

An Examination of Parental College Expectations' Mediating Role between Children's Savings Accounts and Children's Educational Attainment by Income Level

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Abstract

Even though ownership of a Children's Savings Account (CSA), children's academic achievement, and parental college expectations are potentially key components for closing the inequality gap in education, the interdependence of these elements is not yet fully understood. Guided by the Theory of Planned Behavior, we utilize structural equation modeling (SEM) in this cross-sectional study to examine the mediating role of parental college expectations on the relationship between ownership of a Harold Alfond College Challenge (HACC) account and parents' perception of children's math and reading abilities by the level of household income. Although it is currently a universal, opt-out CSA program available to all babies born in Maine, HACC started in 2008 as an opt-in program, and it is this timeframe that is the focus of the current study. SEM models utilizing survey data from a sample of Maine parents reveal a positive association between the Alfond Grant enrollment and parental college expectations among low-to-moderate income families. Moreover, parental expectations are found to be a complete mediator between having a HACC account and parental perceptions of children's math ability (but not reading ability) among low-to-moderate income students. No findings were significant for high income families. Correlational evidence from this study suggests that HACC may complement schools' academic objectives in Maine, particularly about improving parents' perceptions of their child's math performance among low-to-moderate income families. This study highlights the need for more rigorous research on HACC and its potential effects on children's educational attainment.

Keywords

Children's Savings Accounts, Early Education, Savings, Assets, Poverty

1. Introduction

College enrollment and completion rates reflect the reproduction of educational inequality in the United States, especially along axes of socioeconomic status and racial and ethnic background (Breen & Jonsson, 2005; Perna & Kurban, 2013). The causes and factors that contribute to the prevalence of disparities between the enrollment and completion rates of different groups often have a compounding effect from early childhood, particularly for children from low income households (Reardon, 2011). Despite public investments in financial aid and college readiness programs, the systemic barriers to college enrollment and completion for low-to-moderate income families persist. In recent years, states and local authorities have increasingly implemented Children's Savings Account (CSA) to promote asset-building and to develop a college-going identity among children, their parents, and their broader communities (Elliott & Lewis, 2018). CSAs are interventions that build assets for children to use as long-term investments (Sherraden, 1991), particularly for postsecondary education (Elliott & Lewis, 2015). Provided through financial institutions including state 529 college savings plans, banks, or credit unions, CSAs generally include progressive features such as initial deposits, savings matches, and/or other incentives (Goldberg, 2005; Sherraden, 1991). Unlike traditional financial aid approaches, CSA programs specifically aim to cultivate positive educational outcomes among low income households (Elliott, 2013; Elliott & Beverly, 2011).

Our understanding of the impact of different mechanisms for accumulating wealth (i.e., private wealth vs. sponsored accounts such as 529s) on academic achievement is lacking (Pratt-Adams et al., 2010). Extant studies have largely relied on proxies for CSA participation, such as children who have savings for college in a bank account, and not actual participation in a CSA. Still, the findings from these studies support a positive relationship between savings and academic outcomes (Elliott, 2009; Elliott, Jung, & Friedline, 2010, 2011); however, further examination by subgroups of interest is needed. For example, Elliott, Kim, Jung, and Zhan (2010) found the relationship between savings for school and educational outcome varied by race with a positive relationship to math only among White children, whereas among Black children the positive impact of savings was related to reading. Only recently has evidence from primary data begun to emerge about actual CSA participation and academic outcomes. This is due in large part to the fact that many children in CSA programs started at birth and therefore are just now maturing to the point that academic outcomes are available for study. It is also important to note that the impact of CSAs is not limited to the amount saved. Rigorous research suggests that the positive effects of CSAs on such outcomes as college expectations (Kim et al., 2017) and children's well-being (Huang et al., 2013) can be realized even if families are not contributing to the account (Sherraden et al., 2015).

While an emerging body of research has shown a relationship between assets and children's academic achievement or between assets and parental college ex-

pectations (which, in turn, have been found to be related to children's academic achievement), the generalizability of these findings to actual CSA participation has received little attention. In this study, we explore the relationship of CSA account ownership and parental college expectations to children's academic achievement. By fine-tuning our understanding of the link between CSA program involvement, parental expectations, and children's math and reading performance, we can continue to refine asset-building interventions as a vehicle for overcoming educational inequality.

1.1. Background

Math Achievement and CSAs

Although the relationship between family financial situation, as measured by either income or wealth, and math achievement has been established, (Elliott et al., 2010b, 2011b; Fang et al., 2018; Friedline et al., 2015; Loke & Sacco, 2011; Shanks, 2007; Yeung & Conley, 2008), as stated above, study of this relationship in the context of CSAs *specifically* is emergent. To our knowledge, the first study of the relationship between CSAs and math and reading outcomes came from an analysis of account ownership in the Promise Indiana Children's Savings Account program and standardized math and reading scores (Elliot et al., 2018). For a comprehensive explanation of the Promise Indiana program, see Elliott and Lewis (2015). Standardized math and reading scores of third and fourth graders were examined in relationship to account opening, with average account opening occurring two years prior. Multiple regression models, controlling for race/ethnicity, gender, special education status, grade, and school, revealed that low income students with CSAs exhibited significantly higher math scores than those without accounts. It is important to note, however, that while CSA ownership alone significantly predicted math scores among low income families, in the overall sample, more dollar amount was also significantly associated with higher math scores. These findings are indicative of the complex relationship between account ownership alone, and the importance of engagement with the account as measured by, for example, savings behaviors.

In a related study, Elliott et al. (2019) looked at the relationship of account ownership and participation in the Wabash County Promise Scholarships program, which combines CSAs with a scholarship program that granted small monetary awards based on completion of specific activities or meeting academic goals. This program, while independent, is partially an extension of the Promise Indiana program offered to students in kindergarten through third grade. Starting in fourth grade, students may participate in the scholarship program by using their existing Promise Indiana account or signing up for an account as part of enrolling in the Promise Scholars program. Results of propensity score matching found that participants in the Promise Scholars program had significantly higher math and reading scores compared to students who did not participate in the program, with stronger effects among low income participants.

This study also found that being a saver is associated with children's math scores but not their reading scores, which contradicts findings from Elliott et al.'s earlier (2018) study, that being part of a CSA program and being a saver (i.e., contributing to the account) are associated with improved reading scores but not math scores. Such discrepancy may be since the program under study of Elliott et al. (2018) did not have a scholarship component, and participants were younger than those in the 2019 study. However, both studies found significant, positive association between CSA participation and educational outcomes when examining low income children. The finding that effects of CSAs are consistent and stronger among low income families, even in areas that are not specific to children's math and reading scores, have also been observed in other studies (e.g., Huang, Sherraden, Kim, & Clancy, 2014).

1.2. Reading Achievement and CSAs

The results are less conclusive for the association between assets and reading achievement, with some studies finding no relationship (Shanks, 2007) and others finding only weak or partial associations (Chowa et al., 2013; Fang et al., 2018; Loke & Sacco, 2011; Elliott, Kim, Jung, & Zhan, 2010c). Using a sample of youth from the Ghana Youth Save Experiment, Chowa et al. (2013) found that children from households with household assets (such as Televisions, refrigerator, electric irons, etc. Not all Ghanaian households have them.) scored nearly one unit higher on English than their peers from households without household possessions. These researchers used propensity score analysis and controlled for gender, education, marital status, age, employment status, and household income. Meanwhile, although they found significant positive associations between holding assets and math scores, Elliott et al. (2010a) did not find any statistically significant association between holding assets and reading scores. Mixed results were also found by Loke & Sacco (2011): they found that the initial household net worth in 1994 was not significantly associated with reading achievement in 2000. They noted, however, that higher net worth accumulation rates were associated with lower rates of decline in reading achievement.

Looking again at the Promise Indiana and Wabash County Promise Scholarship programs described earlier, Elliott et al. (2018) found that having a CSA alone is also positively associated with reading scores among low income participants. Unlike with math scores, being a saver was found to be positively associated with reading scores among low income families. As with math scores, Elliott et al. (2019) found that having a CSA combined with a scholarship is associated with higher reading scores. As with math, findings on reading scores are strongest among low income children.

1.3. Parental College Expectations and CSAs

The expectations parents have about their child's future educational achievement have emerged as a keystone for understanding how savings dedicated to a

child can become a powerful force for educational success. Elliott & Lewis (2018) believe this process of moving from what is hoped for to what is planned for “underlies much of CSA’s potency in the lives of children and families” (p. 109). Prior studies have shown that parental college expectations act as a mediator between school savings and children’s math scores (Elliott, 2009; Elliott, Jung, Kim, & Chowa, 2010; Fang et al., 2018). Elliott, Jung, Kim, & Chowa (2010) also found that college expectations is a partial mediator of math scores, while it is a complete mediator of reading scores among White male children.

In a randomized control trial, Kim and colleagues (2017) investigated the mediating effect of parent financial investment, in the form of a participant-owned 529 savings account, on the relationship between having a state-owned child development account (equivalent to a CSA with a 529 account plus additional incentive features) and parent college expectations for their child. They found that the effect of having a state-owned child development account on parent education expectations was fully mediated by holding a separate participant-owned 529 account in the state of Oklahoma. Similarly, Rauscher et al. (2017) examined the relationship between exposure to a community-based CSA program and parent college expectations. Their findings indicate that the odds of parents expecting their child to attend any form of postsecondary education increased by 59% when they had a 529 account and a CSA; however, these odds were only observed with high income parents.

Beyond their mediating effect on outcomes, parental expectations are often measured in CSA program outcomes due to their strong correlation with CSA program participation and children’s academic achievement (Glick & White, 2004; Gregory & Huang, 2013; Sandefur, Meier, & Campbell, 2006). According to the Theory of Planned Behavior, parental college expectations inform the behaviors that parents demonstrate to promote their child’s academic achievement. Therefore, in lieu of being able to determine children’s college completion rates (due to the relative newness of CSA programs and the fact that they typically start at birth or kindergarten), measuring parental college expectations against children’s math and reading achievement may provide valuable insight into CSA program’s potential success at increasing college enrollment and completion (i.e., are CSA programs on course for increasing enrollment).

In sum, research suggests that the effects of wealth and savings on educational outcomes are theoretically sound in the prediction of math scores but remained debatable in the prediction of reading scores. However, these studies have relied primarily on secondary data analysis using proxies, such as wealth, assets, or savings, for participation in CSA programs rather than actual participation in a CSA. Moreover, despite mixed evidence on the effect of CSAs on academic achievement, there is a dearth of research on the relationship between a child’s participation in a CSA and parental perception of the academic achievement of their child. Whether parents’ college expectations intervene in this relationship also needs to be explored. This study furthers our understanding of the role of

CSA program participation and associations with children's academic performance and parental expectations, moving beyond investigating wealth and assets as a proxy through the use of data collected from the oldest universal statewide CSA program in the United States.

2. Theoretical Framework

The Theory of Planned Behavior (TPB) informs this study. TPB assumes that volitional behavior is informed by intention, attitude, subjective norms, and perceived behavioral control (Ajzen, 1991; Fishbein & Ajzen, 2010). Intention is a person's plan to engage in behavior and is influenced by their attitudes, perceived behavioral control, and subjective norms. Attitude is a person's emotion toward and evaluation of the consequences for behavioral engagement. Perceived behavioral control is a person's confidence to engage in behavior after evaluating the environmental context and available resources and information. Subjective norms, which are of particular importance in this study, are an individual's normative expectations of others for engaging in a behavior. Subjective norms are informed by the value a person's places on the behavioral expectations of others.

The environmental context, resources, and information are indicators of actual control within the TPB. Actual control suggests that behavior is influenced by factors that extend beyond an individual's volition. Indicators of actual control reflect key factors that impede or enhance a person's ability to perform behaviors that enhance opportunity for social and economic mobility. **Figure 1** further illustrates the theoretical assumptions and properties of the TPB.

The TPB guides existing scholarship regarding individual fiscal management of cash, credit, or savings (Xiao, 2008). Attitude is the strongest predictor of financial behavior intention, whereas the effect of subjective norms (i.e., behavioral expectation) on intention is inconclusive (Peeters et al., 2018). The subjective

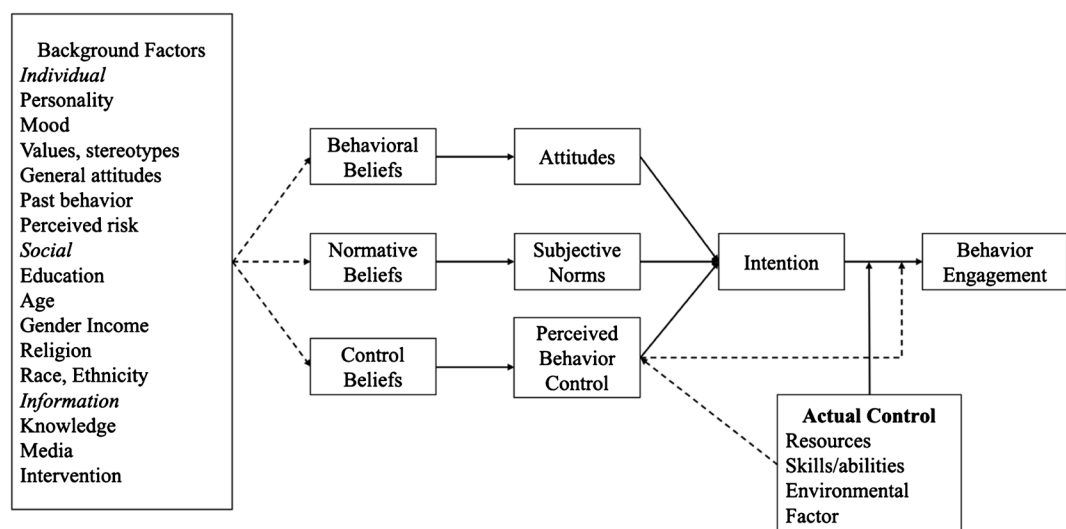


Figure 1. Theory of planned behavior model.

norms college students have about their parents' expectations about financial and life decisions strongly influence these students' attitudes toward saving money (Nga & Yeoh, 2015). Additionally, parent socialization about financial well-being and taking formal financial classes positively relates to financial behavioral attitudes, subjective norms, perceived behavioral control, and intention (Shim, et al., 2009). The relationship between parent socialization about personal finances and financial behavior engagement among college students is mediated by the attitudes, role modeling, and financial knowledge of their parents (Shim et al., 2010).

College students' subjective norms, in the case of parents being an important influence on attitudes toward debt, negatively influence borrowing intention among business majors and positively influence borrowing intention among education majors (Chudry et al., 2011). Moreover, parents who expect their child to achieve at least a bachelor's degree are more likely to engage in financial planning (e.g., contribute to a savings account, plan to reduce daily expenses, reduce daily expenses, and have a 10th grade child set aside earnings) than parents who have lower educational expectations for their child (Manly et al., 2017).

The TPB informs the current study because it is an important framework for understanding whether contextual factors, such as participating in a CSA program, inform parents' beliefs about the educational opportunities for their child and subsequent student academic achievement. Moreover, we consider the socioeconomic status of families as a key indicator of actual control, which influence this aforementioned relationship. The TPB provides a framework upon which our analyses are based and models the relationship between parental college expectations, CSA program participation, and children's reading and math achievement.

The Harold Alfond College Challenge (HACC) Children's Savings Account Program

The context for the current study is the Harold Alfond College Challenge (HACC) Children's Saving Account Program. In 2008, HACC started as a pilot program in two hospitals in the state of Maine, and in 2009 it was offered to all babies born in Maine. Each year since 2009, HACC has offered a \$500 grant to resident infants of Maine. In the first five years of the program, during which opt-in enrollment was used, families had to open a NextGen 529 account (NextGen is the name for Maine's 529 plan) by the child's first birthday to be eligible for an HACC grant. Savings received from account holders were at that time matched at a rate of 50 cents on the dollar, with a maximum annual match of \$300 available to participants. An additional \$100 match was offered when parents set up automatic deposit. (For more information on the HACC program, see Lewis & Elliott, 2015.) Money received and saved in NextGen accounts may be used only for qualified expenses at eligible in-state and out-of-state colleges, community colleges, and vocational schools (Huang et al., 2013).

In 2014, HACC shifted from an opt-in program where families had to sign up

to receive the \$500 HACC grant, to an opt-out program where all families are automatically enrolled at birth (about 12,000 births per year). This change to automatic enrollment was made retroactive to include all Maine resident babies born on or after January 1, 2013 (Clancy & Sherraden, 2014). The shift from opt-in to opt-out reflects the consensus in the CSA field that the only way to include everyone is through automatic enrollment (Sherraden et al., 2015, 2018).

The current study focuses just on parents of babies born during the *opt-in period*, allowing us to compare families who chose to sign up for HACC to those who did not choose to sign up. We test the relationship between program participation, parental perception of children's math and reading ability, and parental college expectations to determine what mechanisms are most salient in promoting academic achievement. As such, our research questions are 1) whether holding assets has an effect on children's academic ability (Elliott, 2009), 2) if parental college expectations mediate the effect of holding assets on children's academic ability (Kim et al., 2017), and (3) if the mediational effect of holding assets on children's academic ability differs by the level of household income.

3. Methods

Data for this study are from a 2019 survey of parents of children born in Maine between 2008 and 2017. The survey was conducted by Pan Atlantic Research, a major consulting firm headquartered in Maine with experience in regional and national education-related public policy issues and other market research. Using a targeted online panel combined with cell-phone lists, a random sample of qualifying parents were contacted and screened for inclusion criteria: a parent or guardian or other adult responsible for making decisions for at least one child born in Maine between 2008 and 2017. In households with multiple in-range children, the child with the most recent birthday was selected as the focus child.

A total of 770 surveys ($n = 117$ online; 653 telephone) with eligible parents were completed. This sample included children born during the original opt-in time frame as well as the automatic enrollment (or opt-out) time frame. For the purposes of the current study, we focus only on the parents of children born during the opt-in time period, allowing us to take advantage of the natural comparison group of non-participating families. After removal of children born in the opt-out time period (including the retroactive 2013 year), the final sample was $N = 572$. The sample was not weighted for comparison purposes.

3.1. Sample

The analysis sample for this study included parents of children born between 2009 and 2012. **Table 1** presents descriptive statistics of the sample. The sample consisted of mostly White (about 99%), married (80%) parents with at least a four-year bachelor's degree or higher (60%). Over a half (57%) of the children were female, and about half (51%) of the households made more than \$55,000 in

the previous year and so were considered high income families. The comparison group (44%) had fewer households with incomes above \$55,000 than the treatment group (about 55%).

In the 2018 Census report (note, survey took place in 2019), the overall population in Maine consists of 95% White, 41% married individuals, 30% of Maine residents have a 4-year college degree or higher, and the median household income of Maine residents is \$55,425 (U.S. Census Bureau, 2018). The sample of this study was more concentrated among college-educated, married individuals.

3.2. Survey Instrument

The survey consisted of 63 items and included questions about eligibility requirements, academic performance of children, household finances, child's health and education background, college saving and child saving account, college affordability, family relationship, and socio-demographic information. Items were developed by the study authors in combination with existing scales from previous studies in the CSA field (e.g., Kim et al., 2017). The average survey (telephone and online) duration was 16 minutes.

3.3. Measures

3.3.1. Outcome Variables

Parental perception of academic ability was estimated by asking parents two questions: "Last school year, how would you describe the child's math performance?" and "Last school year, how would you describe the child's reading performance?" Response options were: very poor, below average, average, above average, or excellent. A dichotomous variable was constructed where 0 indicates below average or average and 1 indicates average or above average.

3.3.2. Covariates

In the full model, three control variables were included in the analysis, including the child's gender, parents' marital status, and household income level. Child's gender was coded 0 if male, 1 if female. Parents' marital status was coded 0 if respondent reported not married, 1 if married. Household income was coded 0 if reported household income was \$55,001 or more, 1 if \$55,000 or below. In the two-group model, household income level is the grouping variable, while the child's gender and parents' marital status are kept as control variables.

3.3.3. Hypothesized Mediator

Parents' college expectations for each child were measured by one question: "As things stand now, how far in school do you think the child will actually get?" College expectations were recorded into a dichotomous variable where 0 = less than 4-year college, and 1 = 4-year college or above. The reference group consisted of parents who expected their children to attend less than a four-year college.

3.3.4. Intervention and Comparison Groups

The intervention group consisted of participants who received the Alford Grant

during the opt-in policy period (2008-2012). The comparison group consisted of participants who did not apply for Alford Grant during the opt-in policy. A dichotomous variable was constructed where 0 = Comparison Group and 1 = Treatment Group (also referred to as Alford Grant).

3.4. Analytic Strategy

The model was evaluated using structural equation modeling with the Mplus computer program (version 8.3; Muthén & Muthén, 2017). Parameters were estimated and tested using weighted least square mean and variance adjusted estimator (option WLSMV in Mplus) with the THETA parameterization for non-normality data with missing data. Confidence intervals (95%) are reported in the form of margins of errors, namely the absolute difference between the sample estimate and the respective limits of the 95% confidence interval, whichever was larger. Absolute and alternative model fit indices were evaluated with the traditional chi square fit statistic, the comparative fit index (CFI), the root mean square error of approximation (RMSEA), the p value for close fit associated with the RMSEA, and the standardized root mean residual (SRMR). Localized tests of fit examined modification indices, normalized residuals, and significance tests of differences between predicted and observed covariances.

A mediator is a variable that helps explain the relationship between an independent and dependent variable. Mediation occurs when an independent variable has an indirect effect on a dependent variable. Therefore, when an independent variable influences a mediator, the mediator will in turn influence a dependent variable. Based on previous studies, parental expectations are treated as a mediator of the effect from CSAs on math/reading ability. The indirect effects of the treatment on math/reading ability were evaluated using (a) the joint significance test (JST; MacKinnon & Luecken, 2008) and (b) the bootstrap asymmetric confidence interval approach for the product of coefficients in the causal chain as implemented in Mplus (Bollen & Stine, 1992; MacKinnon & Luecken, 2008; Preacher, 2015). One thousand replications were performed for bootstrapping. A 95% confidence interval (CI) was computed for each indirect and total effect. If the CI did not include 0, then it was significant.

A single-group SEM was performed to examine the overall effects of the model. All parameters that were significant were retained in the model to test for differences among groups. The prediction of reading ability by the treatment was not significant in either income group (low-to-moderate income: $B = 0.066$, $z = 0.425$, $p = 0.671$; high income: $B = -0.089$, $z = -0.525$, $p = 0.600$). The prediction of math ability by the treatment was significant for children from low-to-moderate income households ($B = 0.367$, $z = 2.100$, $p = 0.035$), while there were no significant effects found in high income households ($B = 0.183$, $z = 1.043$, $p = 0.297$). Therefore, the path from treatment to reading was removed from the model.

Multi-group structural equation modeling (SEM) was then performed on

math and reading achievement, predicted by treatment group and parent college expectations, controlling for child's gender and parents' marital status. The grouping variable was the level of household income (0 = \$55,001 or above, 1 = \$55,000 or below). The model was estimated using the WLSMV estimator with the THETA parameterization for non-normality data with missing data. The WLSMV estimator allows a model to be estimated with categorical outcome variables. The THETA parameterization allows the model to access the residual variances of the factor indicators as parameters.

A moderator is a variable that changes the strength or direction of an effect between an independent variable and a dependent variable (MacKinnon & Luken, 2008). In the current study, we hypothesized the level of household income to be a moderator of the effect of CSAs on children's math/reading ability. A test of moderation effects of income was performed using the Wald test for each path from the model (Wald, 1943).

4. Results

The direct and indirect associations that predictors (Alfond Grant, parental expectations, household income, child gender, and parents' marital status) have in relation to children's math and reading ability for each income level group are presented. The direct effects of predictors are shown in the path diagrams for math and reading ability (Figure 2 & Figure 3). The indirect effects are reported. Parental expectations were investigated as mediators in the effect of the treatment, household income, child gender, and parents' marital status. Findings on the direct effects and indirect effects are presented for each predictor. A description of key variables, along with correlations among study variables and their standard deviations, is followed by detailed findings.

4.1. Key Variables

Table 1 presents descriptive statistics for key variables in the model. Preliminary analyses suggested outliers, non-linearity, and missingness would be appropriately handled by the estimation algorithm used. About sixty percent (60%) of children have an Alfond Grant. About seventy-four percent (74%) of parents reported their children had above average math performance and about sixty-two percent (62%) had about average reading performance last year. Most (80%) respondents reported expectations that their children would attend a 4-year college or above. Compared to parents in the comparison group (74%), a larger portion of parents in the treatment group (84%) had expectations for their children to obtain a bachelor's degree.

4.2. Model Fit Statistics

The fit of the full model, where two separate path models (reading and math) were combined in one model, was satisfactory. As shown in Table 2, the chi square statistic of the full model was 6.463 ($df = 8, p > 0.05$). The CFI was 1.000.

Table 1. Characteristics of sample.

Variable name	Full sample (N = 572) Number (%)	Low-to-moderate income households (n = 283) Number (%)	High income households (n = 289) Number (%)
<i>Math Grades</i>			
Above average	423 (74)	203 (72)	220 (76)
Average or worse	149 (26)	80 (28)	69 (24)
<i>Reading Grades</i>			
Above average	354 (62)	159 (56)	195 (33)
Average or worse	218 (38)	124 (44)	94 (67)
<i>Child Gender</i>			
Female	326 (57)	164 (58)	162 (56)
Male	246 (43)	119 (42)	127 (44)
<i>Marital status</i>			
Married	456 (80)	215 (76)	241 (83)
Not married	116 (20)	68 (24)	48 (17)
<i>Parents Race/Ethnicity</i>			
White	555 (99)	274 (99)	281 (99)
Non-White	7 (1)	4 (1)	3 (1)
<i>Parents Education</i>			
4-year bachelor's degree or above	323 (60)	141 (54)	182 (66)
Less than 4-year college	212 (40)	120 (46)	92 (34)
<i>Alfond Grant</i>			
Have	343 (60)	154 (54)	189 (65)
Not have	229 (40)	129 (46)	100 (35)
<i>Parental Expectations</i>			
4-year college or above	459 (80)	215 (76)	244 (84)
Less than 4-year college	113 (20)	68 (24)	45 (16)

Note. Number of missing not included in the calculation of number or percent.

The RMSEA was smaller than 0.001 (90% confidence interval = 0 to 0.061). The p value for close fit was 0.894. The SRMR was 0.032. Inspection of z tests of the difference between predicted and observed covariances and modification indices revealed no theoretically meaningful and significant points of ill-fit at a localized level.

Of the two path models, in which reading and math were separately examined, both models fit the data very well. As for the math-only model, the chi square statistic was 5.360 (df = 10, $p > 0.05$). The CFI was 1.000. The RMSEA was smaller than 0.001 (90% CI = 0 to 0.034). The p value for close fit was 0.985. The SRMR was 0.025. The chi square statistic of the reading-only model was 6.201 (df = 10, $p > 0.05$). The CFI was 1.000. The RMSEA was smaller than 0.001 (90% CI = 0 to 0.042). The p value for close fit was 0.974. The SRMR was 0.027.

No theoretically meaningful and significant points of ill-fit at a localized level were suggested by the inspection of z tests of the difference between predicted and observed covariances and modification indices for both models.

4.3. Alfond Grant and Math/Reading Ability by Income Level

In reference to the total effects (Alfond Grant → Parents' Expectations → Math or Reading), Alfond Grant predicted math ability among children from low-to-moderate income households but not among those from high income families.

Table 2. Model fit information and Wald test across income groups.

	Chi-square test			CFI	RMSEA		SRMR	Wald test
	Value	df	p value		Value	p value		lmi-hi
Full model	6.463	8	0.596	1.000	<0.001	0.894	0.032	N/A
<i>Math model</i>								
Treatment								3.292
Parental expectations								3.978*
Gender	5.360	10	0.876	1.000	<0.001	0.985	0.025	0.018
Marital status								0.978
Alfond → Expectation → Math grades								5.039*
<i>Reading model</i>								
Treatment								2.735
Parental expectations								0.185
Gender	6.201	10	0.798	1.000	<0.001	0.974	0.027	0.003
Marital status								0.522
Alfond → Expectation → Reading grades								0.017

¹lmi, low-to-moderate income; hi, high income. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 3. Correlation matrix for study variables¹.

	1	2	3	4	5	6	7
1 Treatment	1	0.014	-0.033	-0.049	-0.033	0.090	-0.035
2 Parental expectations	0.226	1	-0.092	-0.051	0.104	0.037	0.100
3 Race	-0.081	-0.184	1	-0.011	-0.036	-0.006	-0.008
4 Gender	-0.005	0.053	-0.041	1	0.013	-0.006	-0.003
5 Marital Status	0.034	-0.098	0.083	-0.006	1	0.001	0.012
6 Math achievement	0.166	0.339	-0.066	0.016	-0.028	1	0.203
7 Reading achievement	0.026	-0.007	<0.001	-0.001	0.002	0.212	1

¹Below the diagonal are children from low-income households and above the diagonal are children from high-income households.

As shown in **Table 4** and **Figure 2**, the standardized total effects from the treatment to math ability were statistically significant among children from low-to-moderate income households [$B = 0.165$ ($p < 0.05$)], but not for children from high income households [$B = 0.087$ ($p > 0.1$)]. Reading ability was not predicted by Alfond Grant in any income group (low-to-moderate income: $B = 0.031$, $p > 0.1$; high income: $B = -0.039$, $p > 0.1$).

4.4. Mediation

The Alfond Grant was indirectly related to math ability only among children from low-to-moderate income households ($B = 0.077$, $p < 0.05$; 95% CI from 0.006 to 0.148, for math ability). Parental expectations fully carried the effect of the treatment to math ability given the insignificant direct effect of the treatment on math ability ($p = 0.287$). Lower household income heightens the level of college expectations, which is associated with higher math ability among children from low-to-moderate income households. Parental expectations were a statistically significant mediator of the estimated effects of the treatment on children's

Table 4. Indirect effect (mediation) of Alfond Grant, Race, Gender, and Marital Status on math and reading scores¹.

	Low-to-moderate Income			High Income		
	<i>B</i>	Lower	Upper	<i>B</i>	Lower	Upper
Math Scores						
By Alfond Grant (total effect)	0.163*	0.007	0.313	0.090	-0.069	0.249
Total indirect effect	0.069*	<0.001	0.137	<0.001	-0.007	0.007
By Race (total effect)	-0.126	-0.292	0.041	-0.061	-0.204	0.081
Total indirect effect	-0.037	-0.087	0.013	-0.003	-0.024	0.018
By Gender (total effect)	0.070	-0.087	0.228	0.049	-0.114	0.212
Total indirect effect	0.008	-0.036	0.052	-0.001	-0.013	0.010
By Marital Status (total effect)	-0.147	-0.296	0.002	-0.034	-0.198	0.130
Total indirect effect	-0.014	-0.058	0.029	0.003	-0.021	0.027
Reading Scores						
By Alfond Grant (total effect)	0.026	-0.126	0.154	-0.034	-0.189	0.120
Total indirect effect	-0.006	-0.054	0.034	0.001	-0.012	0.013
By Race (total effect)	-0.012	-0.163	0.139	-0.036	-0.175	0.104
Total indirect effect	0.004	-0.027	0.035	-0.005	-0.027	0.016
By Gender (total effect)	0.056	-0.096	0.208	-0.108	-0.260	0.043
Total indirect effect	-0.001	-0.009	0.007	-0.003	-0.017	0.012
By Marital Status (total effect)	-0.018	-0.172	0.136	0.083	-0.083	0.249
Total indirect effect	0.001	-0.011	0.014	0.006	-0.021	0.033

¹Total indirect effect: Predictor → parental expectations → Outcome (math or reading scores). * $p < 0.05$.

math ability as reflected by MacKinnon’s JST (MacKinnon & Luecken, 2008) and the Sobel test ($p < 0.01$; Sobel, 1982 in this sample. On the other hand, there was no mediation of college expectations in the effect on reading ability.

4.5. Parental Expectations and Math/Reading Ability

Parental expectations were positively related to math ability among children from low-to-moderate income households ($B = 0.355$; $p < 0.01$), while there were no corresponding relationships among students from high income households

Note. Low-to-moderate income households are presented **bold** and high income households are not bold. The path model that includes math scores was analyzed. The standardized coefficients for the paths from Alford grant, marital status, child gender, and parental expectations are presented for math grades. Reference level: No Alford Grant, Male, Not Married, Less than 4-year College Expectation

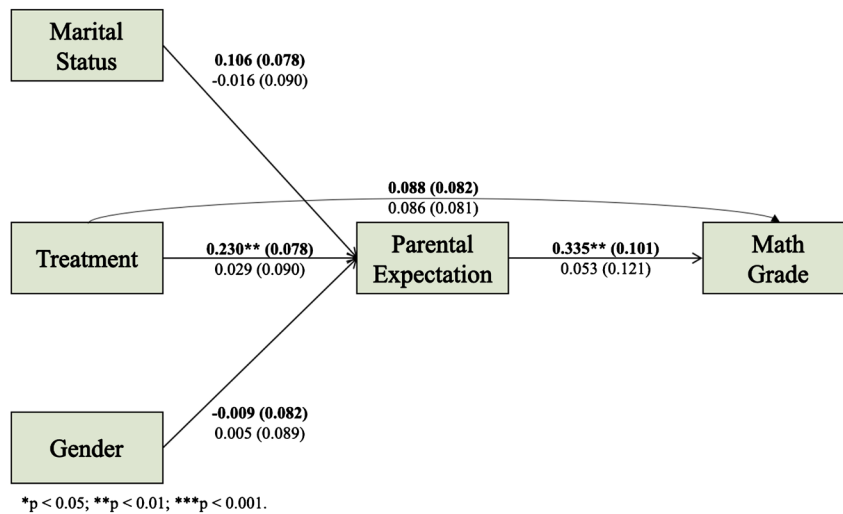


Figure 2. Math grade mediated through parental expectations by income level.

Note. Low-to-moderate income households are presented **bold** and high income households are not bold. The path model that includes reading scores was analyzed. The standardized coefficients for the paths from Alford grant, marital status, child gender, and parental expectations are presented for reading grades. Reference level: No Alford Grant, Male, Not Married, Less than 4-year College Expectation

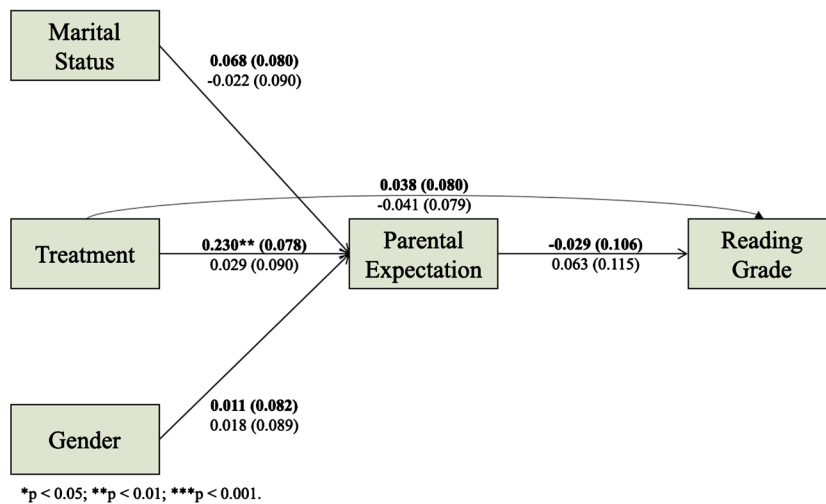


Figure 3. Reading grade mediated through parental expectations by income level.

($p > 0.5$). Parental expectations were not significantly related to reading ability, regardless of income level (low-to-moderate income: $B = -0.029$, $p > 0.5$; high income: $B = 0.063$, $p > 0.5$).

4.6. Moderation

The indirect effect of having an Alford Grant on math ability through parental college expectations is stronger among children from low-to-moderate income households (Wald test chi square statistic was 5.039 [df = 1, $p < 0.05$]). The prediction of having an Alford Grant on math ability mediated by parental college expectations was stronger among children from low-to-moderate income households than those from high income households. There was no moderation of income in the indirect effect on reading ability.

The effect of parental expectations on math ability was also moderated by income (Wald test chi square statistic was 3.978 [df = 1, $p < 0.05$]). The prediction of parental expectations on math ability was stronger among children from low-to-moderate income households. There was no moderation of income in the effect of parental expectations on reading ability.

4.7. Covariates and Math/Reading Ability

Parents' marital status and child's gender did not predict children's math and reading ability consistently across income groups. Household income was a moderator for children's math ability, but not for reading ability.

5. Discussion

Research shows that wealth accumulation has a positive impact on parental college expectations, as well as on children's academic attainments (Elliott et al., 2010b; Yeung & Conley, 2008). Moreover, studies support college expectations as a central linking process between assets and academics. To better understand this link, this study examined the meditational effect of parental college expectations between CSA account ownership and children's academic attainments, and variation by the level of household income.

The findings presented here provide further evidence of the potential effects that giving children access to CSAs can have on academic attainments. While existing literature suggests that the presence of assets and a CSA is positively associated with children's math achievement, most of these studies used secondary data (Elliott et al., 2011b; Fang et al., 2018; Friedline et al., 2015). Using participant data from Maine's HACC, the oldest statewide CSA program in the United States, this study found a positive association between having CSAs and math achievement in a predominantly White sample. These results are similar to those of Elliott et al. (2018), who also found a positive association between having a CSA and math achievement with participant data from Promise Indiana.

As discussed, findings related to the effect of having assets on children's reading ability have been mixed. In the current study, having a CSA was not asso-

ciated with children's reading ability, regardless of their level of household income. Conversely, according to Elliott et al. (2018), CSAs were found to be positively associated with reading achievement. There are two potential explanations for the difference between the two studies. First, the current study examines parental perceptions of children's academic attainments, Elliott et al. (2018) used administrative data from schools. Moreover, they controlled for fewer factors.

Findings from the current study suggest that having an Alford Grant is positively associated with college expectations, which is consistent with previous findings using secondary data (Elliott et al., 2010b; Fang et al., 2018). The current study builds on this research by using data from CSA participants in the oldest CSA program in the country. While previous research has no definite evidence whether parental college expectations fully or partially mediate the effect of holding assets (Elliott, 2009; Kim et al., 2017), the current study found full mediation. Earlier studies may have lacked definite evidence of this effect for the following reasons: in Kim et al. (2017), the study did not differentiate parental expectations and parental aspirations and controlled for the importance of college education for the child, while the current study employed different measurements of aspirations and expectations. In Elliott's (2009) study, he used secondary data with a proxy for CSAs (i.e., savings set aside for college in regular bank account), which is different from using participant data in the current study.

The finding that the association between having a CSA and children's academic outcomes is stronger among low-to-moderate income students than high income students is consistent with previous findings. Specifically, the indirect effect of a CSA on children's math ability and the effect of parental expectations on math ability are stronger among low-to-moderate income students. Regardless of whether the study used a proxy from secondary data or program data from a CSA program, the current study is consistent with the existing literature (Elliott, 2009; Elliott et al., 2010b).

5.1. Limitations

Due to limitations, the current study cannot rule out other explanations for its findings. The purpose of this study was to test whether a correlation exists between participating in the Alford Grant program and children's academic outcomes. While Maine's CSA program is the oldest program in the country, its original opt-in model and later adoption of automatic enrollment (i.e., all kids born receive an account) mean that a randomized control trial is not possible because treatment cannot be randomized. Thus, causal inferences cannot be drawn from findings. However, this is the first attempt to study this historic program and thus adds to the existing body of research. Further, there is still very little known about the relationship between CSAs and children's academic performance (Elliott & Harrington, 2016). Therefore, additional research, even if not casual, moves the field forward.

The current study was also limited to using parental perception of math and reading ability, not their actual math and reading scores collected from administrative data. Importantly, however, despite this limitation, research has shown that parent's perceptions of their child's academic ability are a strong predictor of their actual ability (e.g., Georgiou, 2010; Mann, 2008; Phillipson & Phillipson, 2007). This suggests that the study has importance for understanding the potential of CSAs on children's academic performance, though more research is needed.

Finally, the generalizability of the current study to non-White populations is undermined by the predominantly White (90%) sample. However, similarly to the Indiana Promise study (Elliott et al., 2018), the current study reflects the racial composition of the corresponding state's population, which is approximately 95% White in Maine. While this study might not be able to help researchers understand the effect of CSAs across the nation, the current study contributes to the existing literature by examining the effect of holding assets on children's academic outcomes within racially homogenous states.

5.2. Policy Implications

Findings from this study suggest that education institutions' mission of educating their students may be augmented, at least in Maine, through the Alford Grant program. Findings from this study indicate that the Alford Grant is positively associated with parents expecting their child to attend college and that expecting their child to attend college is positively associated with parents' perceptions of children's math ability. This is likely important to children's actual performance in math because research shows that parental perceptions of their child's ability in math have been positively correlated with children's actual math achievement (e.g., Mann, 2008).

5.3. Future Directions

Future research may need to conduct additional analysis of the Alford Grant program, one of the oldest CSA programs in the United States that collects data from schools in Maine. While this research provides one the first looks at this statewide CSA program in Maine and its relationship with parental perceptions of children's math ability, the findings of the current study are not conclusive. Rather, the current study should provide grounds for a more comprehensive study of this relationship that uses academic performance data from schools in Maine and savings data from the program. If this is not possible, future research might want to continue to follow the families in this study and expand the number of families in the study. With a larger sample and longitudinal data, future research would be able to conduct more advanced statistical inquiries. Future research may also want to examine why CSAs are more consistently associated with children's math ability but not their reading ability. Finally, future research may seek to compare the effect of CSAs on children's academic out-

comes across states by examining the contextual factors that differ by state and program.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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