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Parental Educational Involvement in High School: Practice, Policy, and Implications for Low-Income and Minority Youth

Elizabeth Wehrspann
Purdue University

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PARENTAL EDUCATIONAL INVOLVEMENT IN HIGH SCHOOL: PRACTICE, POLICY, AND IMPLICATIONS FOR
LOW-INCOME AND MINORITY YOUTH

For the degree of Doctor of Philosophy

Is approved by the final examining committee:

Aryn M. Dotterer

Chair

Sharon L. Christ

Marilyn A. Hirth

Shawn D. Whiteman

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Approved by Major Professor(s): Aryn M. Dotterer

Approved by: Melissa M. Franks

Head of the Departmental Graduate Program

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Date

PARENTAL EDUCATIONAL INVOLVEMENT IN HIGH SCHOOL: PRACTICE,
POLICY, AND IMPLICATIONS FOR LOW-INCOME AND MINORITY YOUTH

A Dissertation

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of

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by

Elizabeth Wehrspann

In Partial Fulfillment of the

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of

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ABSTRACT

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Parental educational involvement has become a key factor in policies and practice aimed at improving academic achievement, particularly for low-income and racial/ethnic minority youth. While much previous work has explored parental educational involvement for younger children, few consistent findings have emerged regarding parental educational involvement strategies with adolescents. Further, extant literature has shown mixed findings regarding the effectiveness of parents' school choice (i.e. selecting a school regardless of geographic location) for increasing parents' educational involvement and social capital more broadly. This dissertation addressed these findings in the literature by using two large nationally representative datasets – the Education Longitudinal Study of 2002 and the National Education Longitudinal Study of 1988 – to explore the facets of parental educational involvement that are associated with academic achievement and educational attainment, as well as the role of school choice in increasing parents' social capital.

Findings from the first study suggested that academic socialization may be the most beneficial form of parental educational involvement, particularly for white and

Hispanic/Latino adolescents, whereas school outreach to parents was beneficial particularly for Asian American and African American adolescents. Adolescent sex, race, and SES were also salient predictors of academic outcomes. Findings of the second study revealed an overall positive link between social capital (including parental educational involvement, intergenerational closure, and perceived inclusion in decision-making) and academic outcomes. Contrary to expectation, there was little evidence of differences in social capital for parents of adolescents who transitioned schools by choice. Implications for future research, practice, and policy are discussed.

CHAPTER 1. INTRODUCTION

Parent involvement in education has become a key factor in policies and practices aimed at improving academic achievement in the United States. Broadly defined as “...parents’ work with schools and with their children to benefit their children’s educational outcomes and future success” (Hill et al., 2004, p. 1491), parental educational involvement is a multifaceted construct comprised of involvement at home, at school, and via academic socialization (i.e., parents communicating the value or utility of an education; Hill & Tyson, 2009). A large body of literature has established links between parental educational involvement and academic achievement (Anguiano, 2004; Dotterer & Wehrspann, 2015; Fan & Williams, 2010; Hill et al., 2004; Jeynes, 2007; Karbach, Gottschling, Spengler, Hegewald, & Spinath, 2013; Van Voorhis, 2011), spurring legislators to enact policies intended to promote parental educational involvement (U.S. Department of Education, 2010; No Child Left Behind [NCLB], 2002; Ladd, 2003). However, no clear conclusions have been drawn as to which parental involvement strategies or combinations of strategies are most beneficial for adolescents, particularly among racial/ethnic minority adolescents and adolescents from low-income families (Hill et al., 2004; Hong & Ho, 2005; Jeynes, 2007; Wehrspann, Dotterer, & Lowe, 2015). Further, policies intended to promote parental involvement, such as school choice

initiatives (i.e., policies enacted to provide families with school options beyond traditional geographic school zones), have limited empirical evidence of their effectiveness in improving parental educational involvement and subsequent academic achievement (see Lubienski, Weitzel, & Lubienski, 2009 for review).

Given these gaps in the literature, the goals of this dissertation were to investigate which parental educational involvement strategies are most beneficial for adolescents' academic achievement and educational attainment. This dissertation also examined the effectiveness of school choice in improving parental educational involvement and subsequent adolescent academic outcomes. First, I will discuss the theoretical frameworks that guided the studies. Then, I will define parental educational involvement and provide an overview of previous empirical work that has addressed parental educational involvement, highlighting gaps in the literature. I will also provide an overview of school choice policies. In the chapters that follow, I have provided detailed information regarding the two studies that sought to address gaps in the current literature on parental educational involvement.

Theoretical Frameworks

The Bioecological Model of Human Development. The Bioecological Model of Human Development provides a holistic perspective for investigating the multiple individual and contextual factors that shape development. It is a useful framework for studying academic development given that many factors, including parental educational involvement, contribute to school success. More specifically, Bronfenbrenner (1976) posited, "Whether and how people learn in educational settings is a function of sets of forces at two levels...the relations between the characteristics of learners and the

surroundings in which they live out their lives...the relations and interconnections that exist between these environments” (p. 5). The relations, or proximal processes, between an individual and his or her environment are the mechanisms underlying this academic development. As defined by Bronfenbrenner and Morris (2006), proximal processes involve reciprocal interactions that become more complex over time. Parental educational involvement is a proximal process that involves parents interacting with their child and child’s school in ways that transform as children age (Bogenschneider, 1997; Hill & Taylor, 2004). Parental involvement strategies used during early and middle childhood (e.g., volunteering in the classroom) may be less effective for adolescents (Hoover-Dempsey, Ice, & Whitaker, 2009). Nevertheless, parental educational involvement during adolescence is an important proximal process to investigate because of its links to academic achievement and its emergence in school, state, and federal policy (Hill & Taylor, 2004; NCLB, 2002).

Proximal processes are shaped by characteristics of individuals and the contexts within which the processes take place (Bronfenbrenner & Morris, 2006). Parent–adolescent interactions regarding school and academic achievement may be shaped by adolescents’ changing needs, such as an increased desire for autonomy, or by parent characteristics such as their educational attainment (Hill & Taylor, 2004; Hoover-Dempsey & Sandler, 1995). Proximal processes are also shaped by the environments in which they take place (Bronfenbrenner & Morris, 2006). Bronfenbrenner describes four interconnected systems: the microsystem, mesosystem, exosystem, and macrosystem (Bronfenbrenner & Morris, 2006). Adolescents directly interact with their environment in a microsystem. Microsystems include the home and school setting. A mesosystem

consists of the links between two or more microsystems. Therefore, through meso-system linkages, the interactions that take place between adolescents and their parents will have implications outside of the immediate parent–adolescent dyad (Bronfenbrenner & Morris, 2006). The exosystem level includes environments that do not directly involve adolescents, but may be indirectly linked to his or her development through influences on other contexts or people in those contexts. For example, legislation that facilitates school choice may indirectly influence adolescent outcomes via parent practices. Lastly, the macrosystem involves the culture and societal beliefs within which all other contexts operate (Bretherton, 1993; Tudge, Mokrova, Hatfield, & Karnik, 2009). The present studies are guided by these contexts, particularly mesosystem linkages between the home and school environments and the indirect exosystem links among school choice, parenting practices, and adolescent achievement.

Eccles and Harold (1995) offered a more detailed application of the Bioecological Model of Human Development with their parental involvement framework. In Eccles and Harold's (1995) model, parent/family characteristics (e.g., marital status), neighborhood characteristics (e.g., safety), child characteristics (e.g., ethnicity), teacher characteristics (e.g., years of teaching), and school characteristics (e.g., size) all serve as exogenous influences on parental involvement. In other words, these characteristics (similar to the interconnected systems of the bioecological framework) have direct and indirect influences on all other factors in the model including parent and teacher attitudes and beliefs, teacher practices, parent practices, and child academic outcomes. Overall, Eccles and Harold (1995) describe these factors as mutually influential on each other and on child outcomes and posit a cyclical nature of influence. For example, parents'

participation in school governance may be associated with their child's academic engagement in different ways: the parents' participation may improve their child's engagement at school or the child's engagement may encourage or discourage the parent from participating at school. These associations may differ by socioeconomic statuses (SES), as families may have different levels of financial and educational resources that promote or inhibit participation (Hornby & Lafaele, 2011). Eccles and Harold's (1995) model guides the studies in this dissertation as it specifically outlines the variety of factors that are associated with parenting practices (e.g., family, school, and adolescent characteristics) and how these factors may be related to parenting practices and subsequent child outcomes.

Social capital theory. Although social capital theory does not explicitly address parenting practices, it provides a broad framework for understanding how social structures, and not purely self-interest, may influence individual action. While initially proposed as a bridge between rational action and social structure paradigms, social capital theory has been used to frame a plethora of studies investigating parental educational involvement practices and policies (Klevan, Weinberg, & Middleton, 2015; McNeal, 1999; Schneider, Teske, Marschall, Minstrom, & Roch, 1997; Tedin & Weiher, 2011). Social capital has been defined in a variety of ways, but generally refers to the relationships people build with other people and with institutions that facilitate action (Bourdieu, 1986; Coleman, 1988; Grenfell & James, 1998). Bourdieu (1986) and Coleman (1988) are most widely known for their work on social capital as it relates to education. Both of their theoretical models emphasize the importance of social networks and resources for understanding social capital (Dika & Singh, 2002; McNeal, 1999).

However, there are key distinctions between the models regarding the direct and indirect pathways through which social capital relates to educational outcomes. Bourdieu (1986) took a critical approach to social capital; he emphasized the existence of inherent structural constraints and unequal access to resources based on class, race, and gender that must be considered when studying the effects of social capital on educational outcomes. He posited that social capital constantly interacts with cultural capital (which he defined as the product of education – individual dispositions and qualifications) and economic capital (defined as money wealth) (Grenfell & James, 1998). Other scholars have also taken his perspective, noting the distinct nature of social capital from cultural and economic capital, while recognizing that the effects of social capital for families are less studied than cultural capital or economic capital (e.g., Parcel & Boxby, 2016). For example, much more is known about differences in educational outcomes between higher and lower income families (i.e. higher and lower economic capital) than families with higher and lower social capital. Bourdieu also posited that social capital cannot directly affect educational outcomes such as academic achievement or college enrollment. Instead, social capital acts synergistically with economic and/or cultural capital as a tool for the dominant class to maintain social dominance (Dika & Singh, 2002; Grenfell & James, 1998; Portes, 2000). In contrast, Coleman (1988) viewed social capital as a positive social tool. He emphasized trust, information channels, and norms as key components of social capital as it relates to educational outcomes (Coleman, 1988; Dika & Singh, 2002). He posited that individuals build trust with others to maintain social relationships that provide access to information channels. The exchange of information is guided by norms for reciprocity and expectations for mutual sharing (Dika & Singh,

2002; McNeal, 1999). For example, when parents form relationships with the parents of their children's friends (which Coleman termed "intergenerational closure"), there are expectations regarding the mutual exchange of information that parents can use to inform decision-making. Therefore, in his model, Coleman (1988) posited direct relations between social capital and educational outcomes and did not address the possible synergistic relations among cultural capital, social capital, and economic capital (Dika & Singh, 2002).

Many of the earlier works grounded in social capital theory that examined educational outcomes exclusively used Coleman's (1988) conceptualization of social capital (see Dika & Singh, 2002 for review). However, more recently, scholars have noted the importance of also considering inequality and unequal access to resources described in Bourdieu's (1986) theory (Grenfell & James, 1998; Horvat, Weininger, & Lareau, 2003; Portes, 2000; Whittaker & Holland-Smith, 2014). For example, in their ethnographic study of parent-school relationships, Horvat, Weininger, and Lareau (2003) found that intergenerational closure (measured by the number of relationships parents had with their child's friend's parents) was associated with parents' response to school issues, but was only significantly related to parenting practices for middle class parents. Horvat and colleagues (2003), and others (e.g., McNeal, 1999), have provided evidence of components of both Coleman's (e.g., intergenerational closure) and Bourdieu's (e.g., class differences in the influences of social capital) conceptualizations of social capital.

Therefore, the present studies were guided by components from both Coleman's (1988) and Bourdieu's (1986) theories of social capital. The first study conceptualized parental educational involvement as a form of social capital and sought to understand

which facets of parental educational involvement were most strongly associated with short-term and long-term academic outcomes for adolescents. This conceptualization aligns with Coleman's (1988) theory of social capital as parental educational involvement represents the social relationship between parents and adolescents and directly links social capital (in the form of parental educational involvement) to academic outcomes. The second study investigated the social capital pathways through which school choice is related to parenting practices and adolescent academic achievement. This model aligns closely with Coleman's (1988) theory of social capital by considering the potential for social capital (measured using parental educational involvement, intergenerational closure, and inclusion in school decision-making) to serve as a positive social tool. In line with Bourdieu's (1986) theory of social capital, both studies considered the differential associations among social capital and academic outcomes between adolescents from different racial/ethnic backgrounds and SES. By including these diverse groups of families, these studies recognized that social capital may interact with other types of capital such that unequal access to resources may have implications for understanding the pathways among social capital, parenting practices, and adolescent academic outcomes.

Parental Educational Involvement during Adolescence: Definitions, Implications, and Gaps in the Literature

Parental educational involvement is a multifaceted construct that encompasses a variety of strategies parents use to promote adolescent school success. These strategies may be broadly categorized into parents' involvement at home, at school, and via academic socialization (Epstein, 2001; Grolnick & Slowiaczek, 1994; Hill & Tyson, 2009; Hoover-Dempsey & Sandler, 1995; Yan & Lin, 2005). Home-based involvement

includes parental help with homework or schoolwork (Epstein, 2001; Van Voorhis, 2011), as well as creating a learning environment or participating in events that foster academic success (Hill & Tyson, 2009). School-based involvement includes parents volunteering at school, attending school events, and contacting the school or teacher (Epstein, 2001; Hill & Tyson, 2009). Academic socialization refers to parents' communication of the value or utility of an education, and may include strategies such as discussing coursework options or making plans for college and the future (Hill & Tyson, 2009; Suizzo et al., 2015).

Adolescence is an important developmental time for studying parental educational involvement. Adolescents undergo substantial physical, emotional, and cognitive changes, including renegotiating their roles and relationships with parents (Archibald, Graber, & Brooks-Gunn, 2006; Casey, Getz, & Galvan, 2008). Parents tend to be less directly involved with schools or schoolwork compared to early and middle childhood, but the parent-adolescent relationship continues to have important implications for academic development (Singh et al., 1995). Further, high school is a unique time for parents' educational involvement; the renegotiation of the overall parent-adolescent relationship offers an opportunity for parents to adjust their involvement strategies during a naturally changing time in the relationship (Steinberg, 2001). During this time, parents may need support in navigating the best strategies for helping their adolescents, highlighting the importance of understanding which strategies are associated with positive academic outcomes.

A large body of research has investigated the links between parental educational involvement and adolescents' academic achievement (Fan & Chen, 2001; Hill & Tyson,

2009; Jeynes, 2003; 2007; 2012; Pomerantz, Moorman, & Litwack, 2007). Parental educational involvement overall has been positively associated with a variety of achievement measures such as grade point average (GPA), perceived academic competence, standardized test scores, high school completion, and college enrollment (Anguiano, 2004; Chen & Gregory, 2009; Dotterer & Wehrspann, 2015; Hill et al., 2004; Hong & Ho, 2005; Karbach et al., 2013; Perna & Titus, 2005; Yan & Lin, 2005). However, little work has been done to investigate long-term educational attainment outcomes such as college completion (Ma, 2009; McCarron & Inkelas, 2006). Considering the increased importance of higher education for career success, it is crucial to understand not only the short-term implications of parental involvement (e.g., high school GPA, standardized test scores, or high school graduation), but possible long-lasting benefits for adolescents and young adults. Both studies of this dissertation sought to address this gap by investigating the links among various facets of parental educational involvement, short-term adolescent academic achievement, and long-term educational attainment.

Parental involvement strategies and their potential benefits. Scholars have investigated the intended benefits of various types of parental educational involvement for adolescent academic outcomes. Home-based involvement and school-based involvement are considered direct forms of involvement; when parents use these strategies, they have a presence in adolescents' immediate academic microsystems (e.g., direct involvement with assignments or house rules about schoolwork, direct involvement at school). Adolescents may benefit from their parents' home-based involvement strategies because these strategies provide subject-specific support and direct instruction.

Direct instruction may enhance educational outcomes because it promotes factual knowledge and may support advanced cognitive skills (Grolnick & Slowiaczek, 1994; Hoover-Dempsey et al., 2009; Hoover-Dempsey & Sandler, 1995; 1997). Direct instruction also models the importance of dedicating time to schoolwork (Hoover-Dempsey & Sandler, 1995). Parental involvement at home has also been shown to increase the time adolescents spend on homework and improve their schoolwork management skills (Nuñez et al., 2015; Patall, Cooper, & Robinson, 2008; Van Voorhis, 2011).

School-based involvement may be beneficial because it offers parents direct interaction with the school and teachers (Epstein, 2001; Grolnick & Slowiaczek, 1994). As with home-based involvement, these interactions may model to adolescents that school activities are "...worthy of adult interest and time" (Hoover-Dempsey & Sandler, 1995; 1997). When adolescents perceive school as a priority to their parents, adolescents may also prioritize academic achievement and hold higher educational aspirations (Hong & Ho, 2005). Parents' involvement at school may also be beneficial because it provides parents the chance to gain information about opportunities available to their child and enhance parent-teacher communication (Epstein, 2001; Grolnick & Slowiaczek, 1994; Kuperminc, Darnell, & Jimenez-Alvarez, 2008; Mistry, White, Benner, & Huynh, 2009).

Recent research has highlighted the importance of academic socialization as an indirect form of parental educational involvement that may be more beneficial for adolescents than home-based or school-based strategies (Hill & Tyson, 2009; Hoover-Dempsey et al., 2009; Karbach et al., 2013; Wehrspann et al., 2015). Parents' communication about the value of an education serves as a discrete form of involvement

compared to direct assistance with homework or presence at the school (Hill & Tyson, 2009; Suizzo et al., 2015). Given adolescents' increased desire for autonomy, academic socialization may be the most effective form of parental educational involvement as children age (Hill & Tyson, 2009; Hoover-Dempsey et al., 2009). Academic socialization strategies may be beneficial for adolescents because they provide a less obtrusive opportunity for parents to model or reinforce the value of an education. Academic socialization has been linked to adolescents' own educational values, determination, motivation, behavioral engagement, and emotional engagement (Bhargava & Witherspoon, 2015; Fan & Williams, 2010; Hoover-Dempsey & Sandler, 1995; Suizzo et al., 2012; Wang, Hill, & Hofkens, 2014; Wang & Sheikh-Khalil, 2014; Wehrspann et al., 2015).

Oftentimes, parental educational involvement strategies co-occur. Parental educational involvement strategies tend to be significantly correlated (e.g., Bhargava & Witherspoon, 2015; Wang & Sheikh-Khalil, 2014; Wehrspann et al., 2015) and in interviews, parents report using several strategies to support their adolescents (Auerbach, 2007; Williams & Sanchez, 2012). For example, parents have reported providing positive messages about school or having conversations with their adolescents about school while also creating a positive learning environment at home (e.g., Suizzo et al., 2012). Despite this evidence that parents often jointly employ several involvement strategies, previous work has not explored how strategies may interact in their association with academic outcomes for adolescents and instead focus on the independent contributions of single strategies (e.g., Bhargava & Witherspoon, 2015; Suizzo et al., 2012; Wehrspann et al., 2015).

Lastly, findings in previous work have shown that the strength and direction of the associations between parental educational involvement strategies and academic outcomes may vary by adolescent race/ethnicity or SES (Hill et al., 2004; Hill, Tyson, & Bromell, 2009; Perna & Titus, 2005). Strategies or combinations of strategies that may be beneficial for white or higher income adolescents' academic achievement may be unrelated or detrimental to academic achievement for racial/ethnic minority or lower income adolescents (Desimone, 1999; Hill et al., 2004; Hong & Ho, 2005; Jeynes, 2007; Rowan-Kenyon, Bell, & Perna, 2008; Zhang, Haddad, Torres, & Chen, 2011). For example, home-based involvement strategies may be more beneficial in lower income families who have fewer resources to attend school-based events than higher income families. Understanding which strategies are most beneficial for diverse groups of adolescents, especially regarding long-term educational attainment, is particularly important given the potential for parental educational involvement to benefit adolescents who are the most at-risk of academic failure (Hill & Taylor, 2004; Reardon, Robinson-Cimpian, & Withers, 2014). More specifically, investigating the possible combinations of parental educational involvement strategies that best support academic achievement for diverse groups of adolescents is crucial given that individual strategies alone may not be sufficient for maximizing support (Hoover-Dempsey & Sandler, 1995). Few studies have investigated differences in the associations between parental educational involvement strategies and educational attainment for minority and low-income youth, and no studies to date have examined the potential links between combinations of strategies and academic outcomes. The first study of this dissertation sought to address these gaps in the literature by utilizing a large, nationally representative dataset to explore which parental

educational involvement strategies and combination of strategies were most beneficial for adolescents' academic achievement and educational attainment.

School choice policy and parental educational involvement. Despite the many benefits of parental educational involvement, low levels of involvement may persist due to various barriers parents face, and overcoming these barriers is the goal of many school- and state-level policies. Barriers to involvement may include parents' lack of time or resources due to family circumstances (e.g., parents with multiple jobs or parents who are unemployed), language differences between parents and schools, and schools' failure to include parents in policy decisions (Hornby & Lafaele, 2011). These barriers may be particularly salient for low-income families with limited financial resources and educational attainment or racial/ethnic minority families who may also encounter a cultural mismatch between their family culture and the school culture (Garcia-Coll et al., 1996). Legislation such as school choice initiatives aims to break down these barriers.

Proponents of school choice often cite increased school efficiency, educational equality, and parental social capital as key benefits of weakening the state's power in education and strengthening parents' power and competition among schools (Lubienski et al., 2009). Economist Milton Friedman is considered a key figure in suggesting that free markets in education, via voucher programs, encourage healthy competition among schools that drives school improvement (Fowler, 2013; Lubienski et al., 2009). Several scholars have noted this perceived benefit of school choice, arguing that states and governments are generally ill-equipped for maintaining high-quality educational institutions and that privatizing the education sector would "...unleash the magic of the market..." (Planke & Sykes, 2003, p. xi), generating cost-saving school improvement via

competition (i.e., competition is a free means to an end of school improvement). This competition would hold failing schools accountable for their lack of success, forcing them to become more efficient to meet market demands via higher quality instruction (Goldhaber & Eide, 2002; Lubienski et al., 2009). Ultimately, failing schools would be closed and investment, both monetary and resource, would be redistributed to schools that are successful (Lubienski et al., 2009).

One of the strong ideological appeals of school choice is that it should, in theory, also improve schools by increasing their overall equality (Goldhaber & Eide, 2002; Pöder, Kerem, & Lauri, 2013). Scholars have noted that higher income families have always had access to choice via residential relocation opportunities that are not available to lower income families who may not have as much freedom in choosing their residences. Schools are primarily funded by property taxes (a funding scheme not likely to change; see *San Antonio ISD vs. Rodriguez*, 1982), which leads to an unequal distribution of funding between lower income and higher income neighborhoods (National Center for Education Statistics, 2000). Schools in lower income neighborhoods tend to be lower in quality than those in affluent areas; these schools often have higher teacher turnover rates, lower quality curriculum resources for teachers, and below-average performance on standardized tests (Caldas & Bankston, 1997; Johnson, Kardos, Kauffman, Liu, & Donaldson, 2004; Ronfeldt, Loeb, & Wyckoff, 2013). Therefore, by implementing school choice policies, lower income students would have access to a better education via schools outside their geographic district (Goldhaber & Eide, 2002; Lubienski et al., 2009). This is an especially appealing intended benefit of school choice due to the expanding achievement gap between minority and low-income students and

their affluent peers, as well as the growing need of a quality education for long-term career and developmental outcomes (Hill et al., 2004; Planke & Sykes, 2003).

Finally, advocates for school choice note that competition amongst schools can lead to diversified school options that can better match the needs of the children they serve and create a greater sense of community among families compared to “one size fits all” schools that are not selected via choice (e.g., Ladd, 2003). Schools that specialize in particular subjects (e.g., magnet math and science schools) or emphasize particular values (e.g., schools affiliated with a particular religion) will be more likely to attract families that prioritize the same things, and subsequently may increase parents’ social capital (Planke & Sykes, 2003). Advocates argue that this increased social capital may benefit children in a variety of ways, including improvements in academic achievement (Kao & Rutherford, 2007).

Opponents of school choice initiatives note several drawbacks to providing families greater choice in their children’s schooling. First, applying a free-market model to education has inherent flaws because schools are unique compared to businesses, for which “market magic” is generally applied (Planke & Sykes, 2003). Closing a failing school, though intended as a way to improve overall educational quality, is a complex process with vast implications for the community it serves since school is compulsory for all children (Ladd, 2003). In other words, children are required by law to attend school, so unlike businesses, even low-performing schools will need to remain open in districts where students outnumber the spaces available in high-performing schools.

Further, when schools are competing for student attendance, there may be unintended consequences that actually reduce educational equality. Schools’ efforts to

attract students may not be evenly distributed among students of different socioeconomic and racial/ethnic groups. Families with fewer resources may not have access to information regarding school choice options, keeping them from making informed decisions about the best schools for their child (Jeynes, 2000; Pöder et al., 2013). Even if lower income families have access to information regarding school choice options, they may not have the resources to send their children to schools at different geographic locations. School transportation can be costly and may lead to further stratifying effects; families who can afford to transport their child to better schools will do so, and families who cannot afford to will remain in schools closer to home, regardless of school quality (Goldhaber & Eide, 2002; Jeynes, 2000). School choice efforts might also lead to competition for teachers; the highest quality teachers may accumulate in certain schools, which are likely to be schools that also attract students with greater resources (Pöder et al., 2013). It is important to note, however, that those who oppose school choice do not tend to support further centralization of education. Rather, they aim to bring awareness of potential downfalls of a decentralized system to protect families and encourage policymakers to pursue alternate routes for improving student achievement (Planke & Sykes, 2003).

Empirical findings remain mixed regarding the effectiveness of school choice for improving academic outcomes and educational attainment, particularly for low-income or racial/ethnic minority families (Goldhaber & Eide, 2002; Lubienski et al., 2009). Few studies have investigated the mechanisms through which school choice is intended to operate, such as by increasing parents social capital (Cox & Witko, 2008; Kim & Hwang, 2014; Schneider et al., 1997; Tedin & Weiher, 2011). This is a substantial limitation in

the literature given the potential of understanding these mechanisms for elucidating mixed findings linking school choice to academic outcomes. The second study of this dissertation utilized the unique nature of longitudinal data to investigate the association between school choice and changes in parents' social capital over time, as well as subsequent adolescent academic achievement and educational attainment.

The Current Study

In an effort to build on and elucidate previous work investigating parental educational involvement practice and policy, this dissertation seeks to answer the following research questions:

Study 1:

1. How does adolescents' race/ethnicity or SES moderate the association between facets of parental educational involvement and adolescents' academic achievement?
2. How does adolescents' race/ethnicity or SES moderate the association between facets of parental educational involvement and adolescents' educational attainment?
3. Which combinations of parental education involvement strategies are associated with adolescents' academic achievement? How do these combinations of strategies vary by race/ethnicity or SES?
4. Which combinations of parental education involvement strategies are associated with adolescents' educational attainment? How do these combinations of strategies vary by race/ethnicity or SES?

Study 2:

5. Is school choice associated with changes in parents' social capital, including parental educational involvement, intergenerational closure, and inclusion in school policy decisions, as well as subsequent adolescent academic achievement?
 - Are there differences in these associations for adolescents of different racial/ethnic and socioeconomic groups?
6. Is school choice associated with changes in parents' social capital, including parental educational involvement, intergenerational closure, and inclusion in school policy decisions, as well as subsequent adolescent educational attainment?
 - Are there differences in these associations for adolescents of different racial/ethnic and socioeconomic groups?

CHAPTER 2. PARENTAL EDUCATIONAL INVOLVEMENT: BENEFICIAL PRACTICES IN HIGH SCHOOL FOR DIVERSE POPULATIONS

Achievement gaps in the United States continue to persist between racial/ethnic and socioeconomic groups. In 2015, the National Assessment of Educational Progress revealed staggering differences in test scores: 43% of white eighth graders scored at or above “proficient” compared to just 13% of black students and 20% of Hispanic students. Further, students eligible for the National School Lunch Program scored substantially lower than their peers who were ineligible for the program (Institute of Education Sciences, 2015). These test score disparities, along with other measures of inequality in educational outcomes such as high school dropout rates and college admission rates, continue to spark debate among policymakers and practitioners as to what factors may ameliorate these gaps.

Parental educational involvement – parenting practices at home or at school intended to improve educational outcomes – is often cited as an important avenue for improving academic achievement and educational attainment among diverse populations of students (e.g., Hill et al., 2004). The empirical research investigating the effectiveness of parental educational involvement for adolescents has grown dramatically in the last decade, building a strong research foundation for studying parental educational

involvement (Cheung & Pomerantz, 2012; Gonzalez-DeHass, Willems, & Holbein, 2005; Hill & Chao, 2009; Hill & Taylor, 2004; Pomerantz et al., 2007). Unfortunately, there is still a limited understanding of the most beneficial parental educational involvement strategies for adolescents. In particular, findings remain inconclusive regarding the effectiveness of parental educational involvement strategies for racial/ethnic minority adolescents and adolescents from low-income families – the adolescents who may most need additional support in school (Hill et al., 2004; Hong & Ho, 2005; Jeynes, 2007). Therefore, this paper utilized data from the Education Longitudinal Study of 2002 to examine the links among parental educational involvement strategies, academic achievement, and educational attainment, focusing on potential differences by race/ethnicity and SES. Further, a substantial limitation of previous work has been scholars' sole focus on independent associations between facets of parental involvement and academic outcomes (Jeynes, 2007; Suizzo et al., 2012; Wang et al., 2014; Wang & Sheikh-Khalil, 2014). In reality, none of these parenting strategies operates in isolation; it may be the joint effects of various facets of involvement that best predict academic achievement and educational attainment for adolescents. Therefore, this paper also uses recursive partitioning, an analytic strategy used for identifying higher-order interactions (e.g., three-way and four-way interactions) among variables, to explore the combinations of parental educational involvement strategies that are associated with academic achievement and educational attainment.

Theoretical Framework

This study is guided by Bronfenbrenner's Bioecological Model of Human Development (Bronfenbrenner & Morris, 2006) and theories of social capital (Bourdieu,

1986; Coleman, 1988). The Bioecological Model of Human Development states that interactions among individuals and between individuals and their environment (i.e., proximal processes) are the mechanisms driving development. Parental educational involvement is an example of these interactions that take place between adolescents and their parents or parents and adolescents' schools (Bronfenbrenner, 1976; Hill & Taylor, 2004). Proximal processes are shaped by characteristics within and between the environments in which individuals live (Bronfenbrenner, 1976; Bronfenbrenner & Morris, 2006; Eccles & Harold, 1995). For example, adolescents' interactions with parents in the home environment that focus on education may be related to adolescents' academic performance in the school environment (e.g., Hill & Tyson, 2009). Adolescent academic performance may also be associated with the time their parents spend communicating with teachers or providing direct instruction at home (Hoover-Dempsey & Sandler, 1996). These cross-environmental effects are termed mesosystem linkages, which highlight the importance of considering how interactions in one environment may be related to outcomes in another (Bronfenbrenner & Morris, 2006). The implications of proximal processes may also differ based on individual characteristics, such as race/ethnicity or SES (Bronfenbrenner & Morris, 2006; Eccles & Harold, 1995). In the present study, different facets of parental educational involvement are examined to determine which involvement processes or combinations of processes (e.g., home-based strategies, school-based strategies, and academic socialization strategies) are the most beneficial for diverse groups of adolescents.

Social capital theories also address possible differences in the links between parental educational involvement and academic outcomes based on race/ethnicity and

SES differences. Parental educational involvement is a form of parents' social capital (i.e., social relationships that facilitate action) as it may create information channels between parents and adolescents or parents and schools that promote positive parenting practices (Coleman, 1988; McNeal, 1999). However, parents and adolescents of different racial/ethnic and SES groups may have varying levels of access to resources that promote and sustain social capital, which may subsequently shape the effectiveness of certain parental educational involvement strategies (Bourdieu, 1986; Dika & Singh, 2002). For example, low-income families may not have access to transportation to attend school meetings or to volunteer at the school, which may increase the importance of involvement at home and communication about the value of an education as forms of involvement associated with academic outcomes (Hill & Taylor, 2004). Together, the Bioecological Model of Human Development and social capital theories offer a holistic perspective for investigating the many factors that may influence academic achievement and educational attainment.

Parental Educational Involvement in High School

Parental educational involvement tends to decline as children age, but continues to be an important means of support for high school students' academic achievement and educational attainment (Benner & Mistry, 2007; Eccles & Harold, 1996; Falbo, Lein, & Amodor, 2001; Kuperminc et al., 2008; Stewart, 2008). It is well-recognized in the literature that parental educational involvement is a multi-faceted construct that includes a variety of parenting strategies such as parents' participation in school events, involvement with schoolwork at home, or communication about the importance of school (i.e., academic socialization; Hayes, 2011; Hill & Tyson, 2009; Hong & Ho, 2005;

Suizzo et al., 2015; Stewart, 2008; Toldson & Lemmons, 2013). Scholars often classify these facets into three categories: home-based involvement, school-based involvement, and academic socialization (e.g., Hill & Tyson, 2009). Home-based involvement often includes parents' structure of the home environment to support academics (e.g., enforcing house rules regarding how adolescents spend their time) and parents' help with homework. School-based involvement includes parenting practices that involve visiting or communicating with the school, such as volunteering or attending parent-teacher organization meetings. Academic socialization involves parents' communication about the value of an education for adolescents' future education and career plans (e.g., Hill & Tyson, 2009; Wang & Sheikh-Khalil, 2014). All three forms of involvement have been associated with academic achievement and educational attainment of high school students (e.g., Jeynes, 2007; Suizzo, et al., 2012), although scholars have suggested that academic socialization is most strongly linked to academic outcomes. Parents may engage in academic socialization more often, and it may best serve adolescents given their burgeoning sense of autonomy (e.g., Hoover-Dempsey & Sandler, 1995; Wang et al., 2014; Wang & Sheikh-Khalil, 2014).

Parental educational involvement and academic outcomes. A variety of studies have investigated the association between parental educational involvement and adolescents' academic outcomes such as achievement and educational attainment. Most commonly, scholars have explored how parental educational involvement relates to academic achievement (Jeynes, 2007). Academic achievement has been defined using a variety of measures including GPA, standardized test scores, and adolescent-reported subject-specific grades (e.g., B in Math, A in Reading, D in Science). Generally, parental

educational involvement has been associated with higher levels of academic achievement (Gordon & Cui, 2012; Stewart, 2008; Toldson & Lemmons, 2013; Wang et al., 2014), but some null findings also emerge (Chen & Gregory, 2009; Plunkett, Henry, Houlberg, Sands & Abarca-Mortensen, 2008). For example, Gordon and Cui (2012) used the nationally representative Add Health dataset to assess parental educational involvement and academic achievement for adolescents in grades 7-12, including a 10-year follow-up survey. The authors found that parents who practiced greater amounts of communication about school and parents who provided homework help had adolescents with higher GPA's. Conversely, Chen and Gregory (2009) found no association between parental educational involvement (including school-based and home-based strategies) and achievement for adolescents in 9th grade. Their sample, however, included mostly adolescents who identified as a racial/ethnic minority, suggesting potential differences in the effectiveness of strategies across diverse groups of adolescents.

Though less prevalent, studies have also investigated the link between parental educational involvement and educational attainment (e.g., Anguiano, 2004; Catsambis, 2001; Crosnoe, Mistry, & Elder, 2002). Educational attainment is often defined as the highest level of education an individual achieves, including graduation from high school, college admittance, or completing a higher education degree (e.g., Crosnoe et al., 2002; McCarron & Inkelas, 2006; Rowan-Kenyon et al., 2008). Adolescents whose parents are more involved with their education tend to be more likely to graduate from high school and attend college, (e.g., Catsambis, 2001), but studies have also shown null and negative findings (e.g., Anguiano, 2004; Crosnoe et al., 2002). For example, Catsambis (2001) analyzed the association between various aspects of parental educational involvement and

number of credits completed by 12th grade. Findings showed a positive association between parental educational involvement and credits completed. It is important to note that the most effective strategies were those related to decision-making (e.g., conversations about academic and career plans) versus those related to adolescent behavior. In contrast, Anguiano (2004) found mixed results regarding the links between various forms of parental educational involvement and high school completion. Traditional parental educational involvement (e.g., school-based and homework help) was more strongly related to attainment for Asian American adolescents compared to white, and parental involvement in parent-teacher organizations was negatively associated with high school completion for Native American adolescents.

Together, the findings from studies investigating parental educational involvement and both academic achievement and educational attainment offer little conclusive evidence as to which parental educational involvement strategies are most beneficial for adolescents. Scholars have begun investigating how adolescents' race/ethnicity or SES may explain some of these differences (e.g., Hong & Ho, 2005; Mistry et al., 2009). No work, however, has been done to explore how combinations of strategies may play a role in explaining these mixed findings, despite the frequency with which parental educational involvement strategies co-occur (e.g., Hoover-Dempsey et al., 2009; Williams & Sanchez, 2012).

Differences by race/ethnicity and SES: Potential explanations for mixed findings. Scholars have widely discussed potential explanations for differences in the benefits of parental involvement for adolescents of varying racial/ethnic and socioeconomic groups. Adolescents from lower SES families and/or identifying as a

racial/ethnic minority face unique challenges in education compared to adolescents from higher SES families or those identifying as white. For example, for minority and low SES adolescents, family culture and school culture may be incongruent, and parents may construct their roles regarding the academic environment differently than parents of white or higher SES parents (Auerbach, 2007; Garcia-Coll et al., 1996; Hill & Torres, 2010). The social positions of these families and adolescents may influence adolescent development via racism, oppression, prejudice, and discrimination (Garcia-Coll et al., 1996). While parents may still have high aspirations for their children, a mismatch between home and school cultures may stifle their abilities to support their children (Hill & Torres, 2010). For example, parents whose primary language is Spanish will have difficulty communicating (e.g., in person, over the phone, via email, or reading newsletters) with a teacher whose primary language is English. More broadly, speech patterns, social organization, and contextualization of instruction may not align with family norms or organization of the home environment, creating challenges for families and youth to feel connected to or involved with the school (Garcia-Coll et al., 1996; Hill & Torres, 2010; Lareau, 2011).

Further, parents' role construction regarding their involvement may be influenced by their social class and personal experiences (Auerbach, 2007; Rowan-Kenyon et al., 2008). For example, Rowan-Kenyon, Bell, and Perna (2008) interviewed parents at 15 high schools whose adolescents participated in a college preparation program to learn about why parents became involved. Themes that emerged as to reasons for involvement – reciprocal links between the program and their adolescents' future, schools' outreach efforts, and school policy – varied by parents' SES. Suizzo and colleagues (2015) found

that parents' memories of school satisfaction were related to their academic socialization parenting practices. Auerbach (2007) interviewed 16 working-class African American and Latino parents over three years to learn how they perceived their role in education. Three themes emerged: parents as moral supporters (all Latino parents who had the lowest levels of educational attainment), struggling advocates who were involved as much as they could be but faced barriers to involvement (mixed race/ethnicity and educational attainment), and ambivalent companions, who offered little support and recognized the value of an education without being involved (mostly single mothers and parents with educational attainment of community college or less). It is clear that parents of different race/ethnicity and SES may face unique barriers to involvement (e.g., cultural mismatch between home and school) and have different reasons for becoming involved or strategies for involvement (e.g., moral support vs school involvement). These differences may be related to the association between parental educational involvement and adolescent academic outcomes.

It is important to note that these challenges may be unique to families of different SES regardless of race/ethnicity, despite inherent connections between the two. As described in-depth by Lareau (2011), patterns of parenting substantially differ between upper/middle class families and working/poor class families. The organization of adolescents' lives (e.g., structure of leisure time) and parents' language use tend to differ in predictable ways between social classes, often regardless of families' race/ethnicity. For example, adolescents in middle and upper class families tend to have less control over their leisure time and have parents who reason with them more. These adolescents are involved in multiple extracurricular activities and have parents that enforce rules that

structure their free time, a pattern emerging across racial/ethnic groups (Lareau, Weininger, Conley, & Velez, 2011). In contrast, adolescents in working class and poor families have more control over how they spend leisure time and have parents who create explicit boundaries between adults and children (Lareau, 2011). These differences in family interactions and structure based on social class have long-term implications. Adolescents from middle and upper class families may have institutional advantages as schools', teachers', and employers' priorities align more closely with their upbringing. For example, colleges often value evidence of leadership when making acceptance decisions, as measured by involvement in high school activities. These are the same types of activities in which middle and upper class adolescents' are more likely to be involved than working class and poor adolescents. Recognizing these potential distinctions between social classes across racial/ethnic group (Hill, 2006), the current study will assess group differences by race/ethnicity and by SES.

Differences by race/ethnicity and SES: Empirical evidence. Scholars have empirically tested the potential differences in links between parental educational involvement and academic achievement for diverse groups of adolescents. Unfortunately, findings have remained inconclusive (e.g., Hong & Ho, 2005; Mistry et al., 2009; Zhang et al., 2011). In his meta-analysis of parental involvement in high school, Jeynes (2007) found that parental expectations were the strongest predictor of academic achievement and that this association held across racial/ethnic groups. Wang and Sheikh-Khalil (2014) also found consistent associations across racial/ethnic groups; greater academic socialization (and not home-based or school-based involvement) was associated with higher adolescent GPAs. In contrast, other scholars have found differences in the link

between parental educational involvement and academic achievement across racial/ethnic groups (e.g., Zhang et al., 2011). For example, Wang, Hill, and Hofkens (2014) examined achievement trajectories in high school and their association with parental educational involvement. Findings showed that while all aspects of involvement were related to reduced declines in GPA, structure at home (e.g., family rules) was more strongly related to reduced declines for African American adolescents than white adolescents. The authors suggested that these findings were due to African American adolescents responding more to “no-nonsense” parenting compared to white adolescents. Similarly, using the National Education Longitudinal Study of 1988, Yan and Lin (2005) found differences in the association between parental educational involvement and mathematics achievement across racial/ethnic groups. While parents’ educational expectations were associated with mathematics achievement for all adolescents, school-based involvement was related to achievement only for white and Hispanic adolescents. This finding is in direct contrast with the findings from Hill and colleagues (2004) that school-based involvement was related to GPA for African American adolescents but not white adolescents, and findings from Hong and Ho (2005) suggesting that school-based involvement was associated with adolescent growth for Asian American students only.

Limited work has been done to investigate SES differences in the association between parental educational involvement and academic achievement in high school (Hill et al., 2004; Wang & Sheikh-Khalil, 2014). For example, Hill and colleagues (2004), using multiple group analysis in structural equation modeling, found that parental educational involvement in 6th grade was associated with academic achievement in 9th grade for adolescents from higher-SES families but not adolescents from lower-SES

families. Scholars have called for more work on these differences given that SES achievement gaps are as persistent as racial/ethnic achievement gaps in the United States and given that the challenges lower-SES families face may be different from those of higher-SES families across race/ethnicity (Hill, 2006; Lareau, 2011).

Differences have also surfaced when scholars have examined parental educational involvement and educational attainment with adolescents from different racial/ethnic and socioeconomic groups (Anguiano, 2004; Crosnoe et al., 2002). As mentioned previously, Anguiano (2004) found differential associations between parental educational involvement and high school completion across race/ethnicities; Asian American students benefitted more from involvement than white students. Crosnoe and colleagues (2002) studied parental educational involvement in the context of varying socioeconomic disadvantage. The authors found that economically disadvantaged parents were less likely to engage in positive involvement strategies and their adolescents had lower levels of educational attainment.

There is clearly still work to be done in understanding how the effectiveness of parental educational involvement strategies varies across racial/ethnic and socioeconomic groups. Few studies have examined group differences as they relate to parental educational involvement and educational attainment, and despite several studies examining group differences in parental educational involvement and academic achievement, findings remain inconclusive. Therefore, the present study investigated how race/ethnicity and SES moderate the associations between parental educational involvement and academic outcomes in an effort to disentangle previous findings.

Exploring combinations of parental educational involvement strategies. This study also explored how combinations of parental educational involvement strategies may be related to academic outcomes in an effort to elucidate these mixed findings. Previous studies have exclusively examined parental educational involvement as a general, single parenting behavior (e.g., Dotterer & Wehrspann, 2015; Kuperminc et al., 2008), or as individual facets uniquely predicting outcomes (e.g., Bhargava & Witherspoon, 2015; Suizzo et al., 2012). For example, Wang and colleagues (2014) examined several facets of involvement – communication, scaffolding independence, structure at home, and academic socialization (linking education to the future) – in a single model to determine their individual associations with adolescent GPA. While this study provided important insights as to trajectories of parental educational involvement and differences by race/ethnicity and SES, no consideration was given to the co-occurrence of involvement strategies and possible implications of combinations of strategies for outcomes.

The lack of attention to combinations of strategies overall in the literature is a substantial limitation given that parents often use a variety of parental educational involvement techniques. In quantitative studies assessing different facets of parental involvement, involvement strategies tend to be significantly correlated (e.g., Bhargava & Witherspoon, 2015; Wang & Sheikh-Khalil, 2014; Wehrspann et al., 2015). For example, in Suizzo and colleague's (2012) study, providing an environment for learning was strongly correlated with parents providing messages about the importance of school. In their 2014 study, Wang and Sheikh-Khalil reported no correlation between school-based and home-based involvement, but significant correlations of both with academic

socialization. Further, qualitative analyses involving in-depth interviews with parents often reveal that parents use several parental educational involvement strategies (e.g., Auerbach, 2007). For example, low-income, African American parents discussed physical connections to their adolescents' school, involvement outside of school including educational assistance and structure at home, and communication all as ways through which they were involved in their adolescents' education (Williams & Sanchez, 2012). These qualitative and quantitative findings suggest that parents use a variety of educational involvement strategies, rather than single strategies in isolation. Considering combinations of strategies may be helpful for illuminating the most beneficial ways parents can promote adolescents' academic achievement and educational attainment, considerations that have not been included in previous studies. These findings are especially important given adolescents' increased desire for autonomy – it may be particular combinations of strategies that are the most beneficial for adolescents and not simply greater levels of involvement overall, which have been shown to provide diminishing returns for academic engagement in previous work (Wehrspann et al., 2015).

The Present Study

The present study investigated the association between parental educational involvement strategies and combinations of strategies and academic outcomes for high school students, analyzing differences in these associations based on race/ethnicity and SES. Parental educational involvement will be measured using three facets of involvement: home-based involvement, school-based involvement, and academic socialization. Academic outcomes include academic achievement (assessed using high school GPA) and educational attainment (assessed using college degree completion).

Control factors will include adolescent sex, parents' primary spoken language, school size, and amount of school outreach to parents, as these factors have been associated with parental educational involvement and academic outcomes (e.g., Epstein, 2001; Hill & Taylor, 2004; Pomerantz, Altermatt, & Saxon, 2002).

This study is guided by the following research questions and hypotheses:

1. How does adolescents' race/ethnicity or SES moderate the association between facets of parental educational involvement and adolescents' academic achievement and educational attainment?
 - a. School-based involvement strategies will be more strongly related to academic achievement and educational attainment for Asian American adolescents compared to white adolescents and there will be no difference in the association between African American or Hispanic adolescents and white adolescents.
 - b. School-based involvement strategies will be more strongly associated with academic achievement and educational attainment for higher-SES adolescents compared to lower-SES adolescents.
 - c. Home-based involvement strategies will be more strongly associated with academic achievement and educational attainment for African American and Hispanic adolescents than white adolescents and there will be no difference in the association between Asian American adolescents and white adolescents.

- d. Home-based involvement strategies will be more strongly associated with academic achievement and educational attainment for lower-SES adolescents than higher-SES adolescents.
 - e. Academic socialization strategies will be beneficial for all adolescents; there will not be differences in the association between academic socialization and academic outcomes between adolescents of different race/ethnicity or SES.
2. Which combinations of parental education involvement strategies are associated with adolescents' academic achievement and educational attainment? How do these combinations of strategies vary by race/ethnicity or SES?
 - a. Given the exploratory nature of these analyses and limited prior work addressing this question, no a priori hypotheses are offered regarding which specific combinations of parental educational involvement strategies will be associated with academic achievement or educational attainment and how these combinations may differ across racial/ethnic or SES groups. However, strategies are expected to co-occur and these combinations are expected to vary across racial/ethnic and SES groups.

Method

Procedure. Data for these analyses came from the Education Longitudinal Study of 2002 (ELS) dataset. The ELS was implemented by the National Center for Education Statistics in the Institute of Education Sciences and surveyed a nationally representative sample of high school sophomores. The goal of the study was to follow adolescents through transitions they experienced as they proceeded through high school and beyond,

with a focus on understanding predictors of dropping out and college attendance (Ingels et al., 2014). The study used a complex sampling design to survey high school sophomores, parents, teachers, principals, and librarians during the base year with two follow-up surveys that took place two and four years after the base year, and a third follow-up that took place 10-11 years after the base year. Data collected from adolescents and parents during the base year, and adolescents during the first follow-up, and third follow-up will be used in the present study. Adolescents completed surveys in school during baseline and first follow-up years. Parents completed hard-copy surveys or computer assisted personal interviews. During the third follow-up, participants completed a self-administered online survey or participated in a computer-assisted personal or telephone interview. High school transcripts and postsecondary transcripts were collected during the first and third follow-ups, respectively.

Participants. Participants for the present study include parent-adolescent dyads with data from base year and adolescents with data from the first follow-up, and third follow-up (N = 9,180). Fifty-three percent of participants were female, and just over half identified as white (58%). Fourteen percent of adolescents were Hispanic or Latino, 13% were Black or African American, 10% were Asian or Pacific Islander, and 5% identified as other. Thirty-three percent of adolescents' parents had an education level of high school degree or less, 20% completed some college, and 28% had a college degree or higher (19% of these data were missing).

Measures.

Parental educational involvement. Parents and adolescents responded to questions regarding parental educational involvement at home, at school, and via

academic socialization. Items were chosen to represent these three facets of involvement as described by Hill and Tyson (2009; see Table 1). For home-based involvement, adolescents and parents responded to items regarding homework help and structure at home. Adolescents responded to the question “How often do your parents do the following?” for two items using a four-point scale (1 = *Never*, 4 = *Often*). A sample item is “Check on whether you have done your homework.” Parents responded to two questions regarding their homework help: 1) “How often do you... check that your tenth grader has completed homework?” using a four-point scale (1 = *Never*, 4 = *Always*) and 2) “Looking back over the past year, how frequently did you and your tenth grader participate in the following activities together?” using a four-point scale (1 = *Never*, 4 = *Frequently*). Adolescents and parents also responded to items regarding rules and structure at home. The four adolescent items included, for example, “How often do your parents do the following? Limit the amount of time going out with friends on school nights.” Adolescents responded using a four-point scale (1 = *Never*, 4 = *Often*). Parents responded to one item – “How often do you... enforce curfews for your tenth grader on school nights?” using a four-point scale (1 = *Never*, 4 = *Always*). Scores were averaged for each reporter such that higher scores indicated greater amounts of involvement.

School-based involvement was measured using parents’ responses to four items. Parents responded with a yes/no response (0 = *no*). A sample item is “Do you and/or your spouse/partner do any of the following? Belong to the school’s parent-teacher organization.” Scores were averaged for each reporter such that higher scores indicated greater amounts of involvement.

Parents and adolescents responded to items regarding academic socialization. Adolescents responded to six items using a three-point scale (1 = *Never*, 3 = *Often*). A sample item is “How often have you discussed the following with either or both of your parents or guardians? Going to college.” Parents responded to four items using a three-point scale (1 = *Never*, 3 = *Often*). A sample item is “How often have you and/or your spouse/partner provided advice or information about the following to your tenth grader? Applying to colleges or other schools after high school.” Scores were averaged for each reporter such that higher scores indicated greater amounts of involvement. Table 1 details all items used for each facet of involvement.

Academic outcomes. Adolescent academic achievement was measured using adolescent average GPA from grades 9 – 12 obtained from high school transcripts during the first follow-up year. GPA was recoded by the National Center for Education Statistics (NCES) into a 6-point scale (0 = 0 - 1, 1 = 1.0 - 1.5, 2 = 1.5 – 2.0, 3 = 2.0 – 2.5, 4 = 2.5 – 3.0, 5 = 3.0 – 3.5, 6 = 3.5 – 4.0). Educational attainment was measured using data from the third follow-up to determine the highest level of education for each adolescent. Responses ranged from 1 = No high school credential to 9 = Doctoral degree. Educational attainment was treated as a continuous variable in all analyses.

Race/ethnicity. Adolescents were asked to identify their race/ethnicity using the following two questions: “Are you Hispanic or Latino/Latina?” and “Please select one or more of the following choices to best describe your race.” Options included white, Black/African American, Asian, Native Hawaiian or Other Pacific Islander, and American Indian or Alaska Native. When data were missing on the questionnaire, race/ethnicity were obtained from the school sampling roster, and when missing on the

sampling roster, from the parent survey if the parent was the adolescent's biological parent. Otherwise, race/ethnicity was logically imputed from other questionnaire items when all other sources were missing data (Ingels et al., 2014). The final variable for adolescent race/ethnicity consisted of white, Hispanic or Latino, Black or African American, Asian or Pacific Islander, American Indian or Alaska Native, and multiracial. This variable was used to create five dummy coded variables with white as the reference group.

Socioeconomic status. Socioeconomic status (SES) was calculated by NCES using five items from the parent questionnaire. When data were missing, student questionnaire data were used, and if unavailable, scores were imputed by NCES. SES was based on equally weighted, standardized components including father's education level, mother's education level, family income, father's occupational status, and mother's occupational status. Occupational status was determined using the 1989 GSS occupational prestige scores (Ingels et al., 2014). Final SES scores ranged from 0.00 to 2.00, with a higher score indicating higher SES. SES was treated as a continuous variable in regression analyses and was split into quartiles for recursive partitioning analyses.

Control variables. Control variables included adolescent and parent characteristics, as well as school characteristics. Adolescents were asked to report their sex. Parents were asked to report how often they were contacted by the school to volunteer (0 = none, 1 = one or more) and their primary spoken language (0 = English, 1 = something other than English). School size was reported by school administrators. In models predicting educational attainment, GPA was also included as a control.

Analytic Strategy

First, Stata 13 was used to conduct Confirmatory Factor Analyses (CFA) to verify that items used for parental educational involvement accurately represented three facets of involvement. One latent variable was modeled for each type of involvement. Global and component fit indices showed excellent model fit for school-based involvement: $\chi^2(2, N = 11,716) = 65.71, p < .001, RMSEA = .05, CFI = .99, TLI = .99$, and the latent variable accounted for over 77% of variance in each indicator. Global and component fit indices showed poor model fit for a single latent variable representing home-based involvement, and a single latent variable representing academic socialization. Component fit indices revealed low variance explained in parent reports of each construct compared to adolescent reports. Therefore, two correlated latent variables were then modeled to represent adolescent reports and parent reports for both home-based involvement and academic socialization. Global and component fit indices showed good model fit for the two-variable model of home-based involvement: $\chi^2(26, N = 11,716) = 2,035.10, p < .001, RMSEA = .08, CFI = .99, TLI = .98$, and each latent variable explained over 81% of variance in each of its indicators. Global and component fit indices also showed good model fit for the two-variable model of academic socialization: $\chi^2(34, N = 11,716) = 1,553.05, p < .001, RMSEA = .06, CFI = .99, TLI = .99$, and each latent variable explained over 87% of variance in each of its indicators. Overall, CFA resulted in a single latent variable for school-based involvement, two correlated latent variables for home-based involvement (parent report and adolescent report), and two correlated latent variables for academic socialization (parent report and adolescent report). Therefore, in all of the following regression analyses, a single total score was used to represent school-

based involvement and two average scores each for home-based involvement and academic socialization – one for parent report and one for adolescent report.

Next, an unconditional model in multi-level modeling was estimated to assess the proportion of variance in each outcome due to differences between schools. Fifteen percent of the variance in GPA was due to differences between schools, and 13% of the variance in educational attainment was due to differences between schools. These were statistically significant and substantial; therefore, robust standard errors were calculated for all analyses.

GPA and educational attainment were regressed separately onto home-based involvement, school-based involvement, academic socialization, race/ethnicity, SES, and control variables. Structural Equation Model (SEM) was used for estimating coefficients in the regression analyses, as it allowed for adjustment of standard errors given the complex sample features of the ELS data (weights and nesting). Maximum likelihood estimation was used for missing values. After accounting for weights and nesting, the final sample size in all analyses was 9,180. All variables were centered at their means prior to analyses. Interaction terms were created for each race/ethnicity dummy code by each facet of parental educational involvement, as well as an interaction term for SES by each facet of parental educational involvement. These interactions were added to the models for GPA and educational attainment to examine if the association between parental educational involvement and each outcome varied by SES or race/ethnicity. Significant interactions were probed using simple slope analyses.

Finally, recursive partitioning (RP) classification tree ensembles (or forests) were used to identify higher-order interactions (two- to four-way) among study variables.

Recursive partitioning is an analytic strategy used for exploring higher-order interactions or non-linear pathways among factors to predict a particular outcome (e.g. Gruenewald, Mroczek, Ryff, & Singer, 2008; Gruenewald, Seeman, Ryff, Karlamangla, & Singer, 2006; Speybroeck, 2012; Strobl, Malley, & Tutz, 2009). The goal of RP is to create homogenous groups of individuals through step-wise partitioning based on given values or categories of predictor variables. More specifically, all participants in a data set (the parent node) are continuously split into smaller groups (child nodes) based on categories or cut points of predictor variables in order to create the most homogenous groups as possible for a particular outcome (the terminal node). Recursive partitioning can be used to predict continuous or categorical outcomes; in the present study, these were high school GPA and educational attainment (both continuous outcomes). Probability values were derived from *F* tests to determine splits to create groups with distinctly different mean scores for each outcome (Gruenewald et al., 2008). Splits were maintained when the groups were significantly different, and groups that were not significantly different were grouped together.

Figure 1 provides an illustrative example of a single RP tree predicting college degree completion. We can see from this tree that adolescents' race/ethnicity, home-based involvement, school-based involvement, and academic socialization are associated with adolescents' college degree completion. More specifically, for African American adolescents, the combination of home-based involvement and academic socialization was most predictive of college degree completion, whereas for white adolescents, it was the combination of school-based involvement and academic socialization. For Hispanic adolescents, school-based involvement alone best predicted college degree completion.

Detailed information regarding interpretation of the tree can be found in Appendix A. It is important to note that these pathways are not indications of an order of events that lead to a college degree, but are a series of AND statements of the associations among the predictors in the pathway (Gruenewald et al., 2006).

Because RP trees may be sensitive to small changes in the data, Strobl and colleagues (2009) suggested that a “forest” of trees may provide the best depiction of the relations among variables. When random sub-samples are drawn from the full sample to create the forest, the resulting ensemble of trees can offer insight as to which combinations of predictors tend to consistently predict the outcome, rather than relying on a single tree. Using the example in Figure 1, we would generate a large number of trees that may look similar to the one shown, but each tree may include different variables predicting college degree completion. Then, trees would be selected from the larger forest using validation and predictability measures (described in detail below) to create a final forest of trees predicting college degree attainment. Figure 2 provides an illustrative example of a forest of trees, and suggests that the combination of Variables 1, 3, 5, and 7 are most commonly associated with this outcome (detailed information regarding interpretation of the forest can be found in Appendix A).

Exhaustive chi-square automatic interaction detector (CHAID; Biggs, de Ville, & Suen, 1991) offered in IBM SPSS Decision Trees software was used to generate 50 trees for each outcome using home-based involvement, school-based involvement, academic socialization, race/ethnicity, SES, and control variables as predictors (see Table 2 for a summary of these measures). Initial splits were first set to default to racial/ethnic groups (i.e., the first set of child nodes will automatically be racial/ethnic groups) in order to

examine group differences in the combinations of factors predicting academic achievement and educational attainment between these groups. Then, initial splits were set to default to SES groups to examine group differences in the factors predicting these outcomes between SES groups. Exhaustive CHAID is an algorithm that uses F statistics for continuous outcomes to generate splits – when examining the cross-tabulation between each predictor and the outcome, CHAID will select the statistically significant relations ($\alpha = .05$) and if multiple relations are significant, the one with the smallest p value. Categories that are not significant are collapsed (IBM Corporation, 2013). Bonferroni adjustments are made to reduce the chances of Type I error, given the multiple tests for significance that take place throughout the analysis. The CHAID algorithm partitions continuous predictors prior to analysis. To avoid over-fitting the data, partitions were set to tertiles for all continuous variables in these analyses (Gruenewald et al., 2008).

Once 50 trees were generated for each outcome, trees to represent a forest for each racial/ethnic group and each SES quartile were selected using the following criteria: a) terminal nodes contained at least 10% of the tree sample and b) trees predicted unique pathways (i.e., if two trees model an identical pathway, the pathway was only represented in the forest once) Additionally, a split-sample validation technique was used to test the robustness of the pathways. Each tree was grown in a randomly selected 60% of participants to create a training tree. This tree structure was applied to the remaining 40% of participants as a testing tree. t -tests were calculated to compare each pathway from the training and test samples. Non-significant values indicated no difference between the two

trees and provided evidence of predictive performance. Trees with significant values were not included in the forests for each outcome. The proportion of variance explained by the tree was calculated using the following equation:

$$1 - \frac{\text{risk estimate}_{\text{final model}}}{\text{risk estimate}_{\text{baseline model}}} \times 100$$

Trees that contained substantially low proportions of variance (<2 standard deviation units below the average proportion) were excluded from the final forest for each group.

Results

Descriptive statistics. Table 3 includes correlations and descriptive statistics for all study variables. All parental involvement variables were positively correlated with educational attainment and GPA with the exception of home-based involvement, which was negatively correlated with educational attainment and GPA. *t*-tests revealed significant differences between males and females for both GPA (female $M = 4.53$, male $M = 4.10$; $t(9,197) = -15.79$, $p < .001$) and educational attainment (female $M = 4.92$, male $M = 4.54$; $t(9,805) = -10.02$, $p < .001$). Analysis of Variance showed significant differences in GPA ($F(5, 9,191) = 173.98$, $p < .001$) and educational attainment ($F(5, 9,799) = 74.31$, $p < .001$) across racial/ethnic groups (see Table 4). There were no significant differences in GPA or educational attainment for adolescents whose parents' primary language was English compared to other languages ($t(8,185) = -1.10$, *n.s.*; $t(8,708) = .38$, *n.s.*, respectively).

Parental educational involvement and GPA. GPA was regressed onto the control variables and parental educational involvement in order to examine the unique

association between each type of involvement and GPA. As can be seen in Table 5, all control and parental educational involvement variables were significantly associated with GPA. Greater school-based involvement ($\beta = .04, p < .001$) and academic socialization (β (parent) = .03, $p < .05$, and β (adolescent) = .24, $p < .001$) were associated with a higher GPA. Adolescent reports of academic socialization were the most strongly related to GPA, such that on average, every one-unit increase in academic socialization was associated with a .67 increase in GPA. In contrast, greater home-based involvement was associated with a lower GPA, β (parent) = -.07, $p < .001$ and β (adolescent) = -.16, $p < .001$.

Next, interaction terms between each type of involvement and SES were entered to examine if the association between involvement and GPA varied as a function of SES. Findings showed no significant interactions (see Table 6). Finally, interaction terms between each racial/ethnic group and each type of involvement were entered to examine if there was a significant difference in the association linking each type of involvement with GPA between white adolescents and other racial/ethnic groups. There were three significant interactions (see Table 7). The association between GPA and adolescent reports of home-based involvement and academic socialization were significantly different for African American youth compared to white youth, $\beta = .03, p < .05$ and $\beta = -.04, p < .01$, respectively. Simple slope analyses confirmed a significant negative association between home-based involvement and GPA for both white ($\beta = -.18, p < .001$) and African American ($\beta = -.08, p < .01$) adolescents. The association was attenuated for African American youth (see Figure 3). Simple slope analyses also confirmed a significant positive association between academic socialization and GPA for

both white ($\beta = .26, p < .001$) and African American ($\beta = .12, p < .01$) adolescents. Again, the association was attenuated for African American youth (see Figure 4). Lastly, the association between GPA and adolescent reports of academic socialization was significantly different for Asian American adolescents compared to white adolescents (see Figure 5). Simple slope analyses confirmed a positive association between academic socialization and GPA for Asian American ($\beta = .16, p < .001$) and white ($\beta = .26, p < .001$) adolescents.

Parental educational involvement and educational attainment. In order to examine the unique association between each type of involvement and educational attainment, educational attainment was regressed onto control variables and parental educational involvement (see Table 8). All control variables were significantly associated with educational attainment with the exception of school contact. School-based involvement and academic socialization were positively associated with educational attainment, $\beta = .03, p < .01$, β (parent) = $.03, p < .01$, and β (adolescent) = $.10, p < .001$. Adolescent reports of academic socialization were the most strongly related to educational attainment, such that every one-unit increase in academic socialization on average was associated with a .37 increase in educational attainment. Home-based involvement was negatively associated with educational attainment, β (parent) = $-.04, p < .001$, and β (adolescent) = $-.04, p < .01$. Next, interaction terms between each type of involvement and SES were entered to examine if the association between involvement and educational attainment varied as a function of SES. Findings showed no significant interactions (see Table 9). Finally, interaction terms between each racial/ethnic group and each type of involvement were entered to examine if there was a significant difference in

the association linking each type of involvement with educational attainment between white adolescents and other racial/ethnic groups. There was one significant interaction suggesting a different association between school-based involvement and educational attainment for Asian American adolescents compared to white adolescents (see Table 10 and Figure 6). Simple slope analyses revealed no association between school-based involvement and educational attainment for Asian American adolescents ($\beta = -.06, n.s.$) and a positive association for white adolescents ($\beta = .04, p < .01$).

Recursive partitioning – GPA.

Socioeconomic status. Recursive partitioning resulted in 10 trees for the first (lowest) SES quartile, 17 trees for the second quartile, 14 trees for the third quartile, and 13 trees for the fourth quartile. Percentage of variance explained across these trees ranged from 15.03-18.32%. In the first quartile, race, sex, school contact, school size, academic socialization (parent report), and school-based involvement all appeared in at least one tree (see Figure 7). Race and sex were the most common individual predictors of GPA, appearing in almost all trees. Adolescents who were Asian American and female most commonly had higher GPA in all trees. Adolescents who were Hispanic/Latino, multiracial, African American, Native American, and male most commonly had lower GPA in all trees.

In the second quartile, race, sex, school contact, academic socialization (adolescent reports), home-based involvement, and school-based involvement each appeared in at least one tree (see Figure 8). Race, sex, and academic socialization were the most common individual predictors of GPA. Adolescents who were African American or Native American and male most commonly had low GPA, a combination

appearing in three trees. Additionally, adolescents who were Hispanic Latino, African American, multiracial, or Native American who reported low levels of academic socialization had low average GPA, a combination that also appeared in three trees. Across all trees, the combination of factors that was associated with the lowest GPA was race, sex, and school contact such that adolescents who were African American or multiracial, male, and whose school contacted parents at least one time had the lowest GPA. Adolescents who were white or Asian American and female who also reported levels of academic socialization > 1.83 most commonly had the highest GPA, a combination of race and academic socialization appearing in all trees.

Findings were similar for the third SES quartile; race, sex, school contact, academic socialization (adolescent reports), and school-based involvement each appeared in at least one tree (see Figure 9). Race, sex, school contact, and academic socialization were the most common individual predictors of GPA. Adolescents who were African American and male most commonly had low GPA, a combination appearing in two trees. Across all trees, the combination of factors associated with the lowest GPA was race and sex – adolescents who were Hispanic/Latino and male. Adolescents who were white or Asian American and female who reported high levels of academic socialization most commonly had the highest GPA, a combination appearing in five trees. Across all trees, the combination of factors that was associated with the highest GPA was race, sex, and academic socialization – adolescents who were white or Asian American and female who reported academic socialization levels of 2.40 or more.

In the fourth and highest SES quartile, race, sex, school contact, academic socialization (adolescent report), and home-based involvement each appeared in at least

one tree (see Figure 10). Race, sex, and school contact were the most common individual predictors of GPA. Race and sex were the most common combination of factors associated with low GPA – adolescents who were African American, Native American, Hispanic Latino, or multiracial and male appeared in seven trees with the lowest GPA. Across all trees, the combination of factors associated with the lowest GPA was race and sex (African American or Native American male adolescents). Adolescents who were Asian American and female most commonly had higher GPA, a combination that appeared in six trees and was the combination associated with the highest overall GPA.

Race and ethnicity. Recursive partitioning resulted in nine trees for Hispanic/Latino adolescents, two trees for the combination of white and Asian American adolescents, 10 trees for Asian American adolescents, 12 trees for multiracial adolescents, five trees for African American adolescents, and 17 trees for the combination of African American and Native American adolescents. Percentage of variance explained across these trees ranged from 15.14 - 18.32%. For Hispanic/Latino adolescents, SES, sex, school contact, school size, academic socialization (adolescent report) and home-based involvement each appeared in at least one tree (see Figure 11). Sex and academic socialization were the most common individual predictors of GPA. Adolescents who were male and reported academic socialization levels of 2.40 or less most commonly had low GPA, a combination appearing in six trees. Across all trees, the combination of factors associated with the lowest GPA was SES ($\leq 2^{\text{nd}}$ quartile), sex (male), and academic socialization (≤ 1.83). Adolescents who were female and reported academic socialization levels above 2.40 most commonly had high GPA, a combination

appearing in five pathways. This was also the combination of factors associated with the highest GPA across all trees.

For white and Asian American adolescents, SES, sex, school contact, and academic socialization (adolescent report) each appeared in at least one tree (see Figure 12). SES, sex, and academic socialization were the most common individual predictors of GPA. Adolescents who were male, had an SES $\leq 2^{\text{nd}}$ quartile, and who reported academic socialization of 1.83 or less most commonly had low GPA, a combination appearing in two trees. This was also the combination associated with the lowest GPA across all trees. Adolescents who were female, had an SES in the fourth quartile, and who reported academic socialization levels greater than 2.40 most commonly had high GPA, a combination appearing in four trees. This was also the combination of factors associated with the highest GPA across all trees.

Ten trees also included pathways for Asian American adolescents alone (not in combination with white adolescents). SES, sex, school contact, parents' primary language, academic socialization (parent and adolescent report), and home-based involvement (parent report) each appeared in at least one tree (see Figure 13). SES, sex, and school contact were the most common predictors of GPA. The combination of SES (first quartile) and sex (male) was the most common combination of factors associated with low GPA. Across all trees, the combination of factors associated with the lowest GPA was SES (first quartile), sex (male), and parents' primary spoken language (not English). Adolescents who were female and had an SES in the fourth quartile most commonly had high GPA, a combination appearing in four trees. Across all trees, the

combination of factors associated with the highest GPA was SES (4th quartile), sex (female), and school contact (> 1).

For multiracial adolescents, SES, sex, school contact, academic socialization (adolescent report) and school-based involvement each appeared in at least one pathway (see Figure 14). SES, School contact, and school-based involvement were the most common individual predictors of GPA. There were no combinations of factors that were consistently associated with higher and lower GPA (no combinations appeared in more than one tree). Across all trees, the combination of SES ($\leq 2^{\text{nd}}$ quartile) and school contact (≤ 1) was associated with the lowest GPA, and school contact greater than one was associated with the highest GPA.

For African American adolescents, SES, sex, school contact, school size, and school-based involvement each appeared in at least one tree (see Figure 15). SES and school contact were the most common individual predictors of GPA. The most common combination of factors associated with lower GPA was SES ($\leq 2^{\text{nd}}$ quartile) and school contact (≤ 1), which appeared in four trees. Across all trees, the combination of factors associated with the lowest GPA was SES ($\leq 2^{\text{nd}}$ quartile) and school-based involvement (≤ 1). There were no combinations of factors associated consistently with GPA. Across all trees, adolescents who were female in had an SES in the 4th quartile had the highest GPA.

Lastly, there were 17 trees that included pathways for African American and Native American adolescents together (see Figure 15). SES, sex, school contact, school size, academic socialization (adolescent report), home-based involvement, and school-based involvement each appeared in at least one tree. SES, sex, and school contact were

the most common individual predictors of GPA. Adolescents with an SES less than or equal to the 2nd quartile and who had school contact less than or equal to one most commonly had low GPA, a combination appearing in five trees. Across all trees, the combination of factors associated with the lowest GPA was SES ($\leq 2^{\text{nd}}$ quartile), school contact (≤ 1), and academic socialization (≤ 1.83). The most common combination of factors for high GPA was sex (female) and school contact (> 1), a combination appearing in six trees. Across all trees, the combination of factors associated with the highest GPA was SES ($> 3^{\text{rd}}$ quartile) and sex (female).

Recursive partitioning – educational attainment.

Socioeconomic status. Recursive partitioning resulted in eight trees for the first (lowest) SES quartile, 17 trees for the second quartile, eight trees for the third quartile, and 13 trees for the fourth quartile. Percentage of variance explained across these trees ranged from 26.04 – 30.21%. GPA was the most common individual predictor of educational attainment for all trees across quartiles. In the first quartile, sex, parent language, school size, and academic socialization (adolescent report) also appeared in at least one tree (see Figure 16). GPA and academic socialization were the most common individual predictors of educational attainment. The combination of GPA (≤ 3) and academic socialization (≤ 2.40) was most commonly associated with lower educational attainment. Across all trees, lower GPA, school size, and academic socialization were associated with the lowest educational attainment. There were no combinations of factors commonly associated with higher educational attainment. Across all trees, GPA greater than 5 was associated with the highest educational attainment.

In the second quartile, GPA, race, sex, parent language, academic socialization, and school-based involvement each appeared in at least one tree (see Figure 17). GPA, race, sex, and academic socialization (parent report) were the most common individual predictors of educational attainment. Adolescents who were white, Hispanic/Latino, multiracial or Native American with a GPA less than or equal to 3 most commonly had low educational attainment, a combination appearing in five trees. Across all trees, the combination of factors that was associated with the lowest educational attainment was GPA, sex, and academic socialization – adolescents had a GPA at or below 3, were male, and had parents who reported academic socialization of 1.75 or less. There were no combinations of factors commonly associated with higher educational attainment. Across all trees, GPA greater than 5 was associated with the highest educational attainment.

For the third SES quartile, GPA, sex, school contact, academic socialization (adolescent report), home-based involvement, and school-based involvement each appeared in at least one tree (see Figure 18). GPA was the most common individual predictor of educational attainment. There were no combinations of factors that were consistently associated with higher or lower educational attainment. Across all trees, the combination of factors associated with the lowest educational attainment was GPA, sex, and home-based involvement – adolescents were female, had a GPA of three or less, and reported low levels of home-based involvement (≤ 3.33). Across all trees, the combination of factors that was associated with the highest educational attainment was GPA (> 5).

In the fourth and highest SES quartile, GPA, sex, school size, academic socialization, and school-based involvement each appeared in at least one tree (see Figure

19). GPA, sex, and academic socialization were the most common individual predictors of educational attainment. GPA (≤ 3) and sex (male) were the most common combination of factors associated with low educational attainment, a combination appearing in four trees. Across all trees, the combination of factors associated with the lowest educational attainment was GPA and academic socialization – adolescents with a GPA of 3 or less and who reported academic socialization levels of 1.83 or less. The most common combination of factors associated with higher educational attainment was GPA (> 5) and academic socialization (parent report: > 1.75 ; adolescent report > 1.83). Across all trees, the combination associated with the highest educational attainment included GPA (> 5), school size (≤ 4), and academic socialization (parent report: > 1.75).

Race and ethnicity. Recursive partitioning resulted in seven trees for Hispanic/Latino, African American, and Native American adolescents, 13 trees for white adolescents, six trees for Asian American adolescents, and four trees for multiracial adolescents. Percentage of variance explained across these trees ranged from 25.48 – 28.65%. GPA was the most common predictor of educational attainment across racial/ethnic groups. For Hispanic/Latino, African American, and Native American adolescents, SES, sex, school contact, and academic socialization (adolescent report) also each appeared in at least one tree (see Figure 20). GPA and SES were the most common individual predictors of educational attainment. Adolescents with a GPA of three or less with an SES in the 2nd quartile or below most commonly had low educational attainment, a combination appearing in five trees. This was also the combination associated with the lowest educational attainment across all trees. There were no combinations of factors

commonly associated with higher educational attainment. Across all trees, GPA greater than 5 was associated with the highest educational attainment.

For white adolescents, GPA, SES, sex, school contact, and academic socialization and school-based involvement each appeared in at least one tree (see Figure 21). GPA, SES, and academic socialization were the most common individual predictors of educational attainment. The most common combination of factors associated with lower educational attainment included GPA (≤ 3), SES ($\leq 2^{\text{nd}}$ quartile), and academic socialization (parent report: ≤ 1.75 ; adolescent report ≤ 1.83), appearing in five trees. This was also the combination associated with the lowest educational attainment across all trees. The most common combination of factors associated with higher educational attainment also included GPA (> 3), SES ($> 2^{\text{nd}}$ quartile), and academic socialization (parent report: > 1.75 ; adolescent report > 1.83), appearing in six trees. This was also the combination associated with the highest educational attainment across all trees.

For Asian American adolescents, GPA, sex, academic socialization, and home-based involvement (parent report) each appeared in at least one pathway (see Figure 22). GPA was the most common individual predictor of educational attainment. There were no combinations of factors consistently associated with lower educational attainment; a GPA of 3 or less was associated with the lowest educational attainment across all trees. The combination most commonly associated with higher educational attainment included GPA (> 5) and academic socialization (parent report: > 1.75 or 2.33 ; adolescent report: > 1.83), appearing in three trees. This was also the combination associated with the highest educational attainment across all trees.

Lastly, for multiracial adolescents, GPA, SES, and school-based involvement each appeared in at least one pathway. GPA and SES were the most common individual predictors of educational attainment (see Figure 22). There were no combinations of factors consistently associated with lower educational attainment; a GPA of 3 or less was associated with the lowest educational attainment across all trees. The combination most commonly associated with higher educational attainment included GPA (> 3) and SES (> 2nd quartile or 4th quartile), appearing in two trees. This was also the combination associated with the highest educational attainment across all trees.

Discussion

Given the persistent achievement gaps in the United States (Institute of Education Sciences, 2015), professionals and policymakers have encouraged parents to be more involved in their adolescents' academic lives as an important way to improve academic outcomes. However, research findings have remained unclear regarding the strategies that support diverse groups of adolescents, particularly across racial/ethnic and SES groups. Therefore, there were two main goals of this paper: 1) to examine how SES and race/ethnicity moderate the associations between three facets of parental educational involvement and academic outcomes and 2) to explore which combinations of parental educational involvement strategies are associated with academic outcomes, particularly how these combinations may vary between SES and racial/ethnic groups.

Regression analyses were used to address goal one, including interactions by SES and race/ethnicity. Overall, findings revealed no significant interactions between SES and parental educational involvement and four interactions between race/ethnicity and parental educational involvement. These findings partially supported hypotheses 1a-1e.

Recursive partitioning analyses were used to address goal two, and findings mostly corroborated regression results. Recursive partitioning also extended regression findings to provide information regarding more specific combinations of SES, race/ethnicity, and parental educational involvement strategies (particularly academic socialization) that were associated with academic outcomes. Hypothesis 2 was not supported, as parental educational involvement strategies did not consistently interact to predict academic outcomes. This was surprising given the evidence from previous literature suggesting parents use multiple strategies with their adolescents (e.g., Auerbach, 2007; Wang & Sheikh-Khalil, 2014). In the present study, parental educational involvement strategies were significantly correlated, but correlations were small-to-moderate in effect size (range: .07 - .45). The facets of involvement were also differentially associated with academic outcomes, with academic socialization having the strongest bivariate correlation with both GPA and educational attainment. Therefore, while parents may be practicing multiple involvement strategies, the strength of the association between academic socialization and academic outcomes may overshadow any effects of home-based or school-based involvement. Further, in RP analyses, samples are split based on the variables that create the most substantial difference in the outcome, and nodes only split four times to avoid over-fitting the data (i.e. ending in terminal nodes that contain small numbers of participants). Overall, in the present study, race/ethnicity, SES, adolescent sex, and academic socialization most commonly split nodes, leaving few additional splits for other forms of involvement. Future RP analyses that examine specific sub-groups of adolescents (e.g., trees specifically for lower-income males) would offer more opportunities for nodes to split on other variables and may provide greater insight

as to combinations of parental educational involvement strategies that are associated with academic outcomes.

Parental educational involvement and academic outcomes: Differences by SES. There were no differences in the associations between home-based and school-based involvement and academic outcomes across SES groups, refuting hypotheses 1b and 1d. Findings did support hypothesis 1e, however; the positive association between academic socialization and GPA did not differ by SES. Across SES groups, adolescents who reported greater academic socialization and school-based involvement had greater academic outcomes, whereas greater home-based involvement was associated with worse academic outcomes. These findings contrast previous studies reporting differences in these associations between SES groups (e.g., Benner, Boyle, & Sadler, 2016; Hill et al., 2004), but align with previous work detailing the main effects of school-based and home-based involvement. Greater school-based involvement has been associated with higher GPA and the likelihood of graduating high school, albeit with smaller effect sizes compared to academic socialization (e.g., Anguiano, 2004; Toldson & Lemmons, 2013). Findings regarding home-based involvement strategies have been more mixed, but similar to the present study, some studies have found negative associations with academic outcomes (e.g., Spera, 2006; Van Voorhis, 2011). Scholars have suggested that these negative findings reflect parents' response to adolescents' low prior achievement levels, also known as the "reactive hypothesis" (Catsambis, 1998). However, McNeal (2012) found limited support for this hypothesis - parents of lower performing adolescents actually became less involved over time rather than more involved. Scholars have also suggested that home-based involvement, as a direct form of involvement, may be a less

developmentally appropriate and more intrusive form of involvement for adolescents. For example, Karbach, Gottsclung, Spengler, Hegewald, and Spinath (2013) found that after accounting for general cognitive ability, autonomy-supportive home-based strategies were unrelated to achievement and achievement-oriented control was negatively associated with achievement. In the present study, parents and adolescents reported moderately high levels of home-based involvement (parents $M = 3.17$, adolescents $M = 2.63$ on a 1-4 scale), which included measures of parents' help with homework and structure at home. If these adolescents perceived their parents' involvement as too controlling or intrusive, home-based strategies may have been negatively associated with outcomes due to less motivation or effort from adolescents (Wehrspann et al., 2015). Future work that includes measures of quality of involvement, rather than just quantity, may help elucidate these differences in associations between home-based involvement and academic outcomes.

Further, the association between academic socialization and academic outcomes was substantial and was the strongest among the three facets of involvement. These findings were consistent with previous work, particularly a meta-analysis by Hill and Tyson (2004) of parental educational involvement during middle school. Hill and Tyson (2004) found that academic socialization had the strongest association with academic outcomes. The authors posited that these strong associations were due to the indirect nature of academic socialization as a form of involvement that meets adolescents' desires for autonomy (Hill & Tyson, 2004; Hoover-Dempsey & Sandler, 1995).

Recursive partitioning results corroborated regression findings – academic socialization appeared in more pathways predicting academic outcomes compared to

home-based and school-based involvement. These findings also suggested, however, that the association between academic socialization and academic outcomes varied across SES groups when in combination with other factors such as race and sex. Race and sex were consistently linked to GPA across SES groups (Asian American and white females had the highest GPA, and Hispanic/Latino, African American, multiracial, and Native American males had the lowest), but for adolescents in the 2nd SES quartile, academic socialization was also associated with higher and lower GPA, and in the 3rd SES quartile, higher GPA. For educational attainment, academic socialization also appeared as a predictor of educational attainment, particularly in combination with lower GPA for adolescents in the 1st and 2nd SES quartiles, and in combination with higher GPA for adolescents in the 4th SES quartile.

Findings regarding race and sex are not surprising – previous work has shown that females out-perform males and that adolescents identifying with a minority racial/ethnic group other than Asian American are at-risk for low academic achievement across SES groups (e.g., Pomerantz et al., 2002). However, the present study provided new insight as to how academic socialization may differentially interact with these factors for adolescents of varying SES. Regarding GPA, academic socialization may be the most effective form of parental educational involvement for supporting adolescents of moderate SES (2nd and 3rd SES quartiles in the present study), increasing achievement levels for white and Asian American females, and buffering against low achievement for Hispanic/Latino, African American, multiracial, and Native American male adolescents. Regarding educational attainment, for adolescents with lower prior achievement who are in low and moderately low SES groups, academic socialization may buffer against lower

educational attainment. For adolescents in the highest SES group, greater academic socialization may increase educational attainment for adolescents with higher prior achievement levels.

Parental educational involvement and academic outcomes: differences by race/ethnicity. Findings regarding academic outcomes among adolescents of different racial/ethnic groups were more complex than those for SES. Regression analyses provided no evidence of moderation for school-based involvement and GPA, but findings did show that while school-based involvement was positively associated with educational attainment for white adolescents, it was not associated with attainment for Asian American adolescents. These findings did not support hypothesis 1a, which posited that school-based involvement would be more strongly related to academic outcomes for Asian American adolescents compared to white adolescents. Recursive partitioning analyses substantiated regression results; school-based involvement did not appear in any trees for Asian American students, but did for white adolescents. These findings directly contrasted findings from Anguiano (2004) that showed school-based involvement was more strongly associated with high school completion for Asian American students compared to white students, as well as Hong and Ho (2005) who found a stronger association between school-based involvement and GPA for Asian American adolescents. These differences in findings may reflect differences in how each study measured school-based involvement. The Hong and Ho (2005) scale for school-based involvement included items regarding parents' active engagement with school personnel (e.g., teacher and school counselor) and involvement in adolescents' classrooms, and Anguiano (2004) also included information regarding parent participation in school decision-making. In

contrast, in the present study, school-based involvement focused on parents' involvement in the parent-teacher organization and general school volunteer activities. These conceptualizations of school-based involvement may tap into different aspects of parents' social capital. Parents who have relationships with teachers and counselors, are involved in school decision-making, and are present in their adolescents' classrooms may create different information channels (i.e., relationships with school personnel) compared to parents who are involved in activities with the PTO and create information channels with other parents. It may be that information channels with the school are more beneficial for parents accessing information about postsecondary educational opportunities or strategies for supporting GPA compared to information gained from other parents. Evidence of the benefits of information channels with the school may also be seen in the consistency of contact by the school as a predictor of GPA in RP analyses for Asian American adolescents.

For home-based involvement, regression analyses also suggested differences between white adolescents and African American adolescents. The negative association between home-based involvement and GPA was attenuated for African American adolescents. These findings partially supported hypothesis 1c; while the association for home-based involvement was unexpectedly negative, it was less so for African American youth. As noted by Wang and colleagues (2014), African American adolescents may respond more positively to "no-nonsense" parenting compared to white adolescents. Therefore, African American adolescents may respond more positively to greater home-based involvement; if parents are using more controlling or intrusive strategies, these

strategies may be perceived as normative for African American adolescents yet may be perceived as an infringement on autonomy for white adolescents.

Lastly, regression results also provided evidence for differential effects of academic socialization for GPA, but not educational attainment. Academic socialization was more strongly related to GPA for white adolescents compared to Asian American and African American adolescents, refuting hypothesis 1e. Again, RP analyses substantiated these findings, as academic socialization appeared in trees for white adolescents, but not for Asian American or African American adolescents. This was surprising given previous research that has detailed the benefits of academic socialization across racial/ethnic groups (Hill & Tyson, 2004). However, RP results suggested there may be other factors associated with academic outcomes for Asian American and African American adolescents; while academic socialization was beneficial for adolescents when it did appear in trees, contact by the school appeared much more frequently. These findings suggest that academic socialization may be the most beneficial strategy for white adolescents (in combination with sex and SES), whereas contact by the school (in combination with sex and SES) may be more beneficial for Asian American and African American adolescents. When the schools reach out to families, regardless of parents' actual participation at school, they may be signaling to families a bridge in the cultural gap that often exists between schools and families of racial/ethnic minority (Garcia-Coll et al., 1996). Therefore, contact by the school may be more important for distinguishing levels of academic achievement for Asian American or African American adolescents than academic socialization. Following this logic, it was surprising that contact by the school did not appear in many GPA trees for Hispanic/Latino adolescents, whose parents

may also experience a cultural mismatch with the school (Hill & Torres, 2010). However, Hispanic/Latino parents may see themselves more as moral supporters (Auerbach, 2007), which may explain the appearance of academic socialization in GPA trees compared to contact by the school.

Overall, these findings suggest that GPA and educational attainment are associated with different combinations of factors for adolescents of varying SES and racial/ethnic groups. Academic socialization was the most consistent form of parental educational involvement related to GPA and educational attainment overall, but appeared most in trees for Hispanic/Latino adolescents (for GPA) and white adolescents (for both GPA and educational attainment). It seemed to be particularly beneficial for buffering against lower achievement for white, male adolescents who had low SES, as well as for adolescents in moderate SES groups who were male and identified as a racial/ethnic minority (other than Asian American). It was also beneficial for educational attainment for adolescents in the lowest and highest SES quartiles. Contact by the school was more commonly associated with GPA than academic socialization for African American, Native American, and Asian American adolescents. It seemed particularly beneficial for female Asian American adolescents, as well as male African American and Native American adolescents with lower SES.

These findings align with Bronfenbrenner's Bioecological Model of Human Development. Broadly, these findings are evidence that a variety of individual and contextual factors are associated with adolescent academic development. As suggested by Bronfenbrenner and Morris (2006), parental educational involvement (a proximal process) was associated with educational outcomes as posited by mesosystem linkages

between home and school contexts. Recursive partitioning is a novel method for exploring these person-process-context interactions in ways that may provide richer interpretation of higher-order interactions compared to traditional regression methods. As Bronfenbrenner and Morris (2006) described in detail, the role of research design in the Bioecological Model of Human Development is "...not the usual one of testing for statistical significance" (p. 801), but instead one of discovery. Recursive partitioning provides a framework for such discovery and exploration.

Further, findings aligned with theories of social capital. As suggested by Coleman (1988), parental educational involvement strategies were directly linked to GPA and educational attainment. Findings also corroborated suggestions by Bourdieu (Dika & Singh, 2002) and Bronfenbrenner and Morris (2006) that characteristics of individuals shape proximal processes; in this study, there were differences in the links between parental educational involvement and academic outcomes based on characteristics such as race/ethnicity.

Limitations and future directions. This study contributes to existing parental educational involvement literature by illuminating the different combinations of factors associated with academic outcomes for adolescents, combinations that have not previously been explored. Despite the many strengths of the study, there are several limitations to note. While educational attainment was a longitudinal outcomes measure, measures of parental involvement came from just one time point, and GPA was an average across grades 9-12. Future work that explores trajectories of parental involvement and GPA through high school and beyond may offer deeper insight as to which types of involvement most benefit diverse groups of adolescents. Further, while

this study explored meaningful differences between adolescents of different race/ethnicities and SES groups, it did not explore possible community characteristics (e.g., urban vs rural communities or differences in community resources such as college preparation programs or access to a college campus) that may interact with race/ethnicity and SES, an area that would benefit from further research (Hill, 2006). This study used RP to explore higher order combinations of factors associated with academic outcomes. While innovative, this approach also provided challenges for interpreting results. Adolescents who identified as Native American were combined during tree splitting due to non-significant differences in outcomes between adolescents in this group and other groups, offering less insight about Native American adolescents compared to other racial/ethnic groups. Recursive partitioning analyses also restricted the ability to account for the complex sampling design of this study. Future studies should replicate these RP analyses with other populations of adolescents. Finally, while there were statistically significant interactions in regression analyses, effect sizes were small, and there were multiple comparisons that may have biased significance findings.

Implications for research, policy, and practice. Findings from this study clearly suggest that different combinations of factors are associated with GPA and educational achievement for adolescents of diverse racial/ethnic and SES groups. Previous studies have not explored these higher-order interactions (e.g., SES by race by sex by academic socialization), and these findings have important implications for future research, policy, and practice. Future longitudinal studies of parental educational involvement would benefit from incorporating finer distinctions among adolescents (e.g., specific racial/ethnic groups rather than white vs non-white), as there appear to be substantial

differences between groups. These studies may also focus on academic socialization, as it seems to be a salient factor linked to academic outcomes. More specifically, intervention studies incorporating academic socialization may provide evidence of a causal association between academic socialization and academic outcomes, or shed light on intermediary factors linking academic socialization and academic outcomes.

Future policy and practice may also benefit from the findings of this study. Oftentimes, legislation and school policy provide broad, vague references to parental educational involvement, encouraging parents generally to “be more involved.” This study provides evidence of the many factors that differ in their association with academic outcomes across diverse groups of adolescents, challenging the notion of one-size-fits-all parental educational involvement. Similarly, teachers may tailor their efforts with parents to incorporate strategies or encourage strategies that may be more culturally sensitive and effective for individual students. Finally, parents may have limited time and resources – by focusing efforts on encouraging parenting strategies that seem to be most related to academic outcomes for specific groups, there may be a greater return on investment for adolescents’ success.

Tables

Table 1.
Summary of Parental Educational Involvement Measures for Adolescents and Parents at Base Year

	<u>Adolescent</u>		<u>Parent</u>	
	Question	Scale	Question	Scale
Home-based involvement	How often do your parents do the following? -Check on whether you have done your homework -Help you with your homework -Give you privileges as a reward for good grades -Limit privileges because of poor grades -Limit the amount of time watching TV/playing video games -Limit the amount of time going out with friends on school nights	1 – never 2 – rarely 3 – sometimes 4 – often	How often do you... - check that your tenth grader has completed homework? - make and enforce curfews for your tenth grader on school nights?	1 – never 2 – seldom 3 – usually 4 – always
			Looking back over the past year, how frequently did you and your tenth grader participate in the following activities together? - Working on homework or other school projects	1 – never 2 – rarely 3 – sometimes 4 – frequently
School-based involvement	N/A		Do you and your spouse/partner do any of the following? - Belong to the school’s parent-teacher organization - Attend meetings of the parent-teacher organization - Take part in activities of the parent-teacher organization - Act as a volunteer at the school	0 – no 1 – yes

Table 1. Continued

	How often have you discussed the following with either or both of your parents or guardians?		How often have you and/or your spouse/partner provided advice or information about the following to your tenth grader?	
Academic socialization	- Selecting courses or programs at school	1 – never	- Selecting courses or programs at school	1 – never
	- School activities or events of particular interest to you	2 – sometimes	- Plans and preparation for college entrance exams such as ACT, SAT or ASVAB	2 – sometimes
	- Things you’ve studied in class	3 – often	- Applying to colleges or other schools after high school	3 – often
	- Your grades		- Specific jobs your tenth grader might apply for after high school	
	- Plans and preparation for ACT or SAT tests			
	- Going to college			

Table 2.
Summary of Variables used in Regression Models and Recursive Partitioning

	Regression Analyses	Recursive Partitioning Analyses
Adolescent sex	Dichotomous: male/female	Dichotomous: male/female
Parent primary language spoken	Dichotomous: English/other	Dichotomous: English/other
School size	Continuous	Continuous
Adolescent race/ethnicity	Five dummy codes (white as reference): Black or African American Hispanic or Latino Asian or Pacific Islander American Indian or Alaska Native Mixed race	Categorical: Six categories
Socioeconomic status	Continuous	Continuous
Home-based involvement	Continuous	Continuous
School-based involvement	Continuous	Continuous
Academic Socialization	Continuous	Continuous
Race/ethnicity X involvement (separate interactions for each type of involvement)	Five interaction terms (white as reference): Black or African American X involvement Hispanic or Latino X involvement Asian or Pacific Islander X involvement American Indian or Alaska Native X involvement Mixed race X involvement	N/A
SES X involvement (separate interactions for each type of involvement)	SES X involvement	N/A

Table 3.
Correlations and Descriptive Statistics for Study Variables

Variables	1	2	3	4	5	6	7	8	9	10
1. Socioeconomic status	–									
2. School contact	.26***	–								
3. School size	-.10***	-.20***	–							
4. Home-based involvement – parent	.01	.07***	-.01	–						
5. Home-based involvement – adolescent	.10***	.07***	.02	.21***	–					
6. School-based involvement	.21***	.30***	-.12***	.10***	.07***	–				
7. Academic socialization – adolescent	.23***	.17***	-.01	.10***	.45***	.11***	–			
8. Academic socialization – parent	.17***	.13***	.03**	.33***	.12***	.13***	.22***	–		
9. Educational attainment	.39***	.17***	-.06***	-.06***	.02	.13***	.30***	.11***	–	
10. GPA	.33***	.20***	-.14***	-.09***	-.02*	.12***	.26***	.07***	.54***	–
<i>M</i>	.09	1.70	3.40	3.17	2.63	2.12	2.17	2.20	4.53	4.11
<i>SD</i>	.76	.98	1.83	.60	.69	1.38	.50	.55	1.94	1.48
Range	-2 – 2	1 – 4	1 – 7	1 – 4	1 – 4	1 – 4	1 – 3	1 – 3	1 – 9	0 – 6

Table 4.
Summary of Mean Differences for GPA and Educational Attainment across Racial/Ethnic Groups

	<i>M(SD)</i>					
	White	African American	Asian American	Hispanic/Latino	Multiracial	Native American
GPA	4.54 (1.27)	3.50 (1.29) _a	4.70 (1.24)	3.79 (1.33) _b	4.17 (1.27)	3.54 (1.33) _{a,b}
Educational attainment	4.92 (1.92)	4.20 (1.69) _c	5.23 (1.98)	4.10 (1.70) _c	4.54 (1.95)	3.73 (1.76) _c
<i>N</i>	5,700	1,000	890	1,130	400	70

Note. All mean differences statistically significantly different ($p < .01$) unless indicated with a matching subscript. Sample sizes rounded to the nearest ten as per IES requirements.

Table 5.
Summary of Regression Analysis Predicting GPA (N = 9,180)

Variable	<i>B</i>	<i>Robust SE B</i>	β
Intercept	4.13	.09	
Parent language	-.27	.07	-.07***
Female	.38	.03	.14***
School contact	.10	.02	.07***
School size	-.05	.01	-.07***
Socioeconomic Status	.39	.03	.20***
African American	-.94	.07	-.22***
Hispanic/Latino	-.51	.07	-.13***
Asian American	.15	.07	.02*
Multiracial	-.38	.08	-.05***
Native American	-.57	.18	-.04**
Home-based – parent	-.17	.03	-.07***
Home-based – adolescent	-.33	.03	-.16***
School-based involvement	.04	.01	.04***
Academic socialization – adolescent	.67	.01	.24***
Academic socialization – parent	.08	.04	.03*

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

Table 6.
Summary of Regression Analysis Predicting GPA including SES as a Moderator (N = 9,180)

Variable	<i>B</i>	<i>Robust SE B</i>	β
Intercept	4.14	.09	
Parent language	-.27	.07	-.07***
Female	.38	.03	.14***
School contact	.11	.02	.07***
School size	-.05	.01	-.07***
Socioeconomic Status	.39	.03	.20***
African American	-.95	.07	-.22***
Hispanic/Latino	-.51	.07	-.13***
Asian American	.15	.07	.02*
Multiracial	-.38	.08	-.05***
Native American	-.57	.18	-.04**
Home-based – parent	-.18	.03	-.08***
Home-based – adolescent	-.34	.03	-.17***
School-based involvement	.04	.01	.04**
Academic socialization – adolescent	.66	.04	.24***
Academic socialization – parent	.08	.03	.03*
Home-based – parent X SES	-.05	.04	-.02
Home-based – adolescent X SES	-.00	.04	-.00
School-based X SES	-.03	.02	-.02
Academic socialization – adolescent X SES	-.07	.05	-.01
Academic socialization – parent X SES	.08	.04	.02

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

Table 7.
Summary of Regression Analysis Predicting GPA including Race as a Moderator

Variable	<i>B</i>	<i>Robust SE B</i>	β
Intercept	4.12	.09	
Parent language	-.27	.07	-.06***
Female	.38	.03	.14***
School contact	.11	.02	.07***
School size	-.06	.01	-.07***
Socioeconomic Status	.39	.03	.20***
African American	-.91	.07	-.21***
Hispanic/Latino	-.49	.07	-.12***
Asian American	.13	.07	.02
Multiracial	-.36	.08	-.05***
Native American	-.54	.02	-.04**
Home-based – parent	-.19	.04	-.08***
Home-based – adolescent	-.37	.04	-.18***
School-based involvement	.02	.02	.02
Academic socialization – adolescent	.73	.05	.26***
Academic socialization – parent	.10	.04	.04**
Home-based – parent X African American	-.07	.10	-.01
Home-based – adolescent X African American	.20	.09	.03*
School-based X African American	.07	.04	.02
Academic socialization – adolescent X African American	-.39	.15	-.04**
Academic socialization – parent X African American	-.09	.11	-.01
Home-based – parent X Hispanic/Latino	.09	.10	.01
Home-based – adolescent X Hispanic/Latino	.04	.10	.01
School-based X Hispanic/Latino	.07	.05	.02
Academic socialization – adolescent X Hispanic/Latino	-.02	.14	-.00
Academic socialization – parent X Hispanic/Latino	-.07	.09	-.01

Table 7. Continued

Variable	<i>B</i>	<i>Robust SE B</i>	β
Home-based – parent X Asian American	.01	.09	.00
Home-based – adolescent X Asian American	.09	.10	.01
School-based X Asian American	-.01	.04	-.00
Academic socialization – adolescent X Asian American	-.28	.12	-.02*
Academic socialization – parent X Asian American	-.04	.11	-.00
Home-based – parent X Multiracial	.10	.17	.01
Home-based – adolescent X Multiracial	.11	.12	.01
School-based X Multiracial	.10	.06	.02
Academic socialization – adolescent X Multiracial	-.06	.17	-.00
Academic socialization – parent X Multiracial	-.19	.20	-.01
Home-based – parent X Native American	.47	.30	.02
Home-based – adolescent X Native American	.40	.32	.02
School-based X Native American	.09	.24	.01
Academic socialization – adolescent X Native American	-.39	.36	-.01
Academic socialization – parent X Native American	.23	.29	.01

Table 8.
Summary of Regression Analysis Predicting Educational Attainment (N = 9,180)

Variable	<i>B</i>	<i>Robust SE B</i>	β
Intercept	4.49	.11	
Parent language	-.23	.08	-.04**
Female	.14	.04	.04***
School contact	.02	.03	.01
School size	.04	.01	.04**
Socioeconomic Status	.55	.04	.21***
African American	.15	.07	.03*
Hispanic/Latino	-.15	.08	-.03*
Asian American	.30	.09	.03***
Multiracial	-.03	.10	-.00
Native American	-.04	.23	-.00
Home-based – parent	-.13	.04	-.04***
Home-based – adolescent	-.11	.04	-.04**
School-based involvement	.05	.02	.03**
Academic socialization – adolescent	.37	.05	.10***
Academic socialization – parent	.12	.04	.03**

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

Table 9.
Summary of Regression Analysis Predicting Educational Attainment including SES as a Moderator (N = 9,180)

Variable	<i>B</i>	<i>Robust SE B</i>	β
Intercept	4.50	.11	
GPA	.56	.02	.41***
Parent language	-.23	.08	-.04**
Female	.14	.04	.04***
School contact	.02	.03	.01
School size	.04	.01	.04***
Socioeconomic Status	.55	.03	.21***
African American	.15	.07	.03*
Hispanic/Latino	-.15	.08	-.03*
Asian American	.30	.09	.03**
Multiracial	-.03	.10	-.00
Native American	-.03	.22	-.00
Home-based – parent	-.13	.04	-.04***
Home-based – adolescent	-.11	.04	-.04**
School-based involvement	.04	.02	.03*
Academic socialization – adolescent	.37	.05	.10***
Academic socialization – parent	.12	.04	.13**
Home-based – parent X SES	-.01	.05	-.00
Home-based – adolescent X SES	.02	.05	.01
School-based X SES	.03	.02	.01
Academic socialization – adolescent X SES	-.07	.07	-.01
Academic socialization – parent X SES	-.01	.06	-.00

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

Table 10.
Summary of Regression Analysis Predicting Educational Attainment including Race as a Moderator (N = 9,180)

Variable	<i>B</i>	<i>Robust SE B</i>	β
Intercept	4.49	.11	
GPA	.56	.02	.41***
Parent language	-.23	.08	-.04**
Female	.14	.04	.04***
School contact	.02	.03	.01
School size	.04	.01	.04**
Socioeconomic Status	.55	.03	.21***
African American	.14	.07	.02*
Hispanic/Latino	-.17	.08	-.03*
Asian American	.25	.09	.03**
Multiracial	-.02	.10	-.00
Native American	-.08	.27	-.00
Home-based – parent	-.16	.05	-.05**
Home-based – adolescent	-.11	.05	-.04**
School-based involvement	.06	.02	.04**
Academic socialization – adolescent	.38	.06	.10***
Academic socialization – parent	.13	.05	.04**
Home-based – parent X African American	.12	.13	.01
Home-based – adolescent X African American	.00	.11	.00
School-based X African American	-.05	.05	-.01
Academic socialization – adolescent X African American	-.03	.16	-.00
Academic socialization – parent X African American	-.02	.13	-.00
Home-based – parent X Hispanic/Latino	.18	.11	.02
Home-based – adolescent X Hispanic/Latino	-.00	.10	-.00
School-based X Hispanic/Latino	-.05	.05	-.01
Academic socialization – adolescent X Hispanic/Latino	-.10	.16	-.01
Academic socialization – parent X Hispanic/Latino	.00	.11	.00

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

Table 10. Continued

Variable	<i>B</i>	<i>Robust SE B</i>	β
Home-based – parent X Asian American	-.00	.14	-.00
Home-based – adolescent X Asian American	.10	.15	.01
School-based X Asian American	-.15	.06	-.02**
Academic socialization – adolescent X Asian American	.02	.17	.00
Academic socialization – parent X Asian American	-.06	.16	-.00
Home-based – parent X Multiracial	-.16	.24	-.01
Home-based – adolescent X Multiracial	.04	.16	.00
School-based X Multiracial	.07	.08	.01
Academic socialization – adolescent X Multiracial	-.02	.23	-.00
Academic socialization – parent X Multiracial	-.09	.26	-.00
Home-based – parent X Native American	.09	.26	.00
Home-based – adolescent X Native American	.06	.30	.00
School-based X Native American	-.44	.30	-.02
Academic socialization – adolescent X Native American	.58	.58	.01
Academic socialization – parent X Native American	.33	.45	.01

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

Figures

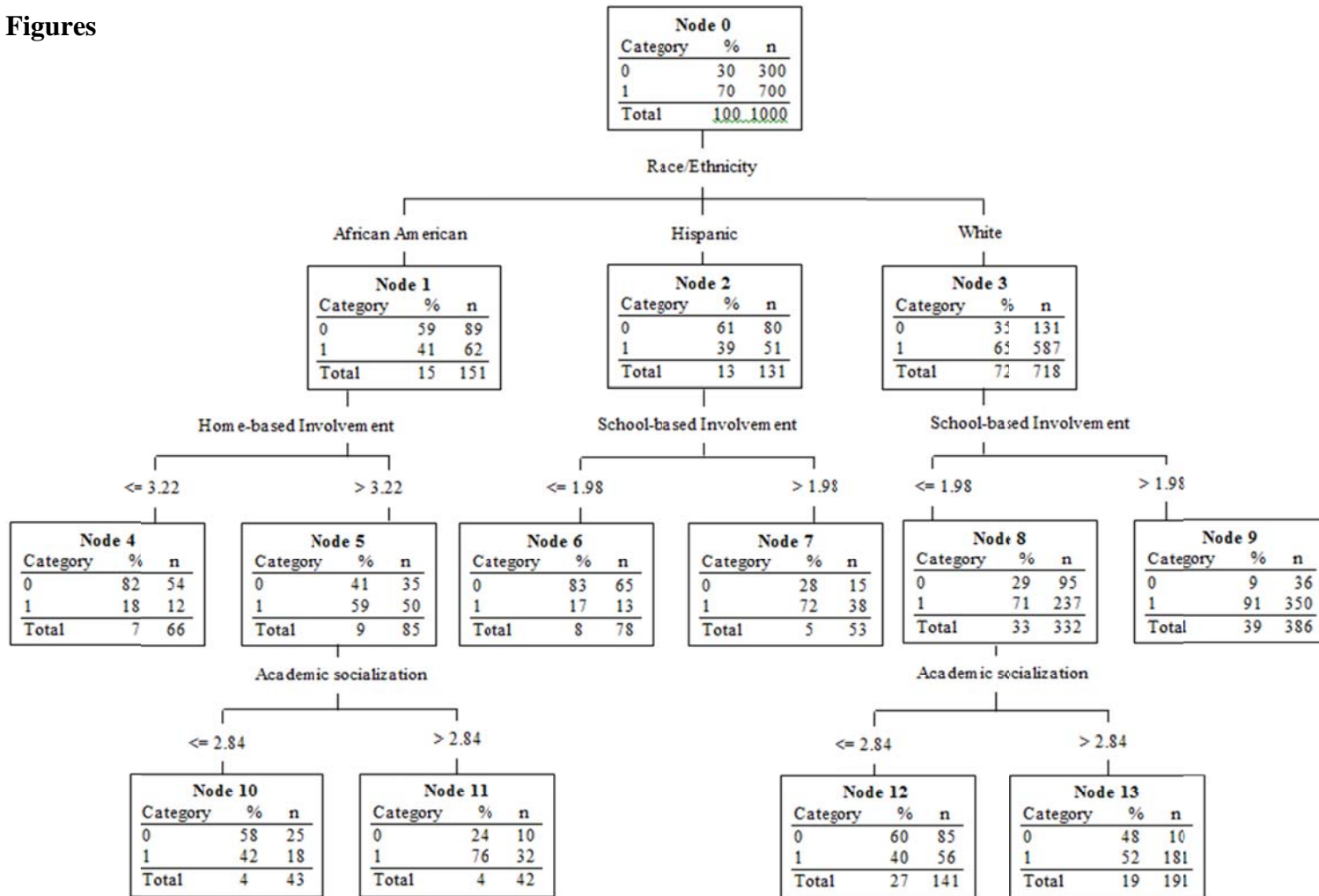


Figure 1. Example of a single recursive partitioning tree predicting college degree attainment (did complete a college degree = 1).

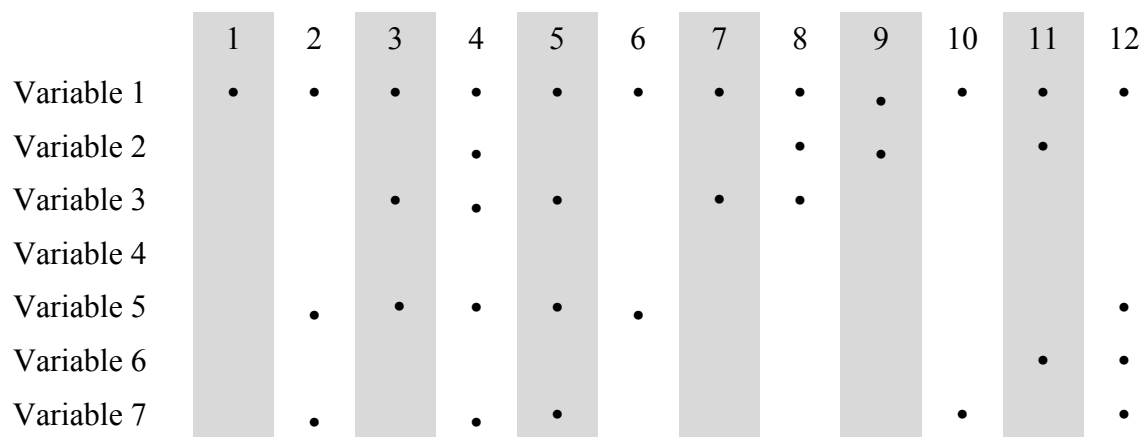


Figure 2. Example of a forest of trees created using seven predictors.

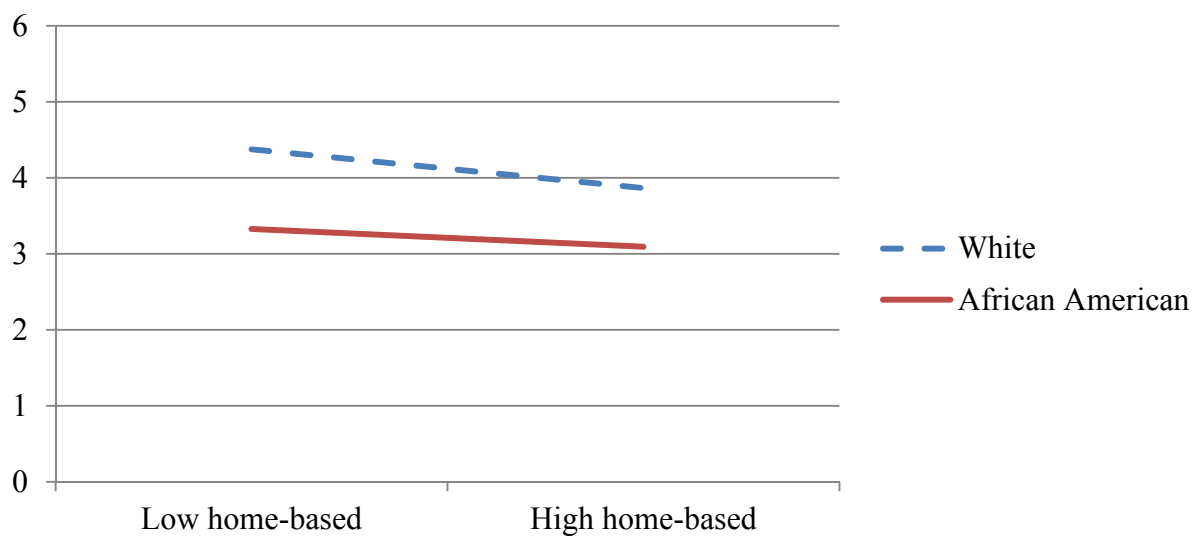


Figure 3. The association between home-based involvement and GPA for white and African American adolescents. Low home-based represents 1SD below the mean, and high represents 1SD above.

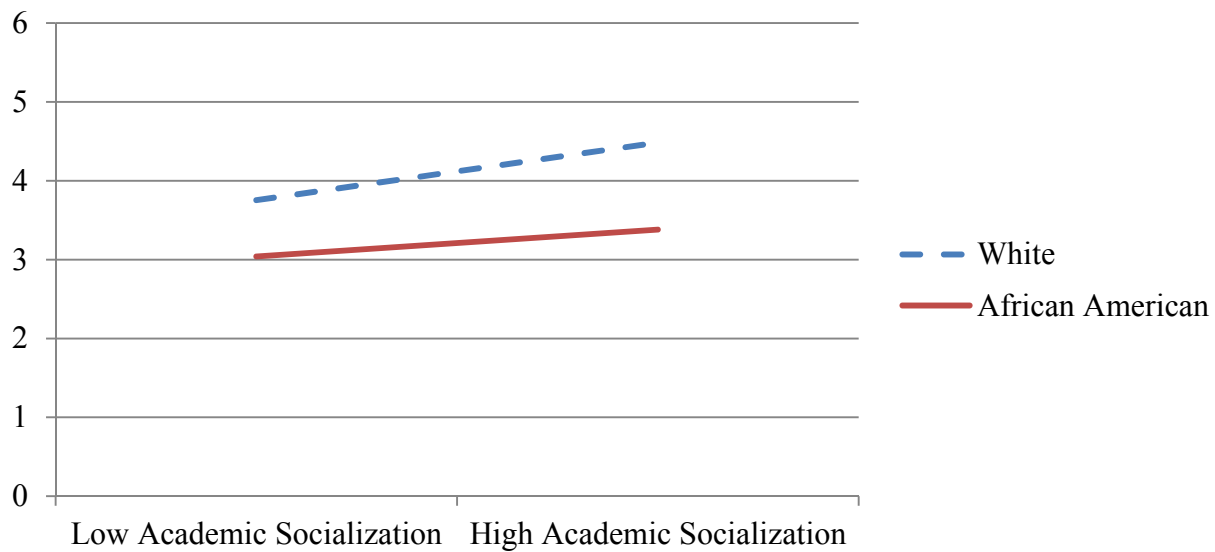


Figure 4. The association between academic socialization and GPA for white and African American adolescents. Low academic socialization represents 1SD below the mean, and high represents 1SD above.

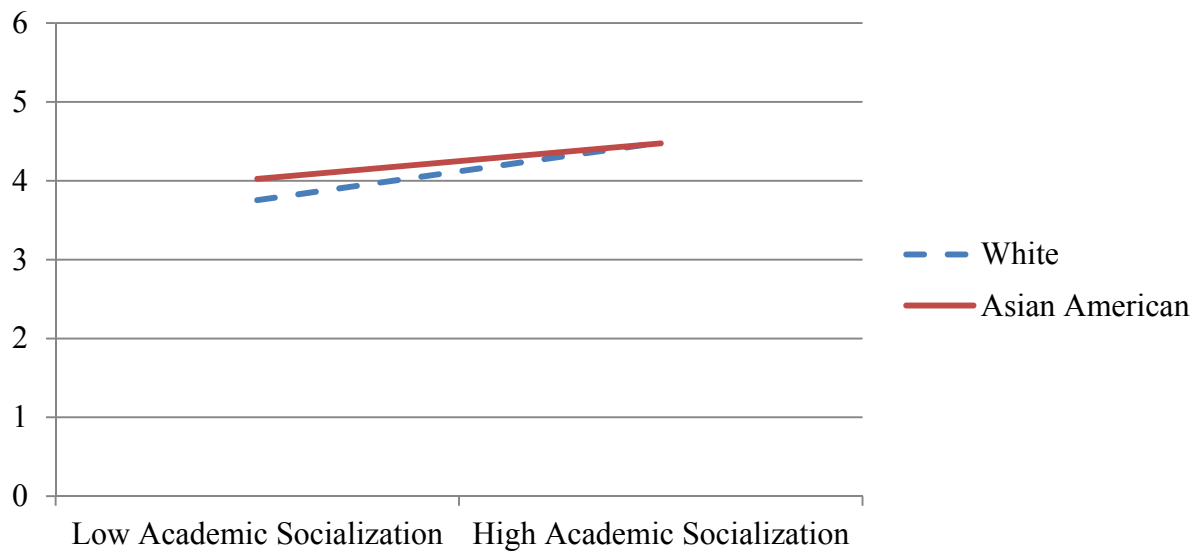


Figure 5. The association between academic socialization and GPA for white and Asian American adolescents. Low academic socialization represents 1SD below the mean, and high represents 1SD above.

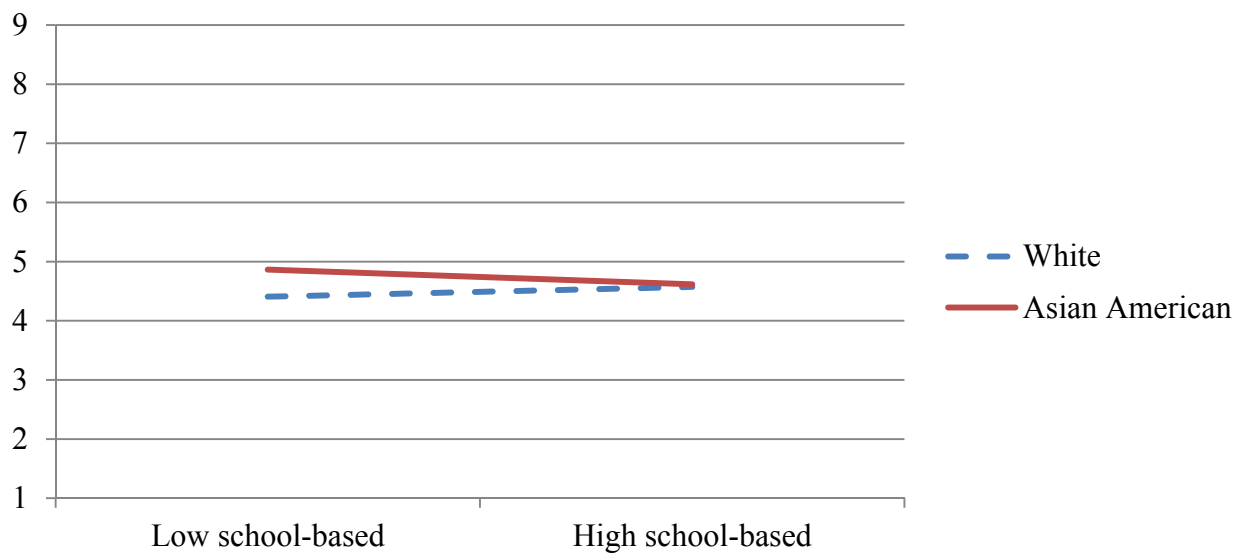


Figure 6. The association between school-based involvement and educational attainment for white and Asian American adolescents. Low school-based involvement represents 1SD below the mean, and high represents 1SD above.

Path	Mean GPA ^a	Race	Sex	Contact	English	Size	AS - parent	AS - adolescent	HB - adolescent	HB - parent	SB
1	Highest:	4.67 - 4.79	AsA	F							
	Lowest:	3.16 - 3.17	HL, AA, MR, NA	M	<=1						
2	Highest:	4.69 - 4.94	AsA	F							
	Lowest:	3.01 - 3.14	HL, MR	M							
3	Highest:	4.96	AsA	F							
	Lowest:	3.02	HL, MR, NA	M							0
4	Highest:	4.55 - 4.91	AsA	F							
	Lowest:	2.92 - 3.14	HL, MR, NA	M							
5	Highest:	4.81	AsA	F							
	Lowest:	3.29	HL, NA	M							
6	Highest:	4.73 - 4.84	AsA	F							
	Lowest:	3.02 - 3.06	AA, NA				>2.33				
7	Highest:	4.61 - 4.91	AsA	F							
	Lowest:	2.97 - 3.85	AA								
8	Highest:	5.10	AsA	F							
	Lowest:	3.06	HL, AA	M							
9	Highest:	4.78	AsA	F							
	Lowest:	3.13	HL, AA, MR, NA	M							>2
10	Highest:	4.61 - 4.81	AsA	F							
	Lowest:	3.21 - 3.30	AA	M							

Figure 7. Recursive partitioning forest of trees for adolescents in the first (lowest) SES quartile predicting GPA.

Note. AsA = Asian American; AA = African American; HL = Hispanic/Latino; W = white; NA = Native American; MR = multiracial; F = female; M = male; AS = academic socialization; HB = home-based involvement; SB = school-based involvement. Highest and lowest values are in bold.

^aRanges of attainment represent the multiple forests with identical pathways.

		Mean GPA ^a	Race	Sex	Contact	Size	AS - parent	AS - adolescent	HB - adolescent	HB - parent	SB
1	Highest:	4.65 - 4.74	W, AsA	F				>1.83			
	Lowest:	3.18 - 3.34	AA, NA		<=1						
2	Highest:	4.63 - 4.67	W					1.83 - 2.40	<=2.83		
	Lowest:	3.26 - 3.42	AA, NA	M							
3	Highest:	4.70	W		>1			>1.83			
	Lowest:	3.26	AA, NA								<=1
4	Highest:	4.70 - 4.75	W, AsA	F				>1.83			
	Lowest:	3.27 - 3.50	HL, AA, MR, NA		<=1			<=1.83			
5	Highest:	4.66	W, AsA	F				>1.83			
	Lowest:	3.45	HL, MR		<=1						
6	Highest:	4.72 - 4.75	W, AsA	F				>1.83			
	Lowest:	3.32 - 3.42	HL, AA, MR, NA	M	<=1						
7	Highest:	4.73	W, AsA	F				>1.83			
	Lowest:	3.58	HL, AA, MR, NA					<=2.40			
8	Highest:	4.62 - 4.72	W	F				>1.83			
	Lowest:	3.34 - 3.40	AA, NA								
9	Highest:	4.70	W					>1.83	<=2.83		
	Lowest:	3.32	HL, AA, MR, NA					<=1.83			
10	Highest:	4.59	W					>1.83	<=2.83		
	Lowest:	3.29	AA, NA	M							
11	Highest:	4.67	W, AsA					>1.83	<=2.83		
	Lowest:	3.20	AA, NA								<=1

Figure 8. Recursive partitioning forest of trees for adolescents in the second SES quartile predicting GPA.

Note. AsA = Asian American; AA = African American; HL = Hispanic/Latino; W = white; NA = Native American; MR = multiracial; F = female; M = male; AS = academic socialization; HB = home-based involvement; SB = school-based involvement. Highest and lowest values are in bold. ^aRanges of attainment represent the multiple forests with identical pathways.

Path	Mean GPA ^a	Race	Sex	Contact	Size	AS - parent	AS - adolescent	HB - adolescent	HB - parent	SB
12	Highest:	4.7	W	F		>1.83				
	Lowest:	3.15	AA, NA				<=2.33	>3.33		
13	Highest:	4.68	W			>1.83	<=2.83			
	Lowest:	3.05	AA, NA	M	<=1					
14	Highest:	4.78	W	F			>1.83			
	Lowest:	3.29	AA, NA							0
15	Highest:	4.78	W	F			>1.83			
	Lowest:	3.22	AA, NA				<=1.83			
16	Highest:	4.71	W	F			>1.83			
	Lowest:	3.25	AA, NA	M						
17	Highest:	4.70	W, AsA		>1		>1.83			
	Lowest:	3.58	HL, AA, MR, NA				<=1.83			

Figure 8. Continued

Path	Mean GPA ^a	Race	Sex	Contact	AS - parent	AS - adolescent	HB - adolescent	HB - parent	SB
1	Highest:	4.91 - 5.06	W, AsA, MR	F	>1				
	Lowest:	3.50 - 3.52	HL, AA, NA	M					
2	Highest:	4.91 - 4.99	W, AsA, MR	F		>2.40			
	Lowest:	3.35 - 3.37	HL	M					
3	Highest:	5.07	W, AsA	F		>2.40			
	Lowest:	3.64	HL, AA, NA, MR	M	<=1				
4	Highest:	4.96	W, AsA	F		>1.83			
	Lowest:	3.50	AA	M					
5	Highest:	4.86	W, AsA, MR	F	>1				
	Lowest:	3.75	HL, MR	M					
6	Highest:	5.06	W, AsA	F		>2.40			
	Lowest:	3.55	AA, NA						
7	Highest:	4.85	W, AsA, MR, NA	F	>1				
	Lowest:	3.59	HL, AA						
8	Highest:	5.01 - 5.03	W, AsA	F	>1				
	Lowest:	3.42 - 3.54	AA	M					
9	Highest:	5.15	W, AsA	F		>2.40			
	Lowest:	3.69	AA						

Figure 9. Recursive partitioning forest of trees for adolescents in the third SES quartile predicting GPA.

Note. AsA = Asian American; AA = African American; HL = Hispanic/Latino; W = white; NA = Native American; MR = multiracial; F = female; M = male; AS = academic socialization; HB = home-based involvement; SB = school-based involvement. Highest and lowest values are in bold. ^aRanges of attainment represent the multiple forests with identical pathways.

	Highest:	4.99	W, AsA, MR, NA	F	>1		
10	Lowest:	3.56	AA, NA		<=1		
	Highest:	4.91	W, AsA	F		>1.83	
11	Lowest:	3.70	HL, AA, NA, MR			<=2.40	<=1
	Highest:	4.97	W, AsA, MR	F	>1		
12	Lowest:	3.51	AA			<=2.40	
	Highest:	4.95	W, AsA, MR, NA	F		>2.40	
13	Lowest:	3.65	HL, AA	M			
	Highest:	4.99	W, AsA, MR			>2.40	
14	Lowest:	3.45	HL, NA	M			

Figure 9. Continued

Path	Mean GPA ^a	Race	Sex	Contact	AS - parent	AS - adolescent	HB - adolescent	HB - parent	SB
1	Highest:	5.22 - 5.45	AsA	F					
	Lowest:	3.58 - 4.11	AA, NA	M					
2	Highest:	5.29	W, AsA	F		>2.40			
	Lowest:	4.17	AA, NA						
3	Highest:	5.16	W	F	>1				
	Lowest:	4.08	HL, MR	M					
4	Highest:	5.25 - 5.32		F		>2.40	<=2.83		
	Lowest:	3.81 - 3.88	HL, AA, NA						
5	Highest:	5.32	AsA	F					
	Lowest:	3.88	HL, AA	M					
6	Highest:	5.35 - 5.37	AsA	F					
	Lowest:	4.07 - 4.11	AA						
7	Highest:	5.25	W, AsA, MR	F	>1				
	Lowest:	3.95	HL, AA, NA			<=1.83			
8	Highest:	5.33 - 5.51	AsA	F					
	Lowest:	3.82 - 4.12	HL, AA, NA	M					
9	Highest:	5.18	W	F	>1				
	Lowest:	4.34		M	<=1		>2.33		
10	Highest:	5.15	W		>1		<=2.33		
	Lowest:	4.00	AA, NA						
11	Highest:	5.23			>1		<=2.83		
	Lowest:	4.01	HL, AA	M					
12	Highest:	5.39	AsA	F					
	Lowest:	4.16	HL, MR, NA	M				>2.67	
13	Highest:	5.29	AsA	F					
	Lowest:	4.22	HL, MR	M				>2.67	

Figure 10. Recursive partitioning forest of trees for adolescents in the fourth SES quartile predicting GPA.

Note. AsA = Asian American; AA = African American; HL = Hispanic/Latino; W = white; NA = Native American; MR = multiracial; F = female; M = male; AS = academic socialization; HB = home-based involvement; SB = school-based involvement. Highest and lowest values are in bold. ^aRanges of attainment represent the multiple forests with identical pathways.

Path	Mean GPA ^a	SES	Sex	Contact	Size	AS - parent	AS - adolescent	HB - adolescent	HB - parent	SB
Hispanic/Latino										
1	Highest:	4.81						>2.40		
	Lowest:	2.99	≤2nd quart.					≤1.83		
2	Highest:	4.52 - 4.74						>2.40		
	Lowest:	3.23 - 3.41						≤1.83		
3	Highest:	4.57	>2nd quart.						≤2.83	
	Lowest:	3.08	≤1st quart.							
4	Highest:	4.43 - 4.57						>2.40		
	Lowest:	3.13 - 3.28	≤1st quart.							
5	Highest:	4.41						>2.40		
	Lowest:	3.62						1.83 - 2.40		
6	Highest:	4.26 - 4.29						>2.40		
	Lowest:	3.20						≤1.83		
7	Highest:	4.31						>2.40		
	Lowest:	3.32				2.0-4.0		≤1.83		
8	Highest:	4.59						>2.40		
	Lowest:	3.24						≤2.40		≤1.0
9	Highest:	4.16	>2nd quart.							
	Lowest:	3.23						≤1.83		

Figure 11. Recursive partitioning forest of trees for Hispanic/Latino adolescents predicting GPA.

Note. F = female; M = male; AS = academic socialization; HB = home-based involvement; SB = school-based involvement.

Highest and lowest values are in bold.

^aRanges of GPA represent the multiple forests with identical pathways.

Path	Mean GPA ^a	SES	Sex	Contact	AS - parent	AS - adolescent	HB - adolescent	HB - parent	SB
White and Asian American									
1	Highest:	5.29							
	Lowest:	3.75	4th quart.	F		>2.40			
2	Highest:	5.17							
	Lowest:	3.84	≤2nd quart.	M		≤1.83			
3	Highest:	5.34	4th quart.	F		>2.40			
	Lowest:	4.07		M		1.83-2.40			
4	Highest:	5.17	4th quart.	F					
	Lowest:	3.80	≤1st quart.	M					
5	Highest:	5.29	4th quart.	F		>2.40			
	Lowest:	3.77	≤2nd quart.	M		≤1.83			
6	Highest:	5.22							
	Lowest:	3.60	≤2nd quart.	M		≤1.83			

Figure 12. Recursive partitioning forest of trees for white and Asian American adolescents predicting GPA.

Note. F = female; M = male; AS = academic socialization; HB = home-based involvement; SB = school-based involvement. Highest and lowest values are in bold.

^aRanges of GPA represent the multiple forests with identical pathways.

Path	Mean GPA ^a	SES	Sex	Contact	English	AS - parent	AS - adolescent	HB - adolescent	HB - parent	SB
Asian American										
1	Highest:	5.12								
	Lowest:	4.25	1st quart.							
2	Highest:	5.17 - 5.40								
	Lowest:	4.12 - 4.23								
3	Highest:	5.34	4th quart.							
	Lowest:	4.22								
4	Highest:	4.90	≤3rd quart.							
	Lowest:	4.24	1st quart.							
5	Highest:	5.21								
	Lowest:	4.26	≤3rd quart.							
6	Highest:	5.36	4th quart.							
	Lowest:	4.39								
7	Highest:	5.26	4th quart.							
	Lowest:	4.17	1st quart.							
8	Highest:	5.40	4th quart.							
	Lowest:	4.60	≤3rd quart.							
9	Highest:	5.32								
	Lowest:	4.12	≤3rd quart.							
10	Highest:	5.22	4th quart.							
	Lowest:	4.24								

Figure 13. Recursive partitioning forest of trees for Asian American adolescents predicting GPA.

Note. F = female; M = male; AS = academic socialization; HB = home-based involvement; SB = school-based involvement. Highest and lowest values are in bold.

^aRanges of GPA represent the multiple forests with identical pathways.

Path	Mean GPA ^a	SES	Sex	Contact	AS - parent	AS - adolescent	HB - adolescent	HB - parent	SB
Multiracial									
1	Highest:	4.53 - 4.68		>1					>0
	Lowest:	3.80 - 3.94							0
2	Highest:	4.53 - 4.69	>2nd quart.						>0
	Lowest:	3.59 - 3.84	≤2nd quart.						
3	Highest:	4.32	>2nd quart.	M					
	Lowest:	3.61	≤2nd quart.						
4	Highest:	4.50		F	>1				
	Lowest:	3.90		F	≤1				
5	Highest:	4.39 - 4.69			>1				
	Lowest:	3.47 - 3.78	≤2nd quart.		≤1				
7	Highest:	4.34					>2.40		
	Lowest:	3.88	≤2nd quart.				≤2.40		
8	Highest:	4.46 - 4.72			>1				
	Lowest:	3.85 - 4.04			≤1				
9	Highest:	4.43			>1				
	Lowest:	3.90			≤1		≤1.83		
10	Highest:	4.33 - 4.51							>0
	Lowest:	3.88 - 3.96							0
11	Highest:	4.28	>2nd quart.						
	Lowest:	3.65	≤2nd quart.						
12	Highest:	4.37 - 4.48							>0
	Lowest:	3.50 - 3.92		M					0
13	Highest:	4.34							>1
	Lowest:	4.14							≤1

Figure 14. Recursive partitioning forest of trees for multiracial adolescents predicting GPA.

Note. F = female; M = male; AS = academic socialization; HB = home-based involvement; SB = school-based involvement. Highest and lowest values are in bold. ^aRanges of GPA represent the multiple forests with identical pathways.

Path	Mean GPA ^a	SES	Sex	Contact	Size	AS - parent	AS - adolescent	HB - adolescent	HB - parent	SB
African American										
1	Highest:	3.87		F	>1					
	Lowest:	3.38	≤2nd quart.		≤1					
2	Highest:	3.82	>2nd quart.			2.0-4.0				
	Lowest:	3.50	≤2nd quart.		≤1					
3	Highest:	3.96				≤2.0				>1
	Lowest:	3.10	≤2nd quart.							≤1
4	Highest:	4.12	4th quart.	F						
	Lowest:	3.18	≤2nd quart.		≤1					
5	Highest:	4.04	4th quart.							
	Lowest:	3.35	≤2nd quart.		≤1					
African American and Native American										
1	Highest:	4.03				>4.0				>1.0
	Lowest:	3.31					≤2.40			≤1.0
2	Highest:	4.00		F	>1					
	Lowest:	3.37			≤1				>2.67	≤1.0
3	Highest:	4.00			>1					>1
	Lowest:	3.06	≤3rd quart.	M	≤1					
4	Highest:	4.07	>2nd quart.		>1	>2.0				
	Lowest:	3.12	≤2nd quart.	M	≤1					
5	Highest:	3.95		F	>1					
	Lowest:	3.31		M	≤1					

Figure 15. Recursive partitioning forest of trees for African American and Native American adolescents predicting GPA.

Note. F = female; M = male; AS = academic socialization; HB = home-based involvement; SB = school-based involvement. Highest and lowest values are in bold. ^aRanges of GPA represent the multiple forests with identical pathways.

Path	Mean GPA ^a	SES	Sex	Contact	Size	AS - parent	AS - adolescent	HB - adolescent	HB - parent	SB
African American and Native American										
6	Highest:	4.07								
	Lowest:	3.40	>3rd quart.	>1						
7	Highest:	4.26	>3rd quart.	F						
	Lowest:	3.32	≤2nd quart.	≤1						
8	Highest:	4.00	>2nd quart.					≤2.83		
	Lowest:	3.22	≤2nd quart.	≤1						
9	Highest:	4.00	>3rd quart.							
	Lowest:	3.27	≤2nd quart.	≤1						
10	Highest:	3.94		F						
	Lowest:	3.29	≤2nd quart.	F						
11	Highest:	4.09 - 4.15	>2nd quart.					>2.40		
	Lowest:	3.13 - 3.22	≤2nd quart.	≤1						
12	Highest:	4.12	4th quart.					>1.83		
	Lowest:	3.25		≤1				≤1.83		
13	Highest:	4.01 - 4.03		F				>1.83		
	Lowest:	3.03 - 3.26	≤2nd quart.	≤1				≤1.83		
14	Highest:	3.88			>1	2.0-4.0				
	Lowest:	3.39		≤1						
15	Highest:	3.93		F	>1					
	Lowest:	3.09	≤3rd quart.	M	≤1					
16	Highest:	4.18		F	>1					
	Lowest:	3.28		≤1				≤2.40		
17	Highest:	4.22	4th quart.	F						
	Lowest:	3.17	1st quart.							

Figure 15. Continued

Path	Mean Attainment ^a	GPA	Race	Sex	English	Size	AS - parent	AS - adolescent	HB - adolescent	HB - parent	SB
1	Highest:	5.51 - 5.74	>5								
	Lowest:	2.92 - 3.13	≤3					≤1.83			
2	Highest:	5.44 - 5.58	>5								
	Lowest:	3.08 - 3.14	≤3					≤2.40			
3	Highest:	5.70	>5			>2					
	Lowest:	3.01	≤3	M				≤2.40			
4	Highest:	5.61 - 5.82	>5								
	Lowest:	3.00 - 3.04	≤3	M				≤2.40			
5	Highest:	5.54 - 5.6	>5								
	Lowest:	2.88 - 3.32	≤3			≤4		≤1.83			
6	Highest:	5.46 - 5.60	>5		Yes						
	Lowest:	3.01 - 3.06	≤3					≤1.83			
7	Highest:	5.73 - 5.58	>5			>2					
	Lowest:	3.05 - 3.11	≤3					≤1.83			
8	Highest:	5.68	>5								
	Lowest:	3.07	≤3								

Figure 16. Recursive partitioning forest of trees for adolescents in the first (lowest) SES quartile predicting educational attainment.

Note. F = female; M = male; AS = academic socialization; HB = home-based involvement; SB = school-based involvement. Highest and lowest values are in bold.

^aRanges of attainment represent the multiple forests with identical pathways.

Path	Mean Attainment ^a	GPA	Race	Sex	English	AS - parent	AS - adolescent	HB - adolescent	HB - parent	SB
1	Highest: 5.78 - 5.86	>5	HL, W, NA							
	Lowest: 3.17 - 3.28	≤3								
2	Highest: 5.73 - 5.77	>5								
	Lowest: 3.36 - 3.38	≤3								
3	Highest: 5.50 - 5.67	>5								0
	Lowest: 3.18 - 3.29	≤3								
4	Highest: 5.65 - 5.76	>5	W, HL, MR, NA							
	Lowest: 3.18 - 3.26	≤3								
5	Highest: 5.54 - 5.70	>5								0
	Lowest: 3.20 - 3.36	≤3								
6	Highest: 5.75 - 5.82	>5								
	Lowest: 3.31 - 3.33	≤3								
7	Highest: 5.64 - 5.72	>5	W, HL, MR, NA							
	Lowest: 3.18 - 3.24	≤3								
8	Highest: 5.78 - 5.91	>5						>1.83		0
	Lowest: 3.26 - 3.28	≤3								
9	Highest: 5.57	>5	HL, W							
	Lowest: 3.17	≤3								
10	Highest: 5.53 - 5.60	>5								
	Lowest: 3.10 - 3.16	≤3								

Figure 17. Recursive partitioning forest of trees for adolescents in the second SES quartile predicting educational attainment. *Note.* HL = Hispanic/Latino; W = white; NA = Native American; MR = multiracial; F = female; M = male; AS = academic socialization; HB = home-based involvement; SB = school-based involvement. Highest and lowest values are in bold. ^aRanges of attainment represent the multiple forests with identical pathways.

Path	Mean Attainment ^a	GPA	Race	Sex	English	AS - parent	AS - adolescent	HB - adolescent	HB - parent	SB
11	Highest:	6.06	>5				>1.83			
	Lowest:	3.19	≤3							
12	Highest:	5.48 - 5.69	>5							
	Lowest:	3.13 - 3.20	≤3							0
13	Highest:	5.62	>5							
	Lowest:	3.19	≤3							
14	Highest:	5.74 - 5.89	>5							
	Lowest:	3.22 - 3.24	≤3							
15	Highest:	5.72	>5							
	Lowest:	3.25	≤3		Yes					
16	Highest:	5.66	>5							
	Lowest:	3.25	≤3		M					
17	Highest:	5.68	>5							
	Lowest:	3.17	≤3		W, MR, NA					

Figure 17. Continued

Path	Mean Attainment ^a	GPA	Race	Sex	Contact	AS - parent	AS - adolescent	HB - adolescent	HB - parent	SB
1	Highest:	6.00 - 6.34	>5							
	Lowest:	3.59 - 3.87	≤3							
2	Highest:	5.98	>5							
	Lowest:	3.56	≤3		F				≤3.33	
3	Highest:	6.17	>5							
	Lowest:	3.70	≤3					≤1.83		
4	Highest:	6.08	>5							
	Lowest:	3.78	≤3			1.00		≤2.40		
5	Highest:	6.12	>5							
	Lowest:	3.71	≤3		M					
6	Highest:	6.24	>5							
	Lowest:	3.69	≤3						≤3.33	
7	Highest:	6.39	>5		F			≤2.83		
	Lowest:	3.70	≤3							
8	Highest:	6.14	>5							>0
	Lowest:	3.70	≤3							

Figure 18. Recursive partitioning forest of trees for adolescents in the third SES quartile predicting educational attainment.

Note. F = female; M = male; AS = academic socialization; HB = home-based involvement; SB = school-based involvement.

Highest and lowest values are in bold.

^aRanges of attainment represent the multiple forests with identical pathways.

Path	Mean Attainment ^a	GPA	Race	Sex	Size	AS - parent	AS - adolescent	HB - adolescent	HB - parent	SB
1	Highest:	6.59	>5		≤4	>1.75				
	Lowest:	4.23	≤3							
2	Highest:	6.53	>5			>1.75	>1.83			
	Lowest:	3.92	≤3				≤1.83			
3	Highest:	6.50	>5				>1.83			
	Lowest:	4.09	≤3							≤1
4	Highest:	6.42 - 6.47	>5							
	Lowest:	4.09 - 4.14	≤3							
5	Highest:	6.26	>5		≤4					
	Lowest:	3.97	≤3	M			≤2.40			
6	Highest:	6.56	>5			>2.50				
	Lowest:	4.17	≤3	M						
7	Highest:	6.49	>5				>1.83			
	Lowest:	4.03	≤3				≤1.83			
8	Highest:	6.37	>5				>1.83			
	Lowest:	4.13	≤3							
9	Highest:	6.44 - 6.48	>5			>1.75				
	Lowest:	4.01 - 4.23	≤3							
10	Highest:	6.39	>5			>1.75	>1.83			
	Lowest:	3.99	≤3	M						
11	Highest:	6.5	>5				>1.83			
	Lowest:	4.06	≤3	M						
12	Highest:	6.39	>5			>1.75				
	Lowest:	3.97	≤3	M						≤1
13	Highest:	6.35	>5							
	Lowest:	4.15	≤3	M						

Figure 19. Recursive partitioning forest of trees for adolescents in the fourth (highest) SES quartile predicting educational attainment.

Note. F = female; M = male; AS = academic socialization; HB = home-based involvement; SB = school-based involvement. Highest and lowest values are in bold. ^aRanges of attainment represent the multiple forests with identical pathways.

Path	Mean Attainment ^a	GPA	SES	Sex	Contact	AS - parent	AS - adolescent	HB - adolescent	HB - parent	SB
Hispanic/Latino, African American, and Native American										
1	Highest:	5.94	>5							
	Lowest:	3.27	≤3							≤2nd quart.
2	Highest:	5.73 - 5.89	>5							
	Lowest:	3.10 - 3.13	≤3							1st quart.
3	Highest:	5.94 - 5.96	>5							
	Lowest:	3.06 - 3.16	≤3							1st quart. ≤1.83
4	Highest:	5.72	>5							
	Lowest:	3.10	≤3							1st quart.
5	Highest:	6.09	>5							
	Lowest:	3.20	≤3							≤2nd quart. ≤1
6	Highest:	5.86	>5							
	Lowest:	3.20	≤3							1st quart. M
7	Highest:	5.93	>5							
	Lowest:	3.14	≤3							1st quart. ≤2.40

Figure 20. Recursive partitioning forest of trees for Hispanic/Latino, African American, and Native American adolescents predicting educational attainment.

Note. F = female; M = male; AS = academic socialization; HB = home-based involvement; SB = school-based involvement. Highest and lowest values are in bold.

^aRanges of attainment represent the multiple forests with identical pathways.

Path	Mean Attainment ^a	GPA	SES	Sex	Size	AS - parent	AS - adolescent	HB - adolescent	HB - parent	SB
White										
1	Highest:	6.26 - 6.27	>5	>2nd quart.						
	Lowest:	3.01 - 3.10	≤3	1st quart.			≤1.83			
2	Highest:	6.25 - 6.27	>5	>2nd quart.						
	Lowest:	3.01 - 3.09	≤3	≤2nd quart.			≤1.83			
3	Highest:	6.34	>5	4th quart.			>1.83			
	Lowest:	3.12	≤3	≤2nd quart.						
4	Highest:	6.29	>5	>2nd quart.						>1
	Lowest:	3.19	≤3	1st quart.	M					
5	Highest:	6.37 - 6.44	>5	4th quart.						
	Lowest:	3.12 - 3.22	≤3	≤2nd quart.						
6	Highest:	6.39	>5							
	Lowest:	3.24	≤3							
7	Highest:	6.31 - 6.39	>5	4th quart.		>1.75				
	Lowest:	3.03 - 3.08	≤3	≤2nd quart.			≤1.83			
8	Highest:	6.38	>5	4th quart.			>1.83			
	Lowest:	3.01	≤3	≤2nd quart.						0
9	Highest:	6.22	>5	>2nd quart.						
	Lowest:	3.28	≤3	≤2nd quart.		≤2.3				
10	Highest:	6.26 - 6.34	>5	>2nd quart.			>1.83			
	Lowest:	2.91 - 3.10	≤3	≤2nd quart.			≤1.83			
11	Highest:	6.34 - 6.44	>5	4th quart.		>1.75				
	Lowest:	3.01 - 3.14	≤3	≤2nd quart.						0
12	Highest:	6.35	>5	>2nd quart.			>1.83			
	Lowest:	3.23	≤3	≤2nd quart.						≤1
13	Highest:	6.32	>5	4th quart.						
	Lowest:	3.12	≤3	≤2nd quart.						0

Figure 21. Recursive partitioning forest of trees for white adolescents predicting educational attainment.

Note. F = female; M = male; AS = academic socialization; HB = home-based involvement; SB = school-based involvement.

Highest and lowest values are in bold. ^aRanges of attainment represent the multiple forests with identical pathways.

Path	Mean Attainment ^a	GPA	SES	Sex	Size	AS - parent	AS - adolescent	HB - adolescent	HB - parent	SB
Asian American										
1	Highest:	6.44	>5			>1.75				
	Lowest:	4.13	≤3							
2	Highest:	6.08 - 6.58	>5							
	Lowest:	3.85 - 4.10	≤3							
3	Highest:	6.22 - 6.87	>5			>2.33				
	Lowest:	3.79 - 4.09	≤3							
4	Highest:	6.08	>5						>3.33	
	Lowest:	3.93	≤3							
5	Highest:	6.34 - 6.39	>5	F						
	Lowest:	3.81 - 4.05	≤3							
6	Highest:	6.23 - 6.48	>5				>1.83			
	Lowest:	3.87 - 4.20	≤3							
Multiracial										
1	Highest:	5.33 - 5.57	>3			>2nd quart				
	Lowest:	3.23 - 3.56	≤3							
2	Highest:	5.00 - 5.32					4th quart.			
	Lowest:	3.63 - 3.94					≤2nd quart.			
3	Highest:	5.10	>3							>0
	Lowest:	3.52	≤3							
4	Highest:	5.63	>3			4th quart.				
	Lowest:	3.67	≤3							

Figure 22. Recursive partitioning forest of trees for Asian American and multiracial adolescents predicting educational attainment. Note. F = female; M = male; AS = academic socialization; HB = home-based involvement; SB = school-based involvement. Highest and lowest values are in bold. ^aRanges of attainment represent the multiple forests with identical pathways.

CHAPTER 3. SCHOOL CHOICE, PARENTAL SOCIAL CAPITAL, AND ADOLESCENT EDUCATIONAL ACHIEVEMENT AND ATTAINMENT

A college education has become increasingly important for long-term success in the United States; by the year 2020, over two-thirds of all jobs will require an associate's degree and one third will require a bachelor's degree (Carnevale, Smith, & Strohl, 2013). Yet achievement gaps between children in lower-income families and families that are more affluent persist, reinforcing racial and socioeconomic inequity in opportunities for higher education (Reardon et al., 2014). Given the pervasive links between K-12 academic achievement and college admittance, policymakers, school administrators, and researchers have emphasized the importance of the family-school connection for promoting academic success (e.g., NCLB, 2002).

More specifically, parents' social capital – their relationships with the school, their adolescent, and other parents of adolescents attending the school – has been targeted as a pathway for improving adolescent educational achievement and attainment (Bourdieu, 1986; Coleman, 1988; Grenfell & James, 1998). Parents' social capital has been linked to a variety of beneficial outcomes for youth including higher levels of academic achievement, staying in school vs dropping out, and greater school engagement (Abada & Tenkorang, 2009; Israel, Beaulieu, & Hartless, 2001; Kao & Rutherford, 2007;

Perna & Titus, 2005). It is a characteristic amenable to change, and therefore has become a goal for programs and policies such as school choice policies (Lubienski et al., 2009). School choice initiatives, which allow parents to choose their child's school regardless of geographic location, have long received the attention of researchers and policymakers as an avenue for increasing parents' social capital (Ladd, 2003; Lubienski et al., 2009; Rist, 1989). Scholars have found links between school choice and some aspects of social capital: parents' attendance at school functions, parents' relationships with other parents at school, and parents' membership in the school PTA (e.g., Schneider et al., 1997; Tedin & Weiher, 2011). However, empirical evidence is sparse examining these links for high school students. Given the dynamic nature of the family-school connection as children age (Hill & Chao, 2009) it is important to understand these associations beyond middle school. Further, studies have not investigated the longitudinal implications of these links for adolescent academic achievement and educational attainment, particularly for racial/ethnic minority adolescents and adolescents from low SES families. This is also a substantial gap in the literature since legislators are enacting school choice policies at a growing rate in the United States with the ultimate goal of improving academic outcomes.

In an effort to close these gaps in the research, this study examined changes in parents' social capital after their adolescent transitioned to a school by choice. Further, this study investigated how potential changes in social capital were associated with subsequent adolescent academic achievement (standardized test performance) and educational attainment (highest level of education completed). This study also explored racial/ethnic and socioeconomic group differences in these associations.

Theoretical Background

The Bioecological Model of Human Development and theories of social capital guided this study. The Bioecological Model of Human Development frames individual development in the context of nested systems (Bronfenbrenner & Morris, 2006). Among these systems are the microsystem, mesosystem, and exosystem. A microsystem consists of the immediate environments in which adolescents live out their lives, such as home and school. The mesosystem represents the interconnections between microsystems. For example, forms of parents' social capital such as parental educational involvement at home may be associated with adolescent achievement at school. The exosystem represents contexts that indirectly affect individual development via changes in other individuals or environments. State and school policies such as school choice legislation are an example of an exosystem; adolescent achievement may be associated with these policies via changes in parents' social capital.

Social capital theories also guided this study. These theories, extensively detailed by Coleman (1988) and Bourdieu (1986), generally posit that social networks and feelings of connection with institutions serve as information channels that promote positive action. Coleman (1988) and Bourdieu (1986) emphasize the importance of norms, resources, and the forms of social relationships for understanding social capital (Dika & Singh, 2002; McNeal, 1999). More specifically, social networks are the most beneficial when there is closure among the individuals regarding social norms (Coleman, 1988; McNeal, 1999). This closure creates consistency and promotes efficiency of information channels among individuals in the network. Intergenerational closure is one example; it refers to parents' relationships with parents of their adolescents' friends

(Coleman, 1988). Resources also play an important role in shaping social capital. Some individuals may have more access to resources through which they can acquire social capital (Bourdieu, 1986). For example, racial/ethnic minority parents or parents from lower income families may have less financial resources than white parents or parents from higher socioeconomic group that prohibit them from being as involved (Ladson-Billings, 2006). Further, racial/ethnic minority parents and parents from lower-income families may encounter a cultural mismatch between their family's culture and the school culture, or experience institutionalized racism (Bell & Goluboff, 2008) – problems in the United States resulting in these families historically being shut out of schools (Grenfell & James, 1998; Garcia-Coll et al., 1996; Horvat et al., 2003; Ladson-Billings, 2006). Lastly, the form or structure of social relationships is also central to understanding social capital. For example, parental educational involvement is a type of social capital taking the form of a dyadic relationship between parents and adolescents or parents and schools that creates information channels that may shape parenting practices (McNeal, 1999).

Social Capital and Academic Outcomes

A large research base has established links between social capital and a variety of academic outcomes (see Dika & Singh, 2002 for review). Different measures of social capital including intergenerational closure, parental educational involvement (e.g., parent-school contact, volunteering at school), and inclusion in school policy decision-making have all been associated with academic outcomes such as grades, standardized test scores, and high school completion. Most studies have found a positive link between social capital and academic outcomes (Abada & Tenkorang, 2009; Carbonaro, 1998; Coleman 1988; Crosnoe, 2004; Israel et al., 2001; Kao & Rutherford, 2007; Kim &

Schneider, 2005; Perna & Titus, 2005), with few exceptions (McNeal, 1999; Morgan & Sorensen, 1999). For example, Israel, Beaulieu, and Hartless (2001) found that greater levels of social capital (in the form of parental educational involvement) were associated with higher grades, higher standardized test scores, and lower levels of school dropout. Morgan and Sorensen (1999), in contrast, found that increased intergenerational closure was associated with smaller gains in math test scores between 8th grade and 10th grade.

These different findings may reflect differences based on outcomes (test scores vs grades) or unmodeled differences in these associations based on racial/ethnic or socioeconomic group differences. For example, Kao and Rutherford (2007) focused on immigrant status and racial/ethnic group differences in the association between social capital and academic outcomes. They found that for most parents, social capital was beneficial for adolescents' grades and standardized test scores, but that variations occurred when splitting the sample by racial/ethnic group. Asian students benefitted less from parental-school involvement than white students, and Black students benefitted less from intergenerational closure than did white students. Perna and Titus (2005) also found differences by racial/ethnic group. While social capital was beneficial for African American adolescents, the association between social capital and enrollment in a 4-year college was weaker for African American youth compared to other racial/ethnic groups. Israel and colleagues (2001) concluded that SES was associated with both social capital and academic achievement, but did not statistically test these potential moderating effects. These findings suggest differences in the potential benefits of social capital from families of varying racial/ethnic and socioeconomic groups. While other studies have examined racial/ethnic group or socioeconomic group differences in levels of social

capital, more work needs to be done to determine the implications of these differences for subsequent academic achievement and educational attainment (Abada & Tenkorang, 2009; Kim & Schneider, 2005; Lee & Bowen, 2006; Perna & Titus, 2005).

It is important to note that social capital is a malleable trait (Bourdieu, 1986; Coleman, 1988; Tomai et al., 2010; Turley, Gamoran, Turner, & Fish, 2012). Parents can gain social capital by creating closer ties to individuals and institutions, although some parents (e.g., higher SES and White) may have more opportunities to increase their social capital than others (Bourdieu, 1986; Dika & Singh, 2002). Given its malleability and the benefits it may provide to adolescents, increased social capital has been cited as a key benefit of school choice policies (Lubienski et al., 2009).

What is School Choice?

School choice refers to parents' selection of their child's school regardless of where they live. School choice options have been provided to parents by state legislatures via school choice policies, which are summarized by Goldhaber and Eide (2002) as "...any policy designed to break the link between residential location and school attendance zones in order to reduce the geographic constraint inherent in traditional public schooling" (p. 157). Parents may have access to choosing schools through several avenues. Chartered public schools are one common approach to school choice. Charter schools are publicly funded schools operated by independent boards, allowing them less state regulation and greater ability to diversify their school missions (Merrifield, 2008). As of the 2011-2012 school year, 42 states and the District of Columbia had passed charter school legislation (National Conference of State Legislatures, 2014). Public school choice is another approach through which families can choose amongst public

schools in their district (intradistrict choice) or across several districts (interdistrict choice). This can include choices to attend magnet schools, which are schools specializing in a particular area such as math and science (Goldhaber & Eide, 2002). School choice policies may also provide targeted tuition vouchers, an approach that seeks to improve access to certain private schools. In this approach, the state provides flat-rate vouchers to families, often based on low-income or failing school requirements, to use for tuition at private schools (these are restricted to certain dollar amounts). Pure universal tuition vouchers, on the other hand, are an approach in which public and private schools receive the same per child subsidy, with fewer monetary and use restrictions than targeted vouchers. As of January 2014, thirteen states and the District of Columbia had school voucher legislation. These policies vary widely, with most states targeting low-income students or students with disabilities, but with a range of regulations regarding private school participation and caps on the number of vouchers allotted throughout the state (see the National Conference of State Legislatures, 2014, for a review of these policies). Finally, tuition tax credits are another school choice approach through which, as the name implies, families who send their children to private schools can receive credit for tuition in their federal taxes (Merrifield, 2008).

As the number of states implementing a variety of school choice initiatives has grown (for example, the percentage of public charter schools increased from 1.7 to 5.8 percent from 1999 to 2011), so has the debate on the effectiveness of allowing parents to choose their adolescents' schools (Hsieh & Urquiola, 2006; Zimmerman & Vaughan, 2013). Further, empirical findings remain mixed regarding the benefits and drawbacks of school choice, particularly for minority and low-performing students (Goldhaber & Eide,

2002). It is important to understand the mechanisms through which school choice is related to academic outcomes as school choice policy legislation continues to be enacted throughout the United States.

Are School Choice Policies Effective?

In response to the many hypothesized benefits and drawbacks of school choice, researchers have empirically investigated the effectiveness of school choice policies in improving efficiency and equality, as well as the links between school choice and academic achievement. Overall, findings remain inconclusive (Godwin, Leland, Baxter, & Southworth, 2006; Goldhaber, 2000; Goldhaber & Eide, 2002; Lubienski et al., 2009). For example, Zimmerman and Vaughan (2013) conducted a short-term longitudinal study of over 38,000 students in New Orleans, Louisiana. The authors reported that students from low-income families who were low-performing (based on standardized test scores) did not consistently attend a higher performing school (based on school performance score) even when the option was available. The authors noted that parents did not always have access to reliable information regarding school choice, nor was the application and enrollment process easily navigated. Similar findings have also been reported in studies of policies aimed at increasing parents' knowledge of school quality (e.g., Rich & Jennings, 2015). In their study of the North Carolina charter school system, Bifulco and Ladd (2006) examined longitudinal data (following students from third grade through eighth grade) to examine the equality of racial composition of charter schools versus public schools. They concluded that charter schools increase racial segregation such that white students were more likely to move to schools with more white students than their public school, and black students were more likely to move to a charter school with more

black students than their public school. In contrast, Forster (2009) reported different findings when reviewing studies of a variety of school choice options (e.g., charter schools, voucher programs, and private schools), arguing that most studies found null segregation effects or positive integration effects.

Findings are also mixed regarding the links between school choice and academic achievement, particularly for racial/ethnic minority or low SES youth (Anand, Mizala, & Repetto, 2009; Chen & Pong, 2014; Forster, 2009; see Lubienski et al., 2009 for review; Tooley, Bao, Dixon, & Merrifield, 2011). For example, Bifulco and Ladd (2006) examined the association between charter school attendance and standardized test scores for students in North Carolina. Their study was strong in its use of longitudinal data, as the authors could control for within-student change in test scores when students moved from public to charter schools. Bifulco and Ladd found that on average, there was a negative effect of charter school attendance on math test scores during the first year the student attended the school, and this negative effect was stronger for black students than white students. In other words, charter school attendance exacerbated the racial achievement gap in North Carolina during the elementary and middle school years. In contrast, Cullen, Jacob, and Levitt (2005) reported that school choice was positively correlated with academic achievement and graduation rates in Chicago, Illinois; students who left their assigned high school to attend career academies were more likely to graduate on time. The authors noted, though, that this positive correlation only held for career academies and not the full spectrum of school options available to families in Chicago.

From studies that have been done investigating school choice and educational attainment for high school students, there have been generally positive findings (e.g., Chingos & Peterson, 2012; Zimmer et al., 2009; Wolf et al., 2013). For example, Cowen, Fleming, Witte, Wolf, and Kisida (2013) found that 8th and 9th grade students who used a voucher to transfer schools were more likely to graduate on time and attend a 4-year college or university. Lauen (2009) also found positive main effects of school choice for on-time graduation, but these findings were qualified by an interaction with prior achievement levels: lower achieving students in 8th grade who used vouchers were less likely to graduate on time compared to their counterparts who did not use vouchers. These findings suggest that school choice may only benefit the educational attainment of particular groups of students, such as those with higher prior achievement levels. Chingos and Peterson (2012) also found differential effects – there were increased graduation rates for African American high school students in New York that used vouchers, but not Hispanic youth. These studies provide support for the links between school choice and educational attainment. However, no studies have investigated the association between school choice and long-term outcomes such as college degree completion. This is a substantial gap in the literature given the increased importance of a college degree for future career success (e.g., Carnevale et al., 2013).

School choice and parents' social capital. In an attempt to disentangle the findings linking school choice to a variety of academic outcomes, scholars have begun to empirically investigate the mechanisms through which school choice policies are intended to work (e.g., Rabovsky, 2011). Social capital is an important mechanism that is often cited as an intended benefit of school choice. Proponents of school choice reason

that parents' active choosing of schools may provide parents with a school environment that matches their preferences more closely than "one-size-fits-all" schools (Ladd, 2003). For example, special courses offered at a school are likely to attract families who place similar priority on those subjects, facilitating a stronger family-school connection and subsequently benefiting adolescents' academic outcomes (Planke & Sykes, 2003; Tedin & Weiher, 2011). In theory, these family-school connections can be facilitated at a variety of types of schools (e.g., magnet, private, charter) through a variety of means (e.g., vouchers, tax credits), but most importantly, it's the opportunity parents receive to match their personal preferences that lend support to the benefits of school choice (Planke & Sykes, 2003).

Unfortunately, little work has been done to empirically investigate this claim. Three studies have examined school choice and social capital with elementary and middle school populations (Cox & Witko, 2008; Schneider et al., 1997; Tedin & Weiher, 2011) and just one with high school populations (Kim & Hwang, 2014). The most commonly cited article linking school choice to social capital is the study by Schneider and colleagues (1997). In this study, data came from two school districts (grades Pre-K through ninth) that were demographically similar but varied on school choice policy. The authors assessed the relation between school choice and parents' PTA involvement, volunteer activities, networks with other parents, and trust in teachers. Findings showed that parents who actively chose their child's school were more involved, had larger parent networks, and more trust in teachers. The authors did not investigate potential racial/ethnic or socioeconomic group differences in their findings. The study by Tedin and Weiher (2011) focused on charter school attendance and its links to parents' PTA

involvement, volunteer activities, helping with curriculum decisions, attending school board meetings, helping with fundraisers, and attending parent–teacher conferences. As in the Schneider et al. (1997) study, findings showed a positive link between school choice and each marker of social capital. Interestingly, findings provided little evidence that parents’ ability to choose was related to school choice, and instead attributed these associations to charter school attendance specifically. Further, findings revealed a delayed effect of school choice – parents whose child had attended the charter school for at least two years had greater social capital than parents whose children attended public school. This study revealed no differences in findings based on race or ethnicity. Both the study by Schneider et al. (1997) and the study by Tedin and Weiher (2011) used cross-sectional data. While the authors of both studies used statistical strategies in an attempt to reduce selection bias, they all recognized the nature of the data as a limitation, and highlighted the importance for further research to be done using longitudinal data.

The final study that has examined school choice and social capital with an elementary population was strong in its use of longitudinal data (Cox & Witko, 2008). Cox and Witko (2008) used the Early Childhood Longitudinal Study’s kindergarten class of 1998-1999 to assess changes in parents’ social capital (measured as parental involvement in the PTA, volunteer activities, attending school events, and talking with four or more other parents) from kindergarten to third grade. Findings were mixed among the different types of involvement, but overall, findings showed that transitioning to a religious school (most were Catholic) was related to increased parental involvement, whereas transferring to another public school was not. These findings held when controlling for the number of events put on by the school for parents. This study did not

assess moderation by parents' race/ethnicity or SES, but did find main effects for both; minority and lower income parents were less likely to be involved across school types. In contrast to Schneider and colleagues (1997) and Tedin and Weiher (2011), these positive findings were limited to the transition to a private religious school. The authors suggested that this may be evidence of school-specific factors being related to social capital rather than the ability to choose.

Lastly, one study has examined school choice and social capital with a high school population. Kim and Hwang (2014) used longitudinal data from the Seoul Education Longitudinal Study to investigate the association between school choice and parental school involvement. The authors found that school choice was not related to parental involvement; individual level factors were more predictive of parental involvement than school level factors. The strength of this study was its longitudinal design, but the narrow definition of parents' social capital (participation in Parent Teacher Association and school committees) and no measure of social capital from wave one of their data were substantial limitations. Parents' social capital may include a variety of connections with the school or other parents (Coleman, 1986). Further, parental involvement as a form of social capital is multi-faceted and is not limited to participation in committees or the PTA (Hoover-Dempsey & Sandler, 1995). Therefore, this study leaves further gaps in the literature regarding school choice and parents' social capital for populations of high school students.

Together, these studies offer a start to understanding the links between school choice and parents' social capital. However, there are several limitations. First, inconsistent findings across these studies suggest that more work needs to be done to

elucidate the association between school choice and social capital. Additionally, three of the four studies assessed an elementary or middle school population, whereas just one used a high school sample, and none of the studies linked social capital to subsequent adolescent outcomes. Given that the overarching goal of school choice is to improve academic outcomes, it is important to include measures of achievement as outcomes along with social capital. Further, it is important to study high school populations because associations between school choice, social capital, and academic achievement may vary by grade level (e.g., Zimmer et al., 2009). Lastly, race/ethnicity and SES were not foci in these studies, despite evidence of differences between these groups for school choice, social capital, and achievement (e.g., Cox & Witko, 2008).

The Present Study

To address these gaps in the literature, this study investigated the implications of school choice for changes in parents' social capital and subsequent adolescent academic outcomes. This study also assessed the potential moderating roles of race/ethnicity and SES for social capital and subsequent adolescent outcomes. The longitudinal design of this study offered a unique opportunity to assess social capital at two time points, in between which adolescents may have transitioned schools. Parental educational involvement, intergenerational closure, and parents' perceived inclusion in school policy decision-making represented three facets of social capital. Academic achievement was assessed using standardized test scores taken at two time points, and educational attainment was assessed using the adolescents' highest degree completed eight years post-high school. Given that past research has indicated associations among social capital, academic outcomes, and adolescent sex, years at a new school, parents' marital

status, parents' primary spoken language, type of new school (public or private), school size, and amount of school outreach to parents (e.g., Abada & Tenkorang, 2009; Kim & Schneider, 2005), these factors were included as controls.

This study was guided by the following research questions and hypotheses:

1. a) Is school choice associated with changes in parents' social capital (including parental educational involvement, intergenerational closure, and inclusion in school policy decisions) and b) subsequent adolescent academic achievement?
 - a) School choice will be associated with increases in all facets of parents' social capital and, subsequently, b) greater academic achievement levels. In other words, parents' social capital will mediate the association between school choice and academic achievement.
2. Do these associations differ by adolescent race/ethnicity or SES?
 - The associations among school choice, social capital, and academic achievement will vary based on adolescents' race/ethnicity and SES.
3. a) Is school choice associated with changes in parents' social capital (including parental educational involvement, intergenerational closure, and inclusion in school policy decisions) and b) subsequent adolescent educational attainment?
 - a) School choice will be associated with increases in all facets of parents' social capital and b) a higher level of education completed. In other words, parents' social capital will mediate the association between school choice and educational attainment.

4. Do these associations differ by adolescent race/ethnicity or SES?
 - The associations among school choice, social capital, and educational attainment will vary based on adolescents' race/ethnicity and SES.

Method

Procedure

Data for these analyses came from the National Education Longitudinal Study of 1988 (NELS) restricted-use dataset. Conducted by the National Center for Education Statistics in the Institute of Education Sciences, the NELS used a complex sampling design to survey a nationally representative sample of eighth grade students and their parents, teachers, and school principals (Curtin, Ingels, Wu, & Heuer, 2002). The goal of the study was to learn about adolescent life in the school, work, and home contexts.

Adolescents completed surveys in 1988 with four follow-ups in 1990, 1992, 1994, and 2000. They also completed cognitive tests in 1988 and 1992 that were designed to assess achievement in reading, math, science, and social studies. In the base year (1988) and first two follow-ups (1990 and 1992), surveys were administered in-school or at off-campus survey sessions to all sample participants who were still enrolled in school. For the third (1994) and fourth (2000) follow-ups, data were collected using computer-assisted telephone interviews (CATI) and computer-assisted personal interviews (CAPI). Post-secondary education data were also collected during the fourth (2000) follow-up, including college transcripts and information regarding the highest level of educational attainment for each participant.

Though not an intended focus of the study, NELS also captures the associations among school choice, social capital, and academic outcomes. Its longitudinal design

includes parents' social capital data at two time points, between which a substantial number of adolescents transitioned schools for a variety of reasons, including by choice. These data uniquely allow for the assessment of change in social capital due to transitioning schools, as well as proximal (standardized test scores) and distal (highest level of educational attainment) adolescent academic outcomes.

Participants

Participants for this study included adolescents who participated in the base year and waves two and four of data collection ($N = 10,000$) and their parents ($N = 9,350$). Just over half of adolescent participants were female (53%). Seventy percent of adolescent participants identified as white, 12% as Hispanic, 8% as Black, 6% as Asian/Pacific Islander, 3% as multiracial, and 1% as American Indian. A majority of parents were adolescents' mothers (74%), 16% identified as the adolescent's father, 3% identified as other (e.g., stepparent, grandparent, or other adult relationship), and 7% of participants did not answer or provided multiple responses regarding their relationship to the adolescent. Most parents were married (83%) and had an education of some college or more (58%).

Measures

Parents' social capital. Social capital was measured at two time points (base year and second follow-up) and indexed three different types of social capital: parental educational involvement, intergenerational closure, and perceived inclusion in school decision-making. Parental educational involvement was comprised of three facets of involvement: home-based involvement, school-based involvement, and academic socialization, which are consistent with the definitions provided by Hill and Tyson (2009;

see Table 1). Using confirmatory factor analyses (CFA), home-based involvement was modeled as a single latent variable with three indicators. Model fit was poor (the latent variable was not significantly associated with the indicators) therefore, home-based involvement was split into two observed variables representing two types of strategies: help with homework and rules at home. The single item for help with homework is, “How often do you or your spouse/partner help your eighth grader with his or her homework?” answered on a scale from 1 (*seldom/never*) to 4 (*almost every day*). An example item for rules at home is, “Are there family rules that are enforced for your teenager about any of the following activities? Maintaining a certain GPA” answered as 0 (*no*) or 1 (*yes*). School-based involvement was measured using an average score of school-based involvement for base year (two items) and the score of school-based involvement for the follow-up (one item). The items ask, “How many times have you or your spouse/partner contacted the school about each of the following? Participating in school fundraising activities.” Academic socialization was measured using an average score of academic socialization for base year (two items) and an average score of academic socialization for the follow-up (four items). An example item is, “How often do you or your spouse/partner talk with your eighth grader about his or her educational plans for after high school?” answered on a scale from 1 (*not at all*) to 4 (*regularly*). Scores were standardized prior to analysis given the differing scales at Time 1 and Time 2. Table 1 provides detailed information regarding these measures. For all types of involvement, higher scores indicated higher levels involvement.

For intergenerational closure, parents responded to an identical item at base-year and follow-up from the questions “Do you know the first name (or nickname) of any of

your eighth grader's closest friends?" and after naming up to five friends, responding yes (1) or no (0) to "I know parent/s of this teenager" and yes (1) or no (0) to "Attends same school." Parents received a score of 1 for each adolescent for whom they indicated "yes" for both follow-up questions. A total score was calculated for base year and follow-up, such that a higher score indicates a higher level of intergenerational closure.

Parents' perceived inclusion in school decision-making was measured using two questions at base-year and follow-up: "How much do you agree or disagree with each of the following statements..." including "Parents have an adequate say in school policy" and "Parents work together in supporting school policy." Responses ranged from one (*strongly agree*) to four (*strongly disagree*), such that higher scores indicated higher levels of perceived inclusion in school decision-making.

School choice. School choice was measured using two questions from the second follow-up. Parents were asked, "In the past 4 school years, how many times has your teenager changed schools?" Parents who responded with any number greater than zero were then asked the reason for the school change, which included reasons by choice (e.g., "Wanted to switch from public to private school") and reasons not by choice (e.g., "School asked my teenager to leave because of disciplinary problems") (see Table 2). Parent-adolescent dyads were categorized into four groups in order to test for the differences in changes in social capital over time between parents who chose their adolescents' school and those who did not. The four groups included adolescents with no transfer of school, transfer by choice, transfer not by choice, and transfer for other reasons. Following, three dummy-coded variables were created to represent school

transfer by choice, school transfer not by choice, and school transfer for other reasons. Students who did not transfer served as the reference group.

Academic outcomes. Adolescent academic achievement was measured using adolescent cognitive test scores at Time 1 and Time 2. These tests were developed by Educational Testing Services (ETS) and covered four subject areas – math, reading, science, and history. Adolescents completed tests at school and test times ranged from 15 to 30 minutes. At Time 2, adolescents were given tests based on their previous score in an effort to avoid ceiling and floor effects. In the present study, a composite score for reading and math assessments (calculated by NCES) was used at Time 1 and Time 2. Educational attainment was measured using data from the fourth follow-up to determine adolescents' highest level of education (1 = *no degree*, 6 = *advanced degree*)

Race/ethnicity. Adolescents were asked to identify their race/ethnicity using the following three questions: “Which best describes you?” and “Which of these best describes your background?” and “What is your race?” The final variable for race/ethnicity created by NCES included white, Black/African American, Asian/Pacific Islander, Hispanic, multiracial, and American Indian/Alaska Native. When used as control variables in regression models, five dummy-coded variables were created with white adolescents serving as the reference group. In multiple group analyses, a 3-category variable was used (1 = *white adolescents*, 2 = *Asian American adolescents*, and 3 = *African American, Native American, Hispanic/Latino, and multiracial adolescents*). Groups were collapsed due to small sample sizes of adolescents whose parents indicated they had transitioned by choice for African American (n ~ 50), Native American (n ~ 10), Hispanic/Latino (n ~ 40), and multiracial (n ~ 20) adolescents. There were also smaller

numbers of Asian American adolescents (n ~20), but given the meaningful differences between experiences of Asian American adolescents compared to other racial/ethnic minority adolescents, Asian American adolescents were in a separate group.

Socioeconomic status. Socioeconomic status (SES) was calculated by NCES using five items from the parent questionnaire. Student questionnaire data were used when parent data were missing. SES was based on equally weighted, standardized components including father's education level, mother's education level, family income, father's occupational status, and mother's occupational status. A continuous measure of SES was used as a control variable in regression analyses. For multiple group analyses, SES was measured using two groups (0 = lower SES, 1 = higher SES). The lower SES group included adolescents in the first and second SES quartiles and the higher SES group included adolescents in the third and fourth SES quartiles.

Control variables. Control variables included adolescent and parent characteristics, as well as school characteristics. Adolescents were asked to report their sex. Parents were asked to report their marital status using five categories that were combined into a three-category marital status variable. Two dummy codes were used in analyses to represent parents who were divorced and in other relationship types (e.g., cohabitating but not married), with married parents serving as the reference group. Parents were also asked to report the primary language spoken at home (0 = *something other than English*, 1 = *English*), and how often they were contacted by the school to volunteer (0 = *none*, 4 = *more than 4 times*). Parents were also asked how long their child had attended his or her present school using a five-point scale (1 = *one year or less*, 5 = *five years or more*). School administrators were asked to identify the type of school they

lead (public, catholic, private - other religion, private – non-religious) and the school's size. Type of school was recoded into a dummy variable representing private schools; public school served as the reference group.

Analytic Strategy

Data were analyzed using structural equation modeling in Stata 13 to determine the direct and indirect associations among school choice, parents' social capital, and adolescents' academic outcomes. Six full models (each measure of social capital with each outcome) were analyzed and included sample weights and robust standard errors to account for adolescents' nesting within schools.

First, data were transformed to long form so that each adolescent could have unique social capital and standardized test data for each time point. This reshaping of the data also resulted in the creation of a Time variable to index measurement occasion (0 = baseline, 1 = second follow-up – four years after baseline). To assess the association between school choice and parents' social capital, three interaction terms were created – one for each choice group dummy code. These included Transfer by choice X Time, Transfer not by choice X Time, and Transfer for other reason X Time. Adolescents who did not transition served as the reference group. These interactions were included in SEM analyses. These interactions were used to test if there was a significant change in parents' social capital over time and if these changes in social capital differed between choice groups. These analyses were used to answer research questions 1a and 3a. Then, the significance of indirect pathways was used to assess the links between school choice, parents' social capital, and subsequent adolescent outcomes. Using the product of coefficients method (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002), the path

coefficient linking each Choice X Time term to social capital was multiplied by the path coefficient linking social capital to the outcome. For the academic achievement model, each interaction was by the path coefficient linking social capital and standardized test score. For the educational attainment model, each interaction term was multiplied by the path coefficient linking social capital to educational attainment. The standard error of the product was calculated using the delta method (Oehlert, 1992). The significance of these indirect effects were used to answer research questions 1b and 3b.

Lastly, multiple group analyses were used to assess differences in the significance of direct and indirect pathways in each model based on adolescents' race/ethnicity and SES (research questions 2 and 4). All coefficients were set to vary by group for each SEM. Differences in direct and indirect effects across groups should be interpreted with caution, as the statistical difference in coefficients between groups was not tested. Simple effects for individual groups are reported in the present study.

Results

Descriptive Statistics

Correlations and descriptive statistics for all study variables can be found in Table 3. Maximum likelihood for missing values was used in all analyses to account for missing data (37% of participants had complete data, and no variable had more than 23% of data missing). Adolescents scored, on average, 52.58 (maximum score was 75.81) across standardized test measures for reading and math at Time 1 and Time 2, and had an educational attainment of 2.72 (between a high school degree and associates degree). Measures of social capital were positively correlated with academic achievement and educational attainment with the exception of homework help, which was negatively

correlated with academic achievement and not correlated with educational attainment. *t*-tests revealed mean differences between males and females, public and private schools, and parents whose primary language was English and parents whose was not (see Table 4). Females, students who attended private schools, and adolescents whose parents' primary language was English had the highest scores for academic achievement and the highest educational attainment. Analysis of Variance revealed group differences for race/ethnicity, school choice groups, and parents' marital status for academic achievement and educational attainment (see Table 5). Asian American adolescents, adolescents whose parents were married, and adolescents who did not transition schools had the highest average academic achievement and educational attainment.

School Choice, Social Capital, and Academic Achievement

Model fit for academic achievement across all mediation models was poor when including all predictors and controls (χ^2 ranged from 991.55 - 9396.07, RMSEA from .06-.08, CFI from .42 - .82, TLI from -.05 - .47) likely due to the large number of coefficients being estimated that were not statistically significant. Therefore, fit statistics were estimated for more parsimonious models (i.e., non-statistically-significant control variables were removed to reduce the number of estimates overall) and findings showed good model fit, (χ^2 ranged from 28.09 – 873.82, RMSEA from .02 - .06, CFI from .87 - .97 TLI from .46 - .95). For all mediation analyses, control variables remained in models given their meaningful (even if not statistically significant) links to academic outcomes.

Across all social capital models, race/ethnicity, SES, sex, and contact by the school were associated with academic achievement. On average, adolescents from higher SES families, white adolescents, female adolescents, and adolescents who attended

schools with greater levels of contact to parents had higher academic achievement scores overall. Changes in academic achievement over time differed across social capital models. For models that included parental educational involvement, academic achievement scores increased over time. In models that included perceived inclusion in decision-making and intergenerational closure, academic achievement did not change over time. There was no difference in achievement scores between adolescents who transitioned by choice and those who did not transition.

Parental educational involvement. Structural equation models revealed direct associations among school choice, social capital, and academic achievement over time (see Figure 1). Levels of homework help, rules at home, and school-based involvement all significantly changed over time. Parents reported less rules at home, $\beta = -.09, p < .001$, and greater homework help, $\beta = .25, p < .001$, and school-based involvement, $\beta = .24, p < .001$, between Time 1 and Time 2. Homework help, rules at home, and academic socialization were directly associated with academic achievement. Greater homework help and rules at home were associated with lower achievement levels, $\beta = -.16, p < .001$ and $\beta = -.09, p < .001$, respectively. Greater academic socialization was associated with higher achievement levels, $\beta = .08, p < .001$. Parents of adolescents who transitioned schools by choice had significantly higher average levels of school-based involvement compared to adolescents who did not transition, $\beta = .06, p < .05$. Regarding hypothesis 1a, social capital did not increase over time for parents of adolescents who transitioned by choice for the full sample (homework help, $\beta = .02, n.s.$, rules at home, $\beta = .02, n.s.$, school-based involvement, $\beta = -.03, n.s.$, academic socialization, $\beta = -.01, n.s.$). Table 6 provides results for direct associations between all variables and academic achievement.

Regarding hypothesis 1b, there were no indirect effects linking school choice and academic achievement via homework help, rules at home, or school-based involvement for the full sample (see Table 7). There was only evidence of indirect effects via academic socialization for adolescents who transitioned schools not by choice, $b = -.48, p < .001$. The difference in academic achievement scores between adolescents who did not transition and adolescents who did transition but not by choice was partially explained by the decrease in parents' academic socialization over time for those who transitioned not by choice.

Differences by SES and race/ethnicity. Multiple group analyses were used to test hypothesis 2 for parental educational involvement. Findings revealed a variety of significant main effects for individual groups (see Tables 8 - 15). Parents of adolescents in lower SES families who transitioned by choice reported more overall rules at home than parents of adolescents who did not transition ($b = .08, p < .01$), and these parents also reported increased in rules at home over time compared to adolescents who did not transition ($b = .08, p < .01$; see Figure 2). Further, differences in average academic achievement levels between adolescents who transitioned by choice and those who did not were partially explained by rules at home ($b = -.17, p < .05$; see Figure 3). Parents in higher SES families whose adolescents transitioned by choice reported more overall school-based involvement compared to parents of adolescents who did not transition ($b = .25, p < .05$).

Parents of white adolescents had decreased rules at home on average over time ($b = -.08, p < .001$) but there was no statistically significant change over time of rules at home for parents of Asian American or African American, Native American,

Hispanic/Latino, or multiracial adolescents. Parents of Asian American adolescents reported greater levels of rules at home overall if their adolescent transitioned by choice compared to parents of adolescents who did not transition ($b = .24, p < .001$). Parents of Asian American, African American, Native American, Hispanic/Latino, and multiracial adolescents who transitioned by choice reported greater academic socialization overall compared to parents of adolescents who did not transition ($b = .84, p < .05$; $b = .45, p < .01$, respectively). Parents of African American, Native American, Hispanic/Latino or multiracial adolescents who transitioned by choice also reported greater levels of school-based involvement overall compared to adolescents who did not transition ($b = .68, p < .01$).

Inclusion in decision-making. Levels of inclusion in decision-making significantly changed over time. Parents reported less inclusion in decision-making between Time 1 and Time 2, $\beta = -.08, p < .001$. There were no significant differences in change in inclusion in decision-making between school choice groups. Inclusion in decision-making was, however, directly associated with academic achievement, $\beta = .04, p < .01$, such that each unit increase in inclusion in decision-making was associated with a .60 increase in academic achievement on average. Regarding hypothesis 1a, social capital did not increase over time for parents of adolescents who transitioned by choice for the full sample, $\beta = .00, n.s.$ Table 16 provides results for direct associations between all variables and academic achievement. Regarding hypothesis 1b, there were no indirect effects linking school choice and academic achievement via inclusion in decision-making.

Differences by SES and race/ethnicity. Multiple group analyses were used to test hypothesis 2 for parents' perceived inclusion in decision-making. As with parental educational involvement, findings revealed a variety of main effects for individual groups (see Table 17 and 18). For adolescents in low SES groups, academic achievement overall was lower for adolescents who transitioned by choice compared to adolescents who did not transition ($b = -2.07, p < .05$). For adolescents in higher SES groups ($b = .78, p < .01$) and for white ($b = .51, p < .05$) and African American, Native American, Hispanic/Latino, or multiracial adolescents ($b = .73, p < .05$), parents' perceived inclusion in decision-making was associated with greater levels of academic achievement overall. For adolescents in higher SES groups, there was a significant indirect association: changes in academic achievement over time were partially explained by changes in inclusion in decision-making over time (see Figure 4). Parents of white ($b = -.09, p < .001$) and African American, Native American, Hispanic/Latino, or multiracial adolescents ($b = -.16, p < .001$) reported decreases in inclusion in decision-making overall over time, where there was no statistically significant change in inclusion in decision-making over time for parents of Asian American adolescents.

Intergenerational closure. Intergenerational closure significantly increased over time, $\beta = .09, p < .001$. Intergenerational closure was also directly associated with academic achievement, $\beta = .02, p < .01$, such that each additional parent of an adolescents' friend parents knew, academic achievement increased by .15. Regarding hypothesis 1a, social capital did not increase over time for parents of adolescents who transitioned by choice for the full sample, $\beta = .01, n.s$. Table 19 provides results for direct associations between all variables and academic achievement. Regarding hypothesis 1b,

there were no indirect effects linking school choice and academic achievement via intergenerational closure.

Differences by SES and race/ethnicity. Multiple group analyses were used to test hypothesis 2 for parents' intergenerational closure. As with parental educational involvement and perceived inclusion in decision-making, findings revealed a variety of main effects for individual groups (see Table 20 and 21). Adolescents in lower SES families who transitioned by choice had lower academic achievement overall compared to adolescents who did not transition ($b = 2.06, p < .05$). There was also a significant indirect association for adolescents in lower SES groups. Changes in academic achievement over time were partially explained by changes in intergenerational closure over time ($b = .11, p < .05$; see Figure 5). Parents of white adolescents who transitioned by choice reported lower levels of intergenerational closure overall compared to adolescents who did not transition ($b = -.69, p < .001$).

School Choice, Social Capital, and Educational Attainment

As with academic achievement, model fit for educational attainment across all mediation models was poor when including all predictors and controls (χ^2 ranged from 976.70 – 8828.99, RMSEA from .06-.08, CFI from .48 - .84, TLI from -.03 - .52). Fit statistics were estimated for more parsimonious models and findings showed good model fit, (χ^2 ranged from 26.19 – 1106.50, RMSEA from .03 - .08, CFI from .84 - .99 TLI from .46 - .94). For all mediation analyses, control variables remained in models given their meaningful (even if not statistically significant) links to educational attainment.

Across all social capital models, race/ethnicity, SES, sex, parents' marital status, school type, previous standardized test scores, and contact by the school were associated with educational attainment. On average, adolescents from higher SES families, Asian American adolescents, female adolescents, adolescents who attended private schools, schools with greater levels of contact to parents, adolescents with parents who were married, and adolescents with higher previous test scores had greater educational attainment levels. School choice was directly associated with educational attainment – adolescents who transitioned schools by choice had lower educational attainment compared to adolescents who did not transition ($\beta = -.07, p < .05$).

Parental educational involvement. Structural equation models revealed direct associations among school choice, social capital, and educational attainment over time (see Figure 6). Levels of homework help, rules at home, and school-based involvement all significantly changed over time. Parents reported less rules at home, $\beta = -.09, p < .001$, and greater homework help, $\beta = .24, p < .001$, and school-based involvement, $\beta = .24, p < .001$, between Time 1 and Time 2. Rules at home and school-based involvement were directly associated with educational attainment. More rules at home were associated with lower educational attainment, $\beta = -.03, p < .001$. Greater school-based involvement was associated with higher educational attainment, $\beta = .04, p < .001$. Parents of adolescents who transitioned schools by choice had significantly higher average levels of school-based involvement on average compared to adolescents who did not transition, $\beta = .06, p < .05$. Regarding hypothesis 3a, social capital did not increase over time for parents of adolescents who transitioned by choice for the full sample (homework help, $\beta = .02, n.s.$, rules at home, $\beta = .02, n.s.$, school-based involvement, $\beta = -.03, n.s.$, academic

socialization, $\beta = -.03$, *n.s.*). Table 22 provides results for direct associations between all variables and educational attainment. Regarding hypothesis 3b, there were no indirect effects linking school choice and educational attainment via parental educational involvement for the full sample.

Differences by SES and race/ethnicity. Multiple group analyses were used to test hypothesis 4 for parental educational involvement. Findings revealed significant main effects for individual groups (see Tables 23 - 30). For lower SES families, parents of adolescents who transitioned by choice reported more overall rules at home than parents of adolescents who did not ($b = .08$, $p < .01$), and these parents also increased in rules at home over time compared to adolescents who did not transition ($b = .08$, $p < .01$; refer back to Figure 2). Parents in higher SES families whose adolescents transitioned by choice reported more overall school-based involvement compared to parents of adolescents who did not transition ($b = .25$, $p < .05$). Adolescents in higher SES families who transitioned by choice had lower educational attainment compared to adolescents who did not transition ($b = -.83$, $p < .001$).

Parents of white adolescents had decreased rules at home on average over time ($b = -.08$, $p < .001$) but rules at home did not significantly change over time for parents of Asian American or African American, Native American, Hispanic/Latino, or multiracial adolescents. Also, for white adolescents, greater academic socialization ($b = .07$, $p < .01$), school-based involvement ($b = .05$, $p < .05$), and homework help ($b = .06$, $p < .01$) and lower levels of rules at home ($b = -.11$, $p < .05$) were associated with higher educational attainment overall. White adolescents who transitioned by choice had lower educational attainment than adolescents who did not transition ($b = -.70$, $p < .01$). Parents of Asian

American adolescents reported greater levels of rules at home if their adolescent transitioned by choice compared to parents of adolescents who did not transition ($b = .24$, $p < .001$). Parents of Asian American, or African American, Native American, Hispanic/Latino, and multiracial adolescents who transitioned by choice reported greater academic socialization compared to parents of adolescents who did not transition ($b = .83$, $p < .05$ and $b = .46$, $p < .01$, respectively). Parents of African American, Native American, Hispanic/Latino, and multiracial adolescents who transitioned by choice also reported greater levels of school-based involvement overall compared to adolescents who did not transition ($b = .70$, $p < .01$).

Inclusion in decision-making. Levels of inclusion in decision-making significantly changed over time. Parents reported less inclusion in decision-making between Time 1 and Time 2, $\beta = -.08$, $p < .001$. There were no significant differences in change in inclusion in decision-making between school choice groups. Inclusion in decision-making was, however, directly associated with educational attainment, $\beta = .03$, $p < .01$, such that each unit increase in inclusion in decision-making was associated with a .08 increase in educational attainment on average. Regarding hypothesis 3a, social capital did not change over time for parents of adolescents who transitioned by choice for the full sample, $\beta = .02$, *n.s.* Table 31 provides results for direct associations between all variables and educational attainment. Regarding hypothesis 3b, there were no indirect effects linking school choice and educational attainment via inclusion in decision-making.

Differences by SES and race/ethnicity. Multiple group analyses were used to test hypothesis 4 for parents' perceived inclusion in decision-making. Findings revealed

significant main effects for individual groups (see Tables 32 and 33). For adolescents in higher SES groups, inclusion in decision-making was positively associated with educational attainment ($b = .10, p < .01$). However, educational attainment was lower for adolescents who transitioned by choice compared to adolescents who did not transition ($b = -.81, p < .001$). For white adolescents, adolescents who transitioned by choice had lower educational attainment than adolescents who did not transition ($b = -.71, p < .01$), and there was a positive association between inclusion in decision-making and educational attainment for white adolescents ($b = .06, p < .05$) that was not statistically significant for other racial/ethnic groups.

Intergenerational closure. Intergenerational closure significantly increased over time, $\beta = .09, p < .001$. Intergenerational closure was also directly associated with educational attainment, $\beta = .06, p < .001$, such that each additional parent of an adolescents' friend parents knew, educational attainment increased by .06. Regarding hypothesis 3a, social capital did not increase over time for parents of adolescents who transitioned by choice for the full sample, $\beta = -.02, n.s.$ Table 34 provides results for direct associations between all variables and educational attainment. Regarding hypothesis 3b, there were no indirect effects linking school choice and educational attainment via intergenerational closure.

Differences by SES and race/ethnicity. Multiple group analyses were used to test hypothesis 2 for parents' intergenerational closure. As with parental educational involvement and perceived inclusion in decision-making, findings revealed significant main effects for individual groups (see Table 35 and 36). For higher SES groups, adolescents who transitioned by choice had lower educational attainment compared to

adolescents who did not transition ($b = -.79, p < .001$). White adolescents who transitioned by choice had lower intergenerational closure ($b = -.57, p < .01$) and educational attainment ($b = -.68, p < .001$) than adolescents who did not transition, and there was a positive association between intergenerational closure and educational attainment for white adolescents ($b = .08, p < .001$). A significant indirect association for white adolescents suggested that differences in educational attainment between adolescents who transitioned by choice were partially explained by differences in intergenerational closure ($b = -.04, p < .05$; see Figure 7).

Discussion

In recent years, policymakers and professionals have emphasized the importance of school choice as a way to improve parents' social capital and subsequent academic outcomes for adolescents of different SES and racial/ethnic groups (Ladd, 2003; Lubienski et al., 2009; Rist, 1989). However, research findings have been inconclusive regarding the links among school choice, social capital, and academic outcomes, particularly for high school students. Therefore, the overarching goal of this study was to examine the associations among school choice, social capital, and academic outcomes for a diverse population of adolescents. The longitudinal nature of the NELS:88 data offered a unique opportunity to assess changes in parents' social capital, changes in adolescents' academic achievement, and educational attainment measured eight years after high school. Findings showed mixed support for study hypotheses 1 and 3; school choice was not consistently associated with parents' social capital and/or subsequent adolescent academic outcomes. However, findings did support hypotheses 2 and 4; associations

among school choice, social capital, and academic outcomes varied across SES and race/ethnicity.

Social capital and academic outcomes. Consistent with previous work, findings in the present study showed generally positive direct associations between parents' social capital and adolescents' academic outcomes (e.g., Abada & Tenkorang, 2009; Israel et al., 2001). However, findings in this study offered more detailed insight into these associations for adolescents in high school from diverse SES and racial/ethnic groups. More specifically, across SES and racial/ethnic groups, adolescents had higher academic achievement levels when parents reported more intergenerational closure overall. For adolescents in lower SES families, increases in intergenerational closure over time were also associated with increased academic achievement. Across SES groups and for white adolescents, more intergenerational closure was associated with greater educational attainment. These findings are evidence of the benefits of parents forming networks with other parents whose adolescents attend the same school. As posited in theories of social capital, knowing other parents may help parents be more responsive to their adolescents' academic needs and more informed of opportunities that support their adolescents' educational attainment (Coleman, 1988). These informal sources of support may be particularly beneficial for parents in lower SES families who have fewer resources for accessing formal school networks.

For African American, Native American, Hispanic/Latino, or multiracial adolescents, greater inclusion in decision-making was also linked to higher levels of academic achievement. For these parents, feelings of inclusion in decision-making may reflect broader feelings of inclusion at the school, which are particularly important for

racial/ethnic minority families who may otherwise experience a cultural mismatch between home and school cultures (Garcia-Coll et al., 1996). Parents' feelings of inclusion at school then may be associated with adolescents' own school bonding, which has been positively linked to academic achievement in previous work (Dotterer & Lowe, 2011; Wang & Holcombe, 2010). For adolescents in higher SES families and white adolescents, parents' inclusion in decision-making was associated with academic achievement and educational attainment. These findings are evidence of both proximal (academic achievement) and distal (educational attainment) benefits of parents' perceived inclusion in decision-making for these groups of adolescents. Parents who feel they are appropriately included in school decisions and policy-making in high school may send positive messages about schools to their adolescents that spillover into greater motivation or engagement for adolescents in post-secondary school. It may also be the case that greater perceived inclusion in decision-making reflects parents' broader advocacy efforts at school. Parents in higher SES families in particular may be more likely to advocate on behalf of their adolescent, and the benefits of advocacy may extend beyond high school (Lareau, 2011).

Findings were mixed regarding parental educational involvement and associations with academic outcomes. Homework help, rules at home, and school-based involvement were inconsistently associated with academic achievement and educational attainment, findings that align with previous work offering mixed conclusions regarding the benefits of these involvement strategies. For example, in the present study, school-based involvement was unrelated to academic achievement (similar to findings in Hill & Tyson, 2009), but positively associated with educational attainment for adolescents in lower SES

families (similar to findings in Catsambis, 2001). Surprisingly, academic socialization was only positively associated with academic achievement for white adolescents, and for educational attainment for white adolescents and adolescents from higher SES families. In previous literature for adolescents in middle school, academic socialization was beneficial across racial/ethnic groups (Hill & Tyson, 2009) and scholars have noted that it may be the most developmentally appropriate form of parental educational involvement for adolescents (Hoover-De mpsey & Sandler, 1995). It is possible, though, that high school represents a unique time for the effectiveness of academic socialization for promoting academic success in adolescents of different SES and racial/ethnic groups, a new finding in the academic socialization literature. As lower income and racial/ethnic minority adolescents develop advanced reasoning and abstract thinking skills as they age (Byrnes, 2008), they may become more aware of cultural and institutional barriers that exist in regards to their education (Bourdieu, 1986; Bell & Golubuff, 2008). Awareness of these barriers and experiences with discrimination have been associated with distress and lower levels of motivation and engagement in previous work (Dotterer & Lowe, 2015; Fisher, Wallace, & Fenton, 2000). These negative effects may overshadow or negate any potentially positive effects of academic socialization for school engagement and subsequent academic outcomes (e.g., Dotterer & Wehrspann, 2015). In contrast, white adolescents and adolescents from higher SES families are not likely to face institutional and cultural barriers that may relate to school engagement and subsequent academic outcomes. This difference may explain why the benefits of academic socialization persist through high school for these adolescents.

School choice, social capital, and academic outcomes. Contrary to study hypotheses and previous research on elementary and middle school populations (e.g., Tedin & Weiher, 2011), there was scant evidence of changes in social capital and subsequent academic outcomes for adolescents who transitioned schools by choice compared to adolescents who did not transition. These findings provided no support for school choice as a way to improve parents' social capital and to improve subsequent adolescent outcomes for diverse groups of adolescents.

In the present study, differences in social capital that were subsequently related to academic achievement for adolescents who transitioned schools by choice compared to adolescents who did not transition surfaced only for lower SES families. Parents of adolescents who transitioned by choice reported greater levels of rules at home overall and increases in levels of rules at home over time. In contrast, parents of adolescents who did not transition reported decreased levels of rules at home over time. Rules at home were negatively associated with academic achievement. These findings may indicate two things: parents in lower SES families who have more rules at home regarding school may be more likely to transition their adolescent by choice in the first place, and/or these parents may maintain more rules at home because their adolescent has switched schools by choice. Both of these explanations are plausible – lower SES adolescents tend to have lower academic achievement levels compared to higher SES peers (Reardon et al., 2014), so parents in lower SES families who implement rules at home in order to promote academic success may also be likely to take advantage of switching schools to promote achievement. Further, these parents may continue to enforce rules at home with the goal of continuing to promote academic success at their adolescent's new school.

Unfortunately, in the present study, rules at home were subsequently associated with lower levels of academic achievement. This negative association may be due to adolescents' growing desire for autonomy with which direct forms of involvement such as rules at home may interfere (Hill & Chao, 2009). Therefore, despite good intentions, parents in lower SES families whose adolescents transitioned by choice may have undermined their adolescents' success because their parenting practices did not adjust to meet the developmental needs of their adolescents.

Differences in social capital for adolescents who transitioned schools by choice compared to adolescents who did not transition that were subsequently related to educational attainment surfaced only for white adolescents. Parents of adolescents who transitioned schools by choice had lower levels of intergenerational closure overall compared to adolescents who did not transition, and less intergenerational closure was associated with lower educational attainment. These findings suggest that parents of white adolescents who had fewer social connections with parents of their adolescents' friends may have been more likely to transition their adolescent compared to parents who knew more parents of their adolescents' friends. One proposed benefit of school choice is that it offers parents the opportunity to move their adolescent to a school whose courses or culture more closely align with their own (Planke & Sykes, 2003). This may create an environment where it would be easier to increase intergenerational closure, a benefit that may have motivated parents in the present study. However, in the present study, there was no time X choice interaction for intergenerational closure, suggesting that parents who transitioned their adolescent by choice did not experience changes in intergenerational closure over time that differed from parents of adolescents who did not

transition. These findings contrast previous work with elementary and middle school populations (e.g., Schneider et al., 1997; Tedin & Weiher, 2011), providing no evidence that school choice may increase intergenerational closure for parents of high school youth who transition schools by choice and subsequently promote adolescents' educational attainment. Again, high school may represent a unique time in adolescent development that differs from middle school. Adolescents' increased desire for autonomy and less time spent with parents (Hill & Chao, 2009) may be related to parents' ability to meet parents of their adolescents' friends, particularly if they have transitioned to a new school, even if there are more parents at the school with similar values or culture.

Finally, adolescents who transitioned schools for reasons other than choice were not a focus of this study, but group differences revealed interesting findings regarding social capital that should be explored in future work. For example, parents of white and Asian American adolescents and adolescents across SES groups who transitioned schools not by choice reported declines in academic socialization over time compared to parents of adolescents who did not transition. These declines in academic socialization were subsequently related to declines in academic achievement over time (approximately a four-point test score decline) and lower levels of educational attainment for white adolescents and adolescents from higher SES families. Scholars have noted that academic socialization may be beneficial for adolescents' achievement and educational attainment because it is a way for parents to emphasize the value of an education without directly intervening with academics (Hoover-Dempsey et al., 2009). Therefore, it was not surprising that parents' declines in academic socialization were detrimental to adolescents' academic achievement levels and educational attainment. However, previous

work has not explored associations between school transitions and academic socialization. It is not clear why these parents of adolescents who transitioned schools not by choice decreased their academic socialization over time. Given that inclusion in the “transition not by choice” group in this study included items such as “school asked my teenager to leave because of disciplinary problems” and “school asked my teenager to leave because of academic problems,” it may be that parents lowered their levels of academic socialization over time because they replaced academic socialization with other parenting practices to support their adolescent’s more immediate academic needs. For example, parents may shift the topic of conversation from discussing future plans or career options to focus on more proximal academic topics such as grades and school behavior. Parents also may have become overwhelmed by adolescents’ academic and/or disciplinary problems, feeling helpless in their attempts to support their adolescents. Studies that further explore how different transitions are related to parents’ social capital are needed.

Overall, the findings from this study offered detailed insight into the associations (or lack of association) among school choice, social capital, and academic outcomes for adolescents of different SES and racial/ethnic groups that have not been explored in previous work. In this study, parents of adolescents who transitioned schools by choice did not report increases in any types of social capital that were beneficial for adolescents’ academic outcomes. These findings directly contrasted hypotheses based on previous literature with younger populations that school choice is positively associated with social capital. For parents of most adolescents in the present study, there was no association between school choice and social capital. Parents of white adolescents and adolescents in

lower SES families who transitioned schools by choice actually reported detrimental changes in social capital compared to parents of adolescents who did not transition. These findings contribute new insight into the school choice and social capital literature, which is scant for high school populations.

Further, the findings in this study generally align with the Bioecological Model of Human Development and theories of social capital. In the present study, social capital was directly associated with higher levels of academic outcomes and the Bioecological Model of Human Development (Bronfenbrenner & Morris, 2006) posits that mesosystem linkages (e.g., interconnections between home and school), as well as exosystems (e.g., parents' relationships with other parents that do not directly involve their adolescent) are associated with academic outcomes. Findings also align with Coleman's (1988) theory of social capital (particularly for intergenerational closure) which posits direct associations between social capital and academic outcomes. However, inclusion in decision-making and parental educational involvement seemed to be most beneficial for white adolescents and adolescents from higher SES families. These findings align more closely with Bourdieu's (1986) theory of social capital, which takes a more critical approach to social capital than Coleman's (1988). Bourdieu (1986) suggested that social capital is only beneficial for more advantaged SES and racial/ethnic groups as a way to maintain social dominance. Across both approaches to social capital, findings in the present study highlight the potential differences in the effectiveness of social capital based on its form or structure (e.g., parent-parent information channels vs parent-adolescent information channels vs parent-school information channels) for adolescents in different SES and racial/ethnic groups (McNeal, 1999).

Limitations and future directions. This study provided novel insight into the associations among school choice, social capital, and academic outcomes, but there are limitations to mention. A considerable strength of the NELS:88 dataset is that it included parent reports of social capital at two time points, between which a substantial number of adolescents had transitioned schools. These measures allowed for analyses of changes in social capital that have not previously been tested. However, data for this study were collected during a time when charter schools and school vouchers were not nearly as popular as they are now. Increased availability of school choice may contribute to meaningful differences in associations among school choice, social capital, and academic outcomes. Further, parental educational involvement and methods through which parents may increase intergenerational closure or inclusion in school decision-making have transformed with advances in technology (e.g., email, teacher websites and blogs, social media). Therefore, future studies should include multiple measurement occasions for parents and adolescents across a wide range of school choice mechanisms (e.g., vouchers or tax credits) and strategies for increasing social capital in order to test the replicability of the current findings.

Additionally, despite their many strengths, there are inherent limitations to the use of large, nationally representative datasets. For example, while efforts were made to control for meaningful parent, adolescent, and school factors that are associated with social capital and academic outcomes, measures were limited to those selected by survey writers. Future work should include other important factors (e.g., parent-adolescent relationship quality) that may moderate these associations. Further, the large sample size provided statistical power to detect even small effect sizes. While this provides support

for the non-significant associations between school choice and social capital, it also may inflate Type I error.

Finally, despite the large sample size of this dataset overall, SES and racial/ethnic groups had to be combined for multiple group analyses due to small numbers of each group when split into school choice groupings. For example, Asian American adolescents were grouped separately due to their significant differences in academic outcomes compared to other adolescents, but only 10 Asian American adolescents in this sample transitioned schools by choice, limiting the generalizability of significant differences for these adolescents. Further, these differences in sample sizes may reflect meaningful differences in the likelihood for adolescents of different SES and racial/ethnic groups to transition schools for various reasons. Future work focusing explicitly on within-group differences may shed more light on how school choice is related to social capital and subsequent academic outcomes.

Implications for research, policy, and practice. To my knowledge, this is the first study to link school choice and social capital to subsequent academic outcomes. Importantly, these findings have implications for research, policy, and practice. School choice policies are a means through which federal and state governments facilitate parents' abilities to choose their adolescents' schools with one aim being to improve parents' social capital and subsequent adolescent academic outcomes. Given the null findings of the present study, future research needs to be done to explore other pathways through which school choice may be associated with academic outcomes and to analyze the costs and benefits of implementing these policies, particularly in high school. If there is little evidence of an association between school choice and academic outcomes,

government resources may be used more effectively through other types of education policy.

Findings from this study also provide evidence of the importance for scholars to explore school transitions more broadly and their associations with parents' social capital and adolescents' academic outcomes with diverse populations. In the present study, there was evidence of declines in social capital for parents whose adolescents transitioned schools (for a variety of reasons), along with subsequent declines in academic outcomes. School transitions may provide a unique opportunity for implementing programs that support both parents and adolescents during the school transition. Future research, perhaps qualitative in nature, that explicitly explores parents' and adolescents' experiences during a school transition would also enrich this work.

Tables

Table 1.
Social Capital Measures at Base Year and Follow-Up

		<u>Parental Educational Involvement</u>		
		<u>Base Year</u>	<u>Follow-Up</u>	
	Question	Scale	Question	Scale
	How often do you or your spouse/partner help your eighth grader with his or her homework?	1 – seldom/never 2 – once/twice a month 3 – once/twice a week 4 – almost every day	Looking back over the past year, how frequently did you and your teenager participate in the following activities together? Working on homework or other school projects	1 – never 2 – rarely 3 – sometimes 4 – frequently
Home-based involvement	Are there family rules that are enforced for your eighth grader about any of the following activities? - Maintaining a certain GPA - Doing homework	0 – no 1 – yes	Are there family rules that are enforced for your teenager about any of the following activities? - Maintaining a certain GPA - Doing homework	0 – no 1 – yes

Table 1. Continued

School-based involvement	<p>How many times have you or your spouse/partner contacted the school about each of the following:</p> <ul style="list-style-type: none"> - Participating in school fundraising activities - Doing volunteer work such as supervising lunch or chaperoning a field trip 	<p>1 – none 2 – once or twice 3 – three or four times 4 – more than four times</p>	<p>How many times have you or your spouse/partner contacted the school about each of the following:</p> <ul style="list-style-type: none"> - You and/or your spouse/partner helping with school fundraising or doing volunteer work 	<p>1 – none 2 – once or twice 3 – three or four times 4 – more than four times</p>
Academic socialization	<p>How often do you or your spouse/partner talk with your eighth grader about his or her educational plans for after high school?</p> <p>How often do you or your spouse/partner talk with your eighth grader about his or her plans for high school?</p>	<p>1 – not at all 2 – rarely 3 – occasionally 4 – regularly</p> <p>1 – not at all 2 – rarely 3 – occasionally 4 – regularly</p>	<p>How frequently during the past two years have you and/or your spouse/partner talked about the following with your teenager?</p> <ul style="list-style-type: none"> - Applying to colleges or other schools after high school - Specific jobs your teen might apply for after high school - Selecting courses or programs at school - Plans and preparation for the ACT, SAT, or ASVAB 	<p>1 – never 2 – sometimes 3 – often</p>

Table 1. Continued

<u>Intergenerational Closure</u>			
<u>Base Year</u>		<u>Follow-Up</u>	
Question	Scale	Question	Scale
Do you know the first name (or nickname) of any of your eighth grader's closest friends?	0 – no 1 – yes	Do you know the first name (or nickname) of any of your teenager's closest friends?	0 – no 1 – yes
Please list the first names (or nicknames) of your eighth grader's close friends and indicate: whether you know the parent/s of that child	0 – no 1 – yes	Please list the first names (or nicknames) of your teenager's close friends and indicate: whether you know the parent/s of that teenager	0 – no 1 – yes
<u>Perceived Inclusion in School Decision-making</u>			
<u>Base Year</u>		<u>Follow-Up</u>	
Question	Scale	Question	Scale
How much do you agree or disagree with each of the following statements? - Parents have an adequate say in school policy - Parents work together in supporting school policy	1 – strongly disagree 2 – disagree 3 – agree 4 – strongly agree	How much do you agree or disagree with each of the following statements? - Parents have an adequate say in school policy - Parents work together in supporting school policy	1 – strongly disagree 2 – disagree 3 – agree 4 – strongly agree

Table 2. *School Choice Measure and Descriptive Statistics*

Question	Scale (n) ^a
In the past four school years, how many times has your teenager changed schools? DO NOT count changes that occurred as a result of promotion to another grade level or move from a middle school building to a high school building in the same district.	0 – none (7,900) 1 – one or more times (900)
What was the reason for the most recent change of schools?	
Not choice:	
- School asked my teenager to leave because of disciplinary problems	0 – no (820) 1 – yes (30)
- School asked my teenager to leave because of academic problems	0 – no (830) 1 – yes (30)
- School was closed or merged with another	0 – no (810) 1 – yes (40)
Choice:	
- Family/teenager moved to take advantage of a specialized program in another school	0 – no (760) 1 – yes (90)
- Wanted to switch from a public to a private school	0 – no (810) 1 – yes (40)
- Wanted to switch from a private to a public school	0 – no (770) 1 – yes (80)
- Wanted to switch from a public or private school to a magnet school	0 – no (840) 1 – yes (20)
- Wanted to take advantage of special courses offered at new school	0 – no (710) 1 – yes (140)

Table 2. Continued

Other reasons or no reason given:	
- Family moved to a different location for other reasons	0 – no (450) 1 – yes (400)
- My teenager changed schools because he or she came to the U.S. from another country	0 – no (840) 1 – yes (10)
- No reason given	n = 150

Note. Parents could provide multiple reasons for the change of school. All sample sizes rounded to the nearest ten per IES requirements.

Table 3. *Correlations and Descriptive Statistics for Study Variables*

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. SES	-										
2. School size	-.04***	-									
3. Years attended school	.03***	-.18***	-								
4. Contact by school	.25***	-.16***	.07***	-							
5. Homework help	.08***	-.03***	.00	.11***	-						
6. School-based involvement	.18***	-.11***	.03***	.48***	.19***	-					
7. Academic socialization	.18***	.01	.00	.15***	.24***	.17***	-				
8. Inclusion in decision-making	.09***	-.01	.01	.16***	.02*	.11***	.07***	-			
9. Intergenerational closure	.16***	-.21***	.11***	.20***	.13***	.23***	.14***	.03***	-		
10. Educational attainment	.36***	-.07***	.05***	.17***	.00	.13***	.08***	.09***	.12***	-	
11. Academic achievement	.46***	-.05***	.04***	.17***	-.11***	.09***	.09***	.08***	.11***	.39***	-
<i>M</i>	-	1181.40	3.71	1.98	2.46	1.50	-	2.73	2.44	2.72	52.58
<i>SD</i>	-	750.07	1.11	1.05	.98	.83	-	.63	1.58	1.45	9.79
Range	-2.41 - 2.56	8 - 4,653	1 - 5	1 - 4	1 - 4	1 - 4	-3.18 - .99	1 - 4	0 - 5	1 - 6	25 - 76

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

Note. SES and academic socialization measures were standardized prior to analyses. Sample sizes varied between 15,440 and 19,740.

Table 4. Mean Differences for Academic Achievement and Academic Socialization

	Academic achievement				Educational attainment			
	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p-value</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p-value</i>
Female	52.77	0.10	2.41	0.02	2.80	0.02	6.56	0.00
Male	52.41	0.11			2.65	0.02		
English	52.92	0.08	7.40	0.00	2.74	0.01	2.16	0.00
Non-English	21.49	0.18			2.68	0.03		
Public school	51.77	0.08	-28.28	0.00	2.60	0.01	-	0.03
Private school	57.65	0.18			3.41	0.03		

Table 5. *Analysis of Variance for Academic Achievement and Educational Attainment*

	Academic achievement				Educational attainment		
	<i>N</i>	<i>F</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>M</i>	<i>SD</i>
White	13,790		53.87	9.45		2.83	1.44
African American	1,590		46.52 _b	8.99		2.35 _c	1.40
Asian American	1,130	294.28 ^{***}	56.71	9.92	118.53 ^{***}	3.26	1.41
Hispanic/Latino	2,380		48.31 _a	8.86		2.24 _{de}	1.35
multiracial	550		52.11	9.80		2.32 _{cde}	1.41
Native American	140		47.08 _{ab}	9.37		2.11 _e	1.31
Married	15,180		53.20	9.70		2.81	1.45
Divorced	1,730	150.23 ^{***}	51.57	9.45	126.21 ^{***}	2.42	1.41
Other	1,410		48.46	9.74		2.22	1.35
No transition	15,790		53.05	9.77		2.80	1.45
Transition by choice	510	16.71 ^{***}	51.75 _f	10.22	39.75 ^{***}	2.49 _g	1.52
Transition not by choice	170		48.88	9.89		2.02	1.34
Transition - other	1,120		51.50 _f	9.48		2.40 _g	1.43

^{***} $p < .001$.

Note. All means significantly different ($p < .01$) unless indicated by a matching transcript.

Table 6. *Summary of SEM Analyses of Direct Pathways among Control Variables, Parental Educational Involvement, School Choice, and Academic Achievement.*

	Model 1			Model 2		
	<i>b</i>	Robust SE <i>b</i>	β	<i>b</i>	Robust SE <i>b</i>	β
Intercept	58.76	0.79	-	58.79	0.79	-
Hispanic/Latino	-3.16	1.10	-.10**	-3.16	1.10	-.10**
African American	-5.13	0.51	-.16***	-5.13	0.51	-.16***
Asian American	0.65	1.06	.01	0.65	1.06	.01
Native American	-6.88	3.06	-.07*	-6.90	3.07	-.07*
Multiracial	-0.44	1.17	-.01	-0.45	1.17	-.01
SES	4.53	0.27	.34***	4.52	0.27	.34***
Non-English	0.35	0.71	.01	0.36	0.71	.01
Male	-0.97	0.27	-.05***	-0.97	0.27	-.05***
School size	0.00	0.00	.00	0.00	0.00	.00
Years attended school	-0.20	0.12	-.02	-0.20	0.12	-.02
Divorced	-0.15	0.60	-.00	-0.14	0.60	-.00
Marital status - other	-1.32	0.61	-.04	-1.31	0.61	-.04
Private schools	0.43	0.57	.01	0.43	0.57	.01
Contact by school	0.63	0.14	.07***	0.63	0.14	.07***
Homework help	-1.64	0.13	-.16***	-1.64	0.13	-.16***
Rules at home	-2.45	0.34	-.08***	-2.45	0.34	-.09***
School-based involvement	0.01	0.16	.00	0.01	0.16	.00
Academic socialization	0.95	0.16	.08***	0.95	0.16	.08***
Time	0.54	0.20	.03**	0.48	0.21	.02*
Choice	-1.09	1.53	-.02	-1.58	1.37	-.03
Not choice	-5.92	1.42	-.06***	-4.67	1.31	-.05***
Choice other	-2.33	0.72	-.06**	-2.76	0.86	-.07**
Time X Choice				1.03	1.11	.01
Time X Not choice				-2.88	0.86	-.02***
Time X Choice other				0.93	0.58	.02

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

Table 7. *Indirect Effects for Associations between School Choice and Academic Achievement*

	Indirect effects		
	<i>b</i>	SE <i>b</i>	β
School choice			
Homework help	-0.29	0.48	0.00
Rules at home	-0.17	0.18	0.00
School-based involvement	0.00	0.03	0.00
Academic socialization	-0.04	0.08	0.00
Not school choice			
Homework help	-0.10	0.33	0.00
Rules at home	0.23	0.18	0.00
School-based involvement	0.00	0.05	0.00
Academic socialization	-0.48	0.14	-0.01***
School choice - other			
Homework help	0.05	0.16	0.00
Rules at home	0.13	0.12	0.00
School-based involvement	0.00	0.03	0.00
Academic socialization	-0.20	0.1	-0.01

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

Table 8. *Direct and Indirect Effects Linking School Choice, Homework Help, and Academic Achievement for High and Low SES Groups*

Outcome	Higher SES		Lower SES	
	Direct	Indirect	Direct	Indirect
Homework help		-		-
Time	0.46 ^{***}	-	0.49 ^{***}	-
Choice	0.03	-	0.05	-
Not choice	0.2	-	-0.19	-
Choice - other	-0.12	-	-0.28	-
TimeXchoice	0.09	-	0.36	-
TimeXnotchoice	-0.01	-	0.25	-
TimeXother	-0.01	-	-0.05	-
Academic Achievement				
Time	0.31	-0.74 ^{***}	0.49	-0.74 ^{***}
Choice	-0.86	-0.05	-2.07 [*]	-0.08
Not choice	-5.57 [*]	-0.32	-5.21 ^{***}	0.28
Choice - other	-2.40	0.20	-2.36 ^{***}	0.42
TimeXchoice	0.19	-0.14	2.74	-0.54
TimeXnotchoice	-5.34 ^{**}	0.01	-1.11	-0.37
TimeXother	1.12	0.01	1.08	0.07
Homework help	-1.60 ^{***}	-	-1.51 ^{***}	-
Rules at home	-3.16 ^{***}	-	-2.06 ^{***}	-
School-based involvement	0.04	-	0.07	-
Academic socialization	1.32 ^{***}	-	0.97 ^{***}	-

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

Table 9. *Direct and Indirect Effects Linking School Choice, Rules at Home, and Academic Achievement for High and Low SES Groups*

Outcome	Higher SES		Lower SES	
	Direct	Indirect	Direct	Indirect
Rules at home		-		-
Time	-0.06 ^{***}	-	-0.06 ^{***}	-
Choice	-0.02	-	0.08 ^{**}	-
Not choice	0.07	-	0.03	-
Choice - other	0.00	-	0.04	-
TimeXchoice	0.07	-	0.08 [*]	-
TimeXnotchoice	-0.12	-	-0.06	-
TimeXother	-0.03	-	-0.07	-
Academic Achievement				
Time	0.31	0.19 ^{***}	0.49	0.13 ^{**}
Choice	-0.86	0.08	-2.07 [*]	-0.17 [*]
Not choice	-5.57 [*]	-0.23	-5.21 ^{***}	-0.06
Choice - other	-2.40	-0.01	-2.36 ^{***}	-0.09
TimeXchoice	0.19	-0.21	2.74	-0.16
TimeXnotchoice	-5.34 ^{**}	0.37	-1.11	0.12
TimeXother	1.12	0.11	1.08	0.15
Homework help	-1.60 ^{***}	-	-1.51 ^{***}	-
Rules at home	-3.16 ^{***}	-	-2.06 ^{***}	-
School-based involvement	0.04	-	0.07	-
Academic socialization	1.32 ^{***}	-	0.97 ^{***}	-

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

Table 10. *Direct and Indirect Effects Linking School Choice, School-based Involvement, and Academic Achievement for High and Low SES Groups*

Outcome	Higher SES		Lower SES	
	Direct	Indirect	Direct	Indirect
School-based involvement				
Time	0.47***	-	0.29***	-
Choice	0.25*	-	0.32	-
Not choice	0.04	-	0.02	-
Choice - other	-0.03	-	0.05	-
TimeXchoice	-0.30	-	-0.12	-
TimeXnotchoice	-0.37	-	-0.20	-
TimeXother	-0.10	-	-0.28***	-
Academic Achievement				
Time	0.31	0.03	0.49	0.02
Choice	-0.86	-0.02	-2.07*	0.03
Not choice	-5.57*	0.02	-5.21***	0.00
Choice - other	-2.40	0.00	-2.36***	0.00
TimeXchoice	0.19	-0.02	2.74	-0.01
TimeXnotchoice	-5.34**	-0.03	-1.11	-0.02
TimeXother	1.12	-0.01	1.08	-0.02
Homework help	-1.60***	-	-1.51***	-
Rules at home	-3.16***	-	-2.06***	-
School-based involvement	0.04	-	0.07	-
Academic socialization	1.32***	-	0.97***	-

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

Table 11. *Direct and Indirect Effects Linking School Choice, Academic Socialization, and Academic Achievement for High and Low SES Groups*

Outcome	Higher SES		Lower SES	
	Direct	Indirect	Direct	Indirect
Academic socialization		-		-
Time	0.02	-	0.00	-
Choice	0.23	-	0.13	-
Not choice	0.21	-	0.21	-
Choice - other	0.06	-	0.26	-
TimeXchoice	-0.05	-	-0.05	-
TimeXnotchoice	-0.53 ^{***}	-	-0.41 [*]	-
TimeXother	-0.17	-	-0.25	-
Academic Achievement				
Time	0.31	0.03	0.49	0.00
Choice	-0.86	0.30	-2.07 [*]	0.12
Not choice	-5.57 [*]	0.28	-5.21 ^{***}	0.20
Choice - other	-2.40	0.08	-2.36 ^{***}	0.25
TimeXchoice	0.19	-0.07	2.74	-0.04
TimeXnotchoice	-5.34 ^{**}	-0.70 ^{**}	-1.11	-0.40
TimeXother	1.12	-0.22	1.08	-0.24
Homework help	-1.60 ^{***}	-	-1.51 ^{***}	-
Rules at home	-3.16 ^{***}	-	-2.06 ^{***}	-
School-based involvement	0.04	-	0.07	-
Academic socialization	1.32 ^{***}	-	0.97 ^{***}	-

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

Table 12. *Direct and Indirect Effects Linking School Choice, Homework Help, and Academic Achievement for Different Race/Ethnicities*

Outcome	White		Asian American		African American, Native American, Hispanic/Latino or multiracial	
	Direct	Indirect	Direct	Indirect	Direct	Indirect
Homework help		-		-		-
Time	0.49 ^{***}	-	0.50 ^{***}	-	0.48 ^{***}	-
Choice	0.05	-	0.49	-	-0.03	-
Not choice	0.08	-	1.20 ^{***}	-	-0.28	-
Choice - other	-0.11	-	0.08	-	-0.42	-
TimeXchoice	-0.15	-	-0.70	-	0.85	-
TimeXnotchoice	0.22	-	-0.10	-	0.37	-
TimeXother	-0.11	-	-0.62*	-	0.14	-
Academic Achievement						
Time	0.44	-0.77 ^{**}	1.67*	-0.80 ^{**}	0.32	-0.83 ^{**}
Choice	-2.17	-0.08	0.58	-0.79	-1.35	0.05
Not choice	-4.73 ^{**}	-0.12	-5.43	-1.94 ^{**}	-6.19 ^{**}	0.49
Choice - other	-3.20 ^{**}	-0.18	-0.40	-0.13	-1.14	0.76
TimeXchoice	-0.21	0.24	-0.93	1.13	2.79	-1.52
TimeXnotchoice	-2.55*	-0.34	-4.95 ^{***}	0.17	-2.97*	-0.65
TimeXother	1.13	0.18	-0.91	1.00*	0.17	-0.25
Homework help	-1.60 ^{***}	-	-1.69 ^{***}	-	-1.82 ^{***}	-
Rules at home	-2.24 ^{***}	-	-0.20	-	-4.04 ^{***}	-
School-based involvement	-0.02	-	0.61	-	-0.04	-
Academic socialization	1.20 ^{***}	-	0.04	-	0.51	-

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

Table 13. *Direct and Indirect Effects Linking School Choice, Rules at Home, and Academic Achievement for Different Race/Ethnicities*

Outcome	White		Asian American		African American, Native American, Hispanic/Latino or multiracial	
	Direct	Indirect	Direct	Indirect	Direct	Indirect
Rules at home						
Time	-0.08 ^{***}	-	-0.02	-	-0.02	-
Choice	0.01	-	0.24 ^{***}	-	-0.06	-
Not choice	0.07	-	0.21 ^{***}	-	-0.10	-
Choice - other	0.01	-	0.23 ^{***}	-	0.05	-
TimeXchoice	0.03	-	-0.01	-	0.11	-
TimeXnotchoice	0.01	-	-0.03	-	-0.20 ^{**}	-
TimeXother	-0.05	-	-0.26	-	-0.08	-
Academic Achievement						
Time	0.44	0.18 ^{***}	1.67 [*]	0.01	0.32	0.08
Choice	-2.17	-0.03	0.58	-0.05	-1.35	0.23
Not choice	-4.73 ^{**}	-0.16	-5.43	-0.04	-6.19 ^{**}	0.40
Choice - other	-3.20 ^{**}	-0.02	-0.40	-0.05	-1.14	-0.19
TimeXchoice	-0.21	-0.08	-0.93	0.00	2.79	-0.45
TimeXnotchoice	-2.55 [*]	-0.01	-4.95 ^{***}	0.01	-2.97 [*]	0.79
TimeXother	1.13	0.11	-0.91	0.05	0.17	0.33
Homework help	-1.60 ^{***}	-	-1.69 ^{***}	-	-1.82 ^{***}	-
Rules at home	-2.24 ^{***}	-	-0.20	-	-4.04 ^{***}	-
School-based involvement	-0.02	-	0.61	-	-0.04	-
Academic socialization	1.20 ^{***}	-	0.04	-	0.51	-

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

Table 14. *Direct and Indirect Effects Linking School Choice, School-based Involvement, and Academic Achievement for Different Race/Ethnicities*

Outcome	White		Asian American		African American, Native American, Hispanic/Latino or multiracial	
	Direct	Indirect	Direct	Indirect	Direct	Indirect
School-based involvement						
Time	0.43 ^{***}	-	0.16 ^{***}	-	0.33 ^{***}	-
Choice	0.06	-	0.09	-	0.68 ^{**}	-
Not choice	0.13	-	-0.04	-	-0.22 [*]	-
Choice - other	0.03	-	-0.16 ^{**}	-	-0.10	-
TimeXchoice	-0.20	-	-0.11	-	-0.24	-
TimeXnotchoice	-0.41	-	0.68 ^{***}	-	-0.09	-
TimeXother	-0.24 ^{***}	-	0.21	-	-0.04	-
Academic Achievement						
Time	0.44	-0.01	1.67 [*]	0.11	0.32	0.00
Choice	-2.17	0.00	0.58	0.07	-1.35	-0.02
Not choice	-4.73 ^{**}	0.00	-5.43	-0.03	-6.19 ^{**}	0.01
Choice - other	-3.20 ^{**}	0.00	-0.40	-0.11	-1.14	0.00
TimeXchoice	-0.21	0.00	-0.93	-0.07	2.79	0.01
TimeXnotchoice	-2.55 [*]	0.00	-4.95 ^{***}	0.47	-2.97 [*]	0.00
TimeXother	1.13	0.00	-0.91	0.15	0.17	0.00
Homework help	-1.60 ^{***}	-	-1.69 ^{***}	-	-1.82 ^{***}	-
Rules at home	-2.24 ^{***}	-	-0.20	-	-4.04 ^{***}	-
School-based involvement	-0.02	-	0.61	-	-0.04	-
Academic socialization	1.20 ^{***}	-	0.04	-	0.51	-

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

Table 15. *Direct and Indirect Effects Linking School Choice, Academic Socialization, and Academic Achievement for Different Race/Ethnicities*

Outcome	White		Asian American		African American, Native American, Hispanic/Latino or multiracial	
	Direct	Indirect	Direct	Indirect	Direct	Indirect
Academic socialization						
Time	0.03	-	0.07	-	-0.07	-
Choice	-0.03	-	0.84*	-	0.45**	-
Not choice	0.25	-	1.09***	-	-0.09	-
Choice - other	0.12	-	-0.06	-	0.18	-
TimeXchoice	0.13	-	-0.74	-	-0.14	-
TimeXnotchoice	-0.43**	-	-0.87*	-	-0.35	-
TimeXother	-0.23	-	-0.20	-	-0.21	-
Academic Achievement						
Time	0.44	0.04	1.67*	0.02	0.32	-0.03
Choice	-2.17	-0.03	0.58	0.26	-1.35	0.22
Not choice	-4.73**	0.30	-5.43	0.34	-6.19**	-0.04
Choice - other	-3.20**	0.15	-0.40	-0.02	-1.14	0.09
TimeXchoice	-0.21	0.15	-0.93	-0.23	2.79	-0.07
TimeXnotchoice	-2.55*	-0.51**	-4.95***	-0.27	-2.97*	-0.17
TimeXother	1.13	-0.25	-0.91	-0.06	0.17	-0.11
Homework help	-1.60***	-	-1.69***	-	-1.82***	-
Rules at home	-2.24***	-	-0.20	-	-4.04***	-
School-based involvement	-0.02	-	0.61	-	-0.04	-
Academic socialization	1.20***	-	0.04	-	0.51	-

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

Table 16. *Summary of SEM Analyses of Direct Pathways among Control Variables, Inclusion in Decision-making, School Choice, and Academic Achievement.*

	Model 1			Model 2		
	<i>b</i>	Robust SE <i>b</i>	β	<i>b</i>	Robust SE <i>b</i>	β
Intercept	51.59	0.82	-	51.60	0.82	-
Hispanic/Latino	-3.18	1.17	-.09**	-3.18	1.17	-.10**
African American	-5.33	0.50	-.16***	-5.33	0.50	-.16***
Asian American	0.74	1.10	.01	0.74	1.10	.01
Native American	-7.42	3.35	-.07*	-7.44	3.35	-.07*
Multiracial	-0.55	1.31	-.01	-0.55	1.31	-.01
SES	4.57	0.28	.34***	4.57	0.28	.34***
Non-English	0.38	0.76	.01	0.38	0.76	.01
Male	-0.95	0.28	-.05***	-0.95	0.28	-.05***
School size	0.00	0.00	.00	0.00	0.00	.00
Years attended school	-0.17	0.13	-.02	-0.17	0.13	-.01
Divorced	-0.10	0.64	-.00	-0.09	0.64	-.00
Marital status - other	-0.99	0.62	-.03	-0.99	0.61	-.03
Private schools	0.43	0.58	.01	0.43	0.58	.01
Contact by school	0.50	0.13	.05***	0.50	0.13	.05***
Inclusion in decision- making	0.60	0.21	.04**	0.60	0.21	.04**
Time	-0.04	0.18	-.00	-0.08	0.18	-.00
Choice	-1.16	1.62	-.02	-1.34	1.66	-.02
Not choice	-6.11	1.35	-.06***	-4.65	1.30	-.05**
Choice other	-1.96	0.75	-.05*	-2.40	0.81	-.06**
Time X Choice				0.39	0.94	.00
Time X Not choice				-3.30	0.76	-.02***
Time X Choice other				0.94	0.54	.02

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

Table 17. *Direct and Indirect Effects Linking School Choice, Inclusion in Decision-Making, and Academic Achievement for High and Low SES Groups*

Outcome	Higher SES		Lower SES	
	Direct	Indirect	Direct	Indirect
Inclusion in decision-making		-		-
Time	-0.09 ^{***}	-	-0.11 ^{***}	-
Choice	0.06	-	-0.08	-
Not choice	0.02	-	-0.41	-
Choice - other	-0.04	-	0.04	-
TimeXchoice	0.10	-	0.13	-
TimeXnotchoice	-0.18	-	0.29	-
TimeXother	0.11	-	-0.15	-
Academic Achievement				
Time	-0.14	-0.07 ^{**}	-0.04	-0.05
Choice	-0.35	0.04	-2.07 [*]	-0.03
Not choice	-5.87 [*]	0.01	-4.82 ^{***}	-0.17
Choice - other	-2.05	-0.03	-1.84 [*]	0.02
TimeXchoice	-0.31	0.08	1.77	0.05
TimeXnotchoice	-5.78	-0.14	-1.96 ^{**}	0.12
TimeXother	0.92	0.08	1.06	-0.06
Inclusion in decision-making	0.78 ^{**}	-	0.42	-

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

Table 18. *Direct and Indirect Effects Linking School Choice, Inclusion in Decision-making, and Academic Achievement for Different Race/Ethnicities*

Outcome	White		Asian American		African American, Native American, Hispanic/Latino or multiracial	
	Direct	Indirect	Direct	Indirect	Direct	Indirect
Inclusion in decision-making						
Time	0.09 ^{***}	-	-0.07	-	0.16 ^{***}	-
Choice	-0.03	-	-0.20	-	0.07	-
Not choice	-0.16	-	0.24 [*]	-	-0.36	-
Choice - other	-0.03	-	0.11	-	0.06	-
TimeXchoice	0.15	-	0.50	-	0.07	-
TimeXnotchoice	0.01	-	-0.24	-	0.20	-
TimeXother	0.13	-	-0.07	-	-0.45	-
Academic Achievement						
Time	-0.10	0.05	1.00	-0.01	-0.37	-0.12
Choice	-2.30	-0.02	-0.89	-0.03	-0.48	0.05
Not choice	-4.67 ^{**}	-0.08	-8.50 ^{**}	0.04	-4.97 ^{**}	-0.26
Choice - other	-2.91 ^{**}	-0.01	-0.86	0.02	-0.63	0.04
TimeXchoice	0.05	0.08	0.29	0.08	0.56	0.05
TimeXnotchoice	3.57 ^{***}	0.01	4.31 ^{***}	-0.04	-2.79 [*]	0.15
TimeXother	1.12	0.07	-0.57	-0.01	0.46	-0.33
Inclusion in decision-making	0.51 [*]	-	0.17	-	.73 [*]	-

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

Table 19. *Summary of SEM Analyses of Direct Pathways among Control Variables, Intergenerational Closure, School Choice, and Academic Achievement.*

	Model 1			Model 2		
	<i>b</i>	Robust SE <i>b</i>	β	<i>b</i>	Robust SE <i>b</i>	β
Intercept	52.78	0.76	-	52.79	0.75	-
Hispanic/Latino	-3.14	1.17	-.10**	-3.14	1.17	-.10**
African American	-5.25	0.50	-.16***	-5.25	0.50	-.16***
Asian American	0.91	1.10	.01	0.92	1.10	.02
Native American	-7.31	3.38	-.07*	-7.33	3.38	-.07*
Multiracial	-0.48	1.30	-.01	-0.48	1.30	-.01
SES	4.54	0.29	.34***	4.54	0.29	.34***
Non-English	0.41	0.76	.01	0.42	0.76	.01
Male	-0.93	0.28	-.05***	-0.93	0.28	-.05***
School size	0.00	0.00	.01	0.00	0.00	.01
Years attended school	-0.19	0.13	-.02	-0.19	0.13	-.02
Divorced	-0.04	0.64	-.00	-0.04	0.64	-.00
Marital status - other	-0.98	0.61	-.03	-0.98	0.61	-.03
Private schools	0.64	0.59	.02	0.64	0.59	.02
Contact by school	0.52	0.13	.06***	0.52	0.13	.06***
Intergenerational closure	0.14	0.08	.02	0.15	0.08	.02*
Time	-0.14	0.18	-.01	-0.18	0.18	-.00
Choice	-1.10	1.61	-.02	-1.33	1.66	-.02
Not choice	-6.27	1.37	-.06***	-4.83	1.31	-.05**
Choice other	-1.89	0.74	-.05*	-2.35	0.81	-.06**
Time X Choice				0.51	0.95	.01
Time X Not choice				-3.25	0.76	-.02***
Time X Choice other				1.00	0.57	.02

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

Table 20. *Direct and Indirect Effects Linking School Choice, Intergenerational Closure, and Academic Achievement for High and Low SES Groups*

Outcome	Higher SES		Lower SES	
	Direct	Indirect	Direct	Indirect
Intergenerational closure		-		-
Time	0.09**	-	0.48***	-
Choice	-0.38	-	-0.41	-
Not choice	-0.02	-	-0.09	-
Choice - other	-0.55***	-	-0.29	-
TimeXchoice	-0.20	-	-0.34	-
TimeXnotchoice	-0.15	-	-0.76*	-
TimeXother	-0.33	-	-0.52*	-
Academic Achievement				
Time	-0.24	0.02	-0.20	0.11*
Choice	-0.27	-0.08	-2.06*	-0.09
Not choice	-5.97*	0.00	-5.07***	-0.02
Choice - other	-1.99	-0.12	-1.80*	-0.06
TimeXchoice	-0.13	-0.04	1.85	-0.07
TimeXnotchoice	-5.94***	-0.03	-1.77*	-0.17
TimeXother	1.14	-0.07	1.08	-0.11
Intergenerational closure	0.21*	-	0.22*	-

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

Table 21. *Direct and Indirect Effects Linking School Choice, Intergenerational Closure, and Academic Achievement for Different Race/Ethnicities*

Outcome	White		Asian American		African American, Native American, Hispanic/Latino or multiracial	
	Direct	Indirect	Direct	Indirect	Direct	Indirect
Intergenerational closure						
Time	0.11**	-	0.56***	-	0.72***	-
Choice	-0.57**	-	0.54	-	0.34	-
Not choice	0.08	-	0.14	-	0.3	-
Choice - other	0.69***	-	0.04	-	0.34	-
TimeXchoice	-0.27	-	-0.24	-	-0.46	-
TimeXnotchoice	-0.42	-	2.83***	-	-.69*	-
TimeXother	-0.31	-	-0.73	-	-.79*	-
Academic Achievement						
Time	-0.16	0.01	1.11	-0.15	-0.65	0.15
Choice	-2.29	-0.07	-0.90	-0.14	-0.51	0.07
Not choice	-4.78**	0.01	-8.42**	-0.04	-5.30**	0.06
Choice - other	-2.87**	-0.08	-0.82	-0.01	-0.63	0.07
TimeXchoice	0.17	-0.03	0.22	0.06	0.74	-0.10
TimeXnotchoice	-3.50**	-0.05	-3.48**	-0.75	-2.52**	-0.14
TimeXother	1.24	-0.04	-0.69	0.19	0.38	-0.17
Intergenerational closure	0.12	-	-0.26	-	0.21	-

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

Table 22. *Summary of SEM Analyses of Direct Pathways among Control Variables, Parental Educational Involvement, School Choice, and Educational Attainment*

	Model 1			Model 2		
	<i>b</i>	Robust SE <i>b</i>	β	<i>b</i>	Robust SE <i>b</i>	β
Intercept	0.20	0.22	-	0.20	0.22	-
Hispanic/Latino	-0.21	0.10	-.04*	-0.21	0.10	-.04*
African American	0.12	0.10	.02	0.12	0.10	.02
Asian American	0.28	0.13	.03*	0.28	0.13	.03*
Native American	-0.50	0.16	-.03**	-0.50	0.16	-.03**
Multiracial	-0.33	0.16	-.04*	-0.33	0.16	-.04*
SES	0.38	0.04	.19***	0.38	0.04	.19***
Non-English	0.17	0.08	.04*	0.17	0.08	.04*
Male	-0.19	0.04	-.07***	-0.19	0.04	-.07***
School size	0.00	0.00	-.01	0.00	0.00	-.01
Years attended school	-0.03	0.03	-.02	-0.03	0.03	-.02
Divorced	-0.22	0.08	-.04*	-0.22	0.08	-.04*
Marital status - other	-0.12	0.09	-.02	-0.12	0.09	-.02
Private schools	0.24	0.07	.05***	0.24	0.07	.05**
Contact by school	0.08	0.02	.06***	0.08	0.02	.06**
Homework help	0.03	0.02	.17	0.03	0.02	.02
Rules at home	-0.14	0.05	-.33**	-0.14	0.05	-.03**
School-based involvement	0.06	0.02	.04**	0.06	0.02	.04**
Academic socialization	0.04	0.02	0.02	0.04	0.02	.02
Standardized test score	0.05	0.00	.31***	0.05	0.00	.31***
Time	-0.05	0.01	-.02***	-0.05	0.01	-.02***
Choice	-0.59	0.23	-.07*	-0.60	0.23	-.07*
Not choice	-0.89	0.20	-.06***	-0.90	0.20	-.06***
Choice other	-0.38	0.14	-.06**	-0.38	0.14	-.06**
Time X Choice				0.02	0.01	.00
Time X Not choice				0.02	0.03	.00
Time X Choice other				0.01	0.01	.00

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

Table 23. *Direct and Indirect Effects Linking School Choice, Homework Help, and Educational Attainment for High and Low SES Groups*

Outcome	Higher SES		Lower SES	
	Direct	Indirect	Direct	Indirect
Homework help		-		-
Time	0.46 ^{***}	-	0.49 ^{***}	-
Choice	0.03	-	0.05	-
Not choice	0.24	-	-0.20	-
Choice - other	-0.12	-	-0.27	-
TimeXchoice	0.09	-	0.35	-
TimeXnot choice	-0.04	-	0.26	-
TimeXother	-0.01	-	-0.06	-
Educational Attainment				
Choice	-0.83 ^{***}	0.00	0.20	0.00
Not choice	-1.10 ^{***}	0.02	-0.32	0.00
Choice - other	-0.29	-0.01	-0.52 ^{**}	0.00
TimeXchoice	0.01	0.01	0.00	0.00
TimeXnot choice	0.00	0.00	0.01	0.00
TimeXother	0.01	0.00	0.01	0.00
Homework help	0.08 ^{**}	-	0.00	-
Rules at home	-0.15 ^{**}	-	-0.15 [*]	-
School-based involvement	0.05	-	0.09 [*]	-
Academic socialization	0.07 [*]	-	0.03	-

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

Table 24. *Direct and Indirect Effects Linking School Choice, Rules at Home, and Educational Attainment for High and Low SES Groups*

Outcome	Higher SES		Lower SES	
	Direct	Indirect	Direct	Indirect
Rules at home		-		-
Time	-0.06 ^{***}	-	-0.07 ^{***}	-
Choice	-0.02	-	0.08 ^{**}	-
Not choice	0.08	-	0.03	-
Choice - other	0.00	-	0.05	-
TimeXchoice	0.07	-	0.08 [*]	-
TimeXnot choice	-0.13	-	-0.05	-
TimeXother	-0.03	-	-0.07	-
Educational Attainment				
Choice	-0.83 ^{***}	0.00	0.20	-0.01
Not choice	-1.10 ^{***}	-0.01	-0.32	0.00
Choice - other	-0.29	0.00	-0.52 ^{**}	-0.01
TimeXchoice	0.01	-0.01	0.00	-0.01
TimeXnot choice	0.00	0.02	0.01	0.01
TimeXother	0.01	0.01	0.01	0.01
Homework help	0.08 ^{**}	-	0.00	-
Rules at home	-0.15 ^{**}	-	-0.15 [*]	-
School-based involvement	0.05	-	0.09 [*]	-
Academic socialization	0.07 [*]	-	0.03	-

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

Table 25. *Direct and Indirect Effects Linking School Choice, School-based Involvement, and Educational Attainment for High and Low SES Groups*

Outcome	Higher SES		Lower SES	
	Direct	Indirect	Direct	Indirect
School-based involvement		-		-
Time	0.47 ^{***}	-	0.29 ^{***}	-
Choice	0.25 [*]	-	0.32	-
Not choice	0.03	-	0.01	-
Choice - other	-0.03	-	0.05	-
TimeXchoice	-0.30	-	-0.12	-
TimeXnot choice	-0.37	-	-0.20	-
TimeXother	-0.10	-	-0.29 ^{***}	-
Educational Attainment				
Choice	-0.83 ^{***}	0.01	0.20	0.03
Not choice	-1.10 ^{***}	0.00	-0.32	0.00
Choice - other	-0.29	0.00	-0.52 ^{**}	0.00
TimeXchoice	0.01	-0.02	0.00	-0.01
TimeXnot choice	0.00	-0.02	0.01	-0.02
TimeXother	0.01	0.00	0.01	-0.03 [*]
Homework help	0.08 ^{**}	-	0.00	-
Rules at home	-0.15 ^{**}	-	-0.15 [*]	-
School-based involvement	0.05	-	0.09 [*]	-
Academic socialization	0.07 [*]	-	0.03	-

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

Table 26. *Direct and Indirect Effects Linking School Choice, Academic Socialization, and Educational Attainment for High and Low SES Groups*

Outcome	Higher SES		Lower SES	
	Direct	Indirect	Direct	Indirect
Academic socialization		-		-
Time	0.03	-	0.00	-
Choice	0.23	-	0.13	-
Not choice	0.22	-	0.22	-
Choice - other	0.06	-	0.26	-
TimeXchoice	-0.06	-	-0.05	-
TimeXnot choice	-0.52 ^{***}	-	-0.41 [*]	-
TimeXother	-0.17	-	-0.24	-
Educational Attainment				
Choice	-0.83 ^{***}	0.02	0.20	0.01
Not choice	-1.10 ^{***}	0.02	-0.32	0.01
Choice - other	-0.29	0.00	-0.52 ^{**}	0.01
TimeXchoice	0.01	0.00	0.00	0.00
TimeXnot choice	0.00	-0.04 [*]	0.01	-0.02
TimeXother	0.01	-0.01	0.01	-0.01
Homework help	0.08 ^{**}	-	0.00	-
Rules at home	-0.15 ^{**}	-	-0.15 [*]	-
School-based involvement	0.05	-	0.09 [*]	-
Academic socialization	0.07 [*]	-	0.03	-

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

Table 27. *Direct and Indirect Effects Linking School Choice, Homework Help, and Educational Attainment for Different Race/Ethnicities*

Outcome	White		Asian American		African American, Native American, Hispanic/Latino or multiracial	
	Direct	Indirect	Direct	Indirect	Direct	Indirect
Homework help		-		-		-
Time	0.49***	-	0.50***	-	0.46***	-
Choice	0.05	-	0.47	-	-0.03	-
Not choice	0.08	-	1.26***	-	-0.23	-
Choice - other	-0.10	-	0.08	-	-0.43	-
TimeXchoice	-0.15	-	-0.68	-	0.86	-
TimeXnot choice	0.20	-	-0.09	-	0.35	-
TimeXother	-0.12	-	-0.61*	-	0.14	-
Educational Attainment						
Choice	-0.70**	0.00	0.4	0.00	-0.46	0.00
Not choice	-0.86***	0.00	0.13	0.00	-1.19**	0.00
Choice - other	-0.50**	0.00	0.61**	0.00	0.04	0.01
TimeXchoice	0.00	-0.01	0.05	0.00	0.03	-0.01
TimeXnot choice	0.04	0.01	-0.06	0.00	-0.07	-0.01
TimeXother	0.02	0.00	-0.06	0.00	-0.04	-0.01
Homework help	0.06**	-	0.01	-	-0.01	-
Rules at home	-0.11*	-	-0.15	-	-0.10	-
School-based involvement	0.05*	-	0.14	-	0.07	-
Academic socialization	0.07**	-	-0.02	-	-0.04	-

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

Table 28. *Direct and Indirect Effects Linking School Choice, Rules at Home, and Educational Attainment for Different Race/Ethnicities*

Outcome	White		Asian American		African American, Native American, Hispanic/Latino or multiracial	
	Direct	Indirect	Direct	Indirect	Direct	Indirect
Rules at home						
Time	-0.08***	-	-0.03	-	-0.02	-
Choice	0.01	-	0.24***	-	-0.06	-
Not choice	0.08	-	0.22***	-	-0.11	-
Choice - other	0.01	-	0.23***	-	0.05	-
TimeXchoice	0.03	-	-0.01	-	0.11	-
TimeXnot choice	0.00	-	-0.02	-	-0.20**	-
TimeXother	-0.05	-	-0.26	-	-0.08	-
Educational Attainment						
Choice	-0.70**	0.00	0.40	-0.03	-0.46	0.01
Not choice	0.86***	0.00	0.13	-0.03	-1.19**	0.01
Choice - other	-0.50**	0.00	0.61**	-0.03	0.04	-0.01
TimeXchoice	0.00	0.00	0.05	0.00	0.03	-0.01
TimeXnot choice	0.04	0.00	-0.06	0.00	-0.07	0.02
TimeXother	0.02	0.01	-0.06	0.04	-0.04	0.01
Homework help	0.06**	-	0.01	-	-0.01	-
Rules at home	-0.11*	-	-0.15	-	-0.10	-
School-based involvement	0.05*	-	0.14	-	0.07	-
Academic socialization	0.07**	-	-0.02	-	-0.04	-

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

Table 29. *Direct and Indirect Effects Linking School Choice, School-based Involvement, and Educational Attainment for Different Race/Ethnicities*

Outcome	White		Asian American		African American, Native American, Hispanic/Latino or multiracial	
	Direct	Indirect	Direct	Indirect	Direct	Indirect
School-based involvement						
Time	0.43 ^{***}	-	0.15 ^{***}	-	0.33 ^{***}	-
Choice	0.05	-	0.09	-	0.70 ^{**}	-
Not choice	0.12	-	-0.03	-	-0.22 ^{**}	-
Choice - other	0.03	-	-0.16 ^{**}	-	-0.10	-
TimeXchoice	-0.20	-	-0.11	-	-0.24	-
TimeXnot choice	-0.41	-	0.68 ^{***}	-	-0.10	-
TimeXother	0.24 ^{***}	-	0.23	-	-0.04	-
Educational Attainment						
Choice	-0.70 ^{**}	0.00	0.40	0.01	-0.46	0.05
Not choice	0.86 ^{***}	0.01	0.13	0	-1.19 ^{**}	-0.02
Choice - other	-0.50 ^{**}	0.00	0.61 ^{**}	-0.02	0.04	-0.01
TimeXchoice	0.00	0.00	0.05	-0.02	0.03	-0.02
TimeXnot choice	0.04	-0.03	-0.06	0.1	-0.07	-0.01
TimeXother	0.02	-0.01 [*]	-0.06	0.03	-0.04	0.00
Homework help	0.06 ^{**}	-	0.01	-	-0.01	-
Rules at home	-0.11 [*]	-	-0.15	-	-0.10	-
School-based involvement	0.05 [*]	-	0.14	-	0.07	-
Academic socialization	0.07 ^{**}	-	-0.02	-	-0.04	-

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

Table 30. *Direct and Indirect Effects Linking School Choice, Academic Socialization, and Educational Attainment for Different Race/Ethnicities*

Outcome	White		Asian American		African American, Native American, Hispanic/Latino or multiracial	
	Direct	Indirect	Direct	Indirect	Direct	Indirect
Academic socialization						
Time	0.03	-	0.06	-	-0.06	-
Choice	-0.03	-	0.83*	-	0.46**	-
Not choice	0.26	-	1.14***	-	-0.04	-
Choice - other	0.12	-	-0.08	-	0.18	-
TimeXchoice	0.12	-	-0.73	-	-0.14	-
TimeXnot choice	-0.42**	-	-0.85*	-	-0.38	-
TimeXother	-0.21	-	-0.18	-	-0.23	-
Educational Attainment						
Choice	-0.70**	0.00	0.40	-0.02	-0.46	-0.02
Not choice	-	0.86***	0.13	-0.03	-1.19**	0.00
Choice - other	-0.50**	0.01	0.61**	0.00	0.04	-0.01
TimeXchoice	0.00	0.01	0.05	0.02	0.03	0.01
TimeXnot choice	0.04	-0.03*	-0.06	0.02	-0.07	0.02
TimeXother	0.02	0.00	-0.06	0.00	-0.04	0.01
Homework help	0.06**	-	0.01	-	-0.01	-
Rules at home	-0.11*	-	-0.15	-	-0.10	-
School-based involvement	0.05*	-	0.14	-	0.07	-
Academic socialization	0.07**	-	-0.02	-	-0.04	-

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

Table 31. *Summary of SEM Analyses of Direct Pathways among Control Variables, Inclusion in Decision-Making, School Choice, and Educational Attainment*

	Model 1			Model 2		
	<i>b</i>	Robust SE <i>b</i>	β	<i>b</i>	Robust SE <i>b</i>	β
Intercept	-0.02	0.22	-	-0.02	0.22	-
Hispanic/Latino	-0.20	0.10	-.04*	-0.20	0.10	-.04*
African American	0.11	0.10	.02	0.11	0.10	.02
Asian American	0.26	0.13	.03*	0.26	0.13	.03*
Native American	-0.49	0.17	-.03*	-0.49	0.17	-.03*
Multiracial	-0.33	0.15	-.04*	-0.33	0.15	-.04*
SES	0.40	0.04	.20***	0.40	0.04	.20***
Non-English	0.15	0.08	.04	0.15	0.08	.04
Male	-0.20	0.04	-.07***	-0.20	0.04	-.07***
School size	0.00	0.00	-.02	0.00	0.00	-.02
Years attended school	-0.03	0.03	-.02	-0.03	0.03	-.02
Divorced	-0.23	0.08	-.05**	-0.23	0.08	-.05**
Marital status - other	-0.13	0.09	-.02	-0.13	0.09	-.02
Private schools	0.22	0.07	.04**	0.22	0.07	.04**
Contact by school	0.10	0.02	.07***	0.10	0.02	.07***
Inclusion in decision-making	0.08	0.03	.03**	0.08	0.03	.03**
Standardized test score	0.05	0.00	.31***	0.05	0.00	.31***
Time	0.01	0.00	.01**	0.01	0.00	.01**
Choice	-0.58	0.24	-.07*	-0.58	0.24	-.06*
Not choice	-0.87	0.21	-.06***	-0.87	0.21	-.06***
Choice other	-0.38	0.14	-.06**	-0.38	0.14	-.06**
Time X Choice				-0.01	0.01	-.00
Time X Not choice				0.01	0.01	.00
Time X Choice other				-0.01	0.01	-.00

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

Table 32. *Direct and Indirect Effects Linking School Choice, Inclusion in Decision-Making, and Educational Attainment for High and Low SES Groups*

Outcome	Higher SES		Lower SES	
	Direct	Indirect	Direct	Indirect
Inclusion in decision-making		-		-
Time	-0.09 ^{***}	-	-0.11 ^{***}	-
Choice	0.06	-	-0.08	-
Not choice	0.02	-	-0.40	-
Choice - other	-0.04	-	0.04	-
TimeXchoice	0.10	-	0.13	-
TimeXnot choice	-0.18	-	0.29	-
TimeXother	0.11	-	-0.15	-
Educational Attainment				
Choice	-0.81 ^{***}	0.01	0.21	0.00
Not choice	-1.08 ^{***}	0.00	-0.29	-0.02
Choice - other	-0.29	0.00	-0.50 ^{**}	0.00
TimeXchoice	-0.01	0.01	0.00	0.01
TimeXnot choice	0.02	-0.02	0.00	0.01
TimeXother	-0.01	0.01	-0.01	-0.01
Inclusion in decision-making	0.10 ^{**}	-	0.05	-

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

Table 33. *Direct and Indirect Effects Linking School Choice, Inclusion in Decision-making, and Educational Attainment for Different Race/Ethnicities*

Outcome	White		Asian American		African American, Native American, Hispanic/Latino or multiracial	
	Direct	Indirect	Direct	Indirect	Direct	Indirect
Inclusion in decision-making						
	-				-	
Time	0.09***	-	-0.07	-	0.16***	-
Choice	-0.03	-	-0.21	-	0.07	-
Not choice	-0.16	-	0.27**	-	-0.33	-
Choice - other	-0.03	-	0.11	-	0.06	-
TimeXchoice	0.15	-	0.50	-	0.07	-
TimeXnot choice	0.01	-	-0.23	-	0.18	-
TimeXother	0.13	-	-0.07	-	-0.45	-
Educational Attainment						
Choice	-0.71**	0.00	0.39	0.04	-0.42	0.01
	-					
Not choice	0.82***	-0.01	0.18	-0.05	-1.28**	-0.03
	-					
Choice - other	0.50***	0.00	0.63*	-0.02	0.02	0.01
TimeXchoice	-0.01	0.01	0.08	-0.09	-0.01	0.01
TimeXnot choice	0.01	0.00	-0.04	0.04	0.02	0.02
TimeXother	-0.01	0.01	-0.02	0.01	-0.02	-0.05
Inclusion in decision-making	0.06*	-	-0.18	-	0.1	-

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

Table 34. *Summary of SEM Analyses of Direct Pathways among Control Variables, Intergenerational Closure, School Choice, and Educational Attainment*

	Model 1			Model 2		
	<i>b</i>	SE <i>b</i>	β	<i>b</i>	SE <i>b</i>	β
Intercept	0.03	0.20	-	0.03	0.20	-
Hispanic/Latino	-0.20	0.10	-.04*	-0.20	0.10	-.04*
African American	0.14	0.10	.03	0.14	0.10	.03
Asian American	0.31	0.13	.03*	0.31	0.13	.03*
Native American	-0.46	0.16	-.03*	-0.46	0.16	-.03*
Multiracial	-0.29	0.16	-.03	-0.29	0.16	-.03
SES	0.39	0.04	.19***	0.39	0.04	.19***
Non-English	0.16	0.08	.04*	0.16	0.08	.04*
Male	-0.19	0.04	-.07***	-0.19	0.04	-.07***
School size	0.00	0.00	-.00	0.00	0.00	-.00
Years attended school	-0.03	0.03	-.02	-0.03	0.03	-.02
Divorced	-0.22	0.08	-.04*	-0.22	0.08	-.04**
Marital status - other	-0.12	0.09	-.02	-0.12	0.09	-.02
Private schools	0.26	0.07	.05***	0.26	0.07	.05***
Contact by school	0.09	0.02	.07***	0.09	0.02	.07***
Intergenerational closure	0.06	0.01	.06***	0.06	0.01	.06***
Standardized test score	0.05	0.00	.31***	0.05	0.00	.31***
Time	-0.01	0.00	-.01***	-0.01	0.00	-.01***
Choice	-0.55	0.23	-.06*	-0.56	0.24	-.06*
Not choice	-0.89	0.20	-.06***	-0.89	0.20	-.06***
Choice other	-0.34	0.14	-.06*	-0.35	0.14	-.06*
Time X Choice				0.02	0.02	.00
Time X Not choice				0.02	0.03	.00
Time X Choice other				0.03	0.01	.01

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

Table 35. *Direct and Indirect Effects Linking School Choice, Intergenerational Closure, and Educational Attainment for High and Low SES Groups*

Outcome	Higher SES		Lower SES	
	Direct	Indirect	Direct	Indirect
Intergenerational closure		-		-
Time	0.09**	-	0.48***	-
Choice	-0.38	-	-0.41	-
Not choice	-0.02	-	-0.09	-
Choice - other	-0.55***	-	-0.29	-
TimeXchoice	-0.2	-	-0.34	-
TimeXnot choice	-0.15	-	-0.76*	-
TimeXother	-0.33	-	-0.52*	-
Educational Attainment				
Choice	-0.79***	-0.03	0.23	-0.02
Not choice	-1.11***	0.00	-0.29	0.00
Choice - other	-0.26	-0.04*	-0.48**	-0.01
TimeXchoice	0.02	-0.02	0.01	-0.02
TimeXnot choice	0.01	-0.01	0.02	-0.01
TimeXother	0.03	-0.03	0.02	-0.03
Intergenerational closure	0.07***	-	0.04**	-

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

Table 36. *Direct and Indirect Effects Linking School Choice, Intergenerational Closure, and Educational Attainment for Different Race/Ethnicities*

Outcome	White		Asian American		African American, Native American, Hispanic/Latino or multiracial	
	Direct	Indirect	Direct	Indirect	Direct	Indirect
Intergenerational closure						
Time	0.11**	-	0.56***	-	0.72***	-
Choice	-0.57**	-	0.53	-	0.35	-
Not choice	0.08	-	0.22	-	0.38	-
Choice - other	-0.69***	-	0.04	-	0.34	-
TimeXchoice	-0.27	-	-0.25	-	-0.46	-
TimeXnot choice	-0.41	-	2.92***	-	-0.69**	-
TimeXother	-0.31	-	-0.74	-	-0.79*	-
Educational Attainment						
Choice	-0.68***	-0.04*	0.43	0.01	-0.42	0.00
Not choice	-0.84***	0.01	0.15	0.01	-1.26**	0.00
Choice - other	-0.46**	-0.05*	-0.61**	0.00	0.02	0.00
TimeXchoice	0.03	-0.02	0.01	-0.01	0.00	0.00
TimeXnot choice	0.03	-0.03	-0.10	0.08	0.02	0.00
TimeXother	0.01	-0.02	0.02	-0.02	0.01	0.00
Intergenerational closure	0.08***	-	0.03	-	0.00	-

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

Figures

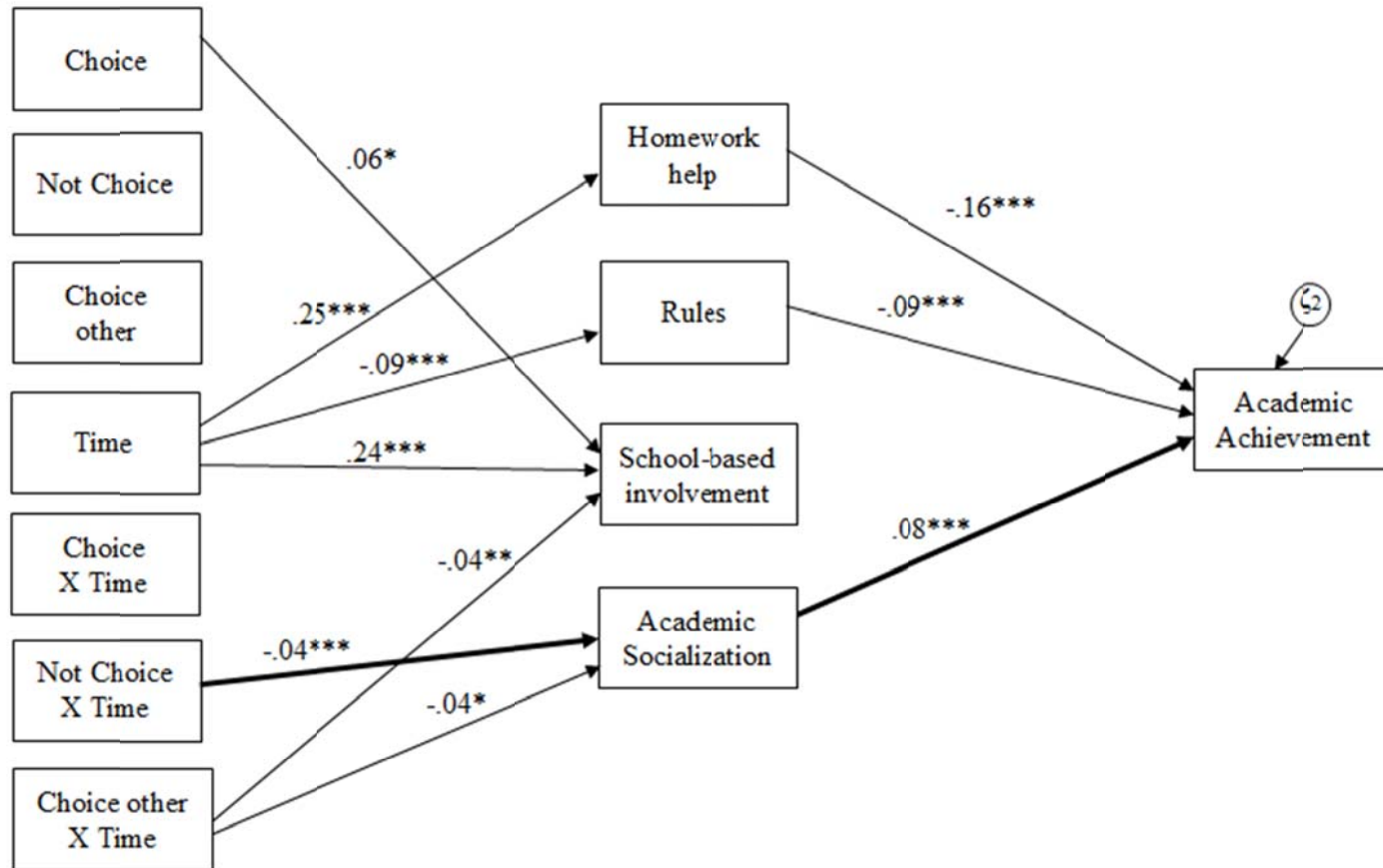


Figure 1. Standardized estimates of statistically significant direct associations among time, school choice, parental educational involvement, and academic achievement. Significant indirect pathways are in bold. Analysis controlled for adolescent race, sex, SES, years attended school time 2, school type, school outreach to parents, and parents' marital status.

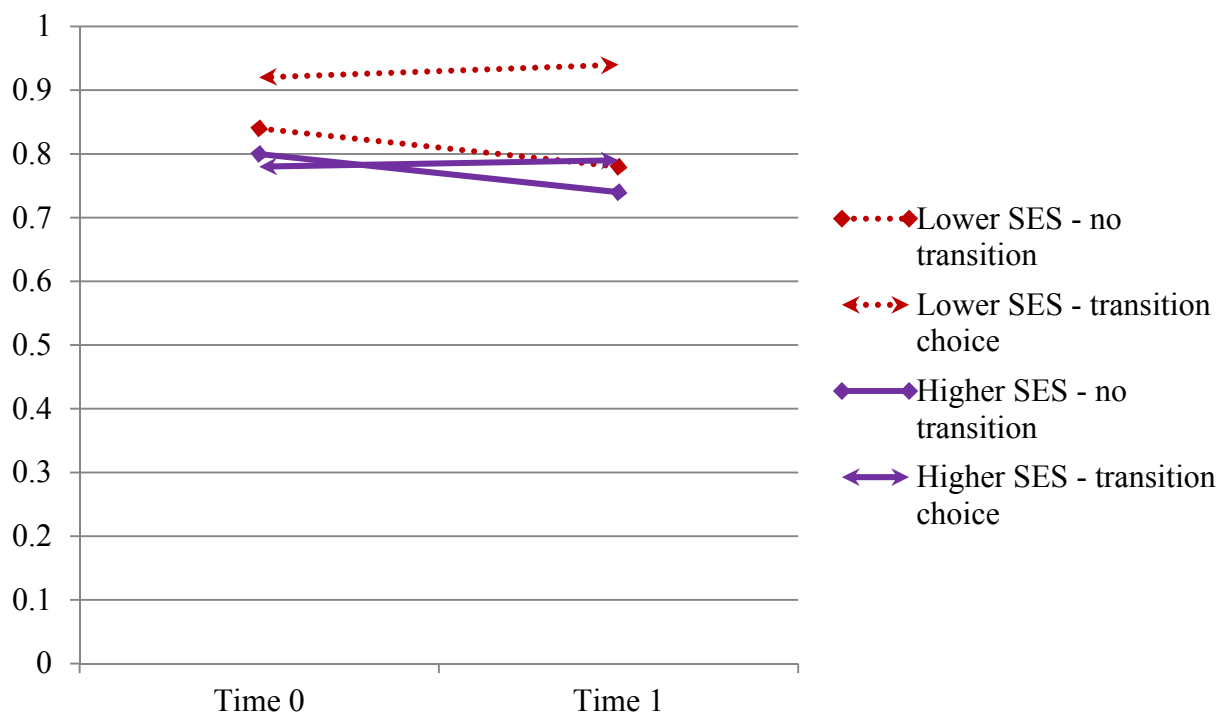


Figure 2. Change in rules at home over time for parents of adolescents of lower and higher SES and different transition groups.

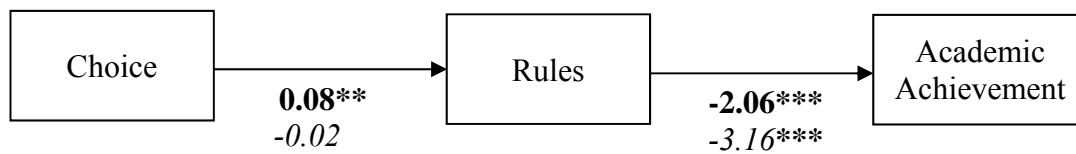


Figure 3. The indirect associations among choice, rules at home, and academic achievement for adolescents of low and high SES groups. High SES coefficients are italicized. Significant mediation pathway coefficients in bold.

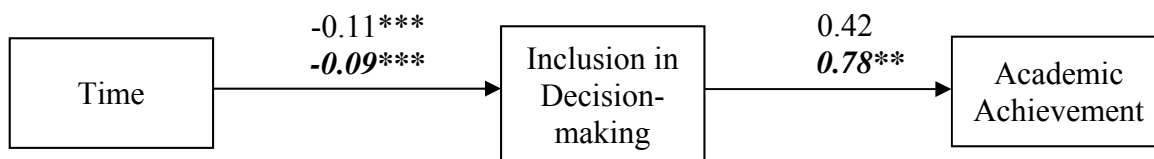


Figure 4. The indirect associations among inclusion in decision-making and academic achievement for adolescents of low and high SES groups. Higher SES coefficients are italicized. Significant mediation pathways in bold.

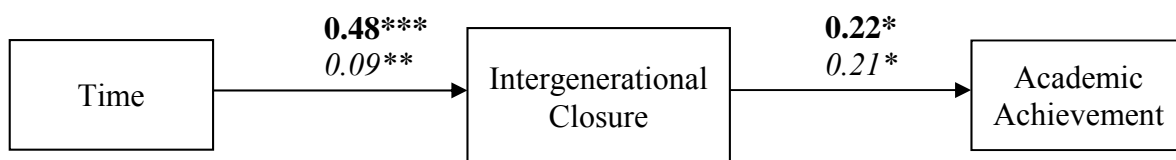


Figure 5. The indirect associations among intergenerational closure and academic achievement for adolescents of low and high SES groups. Higher SES coefficients are italicized. Significant mediation pathways in bold.

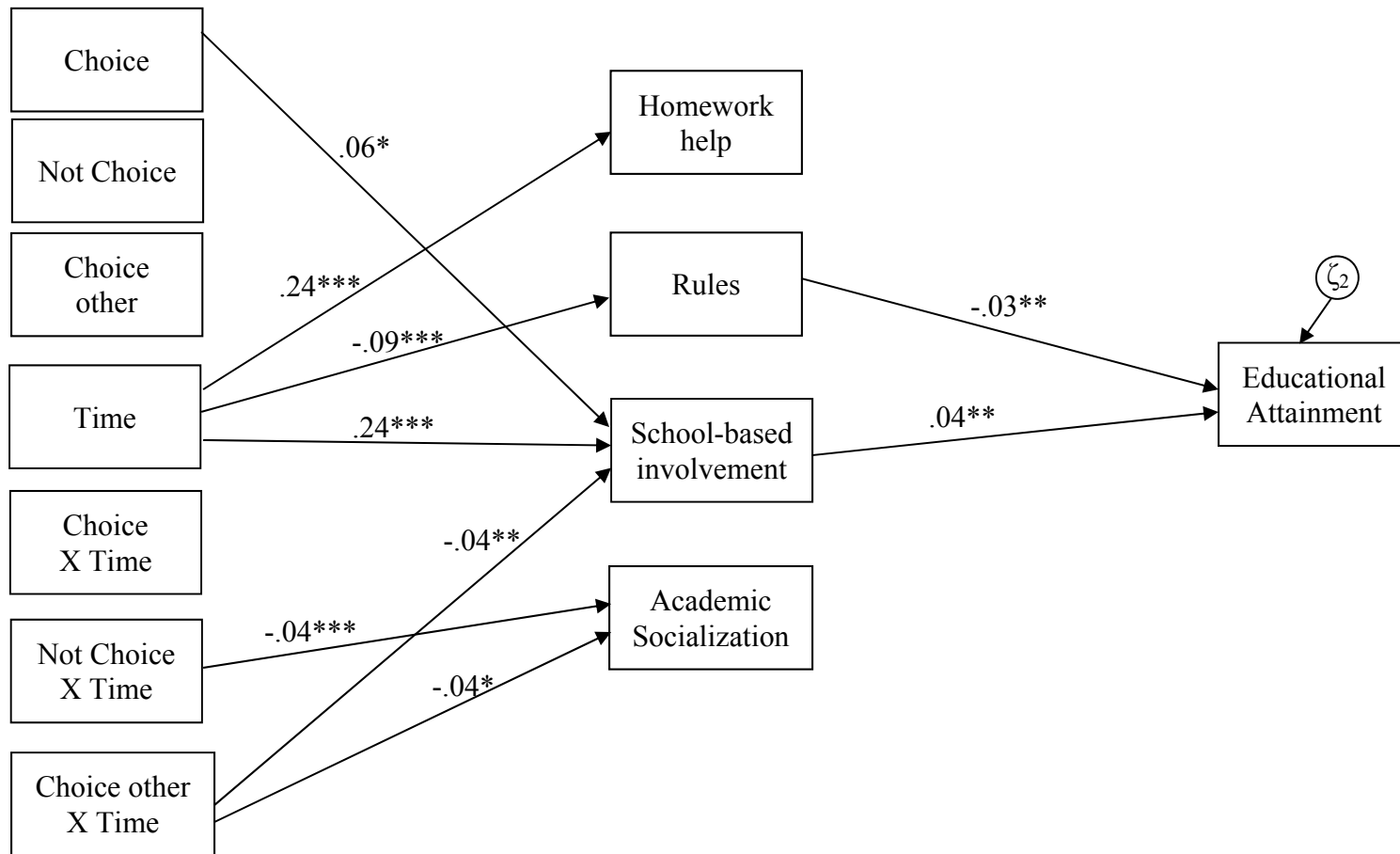


Figure 6. Standardized estimates of statistically significant direct associations among time, school choice, parental educational involvement, and educational attainment. Analysis controlled for adolescent race, sex, SES, years attended school time 2, standardized test score time 2, school type, school outreach to parents, and parents' marital status.

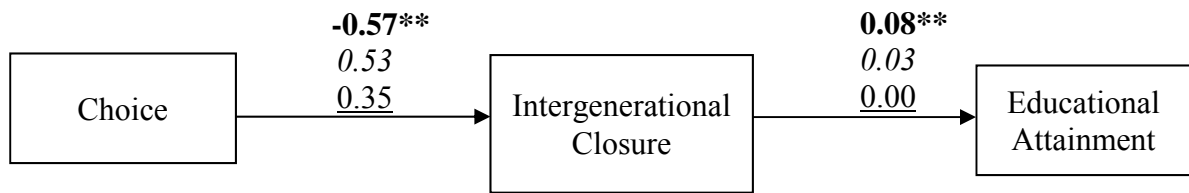


Figure 7. The indirect associations among school choice, intergenerational closure, and educational attainment for white adolescents. Coefficients for white adolescents are italicized and African American, Native American, Hispanic/Latino, and multiracial adolescents are underlined. Significant mediation pathways in bold.

CHAPTER 4. DISCUSSION

This dissertation sought to build on previous work investigating parental educational involvement practice and policy, particularly regarding implications for diverse populations of adolescents. Using data from the Education Longitudinal Study of 2002, the first study focused exclusively on parental educational involvement and explored how three facets – home-based involvement, school-based involvement, and academic socialization – were associated with academic achievement and educational attainment, independently and interacting with other factors. Findings suggested that academic socialization may be the most beneficial form of parental educational involvement, particularly for white and Hispanic/Latino adolescents, whereas school outreach to parents was beneficial particularly for Asian American and African American adolescents. Adolescent sex, race, and SES were also salient predictors of academic outcomes. The second study used data from the National Education Study of 1988 to examine associations among school choice, social capital, and academic outcomes. Findings of this study revealed an overall positive link between social capital (including parental educational involvement, intergenerational closure, and perceived inclusion in decision-making) and academic outcomes, but little evidence of differences in social capital for parents of adolescents who transitioned schools by choice. Intergenerational closure was the most consistently beneficial form of social capital, whereas perceived

inclusion in decision-making and parental educational involvement had more mixed associations with academic outcomes.

Theoretical Frameworks

The Bioecological Model of Human Development and theories of social capital guided this dissertation. Findings largely supported facets of the Bioecological Model of Human Development, which posits proximal processes, such as parental educational involvement, are the mechanisms underlying development. In this dissertation, facets of parental educational involvement, and parents' social capital more broadly, were associated with adolescents' academic outcomes. Further, as defined by Bronfenbrenner and Morris (2006), proximal processes are shaped by characteristics of individuals. In line with this idea, across both studies, parental educational involvement was differentially associated (in both strength and direction) with academic outcomes for adolescents from different SES and racial/ethnic groups. Finally, Bronfenbrenner and Morris (2006) posited a variety of contexts that shape proximal processes and development, including the microsystem, mesosystem, and exosystem. There was substantial evidence of these factors shaping academic outcomes for adolescents. For example, parents' relationships with parents of their adolescents' friends represented a context that did not directly include the adolescent (the exosystem), but was associated with adolescents' academic achievement and educational attainment (via mesosystem linkages). Again, these associations were also shaped by individual characteristics such as SES and race/ethnicity.

Study 1 of this dissertation incorporated recursive partitioning, a novel method used in order to explore interconnections among proximal processes, individual

characteristics, and contextual factors. Higher-order interactions among characteristics are the cornerstone of the Bioecological Model of Human Development (Bronfenbrenner & Morris, 2006). Recursive partitioning was a way to model these complex interactions and offer interpretations that may not be captured using more traditional regression analyses.

Theories of social capital also guided this study, providing a broad framework for understanding how social structures may be related to individual actions and outcomes. Coleman (1988) and Bourdieu (1986) were key scholars of social capital theory, each with unique perspectives regarding the role of social capital in education. Findings from this dissertation provided support for both perspectives. Regarding Coleman's (1988) conceptualization of social capital, parents' intergenerational closure, perceived inclusion in decision-making, and educational involvement were directly associated academic outcomes, and generally served as a positive social tool. However, regarding Bourdieu's (1986) conceptualization of social capital, these associations appeared most often for white adolescents and adolescents in higher SES families. Therefore, as has been found in other work (e.g., Horvat et al., 2003), social capital likely interacts with other forms of capital such as economic capital or cultural capital in its associations with parenting behaviors and subsequent adolescent outcomes. Regarding inclusion in decision-making, for example, parents may have perceived different actual levels of inclusion as "appropriate" based on their previous experiences with the school, their cultural orientation compared to the schools, or the economic capital they had to use to be actively engaged at the school. Overall, findings in this dissertation underscore social capital as an important resource to consider for understanding the family-school

connection for adolescents while also emphasizing a critical approach to studying it across diverse populations.

Empirical Contributions

Both studies in this dissertation explored correlates of parental educational involvement, as it has become an important factor in school policy and practice as a way to support adolescent academic success (Jeynes, 2007; U.S. Department of Education, 2010). Recent work has specifically highlighted academic socialization as a developmentally appropriate form of involvement during adolescence, and empirical work has shown associations between academic socialization and adolescent academic outcomes (Hill & Tyson, 2009). A key contribution of this dissertation is that the present studies extended this work to diverse groups of high school students. Findings provided evidence that academic socialization was beneficial for white adolescents and adolescents from higher SES families, but offered little evidence of its associations with academic outcomes for other youth. It is important to note that across all findings, academic socialization was never detrimental to adolescents' academic outcomes. However, there may be other more effective strategies for promoting academic success for low-income and minority youth. This may be particularly true given the institutional and cultural barriers they may face that white and more affluent youth do not encounter. Study 1 provided evidence that school outreach to parents may be one such strategy for high school adolescents, as it may bridge certain cultural or institutional gaps between families and schools.

For home-based and school-based involvement, findings largely aligned with previous studies of parental educational involvement with adolescent populations. Both

studies in this dissertation found negative associations between home-based involvement and academic outcomes across SES and racial/ethnic groups (the exception was an attenuated negative association for African American adolescents in study 1). As other scholars have suggested, home-based involvement may be perceived by adolescents as an infringement upon their independence, leading to disengagement from schoolwork or from their parents (e.g., Karbach et al., 2013). Findings in this dissertation were mixed for school-based involvement. In study 1, school-based involvement was positively associated with academic outcomes with some differences by race/ethnicity. In contrast, in study 2, school-based involvement was largely unrelated to academic outcomes. School-based involvement was measured slightly differently in each study; study 1 focused on parents' inclusion in the school PTO, whereas study 2 focused on parents' outreach to the school to find out information about fundraising and volunteer events. Differences in these associations highlight the importance for future work to consider various facets of school-based involvement and its associations with academic outcomes, as they are likely to differ.

Finally, study 2 incorporated school choice and other forms of parents' social capital beyond parental educational involvement, offering new evidence of differential associations among these factors for diverse groups of adolescents. To my knowledge, this is the only study to date to examine how school choice is associated with parents' social capital over time including its associations with subsequent adolescent academic outcomes. Findings provided minimal support for differences in changes in social capital for parents' whose adolescents transition schools by choice compared to parents of adolescents who do not transition, and no evidence that these associations were related to

subsequent academic outcomes. These findings may serve as the groundwork for future studies exploring school choice and its associations with social capital and adolescents academic outcomes.

Limitations and Future Directions

This dissertation contributed to existing empirical literature on school choice, social capital, and academic outcomes, but did have several limitations. A substantial limitation was that this study focused primarily on the quantity of parents' educational involvement, other facets of social capital, and school choice, and did not include measures of quality. Survey responses to items such as "How frequently during the past two years have you and/or your spouse partner talked about the following with your teen?" do not offer insight as to the tone of these conversations, who initiates these conversations, or how responsive adolescents are to these conversations. All of these may be related to the effectiveness of these types of conversations – poor-quality communication, even if it occurs more often, is likely to differ in effectiveness from high-quality communication. Future work should explore these types of characteristics when studying parental educational involvement, social capital, and school choice. For example, a phenomenological qualitative study aimed at understanding how parents and adolescents perceive and experience academic socialization interactions may shed light on some of the differences in its effectiveness across SES and racial/ethnic groups.

Further, this study focused primarily on characteristics parents and adolescents, and did not incorporate school and teacher characteristics other than as control variables. Studying these characteristics may be particularly important for low income or racial/ethnic minority high school students who may development a stronger cognitive

awareness of and sensitivity to institutional and cultural barriers between themselves and the educational environment. Teachers may play a key role in supporting adolescents despite these barriers, as might school culture or efforts made by the school to promote feelings of inclusion. Exploring complex interactions among parent and teacher practices, as well as school characteristics, is important work for future studies.

Finally, the second study of this dissertation was strong in its analysis of intermediary pathways between school choice and academic outcomes via social capital. However, there are other pathways through which school choice may be related to academic outcomes (e.g., differences in teacher quality), and there are other pathways that may link social capital to academic outcomes (e.g., intergenerational closure may be related to parental knowledge, which may subsequently relate to adolescent academic outcomes). Future studies that incorporate additional pathways through which school choice and social capital are related to academic outcomes may help elucidate mixed findings in the effectiveness of school choice and social capital for diverse populations of adolescents.

Implications for Research, Policy, and Practice

Overall, findings in this dissertation extend previous work on parental educational involvement, and social capital more broadly, including associations with school choice. Findings made it clear that it is crucial for future research to model interactions among individual and contextual characteristics (including SES and race/ethnicity) in order to best understand associations among school choice, social capital, and academic outcomes. Recursive partitioning was a fruitful method in this dissertation for exploring these interactions that can be applied more broadly to future research that includes other

individual and contextual factors associated with academic outcomes. Additionally, findings in this dissertation provided some insight as to what differences exist between SES and racial/ethnic groups in the effectiveness of particular types of parents' social capital. These findings may inform scholars as to what facets of social capital they may prioritize or measure using different approaches in future studies with high school populations.

Finally, findings from this dissertation have implications for policy and practice. Most notably, there was little evidence in this dissertation of the effectiveness of school choice for changing parents' social capital and benefiting adolescents' academic outcomes. Proponents of school choice often cite increased social capital as a beneficial effect of school choice; legislators should use caution when implementing school choice policies with this line of reasoning. Legislators should also consider the diverse populations these policies will affect, as the mechanisms through which school choice is associated with academic outcomes may vary for different SES and racial/ethnic groups. Teachers and administrators should also be sensitive to differences among diverse populations of families when promoting particular parental involvement strategies, as not all strategies may be a good fit for all families. Findings suggest that school outreach to parents and schools' provision of opportunities for parents to increase intergenerational closure may be the most beneficial for adolescents in lower SES or minority families, whereas academic socialization practices may be the most beneficial for white adolescents or adolescents in higher SES families. Ultimately, findings across both

studies in this dissertation substantiate prior evidence that parental educational involvement is multifaceted and has the potential to support academic outcomes for adolescents in high school.

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APPENDIX

APPENDIX

Recursive Partitioning: Detailed Interpretation

Figure 1. Figure 1 in study 1 provides an example of a tree predicting college degree attainment. In the initial sample of 1,000 adolescents, 700 had completed a college degree. In the first split, we see that 151 adolescents were classified into child node 1 (African American), 131 into child node 2 (Hispanic), and 718 into child node 3 (White). When we compare nodes 1, 2, and 3 we see that a substantially larger proportion of white adolescents completed a college degree (node 3: 65%) than African American (node 1: 41%) or Hispanic adolescents (node 2: 39%). For African American youth, further splits based on home-based involvement and academic socialization suggest that both home-based involvement AND academic socialization practices predict adolescents' college degree attainment. Comparing Nodes 4 and 5, we see that a substantially larger proportion of adolescents with levels of home-based involvement above 3.22 completed a college degree (node 5: 59%) compared to those with home-based involvement less than or equal to 3.22 (node 4: 18%). In node 11, we see that higher levels of academic socialization in combination with high levels of home-based involvement best predicted college degree completion – of the adolescents with higher levels of home-based involvement, 76% of those with higher levels of academic socialization had obtained a

college degree compared to just 42% of those with lower levels of academic socialization (node 10). For Hispanic youth, school-based involvement was the only predictor of college degree obtainment. Adolescents with higher levels of school-based involvement were substantially more likely to have completed a college degree (node 7: 72%) compared to those with lower levels of school-based involvement (node 6: 17%). Lastly, for white adolescents, a combination of school-based involvement and academic socialization best predicted college degree obtainment. Comparing Nodes 8 and 9, we see that a substantially larger proportion of adolescents with levels of school-based involvement above 1.98 completed a college degree (node 9: 91%) compared to those with school-based involvement less than or equal to 1.98 (node 8: 71%). In node 13, we see that higher levels of academic socialization in combination with low levels of school-based involvement predict college degree completion – of the adolescents with lower levels of school-based involvement, 52% of those with higher levels of academic socialization had obtained a college degree compared to just 40% of those with lower levels of academic socialization (node 12).

Figure 2. Figure 2 in study 1 provides an example of a forest of trees. Each tree was created using seven predictors, and the final forest included 12 trees. We can see that Variable 1 most consistently predicted the outcome, commonly interacting with Variables 3 and 5. In contrast, Variable 4 was not predictive in any of the trees, and Variable 2 only appeared when in combination with Variable 1. This forest suggests that Variables 1, 3, 5, and 7 most commonly predict this outcome.

VITA

VITA

Education

- Ph.D., Human Development and Family Studies June, 2016
 Social Policy Certificate
 Dissertation Title: *Parental involvement in high school: Practice, policy, and implications for low-income and minority youth*
 GPA 4.0, Purdue University, West Lafayette, Indiana
- M.S., Human Development and Family Studies August, 2014
 Thesis Title: *The nature of parental involvement in middle school: Examining nonlinear associations*
 GPA 4.0, Purdue University, West Lafayette, Indiana
- B.S. with Highest Distinction, Youth Adult and Family Services, Minor in Dance May, 2009
 Honors Thesis Title: *Age and marital satisfaction in couples with cancer*
 GPA 4.0, Purdue University, West Lafayette, Indiana

Awards and Honors

- Outstanding Doctoral Student Award 2016
 Department of Human Development and Family Studies
 Purdue University, West Lafayette, Indiana
- Compton Graduate Research Travel Award 2015
 College of Health and Human Sciences Research Advisory Council
 Purdue University, West Lafayette, Indiana
- Leo and Elva Levien Award 2015
 Center for Families
 Purdue University, West Lafayette, Indiana

- Graduate Student Interdisciplinary Research Award 2015
Center for Families
Purdue University, West Lafayette, Indiana
- Graduate Student Summer Research Award 2015
Center for Families
Purdue University, West Lafayette, Indiana
- Purdue Graduate Student Government Travel Grant 2014
Purdue University, West Lafayette, Indiana

Research Experience

- Trust in Research, Trust in Relationships: How State Legislators Acquire and Use Research in Deliberation* 2015-present
Purdue University and the University of Wisconsin – Madison
Advisors: Shelley MacDermid Wadsworth, Ph.D. and Karen Bogenschneider, Ph.D.
Responsibilities: Recruited Indiana legislators to participate in the study, conducted inductive, case-based qualitative interviews with Indiana legislators, and following the completion of interviews, will assist in discourse analysis of legislative hearings
- School and Family Experiences (SAFE) Project* 2012-present
Purdue University, West Lafayette, Indiana
Advisor: Aryn Dotterer, Ph.D.
Responsibilities: Conducted in-depth literature review of topics including parental knowledge, school engagement, and academic achievement, analyzed data using SEM and polynomial regression along with multiple imputation for missing data, collaborated with Dr. Dotterer on posters presented at the biennial meeting of the Society for Research on Child Development, and the biennial meeting of the Society for Research on Adolescence, including publications following this work
- Improving Mathematics Language through Storybooks* 2015
Purdue University, West Lafayette, Indiana
Advisor: David Purpura, Ph.D.
Responsibilities: Implemented an eight-week math language intervention program to children in Head Start classrooms, and conducted post-tests with children using the Preschool Early Numeracy Skills Screener – Brief Version, Preschool Mathematical Language Test, Expressive One-Word Picture Vocabulary Test, Rapid Automated Naming, and Sun/Moon Stroop

Social Patterning of Chronic Illness: Moderation by Psychosocial Resources 2013-2015

Purdue University, West Lafayette, Indiana

Advisor: Elliott Friedman, Ph.D.

Responsibilities: Analyzed data from the large, nationally representative Survey of Midlife in the United States longitudinal dataset, reviewed multiple chronic conditions literature, collaborated on publications following this work, and supervised undergraduate statistics students in work learning multiple imputation with chained equations

Transition from Hospital Care Study 2013-2014

Relationships and Healthcare Lab

Purdue University, West Lafayette, Indiana

Advisor: Melissa Franks, Ph.D.

Responsibilities: Collected discharge and longitudinal data from St. Vincent Hospital, entered and managed study data, conducted preliminary data analyses

Practical Experience

Policy Intern, Family Impact Institute 2014-2015

Purdue University, West Lafayette, Indiana

Responsibilities: Assisted with the transition of the Family Impact Institute from Wisconsin-Madison to Purdue by communicating with seminar directors across the country, coordinating phone calls with speakers relevant to directors' needs, managing the Institute website, and helping plan and execute a training for five seminar sites

Policy Intern, Purdue Center For Families 2013-2014

Purdue University, West Lafayette, Indiana

Responsibilities: Worked with the Legislative Advisory Committee as they selected seminar topics each year, conducted in-depth literature searches to identify potential speakers for the seminar, compiled seminar evaluation data, drafted the briefing report, and created the summary fact sheet each year including analyses from evaluation data

Teaching Assistant 2012-2013

Purdue University, West Lafayette, Indiana

HDFS 255: Introduction to Couple and Family Relationships

HDFS 331: Skills for Helping Professionals

HDFS 343: Assessment and Case Management

Responsibilities: Designed and managed course webpages, graded assignments (class sizes range from 40 to 160 students) and prepared and provided guest lectures

- Reading Intervention Specialist 2011-2012
 Klondike Elementary School, West Lafayette, Indiana
Responsibilities: Taught small group literacy intervention lessons to students in grades kindergarten through 5th grade and managed one Response to Intervention team
- 5th Grade Teacher 2009-2011
 Teach For America, Eastern North Carolina
 Principal: Chris Elliott
Responsibilities: Instructed twenty-five students in a low-performing school as a member of a highly selective service corps

Publications

- Dotterer, A. M., & **Wehrspann, E.** (2015). Parent involvement and academic outcomes among urban adolescents: Examining the role of school engagement. *Educational Psychology*. doi: 10.1080/01443410.2015.1099617
- Franks, M. M., **Wehrspann, E.**, August, K., Rook, K. S., & Stephens, M. A. (in press). *Aid, influence, and adjustment: Spouse involvement in health behavior change of partners managing chronic disease*. In J. Bookwala (Ed.), *Couple Relationships in Mid and Late Life*. American Psychological Association.
- Purpura, D. J., Napoli, A. R., **Wehrspann, E.**, & Gold, Z. S. (in press). Improving mathematical knowledge through mathematical language: A storybook intervention with preschool children. *The Journal of Research on Educational Effectiveness*.
- Wehrspann, E.**, Dotterer, A. M., & Lowe, K. (2015). The nature of parental involvement in middle school: Examining nonlinear associations. *Contemporary School Psychology*. doi: 10.1007/s40688-015-0071-9
- Under review:*
- Dotterer, A. M., & **Wehrspann, E.** (2016). *Parental knowledge: Examining reporter discrepancies and links to school engagement in middle school*. Manuscript submitted for publication.
- Fuzzell, L., **Wehrspann, E.**, & Friedman, E. M. (2015). *Longitudinal increases in chronic medical conditions are related to poorer cognition*. Manuscript submitted for publication.
- Purpura, D. J., **Wehrspann, E.**, Napoli, A. R., & Hart, S. A. *Identifying domain-general and domain-specific predictors of low mathematics performance: A classification and regression tree analysis*. Manuscript submitted for publication.

Presentations

Refereed:

Wehrspann, E., & Dotterer, A. M. (2016, March). *Parental knowledge: Examining reporter discrepancies and links to school engagement*. Poster presented at the biennial meeting of the Society for Research on Adolescence, Baltimore, MD.

Wehrspann, E. (2016, March). *School choice policy, parental social capital, and adolescent educational attainment and achievement: A study in progress*. Poster presented at the Annual Graduate Student Education Research Symposium, West Lafayette, IN.

Friedman, E. M., Wehrspann, E., Plewniak, K., Knapik, S., Fuzzell, L., Marini, C. M., Franks, M. M. (2015, November). *Multiple chronic medical conditions are associated with autonomic dysregulation*. Poster presented at the annual meeting of the Gerontological Society of America, Orlando, FL.

Fuzzell, L., Friedman, E. M., & Wehrspann, E. (2015, November). *Longitudinal increases in chronic medical conditions are related to poorer cognition*. Poster presented at the annual meeting of the Gerontological Society of America, Orlando, FL.

Marini, C. M., Franks, M. M., Friedman, E. M., Wehrspann, E., & Nowakowski, A. (2015, November). *Chronic conditions and health: The moderating role of spouse emotional support*. Poster presented at the annual meeting of the Gerontological Society of America, Orlando, FL.

Wehrspann, E., Friedman, E. M., & Fuzzell, L. (2015, November). *Psychosocial factors and chronic conditions: Longitudinal associations using MIDUS*. Poster presented at the annual meeting of the Gerontological Society of America, Orlando, FL.

Wehrspann, E., & Dotterer, A. M. (2015, March). *Parental involvement in middle school: Examining nonlinear associations*. Poster presented at the biennial meeting of the Society for Research in Child Development, Philadelphia, PA.

Wehrspann, E., & Dotterer, A. M. (2014, March). *Parental involvement and school achievement in middle school: Exploring the indirect effects of school engagement*. Poster presented at the biennial meeting of the Society for Research on Adolescence, Austin, TX.

Lowe, K., Dotterer, A. M., & Wehrspann, E. (2013, April). *Links between parenting practices and minority youth's academic functioning*. Poster presented at the biennial meeting of the Society for Research in Child Development, Seattle, WA.

Invited:

Wehrspann, E., & Dotterer, A. M. (2015) *Adolescent development and a growth mindset: Supporting your teen's STEM success*. Presentation for Minority Engineering Programs parent training session. Purdue University, IN.

Wehrspann, E., Dotterer, A. M., & Lowe, K. (2014). *Adolescent development and adolescents' academic achievement*. Presentation for Minority Engineering Programs training. Purdue University, IN.

Wehrspann, E., Dotterer, A. M., & Lowe, K. (2013). *Adolescent development*. Presentation for Minority Engineering Programs training. Purdue University, IN.

Other:

Wehrspann, E., & Dotterer, A. M. (November 2014). *Parental involvement in middle school: is more always better?* Poster presented at the Next Generation Scholars Fair. Purdue University, IN.

Service

- HDFS Graduate Student Association President 2015-present
 Purdue University, Human Development and Family Studies
Responsibilities: Serve as the liaison between graduate students and the HDFS Graduate Committee by leading feedback sessions for graduate students, overseeing graduate student service committee leadership and participation, and attending monthly Graduate Committee meetings with faculty
- HDFS Search Committee Member 2014-2015
 Purdue University, Human Development and Family Studies
Responsibilities: Served as the graduate student voice as a member of the search committee by attending search committee meetings and soliciting feedback from graduate students regarding candidates
- HDFS Graduate Student Social Committee Co-Chair 2012-2015
 Purdue University, Human Development and Family Studies
Responsibilities: Organize and execute activities among graduate students and faculty

Professional Affiliations

American Psychological Association
 Society for Research in Child Development
 Society for Research on Adolescence
 Society for Research on Educational Effectiveness