

EMBODIED CAPITAL AND HERITABLE WEALTH IN COMPLEX CULTURES: A CLASS-BASED ANALYSIS OF PARENTAL INVESTMENT IN URBAN SOUTH INDIA

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ABSTRACT

In the recent literature in human behavioral ecology, two types of explanations have emerged as important for understanding fertility and parental investment in modern market economies: embodied capital and heritable wealth. Using this perspective, I compare the education, income, and marriage outcomes of daughters and sons among three urban south Indian social class groups that differ in terms of their education, resources, and the types of jobs they typically perform. The three class groups are found to have predictably different parental investment strategies based on their position in competitive labor markets and the investment currencies they rely on most heavily. Furthermore, I find that the currencies of both embodied capital and heritable wealth have important but separate impacts on parental investment behavior. Finally, I find that these different investment currencies may entail different

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investment structures, which in turn may differ by social class: in some classes, education attracts education in the marriage market and marriage expenditures help ensure a wealthy spouse, but in other classes, these currencies are substitutable.

INTRODUCTION

In recent years there has been significant attention among behavioral ecologists to the fertility and parental investment behavior of people in modern, industrial nations in an effort to explain the features of the demographic transition to low fertility (e.g. Borgerhoff Mulder, 1998; Kaplan, 1996; Kaplan & Lancaster, 2000; Kaplan et al., 2002; Low, 2000; Low et al., 2002; Luttberg et al., 2000; Mace, 1998, 2000). In this recent literature, two types of explanations have emerged as being especially important for understanding fertility and parental investment in modern market economies: (1) a focus on embodied capital (Kaplan, 1996; Kaplan & Lancaster, 2000; Kaplan et al., 2002); and (2) a focus on inherited wealth (Borgerhoff Mulder, 1998; Luttberg et al., 2000; Mace, 1998, 2000). In this paper, I argue that these two theoretical approaches can be usefully combined to study parental investment decision-making in socially complex, hierarchical, and market-driven cultures.

This paper applies these ideas to the analysis of the parental investment strategies of three social classes in urban south India, each of which faces different sets of social and economic opportunities and constraints. For each class, I examine investment in the currencies of education and heritable wealth, focusing on how parents optimize between these currencies by means of both direct investment (in their children's education and income) and indirect investment (by arranging their children's marriages to spouses with complementary characteristics). Because of the important ways in which opportunity structures are organized by gender, investment in sons and daughters is examined separately. Social classes are found to have predictable differences in parental investment behavior, and investment in education and income is found to be substitutable in some classes but not in others.

THEORETICAL BACKGROUND

Embodied Capital Theory

In a set of important articles, Kaplan (Kaplan, 1996; Kaplan et al., 1995, 2002; Kaplan & Lancaster, 2000), drawing on the work of Becker (Becker,

1975, 1991; Becker et al., 1990) and basic tenets of behavioral ecology, argues that in allocating resources to having and raising children, parents should optimize their total lifetime allocations so as to maximize investment in their grandchildren. To do this, parents must optimally allocate their resources among investments in number (quantity) of children and the embodied capital (quality) of those children. Under Kaplan's model, embodied capital includes "strength, immune function, coordination, skill, [and] knowledge, all of which affect the profitability of allocating time and other resources to alternative activities such as resource acquisition, defense from predators and parasites, mating competition, parenting and social dominance" (Kaplan, 1996, p. 95). Put more simply, embodied capital can be *any* physical capacity, skill, or level of knowledge that increases a child's expected lifetime income, defined as the cumulative value of the child's time allocated to competing life activities. Lifetime income can thus be measured in terms of calories, cows, cash, or any other salient currency that humans in different environments use to fund their survival and reproduction.

In behavioral ecology, parental investment is typically understood to be any type of investment, whether in terms of resources or care, which increases one child's survival or ability to reproduce at the cost of parental ability to invest in other offspring (Trivers, 1972). While investment in a child can thus include food, shelter, or health care, in a market economy the largest and most variable aspect of investment is often in embodied capital (in most cases education), specifically the skills necessary to obtain employment in competitive labor markets. In such environments, Kaplan argues, the returns (in terms of lifetime income, and theoretically also of long-term fitness) to investment in embodied capital do not begin to diminish until very high levels, resulting in an increase in optimal per child investment and a consequent decrease in fertility among those who have access to education and skills-based employment. Furthermore, if parents with more embodied capital (in the form of education) are more efficient at educating their own children, more educated people should tend to have both lower fertility and higher levels of per-child investment than less-educated people in the same economic and cultural environment. Kaplan's model thus provides a framework that should allow us to predict relative levels of investment given the embodied capital and economic resources of the parents.

Parental Investment and Heritable Wealth

Recent articles in human behavioral ecology have provided evidence of material motivations in traditional societies with relatively high fertility, and of the

important link between wealth accumulation, future resource acquisition, and parental investment behavior. Mace (1998, 2000) models fertility and wealth endowment with dynamic models based on an African pastoralist system in which wealth is an important determinant of future resource production and acquisition. She finds that reducing mortality and risk seems to have little impact on fertility, but that increasing the cost of raising children “decreases optimal fertility and increases the inheritance left to each child at each level of wealth, and has the potential to reduce fertility to very low levels” (Mace, 2000, p. 279). Luttberg et al. (2000) use a dynamic model to understand the decisions of men to marry additional wives among Kipsigis pastoralists in Kenya. The authors find that men do not strictly seek to maximize the number of children born but rather use a decision rule that combines an interest in relatively high fertility with an interest in leaving one’s children well endowed with wealth.

Indian Marriage and the Indian Dowry System

Despite a great deal of cultural diversity in marriage practices in South Asia, several factors are common to most marriages in south India. These customs operate as a set of constraints that direct and limit the forms that parental investment can take in this social context, and create different ecologies for investment in daughters and sons. All information from here forward is from informant interviews conducted by the author unless otherwise cited.

Marriage is nearly universal, monogamy is both legally and socially enforced, and almost all marriages are arranged by the parents or close relatives of the bride and groom (e.g. Srinivas, 1996, 1984, 1978). Moreover, Indian marriages are traditionally endogamous in terms of caste, a custom which limits the potential pool of acceptable spouses to those who fit both caste and class preferences. This makes finding an appropriate mate more difficult and potentially increases the resources that must be spent by the parents to make sure the marriage takes place (Caldwell et al., 1983; Rao, 1993). Furthermore, weddings are lavish social occasions the costs of which are borne predominantly by the family of the bride, and which may entail a significant transfer of wealth from the family of the bride to the family of the groom, typically referred to as dowry (e.g. Caldwell et al., 1983; Goody & Tambiah, 1973; Srinivas, 1984). Expensive weddings and large dowries put pressure on the families of girls, who must either spend years saving or borrow significantly to be able to compete for desirable grooms. Though the expenses are less extreme, families of boys must also plan ahead to be able to spend the large sums that will be expected of them at the time of a wedding. Finally, Indian society traditionally prescribes different social roles for men and women in relation to

marriage and the family (Boserup, 1970; Goody & Tambiah, 1989; Srinivas, 1984). Generally, women are expected to leave their natal home at marriage and go to live with the family of the groom to whose customs and interests they are expected to adapt. Although educational and job opportunities are becoming increasingly accessible to women, the effects of these traditional norms still have repercussions in terms of both parental investment and marriage market decision-making.

PARENTAL INVESTMENT IN SOUTH INDIA

In the modern South Asian social context, there are three primary ways of enhancing the quality of one's children. First, one can help them obtain embodied capital in the form of skills training or formal education. The primary advantage of embodied capital investment is that, once the initial investment has been made, it is a renewable source of both income and enhanced investment ability. Second, one can make direct transfers of capital (e.g. cash or land) to that child. The primary advantage of such wealth bequests is their flexibility of use; these "real" capital transfers can be used by the child directly, spent on grandchildren, or invested so that they produce more wealth. Finally, a parent can invest in a child by arranging his or her marriage to a spouse with levels of embodied capital or real capital that complement or enhance those of the child, thus increasing the child's ability to invest in his or her own children.

Investment in Education

Education can be very costly in India. However, under the theoretical framework presented in this paper there are three primary reasons why parents should be motivated to bear the costs of education in order to invest in the embodied capital of their children. First, more education can result in a greater lifetime income. Second, under Kaplan's embodied capital framework a better education can theoretically create greater efficiency at future investing in embodied capital. Finally, more education can result in a better position in the marriage market and improved access to desirable mates.

Education in south India can be very expensive in terms of both direct and indirect costs. Public education is often unavailable or of low quality, and tuition at private schools is often concomitant with quality. Moreover, many schools may ask for a large "donation" as a consideration for admittance to the school. Furthermore, Indian children are generally supported by their parents during the entirety of

their education, including graduate school. Finally, poorer parents may suffer the opportunity costs of lost income if they allow their children to stay in school rather than work.

In urban India, investment in the education of sons has a direct economic and social benefit to both the sons and their parents because sons remain socially tied to and economically responsible for their family of birth (e.g. Caldwell et al., 1983; Goody, 1976). Not only do sons incur the social obligation to care for their aging parents, but also a son's income is often under the direct control of his parents for a significant portion of his adult life. Men are expected to be the primary or exclusive breadwinners of their families, and a more educated son can usually command a higher salary and/or obtain a more secure job, both of which will improve his lifetime income (access to resources over time). Moreover, from the perspective of embodied capital theory, education should also make him more efficient at investing in the education of his children through indirect effects of socialization (Behrman et al., 1999; Kaplan, 1996; Rosenzweig, 1995). Finally, an educated son with a good income is in great demand in the marriage market, able to command an educated, beautiful, and/or wealthy bride, an expensive wedding, and potentially a significant dowry.

Educating daughters may have direct economic benefits or may primarily be motivated by matchmaking considerations. In social classes where a daughter is allowed to work, her income will generally be under the control of her parents before she is married and may be used by them to help defray the costs of her wedding (Caldwell et al., 1983; Rao, 1993). If a woman works after marriage she will often earn less than her husband, take time off when she has small children, and be expected to follow her husband if it is necessary for his job that he should move. Moreover, her income will ultimately be under the control of her husband or her in-laws. In all social classes, education may improve a woman's position in the marriage market as better-educated grooms often demand better-educated, brides, and sometimes brides who work.

Investment in Child Wealth

The second important means of parental investment in South Asia is via direct wealth transfers to children. Parents should be motivated to make such transfers for three reasons. First, wealth can be used to invest directly in the quality of children or grandchildren. Second, following Mace (2000) and Luttberg et al. (2000), wealth can be invested to produce more wealth, thus creating a renewable source of income for the child and his or her children. Finally, wealth transfers can improve a child's position in the marriage market.

Wealth or income can be used in many ways to invest directly in offspring quality. Most relevantly, it can be spent on food, medical care, and education. While parents routinely pay for most of their children's expenses, grandparents may also play a role in direct investment by volunteering to pay for educational or other costs if the child's parents are having difficulty meeting the expenses of all of their children.

Wealth can also be used as a form of indirect investment to create an increase in a child's lifetime income. Parents in India often bear or share in the expenses of setting their children up in businesses or occupations that will provide the livelihood for that child and his or her own family. Additionally, a child may receive income from rent or interest on land, property, or investments that their parents have given them. Moreover, wealthier parents also often use their resources to enhance income opportunities available to educated children. For instance, parents who are well educated may invest in a son's M.B.B.S. (the Indian equivalent of an M.D.), but if they are also wealthy they may use their resources to additionally set him up with his own medical clinic. Mace (2000) and Luttberg et al. (2000) argue that wealthier parents are more efficient at increasing their own wealth and thus investing in the wealth of their children. Using this as an operating assumption, we can predict that wealthier parents should have an increased incentive to invest in their children's capital over less wealthy parents.

Finally, a child with a higher income or greater real capital assets may be able to attract better mates in the marriage market. While this may be important for children of either sex, it is especially important for sons, who are expected to be the primary breadwinners of their families. A daughter's income may be attractive to a potential spouse; however, as daughters frequently do not work after marriage, other types of assets are usually more important.

Investment in Marriage Costs

The third major form of parental investment in south India is in marriage costs, a broad term that I use to apply to all types of expenses associated with weddings. There are two important reasons why parents should be motivated to pay high marriage costs for their children. First, in South Asia parents of all social classes frequently have no option but to spend lavishly in order to ensure that their children marry someone of reasonably similar social standing. Second, marriage costs can be seen as a means of purchasing or securing the parental investment power of the spouse and his or her family – their education, their income and other wealth, and their other social resources – which will be directed towards investment in grandchildren. For this reason, marriage costs are not themselves an appropriate

outcome variable – they are a type of investment, but they are not the point of that investment. The point of investment in marriages is a high quality spouse, as measured in this study by spouse education and income.

In Indian society, it is usually necessary to pay high marriage costs for one's daughter, especially if she is to be married in a socially acceptable manner and to a socially acceptable groom. Families spend the largest sums on costly silk saris and gold jewelry for the bride, on renting and decorating a large hall for the wedding, on feeding several meals to large numbers of guests over two days, and on gifts for the wedding party and close relatives. These expenses are often part of the marriage negotiations. Failure to offer enough gold or a lavish enough wedding, or to produce what has been promised, may result in consequences including a broken engagement, damage to the bride's reputation, or even physical and psychological mistreatment of the bride (e.g. Caplan, 1984; Sharma, 1993). Although investment in marriage costs is not of direct economic benefit to a bride's family, it is in keeping with an embodied capital framework to treat these costs as parental investment because they will affect a daughter's lifetime income in the sense that she will share in the benefits of her husband's income and that of his family, which, in turn, will affect her ability to invest in her own offspring.

Parents also invest in the marriage costs of their sons, though the amount is usually significantly less than is invested in the marriage costs of daughters. The groom's family is obliged to give costly gifts to the wedding party, and is responsible for hosting one or more marriage functions. These gifts and functions must be of a style that is appropriate to the status of the bride's family and the style in which the bride's family is celebrating the wedding. If a bride has wealthy parents or a large income, the wedding is likely to be lavish, and the groom's family has little choice but to match the style or lose face, a consequence which may have negative implications for his own marriage as well as his siblings' marriage prospects. From an embodied capital perspective, son's marriage costs are probably less crucial than are daughters' in affecting a child's long-term income. However, an educated bride will certainly contribute to the embodied capital attainments of her children, and an employed bride will bring in income which may be used for many types of parental investment. Consequently, we should expect that sons' marriage costs should be lower than daughter's marriage costs but should still be linked to the level of embodied capital and real capital endowments of the bride.

Investment Efficiency and Currency Tradeoffs

Kaplan hypothesizes that in modern wage-labor economies those who are more educated have an advantage in endowing their children with education. If we accept

this, then we can predict that the same logic should hold true in the marriage market. Specifically, those whose primary investment is in their own children's education should be expected to value education in their children's spouses, as it should increase the total efficiency with which their children embody capital through education. Moreover, since this advantage in investment efficiency would apply to both sets of families involved in a marriage contract, we should further predict that those who are better educated will be more efficient at obtaining education in their spouses (i.e. marrying others who are well educated).

A similar argument can be made with respect to wealth. It is specifically suggested by the findings of Mace (2000) that wealthier parents are more efficient at accumulating wealth and thus endowing their children with capital. If this is true, we can predict that wealthier parents should value capital in the marriage market (in the form of high incomes or high marriage costs) more than they value other measures of child quality, such as education. Moreover, since this advantage would obtain for both the bride's parents and the groom's, wealthy parents should have an advantage at obtaining wealthy spouses for their children.

Finally, Kaplan predicts that those with less education are not in a position to achieve as much efficiency in embodied capital investment as those with more education. If this is true for wealth as well as education, we can predict that parents who have only moderate amounts of either will be more indifferent regarding whether they acquire education or wealth in the marriage market. Moreover, since both sets of parents should be in similar positions, we can predict that among moderately endowed parents education will sometimes be used to obtain wealth, and vice versa, in the marriage market.

Predictions

Prediction 1. A higher education should make parents more efficient at endowing their offspring with education. Thus, parents' education should be significantly predictive of child's education in all groups, but more strongly so in more educated groups.

Prediction 2. A higher income should make parents more efficient at endowing their offspring with real capital. Thus, parents' income should be significantly predictive of child's income in all groups, but more strongly so in wealthier groups.

Prediction 3. A child's education and income should be affected by the probability that he or she will work after marriage. Thus, we should expect sons to be more educated than daughters in all groups, but the ratio of sons' to

daughters' education to be smaller in families and social classes where women are more likely to work.

Prediction 4. Higher daughter's marriage costs as a proportion of parents' income should be paid in groups with more emphasis on real capital (rather than education-based embodied capital) for employment and/or income-generating opportunities.

Prediction 5. Higher son's marriage costs as a proportion of parents' income should be paid in groups where women are more likely to work. In contrast, lower son's marriage costs should be paid in groups where women are less likely to work.

Prediction 6. Less wealthy groups will face more general tradeoffs in their ability to invest than will members of other classes.

Prediction 7. Members of wealthier groups will face greater tradeoffs between children in areas where their investment emphasis is higher. Specifically, members of more educated groups are more likely to face tradeoffs over child's education, while members of wealthier groups are more likely to face tradeoffs over child's income.

Prediction 8. If there are improving returns to investment with higher levels of a particular currency, those who have more of that currency will be more efficient at obtaining it in their spouses. Thus, education should be a better predictor of spouse education than parent's resources or child income. Likewise, marriage costs (for daughters) or child income (for sons and working daughters) should be a better predictor of spouse income than parents' or child's education.

STUDY POPULATION

Research was conducted in Bangalore, the capital of Karnataka state and a city of approximately 8 million people located in India's south central Deccan plateau. Informants were married men or women between the ages of 45 and 70 who were interviewed about their family characteristics, their own marriages, and the marriages of their children. Analysis focuses on the investment decisions of informants with respect to their children and their children's spouses.

In pre-modern India, a person's occupation, economic situation, and social and economic opportunities were defined by their caste. Social classes in the typical Western sense of the term are generally argued to have developed because of the emergence of formal education and a market economy. This process began in major urban centers in the late nineteenth century under British colonial rule as Indians

Table 1. Mean Values For Parent and Family Characteristics For Each Social Class.

Variables in Model	Working Class		Business Class		Professional Class	
	Mean	N	Mean	N	Mean	N
Father's education	1.13	244	4.74	93	5.18	472
Mother's education	0.60	243	3.08	93	3.18	470
Parents' income ^a	2,904.00	224	35,296.00	81	13,482.00	457
Number of children	4.49	245	3.51	93	3.47	468
Proportion daughters	0.45	245	0.34	93	0.50	468
Mother working	0.22	246	0.01	93	0.16	472

^aAll income data is per month and in Indian Rupees.

were trained to fill administrative and bureaucratic positions in the government (Srinivas, 1962, 1996). Since this time, class has emerged as an increasingly important determinant of social behavior, eclipsing caste in its effects on education, occupation, and the economic position of women in many areas (Srinivas, 1978, 1984). My sample was limited to members of several castes that traditionally lived in Karnataka so that the data would reflect coherent sets of customs and values. However, there is significant overlap between these groups in terms of class characteristics relevant to this paper which allows for stratification of the sample without compromising the importance of studying endogenously-defined social groups.

For the purposes of this analysis, the dataset was divided into three class categories based primarily on the father's occupation and secondarily on his income using a method that was suggested by ethnographic research. An overview of the means, standard deviations, and sample sizes for several parental characteristics for each class group can be found in Table 1. The parental characteristics and occupational structure of each class defines a set of constraints in which decisions about parental investment are made, and thus we should expect to see evidence of distinct strategies of investment among the members of each class.

Professional Class

This is the largest class in my sample, with 472 total children. Members of this group have white collar jobs for which at least a moderate amount of education is necessary, and for which income closely tracks the amount and type of education obtained. These occupations range from clerical jobs such as secretary, typist, and executive assistant, to professional jobs such as doctor, engineer, professor, and manager. Professional occupations tend to be relatively high paying by Indian standards, enough to provide a reasonably comfortable urban lifestyle for one's

family, educate one's children, and pay reasonably high marriage costs for their marriages. Family sizes in this group tend to be on the smaller side for my sample, with the modal number of children being three. Members of the parents' generation tend to be relatively well educated. A typical man has a 12th grade education or a B.A., while a typical woman has frequently completed the equivalent of 10th grade. It is reasonably common in this group for women to work both before and often after marriage – approximately 16% worked in the parental generation and 30% do so among their children.

In making matches, the focus in this class tends to be on finding a well-educated groom with a good job for one's daughter, and a bride who will be compatible in terms of education and family characteristics with one's son. Sons especially are given a certain amount of choice – at least veto power – in whom they will marry. Though marriage costs tend to be relatively high, in keeping with the parents' income, large dowries of cash or property are not standard.

Business Class

This is the smallest class in my sample, with 93 children. While this presents potential problems of comparability with the other social classes, this is mitigated by the fact that it is the most tightly defined social group of the three. Members of this group generally own businesses that range from retail stores to large factories or chains of restaurants which are typically run by the male members of a family. Formal education is typically not necessary to obtain or maintain a job, though it may be seen as socially desirable up to a point, especially if it is useful in terms of improving the business or networking. Income is determined by how much capital parents are able to generate to support sons in maintaining, expanding, or starting new businesses. Income in this group can be quite variable, but is on average significantly higher than in the other class groups. Family sizes in this group tend to be similar to those among professionals, the mode also being three children. In the informant's generation, a typical man has completed 10th or 12th grade, while his wife has finished only 8th grade. In this group it is much less common, and somewhat taboo, for women to work; only one woman out of 93 worked in the informants' generation, and only 15% of their daughters and daughters-in-law do.

When arranging marriages in this class the focus is often as much on the relationship between the two families as it is on the compatibility of the bride and groom. Marriage costs are quite high, and large dowries of cash or property are common. The most frequently stated purpose of such gifts is to help establish one's son-in-law in his own business so that one's daughter will be able to live comfortably without being too dependent on her in-laws.

Working Class

There are 246 working class children in my sample. Members of the working class may or may not have some formal education, but in either case frequently have jobs that require little or none. In these families, it is common for boys between the ages of eight and thirteen to apprentice themselves, formally or informally, either in a business or to a tradesman. Frequently this means going to work with their father or another relative, sometimes this means volunteering to run errands in a shop until the owner offers the boy a job. Girls also learn trades in this way, though in smaller numbers than boys. Examples of the types of trades and occupations learned in this way are tailor, auto mechanic, carpenter, shop assistant, waiter, cook, maid, autorickshaw driver, hawker, and manual laborer. These jobs are medium to low status, require little or no input of capital, and generally offer little job security. Workers are typically paid by the day or by the week. Household income averages are low, though there is considerable variation. Family size in this group is somewhat larger than in the other classes, with couples in my sample most frequently having four children. The average education of men in the informants' generation is the equivalent of 2nd or 3rd grade (implying basic literacy); women most often have no education at all but those who do only have a year or so. In lower status families (less educated, the men have lower-paying jobs), it is reasonably common for women to work, though they usually begin working out of necessity at some point after their marriage. In families that earn a bit more, however, it is uncommon and somewhat taboo for women to work, especially in the parents' generation. Overall, 20% of women worked in the older generation and approximately 19% of young women work (so far) in the younger generation.

The primary object for working class parents of daughters is to find them husbands who have steady incomes; brides should be modest girls who know how to be useful around the house. Loans are often taken by parents of both daughters and sons to cover the costs associated with a marriage. Dowries of cash are reputedly given for boys with good incomes, but these are relatively modest sums and the practice is not normative.

DATA AND METHODS

Survey

People from various castes ($N = 383$) responded to a 113-item survey administered in interview format by the author or a research assistant. Data cover education, occupation, income, property ownership, and family composition for families of

the respondent, spouses, children and children's spouses. Detailed information on economic and marriage decisions of the respondents and 834 of their children were also covered. Key informant interviews with priests, caste association directors, marriage brokers, a sub-sample of survey informants and other people knowledgeable about local marriage customs provide background ethnographic data on various topics related to marriage.

Sampling

Attempting to sample randomly within communities in Bangalore was not realistic. Since even small castes generally have many thousands of members spread throughout the city, it is not feasible to enumerate and sample from a list of the whole group. Furthermore, existing lists of community membership are either too broad, not inclusive, or both. Moreover, without a personal introduction many, if not most, potential informants would not be willing to participate in a survey, or would provide data of problematic quality. Given these circumstances, "snowball sampling" (Bernard, 1995, pp. 97-98) yields reliable data, insuring that informants are members of appropriate target populations, and resulted in an adequate sample for stratification by occupation and socioeconomic status.

Analysis

The marriages of 811 of the key respondents' children were used for this analysis. Twenty-three children's marriages were excluded from the analysis: four because the marriages occurred prior to 1970 and thus marriage costs could not be accurately standardized, and nineteen because they were so-called "love marriages." Love marriages take place without the approval of the parents and thus present problems with comparability both in terms of the wedding expenses and in terms of the characteristics of the spouse. Often the children who were excluded have siblings who are still included in the sample.

I begin my analysis by addressing the predictions detailed above with a set of descriptive statistics, correlations, and partial correlations designed specifically to test them. In order to provide a more detailed and theoretically robust view of parental investment behavior in each class, I then present a set of multivariate models that include many relevant variables to see which have the strongest influence on investment outcomes for each gender and social class stratum. In this section, I explore eight outcome variables, four child's outcomes (son's education, daughter's education, son's income, and daughter's income) and four marriage outcomes (bride's education, groom's education, bride's income, and groom's

Table 2. Mean Values For All Model Parameters For Each Class/Gender Stratum.

Variables in Model	Working Class		Business Class		Professional Class	
	Mean	N	Mean	N	Mean	N
Sons						
Parents' education	1.47	117	7.56	57	8.51	198
Parents' income ^a	2,946.00	107	46,816.00	49	13,836.00	191
Number of children	4.37	117	3.49	57	3.34	196
Proportion daughters	0.31	117	0.20	57	0.31	196
Probability of working	0.17	118	0.13	57	0.24	198
Child's education	3.15	118	6.49	57	6.46	198
Child's income ^a	3,278.00	111	43,291.00	48	16,299.00	183
Year of marriage	1992.83	116	1992.31	57	1994.19	198
Adjusted marriage costs	1,285.00	108	6,156.00	55	5,538.00	189
Child's spouse's education	2.12	116	5.80	57	5.87	196
Child's spouse's income ^a	256.00	116	1,669.00	56	3,377.00	186
Daughters						
Parents' education	1.96	126	8.22	36	8.30	272
Parents' income ^a	2,866.00	117	17,656.00	32	13,228.00	266
Number of children	4.59	128	3.52	36	3.56	272
Proportion daughters	0.58	128	0.56	36	0.63	272
Probability of working	0.20	128	0.19	36	0.32	274
Child's education	2.21	128	6.05	36	5.79	274
Child's income ^a	341.00	125	2,527.00	36	2,784.00	268
Year of marriage	1991.86	126	1992.33	36	1993.03	274
Adjusted marriage costs	4,903.00	124	38,082.00	36	12,262.00	267
Child's spouse's education	3.05	128	6.86	36	6.34	274
Child's spouse's income ^a	4,339.00	109	25,671.00	33	14,019.00	257

^aAll income data is per month and in Indian Rupees.

income). In all analyses the dataset is stratified by either class or both class and gender. See Table 2 for a summary of the means, standard deviations, and sample sizes for each class/gender stratum.

Model Parameters

The following variables (indicated in italics) are included in various analyses and models presented below. In keeping with an embodied capital perspective in which the education of both parents jointly influences children's learning (Kaplan, 1996), *Parents' Education* was operationalized as father's education plus mother's education, a much better predictor across categories than either mother's or father's

education alone. Education is coded in culturally meaningful units, with each unit representing 2–3 years of schooling. This was preferable to years of education, which was often problematic to determine due to recall bias and the complexity of the Indian higher educational system. *Parent's Resources* was operationalized as parents' combined incomes per month, regardless of the source of the income. If a parent who had previously worked was retired, their income before retirement was used. This variable assumes that present or pre-retirement income is indicative of past income levels, an assumption which is bolstered by relevant qualitative data. The *Probability that a Daughter Will Work* after marriage reflects the proportion of women in a child's family who work after marriage, including the mother, sisters, and sisters-in-law. *Number of Children* is included in the models to control for the effects of family size on investment outcomes. In general, it is predicted that the more children there are in a family the less the individual investment there will be per child. The *Proportion of Daughters* is operationalized as the number of daughters in the family divided by the total number of children in the family, and is intended to control for gender-biased investment within families. *Child's Education* is coded using the same scale as parent's education. *Child's Income* needs to be controlled with the year of marriage because informants were often only able to provide information on current income. *Year of Marriage* is included to control for age effects on child's income (and on child's spouse's income) as well as other temporal effects such as changing norms in the marriage market. The variable *Marriage Costs* is the total marriage costs as reported by the respondent and standardized based on the 1960 base All-India Consumer Price Index. *Child's Spouse's Education* and *Child's Spouse's Income* were both coded in the manner described above for child's education and child's income.

RESULTS

Results of Tests of Predictions

Prediction 1, that educated parents are more efficient at investing in their children's education than are less educated parents, is supported by my results. Once parents' income had been controlled for, the professional class had the highest partial correlation coefficient between parent and child's education, with a coefficient of 0.6127 ($p < 0.001$). The business class was next with a correlation coefficient of 0.4286 ($p < 0.001$). Finally, the working class returned a coefficient of 0.3541 ($p < 0.001$).

Prediction 3 that educational attainment will be linked to the probability of working, is broadly supported by my data. In all three social classes, the average

educational difference between daughters and sons in the same family is in favor of sons. Moreover, the correlation between daughter's education and the probability that she will work in a particular family is stronger in classes where women are less economically dependent. Specifically, the Pearson correlation for daughters in the professional class is 0.468 ($p < 0.001$, $N = 274$), where daughters have on average a 32% likelihood of working after marriage. This value is clearly higher than are either of the correlations for the other classes. The correlation in the working class is 0.228 ($p = 0.009$, $N = 128$) while the correlation in the business class is 0.295 ($p = 0.081$, $N = 36$). These are reasonably consistent with the 20% of working class daughters and 19% of business class daughters who work after marriage.

Furthermore, the educational levels of sons and daughters are more similar in social classes where women are more likely to work. Specifically, we find the smallest average ratio of son's to daughter's education in the professional class (0.39 or approximately one school year's difference, $N = 361$), and larger average differences in the business class (0.97 or approximately three school years' difference, $N = 61$) and the working class (1.13 or between three and four years' difference, $N = 201$). Two-tailed t -tests comparing the means of the different groups indicated that both the working class and the business class averages were significantly different from the professional class average ($p < 0.05$), but that the working class and business class averages were not significantly different from each other.

Results are also consistent with Prediction 4, that higher daughter's marriage costs should be paid in classes with more emphasis on real capital. Specifically, daughter's marriage costs in the business class averaged 24.81 times parents' monthly income ($N = 32$), clearly indicating that these costs are a comparatively larger expense in this group than in the others. In the working class, daughter's marriage costs averaged only 17.00 times parents' monthly income ($N = 114$), and in the professional class they averaged only 16.55 times parents' monthly income ($N = 262$). t -tests revealed that the results for the business class were significantly different from the results for the other two classes ($p < 0.1$), but that the working class and the professional class results were not significantly different from each other.

Results are mixed in their support for Prediction 5, that higher son's marriage costs should be paid in groups where brides are more likely to work after marriage. Specifically, son's marriage costs, at 3.52 times the monthly income of business class parents ($N = 49$), were lowest in the group where women are least likely to work (13% among the female relatives of the sons surveyed). Son's marriage costs were on average 6.42 times the monthly income of professional class parents ($N = 182$), and 7.88 times the monthly income of working class parents ($N = 99$)

whereas the likelihood of women working is 24% in the professional class and 17% in the working class. *t*-tests comparing the son's marriage cost means for each class to the others yielded the result that both the working class and the professional class results were significantly different from the results for the business class ($p < 0.01$). The results for the working class and the professional class, however, were not significantly different from each other.

Results of Multivariate Regressions

Child Characteristics

The multivariate regression results for son's and daughter's education, which can be seen in Table 3, and for son's and daughter's income, which can be found in Table 4, generally support predictions regarding parental investment in child outcomes.

First, the amount of son or daughter's education is significantly influenced in all classes by parents' education even after all of the other variables are included in the model. This result supports Prediction 1 as it lends weight to the argument that there is an added incentive to invest in education for educated parents. Likewise, parent's income is the best predictor of son's income across classes even after education and family size variables have been controlled for. This finding supports

Table 3. Multivariate Regression Results For Son's Education and Daughter's Education.

Variables in Model	Working Class		Business Class		Professional Class	
	β	<i>p</i>	β	<i>p</i>	β	<i>p</i>
Son's education						
Constant		<0.001	0.000			<0.001
Parents' education	0.329	0.003	0.400	0.027	0.558	<0.001
Parents' income	0.290	0.007	0.068	0.674	-0.059	0.357
Number of children	-0.080	0.424	-0.030	0.862	-0.116	0.086
Proportion daughters	0.035	0.715	0.223	0.129	0.009	0.896
Probability of working	-0.239	0.022	-0.091	0.551	0.088	0.183
Daughter's education						
Constant		0.024		0.165		0.000
Parents' education	0.519	<0.001	0.474	0.031	0.591	<0.001
Parents' income	0.307	<0.001	0.032	0.861	0.037	0.445
Number of children	-0.124	0.066	-0.035	0.879	-0.032	0.500
Proportion daughters	-0.063	0.322	0.079	0.706	-0.119	0.012
Probability of working	0.031	0.643	0.213	0.284	0.254	<0.001

Table 4. Multivariate Regression Results for Son's Income and Daughter's Income.

Variables in Model	Working Class		Business Class		Professional Class	
	β	<i>p</i>	β	<i>p</i>	β	<i>p</i>
Son's income						
Constant		0.722		0.429		0.006
Parents' education	0.326	<0.001	0.054	0.494	-0.088	0.349
Parents' income	0.549	<0.001	0.968	<0.001	0.433	<0.001
Number of children	-0.021	0.784	0.007	0.926	-0.054	0.475
Proportion daughters	0.070	0.338	0.088	0.167	0.019	0.794
Probability of working	-0.237	0.005	-0.023	0.731	-0.062	0.392
Child's education	0.154	0.043	-0.149	0.028	0.325	<0.001
Year of marriage	0.115	0.107	0.069	0.332	-0.198	0.006
Daughter's income						
Constant		0.661		0.030		0.139
Parents' education	0.131	0.359	0.189	0.428	-0.035	0.669
Parents' income	-0.037	0.789	0.261	0.161	0.086	0.157
Number of children	-0.110	0.266	0.116	0.651	-0.041	0.487
Proportion daughters	0.055	0.553	0.024	0.910	-0.040	0.505
Probability of working	0.293	0.003	0.354	0.086	0.371	<0.001
Child's education	0.197	0.186	0.351	0.087	0.246	0.002
Year of marriage	0.043	0.639	0.422	0.058	0.083	0.135

Prediction 2, that higher incomes should make parents more efficient at endowing their offspring with real capital.

The probability of women in a family working is a highly significant predictor of a daughter's education in the professional class, where women are most likely to work in jobs that are related to their level of education, a result that supports Prediction 3. Moreover, the probability of a woman working is a highly significant predictor of her income in both of the classes where women are most likely to work. Consistently, a daughter's education is a significant predictor of her income in the business class and nearly significant in the professional class, in both of which a woman, if she works, is likely to obtain a job based on her education.

Results also support Prediction 6, that members of the working class will face greater general tradeoffs between siblings than will members of the other classes because of the generally lower income and higher fertility in this class. Specifically, we see that parents' resources are a significant predictor of child's education for both sons and daughters, which suggests that the costs of education are limiting in this group. We also observe that sons are likely to receive less education if their

sisters are likely to work, and that daughters are likely to receive less education in larger families. Furthermore, Table 4 indicates that the more likely a son's sisters are to work the lower his income is likely to be. Since the proportion of daughters in the family is controlled for in both cases, it seems unlikely that this is the result of a simple tendency towards unequal investment in sons and daughters. Rather, it appears to be the specific result of a tradeoff in investment between children who are likely to work.

Prediction 7, that evidence of tradeoffs will be greater among the business and professional classes in their areas of greater investment emphasis, also receives some support from these results. In the professional class, there appears to be a tradeoff over education as daughters receive less education when the proportion of daughters is higher in a family while sons receive significantly less education if there are more children in a family. However, members of the business class do not appear to face significant tradeoffs between siblings in this sample.

Table 5. Multivariate Regression Results for Bride's Education and Groom's Education.

Variables in Model	Working Class		Business Class		Professional Class	
	β	p	β	p	β	p
Bride's education						
Constant		0.066		0.070		0.693
Parents' education	0.240	0.011	0.416	0.012	0.237	0.001
Parents' income	-0.103	0.382	-0.209	0.510	-0.013	0.825
Number of children	0.045	0.568	-0.355	0.018	-0.082	0.146
Proportion daughters	-0.040	0.594	0.125	0.328	-0.001	0.979
Probability of working	0.066	0.484	0.062	0.618	0.098	0.071
Child's education	0.496	<0.001	0.294	0.036	0.566	<0.001
Child's income	0.215	0.056	0.265	0.384	0.031	0.524
Year of marriage	0.138	0.068	-0.273	0.076	-0.019	0.716
Adjusted marriage costs	0.156	0.055	-0.250	0.066	-0.001	0.985
Groom's education						
Constant		0.162		0.330		0.181
Parents' education	0.318	0.005	-0.046	0.859	0.207	0.002
Parents' income	0.109	0.400	0.387	0.070	-0.008	0.875
Number of children	-0.102	0.209	-0.191	0.498	-0.048	0.306
Proportion daughters	-0.165	0.033	-0.003	0.991	0.005	0.913
Probability of working	-0.045	0.570	0.149	0.511	-0.070	0.197
Child's education	0.318	0.009	-0.207	0.363	0.626	<0.001
Child's income	0.144	0.067	-0.089	0.688	-0.075	0.141
Year of marriage	-0.109	0.179	0.265	0.287	-0.057	0.208
Adjusted marriage costs	-0.014	0.900	0.004	0.983	0.037	0.471

Table 6. Multivariate Regression Results for Bride's Income and Groom's Income.

Variables in Model	Working Class		Business Class		Professional Class	
	β	<i>p</i>	β	<i>p</i>	β	<i>p</i>
Bride's income						
Constant		0.530		0.845		0.779
Parents' education	0.185	0.162	0.007	0.976	-0.044	0.642
Parents' income	0.034	0.841	0.217	0.634	0.052	0.518
Number of children	0.265	0.023	0.152	0.467	0.002	0.981
Proportion daughters	0.140	0.206	0.015	0.932	-0.096	0.190
Probability of working	0.387	0.006	0.381	0.039	0.161	0.031
Child's education	0.123	0.271	0.050	0.797	-0.031	0.717
Child's income	-0.284	0.078	-0.341	0.437	0.546	<0.001
Year of marriage	0.217	0.515	0.113	0.836	-0.086	0.775
Adjusted marriage costs	-0.072	0.071	-0.045	0.557	0.020	0.202
Groom's income						
Constant		0.044		0.210		0.999
Parents' education	0.022	0.831	0.189	0.415	0.201	0.020
Parents' income	0.292	0.012	0.023	0.896	-0.058	0.402
Number of children	0.096	0.199	0.154	0.537	0.054	0.390
Proportion daughters	-0.178	0.012	0.197	0.332	0.086	0.179
Probability of working	-0.061	0.394	-0.107	0.591	0.018	0.805
Child's education	0.404	<0.001	-0.094	0.632	0.112	0.188
Child's income	0.214	0.003	-0.123	0.528	0.098	0.154
Year of marriage	0.154	0.047	0.740	0.211	0.251	0.980
Adjusted marriage costs	-0.149	0.124	0.273	<0.001	-0.001	<0.001

Child's Spouse's Characteristics

Table 5 displays regression results for bride's education and groom's education while Table 6 displays results for bride's income and groom's income. Both sets of results provide significant support for hypotheses related to investment in marriage costs and spouse characteristics.

Table 6 indicates that the most important predictor of a bride's income is the probability that the groom's sisters work. This is true for all social classes, and supports Prediction 3 in suggesting that the probability of working after marriage will improve a daughter's education and income capabilities, though in this case the improvement is after marriage rather than before.

Prediction 8 suggests that those who have more of a particular currency will be more efficient at obtaining it in their spouses. In support of this, the results in Table 5 clearly indicate that in order to obtain an educated bride or groom, members of most classes need to be educated themselves and have educated parents. Furthermore,

education variables are much better predictors of education than are income-related variables, including marriage costs, across nearly all strata. Also in support of Prediction 8 is the finding that daughter's marriage costs are very significant predictors of groom's income in both the business class and the professional class. Moreover, in the professional class, son's income is a powerful predictor of his bride's income. Taken together, these data suggest that in the marriage market education is not obtained with income or vice versa, but that rather education is the best way to attract an educated spouse and wealth is the best currency for attracting a wealthy spouse. Conversely, in the working class, flexibility of preferences is reflected in the results indicating that a son's family needs to pay higher marriage costs if his bride has a good income, but also that a son with a higher income is more likely to marry a woman with a lower income. Furthermore, results also indicate that parents' resources, daughter's education, daughter's income, and the proportion of daughters in the family are all strong predictors of groom's income.

DISCUSSION

Class Strategies

As was predicted, my results indicate that different social classes do indeed have different parental investment profiles. This finding suggests that analyses on large, unstratified datasets may be missing important data about the systems of opportunity and constraint faced by members of different subgroups.

Members of the working class raise a somewhat larger number of offspring endowed with modest amounts of education and real capital. Limited resources and larger numbers of offspring mean that there are tradeoffs within the family. For example, sons are educated significantly more than daughters are in general, but sons' education and income are still negatively affected by the probability that daughters will work. Both men and women typically work in occupations that require little formal education, but this does not prevent their taking education-based jobs if they have the opportunity to do so. In addition, parents appear to use strategies related to both major currencies of investment (education and wealth) to influence their children's earning capacity, a result that is consistent with the variety of types of work available to members of this class. Working class parents pay relatively high marriage costs when compared to their incomes, though the absolute amounts are significantly lower than in the other classes examined. Higher marriage costs appear to be paid by sons for educated or working brides, but individual and family characteristics, rather than high marriage costs, are what appear to attract an educated or wealthy groom.

Members of the business class raise a somewhat smaller number of moderately educated offspring who will usually be employed in the family business or start businesses of their own. Daughters are educated somewhat less than sons are, a finding that is consistent with the fact that they are not likely to work after marriage. However, neither gender is educated as much as their family's resources might allow, probably due to the limited utility of education for improving income in this group. Instead, real capital (in the form of cash and property) endowment appears to be a primary focus of parental investment. Specifically, parent's income has a strong, positive effect on son's income. Moreover, business class parents pay very high marriage costs for their daughters in order to attract a groom with a good income, but pay lower-than-average marriage costs for their sons, possibly because brides typically do not work after marriage.

Members of the professional class raise a smallish number of highly educated offspring who will use their educational endowments to obtain salaried incomes in white-collar occupations. Education appears to be the primary focus of parental investment in both sexes. Daughters are educated nearly as much as sons are, a finding that is probably linked to the fact that they are increasingly likely to work both before and after marriage. Members of this class furthermore appear to face tradeoffs with respect to investment in education: a greater proportion of daughters in a family is associated with less education for any particular daughter, and a large number of children has a less significant negative effect on son's education. High child income appears to be produced primarily through the high levels education obtained by both sons and daughters in this class. However, parent's income is also a significant predictor for sons as is the probability that a woman will work after marriage a significant predictor for daughters. Members of this group pay reasonably high marriage costs in keeping with their own incomes and the incomes of their prospective spouses, but typically do not give large cash dowries. Educated children with educated parents are most efficient at obtaining educated spouses, whereas higher child income (for sons) and higher marriage costs (for daughters) are strongly associated with higher spouse income.

Investment Currencies, Tradeoffs, and Outcomes

My results also appear to yield broad support for the idea that in complex cultures different currencies and outcomes of parental investment should be examined separately as they may entail different patterns of investment. Specifically, I find that education and wealth are not substitutable among those with larger amounts of both, but do appear to be substitutable among those with more moderate levels of both.

In the working class, parents employ a mixed strategy in which they obtain educated children by drawing on both their own education and income. In contrast, members of the business and professional classes seem to be most strongly aided by their own educational level in obtaining educated children. Likewise, son's income is predicted by parents' education, parents' income, and child's education among working class parents, whereas among members of the business and professional classes parent's education is not a significant predictor of son's income. Moreover, among members of the working class there is evidence that education and income are exchangeable in the marriage market as well. Specifically, marriage costs in this group are affected by both educational characteristics and income characteristics of both the bride and groom. Furthermore, in the case of sons, it appears that both individual characteristics (an educated, working girl) and family characteristics (a girl with richer parents with fewer daughters to marry off) can attract grooms with good incomes.

In the business and professional classes, however, education appears to be obtained with education in the marriage market rather than with income. Conversely, education does not appear to appeal to wealthy spouses as both of these groups show the tendency to attract wealthy spouses with various forms of wealth (either income or marriage costs) rather than with education. While some members of my sample are clearly both rich and well-educated, and therefore usually (as we would expect) marry others who are both rich and well-educated too, my data indicates that even in these cases they do not obtain income with education or vice versa.

Limitations of the Study

From a strict perspective, one of the limitations of this study is that it does not address traditional evolutionary outcome measures such as reproductive success. Instead, my approach follows that of Kaplan (1996), who, among many others (see Borgerhoff Mulder, 1998 or Perusse, 1993 for reviews and further discussion), argues that while modern human behavior is consistent with flexible ecological strategies that were adaptive in the past, these strategies may or may not result in higher fitness under modern conditions. Thus, an evolutionary perspective on modern behavior does not necessarily need to imply a direct emphasis on fitness outcomes. This paper attempts to demonstrate that parents with different characteristics may choose different investment strategies, but that the goal of such parents is still to produce high quality offspring and spouses for those offspring. These arguments are consistent with evolutionary approaches that take into account ecological conditions and quantity-quality tradeoffs, but in which no explicit assumptions are made about the long-term adaptive consequences of behavior.

A further limitation of this study is that my analysis does not rule out the possibility of alternative explanations for my findings other than the embodied capital framework I have presented. Specifically, non-evolutionary models such as the intergenerational transmission of cultural values, or assortative mating specific to locally valued currencies, are consistent with my findings, as are evolutionary ideas such as the Red Queen Effect (Ridley, 1993). While I cannot rule out these possibilities, it is not the purpose of this paper to argue that an evolutionary approach is necessarily superior to other types of explanations. Rather, the purpose of this paper is to argue that parental investment behavior in complex cultural settings such as urban south India is consistent with the evolutionary economic approach of embodied capital theory and the evolutionary demographic approach related to heritable wealth.

Finally, it could be argued that I am taking particular features of the local cultural ecology for granted rather than attempting to explain how these cultural constraints evolved to begin with. However, one of the points that I hope readers will take from this paper is that human behavioral ecologists can not afford to ignore cultural variation since it sets up constraints in which evolutionarily-derived ecological strategies are acted out. Even if we assume that humans generally adopt strategies that are in their best interest in evolutionary terms, we must remember that the particular ecologies in which people find themselves are often highly constrained by cultural history. Once a population arrives at an equilibrium pattern of behavior, it will often be difficult or very costly for individuals to deviate from that cultural norm. This is particularly true in large-scale societies with layers of various kinds of legal and social institutions, such as India.

CONCLUSIONS

The two major themes discussed at the beginning of the paper emerge as important in the results of this study. First, three different urban south Indian social classes are confirmed to have different strategies for parental investment which are consistent with predictions based on theory deriving from both embodied capital theory and studies that stress the importance of heritable wealth. These findings lend further support to the idea that parental investment and fertility behavior need to be studied in culturally and economically coherent social groups as large studies that aggregate data across cultures or social classes are likely losing important data on socioecological difference.

Second, there is support for the idea that the currencies of both embodied capital and heritable wealth have important but separate impacts on parental investment behavior in urban south India, and thus should both be included in future studies of

parental investment in complex cultures with market economies. Finally, perhaps the most interesting finding of this paper has been the point that different investment currencies may entail different investment structures – that even in modern cash economies the types of resources one uses to obtain one type of currency may not match the type of resources needed to obtain another type.

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