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# Parental preferences, production technologies, and provision for progeny☆

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ABSTRACT

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This paper theoretically explores the implications of the recent developments in the study of human capital production technologies (Cunha and Heckman, 2007) in intrahousehold human capital investment in children (Becker and Tomes, 1976; Behrman et al., 1982). When credit constraints are not binding, parents adopt a reinforcing intrahousehold investment strategy. When credit constraints are binding, the trade-off between the degree of parental aversion to inequality and the degree of complementarity between pre-natal endowments and family investments determines the parental strategy. The observed investment pattern of reinforcement or compensation does not necessarily reveal the underlying preference or technological parameters. Finally, we discuss empirical methods that may separately identify the preference and technological parameters and discuss the econometric challenges associated with these methods. *Journal of Comparative Economics* **000** (2016) 1–10. Department of Public Finance, School of Economics, Wang Yanan Institute for Studies in Economics, MOE Key Laboratory of Econometrics, and Fujian Key Laboratory of Statistical Science, Xiamen University, Xiamen 361005, Fujian, China; Department of Economics, Faculty of Arts & Social Sciences, National University of Singapore, AS2 Level 6, 1 Arts Link, Singapore 117570, Singapore.



## 1. Introduction

Family is important in fostering children's human capital and affecting their later life-cycle outcomes (Heckman, 2008). But the role of intrahousehold resource allocation in affecting within-family inequality is less clear, although the importance

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of inequality within families has been noticed as early as Sheshinski and Weiss (1982).[1] The seminal work of Becker and Tomes (1976) theoretically pioneers the economic research on intrahousehold compensation and reinforcement of differences among children.[2] Assuming the cost of adding to quality is negatively related to the endowment, Becker and Tomes conjecture that parents take a reinforcement strategy by investing more (less) in the more (less) able child. Behrman et al. (1982) extend Becker and Tomes' research and develop a general preference model for analyzing parental allocations of resources among their children. They further empirically test a particular version of the preference model – the separable earning-bequest model – against a pure investment model. They find evidence supporting the preference model. Parents compensate for children's earning inequality by providing more (fewer) resources to the less (more) able. Since Becker and Tomes (1976) and Behrman et al. (1982), the intrahousehold compensation versus reinforcement investment strategy regarding children's human capital has been one of the core research topics in the field of household economics (Becker, 1991). As more and more household survey data sets have become available, numerous empirical studies have investigated the intrahousehold human capital investment strategies in the past three decades.

The economic literature, however, has not yet achieved a consensus on whether parents take a reinforcement or compensation strategy regarding child human capital investment. Whereas some studies have found evidence of reinforcement behavior (see, e.g., Behrman et al., 1994; Rosenzweig and Wolpin, 1988; Rosenzweig and Zhang, 2009), other studies have found empirical support for parents adopting a compensation strategy (see, e.g., Behrman et al., 1982; Pitt et al., 1990).[3]

This paper aims to interpret the empirical results of the traditional literature on intrahousehold human capital investments in children by drawing implications from the recent literature on human capital production technologies (Cunha and Heckman, 2007; Cunha et al., 2010). The literature on intrahousehold human capital investments may have one major limitation. On one hand, the literature emphasizes the role of parental preferences in the intrahousehold resource-allocation process. For example, Behrman et al. (1982) state that in their preference model, parental aversion to inequality in the distribution of their children's earnings plays a crucial role. Therefore, the authors use a constant elasticity of substitution (CES) utility function to characterize parental aversion to inequality. On the other hand, the role of production technology in intrahousehold human capital investment is minimized. For example, Becker and Tomes (1976), Behrman et al. (1982), and Pitt et al. (1990) use either a linear or Cobb–Douglas (CD) form of the human capital production function. In these cases, they interpret the observed intrahousehold compensation (reinforcement) investment behavior as the evidence of parental (non-) aversion to inequalities.

The recent literature on human capital formation finds technology is important in analyzing the human capital production process (Cunha and Heckman, 2007; Cunha et al., 2010). Estimation results show that a linear or CD form is inappropriate in capturing the human capital production process. The life-cycle human capital production technology in Cunha and Heckman (2007) and Cunha et al. (2010) features strong dynamic complementarity between the initial stock of skills before each period and the human capital investment during the period. Thus, the pre-natal endowment and post-natal investments are complementary inputs in the production of human capital.[4] However, this literature focuses on the production technology by assuming only one child in each household. Thus, it neglects the intrahousehold resource-allocation process among multiple siblings.[5]

This paper theoretically combines the two strands of literature for the first time. We show that three factors determine the intrahousehold human capital investment strategy: credit constraints, parental preferences, and human capital production technologies. When credit constraints are not binding, parents adopt a reinforcing intrahousehold investment strategy on their children as long as investments and endowments are complementary inputs in the child human capital production function, as found empirically in Cunha et al. (2010). When credit constraints are binding, the trade-off between the degree of parental aversion to inequality and the degree of complementarity between pre-natal endowments and family investments determines the parental strategy. Aversion to inequality leads parents to exercise a compensatory intrahousehold investment strategy, whereas the complementarity between investments and endowments in the human capital production function leads to a reinforcing strategy. Therefore, the observed pattern of reinforcement or compensation does not necessarily reveal the underlying preference or technological parameters. Finally, we propose some potential methods to separately identify the preference and production technological parameters in empirical analysis and discuss the econometric challenges associated with each method.

Understanding the preference and production technology parameters separately in determining intrahousehold human capital investment is important. First, separating the production technology parameters from parental preference parameters is necessary to understand the production technology in multiple-child families. The literature on production technol-

[1] Becker and Tomes (1976) conceptually discuss the implications of intrahousehold compensation versus reinforcement of differences among children in three other scenarios: (1) the evaluation of compensatory education policies, (2) biases in the estimates of return to education, and (3) biases in the estimates of the family background effect on child earnings. Griliches (1979) further statistically explores the implications of the intrahousehold investment strategy in using the sibling model to estimate the return to education.

[2] Becker and Tomes (1979),1986) pioneer the study on intrahousehold human capital, inequality, and intergenerational mobility. Please see a review of Becker's methodology in economic research and its application to the household economics in Heckman (2015).

[3] Griliches (1979) speculates that families act as income equalizers.

[4] The other important finding in the recent literature on skill formation technology is the multiple dimensionality of human capital, which implication in intrahousehold human capital investment is explored in Yi et al. (2015).

[5] A notable exception is Aizer and Cunha (2015).

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