Center for Social Development

GEORGE WARREN BROWN SCHOOL OF SOCIAL WORK

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The Potential of College Savings Accounts

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Subsequently published as: Elliott, W. (forthcoming). "At risk" children's college aspirations and expectations: The potential role of Children's Development Accounts (CDAs). *Children and Youth Services Review*.

2008

CSD Working Papers
No. 08-17

Campus Box 1196 One Brookings Drive St. Louis, MO 63130-9906 • (314) 935.7433 • www.gwbweb.wustl.edu/csd

At-risk Children's College Aspirations and Expectations: The Potential of College Savings Accounts

For many children, especially minority and low-income children, attending college is a genuinely desired but elusive goal. Research on aspirations and expectations provides a way to understand the gap between what children desire and what they actually expect to happen. This study examines the potential role of children's college accounts (CCAs) as a way to reduce the gap between aspirations and expectations among at-risk children. I find that only 39 percent of children without savings for college expect to attend college; there is an aspirations/expectations gap of 41 percentage points among children with CCAs. Moreover, children with a CCA are five percent more likely to expect to attend college than children without a CCA. It appears that when the financing of college is perceived to be under the child's control, college attendance becomes a more plausible reality. Children with CCAs are not only more likely to attend college; they also perform better in school.

Key words: *child development accounts, college enrollment, college expectations*

For many young people, especially minority and low-income children, attending college is a genuinely desired but elusive goal. Research on aspirations and expectations provide one way to understand the gap between what children desire and what they actually expect to happen (see for e.g., Cook et al., 1996; Mickelson, 1990; Reynolds & Pemberton, 2001). Aspirations are sometimes expressed as desires or hopes. They are not formed through experience or by making judgments; instead, they are taught through socialization. Aspirations are relatively stable beliefs that are often maintained even in the face of contradictory evidence.

Conversely, research has shown that college expectations are more likely to change depending on children's social and economic circumstances (Cook et al., 1996; Mickelson, 1990; Reynolds & Pemberton, 2001). Moreover, there is reason to believe that expectations are a better predictor of children's behavior than aspirations (Cook et al., 1996; Mickelson, 1990). The practical implication of this is that if children desire to attend college but do not expect to attend college, they are less likely to persist through high school, into college, and ultimately complete college (ACSFA, 2002, 2006; Marjoribanks, 1984). I suggest that to the degree that college expectations fluctuate with children's circumstances, they might provide one way to measure children's actual and perceived educational opportunities. Moreover, if they are grounded in children's social and economic circumstances, we should see aspirations and expectations that are fairly integrated among advantaged children and there should be far less integration among children who are traditionally

The author wishes to thank Michael Sherraden and Margaret Sherraden at the Center for Social Development for their consultation on this paper, and the Ford Foundation, Lumina Foundation for Education, and F.B. Heron Foundation for their support.

seen as being at-risk. Poor children, black children, children with parents with no college, and asset-poor children are considered at risk in this study.

If there is a gap in aspirations and expectations, the question becomes, why is there a gap and how can the gap be narrowed? Increasingly, researchers are looking at college costs and large levels of unmet need as a potential reason why at-risk children are less likely to expect to attend college and ultimately enroll in college in fewer numbers (ACSFA, 2002, 2006; Choy & Carroll, 2003).[1] Choy and Carroll (2003) find that during the 1999/2000 school year, low-income students were faced with unmet need that was between $4,000 and $9,300, depending on the type of college they attended (Choy & Carroll, 2003). ASCFA (2006) estimates that over the next decade, two million college-qualified low to moderate income students will not be able to attend any college at all due to high unmet need, and four million will be forced to attend two-year colleges.

Moreover, college choice researchers consistently find that rising college costs have a negative impact on college enrollment decisions. In a review of twenty-five studies, Leslie and Brinkman (1988) estimated that every $100 increase (in 1982-1983 dollars) would result in a 1.8 to 2.4 percentage point decrease in children enrolling in college. In a follow-up study to Leslie and Brinkman, Heller (1997) reviewed ten studies from 1975 to 1996 on the price of college and enrollment. Heller (1997) concludes that each tuition increase of $100 leads to a reduction in enrollment from 0.5 to 1.00 percentage points. Low-income students' decisions to enroll in college appear to be even more sensitive to college prices than their peers. For example, McPherson and Schapiro (1998) estimate that a $150 net cost increase (in 1993-1994 dollars) will result in a 1.6 percentage point reduction in enrollment among low-income students.

In this study I look at the potential of children's college accounts (CCAs) as a way to increase children's expectations and their math scores. A CCA in this study is the savings children have set aside in a conventional savings account for college. Given this, college savings is a pot of money. There is growing evidence that people use mental accounting techniques to think about different pots of money in different ways, which affects when and how they use the money in these accounts (Kahneman & Tversky, 1979; Lea, Tarpy, & Webley, 1987; Thaler, 1985; Winnett & Lewis, 1995). In other words, money is not entirely fungible; different accounts hold different purposes and meanings. These meanings affect how people deposit money into the accounts, and how they use the money (Winnett & Lewis, 1995). Families, especially those with children, have several household accounts that are non-fungible, designated for certain purposes, and subject to negotiation within the family (Winnett & Lewis, 1995).

A separate savings account or other method that imposes constraints on the person's ability to spend, makes money less likely to be used for current consumption (emergencies or otherwise) (Maital & Maital, 1994). If the account is a savings contract with rules and penalties for early withdrawal, there is even less likelihood of using it for current consumption (Katona, 1975). Therefore, when children have money designated specifically for college in a savings account, they are likely to think about the savings differently than other pots of money, or accounts. Having savings designated for college in a savings account may have the important cognitive effect of

[1] Unmet need is "the portion of college expense not covered by the expected family contribution (EFC) and student aid, including work-study and loans" (ACSFA, 2002, p. 5).

encouraging the beneficiary to think more about college, ponder what it takes to get there (academically and financially), and to picture going to college.

In sum, this study suggests that savings designated specifically for college have two main effects. One is direct: savings increase the means to afford college, making it a more realistic option. But the indirect effect may be as important: saving over a period of years may raise expectations for college. This study examines both the direct and indirect effects that savings may have on children's college expectations and math achievement. I pay particular attention to at-risk children. In addition, I also consider the role that the amount saved plays in forming expectations and children's academic achievement.

Sample

Data

This study uses 2002 data from the Panel Study of Income Dynamics (PSID) and the Child Development Supplement (CDS) to the PSID. The PSID is a nationally representative longitudinal survey of U.S. individuals and families that began in 1968. Data on employment, income, and marital status have been collected annually with questions on wealth added in 1984. In 1997, a supplement was drawn from PSID interviews to collect a wide range of data on parents and their children up to 12 years old.

In the 1997 sample, there are 3,563 children. The numbers are fairly evenly distributed across all ages. There are 1,642 white children and 1,455 black children. There are also Hispanics, Asians, Native Americans, and "other" in the sample, but the counts are much smaller. Because the PSID initially over-sampled low-income families, there are a greater number of blacks than expected in the overall US population. In some cases, data were collected on more than one child per household, but the maximum number of interviews per household was limited to two children. Whenever there were three or more eligible children less than age 13 in a household, two were randomly selected for an interview (Hofferth, Davis-Kean, Davis, & Finkelstein, 1997).

Study Sample

The sample for this analysis includes only children 12 to 18 years of age in 2002 (see Table 1). The sample was also restricted to children in public schools in an attempt to reduce differences in quality of schooling. While it would have been desirable to look at ages prior to 12, the CDS does not ask questions about college aspirations or expectations until age 12. Furthermore, although the CDS is a longitudinal data set, 2002 is the first year with data on youth college savings. The cross-sectional analysis was also restricted to youth currently enrolled in school. This reduces the sample size to 1,065.

The children in this study live in diverse circumstances (see Table 1). More than half live with their married parents (65 percent), while the rest live in single-parent households (35 percent). African Americans make up 45 percent of the non-weighted sample and 55 percent are white. Fifteen percent of the families are poor and 26 percent are upper-class. Fifty-three percent of parents have a high school degree or less, 25 percent have some college, and 22 percent have college degree or more.

Table 1. Non-weighted demographics for sample

Variable Name	Percent	Number	*SE*
Parent controls			
Head's race			
White	55%	567	1.54
Black	45%	473	1.54
Head's gender			
Male	69%	730	1.42
Female	31%	333	1.42
Head's education 2001			
High school or less	53%	540	1.57
Some college	25%	251	1.36
Four years of college or more	22%	222	1.30
Marital status 2002			
Married	64%	685	1.47
Single	36%	378	1.47
Employment status 2001			
Employed	97%	917	.51
Unemployed	3%	24	.51
Child controls			
Child's race			
White	54%	576	1.53
Black	46%	487	1.53
Child's gender			
Male	50%	527	1.53
Female	50%	536	1.53
Economic controls			
Household income 2001			
Poor	14%	150	1.07
Lower middle class	18%	190	1.18
Middle class	18%	191	1.18
Upper middle class	24%	254	1.31
Upper class	26%	278	1.35
Average household income (1997 & 2001)			
Poor	15%	157	1.09
Lower middle class	17%	185	1.16
Middle class	22%	232	1.27
Upper middle class	25%	266	1.33
Upper class	21%	223	1.25
Household wealth 2001			
Less than $4,564	24%	257	1.31
$4,565-$47,743	26%	274	1.34
$47,743 - $153,700	25%	266	1.33
$More than $153,700	25%	266	1.33

Research Variables

This section provides information on how variables are measured in this study. There are both categorical and continuous variables used in the analysis. Variables are collected from 1997, 1999, 2001, and 2002, depending upon when they were available in the PSID/CDS. Variables are categorized into the following groups: parent controls, child controls, academic controls, psychological controls, and economic controls. College expectations of parents and children, math achievement, reading achievement, and savings for college all serve as dependent variables as well as controls.

Parent Controls

Head's education level in the PSID/CDS is a continuous variable (1 to 16) with each number representing a year of completed schooling. In this analysis, the household head's education level has been recoded into a three level variable: (1) no college, (2) some college, or (3) four years of college. Data are downloaded for 2001.

Marital status is measured by asking heads of households, "Are you married, divorced, separated, or have you never been married?" It is recoded as a dichotomous variable: (1) married and (2) not married. Data are downloaded for 2001.

Parent engagement is measured by creating an index summing responses to the following questions: (1)" How often do you encourage your child to read on (his/her) own?" (2) "If your child brought home a report card with grades or progress lower than expected, would you contact his/her teacher or principal?" (3) "If your child brought home a report card with grades or progress lower than expected, would you spend more time helping child with schoolwork?" and (4) "In the past month, how often did you work on homework with (him/her)?"

Child Controls

There are two demographic controls for children used in this study, race and gender. *Race* is recoded in this study as white or black. The sample is reduced to white and black children because PSID/CDS does not include an adequate sample of children of other ethnic backgrounds that would allow for meaningful comparison. *Gender* is also included in the analyses as a control.

Academic Controls

Special education is measured in the PSID/CDS by asking, "Has (he/she) ever been classified by a school as needing special education?" This is coded as yes or no.

Applied problem standardized score will be used as a proxy for math achievement. Applied problem standardized score is measured in the PSID using the Woodcock Johnson (WJ-R), a well-respected measure (Mainieri, 2006). The test is administered by an interviewer and is arranged in order of difficulty. The WJ-R has a standardized scoring protocol that measures the child's math abilities in comparison to the national average for the child's age (Mainieri, 2006). Normed scores will be used in this study. The normed scores are constructed based on the child's raw score, or the number of correct items, and the child's age (Mainieri, 2006). Data on applied problem standardized score are downloaded for 2001.

Psychological Controls

Children's aspirations are measured by asking youth, "How far would you like to go in school?" Response categories include: (1) leave high school before graduation, (2) graduate from high school, (3) graduate from a two-year community college, (4) graduate from a vocational school, such as beauty school, (5) attend a four-year college, (6) graduate from a four-year college, (7) get more than four years of college, (8) do something else. Children's aspirations are recoded into a dichotomous variable. The reference group consists of children who responded by selecting the number 3, 5, 6, or 7. The first time data was collected on children's aspirations in the PSID/CDS was 2002.

Children's college expectations are measured by asking children twelve and older, "What do you think are the chances that you will graduate from a four-year college? Would you say: (1) no chance, (2) some chance, (3) about 50-50, (4) pretty likely, or (5) it will happen?" College expectations are recoded into a dichotomous variable. The reference group consists of children who responded by answering they were either pretty likely to attend college or definitely, it will happen. The first time data was collected on children's expectations in the PSID/CDS was 2002.

Parent expectations for children attending college are measured by asking heads of households, "How much schooling do you expect that (CHILD) will complete? Do you think you will?" Response categories include: (1) eleventh grade or less, (2) graduate from high school, (3) post-high school vocational training, (4) some college, (5) graduate from a two-year college, (6) graduate from a four-year college, (7) master's degree, or (8) MD, LAW, PHD, or other doctoral degree. Parent expectations are recoded into a dichotomous variable. The reference group consists of parents who responded by selecting the number 4, 5, 6, 7, or 8. Parent expectations are downloaded for 2001.

Math efficacy is measured in the PSID/CDS using a set of scales developed by Eccles and colleagues (1993) for the domains of math and reading (Mainieri, 2006). Math efficacy will be used as a proxy for perceived academic capabilities of youth. For descriptive purposes, the variable is collapsed into a dichotomous variable using the mean score. In all regressions, it is used in its continuous form.

Children's self-efficacy is measured in the PSID/CDS using Pearlin's self-efficacy scale (for information on Pearlin's scale see, Pearlin, Menaghan, Lieberman, & Mullan, 1981). According to Mainieri (2006), the children's self-efficacy scale measures the amount of control children perceive they have over their life in the PSID/CDS. Data are downloaded for 2002, ages 12 to 18 (data for children as young as eight are available in the PSID/CDS). For descriptive purposes, the variable is collapsed into a dichotomous variable using the mean score. In all regressions, it is used in its continuous form.

Children's self-concept is measured in the PSID/CDS using Rosenberg's self-esteem scale (for information on Rosenberg's scale see Rosenberg, 1986). According to Mainieri (2006), children's self-concept measures the degree of satisfaction one has with him or herself in the PSID/CDS. Data are downloaded for 2002, ages 12 to 18 (data for children as young as eight are available in the PSID/CDS). For descriptive purposes, the variable is transformed into a dichotomous variable using the mean score. In all regressions, it is used in its continuous form.

Economic Controls

Children's college account (CCA) information from the PSID/CDS was first collected in 2002. It is derived by asking whether children have a conventional savings account and whether they have designated some of this savings for college. By conventional savings account, I mean an account that has not been designed for the purposes of saving for school. A CCA in this study is a regular savings account with savings the child has designated, at least in part, for college.

Specifically, in this study children are asked, "Do you have a savings or bank account in your name?" (1) Yes or (2) no. If they answer no, they are asked to skip to a different section of the survey and are not asked the follow-up question, "Are you saving some of this money for future schooling, like college?" (1) Yes or (2) no. The skip pattern is used because children who do not have savings have practically stated that they do not have a portion of the savings set aside for future schooling. This is important to note, because CDS staff did not account for the skip pattern when constructing the CCA variable (PSID code Q23L3B). As a result, the CCA is missing for several hundred children. To account for this, children who answered no to having savings are coded in this study as also having said no to having set aside a portion of this savings toward future schooling.

Children's savings amount is measured by asking children how much they have set aside for college. They are asked to select an amount between $.01 – $9,997.99. For the purposes of descriptive analysis, the variable is collapsed into a dichotomous variable using the mean to create the categories: (1) children with savings under $401 and (2) children with savings over $401. For regression analysis the continuous form of the variable is used.

Household income is a continuous variable in the PSID, summing total household income from the previous tax year, including all taxable income, transfer income, and Social Security income for anyone in the household. Household income is collected for 1997 and 2001 in this study. Single-year measures of income may not be reliable given yearly fluctuation (Blau, 1999; Mayer, 1997). Income averaged over multiple years provides the best estimate of "permanent income" (Blau, 1999; Mayer, 1997). Therefore, an average for household income is calculated using the 1997 and 2001 data. The 1997 income is inflated to 2001 price levels using the Consumer Price Index (CPI). It is then collapsed into a five level variable: (1) less than $18,256 – poor, (2) $18,256 - $33,376 – lower middle class, (3) $33,377 - $53,161 – middle class, (4) $53,162 - $84,016 – upper middle class, and (5) greater than $84,016 – upper class.

Household wealth (including home equity) in the PSID is a continuous variable calculating household net worth, summing separate values for a business, checking or savings, real estate, stocks, and other assets, subtracting credit card and other debt. Data are downloaded for 1999 and include main home equity. Household wealth is inflated to 2001 price levels using the CPI. Wealth is collapsed into a four level variable: (1) less than $4,564 – asset poor, (2) $4,564 - $47,742, (3) $47743 - $153,700, and (4) more than $253,700. Asset poverty is calculated using the 2001 poverty level. It is equivalent to three months of income at the poverty line (see for e.g., CFED, 2008).

Data Analysis Plan

In the first stage of the data analysis plan, an extensive review of descriptive data is conducted to identify meaningful relationships between groups. In stage two, regression techniques are used to

analyze relationships between dependent and independent variables in attempt to provide a better understanding of what relationships have statistical significance when different controls are included in a model. In the last stage of analysis, tests of mediation are run to better understand important relationships between key variables of interest. In the next section of the data analysis plan, some of the more complicated methods used in the analysis will be discussed.

Tests of Association

Two commonly used analytic techniques were planned in for testing relationships between dependent and independent variables: (1) logistic regression, and (2) multiple regression. Logistic regression is a nonparametric test used to analyze the relationship between a categorical dependent variable and a set of independent variables (Allison, 2001). Multiple regression is a parametric test used to analyze the relationship between a continuous dependent variable and a set of independent variables (Pagno, 2004).

Prior to running logistic regression and multiple regression models, bivariate analysis is conducted using Rao Scott chi-square and the student's t-test. The Rao Scott chi-square is used because of the complex survey design. The Rao Scott chi-square is generated by SAS when using PROC SURVEYFREQ and the CHISQ option. The Rao Scott chi-square "applies a design effect correction to the Pearson chi-square that computes the design effect correction from proportion estimates instead of null proportions" (Baisden, Park, & Hu, 2002-2003, p. 4).[2] Multicollinearity is tested using the SAS syntax, PROC REG with options VIF TOL in SAS. Tests revealed that multicollinearity is not problematic in the models in this study.

Study Weights

Due to the complex survey design of PSID/CDS, weights must be used in order for final results to be representative of the U.S. population (Gouskova, 2001). Weights adjust for possible selection bias. PSID/CDS provides sampling weights (Gouskova, 2001). For analyses involving children's relationship with the head of the household (primary caregiver) or family characteristics, as in this study, Gouskova (2001) states that the following PSID/CDS weight must be used: CH02PRWT.

Weights were adjusted by multiplying the weight by (number of cases/sum of weights). Adjusting weights does not change the relative values of the weights but assures that the mean is one, and that the sum of weights equals the number of cases.

Missing Variables

Prior to running the logistic regression model, CCA was analyzed to determine if missing data are missing at random (MAR). According to Little and Ruin (1987), data are MAR when, given the observed data, the missingness mechanism does not depend on the unobserved data. The following variables have more than ten percent missing in this study: math achievement (11 percent), children's aspirations (14 percent), employment (11 percent), CCA (14 percent), math efficacy (11 percent), children's savings amount (21 percent), and children's college expectations (12 percent).

[2] There is a known defect with the Rao Scott chi-square that occurs when weights are used (Baisden et al., 2002-2003). To correct for this defect, weights must be normalized (Baisden et al., 2002-2003). As discussed in this section, weights have been normalized in this analysis.

However, because no variable had above 20 percent missing, multiple imputation can be used to replace missing values (Little & Rubin, 2002). To test for differences between excluded cases and cases included, all missing variables were transformed to a *miss* variable and a regression analysis was run. Differences were nonsignificant.

Multiple imputation is used to account for missing data. It uses all the information available as well as a random component to fill in missing values. Multiple imputation is recognized as a preferred technique for completing missing data (Little & Rubin, 2002). I used multiple imputation through the Markov Chain Monte Carlo method (Saunders et al., 2006; Schafer & Graham, 2002) to create five independent data sets with no missing data. Five completed data sets were generated, and by utilizing a different random seed at the start of each imputation pass, variance between the data sets more accurately reflects the uncertainty in imputing missing data.

Identical analyses were then conducted using PROC LOGISTIC (for models examining college expectations and savings) or PROC REG (for models examining math achievement) on each data set. The results were combined or "rolled up" to produce less biased estimations of parametric statistics (Saunders et al., 2006). The beta coefficients were averaged across the data sets to produce one estimate; and the standard error for each beta was calculated from the five error estimates as well as the varability between the estimates (Rubin, 1987). Further, the R^2 reported in this study is calculated from averaging the R^2s across the five imputed data sets (Saunders et al., 2006).

Testing Mediation

A mediating variable is a variable that helps explain the relationship between an independent and dependent variable (Baron & Kenny, 1986). Mediation suggests that an independent variable causes a mediator which causes a dependent variable, or indirect effect (Baron & Kenny, 1986). In the theoretical section of this study, it was suggested that college aspirations come prior to the formation of expectations and that expectations are important for understanding children's academic achievement. As such, expectations help to explain the relationship between aspiration and children's academic achievement. To further explore this proposition, I examine whether college expectations mediate the relationship between children's aspirations and their math achievement.

In addition, it was posited that college expectations help to explain the relationship between having a CCA and academic achievement. Therefore, I also examine whether college expectations mediate the relationship between CCAs and math achievement.

Statistical evidence of meditational effects can be established using a series of linear regressions testing whether (a) the intervention is related to the outcome variable, (b) the intervention is related to the proposed mediator, and (c) the mediator is related to outcome in a model controlling for the effects of the intervention (Baron & Kenny, 1986). However, according to Preacher and Hayes (2004), it is possible to observe a large change in the X → Y path after adding a mediator to the model without observing a drop in statistical significance – a Type II error.

Therefore, Preacher and Hayes (2004) suggest that Sobel's test might be a more powerful test of mediation than using a series of regressions, as suggested by Baron and Kenny. According to Preacher and Hayes (Preacher & Hayes, 2004), "the Sobel test directly addresses the primary question of interest – whether or not the total effect of X on Y is significantly reduced upon the

addition of a mediator to the model." Sobel (1982) provides the following formula for testing mediation:

$$z = a \times b \, 1 \sqrt{(b^2 \, x \, Sa^2 + a^2 x \, Sb^2)},$$

where a = path coefficient from the intervention to the mediator, Sa^2 = the standard error of a, b = path coefficient from the mediator to outcome, and Sb^2 = standard error of b.

Bootstrapping is a nonparametric approach to effect-size estimation and hypothesis testing (Mooney & Duval, 1993). Unlike Sobel tests, bootstrapping does not make assumptions about the shape of the distribution of the variables or the sampling distribution of the statistic (Mooney & Duval, 1993). Shrout and Bolger (2002) suggest that bootstrapping is a way of circumventing the power problem introduced by asymmetries and other forms of nonnormality in the sampling distribution of the indirect effect. The bootstrapping is accomplished by taking a large number of samples of size n (where ne is the original sample size) from the data, *sampling with replacement*, and computing the indirect effect, in each sample (Preacher & Hayes, 2004).

Results

In the aggregate, 87 percent of all black and white children aged 12 to 18, who are in school and for whom English is their first language, aspire to attend college. Moreover, aspirations appear to be resistant to the social and economic inequality faced by at-risk children. Among at-risk children, the vast majority aspire to attend college: 79 percent of poor children; 80 percent of the asset poor; 81 percent of blacks, and 83 percent of children with parents who have a high school degree or less. These data suggest that most at-risk children desire to attend college. In the following sections, I will begin to examine the gap between aspirations and expectations among at-risk children and whether CCAs might be a way to reduce that gap.

Children's Expectations by Household Income

Among poor children, 90 percent aspire to attend college, while only 54 percent see it as a realistic possibility in their lives. The aspirations/expectations gap is 36 percentage points among the poor. Conversely, among upper-class children, the aspirations/expectations gap is only 14 percentage points. When compared, the gap in expectations between poor and upper- class children is 29 percentage points. Bivariate analysis indicates that the association between income and children's expectations for attending college was significant (Rao Scott $X^2 = 22.61$, $df = 4$, $p = .00$).

Table 2. Differences in children's college expectations by average household income

Household income	Expect to attend college in 2002		Do not expect to attend college in 2002	
	Percent	Number	Percent	Number
Poor	54%	40	46%	34
Lower middle class	65%	91	35%	49
Middle class	62%	98	38%	60
Upper middle class	69%	202	31%	90
Upper class	83%	227	17%	46

Table results rounded to the nearest percent (number); percent and numbers are weighted using PSID, CDS weights

Children's Expectations by Household Wealth

Among children who are asset poor, 84 percent aspire to attend college; 57 percent expect that they actually will attend college. That is an aspirations/expectations gap of 27 percentage points. In contrast, the aspirations/expectations gap for asset-rich children is only 20 percentage points. The expectations gap between asset-poor children and asset-rich children is 22 percentage points. The association between household wealth and children's expectations for attending college is significant (Rao Scott $X^2 = 24.29$, $df = 3$, $p = .00$).

Table 3. Differences in children's college expectations by wealth

Wealth	Expect to attend college in 2002		Do not expect to attend college in 2002	
	Percent	Number	Percent	Number
Less than $4,564	57%	96	43%	72
$4,564- $47,743	60%	128	40%	85
$47,743- $153,700	77%	189	22%	55
More than $153,700	79%	244	21%	66

Table results rounded to the nearest percent (number); percent and numbers are weighted using PSID, CDS weights

Children's Expectations by Race

Among black children, the aspiration/expectation gap is 22 percentage points. Conversely, the aspirations/expectations gap among white students is actually slightly larger at 25 percentage points. The white/black gap in expectations is a modest seven percentage points. Bivariate analysis indicates that the association between race and children's expectations for attending college is not significant (Rao Scott $X^2 = 2.15$, $df = 1$, $p = .14$).

Table 4. Differences in children's college expectations by race

Race	Expect to attend college in 2002		Do not expect to attend college in 2002	
	Percent	Number	Percent	Number
White	72%	(534)	28%	(211)
Black	65%	(124)	35%	(68)

Table results rounded to the nearest percent (number); percent and numbers are weighted using PSID, CDS weights

Children's Expectations by Parent's Level of Education

Among children whose parents have no college experience, the aspirations/expectations gap is 32 percentage points (see Table 6). By contrast, the aspirations/expectations gap for children who live with parents with four years of college or more is only 15 percentage points. The gap in expectations between children whose parents have no college experience and parents with a four-degree is 26 percentage points. Bivariate analysis indicates that the association between parental level of education and children's expectations for attending college is significant (Rao Scott $X^2 = 16.43$, $df = 2$, $p = .00$).

Table 5. Differences in children's college expectations by parent's level of education

Parent's level of education	Expect to attend college in 2002		Do not expect to attend college in 2002	
	Percent	Number	Percent	Number
High school or Less	58%	(225)	42%	(163)
Some college	77%	(170)	23%	(52)
Four-years or More	84%	(243)	16%	(47)

Table results rounded to the nearest percent (number); percent and numbers are weighted using PSID, CDS weights

Are Children Without a CCA At Risk for Low Expectations?

The descriptive data indicate that 80 percent of children ages 12 to 18 who do not have a CCA aspire to attend college (see Table 7). This is very similar to the percentage of all children 12 to 18 who aspire to attend college: 87 percent. The aspiration gap between children with a CCA (93 percent) and children without a CCA is 13 percentage points.

While the majority of children without a CCA are likely to aspire to attend college, less than half (39 percent) of children without a CCA expect to attend college (see Table 7). The aspiration/expectation gap for children without a CCA is 41 percentage points. Conversely, the aspirations/expectations gap for children with a CCA is only 12 percentage points. Of all subgroups of children ages 12 to 18 analyzed in this study, this is largest gap between aspirations and expectation of any group. Conversely, the aspirations/expectations gap among savers is 12 percentage points. Moreover, the binary relationship between children's college expectations and CCAs is statistically significant (Rao Scott $X^2 = 29.496$, $df = 1$, $p = .0001$).

Table 6. Differences in children's college aspirations and expectations by children's savings for college

Aspirations & Expectations	Have a CCA in 2002		Do not have a CCA in 2002	
	Percent	Number	Percent	Number
Aspirations				
Desire to attend college	93%	397	80%	383
Do not desire to attend college	7%	28	19%	91
Expectations				
Expect to attend college	81%	350	39%	191
Do not expect to attend college	18%	79	61%	294

Table results rounded to the nearest percent (number); percent and numbers are weighted using PSID, CDS weights

Testing the Relationship Between CCAs and Expectations

This section examines the strength of the relationship between college expectations and CCAs by asking, "Is having a CCA associated with a greater likelihood that children will expect to attend college after controlling for parent, child, academic, psychological, and economic factors?" Two logistic regression models are constructed. Model one does not include CCAs; model two includes CCAs (see Table 8). Therefore, results are reported for model two only and model one is for comparison purposes only.

CCAs, parent's level of education, marital status, children's race, children's gender, children's aspirations, and parents' college expectations for children is significant in model two when controlling for all independent variables (see Table 8). All significant independent variables in model two fall within the 95 percent confidence interval.

Children 12 to 18 years old who have savings set aside for college are five percent more likely to expect to attend college than children who do not have a CCA (*odds ratio*=1.05, *p*=.01). In addition, there is a modest change of one percent in the adjusted r-square when CCAs are added to the model (see Table 8). For each level of education (high school or less, some college, four-year degree or more) a parent has, a child is 43 percent more likely to expect to attend college (*odds ratio*=1.43, *p*=.02). Children from single-parent families are more than half as likely to expect to attend college then children whose parents are married (*odds ratio*=.55, *p*=.00). White children are almost twice as likely to expect to attend college as black children (*odds ratio*=2.08, *p*=.02). Males are almost half as likely to expect to attend college as females (*odds ratio*=.43, *p*=.02). Children who aspire to attend college are almost five times more likely to attend college than children who do not expect to attend college (*odds ratio*=4.74, *p*=.00). Children who have parents who expect them to attend college are more than twice as likely to expect to attend college than children who have parents who do not expect them to attend college (*odds ratio*=2.44, *p*=.00).

Table 7. Logistic regression model predicting children's college expectations with and without CCAs (N=1071)

Controls	Model One (without CCAs)			Model Two (with CCAs)		
	b	*SE*	p-value	*b*	*SE*	p-value
Intercept	-13.41	2.49	.00	-11.36	1.28	.00
Parent controls						
Head's education	.35	.12	.01	.37	.14	.02
Marital status	-.53	.26	.05	-.60	.20	.00
Parent engagement	.02	.02	.44	.01	.02	.71
Child controls						
Race	.68	.28	.03	.72	.29	.02
Gender	-.46	.25	.11	-.46	.18	.02
Academic controls						
Special education	-.03	.29	.92	.05	.28	.87
Math std. score	.01	.01	.02	.01	.01	.15
Psychological controls						
Children's self-concept	-.24	.39	.55	-.12	.23	.59
Children's self-efficacy	.14	.20	.50	.18	.17	.32
Children's college aspirations	1.56	.27	.00	1.66	.26	.00
Parent's college expectations	1.09	.21	.00	.99	.23	.00
Economic controls						
Household income	.05	.11	.64	.07	.11	.54
Household wealth	.18	.13	.19	.09	.11	.45
CCAs	------	---	-------	.48	.18	.01
Adjusted R^2	.25			.26		
R^2 *change*	------			.01		
Likelihood ratio	292.63*			303.16*		
df	13			14		

Analysis is weighted using PSID, CDS weights; *p<.000
Note: CCAs are children's college accounts

CCAs Versus Amount Saved, Their Relationship with Children's College Expectations

In this section I ask, "Are CCAs associated with children's college expectations when controlling for children's savings amount?" In model three, children's savings amount is substituted for CCAs. Model six includes both CCAs and children's savings amount. In model four CCAs, parent's level of education, child's race, child's gender, children's aspirations and parental expectations have a significant association with children's expectations when controlling for children's savings amount (see Table 9). All significant independent variables in model four fall within the 95 percent confidence interval.

Children who have a CCA are nearly twice as likely to expect to attend college when controlling for children's savings amount (*odds ratio*=1.86; *p*=.02). For each level of education (high school or less, some college, four-year degree or more) a parent has, their child is 46 percent more likely to expect to attend college (*odds ratio*=1.46, *p*=.01). White children are more than twice as likely to expect to attend college as black children (*odds ratio*=2.05, *p*=.01). Males are 69 percent less likely to expect to

attend college than females (*odds ratio*=.69, *p*=.03). Children who aspire to attend college are more than three times as likely to expect to attend college as children who do not aspire to attend college (*odds ratio*=3.06, *p*=.00). Furthermore, children who have parents who expect to attend college are more than three times as likely to expect to attend college as children whose parents do not expect them to attend college (*odds ratio*=3.32, *p*=.00).

Table 8. Logistic regression model predicting children's college expectations including children's savings amount and CCAs (N=1071)

Controls	Model Three (amount saved only)			Model Four (amount saved and CCAs)		
	B	*SE*	p-value	*B*	*SE*	p-value
Intercept	-9.77	1.14	.00	-11.57	1.42	.00
Parent controls						
Head's education	.34	.15	.05	.34	.12	.01
Marital status	-.66	.25	.01	-.41	.23	.08
Parent engagement	.02	.22	.42	.02	.03	.57
Child controls						
Race	.68	.27	.02	.68	.25	.01
Gender	-.52	.15	.00	-.42	.18	.03
Academic controls						
Special education	.00	.26	.98	-.06	.25	.80
Math std. score	.01	.01	.11	.01	.01	.07
Psychological controls						
Children's self-concept	-.34	.24	.16	-.08	.26	.75
Children's self-efficacy	.18	.18	.33	.07	.16	.66
Children's college aspirations	1.59	.28	.00	1.46	.35	.00
Parent's college expectations	1.07	.22	.00	1.09	.22	.00
Economic controls						
Household income	.06	.11	.58	-.04	.10	.67
Household wealth	.20	.12	.15	.17	.10	.13
Children's savings amount	-.00	.00	.69	-.00	.00	.16
CCAs	--------	-----	------	.59	.23	.02
Adjusted R^2	.25			.24		
R^2 *change*	------			-.01		
Likelihood ratio	282.73*			253.66*		
df	14			15		

Analysis is weighted using PSID, CDS weights; *p<.000
Note: CCAs is an abbreviation for children's college accounts

CCAs and Children's Math Achievement

In this section of the study, I use multiple regressions to examine whether CCAs or children's savings amount has a stronger association with higher math scores. Model five predicts math achievement without either CCAs or children's savings amount. In model eight, CCAs are included. Interpretation of results focuses on model six because it includes both variables of interest.

Model six tests the association between CCAs and math achievement, while controlling for parent, child, academic, psychological, and economic variables (see Table 10). The model accounted for 43 percent of variance in math achievement among children aged 12 to 18. Children's college savings, parent's level of education, parent's engagement, children's race, children's gender, special education, math efficacy, children's expectations, and parent's expectations for children are significant in model eight when controlling for all independent variables (see Table 10). All significant independent variables in model six fall within the 95 percent confidence interval.

Having a CCA is associated with a 4.57 point increase in a child's math scores (b=4.57, t=4.39, p=.00). For each unit increase in parent's level of education (high school or less, some college, four-year degree or more), children's math scores increase by approximately three points (b=2.93, t=5.94, p=.00). A 68 percent increase in parent engagement is associated with a one point decrease in children's math scores (b=-.68, t=-5.96, p=.00).[3] Being black is associated with approximately a 10 point decrease in children's math scores (b=-9.65, t=-8.19, p=.00). Being male is associated with a 3.71 point increase in children's math scores (b=3.71, t=4.34, p=.00). Being classified as needing special education is associated with nearly a nine point decrease in math scores (b=-8.85, t=-6.94, p=.00). For approximately every four point increase in children's math efficacy, math scores increase by one point (b=3.64, t=7.90, p=.00). Moreover, having a parent who expects them to attend college is associated with about a four point increase in children's math scores (b=4.06, t=3.12, p=.00).

[3] It was surprising to see that parent engagement was negatively associated with math achievement. It might be that the kind of engagement measured occurs most often when children are doing poorly in school. Therefore, as engagement increases, math scores decrease. Refer to the measurement section to see how parent engagement was measured.

Table 9. Multiple regression model predicting math achievement with and without CCAs (N=1071)

Controls	Model Five (without CCAs)			Model Six (with CCAs)		
	b (t-value)	*SE*	p-value	*b* (t-value)	*SE*	p-value
Intercept	97.27 (24.89)	3.91	.00	96.15 (24.93)	3.86	.00
Parent controls						
Head's education	2.81 (5.21)	.52	.00	2.93 (2.04)	.53	.00
Marital status	.49 (.35)	1.38	.73	.41 (.34)	1.22	.73
Parent engagement	-.64 (-5.83)	.11	.00	-.68 (-5.96)	.11	.00
Child controls						
Race	-10.33 (-8.69)	1.19	.00	-9.65 (-8.19)	1.18	.00
Gender	3.70 (4.06)	.91	.00	3.71 (4.34)	.85	.00
Academic controls						
Special education	-9.39 (-7.25)	1.30	.00	-8.85 (-6.94)	1.27	.00
Psychological controls						
Children's self-concept	.97 (.84)	1.15	.41	.82 (.92)	.89	.36
Children's math efficacy	3.78 (7.45)	.51	.00	3.64 (7.90)	.46	.00
Children's college expectations	2.64 (2.65)	1.00	.01	2.05 (2.04)	1.01	.04
Parent's college expectations	4.43 (3.28)	1.35	.00	4.06 (3.12)	1.30	.00
Economic controls						
Household income	.77 (1.47)	.52	.14	.47 (.97)	.49	.33
Household wealth	.56 (1.03)	.55	.31	.20 (.44)	.45	.66
CCAs	---------	----	------	4.57 (4.39)	1.04	.00
Df	12			13		
SS	263,158			273,162		
MS	8,793.29			9291.74		
F-value	58.57*			63.97*		
Average R^2	.41			.43		
Average R^2 *change*	--------			.02		

Analysis is weighted using PSID, CDS weights; *p<.000

CCAs Versus Amount Saved: Their Relationship with Children's Math Achievement

Model seven predicts math achievement with children's savings amount. The model accounts for 42 percent of variance in math achievement among children 12 to 18. The model indicates that children's savings amount does have a significant relationship with math achievement when controlling for parent, child, academic, psychological, and economic variables was significant (see Table 11). For each $1,000 of savings, children's math scores increase by one point (b=.001, t=2.74, p=.01).

In model eight, CCAs are included along with children's savings amount. Model ten also accounts for 42 percent of variance in math achievement among children 12 to 18. CCAs have a significant association with children's math scores (b=4.41, t=4.65, p=.00). Having a CCA is associated with a 4.41 point increase in a child's math scores. Moreover, children's savings amount is not significant when CCAs are included in the model (b=.00, t=.49, p=.62).

Table 10. Multiple regression model predicting math achievement with children's savings amount and CCAs (N=1071)

Controls	Model Seven (with CCAs)			Model Eight (CCAs and children's savings amount)		
	b (t-value)	*SE*	p-value	*b* (t-value)	*SE*	p-value
Intercept	93.84 (23.96)	3.92	.00	92.89 (23.64)	3.93	.00
Parent controls						
Head's education	2.78 (5.29)	.53	.00	2.95 (5.30)	.56	.00
Marital status	.01 (.01)	1.43	.99	.63 (.54)	1.17	.59
Parent engagement	-.70 (-5.38)	.13	.00	-.66 (-6.32)	.10	.00
Child controls						
Race	-10.35 (-8.69)	1.19	.00	-9.46 (-8.19)	1.15	.00
Gender	3.50 (3.97)	.88	.00	3.96 (4.79)	.83	.00
Academic controls						
Special education	-9.13 (-7.18)	1.27	.00	-9.20 (-7.30)	1.26	.00
Psychological controls						
Children's self-concept	1.08 (1.15)	.94	.25	.89 (.89)	1.01	.00
Children's math efficacy	3.69 (9.20)	.40	.00	3.52 (8.56)	.41	.00
Children's college expectations	2.80 (2.73)	1.03	.01	2.47 (2.40)	1.03	.02
Parent's college expectations	3.86 (2.78)	1.39	.01	3.77 (2.60)	1.45	.01
Economic controls						
Household income	.93 (1.73)	.54	.09	.45 (.82)	.55	.42
Household wealth	.27 (.50)	.55	.62	.14 (.26)	.54	.79
Children's savings amount	.00 (2.74)	.00	.01	.00 (.49)	.00	.62
CCAs	----------	------	------	4.41 (4.65)	.95	.00
Df	13			14		
SS	273,313			267,371		
MS	9,058.76			7,850.97		
F-value	61.09*			52.25*		
Average R^2	.42			.42		
Average R^2 *change*	-------			.00		

Analysis is weighted using PSID, CDS weights; *p<.000

Indirect Effects of CCAs on Children's Math Achievement

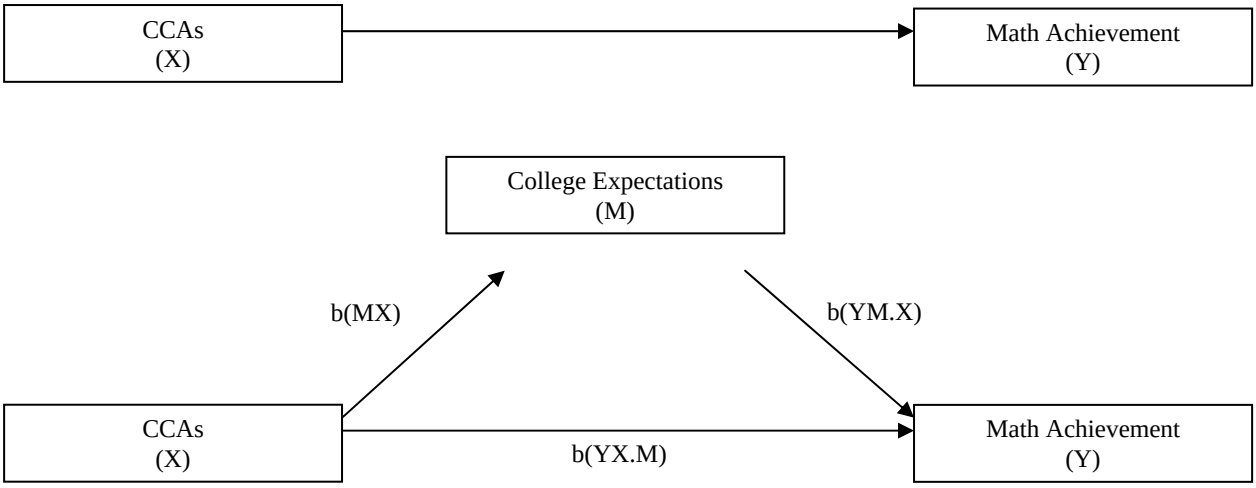
There is some reason to believe that CCAs might have both direct and indirect effects on children's math achievement. For example, Shobe and Page-Adams (2001) suggest that "future orientation may play an intermediate role in the relationship between assets and other positive social and economic outcomes." It is savings, they say, that "provide people with otherwise unattainable opportunities to hope, plan, and dream about the future for themselves and their children" (italics in original, 2001, p. 119). From this perspective, assets lead to positive expectations about college, which in turn lead to better academic outcomes. Thus:

Assets → College expectations → Academic outcomes

In support of the mediating role that college expectations play between assets and child academic outcomes, Zhan (2006) finds that parental assets (net worth) are positively associated with parents' expectations and children's educational outcomes (Zhan, 2006). In addition, she finds evidence that parents' expectations also act as a partial mediator between assets and children's educational performance (Zhan, 2006).

In this section, I test whether or not college expectations act as a partial mediator between college aspirations and academic achievement. Figure 1 illustrates the path diagram for the mediation analysis. The data for the mediation analysis were imputed using multiple imputations to eliminate the potential influence of missing values on the results.

Figure 1: Path diagram for the analysis of college expectations as a mediator between CCAs and math achievement



Results from the Baron and Kenny Test

Results from the Baron and Kenny Test (1986) show that CCAs significantly predict math achievement (see Table 12). The second regression indicates that CCAs significantly predict children's college expectations (see Table 12). The third regression indicates that college expectations significantly predict math achievement when controlling for college aspirations (see Table 12). The first three regressions provide evidence of mediation.

Table 11. Baron and Kenny Results

Path	B	*SE*	*t-test*	p-value
b(YX)	10.36	.47	22.18	.00
B(MX)	.17	.01	12.91	.00
B(YM.X)	4.78	.52	9.28	.00
B(YX.M)	9.54	.47	20.25	.00

The fourth regression indicates that there is a significant relationship between CCAs and math achievement after controlling for college expectations (see Table 12). This suggests that college expectations act as a partial mediator between CCAs and children's math achievement. When testing

whether CCAs significantly predict math achievement, the unstandardized coefficient is 10.36; however, when testing whether CCAs significantly predict math achievement when controlling for college expectations, it decreases to 9.54. A question that arises, however, is whether or not the reduction is significant. The Sobel (1982) test provides a direct answer to this question.

Results from the Sobel Test

Results from the Sobel test suggest that the total effect of CCAs on math achievement is significantly reduced after adding college expectations to the model ($z = 7.52$, $p < .00$) with 95 percent confidence.

Bootstrapping the Sample

I find that the true indirect effect is estimated to lie between .56 and 1.11 with 99 percent confidence. Because zero is not in the 99 percent confidence interval, it can be concluded that the indirect effect is significantly different from zero at $p < .05$ (two-tailed).

Discussion

The aspirations/expectations gap for poor children is 19 percentage points higher than it is for the aggregate sample, 10 percentage points higher for asset-poor children, and 15 percentage points higher for children of parents with no college experience it is 15 percentage points higher. However, in the case of black children, the aspirations/expectations gap is actually slightly lower, one percentage point (16 percent compared to 17 percent). The descriptive data support the contention that at-risk children are more likely to have lower expectations than other children, except in the case of black children.

Moreover, the data on CCAs suggests that there are substantial differences in the expectations of children who have savings for college and children who do not. Only 39 percent of children without a CCA expect to attend college. This is an aspiration/expectation gap of 41 percentage points. This raises real questions about the reality of the educational path for children without CCAs.

While the gap between aspirations and expectations among children without savings is of grave concern, there is some hope. The aspirations/expectations gap among savers is only 12 percentage points. The small aspirations/expectations gap among children with CCAs, along with the finding that the association between CCAs and children's college expectations is significant after controlling for all independent variables, suggests that making CCAs available to at-risk children might be one way to increase expectations. It appears that when the financing of college is perceived as being under a child's own control, college attendance also becomes a reality. However, when children doubt whether they can pay for college, the route to college may appear more like a dream than a well-defined path.

I also examine whether the relationships with math achievement hold up when controlling for both CCA and children's savings amount. On the one hand, I find that children who have a CCA are nearly twice as likely to expect to attend college when controlling for children's savings amount. On the other hand, I find that children's savings amount is not statistically associated with children's college expectations without or without CCAs included in the model. I also find that having a CCA

is associated with more than a four point increase in children's math scores when children's savings amount is not included in the model. When children's savings amount is included in the model along with CCAs, CCAs continue to account for approximately a four point increase in math scores. Children's savings amount is not significantly associated with children's math scores.

While findings suggest that amounts saved might not be as important for raising expectations early on in the college choice process, it should be noted that inadequate savings might ultimately lead to what ACSFA (2006) terms as "melt". What ACSFA (2006) finds is that among 1992 highly college-qualified low-income children (children who have taken at least Trigonometry), 84 percent planned to attend a four-year college; however, only 73 percent actually did. In comparison, of the 95 percent of high-income children who planned to enroll in a four-year college, 90 percent actually did. This suggests that, if the actual amount of savings is not available when children have graduated or are about to graduate from high school, we can expect that fewer children will actually enroll in college.

The mediation analysis indicates that children's college expectations act as a partial mediator between children's aspirations and their math achievement. This suggests that children's college expectations significantly carry the influence of college aspirations to math achievement. Moreover, while no less than 79 percent of children from any at-risk category aspire to attend college (a clear majority), as little as 54 percent of at-risk children expect to attend college. If it is true that children's expectations are more closely linked to math achievement and the overwhelming majority of children aspire to attend college regardless of their parent's income, asset holdings, race, or level of education, it suggests that more attention should be focused on the factors that lead to lowered expectations, then on attempts to increase at-risk children's aspirations. However, more research is needed, using different data sets to satisfactorily answer the question of mediation.

Conclusion

While more research is needed, CCAs show promise for providing a way to help poor and minority youth make decisions about attending college that are in line with their aspirations. Furthermore, expectations may be one of the missing links in predicting poverty and prosperity.

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