DISCUSSION PAPER SERIES

IZA DP No. 9686

Parenting Style as an Investment in Human Development

Deborah A. Cobb-Clark
Nicolas Salamanca
Anna Zhu

January 2016

Forschungsinstitut
zur Zukunft der Arbeit
Institute for the Study
of Labor

Parenting Style as an Investment in Human Development

Deborah A. Cobb-Clark
University of Sydney, ARC Life Course Centre and IZA

Nicolas Salamanca
Melbourne Institute, University of Melbourne

Anna Zhu
Melbourne Institute, University of Melbourne and ARC Life Course Centre

Discussion Paper No. 9686
January 2016

IZA

P.O. Box 7240
53072 Bonn
Germany

Phone: +49-228-3894-0
Fax: +49-228-3894-180
E-mail: iza@iza.org

Any opinions expressed here are those of the author(s) and not those of IZA. Research published in this series may include views on policy, but the institute itself takes no institutional policy positions. The IZA research network is committed to the IZA Guiding Principles of Research Integrity.

The Institute for the Study of Labor (IZA) in Bonn is a local and virtual international research center and a place of communication between science, politics and business. IZA is an independent nonprofit organization supported by Deutsche Post Foundation. The center is associated with the University of Bonn and offers a stimulating research environment through its international network, workshops and conferences, data service, project support, research visits and doctoral program. IZA engages in (i) original and internationally competitive research in all fields of labor economics, (ii) development of policy concepts, and (iii) dissemination of research results and concepts to the interested public.

IZA Discussion Papers often represent preliminary work and are circulated to encourage discussion. Citation of such a paper should account for its provisional character. A revised version may be available directly from the author.

IZA Discussion Paper No. 9686
January 2016

ABSTRACT

Parenting Style as an Investment in Human Development*

We propose a household production function approach to human development in which the role of parenting style in child rearing is explicitly considered. Specifically, we model parenting style as an investment in human development that depends not only on inputs of time and market goods, but also on attention, i.e. cognitive effort. Socioeconomic disadvantage is linked to parenting style and human development through the constraints that it places on cognitive capacity. Our model finds empirical support. We demonstrate that parenting style is a construct that is distinct from standard goods- and time-intensive parental investments and that effective parenting styles are negatively correlated with socioeconomic disadvantage. Moreover, parenting style is an important determinant of young adult's human capital net of other parental investments.

JEL Classification: D13, I31, J13

Keywords: parenting style, cognitive load, locus of control, socioeconomic disadvantage, parental investments, human development

Corresponding author:

Nicolas Salamanca
Melbourne Institute of Applied Economic and Social Research
University of Melbourne
Level 5, FBE Building
111 Barry St.
Parkville, VIC 3010
Australia
E-mail: n.salamanca@unimelb.edu.au

* The data used for this research come from the Youth in Focus Project which is jointly funded by the Australian Government and the Australian Research Council (Grant Number LP0347164) and carried out by the Australian National University. The research was also supported by the Australian Research Council through a Discovery Program Grant (DP140102614) and the Centre of Excellence for Children and Families over the Life Course (project number CE140100027). The Centre is administered by the Institute for Social Science Research at The University of Queensland, with nodes at The University of Western Australia, The University of Melbourne and The University of Sydney. We thank Dan Hamermesh and David Ribar for their comments on earlier drafts of this paper. The views expressed herein are solely those of the authors.

1. Introduction

There is mounting evidence that early experiences are critically important in laying the foundation for one's overall life chances. A recognition that children's intellectual, emotional, and social development is tied to their family circumstances well and truly before they enter school (e.g. Bradley & Corwyn 2002; Feinstein 2003; Heckman 2006), has prompted researchers to renew their efforts to understand the role of families in shaping children's well-being. The overarching concern is that social and economic disadvantage constrains families' ability to invest in their children, thereby perpetuating disadvantage from one generation to the next. The relationship between socioeconomic disadvantage and human development is complex, however, and it is clear that disadvantage is about much more than having low income. Berger et al. (2009), for example, argue that "the hypothesis that the home environment completely mediates the relationship between income and child outcomes can't be rejected" (p. 985). Knowing more about the extent to which disadvantage operates causally through income – or through some other channel – is important in assessing whether increasing incomes through social benefit programs can "buy" better outcomes (Ermisch 2008).

Economists have begun to respond to this debate by extending their research scope beyond traditional models of human development to consider an expanded set of inputs, including the style of parenting itself. The concept of "parenting style" was formalized in developmental psychology more than 50 years ago as a means of characterizing parents' control over and approach to disciplining their children (Baumrind 1966). Although in the intervening years a large psychological literature has developed linking parenting style to outcomes in childhood and adolescence, economists have only recently begun to explicitly consider its importance. Doepke and Zilibotti (2014), for example, develop a model of parenting in which parenting style is the equilibrium outcome of parents' investments in instilling marketable skills in their children, while Cunha (2015) models parenting style as the combination of parental investments and the institutional environment chosen by parents to best raise their children. Others have modeled parenting style in a game-theoretic framework in which parents actively choose the control they exert (or patience they display) in an effort to prompt their child to display good behavior, study hard, and avoid risky behavior (e.g. Burton et al. 2002; Hao et al. 2008; Cosconati 2009; Lundberg et al. 2009). Consistent with these theoretical perspectives, new empirical evidence indicates that parenting style is important in the production of cognitive and non-cognitive ability (Dooley & Stewart 2007; Fiorini & Keane

2014) and that “parenting in early childhood contributes to the intergenerational persistence in incomes found in many studies” (Ermisch 2008 p. 69).

Our objective is to extend this literature by assessing the role of parenting style and socioeconomic disadvantage in human development. We do this by explicitly modelling a household’s parenting style as an investment decision that is important in the production of human development. Tackling the problem in this way has the advantage of allowing parenting style to be endogenous, providing an important explanation for why parents might adopt different styles. Unlike previous researchers, we allow investments in human development – including in parenting style – to rely not only on inputs of time and market goods, but also on a third input which we conceptualize as attention or cognitive effort. Thus, investments in children and adolescents (e.g. helping with school work, reading to children, providing a good diet, monitoring activities, etc.) will be constrained not only by parents’ time or income, but also by the mental effort required to consistently pay attention to, engage with, monitor, and supervise their children. Finally, we take seriously the notion that disadvantage itself limits cognitive capacity and alters decision-making (e.g. Shah et al. 2012; Mani et al. 2013; Mullianathan & Shafir 2013) by allowing a household’s endowment of attention (cognitive capacity) to depend on its socioeconomic status.

We assess the empirical support for the key implications of our theoretical model by investigating the relationship between parenting style and the human capital of young people (aged 18) captured in the Youth in Focus (YIF) Project. The YIF data combine detailed administrative welfare records with survey information from both young people and their parents. The cross-sectional survey data provide extensive information about the interactions young people have with their parents allowing us to construct several measures of parenting style. We capture socioeconomic disadvantage using administrative data on the public assistance families received over more than a decade while young people were growing up. Importantly, we are able to link parenting style to a number of key human capital outcomes including: educational attainment (high-school completion); educational achievement (university entrance scores); non-cognitive skills (locus of control) and risky behavior (i.e. illicit drug use, delinquent behavior, running away, early parenthood, problem drinking, etc.). These data are used to estimate a series of conditional correlations shedding empirical light on the key theoretical predictions of our model.

We make a number of contributions to the literature. Most importantly, we demonstrate that parenting style can be modelled using a production function approach to understand

investments in human development. That is, parenting style can be characterized as an endogenous investment – stemming from parents' rational choice – in the production of human development. To our knowledge, only four other studies model parenting style directly (see Cosconati 2009; Lundberg et al. 2009; Burton et al. 2002 and Doepke & Zilibotti 2014). Like these studies, we also analyze parenting style in the context of an optimal choice problem. In our model, heterogeneity in parenting style does not originate in parental preferences; it comes from differences in the constraints parents face and the choices they make when investing in their children. This allows us to understand diversity in parenting styles without necessarily appealing to heterogeneity in parental preferences. Moreover, our model nests existing production-function approaches to estimating the determinants of children's cognitive and non-cognitive outcomes, providing a theoretical link to traditional models of parental investment.

Second, explicitly modelling parental attention (cognitive effort) as an input in human development provides a conceptual framework for understanding the potential for socioeconomic disadvantage to constrain outcomes not only through a lack of financial resources, but also through a lack of parental cognitive resources. We believe that it is quite natural to view many effective parental behaviors (e.g. establishing control, discipline, and routine, etc.) as being much more taxing of mental effort and attention than of either money or time. Cognitive resources are also central to social interaction and prosocial behavior (Rameson et al. 2012); self-control (Shiv & Fedorkhin 1999), as well as ethical behavior (Gino et al. 2011) all of which are relevant for parenting behavior. Yet disadvantage may deeply affect children and adolescents by taxing their parents' cognitive resources (Mullianathan & Shafir 2013). We provide a framework for developing the theoretical and empirical implications of this proposition as well as for characterizing the inherent tradeoffs between inputs of market goods, time, and attention in human development.[1]

Finally, our paper makes an important contribution to the empirical evidence on socioeconomic disadvantage and human capital formation more generally. In particular, our analysis of young people's human capital extends the existing economics literature on parenting style which to date has only considered outcomes measured in childhood. There is evidence that adolescents' achievement is more closely related to their own perceptions of parenting than to what parents report they are doing (Paulson 1994), making youths' self-

[1] Fiorini and Keane (2014) argue that studies which focus on single inputs into child development and do not consider the trade-offs between alternative inputs provide limited and perhaps misleading information.

reports arguably the most valid way of measuring parenting style (Aunola et al 2000). Moreover, we capture family resources during childhood using administrative data on welfare receipt which allows us to study the link between parenting and human development in the context of a much broader notion of socioeconomic disadvantage than is typically captured by parental income, occupation, or education alone.

Our theoretical model is empirically supported. Parenting style is a construct that is distinct from standard money- and time-intensive parental investments. Moreover, parenting style is correlated with socioeconomic disadvantage. In particular, the extent to which parents monitor their young-adult children decreases with disadvantage, even amongst parents making comparable levels of other goods- and time-related investments. Parenting style is also correlated with young adults' human capital even after accounting for other parental investments. However, we find little evidence that parenting style explains a meaningful portion of the human capital penalty associated with socioeconomic disadvantage over and above money- and time-intensive parental investments.

The remainder of this paper is structured as follows. In Section 2 we review the literature on investments in human development paying particular attention to the role of parenting and socioeconomic disadvantage. Our theoretical framework is described in Section 3. In Section 4 we describe our empirical strategy, while in Section 5 the details of the Youth in Focus data are presented. Results from our preferred specification and our sensitivity analysis can be found in Section 6. Finally, Section 7 concludes.

2. Literature Review

There is a long tradition in developmental psychology, public health, and sociology of relating children's outcomes to the nature of the parenting that they have experienced (e.g. McLoyd 1998; Guo & Harris 2000; Brooks-Gunn & Markman 2005; Berger et al. 2009; Kelly et al. 2011). Economists, in contrast, have historically been much more focused on the decisions – particularly the human capital investment decisions – that parents make for their children rather than on the way that they parent. However, a growing recognition of the importance of childhood in laying the foundation for individuals' long-term social and economic well-being has led economists to increasingly turn to broader concepts of parenting behavior as a means of enriching their understanding of human development.

Drawing on philosophical debates dating back to the 1920s about the role of permissive, child-centered policies in education, Baumrind (1966) proposed a typology of three parenting styles – "permissive", "authoritarian" and "authoritative" – which are distinguished mainly in terms of the relative importance parents attach to control of versus freedom for their children. Over time, this framework has been extended to accommodate a wider range of parental behavior. Today it is common for parenting style to be characterized by two underlying processes: i) the number of demands made by parents; and ii) the contingency of parental reinforcement which are often referred to as demandingness (control) and responsiveness (warmth) respectively (see Darling & Steinberg 1993; Spera 2005 for reviews). This two-factor approach also quite naturally gives rise to an extension of Baumrind's (1966) original parenting-style typology to include "disengaged" as a fourth style of parenting. Disengaged parenting (i.e. low levels of both warmth and control) has been linked to impulsivity, behavioral and emotional problems, school dropout, substance abuse, and delinquency in their children, while children's best social, cognitive, and behavioral developmental outcomes are usually associated with authoritative parenting (i.e. high levels of both warmth and control) (Wake et al. 2007; see also Maccoby & Martin 1983; Baumrind 1991).

Developmental psychologists often argue that it is important to distinguish parenting style (i.e. the emotional climate in which parents raise their children) from parenting practices (i.e. the specific behaviors that parents use to socialize their children) (Darling & Steinberg 1993). Economists, however, are less likely to make this distinction often constructing parenting indexes – sometimes referred to as "style" – that combine elements of both. Many parenting practices including establishing regular family mealtimes, rules about television watching and computer use, and routines around homework and bedtimes have also been linked to a range of positive health and developmental outcomes for children (see Del Bono et al. 2014; Ribar & Zapata 2014).

The good news is that effective parenting seems to protect children from some of the adverse effects of socioeconomic disadvantage (McLoyd 1998; Guo & Harris 2000; McCulloch & Joshi 2002). The bad news is that "economic hardship diminishes parents' ability to interact with and socialize children in ways that are beneficial to their well-being" (Guo & Harris 2000, p. 431). Moreover, it appears that it is this disruption in effective parenting which is at least partially to blame for the adverse consequences of financial stress for children and adolescents (e.g. McLoyd 1998; Bradley & Corwyn 2002; Conger et al. 2002; Mistry et al. 2009; and the references therein). Bradley and Corwyn (2002), for

example, argue that parents with high socioeconomic status engage in a number of practices (e.g. using richer vocabulary, eliciting more child speech, reading, etc.) which "are strongly implicated" as mechanisms underpinning the relationship between socioeconomic status and children's intellectual and academic achievement (p. 382).

Psychologists have traditionally viewed stress as the underlying mechanism linking disadvantage and ineffective parenting. The repeated stresses associated with having too little income and living in inadequate housing in poor, often violent, neighborhoods produce hormonal responses which overtime can take a physiological toll on individuals. Health scientists refer to this as "allostatic load" (McEwen 2000) and it can affect parenting (see Bradley & Corwyn 2002 for a review). Increasingly economists are building upon this idea by incorporating poverty-induced psychological stress into models of economic behavior in an effort to understand how poverty is perpetuated (e.g. Shah et al. 2012; Mani et al. 2013; Haushofer & Fehr 2014). This innovation has the potential to provide a much richer understanding of the ways that socioeconomic disadvantage hinders human development. Importantly, there is growing evidence that being preoccupied with pressing budgetary concerns leaves fewer cognitive resources available for decision making (Mani et al. 2013). In effect, "scarcity changes how people allocate attention: It leads them to engage more deeply in some problems while neglecting others" (Shah et al. 2012 p. 682).[2] Yet effective parenting requires consistent mental effort and continuous attention. Consequently, it may be the tax on cognitive "bandwidth" – generated by a lack of income – which explains the link between disadvantage and ineffective parenting (Mullianathan & Shafir 2013).

The developmental psychology literature on effective parenting styles and the economics literature on parental investments in children and adolescents have evolved largely independently of one another. However, economists are slowly beginning to explicitly consider the process shaping parenting itself. Cosconati (2009), for example, models parenting style as the constraints parents place on their children's time use, while Lundberg et al. (2009) model the control that parents exert over their children's decision making. In contrast, Burton et al. (2002) conceptualize parenting style as parents' degree of patience in response to children's misbehavior. Finally, Doepke and Zilibotti (2014) consider parenting style to be the outcome of a process in which the economic environment shapes families' incentives to instill patience in their children.

[2] Socioeconomic disadvantage, for example, has been linked to increased risk-taking, more impatience, and diminished self-control (Bernheim et al. 2013; Haushofer & Fehr 2014).

Research linking these diverse strands of the literature is producing new insights into human development. It is an important step in developing policy initiatives to mitigate the adverse impact of poverty on human development.

3. **Model**

Our theoretical framework draws heavily on Becker's household production model of consumer behavior in which households use inputs – typically time and market goods – to produce commodities which they then consume, yielding direct utility (Becker 1965; Michael & Becker 1973). This framework has been used extensively in the literature to study a range of household behaviors including households' decisions to have and invest in their children (e.g. Becker & Lewis 1973; De Tray 1974; Liebowitz 1974; Gronau 1977).

We make three innovations on the standard model of home production. First, we explicitly model a household's "parenting style" as a parental investment which is important for the production of human development. Second, parental investments in human development – including in parenting style – rely not only on inputs of time and market goods, but also on a third input which we will refer to as attention or cognitive effort.[3] Third, we allow socioeconomic disadvantage itself to constrain cognitive capacity by modelling a household's endowment of attention (cognitive capacity) as a function of their socio-economic status.

3.1 A Home-Production Investment Approach

We begin by assuming that parents care about parenting-related investments only to the extent that they affect human development.[4] Moreover, parental utility is assumed to be separable in human development (Q) and non-parenting-related ($Z_{\sim P}$) commodities. Specifically,

$$U(Z) = u(Q(Z_P), Z_{\sim P}) \tag{1}$$

[3] Interestingly, Michael and Becker (1973) model home production as a function of time inputs, market goods, and the "environment" in which production takes place. The role of environmental inputs, however, has not received much attention in the home production literature. More recently, economists have explicitly begun to consider the role of inattention in inter-temporal decision making (see Taubinsky 2014), however, as yet these models have not been applied to parental decision making.

[4] Although parenting-related investments can also have consumption benefits for parents and thus children can provide utility directly to them (Becker 1960, p. 210), we abstract from that here in order to focus on the potential for mechanisms that are not preference-based to account for the relationship between socioeconomic disadvantage and human development.

where Z_P denotes parenting-related investments and $U(Z)$ is increasing in both $Q(Z_P)$ and $Z_{\sim P}$. The assumption that the parental utility function is separable is relatively innocuous in our case as it implies, simply put, that parents always prefer greater human development irrespective of the level of non-parenting-related commodities they consume. Separable utility greatly simplifies our analysis since it allows us to recast parents' choice problem as a two-stage process. First, parents decide which (and what level) of parenting-related investments to make in order to maximize their children's development given their total parental inputs (i.e. the time, market goods, and attention allocated to parenting). They do the same for each of the non-parenting-related commodities. Second, given the potential utility outcomes from the first stage, parents then decide how to allocate their overall endowment of inputs to parenting and each of the non-parenting commodities. As our interest is in human development, we will focus our attention solely on the first stage of this problem—i.e., the production of parenting-related investments.[5]

Let the production of human development be given by:

$$Q = q(Z_{P1}, \ldots, Z_{PJ}) \tag{2}$$

where $j = 1 \ldots J$ indexes parenting-related investments Z_P. Parents produce these investments using a combination of market goods (x_j), time (t_j), and attention (a_j). Specifically, let

$$Z_{Pj} = z_j(x_j, t_j, a_j). \tag{3}$$

Parents face the usual income and time constraints. In addition, their attention is also constrained. The assumption that preferences are separable implies that we can abstract from modeling parents' consumption of non-parenting-related commodities and focus only on parents' investment choices. Parental investments in human development are then constrained by the total available income (I^P), time (T^P), and attention (A^P) that has been allocated to parenting. Thus, the constraints facing parents are given by:

$$T^P = t_w + \sum_j t_j \tag{4}$$

$$A^P = a_w + \sum_j a_j \tag{5}$$

$$I^P = w \cdot t_w \cdot a_w + V^P = \sum_j p_j x_j \tag{6}$$

[5] In addition, this approach allows us to analyze parental investment choices abstracting from the role of parent's preferences over parenting vs non-parenting consumption. See Del Boca et al. (2014) for a less general model that explicitly accounts for parents' trade-off between child rearing and other consumption.

Parents devote a fraction of the total time (T^P) and total attention (A^P) allocated to human development to labor market work in order to generate the income necessary to purchase inputs in the form of market goods. The remainder of their time and attention is allocated to producing investments in their children. We define "parenting income" (I^P) to be the sum of labor income ($w \cdot t_w \cdot a_w$) and the non-labor income allocated to human development (V^P). Labor income is the result of rewarding – at predetermined wage w – effective (i.e., attention-augmented) work which is endogenously determined by the time (t_w) and attention (a_w) allocated to work. Finally, market goods are purchased at exogenously-given prices (p_j).[6]

3.2 Endowments of Attention and Socioeconomic Status

The question then arises; how should we conceptualize a household's endowments of attention and cognitive resources? Though many approaches might be adopted to capture heterogeneity in households' cognitive resources, given our specific focus on human development it is particularly useful to link attention endowments to socioeconomic circumstances. This is consistent with the evidence that poverty itself limits self-control (Bernheim et al. 2013), cognitive functioning (Mani et al. 2013), and the ability to parent (McLoyd 1998, Bradley & Corwyn 2002).

Specifically, we assume that a household's available attention (cognitive resources) can be written as:

$$A \stackrel{\text{def}}{=} A(S) \tag{7}$$

with $A' > 0$, $A'' < 0$, and where $S = wT + V$ is Becker's original measure of full income which captures socioeconomic status — and in particular, socioeconomic disadvantage — in our model.[7]

Optimal parental investment in children's human capital and the corresponding effective use of parental time and attention in producing those investments result from the maximization of Q constrained by the relevant investment technologies and the available

[6] A more general way to include attention as a factor in income production is to assume that $w = w(a)$, with $w' > 0$ and $w'' < 0$. The central intuition behind our model does not change under this more general framework.

[7] While economists tend to focus on income-based measures of socioeconomic disadvantage (as we have done here), sociologists are more likely to turn to measures based on parental education, occupation, or family structure (e.g., Sewell & Shah 1967; Mueller & Parcel 1981; Hollingshead 2011). Our modeling approach easily accommodates both perspectives. Moreover, we can derive comparative statics if socioeconomic disadvantage is partly (but not wholly) a function of full income.

resources allocated to investments in human development. We can collapse constraints (4) through (6) into the following overarching constraint:[8]

$$S^P = w \cdot T^P \cdot A^P + V^P = \sum_j p_j x_j + [w\left(T^P \sum_j a_j + A^P \sum_j t_j - \sum_j t_j \sum_j a_j\right)] \quad (8)$$

Equation (8) is an analogue of Becker's full income constraint, which can be more accurately (though less eloquently) described as "full ability-augmented income devoted to parenting." On the left hand side, we have the total (potential) household income when all time and attention allocated to parenting are devoted to producing parenting income. On the right hand side, we have the sum of resources expended by the household on parenting, valued at their respective market prices, and accounting for the complementarities of labor and attention in producing labor income. In particular, the expression in brackets on the right-hand side of equation (8) captures the opportunity cost (lost income) associated with the fact that household effective (attention-augmented) work effort is reduced by devoting both time and attention to parenting.

3.3 A Household's Choice Problem

The household's choice problem can then be written as the unconstrained maximization of

$$L = q\left(Z_{P1}, \ldots, Z_{PJ}\right) + \lambda\left[S^P - \sum_j p_j x_j + w(T^P \sum_j a_j + A^P \sum_j t_j - \sum_j t_j \sum_j a_j)\right] \quad (9)$$

After some algebra, the first order condition for this problem with respect to an arbitrary child investment, Z_{Pj}, can be expressed as

$$\frac{\partial Q}{\partial Z_{Pj}} = \lambda[p_j \frac{\partial x_{ij}}{\partial Z_{Pj}} + \ wa_w \frac{\partial t_j}{\partial Z_{Pj}} + wt_w \frac{\partial a_j}{\partial Z_{Pj}}] \ . \quad (9)$$

These conditions have the usual "marginal productivity equals marginal cost" interpretation.[9] Equation (9) makes clear, however, that while the marginal cost of market goods is their market price, p_j, inputs of time are valued at their opportunity cost at the margin, i.e. the income an additional unit of time would have generated at the current level of wages and attention at work, wa_w. Similarly, attention is also valued at its marginal cost, i.e. the income an additional unit of attention allocated to work would have generated at the current wage and time allocated to work, wt_w.

[8] To see this substitute equations (4) and (5) into equation (6) and rearrange.

[9] The counterpart to Equation (9) when there are joint production—the use of an input in more than one production process at the same time—captures the same intuition but adds notational burden (see Michael & Becker 1973).

Importantly, many of the implications of Becker's original home production model hold here as well. First, in the case of multiple single-input investments, the use of that input will be determined solely by its relative marginal productivity across different investments. The same does not apply for investments that depend on more than one input. In this case, the use of a specific input will generally be affected by the prices and levels of all inputs. We can thus identify parental investments that depend only on a single input, say attention, as those that do not respond to variation in the price of market goods or the opportunity cost of time.

Second, inputs will be more complementary if they are used in the same investments (Michael & Becker 1973). This implies that, if there are important investments for human development which rely on time and market goods as well as attention, these inputs will be stronger complements and their cross-price elasticities will be larger. If, on the other hand, parental investments only require either time, market goods, or attention, then those inputs will not be strong complements. All parental investments in their children's human development – including those in parenting style – will be related to each other to the extent that they use inputs linked through a common budget constraint.

Thus, our rather straight-forward investment model is quite powerful in generating important insights into the relationship between parenting style, socioeconomic disadvantage and human development. It is particularly valuable in providing a conceptual link to the long-standing psychology literature in child development. It is limited, however, by its static nature. Parenting behavior will almost certainly respond to what children and adolescents actually do (e.g. Burton et al. 2002; Lundberg et al. 2009) arguing for extensions of the basic model to permit a dynamic investment approach. Moreover, our simple investment model is best suited to childhood and early adolescence when children's agency is more limited. Youth are more likely to be economic agents with independent preferences and the power to influence family outcomes (e.g. Lundberg et al. 2009), however, making non-cooperative game theoretic approaches to parental investments particularly attractive.

4. Empirical Strategy

Our interest is in assessing whether or not an investment model of parenting style is empirically supported. Unfortunately, modelling attention (cognitive effort) as a key input into investments in human development compounds the well-known barriers to achieving unbiased estimation of production function parameters (see Todd & Wolpin 2003). We will

be unable to overcome these barriers. Instead, we adopt a reduced-form, empirical approach that allows us to interrogate our data to assess whether or not the central predictions of our theoretical model are consistent with the empirical relationships we observe. Details are discussed below.

Previous research that uses a production function approach to analyze children's cognitive achievement is useful in illustrating the empirical challenges we face in taking our theoretical framework to the data. The empirical analog of our human development production function (equation 2) can be written as follows:

$$Q_i = \beta_1 Z_{1i} + \cdots + \beta_J Z_{Ji} + \varepsilon_i \tag{10}$$

This specification corresponds to the cumulative specification commonly used in estimating the production of children's cognitive achievement (see Todd & Wolpin 2003). The biggest hurdle in estimating production functions like that specified in equation (10) arises because parenting-related investments are not exogenously given, but instead result from the active choices that parents make when trying to maximize their children's human development given the constraints they face. As Todd and Wolpin (2003) note, the fact that investments are purposely chosen would not necessarily be a problem if data on all of the relevant factors of production were observed. However, researchers rarely have comprehensive data on all of things that are relevant to human development. Measures of children's endowments (e.g. innate ability) are often unavailable, for example, resulting in biased estimates unless: i) child endowments are orthogonal to parenting-related investments; or ii) child endowments do not in fact contribute to human development. Neither is likely to hold. Moreover, the full range of parental investments is also typically not observed resulting in bias because any unobserved investments will be correlated with the investments captured in the model as a result of the overall budget constraint.

Researchers have adopted a range of empirical strategies to deal with the problems generated by these data limitations (see Todd & Wolpin 2003; 2007). Some use estimators, e.g. fixed-effects or value-added models, which explicitly allow for omitted variables. Fiorini and Keane (2014), for example, argue that such models – in combination with a rich set of controls – are a more practical way to deal with the endogeneity caused by missing inputs than are IV approaches. Others make maintained assumptions about the correlation between observed and unobserved factors in order to place sufficient structure on the problem to generate meaningful estimates (e.g. Ermisch 2008) or restrict analysis to only obtaining

bounds of the parameters. Others condition on "proxy" variables (e.g. family income, prices, preference variables, etc.) which are not necessarily direct inputs into the production process, but which are thought to reduce the omitted variable bias because they are correlated with the omitted inputs. Unfortunately, the inclusion of "crude" proxies that are related to both included and omitted variables (say through parental decision rules) often confounds the interpretation of the estimated effect of the included factors and can result in greater bias (Wolpin 1997, p. 528).

In our view, overcoming the empirical challenge generated by incomplete data on the factors of production is nearly impossible to resolve given existing data sets. This is true even in standard approaches that model human development solely as a function of goods- and time-intensive investments. Adopting a more behavioral approach, as we have done here, by allowing parental attention (cognitive effort) to also influence human development makes practical solutions to this problem even more elusive.

Consequently, we accept the limitations imposed by our data. Rather than attempting to generate unbiased estimates of the role of parenting-related investments in human development, we set a more modest goal of assessing whether or not the conditional correlations that we observe in the data are consistent with the following predictions of our theoretical model. First, we expect that parenting style has independent explanatory power and cannot be completely subsumed by more traditional forms of parental investments. Second, we expect parenting style to be constrained by something other than endowments of time and income. Together, these imply that, if our model holds, parenting style is distinguishable from standard time- and goods-intensive investments. Third, parenting style is expected to be related to family socioeconomic status. Finally, parenting style is expected to matter for human development. We anticipate that parenting style will not only be directly related to youths' outcomes, but that it may potentially also moderate to some degree any negative effect of socioeconomic disadvantage on human development.

5. The Youth in Focus Data

Our data are from the Youth in Focus Project (YIF) which was designed to study the intergenerational transmission of socioeconomic disadvantage.[10] The project's backbone is fortnightly administrative data from Australia's social security system. These data are used to

[10] For details see Breunig et al. (2007; 2009) and http://youthinfocus.anu.edu.au.

identify all young people born between October 1987 and March 1988 who had any contact with the social security system between 1993 and 2005.[11] Most of these young people enter the system because a family member (usually a parent) received a payment which depended in part on the youth's relationship to the payee. Benefits are nearly universal for families with children and a comparison of the YIF youth sample with Australian Census data suggests that the administrative data capture approximately 98 percent of the youths born in the relevant period (Bruenig et al. 2009). For this cohort, we observe high-quality, fortnightly information on the wide range of transfer payments from the Australian government to families. The YIF data are unique in that – for a sample of these young people – we supplement the administrative data with an extensive survey conducted separately with youth and parents in 2006. The survey data focus, among other things, on young people's family background, relationships with their parents, and outcomes including educational attainment, academic achievement, non-cognitive skills, health outcomes, illicit behavior, etc.

One clear advantage of the YIF data is their long-term focus. In the same vein as the recent literature on human development (e.g., Cunha et al. 2010), we see investments in parenting style as a cumulative process with long-run benefits in preparing children for later life. Our data allow us to link parenting to outcomes in early adulthood rather than in childhood which has not yet been done in the economics literature. Moreover, "family disadvantage is poorly assessed by conventional measures of poverty that focus on family income, wealth, and parental education" (Kautz et al. forthcoming, p. 5). In contrast, the YIF data offer an opportunity to measure socioeconomic disadvantage using a complete and accurate administrative history of the social assistance that families received over more than a decade. Specifically, we measure disadvantage as extended reliance on welfare payments which will capture not only periods of low income, but also the hardship associated with family breakdown, parental disability, etc. Finally, the YIF survey asks both youths and parents detailed questions about family life. Thus, we are able to obtain a more balanced perspective on parent-child interactions than is possible when considering only parental reports.

The primary disadvantage of our data is that although they contain self-reported retrospective information, the survey data are essentially cross-sectional. The single wave of

[11] Australia's social security system is nearly universal because many family-related payments are either not means-tested at all or have very high income thresholds. For example, the Family Tax Benefit is an income tax credit for families with children that is denied only to families in the top 15 percent of the income distribution. To place these benefits in context, similar benefits in the United States are provided to families through the tax system in the form of child care rebates and standard deductions for dependent children.

youth-parent survey data provides contemporaneous information about both parenting style and youth outcomes. This means that we will effectively be estimating correlations which condition on, i.e. net out, a range of other factors. Our objective is to assess whether or not our theoretical framework is consistent with the pattern of correlations we observe in the data and in the previous literature.

Our analysis utilizes data from both youth and parent surveys matched to the family's administrative social security records. The construction of our key measures is discussed where relevant throughout the next section.

6. Is the Evidence Consistent with an Investment Model of Parenting Style?

6.1 Is Parenting Style Distinguishable from Goods- and Time-Intensive Investments?

We have modelled parenting style as an investment in children that is constrained not only by time and income, but also by endowments of attention and cognitive capacity. Thus, we expect parenting style to be distinguishable from the other standard types of goods- and time-intensive investments that parents make in their children.

The YIF Survey asks young people and their parents numerous questions about the interactions they have with one another. Parents, for example, report: whether or not they provide financial help to youths (and if they expect to be repaid); their participation in school committees; and their children's extracurricular activities while they were growing up. Young people provide information about the nature of their relationship with their parents including: whether their parents know their friends; how much their parents want to know (and actually do know) about their whereabouts; and whether they were read to and had help with homework when they were younger. Both parents and youths report the extent to which the parent respects the youth's views and opinions. Together, these questions allow us to take a broad perspective on the ways that parents invest in their children. Financial assistance, for example, is goods-intensive in that it imposes an opportunity cost on parents' own consumption. It is primarily constrained by income. Participating in school committees and reading to children and are time-intensive and both are constrained by parents' time endowments. Extracurricular activities require inputs of both time and market goods, while other interactions are less easily characterized as being either goods- or time-intensive.

Responses to a wide range of questions are used to create 12 measures of parent-youth interactions which are categorized into two types (see Appendix Table A1 for details).

Traditional goods- and time-intensive interactions include five measures reflecting: i) the financial help that parents provide to their children; ii) whether this assistance is considered to be a gift; iii) the number of extra-curricular activities the youth participated in; iv) parental involvement in school committees; and v) reading to children. The remaining seven measures capture other dimensions of the parent-child relationship that are not clearly classified as either goods- or time-intensive and are thus the best candidates for being attention-intensive.

With this conceptual categorization in mind, we then investigate the underlying correlation among these 12 parent-child interaction measures using an exploratory principal component analysis (PCA). Our objective is to determine whether the variation in these measures is adequately captured by two components that we can simply interpret as goods- and time-intensive interactions. In other words, are the seven measures we have labeled as attention-intensive, in fact, merely alternative forms of goods- and time-intensive interactions? Exploratory PCA addresses this question since it is designed to reduce the original 12 measures to a few components that are sorted by importance (i.e. the amount of the original variation captured by each component) and are orthogonal to each other. In essence, the components are linear combinations of the original measures. The weights (loadings) associated with each of the measures are informative about how each component can be interpreted. If all the important variation comes from the five goods- and time-intensive measures, the most important PCA components will have high loadings on these measures. The remaining seven measures will not load strongly on any of the primary components and may load only on less important components that explain little of the overall variation. On the other hand, our 12 parent-child interaction measures may have sufficient information to separately identify parenting style from more traditional goods- and time-intensive interactions. In this case, we expect that at least one important PCA component will have low loadings on goods- and time-intensive measures and high loadings on the rest. It is worth noting that, at this stage, our goal is not to derive clearly interpretable components from our analysis. We merely wish to develop a broad understanding of the variation in our parent-child interaction measures.

The PCA results, reported in Table 1, reveal the existence of at least five distinct and important components. Almost a quarter of the variation is captured by the first component which loads very weakly on the goods- and time-intensive interaction measures and very strongly on the other seven measures. Thus, our measures of parent-child interactions do not appear to be simply a function of the market goods and time invested in them by their

parents. Together Components 2, 3 and 4 explain approximately the same portion of the variation as Component 1 alone. Moreover, Components 2 – 5 load much stronger on goods- and time-intensive interaction measures. Together, these results suggest that our attention-intensive interaction measures capture an important share of the overall variation in parent-child interactions and that this variation can be separately identified.

Table 1 Here

Parameterizing Parenting Style and Goods- and Time-Intensive Investments

We use our 12 parent-child interaction measures to obtain indices that can be interpreted as goods-intensive, time-intensive, and (potentially) attention-intensive parental investments.[12] These indices are constructed as linear combinations of our measures using weights (factor loadings) obtained from confirmatory PCAs.[13] In the first step, a confirmatory PCA of the five goods- and time-intensive interaction measures results in two primary components. The component loadings, which are rotated to facilitate interpretability, are reported in the first two columns of Table 2. These two resulting indices can be clearly interpreted as measures of "*time-intensive*" and "*goods-intensive*" parental investments.

Table 2 Here

In step two, we conduct a separate confirmatory PCA on the remaining seven interaction measures. This results in two primary components – together accounting for approximately half of the variation – which are rotated to improve interpretability. Loadings are reported in the third and fourth columns of Table 2.[14] The first component loads highly on measures (reported both by parents and youths) that identify whether the parent respects the youth's views and opinions as well as on youths' assessments of whether their parents' behavior is friendly towards them or not. We label the index using these loadings "*respectful*" parenting. The second component loads highly on youth-reported measures of what their parents want to know—and in fact do know—about where they go after school and at night and what they do with their free time. We label the index based on these loadings "*monitoring*" parenting. Together these two indices form our measure of parenting style.

[12] The value of differentiating between goods- and time-related inputs is shown in Attanasio et al. (2015).
[13] PCA and factor analysis are frequently used to construct indices of latent parenting constructs from multiple items (e.g. Ermisch 2008; Fiorini & Keane 2014).
[14] The use of the Oblimax rotation results in factors that are non-orthogonal and are, in fact, clearly linked through the common loadings on the last two measures.

Interestingly, our two parenting-style indices, respectful and monitoring, align extraordinarily well with aspects of the two canonical dimensions of successful parenting – demandingness and responsiveness – identified in the human development literature (see Baumrind 1991; Maccoby & Martin 1983). Our respectful component is closely associated with the concept of nurturance (Baumrind 1966; 1973); with the key distinction being that our index emphasizes respect over warmth. Our monitoring component shares elements of the parental monitoring index developed by Small and Kerns (1993) and has similarities with Baumrind's (1973) parental control dimension of parenting style. Closely-related constructs have also been identified in the recent literature in economics (Ermisch, 2008; Fiorini & Keane, 2014; Akee et al. 2015).[15]

6.2 Is Parenting Style Related to Socioeconomic Disadvantage?

Previous researchers have found that poverty affects the way people allocate attention and cognitive effort (Shah et al. 2012; Mani et al. 2013) and limits their ability to be effective parents (McLoyd 1998, Bradley & Corwyn 2002; Mullianathan & Shafir 2013). We draw on these insights and choose to formally model parenting style as an investment that is attention (cognitive effort) intensive; endowments of which are constrained by households' socioeconomic circumstances. In short, our theoretical model predicts that socioeconomic disadvantage is related to parenting styles that are less advantageous for children. We consider the empirical support for this proposition below.

Parameterizing Socioeconomic Disadvantage:

We begin by using our administrative social security records to create a measure of socioeconomic disadvantage. Specifically, we cumulate the means-tested welfare payments that families received across a range of programs including: disability support pensions, unemployment benefits, and other welfare payments. We focus on more severe forms of socioeconomic disadvantage by categorizing families as "disadvantaged" if they received

[15] We can use these respectful and monitoring components to categorize parents into four mutually exclusive types: authoritative (highly respectful and highly monitoring); authoritarian (not respectful and highly monitoring); permissive (highly respectful and not monitoring); and emotionally distant (not respectful and not monitoring). These four categories are commonly used in the developmental psychology literature (e.g., Baumrind 1967; Maccoby & Martin 1983), and have recently been incorporated into economic models of preference transmission (Doepke & Zilibotti 2014). We have chosen to retain both respectful and monitoring as continuous measures in the analysis because it maximizes the variation in the parenting styles we can identify. However, results using the four-way classification of parenting style similar and are available upon request.

welfare support for six years or more while the young person was growing up (i.e. during the 1994-2005 period). Our indicator of disadvantage thus identifies families that have received means-tested welfare payments for more than six years. This indicator accounts for a broad, multidimensional notion of family disadvantage which is preferable to more traditional measures based on low income alone (Corak 2006; Heckman 2011; Kautz et al. forthcoming). Moreover, this indicator is based on fortnightly administrative records implying that it has very little measurement error. Disadvantaged families were oversampled in the YIF Survey, resulting in approximately 26 percent of the families in our sample meeting the threshold for being considered disadvantaged. Summary statistics for the variable in our analysis are reported in Table 3 separately for disadvantaged (6+ years of welfare receipt) and relatively advantaged youth (< 6 years or no welfare receipt).

Table 3 Here

Estimation and Results:

A strong unconditional relationship between socioeconomic disadvantage and parenting style is evident in the disparity in average parent-youth interactions across socioeconomic circumstances (see Table 3). Parents from relatively advantaged families are more likely to be involved with, monitor and financially assist their children. We account for possible confounders in this relationship by estimating the following models:

$$Z_{Pj} = \beta_1 D + \beta_2 Z_G + \beta_3 Z_T + \beta_4' X + \varepsilon, \quad (10)$$

where Z_{Pj} represents respectful and monitoring parenting styles, which are indexed by $j = R, M$. Moreover, D is our indicator for socioeconomic disadvantage; Z_G and Z_T are the goods-intensive and time-intensive parental investment components described above; and X is a vector of controls for parental background.[16] Our primary coefficient of interest is β_1; the correlation between socioeconomic disadvantage and parenting style accounting for confounders.

[16] In all analyses we control for standard parental background characteristics including: age, educational attainment, immigrant status, and Aboriginal or Torres Strait Islander status. In some specifications we also include current parental socioeconomic characteristics such as parents' current earnings and employment status, an indicator of whether the mother has an internal locus of control, as well as a number of youth health indicators including: whether they have ever been diagnosed with asthma or depression, and whether they have a physical or a learning disability.

Table 4 presents the parameter estimates for our models of respectful (Panel A) and monitoring (Panel B) parenting styles. We consider four specifications. We first establish the unconditional relationship between socioeconomic disadvantage and the extent of parents' respectful and monitoring parenting by estimating equation (10) including only our socioeconomic disadvantage as a regressor (Column 1). Our second specification adds controls for parental background (Column 2), while specification 3 also controls for a broad set of current family socioeconomic characteristics (Column 3). Our final specification also holds constant the goods- and time-intensive investments that parents make in order to isolate the direct relationship between socioeconomic disadvantage and parenting style (Column 4).

We find that socioeconomic disadvantage is negatively related to the respectful component of parenting style as expected (see Panel A of Table 4). However, the relationship is imprecisely estimated and disappears completely when we account for parental background, family disadvantage, and the goods- and time-intensive investments that parents make. At first glance, this result is unexpected. Reviews of the developmental psychology literature often conclude that the economic stress and other negative life events associated with poverty result in an increased tendency to discipline children in a harsh and inconsistent manner and to ignore children's dependency needs (see McLoyd 1998). Bradley and Corwyn (2002), for example, conclude that "longitudinal studies provide substantial empirical support for the path linking low SES to lower competence and maladaptive behavior via harsh and neglectful parenting" (p. 384).

A closer read of that literature, however, indicates the penalty that disadvantage imposes on parental warmth may be a less robust finding than commonly thought.[17] In addition, our measure of respectful parenting relies more on parental respect for the youth's opinions than on the absence of harsh and abrasive parenting which is at the core of the "warm" parenting component in the existing literature.

Table 4 Here

[17] For example, amongst the supporting studies cited by Bradley and Corwyn (2002), some report only heavily mediated effects which are hard to interpret (e.g., Conger et al. 1992). Others combine warmth, nurturance and other parenting practices together, making it impossible to infer the relationship between disadvantage and separate parenting constructs (e.g., Lempers et al. 1989; Conger et al. 1992; McCoy et al. 1999). Of the studies with good measures of economic disadvantage and parental warmth, at least one does not find a strong association between the two (McLoyd et al. 1994). Several studies find no (or only a weak) relationship between socioeconomic status and parental warmth (e.g., Patterson et al. 1989, Dodge et al. 1994, Davis et al. 2001, Davis-Kean 2005), while Guo and Harris (2000) and Yeung et al. (2002) are somewhat unique in reporting some evidence of a negative relationship.

Importantly, both goods- and time-intensive investments are strongly associated with more respectful parenting. This is consistent with our intuition that goods- and time-intensive investments require different inputs than does respectful parenting. It is also indicative of a strong degree of complementarity in all of these investments into human development. Simply put, if all parental investments utilize the same inputs, then the only reason for parents to simultaneously make different types of investments is if those investments complement one another.

In contrast, there is a strong negative relationship between socioeconomic disadvantage and the monitoring component of parenting style (see Panel B of Table 4). This relationship is economically meaningful, statistically significant, and persistent even when we account for parental background characteristics, family disadvantage, and the other investments that parents make. Interestingly, both goods-intensive and time-intensive parental investments are also strongly associated with higher levels of parental monitoring, again suggesting that they either rely on the same inputs or are complementary in child-rearing. These results for young adults are broadly consistent with previous evidence that social class is associated with the number of organized activities that children engage in, the interest adults take in children's activities, the autonomy children have from adults, and the extent to which it is children's activities (rather than adults) that take precedence in daily life (Lareau 2003).

6.3 Is Parenting Style Related to Youth Outcomes?

If parents' endogenous choices about the style they adopt are, in fact, an important mechanism for investing in their children, then we should observe that parenting style matters. That is, effective parenting styles should be associated with improved outcomes for young adults. We consider this issue below.

Parameterizing Youth Outcomes:

Our focus is on several alternative youth outcomes: i) educational attainment (i.e. high-school completion); ii) academic achievement (i.e. university entrance scores); iii) non-cognitive skills (i.e. locus of control); and iv) risky behavior (i.e. illicit drug use, delinquent behavior, running away, early parenthood, problem drinking, etc.).

Educational attainment is captured by an indicator for high-school completion which takes the value of one if young people report completing 12th grade; and zero otherwise. The young people in our sample are just over 18 years old on average and approximately 72 percent of them report having completed high school.

Our measure of academic achievement comes from the university entrance scores that most Australian students receive upon completing high school. Specifically, high-school graduates who meet certain minimum coursework requirements (e.g. with respect to minimum credit hours, English requirements, school attendance, etc.) are assigned a percentile ranking based on their academic performance in grades 11 and 12. Rankings are based on a combination of in-class performance, performance on standardized state-based exams, and the degree of difficulty in students' curriculum.[18] These rankings are high-stakes in that places for specific degree programs at Australian universities are centrally allocated in rank order on the basis of students' entrance rankings (see Marks et al. 2001). Importantly, rankings are available only for the selective subset of young people (N=715) who graduate from high-school and meet the other requirements. Because of this, we expect that our results will understate the effect of socioeconomic disadvantage on academic achievement. The average university entrance score in our sample is approximately 74.

We measure non-cognitive skills using an index of the degree to which young people have an internal locus of control. Locus of control is a psychological construct that captures "a generalized attitude, belief, or expectancy regarding the nature of the causal relationship between one's own behavior and its consequences" (Rotter 1966 p.2). Individuals who believe that what happens in life is due largely to their own efforts have an internal locus of control, while those believing that life's outcomes are due to external factors (e.g. luck or powerful others) have an external locus of control. Having an internal locus of control has been associated with higher earnings, faster earnings growth, less unemployment, and an increased propensity to make a range of human capital investments (see Cobb-Clark 2015 for a review.) We construct an index of locus of control by summing seven items adapted from the Pearlin Mastery Scale (Pearlin et al. 1981). Responses to those items reflecting external control tendencies have been reversed. The response scale for each item ranges from 1 to 4. Thus, our locus of control index ranges from 7 to 28, has an overall mean of approximately

[18] Although each of Australia's six states and two territories calculates this ranking differently, a national conversion allows comparisons to be made across students educated in different jurisdictions. Rankings range from 30.0 – 99.9 and the average score is approximately 70 (http://www.uac.edu.au/atar/).

21, and is increasing in internal locus of control. To facilitate interpretation, we standardize the index to have a mean of zero and a standard deviation of one.

Finally, YIF respondents were asked whether or not they have ever: run away from home; gotten into trouble with the police; had problems with alcohol; used illicit drugs; attended child or juvenile court due to juvenile offending; hung out with a bad crowd; become pregnant or gotten someone pregnant; and been seriously injured or assaulted. We construct an indicator of risky behavior that takes the value of one if the youth responds 'yes' to one or more of these eight questions. In our sample 41 percent of our youth has engaged in at least one of these risky behaviors.

Estimation and Results:

We assess the relationship between parenting style and youth outcomes (Y_k) using the following model:

$$Y_k = \gamma_1 Z_{PM} + \gamma_2 Z_{PR} + \gamma_3 Z_G + \gamma_4 Z_T + \gamma_4 D + \gamma_5{}' X + \epsilon. \quad (11)$$

where $k = HS, UES, LoC, R$ indexes high-school completion, university entrance score, internal locus of control, and risky behavior. As before, Z_{PM} and Z_{PR} represent the monitoring and respectful components of parenting style, Z_G and Z_T reflect goods- and time-intensive parental investments, D is our indicator for disadvantage, and X is the vector of controls. Our main focus is on the coefficients associated with monitoring and respectful parenting, γ_1 and γ_2.

We find that the respectful component of parenting style is strongly related to youths' outcomes (see Column 1 Table 5). More respectful parenting is significantly associated with a greater likelihood of graduating from high school; a higher university entrance score; a more internal locus of control; and less risky behavior. Specifically, respectful parenting is particularly important for the development of the youths' non-cognitive skills: a one standard deviation increase in the respectful parenting index is associated with a 0.314 standard deviation increase in internal locus of control (see Column 2 of Panel C). This positive effect of respectful parenting is more than twice as large as the negative effect associated with socioeconomic disadvantage (see Column 4 of Panel C), which is consistent with the evidence that effective parenting can protect children from some of the adverse effects of socioeconomic disadvantage (McLoyd 1998; Guo & Harris 2000; McCulloch & Joshi 2002).

Respectful parenting is also associated with a substantial reduction in risky behavior. The likelihood of engaging in a range of risky behaviors falls by 9.2 percentage points for every one standard deviation increase in our index of respectful parenting (see Column 2 of Panel D). Finally, the association between respectful parenting and educational attainment and academic achievement, though much smaller, are nonetheless large enough to be considered economically meaningful.

Table 5 Here

The monitoring component of parenting style, on the other hand, is associated with significantly less risky behavior, but is unrelated to youths' educational attainment, academic achievement, or non-cognitive skills.[19] Given our data, we are unable to determine whether youths' decisions regarding the risks they take respond to the style their parents adopt or whether parents modify their style in response to the choices that their children make. Most likely there is an element of truth in both. Experimental evidence, however, suggests that youths' propensity to engage in risky behavior can respond to the intensity of parental monitoring. Stanton et al. (2004), for example, find that an intervention designed to increase parental monitoring was effective in reducing suspensions, cigarette smoking, illicit drug use, etc., while U.S policy changes in the 1990s that moved parents from welfare to work led to an increase in adolescents' self-reported tobacco and alcohol consumption, perhaps due to a reduction in parental monitoring (Morris et al. 2001).

Our estimates of the association between socioeconomic disadvantage and other parental investments with youth outcomes are largely consistent with the previous literature. We find that time-intensive parental investments are beneficial for young people's human capital development across the board (see Astone & McLanahan 1991, Spera 2005). Goods-intensive investments are also generally beneficial for youth outcomes, though they appear not to improve young people's development of an internal locus of control. Disadvantage, however, is associated with lower educational attainment, less academic achievement, and fewer non-cognitive skills.

Furthermore, it is interesting that the strength of the correlation between respectful parenting and youth outcomes is largely unaffected by the inclusion of controls for goods- and time-intensive investments and socioeconomic disadvantage (see Column 2). In fact,

[19] We also created and analyzed indicators for each of our eight forms of risky behavior separately. Respectful parenting is associated with significant decreases risk across all outcomes monitoring parenting is associated only with significantly lower risks of getting in trouble with the police and using illicit drugs. Results are available upon request.

respectful parenting has an association that in general is as large as, or even larger than, the association with the traditional goods- and time-intensive parental investments. Moreover, a comparison of the incremental goodness of fit (R-squared) across multiple models in Table 5 reveals that overall parenting style explains as much of the variance in educational attainment and academic achievement as goods- and time-intensive investments and a substantially larger fraction of the variation in youths' internal locus of control and risky behavior. Thus, there is clear evidence that parenting style is associated with a range of important youth outcomes in ways that are not explained by goods- and time-intensive forms of parental investments.

However, even though parenting style is clearly an important correlate of youth outcomes, the share of the disadvantage penalty explained by parenting style is small once we condition on the level of goods- and time-intensive investments. The comparison of the socioeconomic disadvantage coefficient in Table 5 (across Columns 2 and 3) shows little movement: the share of the socioeconomic disadvantage penalty explained by parenting style ranges from essentially zero for high school graduation to 8.8 per cent (in absolute value) for university entrance scores. This suggests that other factors (beyond that of respectful and monitoring parenting) can be mediating the relationship between socioeconomic disadvantage and youth outcomes.

6.4 Robustness: Unobserved Heterogeneity

The empirical relationships presented in Tables 4 and 5 are correlations (conditional on a various controls) rather than causal estimates. Our objective is to use these correlations to assess whether or not the economic relationships between parenting style, disadvantage, and youth outcomes that are predicted by our theoretical model have any empirical support. Chief amongst our concerns is the fact that we do not fully observe – and therefore cannot fully control for – all of the factors that underpin youths' outcomes. Children differ in their innate abilities, behavioral tendencies, emotional stability, etc., all of which may affect outcomes directly. Moreover, parents and schools are also likely to adjust their investments in children in ways that may either complement or compensate for these differences. Importantly, the style that parents adopt will not only be constrained by their endowments, but may also respond to children's traits, behaviors, and outcomes. Thus, unobserved heterogeneity may confound our estimates of the association between socioeconomic disadvantage and parenting style as well as the association between parenting style and youth outcomes.

The degree of coefficient stability is often used by applied researchers to make inferences about potential biases due to unobserved heterogeneity. Oster (2015) notes the usefulness of this exercise hinges in part on the explanatory power of the controls, i.e. on changes in the R-squared. Consequently, we implement the tests proposed by Altonji et al. (2005) and Oster (2015) to assess the potential for selectivity on unobserved factors to be driving our results. The intuition behind this procedure is simple and is best illustrated using a concrete example. Suppose we wish to estimate the effect of respectful parenting on high school graduation, for example, in the presence of unobserved factors. If we have measures that relate to respectful parenting in the same way as the unobserved factors do, these observed measures — or more precisely, the change in the coefficient of respectful parenting when the observed measures are included in the regressions — are informative of the true effect of respectful parenting net of unobserved factors. What we learn from this exercise depends on how closely our observed measures reflect the relationship between respectful parenting and our unobserved factors, i.e. the degree of proportional selection. Two scenarios are of particular interest: i) when the selection on unobserved factors is fully captured by our observed measures (i.e. no remaining selection); and ii) when the selection on unobserved factors is equal to the selection on observed characteristics (i.e. equal selection). The former case implies that our observed measures are in fact completely capturing unobserved factors. The latter case is generally regarded as a reasonable benchmark for the maximum degree of selectivity when detailed, relevant controls are available (Altonji et al. 2005). Oster (2015) argues that the causal effect of respectful parenting can be bounded by the coefficients under these two scenarios.

We calculate these bounds for the effect of socioeconomic disadvantage on parenting style and for the effect of parenting style and disadvantage on all of our youth outcomes. The measures we use to inform us about the unobserved factors include: all of the controls used in the proceeding analysis as well as a number of additional measures including: parents' and youths' assessments of the youth's academic ability, measures of youths' misbehavior in school, and youth health indicators.[20] Table A3 in the Appendix shows the bounds for each coefficient in parentheses and the corresponding degree of selectivity that would produce a completely spurious coefficient estimate (Oster's *delta* coefficient) in square brackets. If our maintained assumptions hold, the magnitude of the true effect will lie within the bounds. If the bounds do not include zero — or alternatively, if the delta coefficient in square brackets is

[20] Summary statistics of these child quality measures are reported in Table A2 in the Appendix.

not between zero and one – then there is evidence that the estimated coefficient is not entirely driven by selection on unobserved factors.

We find evidence that there is a penalty of socioeconomic disadvantage on monitoring parenting which is not driven solely by selection on unobserved factors. Similarly, there is a robust positive effect of respectful parenting on youths' internal locus of control and university entrance scores, and a generally negative effect of both respectful and monitoring parenting on youths' risky behavior. Taken together, these findings strengthen our view that the empirical relationships we observe are consistent with our theoretical model.

6.5 Summary of Results

The results of our empirical exercises lend support to the proposition that parenting style is an important investment in human development. The broad range of parent-child interactions we consider are not fully captured by goods- and time-intensive parental investments. Instead, many parent-child interactions are subsumed by two indices of parenting style that can be interpreted as respectful and monitoring parenting. These indices align with the primary parenting constructs in the extensive literature in developmental psychology. Socioeconomic disadvantage is negatively associated with the extent of parental monitoring even after accounting for a number of controls and for the potential effects of unobserved factors. This is consistent with the view that parenting style is constrained by attention and cognitive bandwidth which are taxed by disadvantage. Finally, respectful parenting is associated with a greater likelihood of graduating from high school; a higher university entrance score; and a more internal locus of control, while parental respect and monitoring are both associated with less risky behavior. In short, parenting style matters.

7. **Conclusions**

Fostering parents' capacity to support their children's development – regardless of their socioeconomic circumstances – is an important step in breaking the cycle of intergenerational poverty. Effective parenting can protect children from many of the adverse effects of growing up in disadvantage. At the same time, there is compelling evidence that economic hardship is often associated with less effective parenting behaviors.

This paper makes an important contribution in formalizing the complex relationship between parenting, socioeconomic disadvantage, and children's development. Specifically, we model parenting style as an investment decision that is important in the production of human development. Unlike previous researchers, we allow investments in child rearing – including in parenting style – to rely not only on inputs of time and market goods, but also on a third input which we conceptualize as attention or cognitive effort. Socioeconomic disadvantage affects parental investment decisions through the constraints (taxes) it imposes on households' endowments of attention (cognitive capacity). Importantly, our model finds empirical support in the data and is consistent with the well-established literature in developmental psychology.

Formally modelling the tradeoffs that parents make in raising their children – as we have done here – is fundamental in the formation of social policy designed to generate better outcomes for disadvantaged children. Evaluations of parenting interventions, for example, typically focus only on specific parenting behaviors (e.g. reading to children; monitoring; health care; helping with homework; providing routine; etc.) without considering the consequences for other parental investments. Understanding these tradeoffs is an essential first step in evaluating the overall impact of policies targeting parental decision making. Moreover, to the extent that poverty constrains parents' cognitive bandwidth, income transfers that move families out of poverty will not only increase parents' financial resources, but also permit parents to put more attention and cognitive effort into raising their children. Both are expected to result in better outcomes for children and adolescents. At the same time, effective parenting may be increased more efficiently through parenting interventions that target attention and cognitive effort directly.

Empirically, we provide clear evidence that it is important to distinguish between the "respectful" and "monitoring" components of parenting style. We find that socioeconomic disadvantage appears to limit parents' ability to monitor – but not to be respectful towards– their children, while it is respectful parenting that is mostly associated with better outcomes for young adults. Parental monitoring is associated only with less risky behavior. These alternative components of parenting style have been prominent in developmental psychology for decades and there is a large literature that links authoritative parenting to a range of positive outcomes including childhood weight problems, school readiness, school performance and later school enrolment, subjective well-being, and various risky behaviors (Dornbusch et al. 1987; Steinberg et al. 1992; Rhee et al. 2006; Chan & Koo 2011).

Authoritative parents, however, are characterized by high levels of both parental respect and monitoring, implying that the effect of respectful and monitoring parenting cannot be unequivocally disentangled. Our results indicates that for many outcomes the beneficial effects of an authoritative parenting style may operate through higher levels of parental respect rather than more intensive monitoring.

The advantage of our data is that they allow such distinctions to be made. Ultimately, however, we are constrained by the fact that they are cross-sectional. Thus, our empirical evidence rests on estimated correlations which condition on, i.e. net out, a range of other factors. This is sufficient to assess whether or not our theoretical model is consistent with the pattern of correlations we observe, but leaves a number of pressing questions unanswered.

In particular, Ermisch (2008) argues that parenting in early childhood contributes to the intergenerational persistence in incomes and our theoretical model certainly demonstrates that conceptually this proposition makes a great deal of sense. Empirically, however, we find little evidence that parenting style mediates the socioeconomic disadvantage penalty over and above traditional goods- and time-intensive investments. This is because socioeconomic disadvantage is related to dimensions of parenting style (monitoring) that may be less important than others (parental respect) for children's outcomes. Interestingly, Dooley and Stewart (2007) also find that parental income and parenting style may have effects on human development that are largely orthogonal. This then raises the question: How much does parenting style in fact contribute to the intergenerational persistence of socioeconomic disadvantage?

Moreover, while there is certainly other evidence that effective parenting may compensate for a lack of financial resources (McLoyd 1998; Guo & Harris 2000; McCulloch & Joshi 2002), we know very little about the magnitude of this relationship and the mechanism through which it operates. Explicitly modelling parenting style as an important investment in the production of human development provides a means of quantifying these relationships. In particular, is it the case "an economically advantaged child exposed to low-quality parenting is more disadvantaged than an economically disadvantaged child exposed to high-quality parenting" (Heckman 2011 p. 33)? Does parenting style substitute for, or rather complement, inputs of time and market goods? How does socioeconomic disadvantage affect the technological relationship underpinning the production of human development?

Finally, how do the returns to investments in parenting style depend on: i) the dimension of style we have in mind; and ii) the outcome under consideration? Consistent with the

literature, we find, for example, that young people's risk-taking is linked to the extent to which their parents monitor them (see Stattin & Kerr 2000). Respectful parenting, on the other hand, appears to have benefits across a wide range of outcomes suggesting that the returns to these alternative aspects of parenting style differ. We need to know more about the nature of parenting style itself and the ways that different aspects of parenting behavior are related to human development.

References

Akee, Randall, Emilia Simeonova, E. Jane Costello, and William Copeland. 2015. “How does household income affect child personality traits and behaviors?” NBER Working Paper, No. w21562.

Altonji, Joseph G., Todd E. Elder, and Christopher R. Taber. 2005. “Selection on observed and unobserved variables: Assessing the effectiveness of catholic schools." *Journal of Political Economy* 113(1): 151-184.

Astone, Nan Marie, and Sara S. McLanahan. 1991. “Family structure, parental practices and high school completion.” *American Sociological Review* 56(3): 309-320.

Attanasio, Orazio, Sarah Cattan, Emla Fitzsimons, Costas Meghir, and Marta Rubio-Codina. 2015. “Estimating the production function for human capital: Results from a randomized control trial in Colombia.” NBER Working Paper, No. w20965.

Aunola, Kaisa, Stattin, Håkan, and Jari-ErikNurmi (2000) “Parenting styles and adolescents’ achievement strategies” *Journal of Adolescence* 23: 205-222.

Baumrind, Diana. 1966. “Effects of authoritative parental control on child behavior.” *Developmental Psychology* 37(4): 887-907.

Baumrind, Diana. 1967. “Child care practices anteceding three patterns of preschool behavior.” *Genetic psychology monographs* 75(1): 43-88.

Baumrind, Diana. 1973. “The development of instrumental competence through socialization.” In Anne Pick (Eds.) *Minnesota symposium on child psychology* (Vol. 7, pp. 3-46). Minneapolis: University of Minnesota Press.

Baumrind, Diana. 1991. “The influence of parenting style on adolescent competence and substance use.” *The Journal of Early Adolescence* 11(1): 56-95.

Becker, Gary S. 1960. “An economic analysis of fertility.” In *Demographic and economic change in developed countries* (pp. 209-240). Columbia University Press

Becker, Gary S. 1965. “A theory of the allocation of time.” *The Economic Journal* 75(299): 493-517.

Becker, Gary S., and H. Gregg Lewis. 1973. “On the interaction between the quantity and quality of children.” *Journal of Political Economy* 81(2): S279-88.

Berger, Lawrence M., Christina Paxson, and Jane Waldfogel. 2009. “Income and child development.” *Children and Youth Services Review* 31(9): 978-989.

Bernheim, B. Douglas, Debraj Ray, and Şevin Yeltekin. 2015. “Poverty and self-control.” *Econometrica* 83(5): 1877-1911.

Bradley, Robert H., and Robert F. Corwyn. 2002. “Socioeconomic status and child development.” *Annual Review of Psychology* 53(1): 371-399.

Breunig, Robert, Deborah Cobb-Clark, Tue Gørgens, and Anastasia Sartbayeva. 2007. "User's guide to the youth in focus data version 1.0." Youth in focus project discussion paper series, The Australian National University.

Breunig, Robert, Deborah Cobb-Clark, Tue Gørgens, Chris Ryan and Anastasia Sartbayeva. 2009. "User's guide to the youth in focus data version 2.0." Youth in focus project discussion paper series, The Australian National University.

Brooks-Gunn, Jeanne, and Lisa Markman. 2005. "The contribution of parenting to ethnic and racial gaps in school readiness." *The Future of Children* 15(1): 139-168.

Burton, Peter, Shelley Phipps, and Lori Curtise. 2002. "All in the family: A simultaneous model of parenting style and child conduct." *The American Economic Review* 92(2): 368-372.

Chan, Tak Wing, and Anita Koo. 2011. "Parenting style and youth outcomes in the UK." *European Sociological Review* 27(3): 385-399.

Cobb-Clark, Deborah A. "Locus of control and the labor market." *IZA Journal of Labor Economics* 4(1): 1-19.

Conger, Rand D., Katherine J. Conger, Glen H. Elder, Frederick O. Lorenz, Ronald L. Simons, and Les B. Whitbeck. 1992 "A family process model of economic hardship and adjustment of early adolescent boys." *Child Development* 63(3): 526-541.

Conger, Rand D, Lora Ebert Wallace, Yumei Sun, Ronald L. Simons, Vonnie C. McLoyd, and Gene H. Brody. 2002. "Economic pressure in African American families: A replication and extension of the family stress model." *Developmental Psychology* 38(2): 179-193.

Corak, Miles. 2006. "Do poor children become poor adults? Lessons from a cross country comparison of generational earnings mobility." *Research on Economic Inequality* 13(1): 143-188

Cosconati, Marco. 2009. "Parenting style and the development of human capital in children." Unpublished Manuscript, Bank of Italy.

Cunha, Flávio. 2015. "Subjective Rationality, Parenting Styles, and Investments in Children. In *Families in an Era of Increasing Inequality* (pp. 83-94). Springer International Publishing.

Cunha, Flavio, James J. Heckman, and Susanne M. Schennach. 2010 "Estimating the technology of cognitive and noncognitive skill formation." *Econometrica* 78(3): 883-931.

Darling, Nancy, and Laurence Steinberg. 1993. "Parenting style as context: An integrative model." *Psychological Bulletin* 113(3): 487-496.

Davis, Catherine L., Alan M. Delamater, Kimberly H. Shaw, Annette M. La Greca, Margaret S. Eidson, Jose E. Perez-Rodriguez, and Robin Nemery. 2001. "Parenting styles, regimen adherence, and glycemic control in 4-to 10-year-old children with diabetes." *Journal of Paediatric Psychology* 26(2): 123-129.

Davis-Kean, Pamela E. 2005. “The influence of parent education and family income on child achievement: The indirect role of parental expectations and the home environment.” *Journal of Family Psychology* 19(2): 294-304.

De Tray, Dennis N. 1974. “Child quality and the demand for children.” *Journal of Political Economy* 81(2): S70-95.

Del Boca, Daniela, Christopher Flinn, and Matthew Wiswall. 2014 “Household choice and child development.” *The Review of Economic Studies* 81(1): 137–185.

Del Bono, Emilia, Marco Francesconi, Yvonne Kelly and Amanda Sacker. 2014. “Early maternal time investment and early child outcomes.” University of Essex Department of Economics Discussion Paper Series, No. 726.

Dodge, Kenneth A., Gregory S. Pettit, and John E. Bates. 1994. “Socialization mediators of the relation between socioeconomic status and child conduct problems.” *Child Development* 65(2): 649-665.

Doepke, Matthias, and Fabrizio Zilibotti. 2014. “Parenting with style: Altruism and paternalism in intergenerational preference transmission.” NBER Working Paper, No. w20214.

Dooley, Martin, and Jennifer Stewart. 2007. “Family income, parenting styles and child behavioural–emotional outcomes.” *Health Economics* 16(2): 145-162.

Dornbusch, Sanford M., Philip L. Ritter, P. Herbert Leiderman, Donald F. Roberts, and Michael J. Fraleigh. 1987. “The relation of parenting style to adolescent school performance.” *Child Development* 58(5): 1244-1257.

Ermisch, John. 2008. “Origins of social immobility and inequality: parenting and early child development.” *National Institute Economic Review* 205(1): 62-71.

Feinstein, Leon. 2003. “Inequality in the early cognitive development of British children in the 1970 cohort.” *Economica* 70(277): 73-97.

Fiorini, Mario, and Michael Keane. 2014. “How the allocation of children’s time affects cognitive and non-cognitive development.” *Journal of Labor Economics* 32(4): 787-836.

Gino, Francesca, Maurice E. Schweitzer, Nicole L. Mead, and Dan Ariely. 2011. “Unable to resist temptation: How self-control depletion promotes unethical behavior.” *Organizational Behavior and Human Decision Processes* 115(2): 191-203.

Gronau, Reuben. 1977. “Leisure, home production, and work-the theory of the allocation of time revisited.” *Journal of Political Economy* 85(6): 1099-1123.

Guo, Guang, and Kathleen M. Harris. 2000. “The mechanisms mediating the effects of poverty on children’s intellectual development.” *Demography* 37(4): 431-447.

Hao, Lingxin, Hotz, V. Joseph, and Ginger Z. Jin (2008) “Games parents and adolescents play: Risky behaviour, parental reputation and strategic transfers” *Economic Journal* 118: 515-555.

Haushofer, Johannes, and Ernst Fehr. 2014. “On the psychology of poverty.” *Science* 344(6186): 862-867.

Heckman, James J. 2006. “Skill formation and the economics of investing in disadvantaged children.” *Science* 312(5782): 1900-1902.

Heckman, James J. 2011. “The economics of inequality: the value of early childhood education.” *American Educator* 35(1): 31-35.

Hollingshead, August B. 2011. “Four Factor Index of Social Status.” *Yale Journal of Sociology* (8): 11-20.

Kautz, Tim, James J. Heckman, Ron Diris, Bas ter Weel, and Lex Borghans. Forthcoming. “Fostering and Measuring Skills: Improving Cognitive and Non-Cognitive Skills to Promote Lifetime Success.” OECD.

Kelly, Yvonne, Amanda Sacker, Emelia Del Bono, Marco Francesconi, and Michael Marmot. 2011. “What role for the home learning environment and parenting in reducing the socioeconomic gradient in child development? Findings from the Millennium Cohort Study.” *Archives of Disease in Childhood* 96(9): 832–837.

Lareau, Annette (2003) *Unequal Childhoods: Class, Race, and Family Life*. University of California Press: Berkeley CA.

Leibowitz, Arleen. 1974. “Home investments in children.” *The Journal of Political Economy* 82(2): S111-S131.

Lempers, Jacques D., Dania Clark-Lempers, and Ronald L. Simons. 1989. “Economic hardship, parenting, and distress in adolescence.” *Child Development* 60(1): 25-39.

Lundberg, Shelly, Jennifer L. Romich, and Kwok Ping Tsang. 2009. “Decision-making by children.” *Review of Economics of the Household* 7(1): 1-30.

Maccoby, Eleanor E., and John A. Martin. 1983. “Socialization in the context of the family: Parent-child interaction.” In Paul H. Mussen (Eds.) *Handbook of Child Psychology: formerly Carmichael's Manual of Child Psycholog*. New York: Wiley

Mani, Anandi, Sendhil Mullainathan, Eldar Shafir, and Jiaying Zhao. 2013. “Poverty impedes cognitive function.” *Science* 341(6149): 976-980.

Marks, Gary, Julie McMillan and Kylie Hillman. 2001. “Tertiary entrance performance: The role of student background and school factors.” *LSAY Research Reports*. Longitudinal surveys of Australian youth research report; n.22

McCoy, Monique G., Paul J. Frick, Bryan R. Loney, and Mesha L. Ellis. 1999. “The potential mediating role of parenting practices in the development of conduct problems in a clinic-referred sample.” *Journal of Child and Family Studies* 8(4): 477-494.

McCulloch, Andrew, and Heather E. Joshi. 2002. “Child development and family resources: evidence from the second generation of the 1958 British birth cohort.” *Journal of Population Economics* 15(2): 283-304.

McEwen, Bruce S. 2000. “Allostasis and allostatic load: Implications for neuropsychopharmacology.” *Neuropsychopharmacology* 22(2): 108-124.

McLoyd, Vonnie C., Toby Epstein Jayaratne, Rosario Ceballo, and Julio Borquez. 1994. “Unemployment and work interruption among African American single mothers: Effects on parenting and adolescent socioemotional functioning.” *Child Development* 65(2): 562-589.

McLoyd, Vonnie C. 1998. “Socioeconomic disadvantage and child development.” *American Psychologist* 53(2): 185-204.

Michael, Robert T., and Gary S. Becker. 1973. “On the new theory of consumer behavior.” *The Swedish Journal of Economics* 75(4): 378-396.

Mistry, Rashmita S., Aprile D. Benner, Connie S. Tan, and Su Yeong Kim. 2009. “Family economic stress and academic well-being among Chinese-American youth: The influence of adolescents’ perceptions of economic strain.” *Journal of Family Psychology* 23(3): 279-290.

Morris, Pamela, Aletha Huston, Greg Duncan, Danielle Crosby, and Hans Bos. 2001. *How Welfare and Work Policies Affect Children: A Synthesis of Research.* New York: MDRC.

Mueller, Charles W., and Toby L. Parcel. 1981. “Measures of socioeconomic status: Alternatives and recommendations.” *Child Development* 52(1): 13-30.

Mullainathan, Sendhil and Eldar Shafir. 2013. *Scarcity: Why Having so Little Means so Much*. New York: Henry Holt and Company, LLC.

Oster, Emily. 2015. “Unobservable selection and coefficient stability: Theory and validation.” Working paper, Brown University.

Patterson, Charlotte J., Deborah A. Cohn, and Barbara T. Kao. 1989. “Maternal warmth as a protective factor against risks associated with peer rejection among children.” *Development and Psychopathology* 1(1): 21-38.

Paulson, Sharon E. (1994) “Relations of parenting style and parental involvement with ninth-grade students’ achievement” *Journal of Early Adolescence* 14(2): 250-267.

Pearlin, Leonard I., Elizabeth G. Menaghan, Morton A. Lieberman, and Joseph T. Mullan. 1981. “The stress process.” *Journal of Health and Social behavior* 22(4): 337-356.

Rameson, Lian T., Sylvia A. Morelli, and Matthew D. Lieberman. 2012. “The neural correlates of empathy: Experience, automaticity, and prosocial behavior.” *Journal of cognitive neuroscience* 24(1): 235-245.

Rhee, Kyung E., Julie C. Lumeng, Danielle P. Appugliese, Niko Kaciroti, and Robert H. Bradley. 2006. “Parenting styles and overweight status in first grade.” *Pediatrics* 117(6): 2047-2054.

Ribar, David C., and Daniela Zapata. 2014. “Food assistance and family routines in three American Cities.” *Review of Economics of the Household*: 1-16.

Rotter, Julian B. 1966. “Generalized expectancies for internal versus external control of reinforcement.” *Psychological Monographs: General and Applied* 80(1): 1-28.

Sewell, William H., and Vimal P. Shah. 1967. “Socioeconomic status, intelligence, and the attainment of higher education.” *Sociology of Education* 40(1): 1-23.

Shah, Anuj K., Sendhil Mullainathan, and Eldar Shafir. 2012. “Some consequences of having too little.” *Science* 338(6107): 682-685.

Shiv, Baba, and Alexander Fedorikhin. 1999. “Heart and mind in conflict: The interplay of affect and cognition in consumer decision making.” *Journal of Consumer Research* 26(3): 278-292.

Small, Stephen A and Donell Kerns. 1993. “Unwanted sexual activity among peers during early and middle adolescence: Incidence and risk factors.” *Journal of Marriage and the Family* 55(4): 941-952.

Spera, Christopher. 2005. “A review of the relationship among parenting practices, parenting styles, and adolescent school achievement.” *Educational Psychology Review* 17(2): 125-146.

Stanton, Bonita F., Xiaoming Li, Jennifer Galbraith, George Cornick, Susan Feigelman, Linda Kaljee, and Yong Zhou. 2000. “Parental underestimates of adolescent risk behavior: a randomized, controlled trial of a parental monitoring intervention.” *Journal of Adolescent Health* 26(1): 18-26.

Stattin, Häkan, and Margaret Kerr. 2000. “Parental monitoring: A reinterpretation.” *Child Development* 71(4): 1072-1085.

Steinberg, Laurence, Susie D. Lamborn, Sanford M. Dornbusch, and Nancy Darling. 1992. “Impact of parenting practices on adolescent achievement: Authoritative parenting, school involvement, and encouragement to succeed.” *Child Development* 63(5): 1266-1281.

Taubinsky, Dmitry. 2014. “From intentions to actions: A model and experimental evidence of inattentive choice.” Working paper, Harvard University.

Todd, Petra E., and Kenneth I. Wolpin. 2003. “On the specification and estimation of the production function for cognitive achievement.” *The Economic Journal* 113(485): F3-F33.

Todd, Petra E., and Kenneth I. Wolpin. 2007. “The production of cognitive achievement in children: Home, school, and racial test score gaps.” *Journal of Human Capital* 1(1): 91-136.

Wake, Melissa, Jan M. Nicholson, Pollyanna Hardy, and Katherine Smith. 2007. “Preschooler obesity and parenting styles of mothers and fathers: Australian national population study.” *Pediatrics* 120(6): e1520-e1527.

Wolpin, Kenneth. I. 1997. “Determinants and consequences of the mortality and health of infants and children.” In Mark. R. Rosenzweig and Oded Stark (Eds.) *Handbook of population and family economics. Volume 1A* (pp. 483-557). Amsterdam: Elsevier

Yeung, W. Jean, Miriam R. Linver, and Jeanne Brooks-Gunn. 2002. “How money matters for young children's development: Parental investment and family processes.” *Child Development* 73(6): 1861-1879.

Table 1. Exploratory Principal Component Analysis of all Parent-Child Interactions

	Exploratory Principal Component Analysis				
	Component 1	*Component 2*	*Component 3*	*Component 4*	*Component 5*
Eigenvalues =	2.89	1.42	1.28	1.15	1.02
Variation captured =	0.24	0.11	0.10	0.09	0.08
Parent helps youth with money	0.17	**0.55**	-0.23	0.06	0.14
1 if parents don't expect money aid to be repaid	0.05	0.24	-0.18	**0.66**	-0.30
Parent: Participated in parent committee/meetings	0.14	0.06	**0.59**	0.00	**0.38**
Number of youth's extracurricular activities	0.15	0.10	**0.49**	0.27	**0.35**
Youth: Parents read to me at night when younger	**0.30**	-0.03	**0.35**	0.07	**-0.53**
Parent: I can respect youth's views and opinions	0.28	-0.05	-0.09	**0.48**	0.12
Youth: Mother respects my views and opinions	**0.36**	**-0.37**	-0.22	0.10	0.27
Youth: Mother's behavior towards me is friendly	**0.37**	**-0.37**	-0.27	0.06	0.21
Youth: Mother knows my friends	**0.31**	-0.14	-0.02	**-0.33**	-0.08
Youth: Mother wants to know whereabouts	**0.30**	**0.51**	-0.06	-0.24	0.08
Youth: Mother really knows whereabouts	**0.41**	0.23	-0.18	-0.25	0.01
Youth: Parents help with schoolwork & guidance when younger	**0.36**	-0.10	0.23	-0.06	**-0.45**

This table reports the result of a Principal Component Analysis (PCA) on all parent-child interaction measures. The PCA is based on tetrachoric, polychoric and polyserial correlations of the measures. The components are orthogonal and unrotated. We keep the first five components based on the criterion of eigenvalues larger than one. Factor loadings greater than 0.3 in absolute value are reported in bold.

Table 2. Confirmatory Principal Component Analyses of Parent-Child Interactions used in the Construction of Goods- and Time-Intensive Investments and Parenting Styles (Respectful and Monitoring)

	Parental Investments		Parenting Style	
	Time-Intensive	*Goods-Intensive*	*Respectful*	*Monitoring*
Eigenvalues =	1.37	1.15	2.57	1.26
Variation captured =	0.27	0.23	0.36	0.18
Goods- and Time-intensive Interactions:				
Parent helps youth with money	0.06	**0.65**		
1 if parents don't expect money aid to be repaid	-0.06	**0.73**		
Parent: Participated in parent committee/meetings	**0.64**	-0.16		
Number of youth's extracurricular activities	**0.59**	0.08		
Youth: Parents read to me at night when younger	**0.48**	0.14		
Attention-intensive Interactions:				
Parent: I can respect youth's views and opinions			**0.38**	-0.02
Youth: Mother respects my views and opinions			**0.59**	-0.07
Youth: Mother's behavior towards me is friendly			**0.59**	-0.05
Youth: Mother wants to know whereabouts			-0.16	**0.69**
Youth: Mother really knows whereabouts			0.09	**0.60**
Youth: Mother knows my friends			0.25	0.26
Youth: Parents help with schoolwork & guidance when younger			0.23	0.29

This table reports the factor loadings of two Principal Component Analyses: the first one on a set of goods- and time-intensive parent-child interactions (Columns 1 and 2), and the second one on a set of attention-intensive parent-child interactions (Columns 3 and 4). Each PCA is based on tetrachoric, polychoric and polyserial correlations of the corresponding measures. We keep the first two components in each case based on the criterion of eigenvalues larger than one. The components reported are oblimax rotated to facilitate interpretation. Factor loadings greater than 0.3 in absolute value are reported in bold.

Table 3. Sample Mean of Key Variables by Socioeconomic Disadvantage

	All	By Welfare Support History:		
		<6 years	*6+years*	*Difference*
	(N=1,358)	(N=1,002)	(N=356)	[p-value]
Goods- and Time-intensive interactions:				
Parent helps youth with money	3.92	4.10	3.40	[0.000]
1 if parents don't expect money aid to be repaid	0.83	0.84	0.82	[0.353]
Parent: Participated in parent committee/meetings	1.21	1.26	1.07	[0.001]
Number of youth's extracurricular activities	1.67	1.79	1.34	[0.000]
Youth: Parents read to me at night when younger	3.47	3.53	3.31	[0.003]
Attention-intensive interactions:				
Parent: I can respect youth's views and opinions	5.05	5.07	5.00	[0.266]
Youth: Mother respects my views and opinions	5.12	5.15	5.02	[0.058]
Youth: Mother's behavior towards me is friendly	5.44	5.44	5.45	[0.794]
Youth: Mother knows my friends	2.42	2.43	2.40	[0.428]
Youth: Mother wants to know whereabouts	6.99	7.08	6.72	[0.000]
Youth: Mother really knows whereabouts	7.30	7.35	7.18	[0.118]
Youth: Parents help with schoolwork & guidance when younger	3.67	3.72	3.55	[0.013]
Youth outcomes:				
Youth's internal LOC	0.00	0.04	-0.12	[0.010]
1 if youth graduated high school	0.72	0.76	0.60	[0.000]
Youth's University Entrance Score (N=715)	74.72	75.39	71.56	[0.027]
Parent's background:				
Parent's age	47.06	47.43	46.03	[0.000]
1 if parent completed high school	0.46	0.50	0.33	[0.000]
1 if parent completed university	0.21	0.24	0.12	[0.000]
1 if parent is foreign-born	0.21	0.21	0.21	[0.909]
1 if parent aboriginal	0.02	0.01	0.04	[0.003]
Parent's current socioeconomic information:				
Log. of total earnings	8.24	8.85	6.53	[0.000]
1 if zero earnings reported	0.24	0.20	0.34	[0.000]
1 if parent is unemployed	0.20	0.14	0.36	[0.000]
Mother’s internal LOC	0.00	0.07	-0.21	[0.000]
1 if parent was ever diagnosed with asthma	0.18	0.17	0.22	[0.058]
1 if parent was ever diagnosed with depression	0.24	0.20	0.34	[0.000]
1 if parent ever diagnosed with physical disability	0.15	0.13	0.21	[0.002]
1 if parent ever diagnosed with learning disability	0.02	0.01	0.04	[0.027]

This table reports the mean value of the all relevant measures for our analyses. The first column reports mean values for the estimation sample. The second and third columns report means for the advantaged and disadvantaged subpopulations based on the intensity of welfare support use while the youth was growing up. The fourth column reports the p-value of a two-sided t-test of the difference between the advantaged and disadvantaged means. These tests are based on heteroscedasticity robust standard errors.

Table 4. The Relationship Between Socioeconomic Disadvantage and Parenting Styles

Panel A. Respectful Parenting Style and Disadvantage				
	(1)	*(2)*	*(3)*	*(4)*
More than 6 years of welfare	-0.081	-0.067	-0.038	0.014
	(0.062)	(0.064)	(0.068)	(0.067)
Goods-intensive investments				0.071**
				(0.030)
Time-intensive investments				0.164***
				(0.029)
Parent's background	No	Yes	Yes	Yes
Parent's current SES	No	No	Yes	Yes
Observations	1,358	1,358	1,358	1,358
R-squared	0.001	0.006	0.021	0.050
Panel B. Monitoring Parenting Style and Disadvantage				
	(1)	*(2)*	*(3)*	*(4)*
More than 6 years of welfare	-0.220***	-0.192***	-0.221***	-0.128*
	(0.066)	(0.067)	(0.071)	(0.067)
Goods-intensive investments				0.199***
				(0.028)
Time-intensive investments				0.231***
				(0.029)
Parent's background	No	Yes	Yes	Yes
Parent's current SES	No	No	Yes	Yes
Observations	1,358	1,358	1,358	1,358
R-squared	0.009	0.019	0.022	0.107

*This table reports least squares regression coefficients of respectful parenting style (Panel A) and monitoring parenting style (Panel B) on an indicator of heavy welfare reliance while the youth was growing up, and on goods-intensive and time-intensive parental investments. The respectful and monitoring parenting style indices and the goods-intensive and time-intensive investment indices are constructed as linear combinations of the corresponding measures in Table 2, weighted by their factor loadings. Parent's background includes age, education, and foreign-born and aboriginal status. Parent's current SES includes total earnings, unemployment status, mother's internal Locus of Control, and physical and mental health. Heteroscedasticity robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table 5. The Relationship Between Parenting Styles and Youth Outcomes

Panel A. Parenting and Youths' High School Graduation

	(1)	*(2)*	*(3)*	*(4)*
Respectful parenting	0.028**	0.023*		
	(0.013)	(0.013)		
Monitoring parenting	0.016	0.002		
	(0.013)	(0.013)		
Goods-intensive investments		0.028**	0.030**	
		(0.013)	(0.013)	
Time-intensive investments		0.047***	0.051***	
		(0.013)	(0.012)	
More than 6 years of welfare	-0.128***	-0.110***	-0.110***	-0.133***
	(0.029)	(0.029)	(0.029)	(0.029)
Observations	1,358	1,358	1,358	1,358
R-squared	0.052	0.064	0.062	0.046

Panel B. Parenting and Youths' University Entrance Score

	(1)	*(2)*	*(3)*	*(4)*
Respectful parenting	2.119***	1.993***		
	(0.672)	(0.679)		
Monitoring parenting	-0.209	-0.780		
	(0.645)	(0.654)		
Goods-intensive investments		1.650**	1.519**	
		(0.663)	(0.649)	
Time-intensive investments		1.647**	1.806***	
		(0.646)	(0.640)	
More than 6 years of welfare	-3.414**	-2.716*	-2.496	-3.243**
	(1.597)	(1.591)	(1.593)	(1.594)
Observations	715	715	715	715
R-squared	0.122	0.136	0.124	0.109

(continued below)

(Table 5 continued from above)

Panel C. Parenting and Youths' Internal Locus of Control

	(1)	*(2)*	*(3)*	*(4)*
Respectful parenting	0.323***	0.314***		
	(0.027)	(0.026)		
Monitoring parenting	0.020	0.009		
	(0.029)	(0.030)		
Goods-intensive investments		-0.036	-0.009	
		(0.027)	(0.028)	
Time-intensive investments		0.098***	0.154***	
		(0.028)	(0.029)	
More than 6 years of welfare	-0.112*	-0.095	-0.097	-0.141**
	(0.061)	(0.061)	(0.064)	(0.064)
Observations	1,341	1,341	1,341	1,341
R-squared	0.117	0.126	0.030	0.009

Panel D. Parenting and Youths' Risky Behavior

	(1)	*(2)*	*(3)*	*(4)*
Respectful parenting	-0.095***	-0.092***		
	(0.013)	(0.013)		
Monitoring parenting	-0.041***	-0.030**		
	(0.013)	(0.014)		
Goods-intensive investments		-0.038***	-0.051***	
		(0.014)	(0.014)	
Time-intensive investments		-0.023*	-0.046***	
		(0.014)	(0.014)	
More than 6 years of welfare	0.102***	0.087***	0.089***	0.116***
	(0.030)	(0.031)	(0.031)	(0.031)
Observations	1,341	1,341	1,341	1,341
R-squared	0.089	0.096	0.053	0.035

*This table reports least squares regression coefficients on the following youth outcomes: a high school graduation dummy (Panel A), University Entrance Scores (Panel B), internal Locus of Control scores (Panel C), and risky behavior dummy (Panel D). These youth outcome variables are regressed on: respectful and monitoring parenting styles, goods-intensive and time-intensive parental investments, on an indicator of heavy welfare reliance while the youth was growing up, and on parent's background (with unreported coefficients). The respectful and monitoring parenting style indices and the goods-intensive and time-intensive investment indices are constructed as linear combinations of the corresponding measures in Table 2, weighted by their factor loadings. Parent's background includes age, education, and foreign-born and aboriginal status. Heteroscedasticity robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table A1. Definitions and Coding of the Main Variables

Variable Name	*Description*	*Range and Coding*
Goods- and Time-Intensive Interactions:		
Parent helps youth with money	Based on the following questions asked to parent: 1. *Are you currently living with [Focal Youth]?* 2. *Does [Focal Youth] pay any rent or board to you to live at home?* 3. *Have you helped [Focal Youth] with [payment] in the past 12 months?* Payments Considered: Mortgage, bills, vehicle purchase, study-related costs, general living expenses	Categorical, 0 - 5: 0 - Not living at home, no monetary help 1 - Not living at home, some help with mortgage and bills 2 - Living at home but paying rent, no monetary help 3 - Living at home but paying rent, some monetary help 4 - Living at home and not paying rent, no monetary help 5 - Living at home and not paying rent, some monetary help
1 if parents don't expect money aid to be repaid	Asked to parent: *Thinking about the ways in which you have helped [Focal Youth] financially, do you consider this help to have been primarily a loan or a gift? In other words, do you expect to be paid back or not?*	Dummy, 1 if parent does not expect money to be paid back
Parent: Participated in parent committee/meetings	Asked to parent: *Were you or [Focal Youth]'s /mother/father/ involved in parent committee activities for more than one year?*	Dummy, 1 if involved
Number of youth's extracurricular activities	Total sum of the activities mentioned in the following question asked to parent: *While attending secondary school, did [Focal Youth] participate in any organised activities after school or on weekends, such as sports, gymnastics, dance, scouts, clubs or religious groups?*	Continuous, 0 - 43
Youth: Parents read to me at night when younger	Asked to youth in self-completed questionnaire: *When you were younger did your parent(s) or other persons responsible for you read to you at night?*	Categorical, 1 (Not at all) - 5 (Every night)
Youth: Mother respects my views and opinions	Asked to youth: *Your mother respects your ideas and opinions about the important things in life.*	Categorical, 1 (Never true) - 7 (Always)
Parent: I can respect youth's views and opinions	Asked to parent: *[Focal Youth]'s ideas and opinions about the important things in life are ones you can respect?*	Categorical, 1 (Never true) - 7 (Always)

Variable Name	*Description*	*Range and Coding*
Attention-intensive Interactions:		
Youth: Mother's behavior towards me is friendly	Asked to youth: *Overall, how would you characterize your relationship with your mother? Would you say it is always friendly, often friendly usually friendly, sometimes friendly, hardly ever friendly or never friendly?*	Categorical, 1 (Never true) - 7 (Always)
Youth: Mother knows my friends	Asked to youth in self-completed questionnaire: *Does your mother know who your friends are?*	Categorical, 1 - 3 1 - Does not know any of my friends 2 - Knows some of my friends 3 - Knows all of my friends
Youth: Mother wants to know whereabouts	Total sum of the following questions asked to youth in self-completed questionnaire: *How much does your mother want to know about:* 1. *Where you go at night?* 2. *What you do with your free time?* 3. *Where you are most days after school or in the afternoon?* Answer values are: − Doesn't want to know (1) − Wants to know a little (2) − Expects to know (3)	Continuous, 1 - 9
Youth: Mother really knows whereabouts	Total sum of the following questions asked to youth in self-completed questionnaire: *How much does your mother really know about:* 1. *Where you go at night?* 2. *What you do with your free time?* 3. *Where you are most days after school or in the afternoon?* Answer values are: − Doesn't know (1) − Knows a little (2) − Knows a lot (3)	Continuous, 1 - 9
Youth: Parents help with schoolwork & guidance when younger	Asked to youth in self-completed questionnaire: *Did your parent(s) or other persons responsible for you help you with such things as school work, choosing your options, or preparing for exams?*	Categorical, 1 (Not at all) - 5 (All the time)

Variable Name	*Description*	*Range and Coding*
Other variables:		
Youth's internal LOC	Total sum of the following questions asked to parents and youth: 1. *There is really no way I can solve some of the problems I have (reversed)* 2. *Sometimes I feel that I'm being pushed around in life (reversed)* 3. *I have little control over the things that happen to me (reversed)* 4. *I can do just about anything I really set my mind to* 5. *I often feel helpless in dealing with the problems of life (reversed)* 6. *What happens to me in the future mostly depends on me* 7. *There is little I can do to change many of the important things in my life (reversed)* Answer values for each question are 1 (Strongly Disagree) to 4 (Strongly Agree)	Continuous, 7 - 28
1 if youth graduated high school	Based on the following questions asked to youth: 1. *Are you still going to secondary school or have you left school?* 2. *What year were you in when you left school?*	Dummy, 1 if not in school and completed year 12
Youth's University Entrance Score (N=715)	Asked to youth: *If taken /a University Admission Index (UAI)/ /an Equivalent Tertiary Entrance Rank (ENTER)/ /an Overall Position (OP)/ /a Tertiary Entrance Rank (TER)/ /a University entrance score/, what was your score?*	continuous, 1 - 100
Parent's age	Based on year of birth in Centrelink, and updated by interviewer if needed	
1 if parent completed high school	Asked to parent: *What is the highest level of primary or secondary school you have completed?*	Dummy, 1 if Year 12 or equivalent
1 if parent completed university	Asked to parent: *What is the highest qualification you have completed since leaving secondary school?*	Dummy, 1 if Bachelor Degree or above
1 if parent is foreign-born	Asked to parent: *In which country were you born?*	Dummy, 1 if Not in Australia
1 if parent aboriginal	Asked to parent: *Are you of Aboriginal or Torres Strait Islander origin?*	Dummy, 1 if Aboriginal and/or Torres Strait Islander

Table A2. Summary Statistics of the Additional Youth Academic Activities, Health, and Behavior used for Calculating the Oster (2015) Coefficient Bounds

		By Welfare Support History:		
	All	*<6 years*	*6+years*	*Difference* [p-value]
Youth's academic activities:				
1 if youth participates in extracurricular activities	0.83	0.71	0.80	[0.000]
1 if youth ever repeated a school year	0.08	0.14	0.10	[0.011]
1 if youth ever in program for gifted students	0.21	0.16	0.20	[0.038]
Youth's relative performance in English	3.64	3.43	3.58	[0.000]
Youth's relative performance in math	3.11	2.94	3.07	[0.024]
1 if youth did not take mathematics	0.08	0.06	0.08	[0.300]
Youth's relative performance at school overall	3.57	3.37	3.52	[0.000]
Youth's health:				
1 if youth ever in program for learning difficulties	0.07	0.10	0.08	[0.166]
1 if youth ever in program for physically handicapped	0.00	0.00	0.00	[0.544]
1 if youth ever diagnosed with depression	0.12	0.16	0.13	[0.064]
1 if youth ever diagnosed with ADD	0.04	0.07	0.05	[0.062]
1 if youth ever diagnosed with any physical disability	0.09	0.07	0.08	[0.396]
1 if youth ever diagnosed with any learning disability	0.05	0.08	0.06	[0.079]
Youth's behavior:				
1 if youth ever suspended from school	0.08	0.19	0.11	[0.000]
1 if youth ever expelled from school	0.01	0.01	0.01	[0.377]
1 if youth ever drunk excessively	0.22	0.26	0.23	[0.186]
1 if youth regularly smokes	0.12	0.21	0.14	[0.000]
Youth's self-reported general health (inverse)	2.07	2.25	2.12	[0.004]
1 if youth ever diagnosed with asthma	0.28	0.35	0.29	[0.016]
How often did youth wag school (inverse)	1.31	1.92	1.47	[0.000]

This table reports the mean value of the additional measures of youth academic activities, health, and behaviors used for conducting the coefficient bounds for selection on unobservables analyses (Oster 2015). The first column reports the mean values for the available sample. The second and third columns reports means for the advantaged and disadvantaged subpopulations based on the intensity of welfare support use while the youth was growing up. The fourth column reports the p-value of a two-sided t-test of the difference between the advantaged and disadvantaged means. These tests are based on heteroscedasticity robust standard errors.

Table A3. Confirmatory Principal Component Analysis of Parent-Child Interactions used in the Construction of Goods- And -Time Intensive Investments and Parenting Styles (Respectful and Monitoring)

	Bounds of the coefficient of:					
	Respectful Parenting	*Monitoring Parenting*	*More Than 6 Years of Welfare*	*Observations*	*Controlled R-Squared*	*Maximum R-Squared*
Panel A. Bounds on welfare						
Dependent variable:						
Respectful parenting	-	-	(0.097 , 0.158) [-1.937]	1122	0.175	0.227
Monitoring parenting	-	-	(-0.116 , -0.079) [2.606]	1122	0.210	0.273
Panel B. Bounds on youth outcomes						
Youth's Internal Locus of Control	(0.218 , 0.278) [2.218]	(-0.038 , 0.006) [0.144]	(-0.100 , -0.074) [3.020]	1111	0.198	0.257
Youth's High School Graduation	(-0.021 , -0.002) [-0.088]	(-0.028 , -0.006) [-0.289]	(-0.052 , 0.002) [0.965]	1122	0.329	0.428
Youth's University Entrance Score	(0.348 , 0.808) [1.700]	(-1.835 , -1.143) [-1.892]	(-1.768 , -1.161) [2.552]	665	0.529	0.688
None of these other outcomes	(-0.063 , -0.011) [-0.223]	(-0.045 , -0.018) [1.562]	(-0.010 , 0.017) [0.371]	1167	0.299	0.389

This table reports bounds for the coefficient of family disadvantage on respectful parenting and on monitoring parenting (Panel A), and of respectful parenting, monitoring parenting and family disadvantage on youth's outcomes (Panel B) when there is selection on unobservables correlated to the selection on observables (Oster 2015). The bounds for each coefficient, in parentheses, are calculated under no selection ($\delta=0$) and equal selection ($\delta=1$) scenarios. The corresponding proportional selection parameter estimate (δ) consistent with a zero-treatment effect ($\beta=0$) is reported in square brackets. $\delta>1$ and $\delta<0$ suggest that selection on unobservables is unlikely to explain the entire non-zero coefficient. The observables related to unobservables include: parental investments and parenting style, parental background, current parental characteristics, and all the measures reported in Table A2. The Controlled R-Squared refers to the regression R-Squared when all the observable measures are included in the model. The Maximum R-Squared is taken as 1.3 times the Controlled R-Squared, following Oster (2015).