Testing Socioeconomic Status as a Marker for Condition in the Trivers-Willard Hypothesis within the Human Context

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Abstract

Applying evolutionary reasoning to reproductive strategy differences between the sexes, the Trivers-Willard Hypothesis suggested that parental resources condition sex differentiation of parental investment. This suggests that socioeconomic status could condition child sex preference in humans. While researchers have tested this possibility, they have neglected the explicit condition that the increases in a child's reproductive success from parental investment vary between sons and daughters. This paper tests the assumption's validity by examining sex differences in reproductive success, controlling for parental socioeconomic status and multiple dimensions of parental investment. I use fertility-related behaviors to construct a measure of expected births that bypasses modern contraception. The results of OLS regressions find no significant sex differences in reproductive success at any level of parental socioeconomic status. The lack of support for this underlying assumption calls previous research into question and urges closer attention to the use of biological models within social research.

Introduction

Of growing interest to social science researchers is the role of biology in social behaviors and outcomes. This interest is evidenced by the growing drive to include biological measures and genetic markers in social surveys and the scholarship produced from this data. But while such measures and studies become have become more common, there is still lingering resistance to wholesale inclusion of biological theory and measures into research of social phenomena. While some have minimized this position as a failing of social researchers to understand or be conversant with biological knowledge and theory (e,g, van den Berghe 1990), there are other possible reasons for the resistance. In particular, many evolutionarily derived theories of human action appear to be ad hoc explanations for observed phenomenon as what is found is defined as necessarily evolutionarily advantageous. Consequently, few predictions of hypotheses derived from evolution based logic seem to be testable.

However, there are some hypotheses from evolutionary reasoning that appear to generate testable predictions. One such hypothesis that has received considerable research attention is the Trivers-Willard Hypothesis (Trivers and Willard 1973). This hypothesis explores how parents invest in their children and how these investments vary by sex of the child and parental status. Their argument is based on the difference between male and female reproductive strategies. For males, there exists the possibility of attracting multiple mates, thereby increasing the number of maximum number of children a male can have. However, the likelihood of having multiple mates is related to the quality of a male-those in better condition and with more resources are more likely to attract multiple partners. Females, on the other hand, have less variable reproductive potential because time and the necessary female investment in a child place clear limits on the number of children a woman can bear. This difference suggests that males of high status can expect to have higher reproductive success, number of children, than females of similar status by virtue of having multiple mates. On the other end of the spectrum, males of lower status will be unlikely to attract multiple or even a single mate and females will thus be expected to have higher reproductive success.

These expectations of reproductive success and condition led to the next step in the logic of the Trivers-Willard Hypothesis (henceforth TWH). If the expected reproductive success of an individual depends on the sex and parental resources invested, then a parent can maximize their children's reproductive success by differentially directing their available resources to sons or daughters. Parents with many resources at their command can sufficiently endow sons with enough resources to attract partners and would therefore maximize the number of grandchildren by investing in sons over daughters. Parents with few resources can't invest enough in a son to make him high quality enough to attract mates and would therefore be best served by investing in daughters. Using this logic, Trivers and Willard postulated that parental condition, or the resources parents command, determines whether parents invest more in their sons or daughters.

Many studies have sought to test the presence of the TWH. There has been support for the TWH in many non-human species (e.g. mice [Rivers and Crawford 1974] and red deer [Clutton-Brock, Albon, and Guinness 1986]). In the original paper formulating the hypothesis, Trivers and Willard claimed that the same process would operate in humans using socioeconomic status as a marker for parental condition. The results of studies testing this assertion have been more mixed. Some studies have presented findings of investment differentiation by gender along socioeconomic status consistent with TWH predictions (e.g. Gibson 2008, Godoy et al. 2006, Gaulin and Robbins 1991). However, other studies have found no effect of parental condition on relative investment in sons and daughters (e.g. Freese and Powell 1999).

Though many studies have sought to test whether parental investment differentiation based on child sex occurs in humans along a socioeconomic status gradient, this research trend overlooks a crucial requirement. There is a required assumption that must be met for this prediction of the TWH to be valid. The authors made the required assumption explicit in their piece.

> Despite these complications, the model can be applied to humans differentiated on a socioeconomic scale, as long as the [reproductive success] of a male at the upper end of the scale exceeds his sister's, while that of a female at the lower end of the scale exceeds her brother's.
>
> -Trivers and Willard, Science 1973

In order for the logic of the TWH to be applicable to humans using socioeconomic status as a marker for condition then there is a key assumption that must be met; reproductive success must vary in a specific way by sex within socioeconomic status strata. The goal of this paper is to test whether this condition for the application of the TWH to humans is met by examining whether reproductive success of males exceeds that of females at the top end of the socioeconomic status gradient and that of females exceeds that of males for individuals at the bottom of the socioeconomic status distribution.

Measures

Reproductive Success

The TWH, as with other evolutionary arguments, is centered on differential rates of reproduction, a concept measured by reproductive success. Reproductive success can be thought of as the organism's success, or lack thereof, at producing fertile offspring; in a crude sense, a more reproductively successful person has more offspring. In this hypothesis, individuals seek to maximize their reproductive success by directing what resources they have to their children in such a way as to increase their number of grandchildren, resulting in a higher rate of transmission of their genes to future generations.

However, despite its historic and evolutionary importance, there are concerns about reproductive success in the modern age. Recent trends with regards to fertility have shown delays in fertility (Rindfuss, Morgan and Offut 1996), as well as some people abstaining from pair formation and child bearing altogether (Rindfuss et al 1988). In addition, technological developments and medical understandings allow humans to personally control their procreative practices, albeit imperfectly. With the rise of contraceptives and the resultant absence of "natural fertility", family choice and size patterns are showing marked dependency on culture rather than opportunity. In a well written explanation, Kanazawa (2001) pointed that that in the TWH or other evolutionary hypotheses evolved mechanisms "need only be adaptive in the [evolutionary adaptive environment] and not necessarily in the current environment." With social environment and personal agency affecting reproductive behavior in the modern world, the number of children an individual has in a modern setting is not equal to historical reproductive success. A measure of reproductive success as it would have been in the historical, evolutionary setting is needed. I propose a measure, expected number of children, which uses current sexual practices to estimate an individual's reproductive success in a historical setting.

Though it can come as a surprise to some, the birth of a child has known antecedents. In a classic piece, Davis and Blake (1956) set out the proximate determinants of fertility and using this frame, we can view the outcome of having child as a result of a chain of events. With this in mind, it is possible to move to a point in the chain prior to the use of birth control methods and construct an alternative measure of reproductive success. Absent of contraception, we know the relevant factors involved with the likelihood of having a child are the number of partners an individual has, the frequency of sex with each partner and the actual biological risk of pregnancy for each coital act. Using the data available, these other concepts can be captured and synthesized into a new measure of reproductive success. I make a couple of simplifying assumptions in these calculations. The first is that the conception of a child leads directly to a birth, so I do not take into account fetal mortality or stillbirths as mechanisms that could change the resulting number of children an individual has. The consequences of this modeling condition with regards to the results are discussed below. To simply the model, I also assume there is no possibility of twinning; the expected number of children is calculated on the basis of each conception event results in a single birth.

I have direct reports of the first piece of information as respondents reported the number of sexual partners they have had in the last year. Generating the number of coital acts an individual engages in with each sexual partner is slightly more complicated. Respondents provided information on their total sexual counts over the course of a year as well as their partner count for the same period. Using this information and making assumptions about the distribution of coital acts across partners yields an estimation of the count of sexual activity with each partner. The distributional assumptions I make assign a proportion of sexual acts to each partner until the total count is exhausted. For example, using a constant of 0.9 first assigns one sexual act to every partner and then 90% of the remainder to the first partner, 90% of this remainder to the second partner and so on until the entire count of sexual acts is exhausted. To insure that the results of the analysis are not sensitive to the distributional assumption I make, all models are run at six different levels (1, 0.9, 0.8, 0.7, 0.6, 0.5). These assumptions correspond roughly to an idea of fidelity as the more faithful one is to a partner the fewer times one has sex with other people. As this fidelity level increases, the male value of expected number of children converges to that of females. At perfect fidelity in a monogamous couple, these values should be equal.

To estimate the third essential component of this measure, estimates are needed for the actual biological risk of pregnancy for each sexual act. Fortunately, there are studies that have been performed that can help us estimate this biological risk factor. Two important components define this risk-the proportion of the menstrual cycle during which fertilization can occur and the likelihood of fertilization during this period. Previous research indicates that fertilization is centered during 6 days of the 28 day cycle- from five days prior to ovulation to ovulation (Hollander 1996, Wilcox, Weinberg and Baird 1995). During this period, the single day conception rate varies from 0.08 to 0.36 with an average conception rate during the period of 0.23 (Wilcox, Weinberg and Baird 1995). Extra support for the use of these constants derives from the close demographic similarity between the sample these studies used and the sample used in this paper. Because I do not have sufficient information on the temporal placement of sexual acts from respondents, I assume a random distribution such that the likelihood of a sexual act falling within the fertile period is 6/28 and the likelihood of conception for any act falling into this period is 0.23[1].

With these different components of the reproductive success measure in place, all that remains is to define their relationship. For any given couple, the probability of having a child is given in Equation 1, where f is the frequency of intercourse, v is the proportion of the woman's cycle in which it is possible to become pregnant, c is the biological risk of pregnancy during the fertile period.

$$p(child) = 1 - (1 - c)^{f * v} \qquad \text{Equation1}$$

Using this equation for couple fertility and what is known about sexual strategies of males and females, it is possible to construct equations to determine a man's or woman's expected number of children in a year. Since this measure is limited to a single year, a woman is able to bring to term and give birth to only 1 child. Her expected number of children then is equal to the probability of having a child. Number of sexual

[1] Reducing the likelihood of per coital act conception by half yields a similar pattern of results as presented below.

partners and frequency of coitus with each partner are used to determine the total counts of sexual activity. Using this, the general equation above can be rewritten for women, as seen in Equation 2, where c is the biological risk of pregnancy during the fertile period, v is the proportion of the cycle in which the woman is fertile and fi is the frequency of sex with partner I and np is the total number of sexual partners.

$$E(children) = p(child) = 1 - (1 - c)^{\left(v * \sum_{i=1}^{n_p} f_i \right)} \qquad \text{Equation 2}$$

For men, the equation is a little more complicated since each partner represents not just an increased risk of pregnancy but also a chance to have an additional child. Again, using equation 1 as a starting point, a man's expected number of children can be calculated by adding the couple's probability of having a child across all couples in which he was involved. The resulting equation is shown in Equation 3, where again c is the risk of pregnancy during a woman's fertile period, v is the proportion of a woman's cycle in which she is fertile, and fi is the sexual frequency with partner I and np is tht total number of sexual partners.

$$E(children) = \sum_{i=1}^{n_p} (1 - (1 - c)^{(v * f_i)}) \qquad \text{Equation 3}$$

Parental Investment

Parental investment is the second key concept of the TWH. While many studies have measured parental investment as a single concept, other researchers have suggested that parental investment is a multidimensional concept (Coleman 1988). While describing investments, the most obvious type is monetary, however, under the framework of rational choice, time and effort are also investments that can be made (Becker 1981), a fact that calls for other types of parental investment to be considered. Freese and Powell (1999) in their test of the TWH outlined a five dimension conceptualization of parental investment in which parents could invest in their children through economic, interactional, social, cultural or supervisory means. For the purposes of this paper, I follow the general scheme that they developed.

The most obvious means of parental investment is economic, that is money or opportunity directly spent or foregone for the purpose of enriching the child. To capture this dimension of potential investment, I use information about whether the child is in a private school and whether schools were the primary cause for the choice of residence.

Parents can also invest in their children through greater personal involvement. Research has found that children can benefit from personal involvement with their parents or with their parent's involvement in their lives. Stronger relationships with parents are associated with higher grades (Dornbusch et al. 1987) and delayed onset of sexual activity (Moore and Chase-Lansdale 2001), for example. Active involvement with children can be seen through talking with the child about their grades, working with them on a school project, being aware of school activities and participating in a parent organization (Stevenson and Baker 1987).

Parents can also spend time and energy supervising their child. Parental supervision has been found to be positively associated with a number of childhood improvements, such as reduced likelihood of delinquency (Waizenhofer, Buchanan, Jackson-Newsom 2004). I measure two forms of supervisory investment: whether the child has a set bedtime during weeknights and the number of dinners eaten with the family during the week.

Social investment is parental investment through knowledge and activation of the child's social network. There are benefits to the child, in terms of education, through parental involvement in the child's social network (Teachman, Paasch and Carver 1996). Parents of the survey respondents provided information about knowing their child's best friends, having met these friends and having met these friends' parents.

Work by Bourdieu (1977) suggests that parents invest in cultural capital by taking their children to cultural events and activities. Cultural investment has been shown to improve a number of child outcomes (e.g. DiMaggio and Mohr 1985, DiMaggio 1982). This is measured by attendance at a recent culture event with a mother or father figure.

When these controls are used to account for parental investment, all of the individual measures are included in the models. The alternative possibility of indexing these measures by parental investment dimension involves strong assumptions, such as equal relation to the underlying concept, which may be unwarranted. The addition of so many conceptually related controls might introduce problems with multicollinearity, however in the context of the current research there is no need to actually estimate coefficients for parental investment so this provides no additional cost.

The formulation of the TWH projection into the modern day human condition is built on differential return by sex, with regards to reproductive success, on parental investment. This suggests that models should include these parental investment controls in order to test how much additional reproductive success is enjoyed if investing in a son instead of a daughter. However, since it is not an explicit part of the TWH human projection, I also run models without controls for parental investment.

Socioeconomic Status

The goal of the paper is to test whether males and females of similar social class have different expectations of reproductive success. As is expected of such a complex concept, there are many ways to measure socioeconomic status. One way that socioeconomic status has classically been measured is educational status, which is related closely to job status, income, and life outcomes (see Krieger, Williams and Ross for review of the use of education as a marker for social class and socioeconomic status in research of certain life outcomes).

To capture parental socioeconomic status, I measure the highest attained educational status of the resident parent(s) or their resident partner, capturing the social class of the house in which the child resided. These values are broken into credential levels: less than high school diploma, high school diploma or equivalent, education beyond a high school diploma (some college, associate's degree or technical training beyond high school) or bachelor's or higher degree.

Demographic/Family Factors

To test the contention that the TWH can be applied to humans, a number of confounding factors need to be taken into account. As the age of an individual may be related to their sexual behavior, I control for respondent age. As parental investments and gender preference may vary by race or ethnicity, I control for the race/ethnicity of the child. For the small minority of individuals that report multiracial background, I use the race or ethnicity with which they most closely identify.

Family composition could also be relevant to the distribution of resources to children. Having more children in the household reduces the parental resources available to any one child, so I control for the presence of resident siblings. As some work has shown that parental investment is not or less related than expected to the biological relationship between the parent and the child (Hamilton, Cheng and Powell 2007, Hofferth and Anderson 2003, Judge and Hrdy 1992), this count of other siblings living in the adolescent's house is not limited to full biological siblings, though these comprise the vast majority of siblings in the sample. Because there is evidence that parental resource allocation may vary by sex configuration of children (see Steelman et al. 2002) or sex of the child (Mammen 2008), I also control for whether the respondent is an only son or only daughter.

The construction of the expected children measure overcomes the problem with the use of contraceptives by respondents. However, conscious choice in fertility behavior still poses a problem of measuring what fertility of the respondent would have looked like in an evolutionary setting. Additional controls are needed to account for voluntary sexual abstinence. The individual responses on sexual frequency do not allow us to tease apart abstinence by choice or abstinence through inability to find sexual partners. One of the well-researched predictors of voluntary abstinence is religious sentiment and involvement (e.g. Thornton and Camburn 1989, Paul et al. 2000). As a result, I use religious fundamentalism and personal salience of religion as proxies for voluntary abstinence.

Data

I use data from the National Longitudinal Study of Adolescent Health (Add Health), a nationally representative study of adolescents in grades 7-12 during the 1994-1995 school year (Harris et al. 2003). This study used a multistage, stratified, school based cluster sampling design. A stratified sample of 80 high schools was selected with probability proportional to size. For each school, a feeder school was also selected with probability proportional to its contribution to the high school.

Using the school rosters, a probability sample was then selected for home interviews. Selected populations (such as ethnic, disabled and genetic pairs) were sampled at higher probability for inclusion in the in home interview sample collected during 1995. These interviews constitute Wave 1 of the Add Health study and included interviews of students and, for 85% of the sample, a parent or guardian. I use data both from the student respondent and their parental figure from the Wave 1 collection. In

2001-2002, all Wave 1 respondents were contacted again for additional data collection as part of a third wave of data collection.

Responses are matched from the two waves. I combine information on parenting and family structure from the first wave with information on sexual frequency and partnerships from the third wave to create the analytical sample. This sample is comprised of 4, 596 unique complete cases.

Methods

To test whether sons and daughters experience different levels of reproductive success at different socioeconomic levels, I run regression models predicting the expected number of children and stratified by parental education. Models are calculated taking into account the clustering and weighting resulting from the data collection methodology. The distribution of the expected children measure is not such that a transform of the dependent variable is needed. These models are run both with and without inclusion of parental investment measures.

Results

Table 1 presents weighted means describing the analytic sample. The majority of the sample was in their early twenties. Most of the individuals in the sample had few resident siblings as of the first data collection. While the largest share of respondents came from households where the achieved level of education is a college degree or more, there is considerable variation in this variable.

As described above, this paper uses a number of measures to capture the multidimensional nature of parental investment. Description of these indicators is presented in Table 2. Though some of the indicators have little variance, namely the student being enrolled in a private school or the parent knowing or having met their child's friends, most of the measures of parental investment have significant variation in the sample.

Models stratified by parental education status were run predicting the expected number of children. These models were compiled with the different possible calculations of the expected number of children as set out previously. These models were computed with or without inclusion of parental investment measures. The coefficients for male relative to female, including the 95% confidence interval, resulting from these various models are presented graphically in Figures 1 through 6.

Setting the fidelity constant at 1 or 0.9 yields no significant results with or without the inclusion of measures of parental investment (Figures 1 and 2 respectively). With the fidelity constant set at 0.8 (Figure 3) there is a marginally significant effect of being male for those with parents that have some education in addition to high school ($p<0.10$). This relationship is strengthened ($p<0.05$) when adding controls for parental investment. With the fidelity constant set at 0.7, there is again a marginally significant effect ($p=.06$) of being male for those with parents who have some education beyond a high school diploma (Figure 4). Adding controls for parental investment strengthens this association ($p<0.05$) and uncovers a marginal significant effect ($p=.08$) of being male for those with parents who have completed a college degree. With the fidelity constant set at 0.6 (Figure 5) there is a marginally significant effect of being male for those whose parents have either some education beyond a high school diploma or at least a college degree ($p=0.06$ and $p=0.08$ respectively). This relationship between male and expected number of children strengthens among those whose parents have education beyond high school ($p<0.05$ for parents with more than a high school diploma and $p=0.06$ for parents with at least a college education). In the most liberal assumption of sexual count distribution (fidelity=0.5, Figure 6), there are marginally significant effects for male in the models for those with parents whose education extended beyond a high school degree. Adding the controls for parental investment strengthened the relationship in both of these models ($p<0.05$ for both).

In certain constructions of the expected children count, it seems that at higher levels of socioeconomic status, males have higher expected numbers of children than females given the same level of parental resource investment[2]. There is no evidence that females have a higher expected number of children than males at low socioeconomic status levels. The pattern of the results is the same in a full model not stratified by parental education that includes by group (sex and parental education) measures.

Discussion

[2] Models were also run with alternative specifications of socioeconomic status. Because of a high rate of individual nonresponse on income questions asked of the parent, I used block level area measures, in particular median household income and area unemployment level as proxies for individual socioeconomic status. In these models, I found no significant differences in reproductive success of men and women across socioeconomic status levels.

The results of this study find mixed support for the requirements necessary to apply TWH to humans using socioeconomic status as a marker for parental condition. Under certain conditions of the calculation, males at higher socioeconomic status have higher reproductive success than females. This test, with the inclusion of parental investment and demographic controls, seems to support the required claim for TWH in humans that brothers have higher reproductive success than sisters at high socioeconomic status. If anything, this test might understate this relationship as the data collection is limited to young adults. The ability of older men of high status to attract younger female mates increases the total reproductive success benefit high status men enjoy.

However, meeting this requirement is only half of the story. To justify using socioeconomic status as a marker for condition with regards to the TWH in humans also requires that sisters have higher reproductive success than their brothers at low socioeconomic status levels. Of this requirement, there is no support in any model run. Taken together, the results do not seem to justify using socioeconomic status as a marker for parental condition in the TWH.

Part of the inability to find higher female benefits at low socioeconomic status may be the result of the sampling population or the sampling distribution itself. If this sample failed to capture the poorest of the poor, then it may be that among this unrepresented population such a relationship is to be found. Likewise, if this female benefit only exists for those in the most extreme destitution, it is possible that such a population is too small to capture significantly in the modern American setting.

It may also be possible that the female benefit would be apparent if the simplifying assumptions equating conception to birth in this paper were relaxed. With the likelihood of a healthy birth increasing with socioeconomic status, though there appear to be increasing levels of education homogamy (Swartz and Mare 2005), that in recent history women were more likely to marry individuals of higher socioeconomic status than men were (Elder 1969) suggests that for people with low parental socioeconomic status, the likelihood of healthy births for women is higher than that of men as a function of marrying higher status individuals. This could provide a mechanism whereby daughters of parents with low socioeconomic status have higher reproductive success than their brothers.

The finding of differences between models including or not including controls for parental investment is also interesting. When accounting for parental investment, there are clear differences between male and female reproductive success at the higher levels of parental socioeconomic status. This relationship is weak or nonexistent when not accounting for parental resources. This suggests that parental resources are distributed in such a way to offset in part the reproductive success benefit that sons would enjoy. This is in accord with previous studies that have found evidence of balanced or slightly daughter favored parental investment in the United States (Behrman, Pollack and Taubman 1986).

This study also highlights the importance of awareness of and attention to the underlying assumptions of biological models and theories. Before we begin testing biological, especially evolutionary, theory and hypotheses with our studies, it is important to ensure that the reasoning supporting these hypotheses holds in the circumstances of interest. In the case of the TWH within the human setting, there was an explicit requirement that the reproductive success benefit of parental investment to sons and daughters vary by socioeconomic status. Though many studies have tested whether the hypothesis' predictions were upheld among humans, this essential basis had been left untested. Without work testing the assumptions and scope conditions, we have no reason to expect to find any effect and is impossible to attribute any effect found to the exact relationship postulated by the hypothesis.

This work also demonstrates another benefit of thorough collection of social data. With such rich data, it may be possible to overcome significant theoretical hurdles. Estimation of reproductive success is difficult to accomplish in a modern setting with voluntary abstinence and contraceptive use. However, in this study, using the data from the Add Health project and making clearly enumerated assumptions it was possible to construct a measure of expected number of children that overcame these modern limitations.

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Tables

Table 1: Weighted Means Describing the Analytic Sample

	Mean	**SE**
Male	0.48	0.01
Age	21.76	0.04
White	0.70	0.01
African American	0.15	0.01
Hispanic	0.15	0.01
Asian/Pacific Islander	0.01	0.00
Native American	0.06	0.01
Other	0.07	0.01
Family Composition		
Number of Other Siblings	1.46	0.02
Only Son	0.12	0.01
Only Daughter	0.15	0.01
Parental Education		
Less than HS	0.11	0.01
HS Graduate	0.23	0.01
More than HS	0.30	0.01
College or More	0.38	0.01

Table 2: Weighted Means of Parental Investment Indicators

	Mean	SE
Interactional Investment		
Talk About Grades	0.69	0.01
Work on School Project	0.18	0.01
Talk About School Activities	0.58	0.01
Belong to Parent Organization	0.34	0.01
Supervision Investment		
Dinner with Parents (#/week)	4.69	0.04
Has a Bedtime on Weeknights	0.82	0.01
Cultural Investment		
Go to Cultural Event or Location	0.35	0.01
Social Investment		
Know Best Friend from School	0.94	0.00
Met Friends	0.94	0.00
Met Friends' Parents	0.80	0.01
Economic Investment		
Private School	0.07	0.01
Primary Reason for Location is School	0.15	0.01

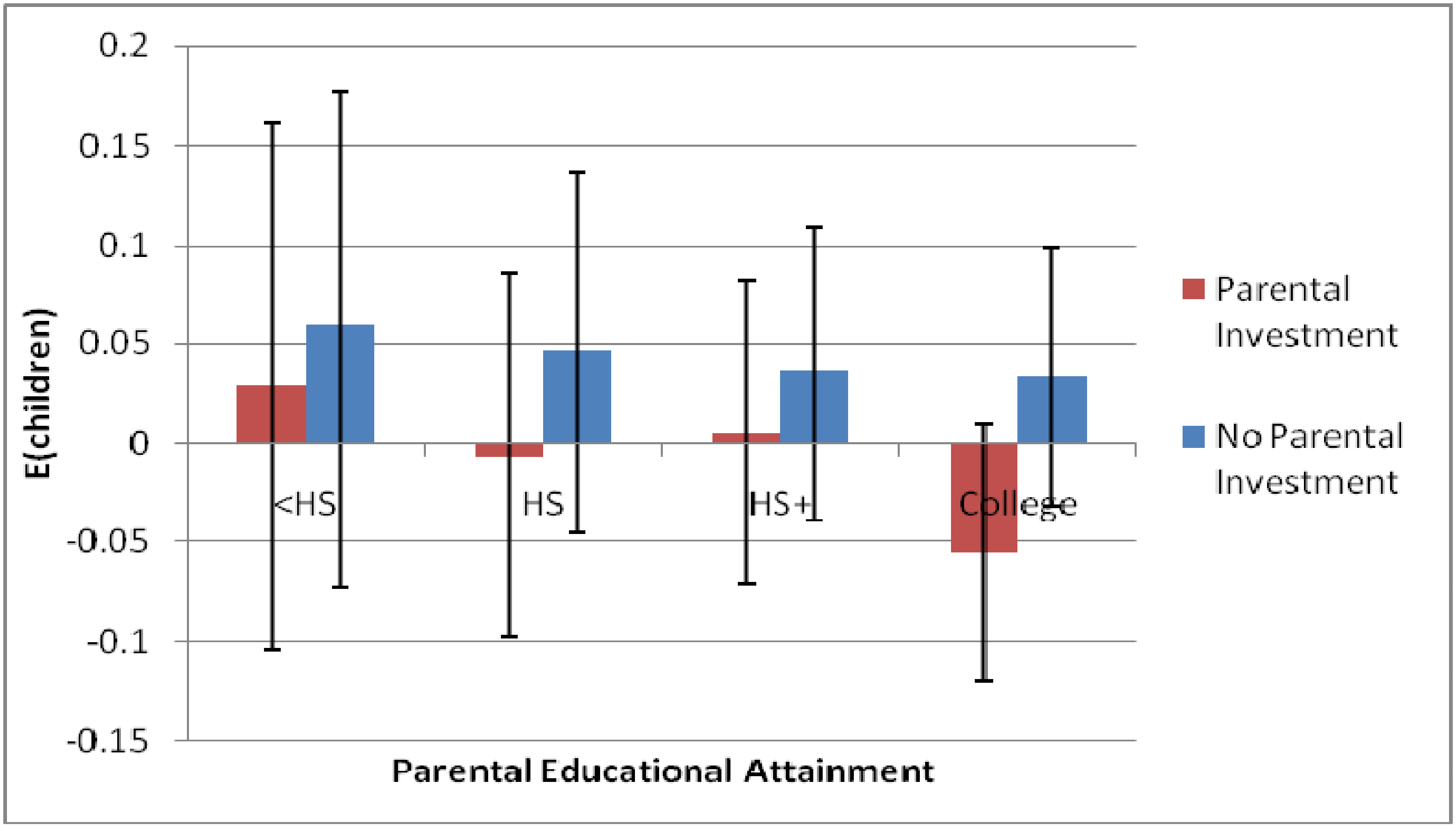

Figure 1: Coeffients for Male in Models Stratified by Parental Education, Fidelity Constant=1.0

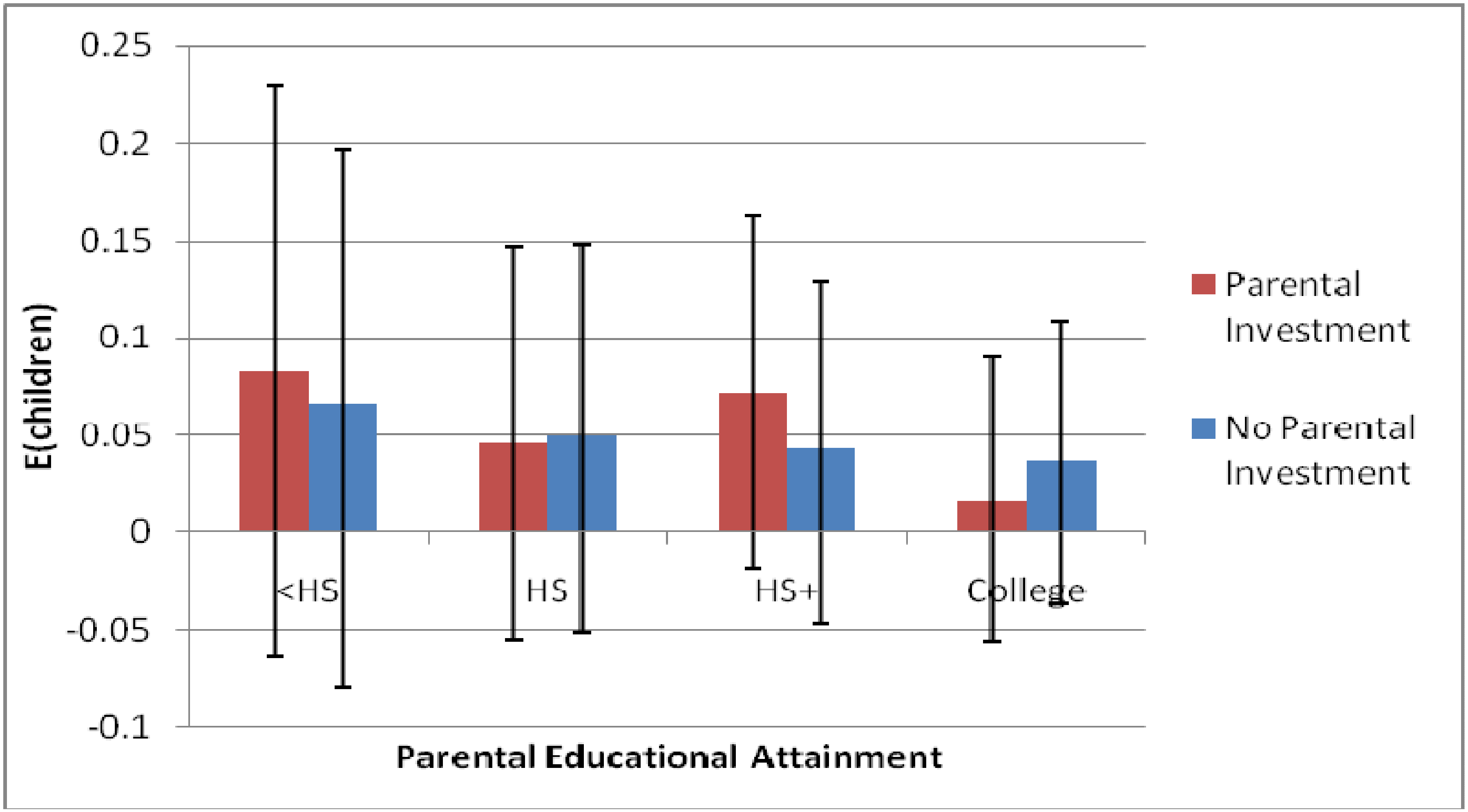

Figure 2: Coeffients for Male in Models Stratified by Parental Education, Fidelity Constant=0.9

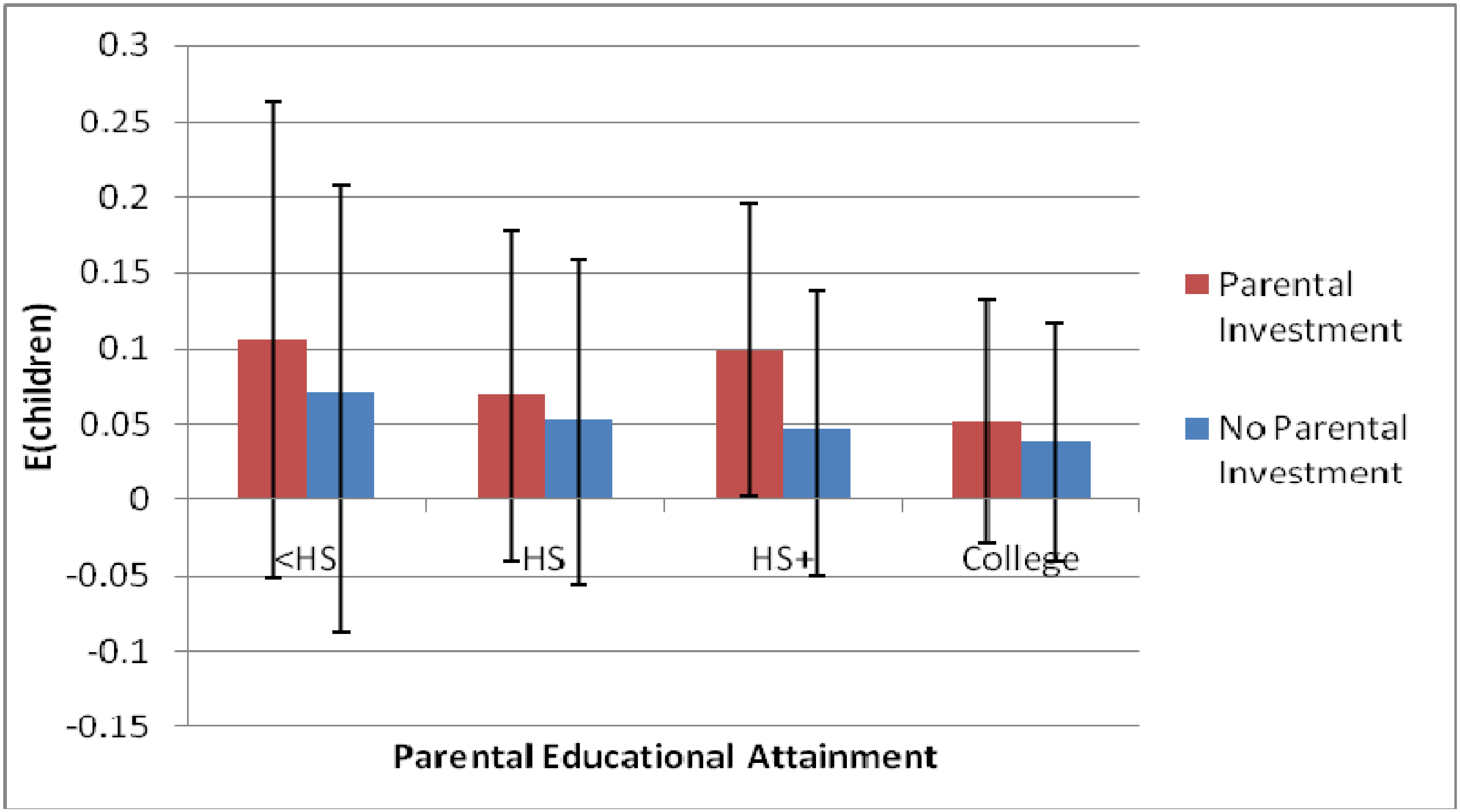

Figure 3: Coeffients for Male in Models Stratified by Parental Education, Fidelity Constant=0.8

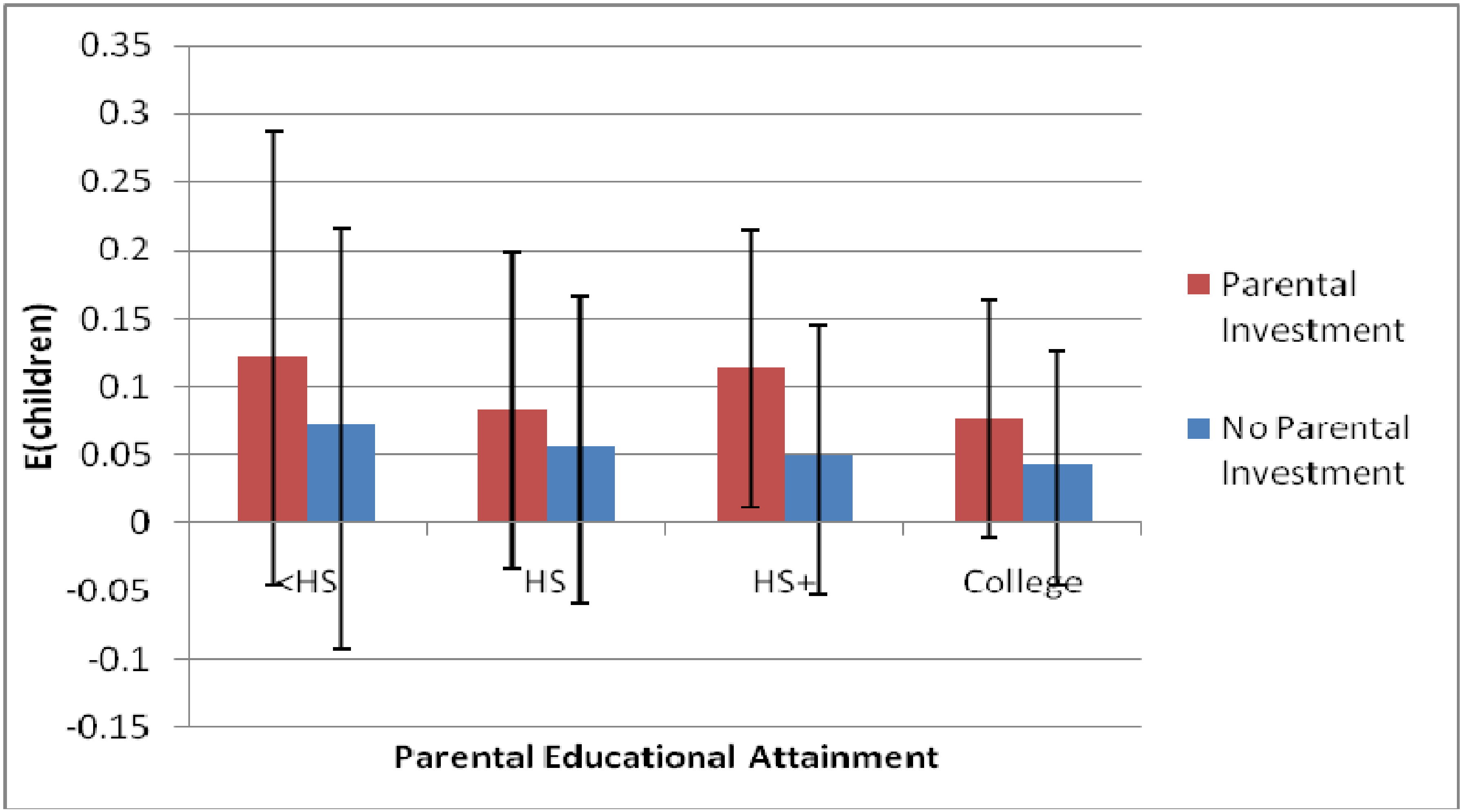

Figure 4: Coeffients for Male in Models Stratified by Parental Education, Fidelity Constant=0.7

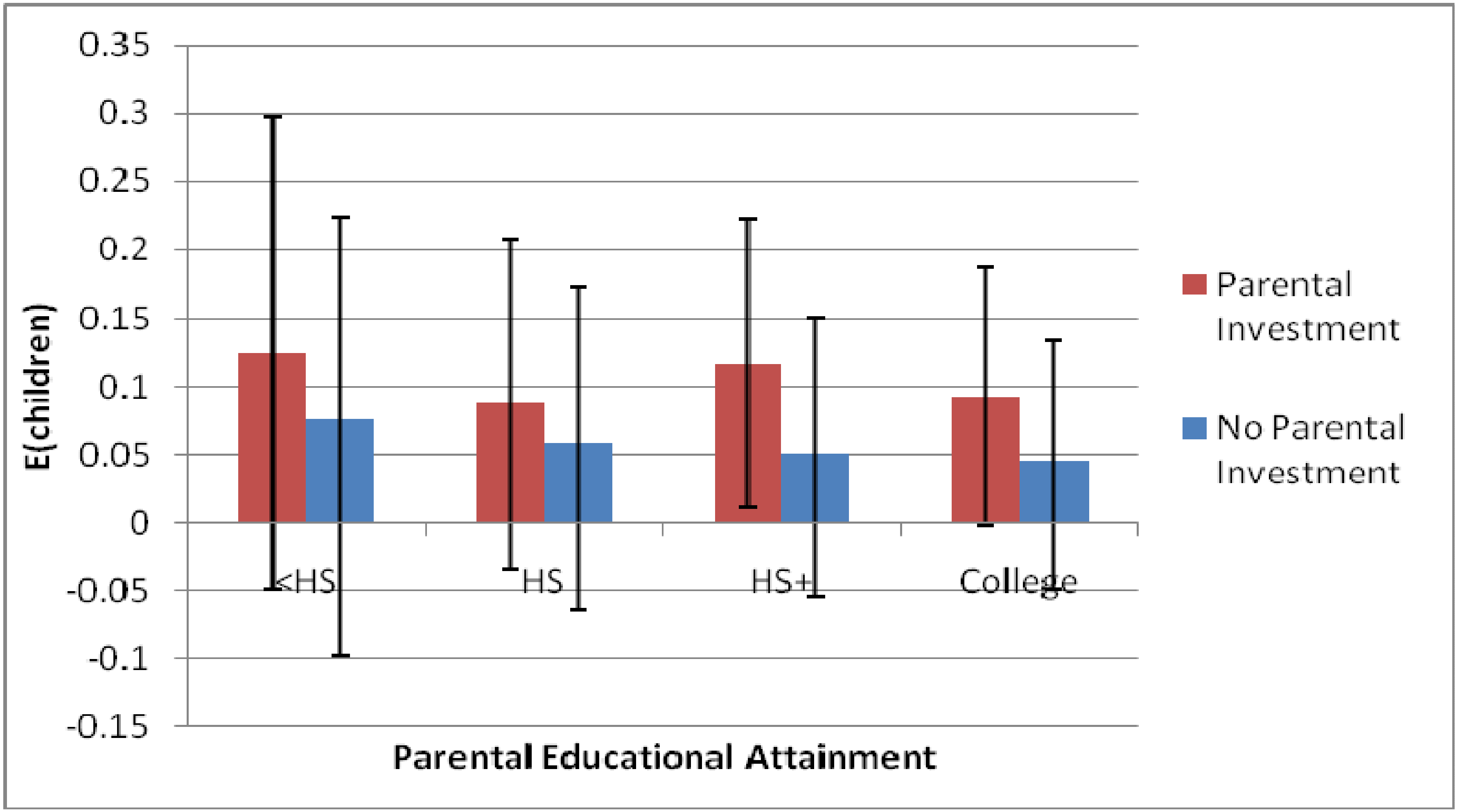

Figure 5: Coeffients for Male in Models Stratified by Parental Education, Fidelity Constant=0.6

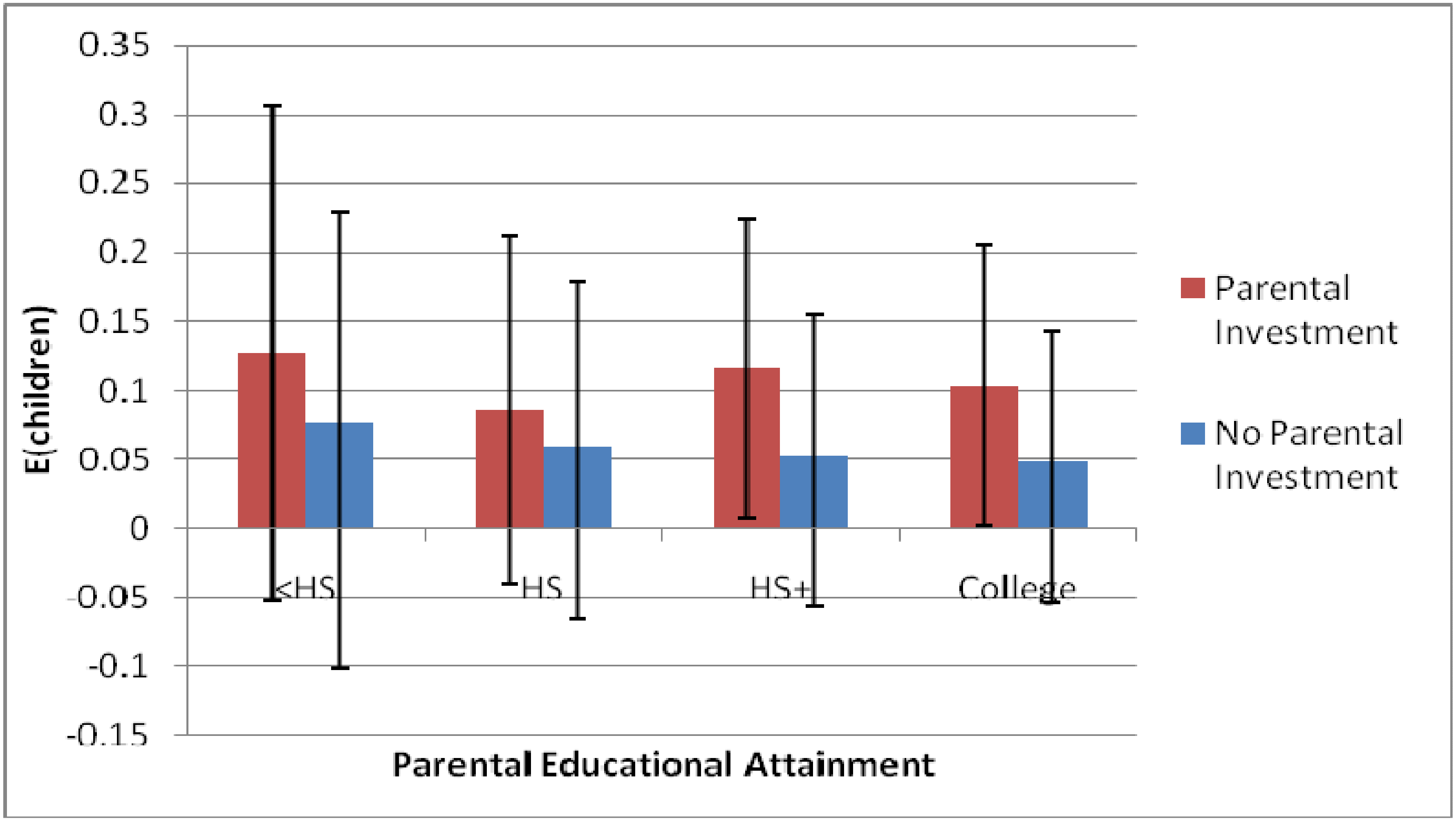

Figure 6: Coeffients for Male in Models Stratified by Parental Education, Fidelity Constant=0.5