age 9-16)	10-item questionnaire	Likert-scale (5-point)	children	across age group	Rosenberg (1965)
risky behaviors (age 10-16)	16-item index of risky behaviors	yes/no	children	across age group	developed by authors, building on local focus group discussions

prosociality	5-item subscale of SDQ on prosociality	Likert-scale (3-point)	mothers	across all ages	R. Goodman (1997)
SDQ internalizing behaviors	5-item subscales on emotional problems and peer problems	Likert-scale (3-point)	mothers	across all ages	R. Goodman (1997); A. Goodman, Lamping, and Ploubidis (2010)
SDQ externalizing behaviors	5-item subscales on hyperactivity and conduct problems	Likert-scale (3-point)	mothers	across all ages	R. Goodman (1997); A. Goodman, Lamping, and Ploubidis (2010)
happiness	question on general happiness	visual Likert-scale (5-point)	children	across all ages	Falk et al. (2018), GPS, modified

NOTES: Table summarizes outcome measures used. Detailed instructions and lists of items are available from the authors upon request.

Parenting style

Items

Mothers rated 18 items on a five-point scale, stating the frequency of different actions (ranging from “never” to “very frequently”). The items were answered once for each household such that values are identical for siblings. The 18 items are combined into six scales (three items per scale), indicating for each mother how much her parenting style is characterized by emotional warmth, monitoring, negative communication, psychological control, strict control, and inconsistent parenting (Thönnissen et al. 2017).

Emotional warmth encompasses the degree of affirmative attention and care in parenting. Monitoring refers to how well parents are informed about activities and social contacts of their child. Negative communication indicates the degree of negative behavior of parents towards their child. Psychological control assesses parents’ negative intrusive thoughts, feelings, and behaviors towards their child with parents potentially building up psychological pressure. Strict control measures how rigorously and harshly parents interact with their child. Inconsistent parenting points to inconsistencies in parents’ behavior when bringing up their children.

Emotional warmth.

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

Monitoring.

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

Negative communication.

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

Psychological control.

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

Strict control.

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

Inconsistent parenting.[8]

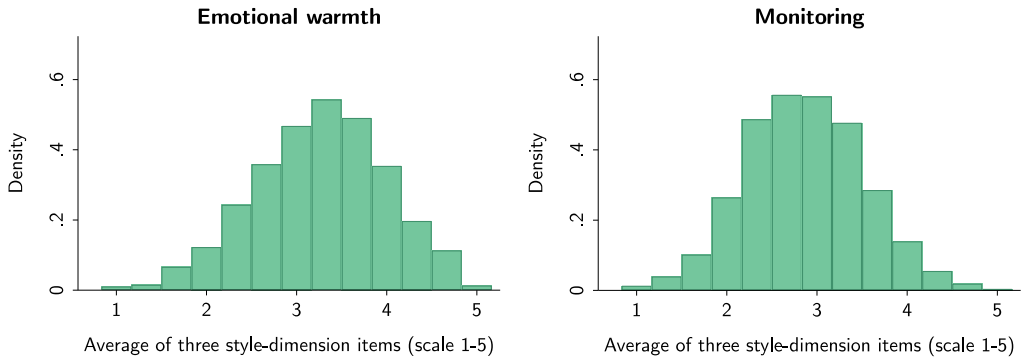
1) I threaten my child with punishment, but don’t actually follow through with it.
2) I reduce punishments or lift them ahead of time.
3) It is hard for me to be consistent in my childrearing.

[8] Due to translation issues, the dimension “inconsistent parenting” is reduced to item 3. The translation of the other two items into Bengali did not convey their intended meaning. As a consequence, we drop the inconsistent parenting scale from our analyses.

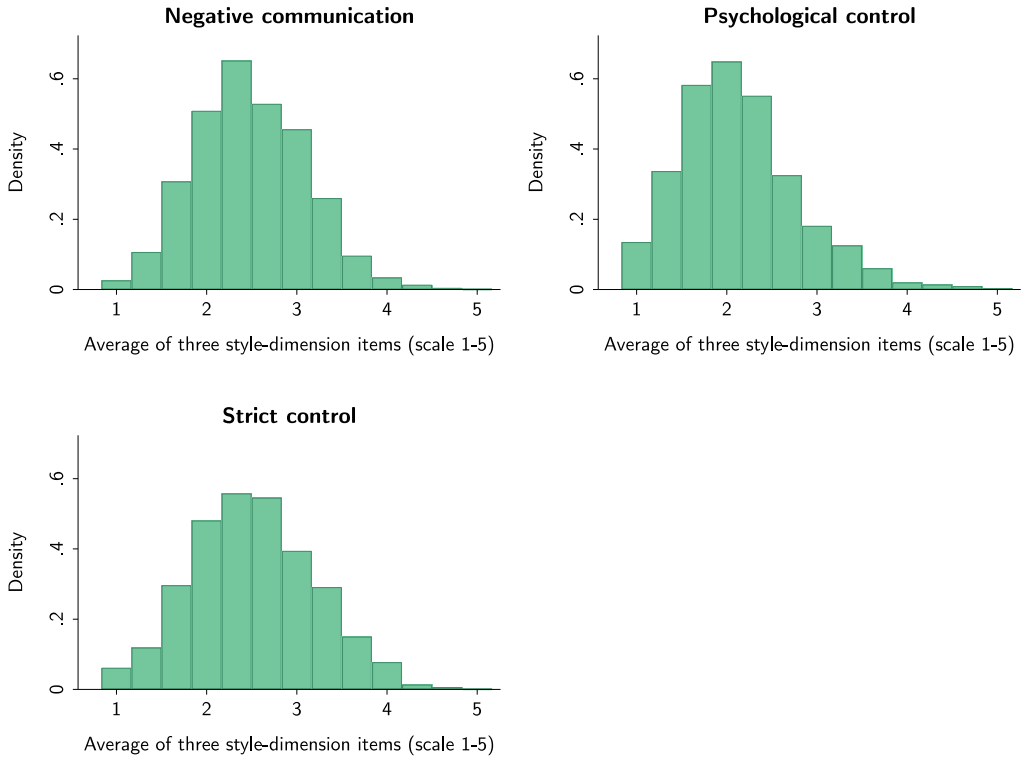
Distributions

Figure A1: Distributions of parenting style dimensions

Positive parenting



Negative parenting



NOTES: The figures above show the distributions (histograms, all with N = 5,580) of the five components of parenting styles: emotional warmth, monitoring, negative communication, psychological control, and strict control.

Appendix B: Linear discriminant analysis

LDA assumptions

In the following, we state and empirically test the model assumptions of LDA.[9]

Assumption 1. Means of the independent variables are significantly different across the two groups.

In our application of LDA, the parenting style dimensions are the independent variables. Table A3 summarizes the standardized parenting style data for the two income groups. The low-income group shows lower means for the positive parenting style dimensions (emotional warmth and monitoring) and higher means for the negative parenting style dimensions (negative communication, psychological control, and strict control) than the high-income group. Tests of equality of group means confirm that parenting style dimensions differ significantly in the two income groups, with all *p*-values < 0.1 and three out of five *p*-values < 0.01.

Table A3: Income group descriptive statistics

Income group		Emotional warmth	Monitoring	Negative commun.	Psych. control	Strict control
	Obs.	2,790	2,790	2,790	2,790	2,790
Low	Mean	3.249	2.837	2.522	2.161	2.538
	Std. dev.	0.721	0.653	0.616	0.675	0.693
	Obs.	2,790	2,790	2,790	2,790	2,790
High	Mean	3.285	2.895	2.447	2.112	2.498
	Std. dev.	0.746	0.675	0.625	0.660	0.686
Test of equality of group means						
	p-value	0.0636	0.001	0.000	0.006	0.033

NOTES: The table shows descriptive statistics for each of the parenting style dimensions corresponding to the income categories. The low-income category is composed of those households that have less than median monthly income. The lower panel displays *p*-values for tests of equality of group means for the different parenting style dimensions.

Assumption 2. The independent variables from the groups have a common variance-covariance matrix, i.e., equal group covariances.

We perform the Box's M test of homogeneous covariance matrices. With *p*-values < 0.05, we reject the null hypothesis that there exist homogeneous covariance matrices of the parenting styles by the two income groups. However, LDA is not overly sensitive to heterogeneous covariance matrices (Melton 1963).

Assumption 3. The independent variables are not highly correlated.

[9] Some literature on LDA (e.g., Lachenbruch and Goldstein 1979, as an early contribution) lists independent sampling of observations as a fifth assumption. Families in our data are sampled independently, yet, siblings within families (who also have the same values for parenting style) are drawn together. Running the LDA on family level leads to an identical classification of individual observations into positive and negative parenting.

Table A4shows the pairwise correlations between the parenting style dimensions that are low to moderate (all below 0.5). As expected, the two dimensions of “warm” parenting as well as the three dimensions of “negative” parenting show higher correlations within than across these two categories.

Table A4: Pairwise correlations between parenting style dimensions

	Emotional warmth	Monitoring	Negative commun.	Psych. control	Strict control
Emotional warmth	1				
Monitoring	0.366	1			
Negative communication	0.074	0.174	1		
Psychological control	0.002	0.210	0.371	1	
Strict control	0.050	0.227	0.426	0.394	1

NOTES: Displayed are Pearson correlation coefficients. Observations for all pairs: 5,580. Correlations are significant at the 1 percent level, except for emotional warmth and psychological control (not significant).

Assumption 4. The independent variables are normally distributed.

Table A5 shows the results of a test for normality of the parenting style dimensions based on skewness and kurtosis. As *p*-values < 0.05, we reject the null hypothesis that the parenting style dimensions are normally distributed. However, visual inspection of the distributions of the five parenting style dimensions in Figure A1 reveals no large divergence from normality.

Table A5: Skewness and kurtosis test for normality

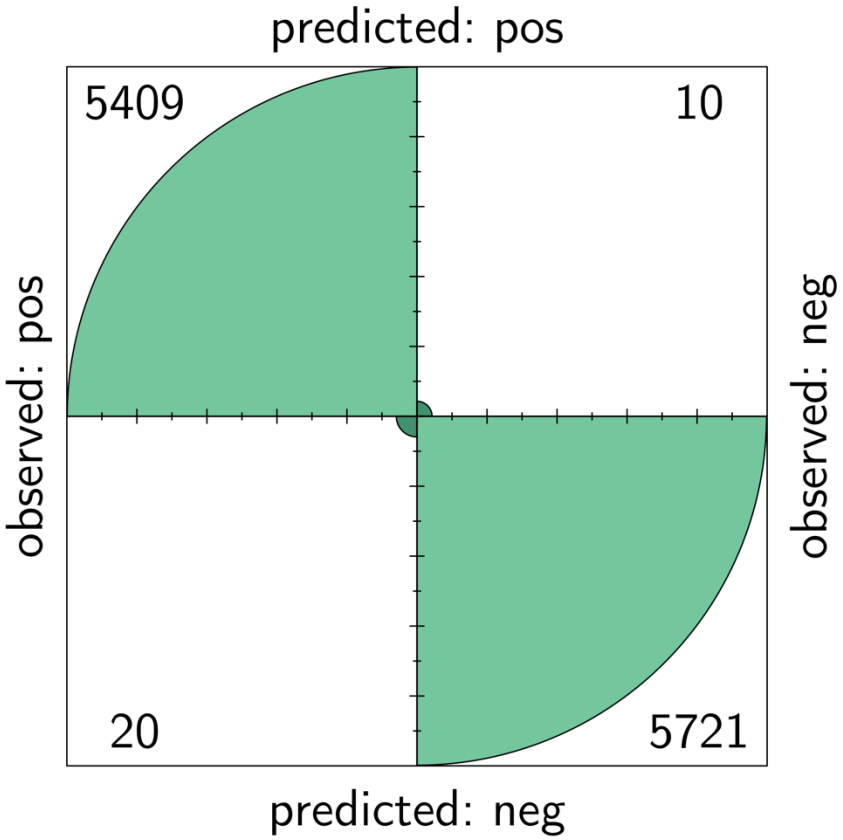
	Skewness	Kurtosis	*p*-value
Emotional warmth	0.000	0.000	0.000
Monitoring	0.013	0.166	0.018
Negative communication	0.000	0.873	0.000
Psychological control	0.000	0.000	0.000
Strict control	0.000	0.000	0.000

NOTES: The table displays results from skewness and kurtosis tests for normality of parenting style dimensions. The last column shows the respective *p*-value of a combined test with the null hypothesis of normality.

In sum, our data largely fulfill the assumptions for LDA to be applied.

LDA accuracy

Figure A2: Accuracy of linear discriminant analysis (LDA)



NOTES: The matrix above shows the accuracy of the linear discriminant analysis using a support-vector machine model. The light green areas show instances where the model was correctly specified, dark green areas show instances where the model was incorrectly specified for the data. The visualized results rely on a random 20 percent split of the data (testing set), over 10 iterations. 80 percent of the data was used as the training set in each iteration.

Appendix C: Additional results

Table A6: Child outcomes and positive parenting for children aged 6 to 9

	(1)	(2)	(3)	(4)	(5)
	positive parenting				
	Coeff.	SE	Adj. R^2	*q*-value	Obs.
Cognitive skills					
IQ	0.157***	(0.047)	0.224	0.001	2,373
Non-cognitive skills					
Economic preferences					
patience	-0.075	(0.050)	0.004	0.036	2,059
risk-taking	-0.096*	(0.050)	0.008	0.017	2,159
altruism	0.059	(0.048)	0.010	0.055	2,256
Personality traits					
Big Five openness	0.336***	(0.050)	0.058	0.001	2,324
Big Five conscientiousness	0.379***	(0.047)	0.065	0.001	2,324
Big Five extraversion	-0.279***	(0.043)	0.097	0.001	2,324
Big Five agreeableness	0.488***	(0.052)	0.088	0.001	2,324
Big Five neuroticism	-0.302***	(0.050)	0.037	0.001	2,324
locus of control	0.249***	(0.049)	0.043	0.001	2,373
self-control	0.434***	(0.058)	0.082	0.001	2,339
self-esteem	0.299***	(0.075)	0.128	0.001	771
Behavioral outcomes					
achievement test score	0.155*	(0.081)	0.155	0.017	561
prosociality	0.376***	(0.055)	0.055	0.001	2,333
SDQ internalizing behavior	-0.442***	(0.055)	0.093	0.001	2,333
SDQ externalizing behavior	-0.486***	(0.056)	0.105	0.001	2,333
happiness	0.116**	(0.046)	0.037	0.005	2,373

NOTES: The table shows results for separate OLS regressions of child outcomes (stated in the left-most column) on parenting style for children aged 6 to 9. All outcomes are standardized across all available observations within this age group. Column (1) shows coefficients for the LDA-based, binary parenting style measure (1 = positive parenting, 0 = non-positive or negative parenting). Column (2) shows conventional standard errors, column (3) the regressions' adjusted R^2, and column (5) the number of observations. To address multiple hypothesis testing, column (4) displays false discovery rate adjusted *q*-values. Control variables include gender, age fixed effects, number of siblings, monthly family income, literacy of father, literacy of mother, and district fixed effects. Standard errors are clustered at the village level. Significance at *p<0.10, **p<0.05, ***p<0.01.

Table A7: Child outcomes and positive parenting for children aged 10 to 16

	(1)	(2)	(3)	(4)	(5)
	positive parenting				
	Coeff.	SE	Adj. R^2	*q*-value	Obs.
Cognitive skills					
IQ	0.111***	(0.035)	0.252	0.001	3,207
Non-cognitive skills					
Economic preferences					
patience	-0.096**	(0.046)	0.005	0.015	2,905
risk-taking	-0.065	(0.046)	0.014	0.053	3,008
altruism	0.083**	(0.041)	0.003	0.016	3,111
Personality traits					
Big Five openness	0.277***	(0.045)	0.060	0.001	3,193
Big Five conscientiousness	0.347***	(0.045)	0.069	0.001	3,193
Big Five extraversion	0.276***	(0.044)	0.065	0.001	3,193
Big Five agreeableness	0.337***	(0.040)	0.040	0.001	3,193
Big Five neuroticism	-0.281***	(0.043)	0.042	0.001	3,193
locus of control	0.229***	(0.048)	0.040	0.001	3,207
self-control	0.455***	(0.049)	0.093	0.001	3,163
self-esteem	0.398***	(0.045)	0.123	0.001	3,199
Behavioral outcomes					
achievement test score	0.057	(0.155)	0.164	0.145	121
prosociality	0.418***	(0.049)	0.066	0.001	3,076
SDQ internalizing behavior	-0.435***	(0.051)	0.100	0.001	3,076
SDQ externalizing behavior	-0.506***	(0.050)	0.126	0.001	3,076
happiness	0.044	(0.038)	0.029	0.056	3,207

NOTES: The table shows results for separate OLS regressions of child outcomes (stated in the left-most column) on parenting style for children aged 10 to 16. All outcomes are standardized across all available observations within this age group. Column (1) shows coefficients for the LDA-based, binary parenting style measure (1 = positive parenting, 0 = non-positive or negative parenting). Column (2) shows conventional standard errors, column (3) the regressions' adjusted R^2, and column (5) the number of observations. To address multiple hypothesis testing, column (4) displays false discovery rate adjusted *q*-values. Control variables include gender, age fixed effects, number of siblings, monthly family income, literacy of father, literacy of mother, and district fixed effects. Standard errors are clustered at the village level. Significance at *p<0.10, **p<0.05, ***p<0.01.

Table A8: Child outcomes and income for children aged 6 to 16

	(1)	(2)	(3)	(4)	(5)
	income category				
	Coeff.	SE	Adj. R^2	*q*-value	Obs.
Cognitive skills					
IQ	0.092***	(0.026)	0.394	0.004	5,580
Non-cognitive skills					
Economic preferences					
patience	-0.005	(0.033)	0.002	0.648	4,964
risk-taking	-0.011	(0.031)	0.017	0.638	5,167
altruism	0.026	(0.027)	0.003	0.377	5,367
Personality traits					
Big Five openness	0.086***	(0.032)	0.028	0.041	5,517
Big Five conscientiousness	0.039	(0.031)	0.027	0.315	5,517
Big Five extraversion	-0.007	(0.027)	0.047	0.638	5,517
Big Five agreeableness	0.010	(0.031)	0.017	0.638	5,517
Big Five neuroticism	-0.048	(0.031)	0.015	0.209	5,517
locus of control	0.015	(0.033)	0.028	0.638	5,580
self-control	0.085**	(0.033)	0.041	0.049	5,502
self-esteem	0.085**	(0.037)	0.089	0.066	3,970
Behavioral outcomes					
achievement test score	0.046	(0.079)	0.154	0.633	682
risky behaviors	-0.157***	(0.034)	0.246	0.001	3,193
prosociality	0.048	(0.031)	0.034	0.209	5,409
SDQ internalizing behavior	-0.034	(0.037)	0.052	0.377	5,409
SDQ externalizing behavior	-0.053*	(0.031)	0.068	0.209	5,409
happiness	0.048*	(0.026)	0.026	0.177	5,580

NOTES: The table shows results for separate OLS regressions of child outcomes (stated in the left-most column, all standardized) on income categories (based on the family's monthly income) for children aged 6 to 16. Column (1) shows coefficients for the income median split indicator (1 = p50 and above, 0 = below). Column (2) shows conventional standard errors, column (3) the regressions' adjusted R^2, and column (5) the number of observations. To address multiple hypothesis testing, column (4) displays false discovery rate adjusted *q*-values. Control variables include gender, age fixed effects, number of siblings, monthly family income, literacy of father, literacy of mother, and district fixed effects. Standard errors are clustered at the village level. Significance at *p<0.10, **p<0.05, ***p<0.01.

Table A9: Association between cognitive skills and positive parenting

	IQ
positive parenting	0.111***
	(0.029)
female	0.070***
	(0.022)
number of siblings	-0.039***
	(0.009)
log income	0.048***
	(0.013)
father's literacy	0.248***
	(0.028)
mother's literacy	0.139***
	(0.030)
districts (base: Netrokona)	
Chandpur	0.265***
	(0.059)
Sunamganj	0.021
	(0.063)
Gopalganj	0.353***
	(0.050)
age (base: age = 6)	
age = 7	0.226***
	(0.051)
age = 8	0.376***
	(0.045)
age = 9	0.753***
	(0.043)
age = 10	0.976***
	(0.046)
age = 11	1.110***
	(0.050)
age = 12	1.531***
	(0.051)
age = 13	1.632***
	(0.056)
age = 14	1.748***
	(0.061)
age = 15	1.966***
	(0.073)
age = 16	1.917***
	(0.082)
constant	-1.327***
	(0.092)
Adjusted R^2	0.397
Observations	5,580

NOTES: The table above shows results for OLS regressions of children's standardized IQ on the LDA-based, binary parenting style measure (1 = positive parenting, 0 = non-positive or negative parenting) and a set of control variables for children aged 6 to 16. Female and parents' literacy are dummy variables where 1 = true. For monthly income (measured in Taka) the log is taken and a dummy is added (not displayed here) to control for negative income values. Base categories for district and age fixed effects are Netrokona and age 6, respectively. Standard errors (in parentheses) are clustered at the village level. Significance at *p<0.10, **p<0.05, ***p<0.01.

Table A10: Association between economic preferences and positive parenting

	patience	risk-taking	altruism
positive parenting	-0.085**	-0.078**	0.073**
	(0.037)	(0.038)	(0.033)
female	0.014	-0.089***	0.029
	(0.030)	(0.028)	(0.030)
number of siblings	-0.016	0.015	0.009
	(0.013)	(0.012)	(0.010)
log income	0.010	-0.012	-0.014
	(0.019)	(0.019)	(0.015)
father's literacy	-0.004	0.041	-0.015
	(0.037)	(0.034)	(0.034)
mother's literacy	-0.046	-0.037	-0.049
	(0.036)	(0.037)	(0.033)
districts (base: Netrokona)			
Chandpur	0.016	0.056	-0.113**
	(0.065)	(0.064)	(0.053)
Sunamganj	0.112	0.231***	-0.052
	(0.080)	(0.061)	(0.057)
Gopalganj	-0.030	-0.032	-0.115***
	(0.052)	(0.048)	(0.044)
age (base: age = 6)			
age = 7	-0.053	0.031	0.029
	(0.086)	(0.073)	(0.071)
age = 8	0.027	0.100	-0.073
	(0.074)	(0.066)	(0.068)
age = 9	-0.025	0.097	-0.030
	(0.080)	(0.067)	(0.066)
age = 10	0.066	0.260***	-0.060
	(0.075)	(0.069)	(0.064)
age = 11	0.022	0.284***	-0.067
	(0.076)	(0.069)	(0.066)
age = 12	-0.094	0.193***	-0.035
	(0.080)	(0.070)	(0.072)
age = 13	0.011	0.285***	-0.012
	(0.083)	(0.074)	(0.074)
age = 14	-0.054	0.245***	0.016
	(0.096)	(0.078)	(0.075)
age = 15	-0.044	0.238***	0.073
	(0.095)	(0.090)	(0.081)
age = 16	0.005	0.314***	-0.071
	(0.112)	(0.107)	(0.098)
constant	0.174	-0.412***	-0.157
	(0.147)	(0.135)	(0.120)
Adjusted R^2	0.003	0.020	0.005
Observations	4,964	5,167	5,367

NOTES: The table above shows results for OLS regressions of children's standardized economic preferences on the LDA-based, binary parenting style measure (1 = positive parenting, 0 = non-positive or negative parenting) and a set of control variables for children aged 6 to 16. Female and parents' literacy are dummy variables where 1 = true. For monthly income (measured in Taka) the log is taken and a dummy is added (not displayed here) to control for negative income values. Base categories for district and age fixed effects are Netrokona and age 6, respectively. Standard errors (in parentheses) are clustered at the village level. Significance at *p<0.10, **p<0.05, ***p<0.01.

Table A11: Association between Big Five personality traits and positive parenting

	Big 5 openness	Big 5 conscient.	Big 5 extraversion	Big 5 agreeablen.	Big 5 neuroticism
positive parenting	0.300***	0.361***	0.044	0.402***	-0.289***
	(0.036)	(0.035)	(0.030)	(0.035)	(0.036)
female	0.031	0.125***	-0.167***	0.138***	0.074***
	(0.025)	(0.026)	(0.026)	(0.028)	(0.027)
number of siblings	-0.033***	-0.003	0.003	-0.010	-0.004
	(0.011)	(0.011)	(0.011)	(0.010)	(0.011)
log income	0.027	0.022	0.003	-0.002	-0.017
	(0.017)	(0.019)	(0.014)	(0.018)	(0.016)
father's literacy	0.089***	0.063**	-0.001	0.078**	-0.016
	(0.030)	(0.031)	(0.033)	(0.031)	(0.031)
mother's literacy	0.050	0.019	0.030	-0.002	-0.044
	(0.037)	(0.037)	(0.029)	(0.036)	(0.034)
districts (base: Netrokona)					
Chandpur	-0.093	-0.225**	0.161***	-0.202**	0.197**
	(0.062)	(0.086)	(0.061)	(0.082)	(0.088)
Sunamganj	-0.145**	-0.405***	-0.112*	-0.223***	0.343***
	(0.061)	(0.068)	(0.063)	(0.068)	(0.069)
Gopalganj	0.098**	-0.187***	0.435***	-0.080*	0.094
	(0.038)	(0.049)	(0.053)	(0.042)	(0.058)
age (base: age = 6)					
age = 7	0.062	0.073	-0.117*	0.072	0.019
	(0.070)	(0.073)	(0.067)	(0.072)	(0.071)
age = 8	0.129*	0.144**	-0.089	0.125*	-0.001
	(0.067)	(0.067)	(0.063)	(0.068)	(0.066)
age = 9	0.064	0.156**	-0.114	0.079	-0.006
	(0.067)	(0.065)	(0.075)	(0.067)	(0.070)
age = 10	0.047	0.074	-0.101	0.085	0.007
	(0.067)	(0.068)	(0.078)	(0.072)	(0.073)
age = 11	0.027	0.049	-0.104	0.095	-0.008
	(0.069)	(0.071)	(0.077)	(0.070)	(0.071)
age = 12	0.089	0.142*	-0.072	0.103	-0.052
	(0.077)	(0.079)	(0.079)	(0.077)	(0.077)
age = 13	0.105	0.123	-0.099	0.068	0.046
	(0.081)	(0.078)	(0.081)	(0.076)	(0.075)
age = 14	0.202**	0.185**	-0.027	0.031	-0.026
	(0.079)	(0.086)	(0.083)	(0.074)	(0.080)
age = 15	0.279***	0.255***	-0.051	0.165**	0.020
	(0.085)	(0.085)	(0.088)	(0.082)	(0.088)
age = 16	0.348***	0.176*	0.022	0.234***	0.021
	(0.106)	(0.094)	(0.108)	(0.089)	(0.098)
constant	-0.421***	-0.212*	0.050	-0.310**	0.022
	(0.124)	(0.120)	(0.133)	(0.123)	(0.124)
Adjusted R^2	0.049	0.059	0.047	0.056	0.035
Observations	5,517	5,517	5,517	5,517	5,517

NOTES: The table above shows results for OLS regressions of children's standardized Big Five personality traits on the LDA-based, binary parenting style measure (1 = positive parenting, 0 = non-positive or negative parenting) and a set of control variables for children aged 6 to 16. Female and parents' literacy are dummy variables where 1 = true. For monthly income (measured in Taka) the log is taken and a dummy is added (not displayed here) to control for negative income values. Base categories for district and age fixed effects are Netrokona and age 6, respectively. Standard errors (in parentheses) are clustered at the village level. Significance at *p<0.10, **p<0.05, ***p<0.01.

Table A12: Association between personality traits/happiness and positive parenting

	locus of control	self-control	self-esteem	happiness
positive parenting	0.237***	0.445***	0.381***	0.075**
	(0.041)	(0.045)	(0.044)	(0.033)
female	0.028	0.144***	0.043	0.060**
	(0.025)	(0.026)	(0.027)	(0.027)
number of siblings	-0.007	0.014	-0.026**	-0.033***
	(0.012)	(0.012)	(0.013)	(0.010)
log income	0.014	0.038**	0.032*	0.028*
	(0.018)	(0.018)	(0.018)	(0.014)
father's literacy	0.006	0.057*	0.115***	0.041
	(0.034)	(0.033)	(0.034)	(0.030)
mother's literacy	0.031	0.096***	0.046	-0.039
	(0.039)	(0.033)	(0.041)	(0.035)
districts (base: Netrokona)				
Chandpur	-0.001	-0.245**	-0.059	-0.135***
	(0.110)	(0.103)	(0.106)	(0.052)
Sunamganj	-0.493***	-0.477***	-0.577***	-0.326**
	(0.068)	(0.088)	(0.112)	(0.129)
Gopalganj	-0.110*	-0.208***	0.228***	-0.303***
	(0.064)	(0.068)	(0.053)	(0.045)
age (base: age = 6; = 9 for self-esteem)				
age = 7	-0.011	0.160**		0.053
	(0.080)	(0.074)		(0.080)
age = 8	-0.005	0.132**		0.081
	(0.064)	(0.064)		(0.071)
age = 9	-0.024	0.143**		0.147*
	(0.064)	(0.065)		(0.082)
age = 10	-0.036	0.108	-0.049	0.127
	(0.070)	(0.067)	(0.051)	(0.084)
age = 11	-0.015	0.264***	-0.034	0.141*
	(0.072)	(0.064)	(0.052)	(0.082)
age = 12	0.111	0.156**	-0.052	0.051
	(0.070)	(0.076)	(0.053)	(0.087)
age = 13	0.034	0.026	-0.173***	0.010
	(0.067)	(0.074)	(0.059)	(0.092)
age = 14	0.063	0.155**	-0.039	-0.039
	(0.080)	(0.077)	(0.063)	(0.088)
age = 15	0.110	0.271***	0.105	-0.049
	(0.090)	(0.081)	(0.067)	(0.096)
age = 16	0.100	0.193**	-0.041	-0.171
	(0.109)	(0.094)	(0.083)	(0.115)
constant	-0.084	-0.463***	-0.024	0.247**
	(0.132)	(0.137)	(0.126)	(0.112)
Adjusted R^2	0.042	0.088	0.124	0.028
Observations	5,580	5,502	3,970	5,580

NOTES: The table above shows results for OLS regressions of children's standardized personality traits and happiness on the LDA-based, binary parenting style measure (1 = positive parenting, 0 = non-positive or negative parenting) and a set of control variables for children aged 6 to 16 (self-esteem: aged 9 to 16). Female and parents' literacy are dummy variables where 1 = true. For monthly income (measured in Taka) the log is taken and a dummy is added (not displayed here) to control for negative income values. Base categories for district and age fixed effects are Netrokona and age 6 (age 9 for self-esteem), respectively. Standard errors (in parentheses) are clustered at the village level. Significance at *p<0.10, **p<0.05, ***p<0.01.

Table A13: Association between behavioral outcomes and positive parenting

	achievement test score	risky behaviors	prosociality	SDQ intern.	SDQ extern.
positive parenting	0.152**	-0.200***	0.398***	-0.437***	-0.495***
	(0.073)	(0.040)	(0.043)	(0.047)	(0.045)
female	0.257***	-0.839***	0.103***	0.028	-0.228***
	(0.085)	(0.032)	(0.026)	(0.025)	(0.027)
number of siblings	-0.041	0.013	-0.001	0.018	0.014
	(0.025)	(0.013)	(0.012)	(0.013)	(0.011)
log income	-0.018	-0.061***	0.017	-0.009	-0.027
	(0.039)	(0.019)	(0.018)	(0.020)	(0.019)
father's literacy	0.274***	-0.035	0.116***	-0.033	-0.139***
	(0.092)	(0.036)	(0.037)	(0.034)	(0.035)
mother's literacy	0.063	-0.030	0.022	0.021	0.011
	(0.102)	(0.042)	(0.037)	(0.038)	(0.037)
districts (base: Netrokona)					
Chandpur	0.716***	-0.343***	-0.082	-0.020	0.155*
	(0.201)	(0.091)	(0.091)	(0.086)	(0.083)
Sunamganj	0.578**	0.117	-0.186**	0.517***	0.423***
	(0.265)	(0.102)	(0.075)	(0.087)	(0.074)
Gopalganj	-0.020	-0.311***	0.005	-0.095**	0.289***
	(0.202)	(0.078)	(0.076)	(0.047)	(0.057)
age (base: age = 6; = 10 for risky behaviors)					
age = 7	-0.075		0.078	0.006	-0.185***
	(0.148)		(0.072)	(0.072)	(0.069)
age = 8	-0.040		0.235***	-0.018	-0.218***
	(0.135)		(0.062)	(0.060)	(0.067)
age = 9	-0.018		0.185***	-0.050	-0.195***
	(0.143)		(0.059)	(0.064)	(0.065)
age = 10	0.003		0.301***	-0.024	-0.297***
	(0.180)		(0.060)	(0.069)	(0.066)
age = 11	-0.045	-0.023	0.309***	-0.070	-0.284***
	(0.195)	(0.048)	(0.061)	(0.070)	(0.071)
age = 12	-0.001	-0.135***	0.393***	-0.131*	-0.392***
	(0.297)	(0.043)	(0.062)	(0.070)	(0.074)
age = 13		-0.168***	0.438***	-0.215***	-0.439***
		(0.048)	(0.070)	(0.078)	(0.078)
age = 14		-0.257***	0.514***	-0.228***	-0.620***
		(0.049)	(0.070)	(0.074)	(0.070)
age = 15		-0.366***	0.522***	-0.273***	-0.619***
		(0.060)	(0.073)	(0.084)	(0.077)
age = 16		-0.452***	0.386***	-0.158	-0.610***
		(0.076)	(0.096)	(0.106)	(0.108)
constant	-0.878**	0.920***	-0.559***	0.037	0.480***
	(0.380)	(0.199)	(0.124)	(0.135)	(0.128)
Adjusted R^2	0.160	0.253	0.072	0.098	0.128
Observations	682	3,193	5,409	5,409	5,409

NOTES: The table above shows results for OLS regressions of children's standardized behavioral outcomes on the LDA-based, binary parenting style measure (1 = positive parenting, 0 = non-positive or negative parenting) and a set of control variables for children aged 6 to 16 (achievement test score: aged 6 to 12; risky behaviors: aged 10 to 16). Female and parents' literacy are dummy variables where 1 = true. For monthly income (measured in Taka) the log is taken and a dummy is added (not displayed here) to control for negative income values. Base categories for district and age fixed effects are Netrokona and age 6 (age 10 for risky behaviors), respectively. Standard errors (in parentheses) are clustered at the village level. Significance at *p<0.10, **p<0.05, ***p<0.01.

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