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The Age Old Question, Which Comes First?

A Simultaneous Test of Children's Savings and Children's College-Bound Identity

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This study has three goals: (1) to provide an extensive review of research on the assets/expectation relationship, (2) to provide a conceptual framework for how children's savings effects children's college-bound identity (children's college expectations are a proxy for children's college-bound identity), and (3) to conduct a simultaneous test of whether owning a savings account leads to college-bound identity or college-bound identity lead to owning a savings account using path analytic technique with Structural Equation Modeling (SEM). Our review reveals asset researchers theorize about college-bound identity in two distinct but compatible ways: college-bound identity as a "linking mechanism", and college-bound identity as a mediator. However, there has been little theoretical development on the attitudinal effects of assets. In this study, we posit a conceptual framework for how children's savings affects children's college-bound identity. Findings from the simultaneous test of the assets/ college-bound identity relationship suggest that savings has modest effect on college-bound identity and vice versa. A policy implication is that asset building policies that seek to build children's college-bound identity in addition to their savings may be more effective than policies that only seek to build children's savings.

Key words: *Wealth, assets, college attendance, college graduation, savings, Child Development Accounts (CDAs), college expectations, PSID, Child Savings Accounts (CSAs)*

In the book, *Assets and the Poor: A New American Welfare Policy*, Michael Sherraden (e.g., 1991) proposes that asset accumulation is the key to improving the well-being of low-income families. From this perspective, well-being is a long-term, dynamic process. Accordingly, financial assets can be used to develop other types of assets such as human, cultural, or social capital. Sherraden (1991) also proposes that there are multiple economic and psychological effects associated with owning assets. Specifically, Sherraden (1991) proposes that assets improve household stability, increase personal efficacy, increase political participation, create an orientation toward the future, enable focus or specialization, and provide a foundation for risk taking. The potential for multiple effects has made assets a particularly alluring and fast-growing policy strategy for improving the well-being of low-income families.

However, research and policy on savings often overlooks children as agents, capable of saving (e.g., Hogarth, Anguelov, & Lee, 2003, 2005). This is, in part, due to the predominant model of savings in economics, the life-cycle hypothesis (LCH) (Modigliani & Brumberg, 1954). LCH theorists suggest that saving over a lifetime looks like an inverted U-shape (e.g., Harrod, 1948). That is, when people are young, they have little money to save and end up borrowing more; when they are middle-aged, they have higher incomes which enable them to save more; and when they are old and their incomes

decline, they have to spend their savings. From this perspective, it makes little sense to talk about children having money to save.

Despite the fact that mainstream economic theory has basically ignored children's savings, savings programs intended for children have been around since the late 1800's through school-based initiatives, such as the School Savings Banking program in New York Public Schools (Cruce, 2001; Tucker, 1991). Since that time, opportunities for financial education and savings have expanded (Cruce, 2001, 2002). Currently a wide range of public and private initiatives support savings for children (American Bankers Association, 2009; Council for Economic Education, 2010; Junior Achievement, 2009; Young Americans Center for Financial Education, 2010). For instance, the Young Americans Center for Financial Education based in Denver, Colorado provides a range of services, including financial summer camps, weekend activities, and even a bank designed specifically for young people aged 21 and younger (Young Americans Center for Financial Education, 2010). The Young Americans Bank serves approximately 15,000 young people nationwide and offers the same types of services as a typical bank, such as checking and savings accounts, loans, and credit card services (Young Americans Bank, 2009; Young Americans Center for Financial Education, 2010). Additionally, the American Bankers Association promotes young people's savings by offering online tutorials, lessons on savings, and partnerships with banks (American Bankers Association, 2009).

Another program designed to build savings among children that is getting a considerable amount of attention around the world as well as in the United States is Child Development Accounts (CDAs) (Loke & Sherraden, 2009). In their simplest form, CDAs are incentivized savings accounts that can be used for long-term investments. CDAs have been proposed as a way to help students finance college (Boshara, 2003; Goldberg & Cohen, 2000; Sherraden, 1991). Four countries (United Kingdom, Singapore, Canada, and Korea) already have some form of national Child Development Account (CDA) policy (Loke & Sherraden, 2009). While no national CDA program has been adopted in the US, several have been proposed in Congress. Examples of wealth-building policies for children in America are the Young Saver's Accounts, 401Kids, Baby Bonds, Plus Accounts and the America Saving for Personal Investment, Retirement, and Education (ASPIRE) Act. In addition to helping children finance college, much of the interest in creating asset-building policies for children is based on their potential for changing how children think and act. However, theory and research on the psychological effects of assets are in their early stages of development (Schreiner & Sherraden, 2007). One promising area of theoretical and research inquiry is the study of college expectations as an explanatory mechanism for the relationship between assets and children's educational outcomes (e.g., Elliott, 2009; Zhan, 2006; Zhan & Sherraden, 2009).

This study has three primary goals. The first goal is to provide an extensive review of research on the assets/college expectations relationship. We pay particular attention to research testing mediation models with college expectations as the mediator. A mediation model hypothesizes that an asset variable (e.g., children's savings) causes a mediating variable (e.g., college expectations),

which in turn causes the dependent variable (e.g., college attendance). In this manner the mediator helps explain the relationship between the independent variable and the dependent variable. The second goal is to begin to build a framework for understanding how children's savings affects children's college expectations. The third goal is to provide a simultaneous test of whether savings predicts expectations or expectations predict savings. In this study, the first two goals are as important as the third goal.

Review of Research

Research on college expectations

Many asset researchers conceptualize college expectations as a "linking mechanism."[1] In this conceptualization, assets are associated with expectations and expectations, in turn, are associated with the education outcome in question (see Figure1).[2] Thus, college expectations act as a link between assets and educational outcomes, but no direct relationship between assets and educational outcomes is hypothesized. In addition, this perspective generally focuses on explaining the relationship between assets and expectations, not the relationship between assets and educational outcomes. We refer to this as the "linking model" of indirect effects.[3]

Figure 1. College expectations as a linking variable between assets and college progress
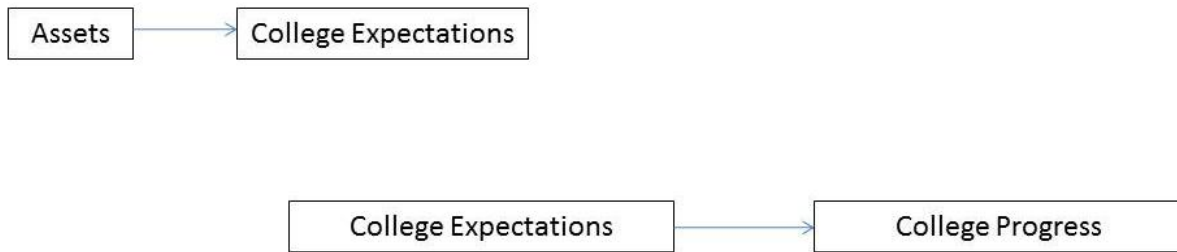
Yadama and Sherraden's (1996) study is an example of a linking study. Using a path analytic technique with 1968 and 1972 data from the Panel Study of Income Dynamics (PSID), Yadama and Sherraden (1996) simultaneously test whether assets (household savings and home equity) increase the chance of having more positive attitudes and behaviors (prudence, efficacy, horizons, connectedness, and effort) or whether attitudes and behaviors increase the chance of having assets (Yadama & Sherraden, 1996). They find evidence of what they call a "virtuous circle," where assets increase the chance of having more positive attitudes and behavior, and attitudes and behavior, in turn, increase the chance of having assets (Yadama & Sherraden, 1996, p. 11). Another example is a

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[1] For discussion on indirect effects and linking, see Mathieu & Taylor, 2006, p. 1039
[2] For information on the relationship between expectations and young people's educational outcomes see Mau (1995).
[3] It should also be noted that some researchers refer to "linking" as a form of mediation (see e.g., Zhao, Lynch, & Chen, 2010). To be specific, Zhao, Lynch and Chen (2010) call this form of mediation indirect-only mediation (p. 200). However, the concept of linking is more in line with how Sherraden (1991) has conceptualized asset effects not mediation.

study done by Williams Shanks and Destin (2009). They draw a sample of Black parents and their children from the PSID and its supplements, the Child Development Supplement (CDS) and the Transition into Adulthood supplement (TA). They perform a two-stage model using regression where they test the relationship between net worth (measured in 1994), parents' college expectations (measured in 1997 and 2002), and children's college attendance (measured in 2005). In the first stage, they find that net worth has a significant association with parents' expectations in 1997 and 2002. In the second stage, they test the relationship between net worth and children's college attendance. They find that net worth is significantly related to children's college attendance. However, they do not control for parents' expectations while testing the relationship between net worth and children's college attendance, and therefore, are unable to establish the existence of mediation. That is, they are unable to establish whether parents' expectations are associated with college attendance or whether the effects of net worth on college attendance are reduced when parents' expectations are included, which are common steps for establishing mediation (Baron & Kenny, 1986).

A more recent approach, which builds on Sherraden (1991), conceptualizes expectations as a mediator rather than a linking mechanism. The focus of this approach is to explain how assets affect children's educational outcomes. This new line of theorizing was first articulated by Shobe and Page-Adams (2001) who stated that expectations "may play an intermediate role in the relationship between assets and other positive social and economic outcomes." In addition, Shobe and Page-Adams make clear that assets precede expectations: "savings *first* 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). Thus, they suggest a causal ordering in which assets precede expectations, and expectations carry at least part of the effect of assets onto educational outcomes.[4]

Researchers have conducted eight studies on indirect effects using a meditational model (Elliott, 2009; Elliott & Beverly, in print-a; Elliott, Kim, Jung, & Zhan, 2010; Elliott, Jung, Kim, & Chowa, 2010; Grinstein-Weiss, Yeo, Irish, & Zhan, 2009; Zhan, 2006; Zhan & Sherraden, 2003; Zhan & Sherraden, 2009). Four of these studies use the Baron and Kenny (1986) method – what may be referred to as the causal sequence method – to test for mediation (Grinstein-Weiss, Yeo, Irish, & Zhan, 2009; Zhan, 2006; Zhan & Sherraden, 2003, 2009). The causal sequence method suggests that statistical evidence of mediation can be determined by estimating a series of linear regressions that test whether (a) assets are related to the educational outcome, (b) assets are related to college expectations, and (c) college expectations are related to the educational outcome in a model controlling for the effects of assets (see Figure 2).

Zhan and Sherraden (2003) use a sample (N=591) of single mothers from the National Survey of Families and Households (NSFH) to test the role of parents' college expectations as a mediator. In

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[4] We build on this by suggesting that the children's assets/expectation relationship is reciprocal, each affecting the other.

this study, assets and parents' college expectations are measured at the same time point. One outcome variable, academic achievement is measured at the same time point (1987 to 1988) as assets and expectations. Another outcome variable, high school graduation, is measured at a later time point (1992 and 1995). Using the casual sequence method, Zhan and Sherraden (2003) find evidence that the mother's educational expectations for her child partially mediate the relationship between the mother's savings and whether the child graduates from high school, and between homeownership and the mother's report of children's grades (i.e., how the mother perceives that their child is doing in school, A to F). They suggest that two-way causation may be present; that is, assets may affect expectations and expectations may also affect accumulation of assets.

Figure 2. College expectations as a mediating variable between assets and college progress
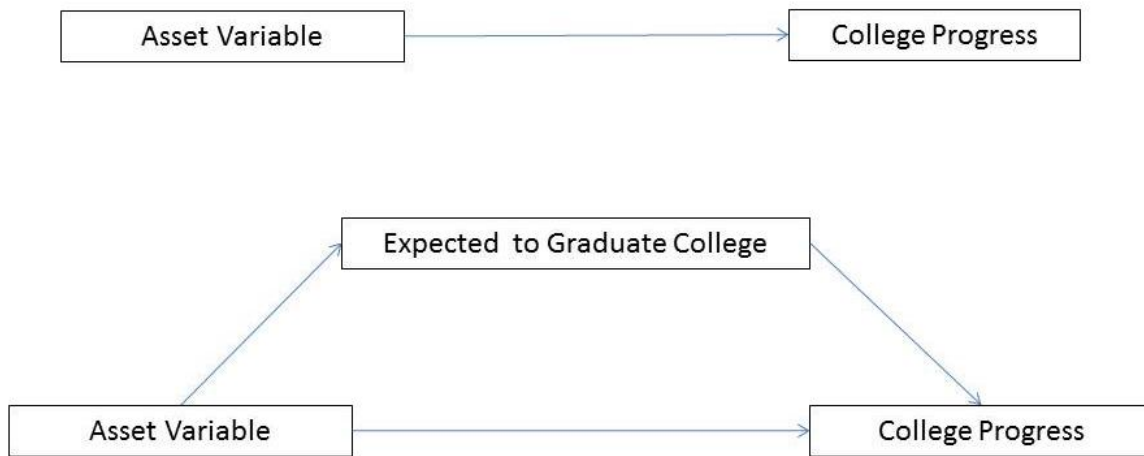
Using data (N=1,370) from the National Longitudinal Survey of Youth from 1997 (NLSY97), Zhan (2006) finds additional evidence suggesting that the asset/education relationship is partially mediated by parents' college expectations. More specifically, she finds that mother's expectations partially mediate the relationship between net worth and her children's educational performance in math and reading using the casual sequence method. In Zhan (2006), parents' college expectations and assets are measured at the same time point, 1998. However, the outcome variable, children's educational performance, is measured in 2000. Therefore, they do not have time order in regards to assets and expectations.

Grinstein Yeo, Irish, and Zhan (2009) use 2001 cross-sectional data (N=7,235) from the Survey of Income and Program Participation (SIPP). They find that parents' educational expectations partially mediate the relationship between net worth and children's school outcomes (repeated grade, expelled or suspended, and interest in schoolwork). The researchers use the Baron and Kenny method.

Using NLSY79 data (N=750), Zhan and Sherraden (2009) test whether the assets/college graduation relationship is mediated by parents' and children's college expectations. They use the

Baron and Kenny method for testing for mediation. They find that financial assets are positively related to parents' and children's educational expectations (i.e., independent variable is associated with the mediator). Moreover, they find that both financial assets (i.e., independent variable is associated with dependent variable) and expectations (i.e., mediator is associated with dependent variable) are associated with whether children graduate from college. However, because the effects of financial assets are not reduced when expectations are included in the model, they conclude that there is no evidence of mediation. However, some scholars claim that the Baron and Kenny test is susceptible to error because of its inability to detect confounding, suppression, and interactive effects that could mitigate any overall effects that the independent variable has on the dependent variable; as a result, researchers may erroneously conclude that there is no mediation (Mathieu & Taylor, 2006). Zhao, Lynch, and Chen (2010) suggest that a direct effect does not need to be present between the independent and dependent variables in order for mediation to occur. Moreover, contrary to the Baron and Kenny test, they suggest that the strength of mediation should be determined by the size of the indirect effect (i.e., size of the effects of assets on expectations), not by the lack of or the reduction in direct effects (also see, Mathieu and Taylor, 2006; Preacher & Hayes, 2004).

Given the growing criticism of the Baron and Kenny method (see e.g., Zhao, Lynch & Chen, 2010), scholars increasingly suggest using a direct test of mediation, such as bootstrapping (Bollen & Stine, 1992; MacKinnon, Lockwood, & Williams 2004; Mathieu & Taylor, 2006; Preacher & Hayes, 2004; Zhao, Lynch, & Chen, 2010).[5] Bootstrapping is a nonparametric approach to effect-size estimation and hypothesis testing (Mooney & Duval, 1993). 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 non-normality in the sampling distribution of the indirect effect. Bootstrapping is accomplished by taking a large number of samples of size n (where n is the original sample size) from the data, sampling with replacement, and computing the indirect effect in each sample (Preacher & Hayes, 2004).

Four of the eight studies testing mediation use bootstrapping (Elliott, 2009; Elliott & Beverly, in press-a; Elliott, Kim, Jung, & Zhan, 2010; Elliott, Jung, Kim, & Chowa, 2010). Using cross-sectional data (N=1071) from the PSID/CDS, Elliott (2009) finds that youth's college expectations act as a partial mediator between youth's school savings and math achievement but not net worth. Elliott (2009) uses the causal sequence method, bootstrapping, and the Sobel test. All three methods provide evidence of partial mediation in regards to youth's school savings.

Elliott and Beverly (in press-a) use PSID/CDS/TA data (N=1003) to test for mediation. College expectations and the asset variables are measured in 2002. The outcome variable, college progress (i.e., whether a child is attending or has graduated from a two-year or four-year college), is measured

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[5] A macro for running bootstrapping in SAS and SPSS by Preacher and Hayes can be found at the following site: http://www.comm.ohio-state.edu/ahayes/spss%20programs/indirect.htm.

in 2007. The Baron and Kenny method produced mixed results regarding mediation. According to the Baron and Kenny method, youth's college expectations partially mediate the relationship between youth's school savings and college progress and fully mediated the relationship between parent's savings for their child and college progress. However, the Baron and Kenny method produced no evidence of mediation in the case of net worth. Bootstrapping confirms indirect effects in the case of both youth's school savings and parent's savings.

In a cross-sectional study, Elliott, Kim, et al. (2010) use PSID/CDS data (N=1063) to test whether mediation effects vary by race (White/Black). Separate samples of White (N=576) and Black (N=487) youth are analyzed. Using Structural Equation Modeling (SEM) and bootstrapping, they find that school savings is significantly related to expectations for both White and Black youth. In the case of math, they find that net worth and school savings have indirect effects through college expectations for White youth only (i.e., expectations mediate the relationship between assets and math achievement). In the case of reading, they find that there are no indirect effects regardless of race. Similarly, in a follow-up study, Elliott, Jung, et al. (2010) use a cross-sectional study from the PSID/CDS data (N=1063) to test whether mediation effects vary by race (White/Black) and gender. This study uses a multi-group SEM model along with bootstrapping. Among the four different groups (Black/Male; Black/Female; White/Male; and White/Female), sample sizes ranged from a low of 228 to a high of 308. In contrast to Elliott, Kim, et al. (2010), there is no evidence of mediation.

A limitation of existing research on mediation is its lack of evidence on causal ordering. Causal ordering deals with the question of which comes first. In the assets/expectations context, the question is: do assets precede expectations or do expectations precede assets? Three types of evidence are required to establish causal ordering: (1) evidence of a correlational relationship between assets and expectations, (2) evidence that the correlational relationship is not spurious, and (3) evidence of temporal precedence. Overall, research findings provide some evidence to suggest that assets and expectations are correlated. Since experimental data are not currently available, researchers have used controls (known predictors of expectations) to help rule out the possibility that the assets/expectations relationship is spurious. They have controlled for a wide variety of factors to include such things as race, family income, marital status, head's level of education, employment status, residency, number of children, special education status, and academic achievement. After controlling for all of these different factors, in most cases the assets/expectations relationship remains significant.

In this study, we focus on providing additional evidence of temporal precedence in regards to the assets/expectations relationship. Confirming a specified temporal order increases confidence in the study's findings (Mathieu & Taylor, 2006). Existing studies have been unable to establish temporal order because they lack longitudinal data on the assets/education relationship. Although one study measures assets prior to expectations (Williams Shanks & Destin, 2009), there are no studies that measure children's savings prior to expectations.

Building on Williams Shanks and Destin's (2009) work, we propose simultaneous tests of whether assets predict expectations or whether expectations predict assets. According to Mathiew and Taylor (2006), because the same data can support various models, simultaneously testing competing theories in the same model can provide additional evidence for a specified order (p. 1039). However, it is rare in the social sciences to have the opportunity for a simultaneous test of key competing theories (Yadama & Sherraden, 1996).

This study builds on previous research in three important ways. First, it further develops a framework for understanding the assets/education relationship using children's college expectations. Second, it uses recent data in which assets were measured prior to expectations. Third, it simultaneously tests two alternative hypotheses: (a) assets predict college expectations and (b) college expectations predict assets. In the next section, we further specify a framework for understanding the asset/education relationship using college expectations.

Conceptual Framework – A College-Bound Identity Theory of Asset Effects

There is a growing need for asset researchers studying children's educational attainment to develop a theoretical framework that builds on existing research in education, economics, and psychology to understand asset effects in regard to children's educational attainment. However, in the research studies identified in this review, asset researchers take little time in integrating assets into existing research and theory on educational attainment. In general, they have relied on asset theory that was developed to understand social development.[6]

More specifically, our conceptual framework focuses on explaining asset effects during adolescence, between ages 12 to 18. The reason for this is that it is likely that asset effects occur differently for children under age 12. For example, evidence from behavioral economics suggests that children may benefit from savings and assets as early as age 12, and that somewhere between the ages of six and twelve, they begin to grasp the relationship between savings and future opportunity (see e.g., Elliott, Sherraden, Johnson, & Guo, 2010; Sonuga-Barke & Webley, 1993). We also focus on this age range because existing research on savings, assets, and educational attainment has primarily focused on children between the ages 12 to 18 (e.g., Elliott & Beverly, in press-a, in press-b).

Although research consistently shows that higher college expectations may lead to increased academic efforts and achievement (e.g., Cook et al., 1996; Marjoribanks, 1984; Mau, 1995; Mickelson, 1990) and more financial assets have been linked to higher expectations (e.g., William Shanks & Destin, 2010; Zhan, 2006; Zhan & Sherraden, 2003), little theory has been developed about *how* assets may influence college expectations. According to Reynolds and Pemberton (2001), college expectations are children's perceptions of the subjective probability that they will be able to attend and graduate from college at a future time point. A more psychologically grounded

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[6] We did find one theoretical article that attempted to integrate asset theory into educational research, see William Shanks, Kim, Loke and Destin (2010).

perspective on college expectations focuses on visions children have of themselves in a future state – i.e., a possible self or more specifically a college-bound identity (Markus & Nurius, 1986).

When children envision their futures, Destin and Oyserman (2010) showed that they tend to express either an education-dependent future identity (i.e., imagine themselves in a career that requires post-secondary education) or an education-independent future identity (i.e., imagine themselves in a career that does not require post-secondary education), and adolescents who envision a future that requires education spend more time on schoolwork and earn higher grades. We posit that children are more likely to hold an education-dependent or college-bound identity if the costs of college feel manageable and the benefits feel salient. This is not to suggest that children make rational judgments about costs and benefits similar to some traditional economic models (Becker, 1962; Sunstein, 1997). Instead, both explicit and subtle environmental messages (potentially derived from the presence of savings and assets) inform children's judgments of the cost and return on college.

Explicit human capital vs. contextually-cued identity

Our conceptual framework updates perspectives on children's subjective judgments that are rooted in an economic model of human capital investment. Human capital can be thought of as a *stock* of skills, capabilities, knowledge, and adaptive behaviors that an individual accumulates through education, work, and other life experiences embodied in the ability to perform labor so as to produce economic value (Becker, 1962; Sunstein, 1997). From the human capital perspective, children make a subjective judgment about whether the expected return on college (benefits) is worth the costs of investing their effort and ability into college (including preparing for, enrolling in, and completing college) (Becker, 1962, 1993; Ellwood & Kane, 2000; Paulsen, 2001). According to the human capital perspective, the subjective judgment that children make is a rational judgment based on the information available to them about the costs and benefits associated with college, accurate or not (Becker, 1962; Ellwood & Kane, 2000; Paulsen, 2001). The human capital model suggests that children with greater academic preparation and achievement and children with greater financial resources are more likely to have positive college outcomes (Catsiapis, 1987).

The conceptual framework we present here differs from the economic model in important ways. Contrary to the economic model, from our perspective the subjective judgment children make about the costs and benefits of college are not rational judgments that assume that children have accurate information and that they go through a formalized process of weighing costs and benefits like an accountant. Instead, more implicit psychological processes are likely to draw connections between environmental information and personal identity.

Because people are unable to actively process all cognitive stimuli and have a limited capacity for making conscious decisions (i.e., Bargh & Chartrand, 1999), it is unlikely that children spend much of their time making conscious judgments about the costs and benefits of college. Therefore, in contrast to the human capital perspective which assumes that children are constantly making such judgments, we draw from the theory of identity-based motivation (IBM), which explains that

contextual cues carry an overwhelming influence on the college-related goals that children set and the strategies that they do or do not enact to pursue a future goal.

How assets and children's savings shape college-bound identity

To understand how a college-bound identity is formed, reinforced, and influences outcomes, we utilize the theory of IBM (Oyserman & Destin, 2010). The theoretical framework also provides a means for understanding the psychological effects of assets and savings on children's behaviors. Specifically, three principal components explain the relation between conceptions of the self, like a college-bound identity and motivation, with significant attention given to how context drives the process. In the following section, we describe each component and how assets can provide a relevant contextual cue that is related to identity and outcomes. The core principles of IBM include 1) identity salience, 2) congruence with group identity, and 3) interpretation of difficulty. These principles have been shown to be important predictors of children's school behaviors (Oyserman & Destin, 2010).

Salience. Although the term 'identity' can be invoked to refer to a diverse array of concepts, our framework focuses on the aspects of identity that directly influence behavioral choices. Abstract conceptions of the self are most likely to guide everyday behaviors when the thoughts are more readily accessible or salient above other social and cognitive stimuli. Stated otherwise, people are more likely to work towards a goal when images of their own future are "on the mind." Destin & Oyserman (2010) made a college-bound future salient by distributing a handout showing the connection between future education and higher income, and, as a result, middle-school students planned to do more schoolwork and were more likely to actually complete an extra-credit assignment. The experimental paradigm showed increased motivation when a college-bound identity was made salient compared to children who received information about a non-college-bound identity (high-paying careers in athletic and entertainment industries).

The findings from classroom experiments suggest that everyday cues that increase the salience of a college-bound identity can boost motivation and improve outcomes. Assets inherently provide signals that remind people of a desired future. When elements of a family's environment contain cues about assets, like when a parent has savings for their child, the presence of such resources can bolster parents' expectations for their children (Elliott & Beverly, in press-a), influencing their own interactions with children and children's own college expectations and school-related behaviors. A lack of assets, on the other hand, makes economic struggles salient, which can be incongruent with a focus on future goals like college. As college-bound identities lose salience, school behaviors decline.

Group identity. Another important factor in the connection between context, college-bound identities, and behaviors is a link to group identity. When an image of the self feels tied to ideas about relevant social groups (e.g., friends, classmates, family, cultural groups), the congruent personal identity becomes reinforced. For example, Destin and Oyserman (2010) find that writing about positive possible selves, or who they want to become, is more motivating for college students after they have

been led to believe that their fellow classmates generally have positive outcomes. On the other hand, writing about negative possible selves, or who they do not want to become, is more motivating after they have been led to believe that their fellow classmates have generally disappointing outcomes. This means that the match between a person's view of their own possible future and their group is important for motivation, even if the match signals a fate to be avoided.

For children, assets are almost always connected to a larger social unit or family. Even when opening their own accounts, children are often supported by parents or other family members. When children and their families save money for college, the meta-message asserts "we save," "we go to college," reinforcing the college-bound identity through its congruence with the actions and goals of the larger group.

Difficulty. A final key insight from IBM highlights the importance of a means for interpreting and overcoming difficulty. In order to sustain and work towards an image of a future self, the context must provide a way to address inevitable obstacles to the goal. It is commonly recognized that high college costs act as an obstacle to attending and graduating from college (e.g., ACSFA, 2010). For example, ACSFA (2010) finds that among college-qualified low- to moderate-income households, parents and children are far more likely to be concerned about the cost of college than parents and children in high-income households. These concerns have real consequences in respect to children's educational attainment. ACSFA (2010) finds that college-qualified low-to-moderate-income children are far less likely to attend college and graduate than high-income children due to concerns about the cost of college.

In a set of field experiments, Destin and Oyserman (2010) provide an example of how assets may provide a way to address inevitable obstacles to doing well in school. Destin and Oyserman (2010) enhanced motivation towards schoolwork for low-SES middle-school students by providing information about need-based financial aid. Comparison group students, who received information about high college costs or did not receive any handout, were less motivated to spend time on schoolwork because they were not provided with a strategy to overcome the real economic hurdle of tuition costs. In addition, as stated in the review section, when describing why owning savings may have unique benefits for children, Elliott, Sherraden, Johnson, and Guo (2010) find that children who are in a school savings program are more likely to perceive that saving is a means to overcome the obstacle of high college costs than children in a comparison group.

Here, the role of assets and savings are clear. Children are more likely to develop and maintain a meaningful college-bound identity when resources feel available to make the image a reality. Family environments with more assets carry an enormous amount of everyday signals that tuition will not obstruct their education. Unfortunately, this is more applicable in high-income families than low-to-moderate-income families. In low- and moderate-income family environments, it is more common for children to receive everyday signals that tuition will obstruct their education. In such cases, we posit that children's savings may be particularly important. For example, Elliott, Constance-Huggins,

and Song (under review) find that net worth is a statistically significant predictor of achievement in a sample of high-income children ($50,000 or above) but not in a separate sample of low-to-moderate-income (below $50,000) children. Conversely, children's savings is a significant predictor of achievement in the sample of low-to-moderate-income children but not in the high-income sample of children.

Unique effects of children's savings

Based on evidence from research on children's savings, we posit that ownership has unique effects. The proposition that ownership has unique qualities has been suggested in other areas of research as well. For example, consumer researchers suggest ownership instills in people (to include children as young as age five) a greater sense of perceived control and sense of self (e.g., Belk, 1988; Furby, 1980). According to Belk (1988), it is through the process of ownership that items (such as money, other people and pets) can become part of the self. The greater exercise of power an adolescent has over a possession, such as money, the more closely identified with the self it becomes (Furby, 1980). What makes ownership important is not ownership for the sake of ownership, but what children perceive that ownership gives them control over – for example, a part in financing college. In a study of 51 fourth-grade children in a college savings program, Elliott, Sherraden, Johnson, and Guo (2010) find that children who are in the school savings program are statistically more likely to perceive that saving is a way to help pay for college than children in a comparison group. Another way to think of account ownership, particularly when children are saving for school, is that it gives children a stake in college.

We also posit that owning savings has benefits for children that household assets do not based, in part, on what children expect to save as a result of owning an account. This proposition is based on the fact that children in studies reported in this review have very little saved. For example, Elliott (2009) finds that on average children 12 to 18 have $401 saved. Given that most children have very small sums of money saved, we speculate that the asset effect of child's savings is due to account ownership or more specifically, expected savings, and not actual savings. Expected savings is the amount of savings children expect to have in the future because of ownership (e.g., Sherraden, 1990). Expected savings is not a specific dollar amount. Children likely think of it in more abstract terms, for example: (1) there is no chance I will be able to pay for college, (2) there is some chance I will be able to pay for college, (3) there is a 50-50 chance I will be able to pay for college, (3) it is pretty likely that I will be able to pay for college, or I will be able to pay for college.

The unique effect of ownership may provide low- and moderate-income children with a means to overcome everyday negative signals that result from a lack of family assets. Children's savings make future identities particularly salient, as children are actively involved in the process that is linked to their college goals. For example, in addition to saving for college, it may be that children's savings increases the likelihood that children will actively develop strategies to confront costs beyond saving, such as supplementing their savings with loans and financial aid.

Summary. Figure 3 provides a graphical depiction of the conceptual framework put forward in this review. In sum, we posit that both household assets and children's savings have direct effects on children's school and savings behavior. In regards to household assets and the asset effect, we posit that they act as explicit and subtle environmental messages (i.e., cues) that inform children's perception of the context (i.e., judgments of the cost and return on college). By positively influencing children's perception of the context, household assets make their college-bound identity more salient (e.g., by bolstering parents' expectations for their child), provide strategies for confronting difficulty (e.g., strategies for how to pay for college), and provide children with connection to the group (e.g., by bolstering the child's peer expectations). When action feels identity congruent, experienced difficulty highlights that the behavior is important and meaningful (Oyserman & Destin, 2010). Evidence suggests that these perceptions about one's college-bound identity (salience, difficulty, and group identity) are associated with whether children engage in school and savings behaviors (Oyserman & Destin, 2010).

The children's savings path contains two noteworthy differences from the household assets path. First, the dashed line in Figure 3 indicates that income and household assets act as a moderator between children's account ownership and expected savings and their perception of context. That is, we posit that, as income and household assets increase, children's savings effects increase. The second difference is that school and savings' behaviors have a reciprocal effect on children's savings (i.e., whether they have savings and/or the amount of expected savings). In the case of household assets, there is no arrow representing a reciprocal effect from behavior to household assets, because we suggest that it is unlikely that children's behavior has a meaningful effect on the amount of household assets available.

Figure 3: A college-bound identity conceptual framework of asset effects
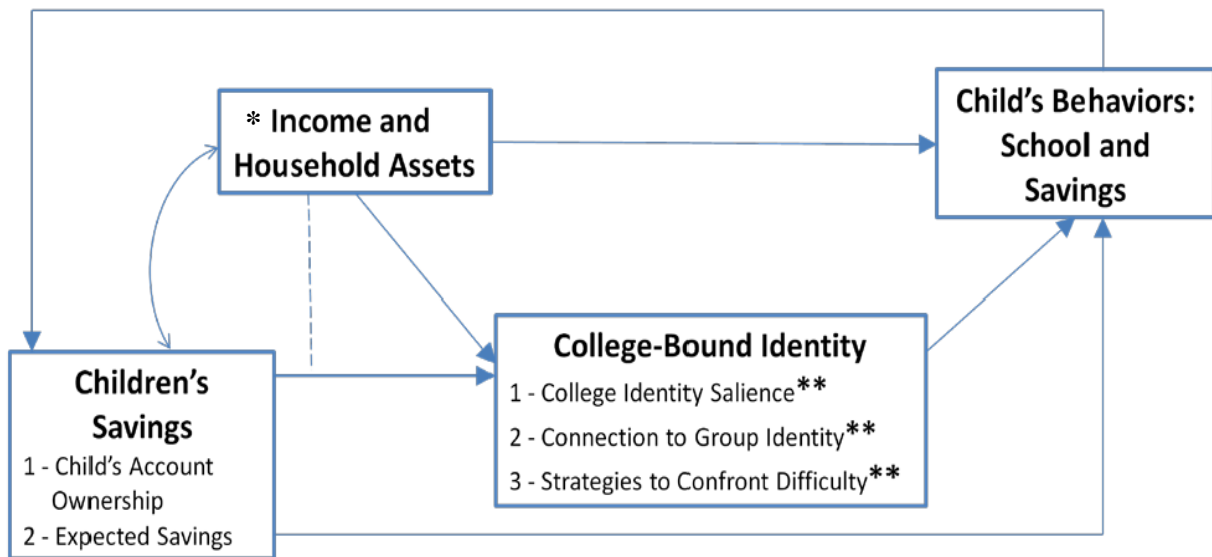
* Income and assets act as moderators in the children's savings path.

** Components of IBM that can each serve as mediators and moderators of effects on behavioral outcomes.

Hypotheses

In the remainder of this study, we conduct a preliminary test of the potentially reciprocal nature of the children's assets/expectation relationship specified in the conceptual framework presented in Figure 3 above. More specifically, we test the following hypotheses based on theory and past research: (1) Having a savings account as a child increases the likelihood that the child will have a positive college-bound identity; (2) Moreover, having a positive college-bound identity increases the likelihood that the child will own a savings account. This is in line with Yadama's and Sherraden's (1996) finding which suggests that, "assets lead to more positive attitudes and behaviors, and the same attitudes and behaviors lead to more assets" (p. 11).

Methods

Data

This study uses longitudinal data from the PSID and its supplements, the CDS and the TA. The PSID is a nationally representative longitudinal survey of US individuals and families that began in 1968. The PSID collects data on such things as employment, income and wealth.

The CDS was administered to 3,563 PSID respondents in 1997 to collect a wide range of data on parents and their children, aged birth to 12 years. Specifically, it focused on a broad array of developmental outcomes across the domains of health, psychological well-being, social relationships, cognitive development, achievement motivation, and education that were not contained in the PSID. Follow-up surveys were administered in 2002 and 2007. Our independent variables for children are taken from the 2002 CDS because this was the first year data were collected on parental savings for youth and youth's savings. The TA supplement, administered in 2005 and 2007, measured outcomes for youth who participated in earlier waves of the CDS, and were no longer in high school. Our outcome variables are taken from the 2007 TA.

The three data sets are linked using PSID, CDS, and TA map files containing family and personal ID numbers. The linked data sets provide a rich opportunity for analyses in which data collected at an earlier point (2002) can be used to predict outcomes at a later point (2007). Because the PSID initially oversampled low-income families, analyses are weighted using the last observed weight variable as recommended by the PSID manual (Gouskova, 2001).

Variables of interest

The variables in this study are children's college-bound identity and children's savings. Children's savings in 2002 is the independent variable affecting children's college-bound identity in 2007. Children's college-bound identity in 2002 is the independent variable affecting children's savings in 2007.

Children's savings. In 2002, children were asked whether they had a savings or bank account in their name. In 2007, they were asked whether they had a checking or savings account. Children who responded in the positive are defined as "having an account." The variable is drawn from the 2002 CDS and the 2007 TA data files.

College-bound identity. Children's college expectations are used as a proxy for children's college-bound identity. Children's college-bound identity is a dichotomous variable indicating whether children expect to attend or graduate from a four-year college or higher. The variable is taken from the 2002 CDS and the 2007 TA, when children are asked whether they expect to graduate from high school, graduate from a two-year college, graduate from a vocational or trade school, attend a four-year college, graduate from a four-year college, get more than a four-year college degree, or do something else. Children who expect to attend a four-year college, graduate from a four-year college, or more than four-years of college are defined as "expect to attend or graduate from a four-year college."

Study sample

The 2007 TA sample consisted of 1,118 participants. Since we are using savings and college-bound identity variables from 2002 as well as 2007, we limit the sample to those children who are in both the 2002 CDS and 2007 TA samples. Further, the sample is restricted to Black and White youth because only small numbers of other racial groups exist in the TA. The sample is also restricted to children who have graduated high school or completed a G.E.D. and are *not* attending a four-year college and have not graduated from a four-year college by 2007. The reason for this restriction is because college-bound identity as measured in this study has no meaning for children who are currently attending a four-year college or have already graduated from a four-year college. Our final weighted sample is 453. Children's age in 2007 ranged from 17 to 23 (mean = 21, SD = 2.53). The rest of the descriptive statistics for the study sample are summarized in Table 1.

Table 1. Characteristics of the study sample (N=453)

Categorical Variables	Percent
Savings 2002	
Has savings	73
Does not have savings	27
Savings 2007	
Has savings	87
Does not have savings	13
College-Bound Identity 2002	
Expects to attend or graduate from four-year college	86
Does not expect to attend or graduate from four-year college	14
College-Bound Identity 2007	
Expects to attend or graduate from four-year college	79
Does not expect to attend or graduate from four-year college	21

Source: Weighted data from the Panel Study of Income Dynamics and its supplements.

Analysis plan

Path analysis is used. First, a saturated SEM is examined. All parameters that are significant are retained in the final model. Since the correlation between college-bound identity and savings in 2007 is not significant, it is removed from the model (i.e., fixed at 0); as a result, model fit statistics can be reported. Second, using SEM, a path analysis is performed among college-bound identity and savings using mean and variance-adjusted weighted least square estimation method (WLSMV) on a tetrachoric correlation matrix. WLSMV adjusts for non-normality and small sample sizes with categorical data. A listwise deletion is performed. Exogenous variables (Independent Variables), college-bound identity, and savings in 2002 are dummy coded, while other variables are defined as categorical variables. The model chi-square along with two fit indices – Comparative Fit Indices (CFI) and Root Mean Square Error of Approximation (RMSEA) – are used to judge model fit. A CFI value of .95 or higher and a RMSEA value of .06 or lower indicate a "good" model (Hu & Bentler, 1998, 1999). Once a good model is identified, parameter estimates are tested using a z-test.

Results

Table 2 presents correlation matrices, means, and standard deviations for the variables used in the analysis. Due to the dichotomous nature of analysis variables, a tetrachoric correlation matrix is calculated. Table 2 indicates that the four main analysis variables are statistically associated: college-bound identity in 2002 with college-bound identity in 2007 (r=.31, p<.001), college-bound identity in 2002 with savings in 2002 (r=.24, p<.001), college-bound identity in 2002 with savings in 2007 (r=.25, p<.001), savings in 2002 with college-bound identity in 2007 (r=.30, p<.001), savings in 2002 with savings in 2007 (r=.40, p<.001),and savings in 2007 with college-bound identity in 2007 (r=.31, p<.001).

Table 2. Tetrachoric correlation matrix of study variables (N=453)

Variables of Interest	1	2	3	4
1 College-Bound Identity (2002)	1.000			
2 College-Bound Identity (2007)	0.31***	1.000		
3 Savings (2002)	0.24***	0.30***	1.000	
4 Savings (2007)	0.25***	0.31***	0.40***	1.000

Source: Weighted data from the Panel Study of Income Dynamics and its supplements.
Note: Given the binary nature of the variables, tetrachoric correlation was calculated.
* p <.05, **p < .01, *** p < .001

Figure 4 presents the path analysis model of children's savings and college-bound identity. Overall, the model fits between observed and modeled covariance matrix are very good: χ2 (2, N=447) = 1.486, p= .223; CFI= .99; RMSEA= .03. Given the viability of the model, we examine the hypothesized paths between factors.

As expected, we find that children's savings in 2002 had a positive significant effect on children's college-bound identity in 2007 (β = .27, z = 2.66, p = .008), while controlling for college-bound identity in 2002. Savings in 2002 also had a positive significant effect on savings in 2007 (β = .37, z = 3.89, p < .001).

As an alternative explanation, we turn to the possibility that college-bound identity predicts children's savings. We find that college-bound identity in 2002 had a positive significant effect on savings in 2007 (β = .19, z = 2.03, p = .04), while controlling for savings in 2002. Children's college-bound identity in 2002 had a positive significant effect on college-bound identity in 2007 (β = .26, z = 2.72, p < .006).

Figure 4. Standardized coefficients for changes in college-bound identity and children's savings at Time 1 (2002) and college-bound identity and children's savings at Time 2 (2007) (N=453) [a, b]
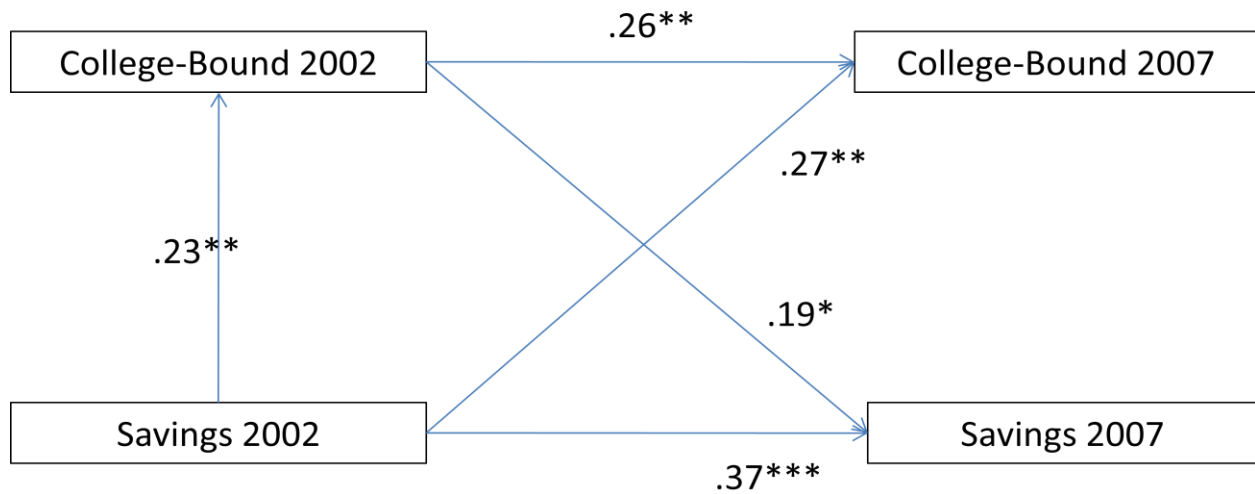
Note: Maximum number of iterations = 2000. Model chi-square(2) = 1.486, p = 0.223, CFI = 0.99, RMSEA = .03; After listwise deletion N = 447. See Appendix A for full model details.
[a] Path analysis model estimated using the mean and variance adjusted weighted least square estimation method (WLSMV).
[b] The correlation between college-bound identity and savings in 2007 is not significant. Therefore, it was removed from the model (i.e., fixed at 0).
* p <.05, **p < .01, *** p < .001

In sum, as expected, we find evidence of a "virtuous circle" between children's savings and college-bound identity. That is, we find that savings in 2002 had a positive significant association with college-bound identity in 2007, while controlling for college-bound identity in 2002. Further, we find that college-bound identity in 2002 had a positive significant relationship with savings in 2007, while controlling for savings in 2002. Additionally, savings has a slightly stronger association with college-bound identity than college-bound identity has with savings.

Discussion and Conclusion

Despite growing evidence that the relationship between assets and college is partially explained by children's college-bound identity, questions about temporal ordering remain: Does savings predict college-bound identity or does college-bound identity predict savings? Mathieu and Taylor (2006) suggest that a way to provide additional evidence of temporal ordering is to conduct a simultaneous test of competing theories in the same model (also see Yadama & Sherraden, 1996). This study provides a simultaneous test of whether savings predicts college-bound identity or college-bound identity predicts savings. The study design has four desirable features: it is based on more highly specified theory than in the past, it is longitudinal in regards to the asset/expectation relationship, it simultaneously considers whether assets predict college-bound identity or vice versa, and it uses data collected recently.

Results support the hypothesized effects. We find that children's savings in 2002 had a modest effect in the predicted direction on children's college-bound identity in 2007. This is consistent with previous research on the relationship between assets and children's college-bound identity. For example, Williams Shanks and Destin (2009) found that net worth measured in 1994 was significantly related to parents' expectations in 1997 and 2002. Further, we find that college-bound identity in 2002 predicted savings in 2007. While no other research has specifically tested the children's college-bound identity → children's savings path, two studies include a future orientation scale. Yadama and Sherraden (1996) used the horizon proxy index, which included questions on such things as expectations about a new job, having more children, and having specific educational goals for one's children. They found that horizons were not significantly related to parents' savings. In contrast, Friedline, Elliott and Nam (in press) found that children's future orientation (a scale created using 2002 data that included children's college expectations) was a significant predictor of whether children have savings of their own in young adulthood (ages 17 to 23 in 2007). These different results may be explained, at least in part, by the fact that Yadama and Sherraden (1996) tested effects on parent savings while "Identifying Citation" tested effects on children's savings.

Results also support our second hypothesis; having savings in 2002 is predictive of having savings in 2007. This is also similar to findings by Friedline et al. (in press). Not surprisingly, we also find that having a positive college-bound identity in 2002 was predictive of having a positive college-bound identity in 2007.

Limitations

A limitation of this study is the uncertainty of omitted variable bias. Children who have accounts and savings may differ from other children in other ways that affect either college-bound identity or college progress (e.g., motivation or self-discipline). Thus, it could be that the significant effect of account ownership or savings is spurious. However, a growing body of research suggests that savings has an independent effect on children's educational outcomes. To the degree that these previous studies have controlled for the right things, we can be confident that assets have an

independent effect on children's college-bound identity. Moreover, controls are of no theoretical or policy interest in this study, and would needlessly over-complicate the model.

Further, it is impossible in this study to measure whether children *grow up* with knowledge that they have financial means to help pay for current and future schooling. This is because we measure children's savings at one time point (2002). We also had to use children's basic savings instead of savings specifically designated for school because there is no such variable in the TA sample. It may be that effects of savings on college-bound identity are stronger when children have savings specifically for school. Further, the TA savings variable is a general question that asks children if they have either a savings or checking account. Children who have recently left high school have increasing responsibilities (such as paying rent, car payments, etc.) that may make a checking account necessary. However, effects may be different for children who only possess a checking account than for children who possess a savings account. Checking accounts are not about the future, but for meeting consumption needs, while savings accounts, in contrast, are for storing money over time. This is illustrated by the fact that interest rates, when applicable are lower on checking accounts than they are on savings accounts. Therefore, it may be that children's college-bound identity, a future self, is less affected by having a checking account than it is by having a savings account. This may reduce the effects of college-bound identity on children's savings in 2007. However, the correlation between savings in 2002 and savings in 2007 is the highest of any of the correlations at $r=.40$. This suggests that many of the children who had savings in 2002 also reported having a savings or checking account in 2007.

Also, the sample includes only those children who have graduated high school or completed a G.E.D., are not currently attending a four-year college and have not graduated from a four-year college by 2007. However, many young people start at a four-year college at age 18 and graduate college at age 22 if they have not dropped out of school sometime in their lives. Accordingly, the study's sample may consist of a specific group of children who may not reflect the general population. Despite this, there are a growing number of children who are attending two-year colleges upon leaving high school as a step toward a four-year degree (Gross and Goldhaber, 2009).

Lastly, the proxy for college-bound identity as measured in this study is whether or not children expect to attend a four-year college, graduate from a four-year college, or have more than four years of college, only captures one aspect of the concept of college-bound identity – salience. It indicates whether children have in the forefront of their minds the goal of attending and graduating from a four-year college. It does not, however, capture group identity or difficulty. Even if we only concern ourselves with salience, college expectations may not be the best measure. Most children in this study have positive college expectations (86%). Destin and Oyserman (2009) find similar results with respect to college expectations. They find that 88.8% of children in their study expect to go on to college. Because of the small amount of variability they argue that education-independent identity (i.e., future identity that requires a college-degree such as lawyer) may better capture salience. They

find that only 54% of children have an education-dependent identity. A better measure of college-bound identity or even salience may change the results.

Implications

Although statistical analyses examining predictive power (which requires only control of time order and showing correlation) cannot establish causal links definitively, they can provide evidence that one direction is more plausible than another, and they can provide invaluable information for the design of fully experimental studies of causal processes (see Bollen, 1989; MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). Findings from this study suggest that children's savings have a slightly stronger relationship with children's college-bound identity than children's college-bound identity has with savings. Given this, the temporal ordering specified in asset theory—that assets lead to more positive college-bound identity—is supported in this study. The best interpretation of current and previous findings is that there is two-way causation (assets → expectations; expectations → assets) (see e.g., Yadama & Sherraden, 1996; Zhan & Sherraden, 2003). This suggests that policies, such as Child Development Accounts (CDAs), that seek to build a positive college-bound identity among children, in addition to encouraging savings, are likely to have a positive effect on children's college-bound identity.

The potential for multiple positive effects may make policies that seek to build assets among children particularly alluring. Further, if our findings of a virtuous circle between children's savings and their expectations are confirmed in future research, asset-building policies that seek to build both children's savings along with college-bound identity may be most effective at increasing the number of children who have savings and their college outcomes. For example, Friedline et al. (in press) find that children's future orientation (a scale created using 2002 data that included children's college expectations) was a significant predictor of whether children had savings of their own in young adulthood (ages 17 to 23 in 2007). Moreover, in a study using a sample of children who expected to graduate from a four-year college, Elliott and Beverly (in press-b) find that children who had an account were three to six times more likely to attend college than children with no account. Further, findings of a virtuous circle provide some support for the theoretical model presented in this article.

Future research

In this study, we focused on the temporal precedence of the asset/college-bound identity relationship. While this study did not seek to test mediation, future research examining mediation will be strengthened if a fully longitudinal design is used in regards to mediation (i.e., assets prior to expectations, expectations prior to the educational outcome under investigation) and more advanced methods for testing mediation are used such as bootstrapping. More research is needed to identify at what age children are actually capable of understanding the link between savings and future events such as college. This has important implications for when we can expect attitudinal effects to occur. Similarly, there is a need for more research on the age at which children develop a college-bound

identity. Future research may want to examine the full conceptual model presented in this paper. Finally, researchers may also want to further examine how well college-bound identity predicts educational outcomes of children. It may be that the specific dimensions of college-bound identity (i.e., salience, congruent identity, or difficulty) are better predictors (e.g., Destin & Oyserman, 2010) and that one aspect of college-bound identity is stronger than others. Along with this, there is a need to develop reliable and valid proxies for each of the components of college-bound identity.

Conclusion

Based on our findings of possible two-way causation and previous research, we suggest that children's asset-building programs that build both their savings and their college-bound identity may be more effective at increasing account ownership (also see Friedline et al., in press) and positive college outcomes (see Elliott and Beverly, in press-a) than those focused solely on savings. In particular, we suggest that programs should reinforce the link between account ownership and college-bound identity by providing children with information about how savings can be used to reduce college costs (see Destin & Oyserman, 2009). Also, programs may want to attempt to increase the amount of savings children expect to have in the future by giving them an initial deposit, providing a match, or offering monetary rewards for school performance. These are just a few ways that asset programs can help build the link between savings and college-bound identity.

While no statistical test can unequivocally differentiate one causal sequence from another, findings from this study provide additional evidence that assets, particularly savings, can lead children to have a positive identity in regards to attending and graduating from college. Moreover, the age-old question, "what comes first, the chicken or the egg?" does not appear to apply in the case of the assets/college-bound identity relationship. As Yadama and Sherraden (1996) suggest, the assets/expectations relationship should be thought of more in terms of being a "virtuous circle," where assets predict expectations and expectations predict assets.

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Appendix A. Standardized coefficients for changes in college-bound identity and savings at Time 1 (2002) and college-bound identity and savings at Time 2 (2007) (N=453) [a, b]

Dependent Variables	Independent Variable	B	SE	z	p	R^2
College-Bound Identity (2007)						0.17
	College-Bound Identity (2002)	0.26	0.10	2.72	0.006	
	Savings (2002)	0.27	0.10	2.66	0.008	
Savings (2007)						0.21
	College-Bound Identity (2002)	0.19	0.10	2.03	0.043	
	Savings (2002)	0.37	0.09	3.89	0.000	

Note: Maximum number of iterations = 2000. Model chi-square(2) = 1.486, p = 0.223, CFI = 0.99, RMSEA = .03; After listwise deletion N = 447.
[a] Path analysis model estimated using the mean and variance adjusted weighted least square estimation method (WLSMV).
[b] The correlation between college-bound identity and savings in 2007 is not significant. Therefore, it was removed from the model (i.e., fixed at 0).