Economic and Parent-Adolescent Relationship Capital Predicting Educational Outcomes

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Thesis submitted to the faculty of the Virginia Polytechnic Institute and State University in partial fulfillment of the requirements for the degree of

Master of Science
In
Human Development

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May 4, 2010
Blacksburg, VA

Keywords: adolescence, attainment, education, parent-child, social capital

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ABSTRACT

Using the perspectives of social capital theory (Coleman, 1988) and life course theory (Elder et al., 2003), this study examined how economic capital and particular dimensions of the parent-adolescent relationship predicted educational outcomes. The economic capital variables were family income, parent education, and parent occupational prestige. Relationship capital variables included: closeness to parents, expectations for schooling, parental values, and parent trust. The three economic capital variables, expectations for schooling, and parent trust all significantly predicted final GPA and educational attainment. However, parent-adolescent closeness and parental values did not predict educational outcomes in the overall model. This study extended research in the field by examining both final GPA and educational attainment as educational outcomes. By using a nationally representative sample and four time points of data collection, this research was able to explore how various forms of capital predict early adulthood educational outcomes.

ACKNOWLEDGEMENTS

First, I would like to thank my committee chair, Dr. Mark Benson, for guiding me through this process. This is just the beginning and I look forward to our future work together. I also want to thank Dr. Christine Kaestle for not only providing the use of the secondary dataset for this study, but also all of her helpful comments on drafts. Dr. Kee Jeong Kim also provided great help in developing my ideas and final results. I sincerely thank all of my committee members for their continued support.

I also want to acknowledge the support of my family and friends throughout this process. My parents put me on my own path for educational attainment and I am deeply grateful for their support and encouragement. I also greatly appreciate that my grandmother, Shirley Cox, will read every page of my thesis. I also want to mention my two younger sisters, Heather and Avery, because this may be the only page they read. Thank you for being two great sisters. Especially close to my heart is Tom Bond, who came with me to Virginia to begin this journey and has stuck with it, thesis writing and all. My colleagues and friends in the department were also a major source of support for this project. They helped me not only specifically with my thesis, but also helped balance out the emotions and daily distractions of life. Special thanks belong to: Emily Cheshire, Danielle Skurka, and Bradford Wiles.

This research uses data from Add Health, a program project directed by Kathleen Mullan Harris and designed by J. Richard Udry, Peter S. Bearman, and Kathleen Mullan Harris at the University of North Carolina at Chapel Hill, and funded by grant P01-HD31921 from the Eunice Kennedy Shriver National Institute of Child Health and Human Development, with cooperative funding from 23 other federal agencies and foundations. Special acknowledgment is due Ronald R. Rindfuss and Barbara Entwisle for assistance in the original design. Information on how to obtain the Add Health data files is available on the Add Health website (http://www.cpc.unc.edu/addhealth). No direct support was received from grant P01-HD31921 for this analysis. The AHAA study was funded by a grant from the National Institute of Child Health and Human Development under grants 01 HD40428-02 to the Population Research Center, University of Texas at Austin; Chandra Muller (PI) and from the National Science Foundation under grant REC-0126167 to the Population Research Center, University of Texas at Austin; Chandra Muller and Pedro Reyes (Co-PI).

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INTRODUCTION

Educational attainment is an important, positive concept in today's research, for both individuals and society as a whole (Plank & MacIver, 2003). Educational attainment is associated with positive outcomes such as higher occupational status, sense of control over life, (Flouri & Hawkes, 2008) and even closer parent-child relationships in adulthood (Lefkowitz, 2005). Antecedents of educational attainment may include, but are not limited to: family socioeconomic status, neighborhood quality, parental support, expectations for the future, and academic ability. The influences of parental involvement on adolescents' academic achievement have been well-documented in the literature (Hill & Tyson, 2009). Additionally, the influence of the child's own engagement in the process that leads to their academic achievement has been thoroughly examined (Johnson, McGue, & Iacono, 2006). It is important to study the combination of economic resources and parent-adolescent relationship interactions utilizing both social capital and life course theories. Using a nationally representative dataset, this study explores how social capital and the investments of parents and adolescents contribute to early adulthood educational attainment.

Social Capital Theory

While ideas of social capital have evolved into different meanings, Coleman (1986) is considered one of the main theorists focused on how the functions of social capital relate to the family relationship. This structure includes people, or actors, who influence how social capital operates. Coleman (1988) argues social capital tends to result in productive activity among groups of people such as families. Families have norms, which help build family structure. For example, the parent-child relationship norm holds the expectation that the parent will provide for the child, in an unbalanced relationship. While this unbalance may be detrimental to other structures, it is an unbalance that works for most families. The parent-child relationship will typically evolve into a new norm of a balanced structure as the child develops into adolescence and early adulthood.

Coleman (1988) does not distinguish between social capital variables such as family structure and parental expectations. While several definitions social capital variables emerged over the decades, the Family Investment Model (FIM) tested a distinction between parental capital and parental investments (Conger & Donnellan, 2007). The distinction is vital as investment variables mediate the relationship between parental capital and children's well-being outcomes. Parental capital, or socioeconomic status, is defined as three main dimensions: family economic resources, parent education level, and parent occupational status (Conger & Dogan, 2007). Parental investments are loosely defined as any behavior focused on helping the child, like reading in the home. A recent study using the FIM model directly observed supportive parenting behaviors in order to measure parental investments (Melby et al., 2008). Supportive parenting behaviors may also be measured by asking both parents and adolescents about their relationship.

This study proposed here will examine parental investments as part of parent-adolescent relationship capital because the assumption cannot be made that every parenting behavior is a positive influence. The word investment assumes a positive meaning, but the term relationship capital assumes the behaviors parents are already involved in may or may not be beneficial for their child. The gathering of several capital resources makes the positive influence on educational outcomes. For example, a parent may believe they are investing in their adolescent's future by having extremely high expectations, but the adolescent may feel too much pressure from those expectations. Those too high expectations as part of parent-adolescent relationship capital may not be positively influencing their academic achievement. At the same time, that parent-adolescent relationship may have strong economic capital to rely upon. The adolescent then still succeeds in their academic achievement and educational attainment, even when lacking a particular variable of capital. In order to understand the history behind educational attainment, it is important to consider and distinguish between these several types of capital.

Bringing all of these types of capital together under one umbrella demonstrates how social capital consists more of processes and interactions rather than definite, quantifiable constructs (Bankston & Zhou, 2002). This study aims to extend the idea that social capital is a process over time and important in studying specific aspects of the life course. As family social capital tends to contribute more to academic achievement compared to community social capital (Duncan, Boisjoly, & Harris, 2001; Israel, Beaulieu, & Hartless, 2001), this study focuses on family social capital concepts in order to better understand the parent-adolescent relationship.

Economic Capital

One quantifiable part of social capital is economic capital. These variables include parental income, father and mother levels of education, and even the type of parental occupation. Studies in the field tend to mesh these individual concepts into one variable of socioeconomic status (SES), but it is more beneficial to separate the variables in order to conduct careful measurement (Duncan & Magnuson, 2003). SES is essential in studying educational attainment as it is one of the most important predictors of early high school dropout rates (Battin-Pearson et al., 2000). Children with low SES tend to have limited access to resources like nutrition, health care, housing, and even cognitively stimulating materials and experiences (Bradley & Corwyn, 2002). As parents influence adolescent’s educational attainment through their own capital of income and socioeconomic status, these capital variables then influence the occupational attainment of the child (Andres & Grayson, 2003).

Family income is another quantifiable part of economic capital and one of the most common way of measuring SES. Family income is a distinct variable separate from education and occupation levels. While higher income has positive effects on most well-being outcomes for children, society cannot simply raise income for all families (Mayer, 1997). Other factors need to be taken into consideration like the environment parents provide, their neighborhood quality, and access to adequate resources. Mediators of the relationship between income and academic achievement include parenting behaviors, home activity, and school behavior (DeGarmo, Forgatch, & Martinez, 1999).

In addition to family income, parental education levels and occupational status are part of socioeconomic indicators. Moderated by gender, parents' occupational and educational levels positively influence student performance (Marks, 2008). Parent occupational status substantially influences educational attainment in adulthood even when other factors are controlled (Dubow, Huesmann, Boxer, Pulkkinen, & Kokko, 2006). Examining parental education levels and occupational status as part of economic capital will help explain socioeconomic status beyond family income.

Parent-Adolescent Relationship Capital

Relationship capital behaviors, such as reading in the home, positively influence children's educational attainment (De Graaf, De Graaf, & Kraaykamp, 2000). This relationship may be especially important when parents have a low level of education. Essentially, the types of parents who have low capital in one area might compensate by building capital in another area, which helps to positively influence their children's outcomes. An example of this phenomenon in current society is a first generation college student (Gofen, 2009). Focusing on the specific population, the study found first generation college students believed their parents were influential in their choice to attend college even though they were lacking some aspects of economic capital. The specific type of parent that encourages their child to succeed beyond their own levels of education is in contradiction with social capital theory. These types of parents make it important to include both economic and relationship capital variables because they serve as an example of low economic capital with high relationship capital still predicting successful educational attainment.

Parental values are another type of relationship capital examined in this study and are associated with social class levels (Kohn, 1963). Historically, parental values of working-class and middle-class mothers have changed over time (Bronfenbrenner, 1958). After World War II, middle-class mothers became more permissive in their parenting, gained greater access to physicians and counselors, and listened to the new advice available in the field. Middle-class parents viewed parenting as hard work and a task they must complete (Kohn, 1963). Alwin (1989) argues parental education levels and occupations lead to different conditions of work (task complexity, supervision, routinization, and size of workplace), which then lead to different parental values (autonomy versus conformity). For example, a parent working in a factory has close supervision, low task complexity, and strict routinization. The familiarity of these tasks most likely influence values towards conformity. Therefore, that parent may expect the same behaviors from their child. Recent research demonstrates the significant influence of parental values on student motivation and competence beliefs (Marchant, Paulson, & Rothlisberg, 2001). Parental values help bridge economic capital variables and educational attainment.

Other dimensions of the parent-adolescent relationship are also important for predicting educational attainment. Close relationships are important for the parent-adolescent relationship as distant relationships tend to be associated with lower academic achievement (Crosnoe, 2004). Parent-child communication is also an important predictor of school performance, but it depends on the type of communication (Pong, Hao, & Gardner, 2005). Talking about school related issues is more important for school performance than talking about daily issues. Closeness and communication are just two of the possible positive dimensions predicting school outcomes.

Overall, parental expectations and aspirations tend to be significantly related to children's educational attainment, but are also mediated by several factors (Marjoribanks, 2002). For example, in a study focusing on immigrant generation status, parents' expectation for college influenced educational attainment through the adolescent investments of previous academic ability and achievement (Keller & Tillman, 2008). Additionally, the aspirations and expectations parents' have for their adolescents strongly predict school grades (Juang & Silbereisen, 2002). These beliefs and expectations are dynamic and bidirectional (Sigel & McGillicuddy-De Lisi, 2002). Marjoribanks (2002) used a distal family model to include both social status and parents' aspirations to predict adolescents' own aspirations. This relationship is moderated by other variables such as individual characteristics and sex-related differences. Female undergraduates form and develop career goals based on their parents' expectations (Li & Kerpelman, 2007). These parental links to educational attainment point to the need for more models that include both parental and adolescent expectations, from their individual perspectives.

Adolescent Perspectives

Adolescents are experiencing the parent-child relationship from a different point of view than their parents. These differences in perceptions are important to examine as ultimately, the adolescent's perceptions may be the most important in determining educational attainment (Pelegrina, Garcia-Linares, & Casanova, 2003). Additionally, emotional distance adolescents experience in their relationship with their parents can be detrimental to academic achievement (Crosnoe & Elder, 2004).

Children are interacting with their parents to build social capital while making their own social investments in order to succeed (Morrow, 1999). These investments include, but are not limited to: academic ability, the track of coursework in high school, and final grade point average upon graduation (Becker, 1993). Young adults value the concepts of living away from home and working and as a result, educational attainment is the main method through which they will achieve these goals (Sandefur, Eggerling-Boeck, & Park, 2005). One of the most influential investments an adolescent makes for their future educational attainment in the context of the Family Investment Model is their overall grade point average (GPA) in high school (Melby et al., 2008), especially as college has almost become a necessity for economic and career choices (Cote, 2006).

Additionally, it is important to keep achievement in the context of expectations. Marjoribanks (2006) proposes a cognitive habitus model that includes a combination of academic achievement and cognitive attitudes towards school. These combinations then sort children who have high or low ability and high or low aspirations. For example, some children with low abilities and high aspirations succeed at the same level as their peers with high abilities and low aspirations. This study includes both variables to help differentiate the students who have high expectations but are still achieving at a low level.

Integrating the Family Life Course Developmental Framework

As the parent-adolescent relationship develops into early adulthood, social capital theory variables are important to study in context of the family life course developmental framework (White & Klein, 2008). Life course theory examines how historical, biological, and family events influence the stages of development (Elder, Johnson, & Crosnoe, 2003). The main principles, life-span development, agency, timing, and linked lives, make social capital theory especially applicable for families as they incorporate the types of capital examined in this study.

The principle of life-span development reminds researchers that educational attainment is a lifelong process (Elder et al., 2003). As discussed earlier, a lack of economic capital variables are not putting students on a track towards failure; rather the principle of agency promotes the active choices parents and adolescents may make to positively influence the future (Gecas, 2003). Through the principle of timing, this study focuses on adolescents as they prepare for and experience the transition into adulthood. Uhlenberg & Mueller (2003) argue the transition from adolescence to adulthood is the most important because so many changes are happening at once. Young adults find themselves with new choices about education, work, and relationships, with no one path being the best choice for everyone. Even though adolescents may have similar experiences of graduating from high school, that event still leads to different patterns of outcomes. As 87% of the U.S. population over the age of 25 has graduated from high school (U.S. Census, 2009), that event has become an age-related expectation (Settersten, 2003). However, only 29% of that same population has obtained a bachelor’s degree (U.S. Census, 2009), demonstrating that higher education does not currently have the same expectation.

The principle of linked lives combines the viewpoints of both parents and adolescents. For example, an adolescent may not realize how their parents are influencing their own behavior until later life transitions have been experienced. Parental involvement tends to decrease in adolescence (Spera, 2005) and autonomy becomes more important (Steinberg, 2001), perhaps biasing the adolescent's perspective about their relationship with their parents negatively. Therefore, it is important to include both parent and adolescent perspectives on the relationship. All of these principles focus on individual processes and decision-making in the context of social capital theory variables (Elder et al., 2003). This study does not presume that studying the range from adolescence to early adulthood covers the scope of life course theory, but instead that life course theory helps put this study into context.

Age, Ethnicity, Gender, and Family Structure Issues

As life course theory suggests, age is an important influence on behavior (Elder et al., 2003). Younger students tend to be more optimistic about the future than older students (Lupart, Cannon, & Telfer, 2004). This age variation may be due to knowledge about potential barriers to education. In addition, emerging adults begin to realize the realities of work and school and how their high expectations have changed (Konstam, 2007). For example, an emerging adult may have high hopes for their future and plan to succeed, but they may be limited by poor choices from the past. Compared to their parents' views, adolescents may feel that high school is not critically important, but as they mature into emerging adults, they begin to see the importance of school as it impacts their immediate and future career choices (Arnett, 2006).

As racial gaps still exist in academic achievement (Orr, 2003), it is important to examine how ethnicity interacts with economic capital, especially when factors like family income may explain the gaps. Socioeconomic status and academic skill influence aspirations among Latino adolescents (Bohon, Johnson, & Gorman, 2006). African American adolescents may be more susceptible to current family structure changes compared to White adolescents (Heard, 2007). For example, an African American adolescent who has been raised in a single mother household has more time to adjust and build capital in other ways compared to an adolescent currently experiencing divorce. While the core capital ideas appear to be the same across different ethnicities, additional variables, such as contact with extended family members, may be explaining more of the unknown variance for certain populations (Ferguson, 2004).

Ethnicity is also important to study in the context of parental perceptions (Eng, Kanitar, Cleveland, Fischer, & Wiersma, 2008) and educational expectations (Mello, 2009). In one study of African American adolescents, dimensions of parental support, behavioral control, and psychological control were not significantly related to academic achievement (Bean, Barber, & Crane, 2006). The African American parents in the study are still influencing their children's academic success, but perhaps in different ways than typically examined. These issues demonstrate the important of examining ethnicity in order to understand how a complete model operates related to educational attainment.

Gender is another important control to examine in this study as historical issues of equality and expectations have changed educational attainment trends (Mello, 2008). Females have higher educational aspirations as compared to males (Mau & Bikos, 2000). In general, the inequality of race and gender tend to result in higher expectations (Eccles & Wigfield, 2002).

Family structure is another important factor to consider in the overall model leading to educational attainment because it predicts parental influences in the parent-adolescent relationship (Tucker, Barber, & Eccles, 2001). Divorce, or union dissolution, negatively influences academic achievement in adolescents (Frisco, Muller, & Frank, 2007). Transitioning after divorce and entering into stepfamilies is a stressful process itself that negatively influences adolescent academic achievement (Guidubaldi & Duckworth, 2001; Tillman, 2007). The researchers point out it is important to remember divorce may not be causing the decline directly, but it is the transition after divorce that influences the grades and coursework adolescents continue to take in high school. These grades and coursework tracks then influence adolescents' educational attainment. In comparing intact, divorced, and blended families, one study supports the modifying effect parental support has on adolescent academic achievement, regardless of family structure (Boyce Rodgers & Rose, 2001).

In addition to divorce, single mother households are a focus of recent studies as they are closely linked to socioeconomic status issues. Biblarz and Raftery (1999) found these structure effects disappear when SES was controlled. They argued it is not a matter of whether you live only with your mother or not, it is whether she can provide the same amount of income and resources compared to two-parent families. Examining family structure in the context of the larger model will help explain those differences.

Addressing Gaps in Literature

Currently, the literature in the field contains a large amount of information demonstrating the link between supportive parenting and high academic achievement (Brown & Iyengar, 2008; Hill et al., 2004; Juang & Silbereisen, 2002). When studies expand academic achievement into educational attainment, they can still be limited by qualitative retrospective data (Gofen, 2009) and lack of parent questionnaires (Mello, 2008). Even longitudinal studies examining the developmental process of educational attainment have their limitations (Melby et al., 2008; Pettit, Yu, Dodge, & Bates, 2009). These studies are not generalizable to nationally representative and diverse populations as their populations were purposefully limited. Specifically, Melby and colleagues (2008) focused on households with two biological parents and at least one sibling. The participants were part of the ongoing longitudinal study focused on rural, lower-income families in North Central Iowa. Pettit and colleagues (2009) were also limited by Midwestern middle-class households, but included family structure and ethnicity for comparisons. These groups were still limited to intact versus nonintact families and European American versus African American families.

Melby and colleagues (2008) were limited to 451 participants, Pettit and colleagues (2009) were limited to 585 participants. The current study used a nationally representative dataset with approximately 8,000 participants. The powerful dataset will enable testing for potential differences in family structure and ethnicity. It is important to examine family structure as the process leading to educational attainment may be different for intact versus divorced families (Tucker et al., 2001). Ethnic differences are also important to examine as racial gaps still exist in academic achievement (Orr, 2003).

Addressing socioeconomic resources, Pettit and colleagues (2009) only used mother's education level measured when the participant was five years old. Melby and colleagues (2008) used three measures of socioeconomic resources in order to test the Family Investment Model. However, in examining the outcome of educational attainment, Melby and colleagues (2008) focused only on educational level reached at 26 years old. The current study examined both cumulative grade point average achieved out of high school and educational attainment levels. Pettit and colleagues (2009) measured level of education at 21 years old. Twenty one years old is still a common time for U.S. students to be enrolled in college, but not yet finished. The current study examined educational attainment levels from a range in age of 26-32 years old.

Overall, the two articles discussed in this section are excellent contributions to the field of educational research. Those studies give excellent examples of how the field needs to continue to develop rigorous studies examining educational attainment over time with advanced statistical techniques. The current study adds to the literature in the field by addressing the issues of sample size, diversity in sample demographics, socioeconomic resource measures used, and types of educational attainment examined.

Hypotheses

Hypothesis 1. There will be a significant direct effect of economic capital variables on GPA and educational attainment.

Hypothesis 2. There will be a significant direct effect of economic capital variables on parent-adolescent relationship capital variables.

Hypothesis 3. There will be a significant direct effect of the parent-adolescent relationship capital variables on each educational outcome.

Hypothesis 4. In the overall model, each addition of sets of variables (background, economic capital, and relationship capital) will result in a significant contribution to predicting educational outcomes.

METHOD

This study uses the contractual data set from the National Longitudinal Study of Adolescent Health (Add Health), a longitudinal study involving adolescents in grades 7-12 in the United States during the 1994-1995 school year (Wave I, N = 20,745). The same respondents were then followed a year later (Wave II, 1996, N = 14,738), into emerging adulthood (Wave III, 2001-2002, N = 15,197), and again at ages 26-32 (Wave IV, 2008-2009, N = 9,421). Additionally, the head of household, preferably the biological mother, was given an in-home parent questionnaire.

Wave I includes a sample of 80 high schools and 52 middle schools from the U.S., selected with unequal probability of selection. Incorporating systematic sampling methods and implicit stratification into the Add Health study design ensured this sample is representative of U.S. schools with respect to region of country, urbanicity, school size, school type, and ethnicity (Harris et al., 2008). Even though Add Health is school based, the in-home questionnaires prevent bias against students who did not complete their high school education (Udry & Chantala, 2003). To qualify for this study, participants must have: participated in Waves I, III, and IV, a valid sampling weight, ranged in age from 12-18 years old, a parent participate in the parental questionnaire, and released their high school transcripts (N = 7,658).

When all independent variables were examined listwise among qualifying participants, only 4,140 participants answered every question required for analyses. None of these questions were particularly sensitive or had theoretical reason to become missing. Therefore, multiple imputation in LISREL 8.80 was utilized to regain 7,658 participants across all variables. In comparing means and standard deviations of original data and imputed data, there were no significant differences. All analyses discussed use the imputed data. Actual analyses were conducted in SPSS 16.0 (Graduate Student Version).

Dependent Variables

Final grade point average. The first dependent variable is final grade point average (GPA) obtained from the Adolescent Health and Academic Achievement Study (AHAA). Add Health participants consented to releasing their official transcripts from the school they last attended. These transcripts address the issues of misrepresentation in self-report. GPA is represented on a scale from 0 to 4.00 (see Table 1). While the main focus of this study is educational attainment, GPA scores as a dependent variable will be used to help understand the overall relationship in more detail.

Educational attainment. The dependent variable of educational attainment is measured using an ordinal scale of a hierarchy containing years attended and degrees obtained representing lowest level of education to highest level of education. Pallas (2003) makes the point that only counting the number of years attended is not sufficient in examining educational attainment across the life course. In current society, the role individuals play as students go beyond their high school degrees and may include certifications and trainings within the workplace. Pallas (2003) suggested instead to use a hierarchical system with distinctions among general and vocational training. For example, lower tertiary education involves vocational program certification while higher tertiary education involves the completion of a typical university degree. Examining educational attainment in these structured methods leads to a better understanding of the life course above and beyond emerging adulthood. This study uses a scale ranging from least amount of education to highest amount of education. These categories were determined by the response categories to questions regarding educational attainment in Wave IV, preserving as much detail as possible: (1) eighth grade or less, (2) some high school, (3) high school graduate, (4) some vocational/technical training (after high school), (5) completed vocational/technical training (after high school), (6) some college, (7) completed college (bachelor's degree), (8) some graduate school, (9) completed a master's degree, (10) some graduated training beyond a master's degree, (11) completed a doctoral degree, (12) some post baccalaureate professional education (e.g., law school, med school, nurse), and (13) completed post baccalaureate professional education (e.g., law school, med school, nurse). See Table 1 for descriptive statistics.

Degree attainment. Early adulthood educational attainment is also examined as a binary categorical variable, facilitating interpretation of the original ordinal scale. Two categories were created: no bachelor's degree completed (0) and bachelor's degree attainment or higher (1). 36% of the sample obtained a bachelor's degree or higher by Wave IV.

Economic Capital Variables

Family income. Income is determined by parental response to total family yearly income before taxes in 1994, with responses ranging from $0 - $999,000. Average income for families is $47,438.

Parent education. This study employs part of the Modified Dominance Model, where the highest status parent's information is used to define the variable (Korupp, Ganzeboom, & van der Lippe, 2002). This addresses the issue of gender stereotypes when only focusing on the father and prevents collinearity in examining both parents' information at the same time. Additionally, this method allows for family structure issues to be taken into consideration, as some families only have one parent's information to report. Adolescents reported on each of their resident parents' education level with categories ranging from: (1) eighth grade or less, (2) more than eighth grade, but did not graduate from high school, (3) went to a business, trade, or vocational school instead of high school, (4) high school graduate or completed a GED, (5) went to a business, trade, or vocational school after high school, (6) went to college, but did not graduate, (7) graduated from a college or university, and (8) professional training beyond a four-year college or university. The parent education categories include two additional categories compared to early adulthood educational attainment due to more variety in responses. See Table 1 for descriptive statistics.

Parent occupational prestige. In the same manner as parent education, parent occupational status is determined by highest occupational prestige in the household, whether that be the mother or father. The occupational prestige categories are reported by the adolescent with the categories ranging from: (1) none, (2) other work not categorized, (3) farm or fishery worker, (4) military or security, (5) transportation, (6) factory worker or laborer, (7) mechanic, (8) construction worker, (9) craftsperson, (10) restaurant worker or personal service, (11) sales worker, (12) office worker, (13) technical, (14) manager, (15) professional II, such as teacher, librarian, nurse, and (16) professional I, such as doctor, lawyer, scientist. See Table 1 for descriptive statistics.

Parent-Adolescent Relationship Capital Variables

See Table 1 for more information on these variables. Details are provided for each variable originally analyzed (see Appendix A), however only *closeness to parents*, *school expectations*, *parent values*, and *parent trust* are included for the main reported analyses. The amount of variables was condensed due to multicollinearity issues within the constructs. For example, it was redundant to measure *school expectations* in three different forms.

Closeness to child. The construct of closeness to child consisted of one item based on parental report. The item statement was, “Overall, you are satisfied with your relationship with your child.” Responses ranged from (1) *strongly disagree* to (5) *strongly agree*.

Closeness to mother. The construct of closeness to mother consisted of five items based on adolescent self-report. Item statements included, “How close do you feel towards your mother?” and “Overall, you are satisfied with your relationship with your mother.” Responses included (1) *strongly disagree* to (5) *strongly agree*, ranging from 5-25 ($\alpha = .84$).

Closeness to father. Father warmth included five items identical to mother warmth, reworded to focus on the father. Responses included (1) *strongly disagree* to (5) *strongly agree*, ranging from 5-25 ($\alpha = .89$).

Closeness to parents. *Closeness to mother* and *closeness to father* were combined into one construct to make an overall measure of *closeness to parents*. The two scales were combined into one because of the high correlations between the two scales. The ten items were combined and transformed to range from 1-18, ($\alpha = .88$).

Perceived parental expectations. The scale of perceived parent expectations for schooling was determined using four items from Wave I ($\alpha = .81$). The respondent was asked, “On a scale of 1 to 5, how disappointed would they be if you did not graduate from high school?” This same question was asked about college graduation. Mother and father expectations were asked separately.

Expectations for schooling. The respondent’s intention to attend college was determined by two items from Wave I ($\alpha = 0.82$). The first item asked “On a scale of 1 to 5, where 1 is low and 5 is high, how much do you want to go to college?” and the second item using the same scale asked “How likely is it that you will go to college?”

Parents' expectations. The parental questionnaire included the question, "How disappointed would you be if your child did not graduate from college?" Responses ranged from (1) *not disappointed* to (3) *very disappointed*.

Parent values. Parents were asked, "Of the following, which do you think is the most important thing for a boy to learn?" The same question was asked about girls. The responses were coded into the categories of (1) conformity values (to be well behaved, to work hard, and to be popular) and (2) autonomy values (to think for himself and to help others). These two responses were added together to form a scale of feelings ranging from (1) *beliefs of conformity* to (3) *beliefs of autonomy*.

Parent trust. Parents responded to the following statement, "You feel you can really trust (him/her)." Responses were reverse coded to range from (1) *never* to (5) *always*.

Control Variables

Gender. Male and female participants were distinguished through the gender variable with males (0) and females (1) with 55% female participants.

Age. Participants' age was controlled, ranging from 25 - 31 years old in Wave IV with an average age of 28.24 years old. Thirteen years prior in Wave I, these participants were 12-18 years old.

Ethnicity. A constructed variable based on adolescent self-report was created by the Add Health study researchers and used in this study. Ethnicity groups included White (71.3%), Black (19.7%), and Other Ethnicity (9.0%). Due to fewer participants, Other Ethnicity was a combination of Asian (7.2%) and Native American (1.8%) respondents.

Family structure. A constructed variable created by the Add Health study researchers is used to determine four levels of family structure, (1) two-parent household (biological or adopted), (2) step-parent family, (3) single parent family, and (4) other family structures (grandparent-headed households, foster families, etc). The majority of participants lived in a two-parent household (58.6%), followed by single parent families (21.7%), step-parent families (15.7%), and other families (4.0%).

RESULTS

Due to the high number of variables, Tables 2 and 3 show relevant correlations to improve readability. In Table 2, the three economic capital variables are all highly correlated with each other $r = .44 - .48$, $p < .001$, yet the other correlations in the table do not suggest identical variables. Economic capital variables vary in correlations with relationship capital variables. The highest correlation among those is *parent education* with *school expectations*, $r = .30$, $p < 0.001$. Interestingly, *parent trust* is not correlated with any of the economic capital variables. The three economic capital variables range in correlation with *final GPA*, $r = .24 - .31$, $p < .001$, and *educational attainment*, $r = .29 - .39$, $p < .001$. These correlations help justify keeping *family income*, *parent education*, and *parental occupational prestige* as separate variables.

Table 2 also shows the correlations among relationship capital variables. The highest correlation is *closeness to parents* with *parental trust*, $r = .24$, $p < .001$. Two correlations are not significant among relationship variables, *closeness to parents* with *parent values* and *parent values* with *parental trust*. All relationship variables are significantly correlated with educational outcomes, with *expectations* and *educational attainment* being the highest, $r = .41$, $p < .001$. Additionally, educational outcomes are highly correlated with each other, $r = .56$, $p < .001$.

Table 3 shows the correlations of background variables with economic capital, relationship, and educational outcome variables. For economic capital variables, gender and age have low correlations, which is to be expected. Being White has a positive correlation with *family income,* $r = .16$, $p < 0.001$, but being Black is the opposite with a negative correlation, $r = -.20$, $p < 0.001$. As far as family structure, being from a two parent family household has a positive correlation with *family income*, $r = .33$, $p < 0.001$, while being in a single-parent household has a negative correlation with *family income,* $r = -.34$, $p < 0.001$. This positive and negative trend within family structure occurs with all economic capital and relationship variables. In examining other background and relationship variables in Table 3, *age* has a negative correlation with *closeness to parents*, $r = -.29$, $p < 0.001$, suggesting younger participants have lower levels of closeness with parents. Being White is positively correlated with *parent values*, $r = .19$, $p < 0.001$, but being from other ethnicities is negatively correlated, $r = -.16$, $p < 0.001$.

Educational outcome correlations with background variables vary in Table 3. For example, *final GPA* has significant correlations with all background variables, but *educational attainment* is not significantly correlated with age, White, or Black. However, gender is both positively correlated with *final GPA* and *educational attainment*. This suggests that females have higher GPAs and early adulthood educational attainment. For family structure, the only negative correlation with *final GPA* is single-parent households. Being from a two-parent household is positively correlated with *educational attainment*, $r = .16$, $p < 0.001$, but all other family structures have a significant negative correlation with *educational attainment.* Regression analyses and interaction tests will clarify the meanings of these correlations.

Multivariate Analyses

A series of hierarchical linear regressions examined how background, economic capital, and relationship capital variables predicted GPA and early adulthood educational attainment. The hierarchical regressions were used to test how each set of predictors added to the overall model predicting educational outcomes. These tests assumed linear relationships with all variables. The results are side by side in Tables 4-7. The appendices include previous analyses using several variables related to the parent-adolescent relationship. After considering the variance issues associated with using several indicators of closeness and several indicators of school expectations, decisions to condense and simplify were made. Four variables of parent-adolescent relationship capital are used for the main analyses.

Additionally, logistic regression results are included in the appendices to examine degree attainment as a binary outcome rather than treating educational attainment as a continuous outcome, as is the case in multiple linear regression. These logistic regressions show similar trends compared to the linear regressions, therefore the linear regressions are displayed in the main tables for easy comparison to GPA.

Economic capital predicts final GPA and educational attainment. Table 4 shows the results of background and economic capital variables predicting 21% of the *final GPA* variance, a significant increase from the background variables alone ($R^2 = .21$, $F(10,7647) = 307.11$, $p < .001$. Background and economic capital variables also predict 22% of the *educational attainment* variance, ($R^2 = .22$, $F(10,7647) = 561.32$, $p < .001$. *Parent education* is the largest predictor of *final GPA* ($\beta = .22$, $p < .001$), followed by *family income* ($\beta = .12$, $p < .001$), and *parent occupational prestige* ($\beta = .06$, $p < .001$). The same order of predictors is true for *educational attainment*: *parent education* ($\beta = .25$, $p < .001$), *family income* ($\beta = .20$, $p < .001$), and *parent occupation* ($\beta = .09$, $p < .001$). These results support Hypothesis 1 because all economic capital variables significantly predict both educational outcomes beyond background variables alone.

Economic capital predicts relationship capital. Table 5 addresses Hypothesis 2 by summarizing the hierarchical linear regression analysis for economic capital variables predicting the parent-adolescent relationship variables in Wave I. Four separate regressions were used to create this table as there are four relationship capital variables. Economic capital variables do not significantly predict *closeness to parents* even though the overall model is significant, R^2 = .09, F(10,7647) = 115.16, p < .001). *Expectations for schooling* is significantly predicted by economic capital variables, with *parent education* being the highest predictor, (β = .19, p < .001). *Parent values* are also significantly predicted by all three economic capital variables, with *parent education* being the highest predictor, (β = .15, p < .001). *Parent trust* was not significantly predicted by economic capital variables. As a result, Hypothesis 2 has partial support because when controlling for background variables, economic capital variables only predict *expectations for schooling* and *parent values*.

Relationship capital predicts final GPA and educational attainment. Hypothesis 3 is addressed in Table 6 which summarizes the hierarchical linear regression analyses for relationship capital variables predicting both educational outcomes. Both overall models are significant with background and relationship variables predicting 25% of the variance for *final GPA*, and 19% of the variance for *educational attainment.* When controlling for background variables, three out of the four parent-adolescent relationship capital variables predict *final GPA*: *expectations for schooling* (β = .30, p < .001), *parent values* (β = .06, p < .001), and *parent trust* (β = .17, p < .001). This part of Hypothesis 3 is partially supported as all relationship capital variables were expected to predict *final GPA. Closeness to parents* does significantly predict *educational attainment*, but the beta value is low and negative (β = -.04, p < .001). The other three relationship variables predict *educational attainment* in the same order as they predicted *final GPA*: *school expectations*, (β = .35, p < .001), *parent trust* (β = .11, p < .001), *and parent values* (β = .08, p < .001). Again, Hypothesis 3 has partial support because when controlling for background variables, *closeness to parents* is not consistently predicting educational outcomes.

Overall models predict final GPA and educational attainment. Table 7 shows the results when all predictor variables are entered into a hierarchical linear regression predicting each educational outcome. When controlling for background variables, all three economic capital variables are significant predictors for both educational outcomes, explaining 19% of the variance of *final GPA* and 20% of the variance of *educational attainment*. Adding the parent-adolescent relationship capital variables explains 30% of the variance of *final GPA*, which is an 11% increase in explaining the variance beyond background and economic capital variables. The two parent-adolescent relationship capital variables that predict *final GPA* are *expectations for schooling*, ($\beta = .23$, $p < .001$), and *parent trust*, ($\beta = .18$, $p < .001$). *Closeness to parents* and *parent values* are not significant predictors.

Examining *educational attainment*, the hierarchical linear regression allows for easy comparison to the overall *final GPA* model. By adding parent-adolescent relationship capital variables, the overall model predicts 29% of the variance of educational attainment. This result is almost identical to the *final GPA* model of 30% variance explained. Controlling for economic capital variables, relationship capital still makes a significant contribution to the model. Just like the overall model on *final GPA*, *expectations for schooling* and *parent trust* are the two main significant predictors of educational attainment. *Closeness to parents* is significant, but the beta values are minimal. As the results of this model are so similar to *final GPA*, the hypothesis that all economic and relationship capital variables would predict educational outcomes has partial support. Economic and relationship capital variables significantly add to the overall model predicting educational outcomes, however two relationship capital variables are not significant predictors.

DISCUSSION

As shown in this study, economic capital and particular dimensions of the parent-adolescent relationship are important combined predictors for educational outcomes. The economic capital variables were family income, parent education, and parent occupational prestige. Relationship capital variables included: closeness to parents, expectations for schooling, parental values, and parent trust. The three economic capital variables, expectations for schooling, and parent trust all significantly predicted final GPA and educational attainment. However, parent-adolescent closeness and parental values did not predict educational outcomes in the overall model. This study extended research in the field by examining both final GPA and educational attainment as educational outcomes. Studies in the past have been limited by lack of extensive longitudinal data. By using a nationally representative sample and multiple time points of data collection, this study was able to explore how various forms of capital predict early adulthood educational outcomes.

Theoretical Contributions

Using a combination of social capital theory, the life course theoretical framework, and past research study findings, a series of hypotheses were developed for this study. These hypotheses originated from Coleman's (1988) definition of human capital. The Family Investment Model (FIM) extended the ideas of social capital into two parts: how resources influence parenting behavior, and then how parenting behaviors influence educational outcomes (Conger & Donnellan, 2007). By examining both economic and relationship capital constructs, this study contributes to the knowledge of what aspects of the parent-adolescent relationship do predict educational outcomes.

The life course theoretical framework puts this study into perspective by linking the constructs of social capital theory to the processes and interactions that occur over time (Bankston & Zhou, 2002). Several principles of life course theory were considered in this study: life-span development, agency, timing, and linked lives (Elder et al., 2003). Different events in childhood and adolescence put people on different paths into their adulthood (Shanahan, 2000). Take for example the well-studied event of divorce and the influences of the transitions that result. Experiencing divorce negatively influences grades in adolescence (Frisco et al., 2007), which can then influence future high school grades, the cumulative GPA of high school, and eventual years of schooling, or educational attainment. This study controlled for the background variables of gender, age, ethnicity, and family structure to account for the different paths adolescents are on within their own cohort. Theoretically, different combinations of background variables may establish different starting points for advantages in capital. However, the results of this study only revealed ethnic differences for part of the model. Another principle of life course theory examined was that of linked lives (Elder et al., 2003). Parents and adolescents are both contributing to the dynamics of their relationship and influencing the adolescent's outcomes. This study examined this principle by including both the parent and adolescent attitudes towards the relationship.

The principle of agency regards the actions parents and adolescents choose to take in order to meet goals they have set (Gecas, 2003). For example, adolescents may have high expectations about their future schooling, and these expectations will be reflected in their relationships and involvement in activities. This study considered the principle of agency by examining expectations and outcomes. By choosing to succeed in school with high GPAs, adolescents are facilitating the process towards high educational attainment as well.

This study examined the principle of timing through considering the educational outcomes as markers of the life course and on-time events for current U.S. society. The transition from adolescence to adulthood is somewhat standardized due to educational requirements and social expectations (Shanahan, 2000). Given that 87% of the U.S. population over the age of 25 has obtained their high school degree (U.S. Census, 2009), graduating from high school can be considered a very typical path for adolescents to follow. It was assumed in this study that educational attainment would be achieved by the ages of this cohort at Wave IV, 26-32 years old. Returning to technical training or college after this age would normatively be off-time.

Though this study was conceptualized using social capital theory and the life course framework, it did not address all parts of either theory. This study narrowly defined social capital as the combination of economic resources and aspects of the parent-adolescent relationship. Life course theory was incorporated by examining how background, economic, and relationship capital variables influenced the important life markers of educational outcomes. The results below are discussed with these theoretical frameworks in mind with relevance to past research findings.

Economic Capital

Consistent with previous studies (Eccles, 2005), economic capital variables did significantly predict both educational outcomes. Consistent with the rigorous requirements of moving educational research forward, this study specifically examined three different types of SES instead of collapsing the information or solely relying on family income as a proxy for SES. Not surprisingly, parent education was the best predictor of early adulthood educational outcomes. Previous literature supports the direct and indirect links of parent education to child academic outcomes (Pettit et al., 2009). Parents with high levels of educational attainment are able to guide their adolescents to follow a similar path, based on their own experiences. Parents who have low levels of educational attainment may want their children to succeed beyond their own education, but may not know how to help the adolescent make guided choices about college and degree completion.

Higher levels of family income also predicted higher levels of educational outcomes. Previous literature suggests higher amounts of income allow for more resources, better opportunities, and more cognitive stimulation (Bradley & Corwyn, 2002). Parents with higher incomes are able to buy more materials for their children, including books or art supplies. They are able to afford vacations and learning opportunities for their children. This ability to provide continues into adolescence where parents can afford tutors and classes to study for college. Even in early adulthood, parents with more income can pay tuition bills, provide transportation, and support their child financially while the child focuses on school or work. Occupational prestige may contribute to the larger picture of why high income is so important for educational outcomes. Occupational prestige may be partially addressed by the family level of income.

Occupational prestige is a component of SES that is not as commonly used as income or parent education. This study demonstrated that occupational prestige positively influenced educational outcomes, which is consistent with previous research findings. Parental occupational prestige has even been associated with young adults' eventual occupational status (Dubow et al., 2006). Parents with occupations that require managerial abilities, professional training, and communication skills presumably transfer these skills to their children, through direct conversations and indirect behaviors. These prestigious occupations possess three parts of occupational self-direction: substantive complexity, closeness of supervision, and routinization

(Featherman, Spenner, & Tsunematsu, 1988). More prestigious jobs have complexity in skills and tasks with less repetition, less direct supervision, and perhaps more supervision of others. Parents with prestigious jobs may be creating environments at home that have similar characteristics. They may teach their children how to build their own occupational self-direction.

Economic capital significantly predicted expectations for schooling and parent values, but did not predict closeness to parents or parent level of trust. This finding is unexpected based on previous literature which has found parental income and education to positively influence parenting behaviors (Cox & Harter, 2003). The finding that economic capital predicts expectations for schooling is consistent with previous research (Dubow, Boxer, & Huesmann, 2009). An adolescent understands the lifestyle they lead is something they want to strive for in their own future lives and they expect to do as well as or better than their parents. Additionally, parent values were predicted by economic capital variables. The higher economic capital for parents resulted in higher value of autonomy for their child. The value of autonomy is congruent with other values associated with more prestigious careers, better salaries, and middle-class status (Kohn, 1963). Economic capital directly predicted expectations for schooling and parent values, but this study also examined how parent-adolescent relationship capital variables predicted educational outcomes.

Parent-Adolescent Relationship Capital

Multiple hierarchical linear regressions allowed for close examination of parent-adolescent relationship variables. This study used multiple questions about different aspects of the relationship and both parent and adolescent perspectives. Some previous research has been limited to studying one-item indicators (Bankston & Zhou, 2002) or generalized ideas about involvement or support (Hill & Tyson, 2009). While previous studies have found parts of the parent-child relationship to predict educational outcomes, the ways in which researchers define closeness or relationship quality is important to consider. Using four different constructs in this study demonstrates that parts of the parent-adolescent relationship are better predictors than others.

Parental trust was a significant predictor of both educational outcomes, but closeness to parents was not. Trust was one of the concepts Coleman (1988) first discussed, and has been used in both quantitative and qualitative studies examining social capital (Dika & Singh, 2002). Parental trust may be foundational for the parent-adolescent relationship because it reinforces the norms and expectations within the relationship (Coleman, 1988). Without trust, parents and adolescents may not have a mutually respecting relationship. Lack of trust may also result in too much parental supervision or control. Parental control must be balanced in the parent-adolescent relationship (Nucci, Hasebe, & Lins-Dyer, 2005) and one way to balance it may be increasing levels of trust. Parental trust may also promote confidence and ability to succeed within the adolescent. Parents who believe in their adolescent's success and are encouraging increase the adolescent's academic achievement (Georgiou, 1999). Parental trust in this study may be tapping into some of those dimensions of the parent-adolescent relationship.

Another dimension of the parent-adolescent relationship in this study was parental values. The topic of parental values has faded from recent research studies examining educational outcomes, but the original ideas still remain salient (Alwin, 1989). This study attempted to examine parental values from the concepts of conformity versus autonomy. However, parental values lost significance in the overall model predicting either educational outcome. Previous research has demonstrated that parental values positively and significantly influence achievement

(Marchant et al., 2001). However, unlike the current study, economic capital variables were not taken into consideration. Parental values may be confounded by economic capital variables. Overall, values are more complex than originally believed and have several layers that need to be examined in future studies.

The variable that seems to matter most for educational outcomes beyond SES is expectations for schooling. Adolescent expectations for graduating high school and college predicted both higher GPA and educational attainment. This finding has been documented in the field (Eccles & Wigfield, 2002), but typically only at the high school educational level. Additionally, this study puts expectations in context of SES factors, as expectations are still important even when considering economic capital. This study focused on the adolescent's perspective of their own expectations. Other researchers have examined related ideas of self-perceptions of ability and value of education (Eccles, 2005). Beliefs of ability, confidence, and expectations are all important predictors for actual achievement. Even if everyone else believes in the adolescent, the adolescent has to believe in their own capabilities to make progress.

Limitations

Theoretically, social capital theory lacks original definitions of testable hypotheses (Dika & Singh, 2002). Many previous studies have relied on the National Educational Longitudinal Survey (NELS) for testing social capital theory (Teachman, Paasch, & Carver, 1997). Coleman helped develop the questions in NELS related to social capital, so moving beyond that dataset by using Add Health helped extend the theory into other reliable and valid questions. However, this study only addressed part of the global ideas of social capital. Continued development of social capital theory will be required to advance the ability to include related, testable hypotheses.

Even though economic capital variables consisted of three different measures, there was an assumption that these variables were steady and constant measures of socioeconomic status. However, family income can change positively or negatively over time, parents can increase their education levels, and even change jobs. Previous research calls attention to these changes over time (Magnuson, Sexton, Davis-Kean, & Huston, 2009). Additionally, the direct link from economic capital to educational outcomes was positive and significant for young adults, but previous studies demonstrate how economic capital variables are an indirect predictor of educational outcomes later in adulthood (Pettit et al., 2009). Some of mediators in that model included proactive parenting, externalizing problems, and parental monitoring. Using theory, this study demonstrated part of how economic capital predicts educational outcomes, but was still limited by the possibilities of mediators and other variables.

It may be easy to assume from this study that wealthy children with highly educated and successful parents have the best advantages in this overall model. However, past research shows that these students are still at risk in terms of unrealistic expectations and academic pressure (Luthar & Latendresse, 2005a). Moreover, adolescents in extreme poverty and those with extreme wealth may have very similar dynamics of the parent-adolescent relationship (Luthar & Latendresse, 2005b). On either extreme, adolescents can feel emotional distance from their parents. This study does not focus on the two extreme categories, but it is important to remember when considering the implications of high levels of economic capital for educational outcomes.

Another limitation of this study was explaining resiliency of how some adolescents obtain successful educational outcomes, despite their economic and relationship capital. First-generation college students are an example of academic success despite low parent education.

Gofen (2009) argues that these students have parents who facilitate success in other ways such as encouraging their children to not follow the path they took themselves. That study showed that there are other nonmaterial ways in which parents help their children, beyond direct measures of economic capital.

This study attempted to examine the nonmaterial forms of capital that adolescents build through examining four different dimensions of the parent-adolescent relationship. One of the key limitations in this study was examining the parent-adolescent relationship using survey data without considering the dynamics of the relationship and how parents and adolescents influence each other (Belsky, 1984). Children influence how parents treat them through their own behavior towards the parents and towards others. Other variables like the personality of the child have a significant influence on the parent-child relationship (Denissen, van Aken, & Dubas, 2009). Ultimately, adolescents are the ones achieving the GPA and educational attainment levels, whether their parents positively supported them or not. Keeping the context of the parent-adolescent relationship in mind is important for conclusions about this study.

Closeness to parents was only examined in the context of educational outcomes for this study. This study used a reliable scale to examine closeness in the parent-adolescent relationship while some previous Add Health studies have used one of these items as a predictor (Berg, 2003). It is important to consider the validity of closeness in the parent-adolescent relationship, especially as most participants responded that they feel very close to their parents with little variance in the scale. Another consideration is that autonomy begins to emerge at this life stage (Steinberg, 2001) and actual parental involvement tends to decline (Spera, 2005). Adolescents may be relying on other relationships in their lives to build academic resilience (Crosnoe &

Elder, 2004). Even though closeness to parents did not predict educational outcomes in the overall model, it most likely still remains an important variable for other life outcomes.

The measurement of parental trust also had limitations. Parental trust was examined from the parent perspective at one time point and does not tap into different types of trust. Parent trust may predict educational outcomes, but perhaps the parent trusted the child because of their previous academic achievement and behavior. If the adolescent has not jeopardized the level of trust in the relationship as a child, perhaps it has been constant and increasing. This study allowed for causal prediction from one time point to another, but it did not assess what the level of trust was before adolescence.

While expectations for schooling were a significant predictor of both educational outcomes, the expectations were solely based on the adolescent's perspective. Previous literature has found parental aspirations are important predictors for educational attainment (Spera, Wentzel, & Matto, 2009), but that was a study examining only the parents' perspectives. Add Health has the capability to examine three layers of expectations for schooling: the adolescent perspective, the parent perspective, and the adolescent's perceptions of parental aspirations. Due to high correlations among the variables, this study only used the adolescent's perspective. As Spera et al. (2009) point out, using multiple perspectives and how parental aspirations are influenced by previous achievement is important in understanding the overall model of educational outcomes.

As this study is a series of hierarchical linear regressions, using advanced statistical techniques like structural equation modeling (SEM) will help address several issues for future studies. First, SEM can help build latent constructs through testing of a measurement model. Instead of entering the four types of relationship capital as a block of predictors into the regression, SEM is one way to examine how these four variables become one latent construct. Perhaps expectations for schooling and closeness to parents are two separate latent constructs that can be examined with the reintroduction of the variables not used in the final models. Next, SEM can describe mediation through several tests of different models. For example, the latent construct of expectations may mediate the relation between economic capital and educational outcomes. SEM also allows for examination of the correlations between exogenous variables. If economic capital, relationship capital, and expectation latent constructs are all predictors of educational outcomes, without a mediational path, the correlations would demonstrate a cleaner picture than the correlational tables used for this study. It would be expected that the economic capital construct would not correlate very highly with the closeness construct, but economic capital probably would correlate highly with the expectations construct. While hierarchical linear regressions allow for longitudinal prediction, SEM techniques would add to the descriptive value of this study.

Future Research

This study extended final GPA by examining educational attainment in early adulthood. Moving beyond educational attainment as an outcome, GPA and educational attainment should be considered as predictors for early adulthood life outcomes. These educational variables may be part of objective attainment, something that may predict higher occupational status and sense of control over life (Flouri & Hawkes, 2008). High educational attainment has also been linked to closer parent-child relationships in adulthood (Lefkowitz, 2005). Educational attainment is even used as a mediator between the experience of good parenting and an adult's own parenting skills (Chen, Liu, & Kaplan, 2008). These studies show how important educational attainment can be for relationships, occupations, and life skills. Future studies can continue to examine how education predicts future life outcomes.

Another variation for where educational variables should be in future models is considering GPA as a predictor of both parent and adolescent expectations. For example, maybe in middle school an adolescent has high expectations for themselves, but as their GPA declines in high school, they change those expectations to be more realistic. An additional alternative is considering school-related stress and the decline of expectations (Kaplan, Liu, & Kaplan, 2005). If obtaining a high GPA is a source of stress, expectations about future GPA may be negative. Add Health allows for the future examination of these dynamics.

Additionally, it is important to consider the type of parent-adolescent relationship capital variables used in future studies, as several of them are unique and individual predictors for educational attainment. This study demonstrates that closeness to parents does not predict educational attainment in the context of economic capital, but parent trust is a significant predictor. These variables may be part of global parental involvement and examining different dimensions of the relationship. Previous studies show how parental involvement, from both the parent and adolescent perspectives, is important for educational outcomes (Pelegrina et al., 2003). A comprehensive study of different dimensions included together is essential for the development of the parent-adolescent relationship literature.

Observational data of the parent-adolescent relationship is a promising direction for understanding how the different dimensions are dynamic. Recent research has video taped the parent-adolescent relationship and their interactions in a longitudinal study, but it lacked a nationally representative and diverse sample (Melby et al., 2008). Observational data allows for examination of different dimensions of parenting behavior that participants do not see themselves. This study attempted to bridge the gaps between those observational data and a representative sample. However, the ideal is for both of these studies to be combined.

Path model analyses combined with longitudinal research can examine how particular aspects of the parent-adolescent relationship predict each other over time. For example, parent values may be predicting the expectations parents have for their children. The parent who values conformity over autonomy may expect their adolescent to obtain a job quickly. The values of conformity may stem from working at a job that focuses on following the rules and completing the same tasks repeatedly. Other parents who work at jobs that require independent thinking and making decisions for others may value more autonomy and pass those values and skills on to their children. There are several parts to parental values beyond conformity versus autonomy and these values can be examined by future studies beyond Add Health.

Unfortunately, there were not significant interactions in these models for age, gender, or family structure. There were some differences in ethnicity for economic capital predicting educational outcomes, but a clear pattern did not emerge. This study had the power to test these interactions, but the overall model had issues as some parent-adolescent relationship capital variables were not significant. Future studies can continue to test for moderation, especially as SEM techniques allow for multiple group analysis of structural models that do predict educational outcomes.

Implications for Practitioners and Intervention Strategies

Findings from this study imply increases in family economic capital lead to increases in educational outcomes. However, it is not simple to increase levels of income for all families (Mayer, 1997). Practitioners should continue their focus on cycle breaking, or breaking the generational transmission of low educational levels (Hauser-Cram, 2009). It is unclear whether it is more important to increase general levels of education or specific aspects of education, like communication skills or parenting techniques (Eccles, 2005). Maybe it would be more effective to increase knowledge about the educational opportunities that do exist. Practitioners can continue to examine what methods are most effective in helping break the cycle of intergenerational low educational attainment.

Practically, these results show how important expectations are for adolescents' future educational attainment. If high expectations lead to high educational outcomes even when accounting for low economic capital, increasing low expectations should raise levels of achievement and attainment. Researchers have developed evolving interventions that successfully increase expectations among disadvantaged youth (Grolnick, Farkas, Sohmer, Michaels, & Valsiner, 2007). Programs like this extend expectations and focus on engagement, competence, and attitudes. Continuing to develop programs that specifically target expectations among adolescents is beneficial for increasing educational attainment.

A part of the parent-adolescent relationship to develop skills in is the level of trust parents have for their adolescents. The more trust parents have for their adolescents, the better educational outcomes they will have in early adulthood. Trust is a foundational tool for building the relationship between parent and adolescent (Coleman, 1988). Building trust may lead to better relationships, aligned expectations for schooling, and open communication. Trust may be overlooked for more salient topics like parental involvement, especially as it is not a concrete activity parents and adolescents can engage in, but it is foundational piece to building the overall relationship.

One of the most important issues this study raises is about the link between high school GPA and early adulthood educational attainment. GPA is an important criterion for admission to college, but it is often forgotten about once admission is obtained. It is common for adults to dismiss GPA in everyday conversations. The dismissal of GPA importance may because of everyday life experience attempting to explain life satisfaction and other life outcomes, but in regards to educational outcomes, there is clearly a strong link between high school GPA and educational attainment. Final GPA may be a proxy for educational attainment. It is important for counselors and parents to reiterate to their children that to be on a successful path, achieving a high GPA is a key component to continuing that successful path.

In sum, this research study bridges theory and past research findings to explain how economic capital and relationship capital components predict educational outcomes. It contributed to the body of educational literature by using a large, nationally representative sample, controlling for different types of family structure and ethnicity, using several types of economic capital, and examining different types of educational attainment. Economic capital is highly predictive of educational outcomes while parts of the parent-adolescent relationship also contribute to the outcomes. Economic capital should not be underestimated for educational outcomes and closer examination of relationship capital variables is needed.

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Table 1

Descriptive Statistics: Economic Capital, Parent-Adolescent Relationship, and Educational Outcomes (N = 7,658)

Variables	*M*	*SD*	Min. - Max.	Skewness	Kurtosis	α
Economic Capital Variables						
Family income[a]	$47,438	$52,028	$0 - $999,000	0.84	3.69	-
Parent education[bc]	5.37	1.91	1 - 8	-0.41	-0.71	-
Parent occupational prestige[bd]	10.40	4.70	1 - 16	-0.74	-0.73	-
Parent-Adolescent Relationship Capital Variables						
Closeness to parents[b]	15.23	2.75	1 - 18	-1.35	2.02	0.88
School expectations[b]	8.62	1.98	2 - 10	-1.40	1.06	0.82
Parent values[a]	2.36	0.85	1 - 3	-0.77	-1.17	0.91
Parent level of trust[a]	4.34	0.80	1 - 5	-1.21	1.49	-
Dependent Variables						
Final grade point average[e]	2.36	0.84	0 - 4	-0.48	-0.19	-
Educational attainment[f]	5.91	2.14	1 - 13	0.35	0.97	-

Note: These descriptive statistics are reported for imputed data, nearly identical to original data. The skewness and kurtosis values are reported after adjustment. The following variables were corrected for skewness and kurtosis using log transformations (family income, closeness to parents, and expectations for schooling). [a] Parent report from Wave I. [b] Adolescent report from Wave I. [c] Highest parent's level of education. [d] Highest parent's level of occupational prestige. [e] Grade point averages obtained from final transcripts released by high school. [f] Self-report from Wave IV.

Table 2

Correlations: Economic Capital Variables, Relationship Capital Variables, and Educational Outcomes (N = 7,658)

Variables	1	2	3	4	5	6	7	8	9
Economic Capital									
1. P. Income	–								
2. P. Education	.47 **	–							
3. P. Occupation	.44 **	.48 **	–						
Relationship Capital									
4. Closeness to parents	.04 **	.07 **	.07 **	–					
5. School expectations	.24 **	.30 **	.23 **	.19 **	–				
6. Parent values	.20 **	.21 **	.16 **	.02	.08 **	–			
7. Parental trust	.03	.02	.01	.24 **	.18 **	.00	–		
Education Outcomes									
8. Final GPA	.31 **	.31 **	.24 **	.10 **	.38 **	.09 **	.25 **	–	
9. Educational attainment	.35 **	.39 **	.29 **	.06 **	.41 **	.10 **	.18 **	.56 **	–

*$p < .01$. **$p < .001$.

Table 3

Correlations: Economic Capital and Relationship Variables with Background and Educational Outcome Variables (N = 7,658)

Variables	Gender	Age	White	Black	Other Ethnic.	Two parents	Step-family	Single parent	Other family
Economic Capital									
P. Income	-.02	-.04 **	.16 **	-.20 **	.03	.33 **	.03 *	-.34 **	-.18 **
P. Education	-.05 **	-.08 **	-.03 *	.01	.04 **	.17 **	-.04 **	-.13 **	-.10 **
P. Occupation	-.05 **	-.04 **	.06 **	-.07 **	.01	.22 **	-.03 *	-.18 **	-.13 **
Relationship Capital									
Closeness to parents	-.13 **	-.19 **	.02	.01	-.03 *	.16 **	-.13 **	-.04 **	-.06 **
Expectations	.11 **	-.12 **	-.05 **	.04 *	.04 *	.12 **	-.06 **	-.05 **	-.06 **
Parent values	-.02	-.02	.19 **	-.09 **	-.16 **	.03	.03 *	-.04 **	-.05 **
Parental trust	.02	-.04 **	.05 **	-.06 **	.01	.12 **	-.09 **	-.06 **	-.03 *
Education Outcomes									
Final GPA	.16 **	-.11 **	.12 **	-.18 **	.06 **	.23 **	-.08 **	.15 **	.10 **
Educational attainment	.11 **	-.03	-.01	-.02	.04 **	.16 **	-.09 **	-.09 **	-.07 **

*$p < .01$. **$p < .001$.

Table 4

Summary of Hierarchical Regression Analysis for Background and Economic Capital Variables Predicting Final Grade Point Average and Educational Attainment (N =7,658)

	Final GPA			Educational Attainment		
Variables	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Background						
Gender	0.31	0.02	0.19 **	0.57	0.04	0.13 **
Age	-0.04	0.01	-0.07 **	0.01	0.01	0.01
Black	-0.29	0.02	-0.14 **	0.09	0.06	0.02
Other ethnicity	0.08	0.03	0.03 *	0.20	0.08	0.03 †
Step-parent family	-0.22	0.03	-0.10 **	-0.49	0.06	-0.08 **
Single parent family	-0.15	0.02	-0.07 **	0.02	0.06	0.00
Other family structure	-0.23	0.05	-0.05 **	-0.08	0.12	-0.01
Economic Capital						
Family income	0.12	0.01	0.12 **	0.51	0.03	0.20 **
Parent education	0.10	0.01	0.22 **	0.28	0.01	0.25 **
Parent occupation	0.01	0.00	0.06 **	0.04	0.01	0.09 **
R^2		0.21			0.22	
F for change in R^2		307.11 **			561.32 **	

Note: Age and Income centered at mean. Only final models are shown in this table, but each block of variables were entered at different steps. The first model for only background variables predicting final GPA, $R^2 = 0.10$, (*F* for change in $R^2 = 107.50$ **). The first model for only background variables predicting educational attainment, $R^2 = 0.05$, (*F* for change in $R^2 = 35.21$ **).

† $p < .05$, * $p < .01$, ** $p < .001$.

Table 5

Summary of Hierarchical Regression Analysis for Economic Capital Variables Predicting Parent-Adolescent Relationship Variables in Wave 1 (N =7,658)

	Closeness to parents			Expectations			Parent values			Parent level of trust		
Variables	*B*	*SE B*	*β*	*B*	*SE B*	*β*	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Background												
Gender	-0.76	.06	-0.04 **	0.45	.04	0.12 **	-0.01	.02	-0.01	0.03	.02	0.02
Age	-0.33	.02	-0.19 **	-0.11	.01	-0.09 **	0.00	.01	0.00	-0.02	.01	-0.04 *
Black	0.18	.08	0.03 †	0.29	.06	0.06 **	-0.23	.03	-0.11 **	-0.09	.02	-0.05 **
Other ethnicity	-0.31	.11	-0.03 *	0.29	.07	0.04 **	-0.55	.03	-0.19 **	-0.02	.03	-0.01
Step-parent family	-1.16	.09	-0.15 **	-0.25	.06	-0.05 **	0.09	.03	-0.04 **	-0.24	.03	-0.11 **
Single parent family	-0.60	.08	-0.09 **	0.00	.06	0.00	0.11	.03	0.05 **	-0.16	.03	-0.08 **
Other family structure	-0.81	.16	-0.06 **	-0.13	.11	-0.01	0.04	.05	0.01	-0.20	.05	-0.05 **
Economic Capital												
Family income	-0.07	.05	-0.02	0.27	.03	0.12 **	0.11	.01	0.11 **	-0.02	.01	-0.02
Parent education	-0.04	.02	0.03 †	0.19	.01	0.19 **	0.07	.01	0.15 **	0.01	.01	0.02
Parent occupation	0.02	.01	0.03	0.03	.01	0.08 **	0.01	.00	0.04 **	-0.00	.00	-0.02
R^2		0.09			0.13			0.10			0.02	
F for change in R^2		4.16 **			261.32 **			156.39 **			1.44	

Note: Age and Income centered at mean. † $p < .05$, * $p < .01$, ** $p < .001$. Values are displayed from second model only, the original R^2 for background variables predicting each outcome explained approximately 4% of the variance.

Table 6

Summary of Hierarchical Regression Analysis for Background and Relationship Variables Predicting Final Grade Point Average and Educational Attainment (N =7,658)

	Final GPA			Educational Attainment		
Variables	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Background						
Gender	0.23	0.02	0.14 **	0.31	0.05	0.07 **
Age	-0.03	0.01	-0.05 **	0.03	0.02	0.02 †
Black	-0.30	0.02	-0.14 **	0.03	0.06	0.01
Other ethnicity	0.10	0.03	0.03 *	0.25	0.08	0.03 *
Step-parent family	-0.20	0.02	-0.09 **	-0.54	0.06	-0.09 **
Single parent family	-0.25	0.02	-0.12 **	-0.47	0.06	-0.09 **
Other family structure	-0.35	0.04	-0.08 **	-0.68	0.12	-0.06 **
Relationship						
Closeness to parents	-0.00	0.00	-0.01	-0.03	0.01	-0.04 *
School expectations	0.13	0.01	0.30 **	0.39	0.01	0.35 **
Parent values	0.06	0.01	0.06 **	0.20	0.03	0.08 **
Parent level of trust	0.18	0.01	0.17 **	0.30	0.03	0.11 **
R^2		0.25			0.19	
F for change in R^2		345.20 **			356.58 **	

Note: Age and Income centered at mean. Only final models are shown in this table, but each block of variables were entered at hierarchical steps. The first model for only background variables predicting final GPA, $R^2 = 0.11$, (*F* for change in $R^2 = 114.22$ **). The first model for only background variables predicting educational attainment, $R^2 = 0.04$, (*F* for change in $R^2 = 43.14$ **).

† $p < .05$, * $p < .01$, ** $p < .001$.

Table 7

Summary of Hierarchical Regression Analysis for Economic Capital and Relationship Variables Predicting Final High School Grade Point Average and Educational Attainment (N =7,658)

	Final GPA						Educational Attainment					
	Model 1			Model 2			Model 1			Model 2		
Variables	*B*	*SE B*	*β*	*B*	*SE B*	*β*	*B*	*SE B*	*Β*	*B*	*SE B*	*β*
Economic												
Family income	0.12	0.01	0.12 **	0.10	0.01	0.10 **	0.51	0.03	0.20 **	0.44	0.03	0.17 **
Parent education	0.10	0.01	0.22 **	0.07	0.01	0.17 **	0.28	0.01	0.25 **	0.22	0.01	0.20 **
Parent occupation	0.01	0.00	0.06 **	0.01	0.00	0.04 **	0.04	0.01	0.09 **	0.03	0.01	0.07 **
Relationship												
Closeness to parents	--	--	--	-0.00	0.00	-0.01	--	--	--	-0.02	0.01	-0.03 *
School expectations	--	--	--	0.10	0.01	0.23 **	--	--	--	0.28	0.01	0.25 **
Parent values	--	--	--	0.00	0.01	0.00	--	--	--	0.02	0.03	0.01
Parent level of trust	--	--	--	0.19	0.01	0.18 **	--	--	--	0.35	0.03	0.13 **
R^2		.21			.30			.22			.29	
F for change in R^2		304.11 **			246.40 **			557.57 **			211.70 **	

Note: Controlling for gender, age, ethnicity, and family structure. Age and Income are centered at mean. † $p < .05$, * $p < .01$, ** $p < .001$.

APPENDIX A

Descriptive Statistics of Excluded Variables

Originally, there were several variables included in analyses that overlapped in constructs. Table 1 showed the descriptive statistics for variables used in final analyses, but the variables displayed in Table 1A are the other variables that were not used. Closeness to mother and closeness to father were combined to make the closeness to parents variable described in final analyses. Closeness to child, perceived parent expectations, and parent expectations were not included at all in final analyses. Degree attainment is a version of educational attainment with two groups: participants who did not complete a bachelor's degree and participants who did complete a bachelor's degree. Degree attainment was created for the purposes of logistic regressions. These descriptive statistics are reported for imputed data, nearly identical to original data. The skewness and kurtosis values are reported after adjustment. The following variables were corrected for skewness and kurtosis using log transformations: closeness to child, closeness to mother, closeness to father, perceived parents' expectations, and parent expectations.

Table 1A

Descriptive Statistics: Other Variables Not Used in Final Analyses (N = 7,658)

Variables	*M*	*SD*	Min. - Max.	Skewness	Kurtosis	α
Parent-Adolescent Relationship Capital Variables						
Closeness to child[a]	4.31	0.89	1 - 5	-0.74	-0.10	-
Closeness to mother[b]	22.12	3.18	5 - 25	-1.37	2.02	0.84
Closeness to father[b]	21.17	3.82	5 - 25	-1.04	1.18	0.89
Perceived parent expectations[b]	17.43	3.50	4 - 20	-1.53	2.09	0.81
Parent expectations[a]	2.31	0.68	1 - 3	-0.48	-0.81	-
Dependent Variables						
Degree attainment[c]	0.36	0.48	0 - 1	0.58	-1.67	-

[a] Parent report from Wave I. [b] Adolescent report from Wave I. [c] Self-report from Wave IV.

APPENDIX B

Correlation Tables for All Variables

The following correlations (Tables 1B and 2B) are similar to the correlations used in final analyses (Tables 2 and 3). These appendix tables include all variables originally considered for analyses. Table 1B allows for close examination of the parent-adolescent relationship capital variable correlations. Closeness to mother and closeness to father are highly correlated, $r = .54$, $p < 0.001$. These two scales were collapsed into one scale. Closeness to child was removed from analyses because it was a similar construct as closeness to parents, but from a different perspective. Own expectations had the highest correlations with the other relationship capital variables compared to perceived parent expectations and actual parent expectations. Additionally, own expectations were from the adolescent's perspective, an important viewpoint for this study. Table 2B shows the correlations of all relationship capital variables with background variables. These correlations did not determine the final analyses, but are useful for comparisons.

Table 1B

Correlations: Economic Capital Variables and Parent-Adolescent Relationship Capital Variables (N = 7,658)

Var.	1	2	3	4	5	6	7	8	9	10	11
1. P. Income	–										
2. P. Education	.47 **	–									
3. P. Occupation	.44 **	.48 **	–								
4. Closeness to child	.05 **	.05 **	.04 **	–							
5. Closeness to mom	.03	.05 **	.05 **	.32 **	–						
6. Closeness to dad	.04 **	.08 **	.07 **	.24 **	.54 **	–					
7. Belief of p. exp.	.15 **	.19 **	.12 **	.08 **	.11 **	.15 **	–				
8. Own expectations	.24 **	.30 **	.23 **	.13 **	.17 **	.17 **	.36 **	–			
9. P. expectations	.06 **	.13 **	.09 **	.05 **	.03 *	.02	.25 **	.32 **	–		
10. Parent values	.20 **	.21 **	.16 **	.00	.02	.02	.01	.08 **	-.06 **	–	
11. Parental trust	.03	.02	.01	.44 **	.22 **	.20 **	.07 **	.18 **	.07 **	.00	–

*$p < .01$. **$p < .001$.

Table 2B

Correlations: Independent Variables with Background Variables and Dependent Variables (N = 7,658)

Variables	Gender	Age	White	Black	Other Ethnic.	Two parents	Step-family	Single parent	Other family	GPA	Educ. Attain.
P. Income	-.02	-.04 **	.16 **	-.20 **	.03	.33 **	.03 *	-.34 **	-.18 **	.31 **	.35 **
P. Education	-.05 **	-.08 **	-.03 *	.01	.04 **	.17 **	-.04 **	-.13 **	-.10 **	.31 **	.39 **
P. Occupation	-.05 **	-.04 **	.06 **	-.07 **	.01	.22 **	-.03 *	-.18 **	-.13 **	.24 **	.29 **
Closeness to child	-.04 *	-.08 **	.00	-.01	.01	.10 **	-.06 **	-.04 **	-.06 **	.17 **	.12 **
Closeness to mom	-.10 **	-.15 **	-.02	.05 **	-.04 **	.09 **	-.08 **	-.02	-.05 **	.07 **	.06 **
Closeness to dad	-.12 **	-.20 **	.04 **	-.03	-.03	.17 **	-.15 **	-.04 **	-.05 **	.10 **	.06 **
Belief of p. exp.	.00	-.06 **	-.04 **	.02	.04 **	.07 **	-.03 *	.07 **	-.06 **	.16 **	.20 **
Own expectations	.11 **	-.12 **	-.05 **	.04 *	.04 *	.12 **	-.06 **	-.05 **	-.06 **	.38 **	.41 **
P. expectations	.03	-.04 **	-.19 **	.12 **	.14 **	.04 **	-.06 **	.00	-.00	.17 **	.23 **
Parent values	-.02	-.02	.19 **	-.09 **	-.16 **	.03	.03 *	-.04 **	-.05 **	.09 **	.10 **
Parental trust	.02	-.04 **	.05 **	-.06 **	.01	.12 **	-.09 **	-.06 **	-.03 *	.25 **	.18 **
Final GPA	.16 **	-.11 **	.12 **	-.18 **	.06 **	.23 **	-.08 **	.15 **	.10 **	-	.56 **
Educ. Attainment	.11 **	-.03	-.01	-.02	.04 **	.16 **	-.09 **	-.09 **	-.07 **	-	-

**p* < .01. ***p* < .001.

APPENDIX C

Summary of Logistic Regression Analysis for Economic Capital Predicting College Degree

Since the educational attainment variable was an ordinal scale, further analyses were conducted to test if the results were similar when comparing participants who did not complete a bachelor's degree and participants who did complete a bachelor's degree or higher. This collapsed categorical variable of degree attainment required the use of hierarchical logistic regressions. Table 1C can be compared to Table 4. The results from this logistic regression showed that all economic capital variables significantly predicted degree attainment while also significantly contributing to the model beyond background variables.

Table 1C

Summary of Logistic Regression Analysis for Economic Capital Predicting College Degree (N=7,658)

	Model 1			Model 2		
Predictor	*B*	*SE B*	e^B	*B*	*SE B*	e^B
Background						
Gender (reference male)	0.35 **	0.05	1.41	0.48 **	0.05	1.62
Age	-0.04 †	0.02	0.97	-0.01	0.02	0.99
Black (reference white)	0.04	0.07	1.04	0.07	0.07	1.07
Other ethnicity (reference white)	0.32 **	0.08	1.37	0.29 *	0.09	1.34
Step-parent family (ref: two-parent)	-0.85 **	0.07	0.43	-0.70 **	0.08	0.50
Single parent family (ref: two-parent)	-0.77 **	0.07	0.46	-0.12	0.08	0.88
Other family structure (ref: two-parent)	-1.17 **	0.15	0.31	-0.34 †	0.17	0.71
Economic Capital						
Family income	--	--	--	0.63 **	0.05	1.87
Parent education	--	--	--	0.31 **	0.02	1.34
Parent occupational prestige	--	--	--	0.05 **	0.01	1.05
Constant	-0.48 **	0.04	0.62	-3.04 **	0.12	0.05
χ^2		352.49 **			1596.11 **	
df		7			3	
% obtained college degree by Wave 4			36%			

Note: Age and Income centered at mean.

† *p* < .05, * *p* < .01, ** *p* < .001.

APPENDIX D

Regression Analysis for Economic Capital Predicting Relationship Capital Variables

One part of the final analyses examined how economic capital predicted parent-adolescent relationship capital. Table 1D can be compared to Table 5. This table shows all of the original variables considered for analyses. Economic capital variables significantly predicted all variables except: closeness to child, closeness to mother, and parent trust. It is interesting to note that economic capital variables did predict closeness to father, but not closeness to mother. These two variables were combined into one construct called closeness to parents for final analyses, but future studies may examine each gender of the parent. In comparing the expectation variables, own expectations has higher β values and R^2 than perceived parent expectations or actual parent expectations.

Table 1D

Summary of Hierarchical Regression Analysis for Economic Capital Variables Predicting Parent-Adolescent Relationship Variables in Wave 1 (N =7,658)

	Closeness to Child	Closeness to Mother	Closeness to Father	Perceived P. Expect.	Own Expectation	Parent Expectation	Parent Values	Parent Trust
Variable	β	β	β	β	β	β	β	β
Gender	-0.04 **	-0.11 **	-0.13 **	0.01	0.12 **	0.03 *	-0.01	0.02
Age	-0.08 **	-0.15 **	-0.20 **	-0.04 **	-0.09 **	-0.04 **	0.00	-0.04 **
Black	0.01	0.06 **	-0.01	0.04 **	0.06 **	0.15 **	-0.11 **	-0.05 **
Other ethnicity	0.01	-0.03 *	-0.03 **	0.04 **	0.04 **	0.16 **	-0.19 **	-0.01
Step-parent family	-0.08 **	-0.09 **	-0.17 **	-0.02 *	-0.05 **	-0.05 **	-0.04 **	-0.11 **
Single parent family	-0.06 **	-0.06 **	-0.08 **	0.01	-0.01	-0.01	0.05 **	-0.08 **
Other family structure	-0.07 **	-0.05 **	-0.05 **	-0.03 **	-0.02	0.00	0.01	-0.05 **
Family income	0.00	-0.01	-0.03 *	0.08 **	0.12 **	0.03 *	0.11 **	-0.02
Parent education	0.03 *	0.02	0.04 **	0.14 **	0.20 **	0.08 **	0.15 **	0.02
Parent occup. prestige	-0.00	0.02	0.02	0.02	0.08 **	0.04 **	0.04 **	-0.02
R^2	0.02	0.05	0.09	0.05	0.14	0.06	0.10	0.02
F for change in R^2	2.13	2.08	5.19 **	95.18 **	278.38 **	38.62 **	156.39 **	1.44

Note: Age and Income are centered at mean. *B* values are displayed from second model only.

* $p <$ .05. ** $p <$ .01.

APPENDIX E

Parent-Adolescent Relationship Variables Predicting Educational Outcomes

Before examining the overall model, one step was examining how parent-adolescent relationship capital variables predicted educational outcomes without considering economic capital variables. Tables 1E and 2E are the results when all variables were considered for analyses. These tables can be compared to Table 6. Table 1E results show that all relationship variables predicted final GPA except: closeness to mother, closeness to father, and perceived parent expectations. These results are difficult to interpret because multicollinearity issues prevented some variables from being significant. Table 2E results show that all relationship variables predicted educational attainment, but the closeness variables are very low coefficients. Table 3E is very similar to Table 2E in that the outcome is degree attainment, the categorical version of educational attainment. However, Table 3E shows the logistic regression results. Closeness to parents does not end up being a significant predictor in Table 6, but collapsing the variables helped address part of the multicollinearity issues among variables. Structural equation modeling will allow for further investigation of these constructs.

Table 1E

Summary of Hierarchical Regression Analysis for Parent-Adolescent Relationship Variables Predicting Final Grade Point Average in Wave 3 (N =7658)

	Model 1			Model 2		
Variable	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Background						
Gender	0.29	0.02	0.17 **	0.23	0.02	0.14 **
Age	-0.05	0.01	-0.09 **	-0.03	0.01	-0.05 **
Black	-0.29	0.02	-0.14 **	-0.32	0.02	-0.15 **
Other ethnicity	0.11	0.03	0.04 **	0.07	0.03	0.02
Step-parent family	-0.29	0.03	-0.13 **	-0.19	0.02	-0.08 **
Single parent family	-0.33	0.02	-0.16 **	-0.24	0.02	-0.12 **
Other family structure	-0.49	0.05	-0.11 **	-0.33	0.04	-0.08 **
Relationship Capital						
Closeness to child				0.05	0.01	0.06 **
Closeness to mother				-0.00	0.00	-0.03
Closeness to father				0.00	0.00	0.00
Perceived parent expect.				0.00	0.00	0.02
Own expectations				0.07	0.00	0.29 **
Parent expectations				0.08	0.01	0.06 **
Parent values				0.06	0.01	0.06 **
Parent level of trust				0.15	0.01	0.15 **
R^2		0.11			0.26	
F for change in R^2		135.93 **			180.88 **	

Note: Age and Income centered at mean.

$*p < .05$. $**p < .01$.

Table 2E

Summary of Hierarchical Regression Analysis for Parent-Adolescent Relationship Variables Predicting Educational Attainment in Wave 4 (N =7658)

	Model 1			Model 2		
Variable	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Background						
Gender	0.49	0.05	0.12 **	0.31	0.05	0.07 **
Age	-0.02	0.02	-0.01	0.03	0.01	0.02 *
Black	0.06	0.06	0.01	-0.07	0.06	-0.01
Other ethnicity	0.28	0.09	0.04 **	0.12	0.08	0.02
Step-parent family	-0.73	0.07	-0.13 **	-0.51	0.06	-0.09 **
Single parent family	-0.66	0.06	-0.13 **	-0.43	0.06	-0.08 **
Other family structure	-1.03	0.13	-0.09 **	-0.62	0.11	-0.06 **
Relationship Capital						
Closeness to child				0.07	0.03	0.03 *
Closeness to mother				-0.01	0.00	-0.03 *
Closeness to father				-0.01	0.00	-0.03 *
Perceived parent expect.				0.01	0.00	0.05 **
Own expectations				0.19	0.01	0.32 **
Parent expectations				0.33	0.04	0.11 **
Parent values				0.22	0.03	0.09 **
Parent level of trust				0.25	0.03	0.10 **
R^2		0.04			0.22	
F for change in R^2		48.70 **			210.74 **	

Note: Age and Income centered at mean.

$*p < .05$. $**p < .01$.

Table 3E

Summary of Logistic Regression Analysis for Parent-Adolescent Relationship Variables Predicting Degree Attainment in Wave 4 (N =7,658)

	Model 1		
Predictor	*B*	*SE B*	e^B
Closeness to parents	-0.03 †	.01	0.98
Expectations for schooling	-0.59 **	.03	1.79
Parent values	0.23 **	.03	1.26
Parent level of trust	0.39 **	.04	1.48
Constant	-7.63 **	0.31	
χ^2	1506.00 **		
df	11		
% obtained college degree by Wave 4	36%		

Note: Controlling for gender, age, ethnicity, and family structure. e^B = exponentiated *B*.

† $p < .05$, * $p < .01$, ** $p < .001$.

APPENDIX F

Hierarchical Linear Regression Analysis for Variables Predicting Educational Attainment

Table 1F shows the results of the overall hypothesized model for educational attainment with all original variables considered. It is an earlier version of Table 7. In these results, closeness to child, closeness to mother, perceived parent expectations, and parent values are not significant predictors of educational attainment. Some of the variables are significant in this model, but other, very similar variables are not. Table 7 addresses these issues for the final analyses.

Table 1F

Summary of Hierarchical Linear Regression Analysis for Variables Predicting Educational Attainment in Wave 4 (N =7,658)

	Model 1			Model 2			Model 3		
Variable	*B*	*SE B*	*β*	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Background									
Gender	0.49	0.05	0.12 **	0.57	0.04	0.13 **	0.41	0.04	0.10 **
Age	-0.02	0.02	-0.01	0.01	0.01	0.01	0.05	0.01	0.03 **
Black	0.06	0.06	0.01	0.09	0.06	0.02	-0.03	0.06	-0.01
Other ethnicity	0.28	0.09	0.04 **	0.20	0.08	0.03 *	0.02	0.08	0.00
Step-parent family	-0.73	0.07	-0.13 **	-0.49	0.06	-0.08 **	-0.34	0.06	-0.06 **
Single parent family	-0.66	0.06	-0.13 **	0.02	0.06	0.00	0.07	0.06	0.01
Other family structure	-1.03	0.13	-0.09 **	-0.08	0.12	-0.01	0.02	0.11	0.00
Economic Capital									
Family income				0.51	0.03	0.20 **	0.43	0.03	0.17 **
Parent education				0.28	0.01	0.25 **	0.22	0.01	0.19 **
Parent occup. prestige				0.04	0.01	0.09 **	0.03	0.01	0.07 **
Relationship Capital									
Closeness to child							0.05	0.03	0.02

Closeness to mother			-0.00	0.00	-0.02
Closeness to father			-0.01	0.00	-0.02 *
Perceived parent expect.			0.00	0.00	0.02
Own expectations			0.14	0.01	0.23 **
Parent expectations			0.31	0.03	0.10 **
Parent values			0.04	0.03	0.02
Parent level of trust			0.31	0.03	0.12 **
R^2	.04	.22		.31	
F for change in R^2	48.70 **	561.32 **		126.90 **	

Note: Age and Income are centered at mean.

*$p < .05$. **$p < .01$.

APPENDIX G

Summary of Logistic Regression Analysis for Variables Predicting Degree Attainment

This appendix uses the nominal variable of educational attainment in the form of the categorical variable called degree attainment. The hierarchical logistic regression results in Table 1G show that all economic capital variables significantly predict degree attainment, even when background and relationship variables are controlled. Adding the relationship capital variables does significantly contribute to the overall model, but only expectations for schooling and parent level of trust are significant predictors. These results are consistent with Table 7, the hierarchical linear regression using educational attainment as the dependent variable.

Table 1G

Summary of Logistic Regression Analysis for Variables Predicting Degree Attainment (N=7,658)

	Model 2			Model 3		
Predictor	*B*	*SE B*	e^B	*B*	*SE B*	e^B
Economic Capital						
Family income	0.63 **	0.05	1.87	0.55 **	0.05	1.74
Parent education	0.31 **	0.02	1.34	0.26 **	0.02	1.29
Parent occupational prestige	0.05 **	0.01	1.05	0.04 **	0.01	1.04
Relationship Capital						
Closeness to parents	--	--	--	-0.02 †	0.01	0.98
Expectations for schooling	--	--	--	0.45 **	0.03	1.57
Parent values	--	--	--	0.03	0.04	1.03
Parent level of trust	--	--	--	0.50 **	0.04	1.64
Constant	-3.04 **	0.12		-8.63 **	0.33	
χ^2		1596.11 **			2272.57 **	
df		10			14	
% obtained college degree by Wave 4						

Note: Controlling for gender, age, ethnicity, and family structure. Age and Income centered at mean.

† $p < .05$, * $p < .01$, ** $p < .001$.

APPENDIX H

Summary of Ethnicity Interaction Effects on Economic Capital Predicting Educational Outcomes

One hypothesis for this study was testing the interaction effects of ethnicity on the overall model. Other possible interaction effects included: gender, age, and family structure. Those interactions were not significant. Additionally, ethnicity interactions were only significant on the relation between economic capital and educational outcomes. Table 1H shows these results. The interaction effects are not consistent between educational outcomes. For example, income has slight differences among the ethnic groups when examining final GPA. For educational attainment, income matters most for other ethnic groups. Level of education is a better predictor for White participants when predicting final GPA, but matters more for Black participants when examining educational attainment. These results do not form a cohesive story in regards to economic capital. Further tests would be required to make conclusions about ethnicity and educational outcomes.

Table 1H

Summary of Ethnicity Interaction Effects on Economic Capital Predicting Educational Outcomes (N =7,658)

	Group 1			Group 2			Group 3		
Variable	*B*	*SE B*	*β*	*B*	*SE B*	*β*	*B*	*SE B*	*β*
				Final Grade Point Average (Wave 3)					
				(1) White, (2) Black, (3) Other ethnicity					
Ethnicity * Income	.13	.02	.12 **	.09	.03	.11 **	.15	.05	.14 *
Ethnicity * Education	.10	.01	.23 **	.09	.01	.21 **	.06	.02	.15 *
Ethnicity * Occupation	.01	.00	.07 **	.00	.00	.00	.02	.01	.09 †
				Educational Attainment (Wave 4)					
				(1) White, (2) Black, (3) Other ethnicity					
Ethnicity * Income	.52	.04	.19 **	.39	.06	.18 **	.81	.13	.27 **
Ethnicity * Education	.29	.02	.26 **	.33	.03	.28 **	.13	.05	.12 *
Ethnicity * Occupation	.05	.01	.10 **	.02	.01	.06 †	.05	.02	.10 †

Note: Controlling for other background variables (gender, age, and family structure). All main effects stay positive and significant at the p < 0.001 level.

† $p < .05$, * $p < .01$, ** $p < .001$.

APPENDIX I

Summary of Economic Capital Interaction Effects Predicting Educational Outcomes

Additional moderation tests not hypothesized were examined for clarity among economic capital variables. Table 1I demonstrates the significant interactions on the relation between economic capital variables and educational outcomes. These tests were conducted after examining the hierarchical linear regression results because higher education, higher occupational prestige levels, and higher income levels may be different in predicting educational outcomes compared to lower economic capital levels.

Results indicate that the interaction of education and income are not significant predictors of *final GPA*. However, the results are significant and positive for *educational attainment.* For the highest educated parents, higher income is a stronger predictor than for parents with less than a high school degree. For parents with less than a high school degree, occupational prestige is not a significant predictor of either educational outcome. Future tests should include calculating the outcomes and confidence intervals to compare with the full model. Adding the first set of interactions where education levels are stratified is a significant addition to the overall model, ($R^2 = .00$, $F(2,7645) = 11.29$, $p < .001$), even though the interaction of income and education was not significant. In the model where occupational prestige is stratified and predicting *final GPA*, adding the interaction is a significant addition to the overall model ($R^2 = .00$, $F(1,7646) = 14.472$, $p < .001$).

Occupational prestige is a significant predictor of these educational outcomes for parents with high school degrees and above. For the different occupational prestige groups, income significantly predicts both educational outcomes, but at a higher level in families where at least one parent works in the second and third groupings of occupational prestige. Adding the occupational prestige interactions is a significant addition to each model. Overall, these moderation tests suggest there are differences in economic capital variables predicting educational outcomes.

Interaction tests suggested that the relation between economic capital predictors and educational outcomes is more nuanced than typically presented. Occupational prestige is a stronger predictor for either educational outcome when the parent has high levels of education. This finding relates to the concept of more education providing better career options and jobs that involve skills. There may be a qualitative difference in types of prestigious jobs that require education. For example, ability may be a factor in the prestige of the job. Income is a stronger predictor of educational attainment for adolescents whose parents have lower levels of occupational prestige. This may be because there are some jobs that still pay very well, even if the job is monotonous and not prestigious. These parents may be able to provide more material resources than nonmaterial capital. Past research does not tend to examine these interactions, if they include all three variables at all. It is important for future studies to consider the combination of the three variables and how they form distinct groups of parents.

Table 1I

Summary of Economic Capital Interaction Effects on Economic Capital Predicting Educational Outcomes (N =7,658)

	Interaction			Group 1			Group 2			Group 3		
Variable	*B*	*SE B*	*β*	*B*	*SE B*	*β*	*B*	*SE B*	*β*	*B*	*SE B*	*β*
					Final Grade Point Average (Wave 3)							
			(1) less than high school degree, (2) high school degree or some college, (3) college degree or higher									
Income * Education	.01	.01	.02									
Occupation * Education	.00	.00	.04 **	.01	.01	.04	.01	.00	.05 *	.02	.00	.09 **
			(1) mechanic/construction/etc, (2) office worker/technical/etc, (3) professional (teacher/doctor/lawyer/etc)									
Income * Occupation	.01	.00	.04 **	.12	.02	.12 **	.16	.02	.14 **	.13	.01	.22 **
					Educational Attainment (Wave 4)							
			(1) less than high school degree, (2) high school degree or some college, (3) college degree or higher									
Income * Education	.06	.01	.05 **	.46	.08	.22 **	.56	.05	.21 **	.68	.06	.22 **
Occupation * Education	.02	.00	.06 **	.01	.02	.01	.05	.01	.10 **	.06	.01	.11 **
			(1) mechanic/construction/etc, (2) office worker/technical/etc, (3) professional (teacher/doctor/lawyer/etc)									
Income * Occupation	.03	.01	.06 **	.49	.05	.22 **	.55	.05	.20 **	.57	.07	.19 **

Note: Two models were conducted for each dependent variable (1 - education stratified, 2 - occupation stratified), controlling for background variables (gender, age, ethnicity, and family structure). All main effects stay positive and significant at the $p < 0.001$ level.

† $p < .05$, * $p < .01$, ** $p < .001$.

APPENDIX J

Institutional Review Board Approval

This study used secondary data which has been approved for use by the Virginia Polytechnic Institute and State University Institutional Review Board. Christine E. Kaestle, Ph.D., is the primary investigator of the secondary data set at Virginia Tech. I, Caitlin S. Faas, am an approved user on the secondary data set. For this specific project, IRB exemption was obtained: The research falls within the exempt status, CFR 46.101(b) category 4, IRB # is IRB00000667. Approval was granted December 2, 2009.