







Making The Grade:

Assessing the Evidence for Integrated Student Supports

February 2014

Child TRENDS

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Acknowledgements

Integrated Student Supports: Assessing the Evidence

February 2014

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EXECUTIVE SUMMARY

An educated workforce is critical to having a competitive economy, and education is also important to the success and well-being of individuals throughout their lives. However, while education levels have risen substantially for many in the U.S. across the decades, disparities remain substantial, and many youth do not even complete high school.

Integrated student supports (ISS), sometimes referred to as integrated student services, represents an emerging field of practice that aims to address persistent disparities in educational achievement and attainment. **ISS is a school-based approach to promoting students' academic achievement and educational attainment by coordinating a seamless system of wraparound supports for the child, the family, and schools, to target student's academic and non-academic barriers to learning.** Programs that fall under an ISS umbrella have arisen in communities around the country. **Five common components to improve academic achievement were identified** across many, if not all, of the ISS models that have emerged in recent years:

- Needs assessments,
- Coordination of supports for students,
- Integration of supports within schools,
- Community partnerships, and
- Data collection and tracking.

All nine models reviewed for this study included these five components, though the way in which each component was defined in the models varied. Though models vary, this approach tends to emphasize the importance of coordination of supports to cost-effectively address identified needs.

Another common characteristic of ISS programs as implemented in communities is that they address not only the student but families, peers, and the school itself, in order to enhance students' educational outcomes.

This **focus on the non-academic factors that influence educational outcomes** arises from practitioner's experiences working in the community and also reflects a research base that clearly indicates that academic achievement and attainment are affected by numerous factors outside the academic domain. Child Trends' review of research studies on the determinants of educational outcomes identified myriad factors that have all been found to affect one or another educational outcome.

Most of the extant studies reviewed tended to have a narrow focus on one outcome or just a handful of influences. To address this narrow focus, Child Trends conducted original analyses of the National Educational Longitudinal Survey (NELS), a nationally representative sample of American adolescents as they age into adulthood. These new analyses included dozens of variables together to identify the factors that rose to the top, for American adolescents at large as well as Hispanic and black subgroups. Importantly, these analyses also did not identify one factor or a small set of factors that are critical or primary determinants of educational outcomes. Rather, these analyses echo those in the narrower studies in indicating that many factors—each with a quite small effect—influence high school graduation and post-secondary education. (The one exception was a teen birth, which was found to have a large negative association with high school graduation, over and above all other factors.)

Thus, practitioner insights and empirical findings agree that improving educational outcomes requires a broad focus. Moreover, **this perspective is supported by the most widely-accepted tenets of theory and research in child development.** For example, the ecological model recognizes the importance of proximal influences, such as the family and peers, as well as more distal influences, such as the school and community, on children's development.

The lifecourse model recognizes that experiences at an earlier stage of childhood affect outcomes at a later stage, and the positive youth development field emphasizes the importance of positive relationships and supportive interactions. And, the whole child perspective sees children as defined by their health, behavior, and socioemotional development, not just their school success. The bioecological model builds on these perspectives, emphasizing the interactive nature of developmental processes, over time, between an individual and the contexts in which they develop.

Thus, the integrated student supports approach to improving educational outcomes and reducing disparities derives from experience as well as research and theory and appears well-warranted. Has it been found to be effective? Three types of evaluation studies have been conducted: outcomes evaluations; cost effectiveness studies; and implementation evaluations.

While several rigorous evaluations have been completed, **the evaluation basis for integrated student supports as an approach can best be described as emerging. To date, it appears that ISS models can improve academic outcomes;** but findings are mixed and tend to be stronger in quasi-experimental studies than in more rigorous random assignment evaluations. Quasi-experimental studies find promising results for student progress, attendance, reading, and math achievement. However, whether outcomes differ for children of varied ages and backgrounds has not received sufficient attention.

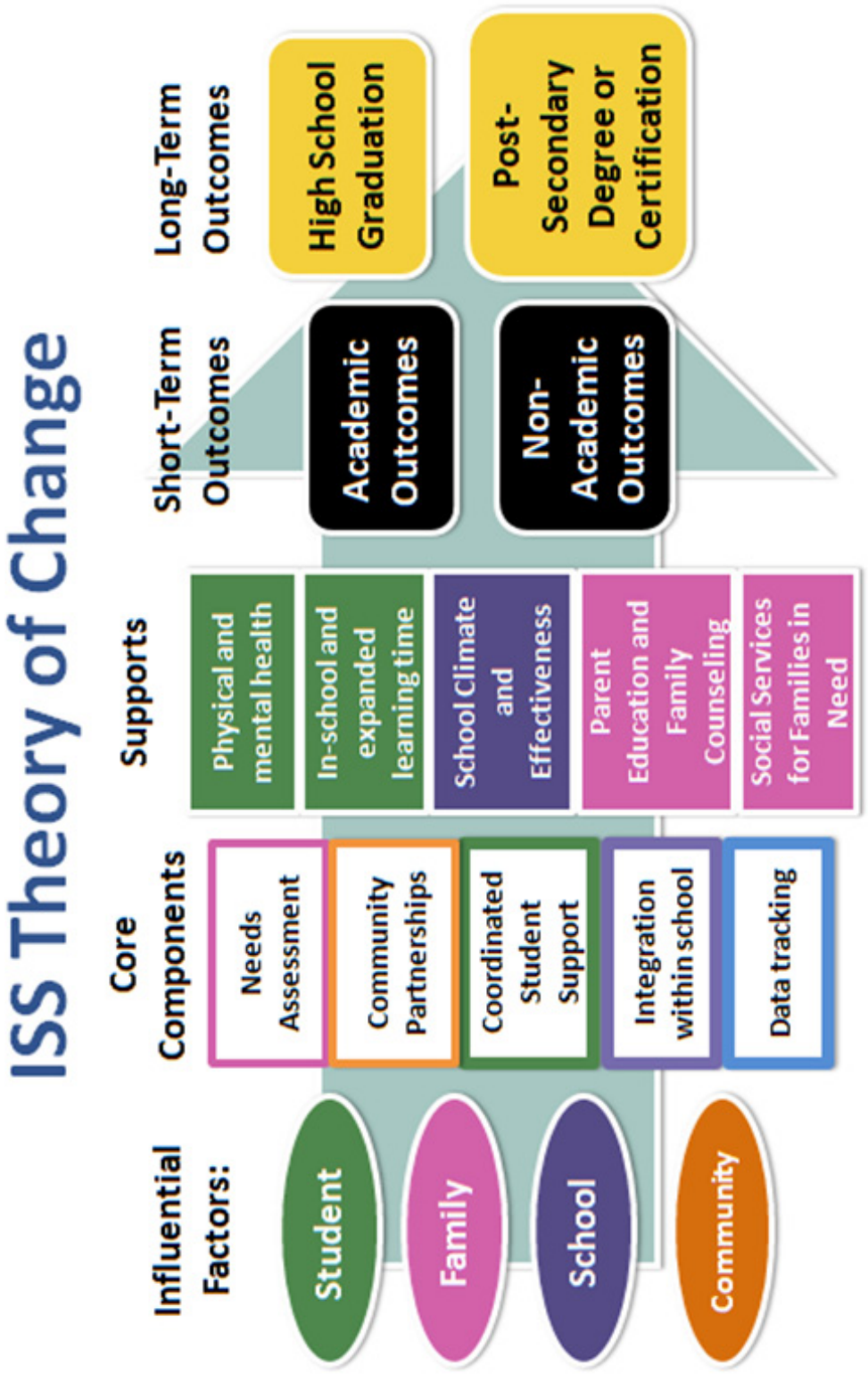
Given that the ISS model explicitly assumes the importance of non-academic factors in enhancing educational outcomes, it is surprising that, as yet, available evaluation evidence does not provide much evidence that the programs enhance those non-academic outcomes (the mediators) that are expected to drive academic outcomes. And, across studies, it is not clear which supports and/or which practices are important mediators. Is there a particular set of supports that are essential, or are supports best seen as a menu that can be offered depending upon the needs of the community or students, and can some supports be dropped as non-essential? Alternatively, is there a set of best practices that need to be implemented, regardless of the supports offered, to insure improved outcomes?

While three studies of cost effectiveness have been completed, they are based on rather different data and employ different approaches. Nevertheless, all three find large returns on investment. One commonality across the studies, though, requires assessment: that the cost of the supports provided in the community are not to be included as an ISS program cost. This assumption reflects the intent of the models to not only provide resources and coordination but to leverage existing community resources. Thus, it is well-aligned with the conceptual framework for ISS approaches; but whether sufficient supports are available at no incremental cost is not clear.

As found in youth development and early childhood research, **evaluations of implementation find that better program quality is a predictor of educational outcomes.** Again, these studies are few and the measures used vary across studies. Moreover, the distinction between supports and practices is again not clear. Quality can refer to fidelity to a strong and proven model, or the positive processes of program implementation, such as school climate, relationships and communication. Presumably quality is necessary for both supports and practices, but it is not clear where investments in quality are most productive, for what or for whom.

In sum, integrated student supports represent a promising approach, well-grounded in theory, research, and community experience. However, the evaluation evidence for the effectiveness of this approach is only beginning to emerge, and many questions remain unanswered. To identify whether, when, how, for whom, and why ISS approaches enhance educational outcomes will require an investment in strong evaluation studies. Such work should enhance the breadth and magnitude of the impacts that this promising approach can achieve.

Figure 1: Integrated Student Supports Theory of Change



CHAPTER I: THE IMPORTANCE OF EDUCATION AND THE CHALLENGE OF EDUCATIONAL DISPARITIES

By Laura Lippman, David Murphey, and Kristin Anderson Moore

Overview

It is widely accepted that education brings broad benefits to an individual as well as to society. Education is the means by which children are socialized and prepared academically for their adult roles as workers and citizens. Often overlooked is how education serves children while they are children: school is the place where children and youth spend most of their day; where they create long-lasting relationships; and where they can build social and emotional competencies, life skills, and character strengths. School is also where children form lifelong attitudes about education and the pursuit of knowledge in general and where they can develop interest (or disinterest) in specific subjects, influencing their future career choices and pastimes.

Unfortunately, levels of educational achievement and attainment vary widely by race-ethnicity, nativity, and socioeconomic status in recent cohorts of students. While increasing numbers of students enter and complete college and obtain graduate degrees, large numbers also fail to complete high school and are unprepared for life and work.

Nation-wide efforts are under way to address disparities in educational attainment and achievement. Integrated student supports (ISS) represents a major and increasingly recognized strategy to address these significant disparities. ISS can be described as a school-based approach to promoting students' academic achievement and educational attainment by coordinating a seamless system of wraparound supports at multiple levels that target student's academic and non-academic barriers to learning.

In this report, we examine the evidence about this emerging approach from multiple perspectives. These include the models developed by practitioners in communities, research on child development, research on education, as well as evaluation studies. We triangulate across these knowledge bases to assess where the integrated student supports field is and the evidence base that underlies this approach. We conclude that ISS is a promising approach, but that the field has many unanswered questions that need to be evaluated. Accordingly, we discuss next steps and implications for further research and evaluation. We begin, though, with a brief review of the importance of education.

THE IMPORTANCE OF EDUCATION

The importance of education as a tool in developing a well-functioning adult is often taken as a given. However, a review of the evidence across each sector of society suggests that educational attainment influences many areas of personal and social well-being.

Health

People with higher levels of educational attainment live longer. For example, college graduates can expect to live at least five years longer than those who have not completed high school. They are more likely to practice healthy behaviors that lead to longer healthier lives such as exercising more regularly, refraining from smoking, and obtaining healthcare check-ups and screening (Egerter, Braveman, Sadegh-Nobari, Grossman-Kahn, & Dekker, 2009). Those with higher levels of education have a lower risk of heart disease and diabetes (Cutler & Lleras-Muney, 2006) and are less likely to be obese (Baum, Ma, & Payea, 2010). In national surveys, the majority of adults reporting poorer health are less educated. Seventy percent of white, Asian, American Indian or Alaska Native adults who report they are in less than very good health have not completed high school. This percentage is even higher among blacks and Hispanics, at 73 and 84 percent, respectively (Egerter et al., 2009).

Economics

A college graduate can expect to earn 66 percent more over a lifetime (working full time for 40 years) than a high school graduate (Baum et al., 2010). Average annual earnings increase with level of education (U.S. Census Bureau. American Fact Finder, 2011). Likewise, educational attainment is closely tied to the risk of experiencing poverty: Almost 28 percent of the adult population with less than a high school degree is living in poverty, compared to 14 percent of those who are high school graduates and 4 percent of college graduates (U. S. Census Bureau. American Fact Finder, 2011). Employment rates increase for each additional level of education, and this has been consistently true over time. In 2012, for example, the employment rate for young adults was 48 percent for those who did not complete high school, 64 percent for those who did, and 87 percent for those with at least a bachelor's degree (Aud et al., 2013). Higher education not only increases the chances of getting any job, but it affects the type of job, even during economic downturns. Before the recent recession, those with a Bachelor's degree had more than twice as many college-level jobs as those with an Associate's degree and more than four times as many college-level jobs as high school graduates. This advantage did not deteriorate during the recession (Pew Charitable Trusts, 2013).

Teen Sexual Activity, Parenting, and Child Outcomes

Teens whose parents had higher levels of education were more likely to delay sexual initiation, to use contraception, and to avoid pregnancy (Kirby, 2002). Babies born to mothers who have not finished high school are nearly twice as likely to die before their first birthdays as babies born to college graduates. Children whose parents have not finished high school are more than six times as likely to be in poor or fair health as children of college graduates (Egerter et al., 2009). In addition, children of parents with less than a high school education are more likely to be obese or have fair or poor dental health than children of parents with more than high school education (47 percent compared with 26 percent and 10 compared with 4 percent, respectively) (National Survey of Children's Health, 2012).

Parenting is also related to parents' level of education. Optimal parenting that is warm yet authoritative, with appropriate levels of monitoring and structure is more prevalent among parents with a college education (Davis-Kean, 2005; Hair et al., 2005). In addition, fathers with higher levels of education are more accessible to and engaged with their school-age children (Halle & LeMenestral, 2000).

The more educated a parent, the more likely they are to pass on that education to their child, by reading to their child (Federal Interagency Forum on Child and Family Statistics, 2013b), providing a place in the home for their child to do homework, taking their child on educational outings outside of the home (U.S. Department of Education. National Center for Education Statistics, 1998; Vaden-Kiernan & McManus, 2005), getting involved in their child's school (Child Trends, 2013), having high expectations for their child's achievement and attainment (Lippman, Guzman et al., 2008), and knowing how to realistically estimate and plan for higher education costs (U.S. Department of Education. National Center for Education Statistics, 2003). Children of parents with at least a college degree score higher on assessments (O'Sullivan, Lauko, Grigg, Qian, & Zhang, 2003), are more likely to have higher expectations for their own educational attainment (Brian A. Jacob & Wilder, 2010), and graduate from high school (Dalton, Glennie, & Ingels, 2009; Haveman, Wolfe, & Spaulding, 1991) and college (Dubow, Boxer, & Huesmann, 2009a) at higher rates than those whose parents did not complete college.

Crime

Education increases opportunities for earning legitimate income and thus the costs to an individual of engaging in crime through loss in earnings and loss of time in the labor market. Education can also increase aversion to risk and build character qualities like patience and tolerance that can check violent behavior. Simply by keeping youth off the streets, schools can lower crime rates in surrounding neighborhoods. High school completers have lower rates of crime, arrests, and incarceration than those who drop out (Lochner & Moretti, 2004). While dropouts constitute less than 20 percent of the overall population, they comprise over 75 percent of the state prison inmate population (Measure of America and United Way, n.d.). It has been estimated that raising the high school completion rate by one percent among men ages 20-60 would save the U.S. as much as $1.4 billion per year in reduced costs from crime incurred by victims and society at large (Lochner & Moretti, 2004).

Civic Engagement

Civic engagement leads to a better understanding of other racial and ethnic groups, independence; moral reasoning; less authoritarianism, dogmatism, and ethnocentrism; and interest in serving others (Cunningham, n.d.). It also provides value to other people, the community, and the environment. Civic engagement can take many forms, including volunteering, voting, interest in world affairs and politics, social activism, boycotting and buycotting, etc. (Keeter, Jenkins, Zukin, & Andolina, 2005). Students engaged in these activities tend to have higher levels of academic achievement and attainment (Davila & Mora, 2007). While nine percent of adults ages 25 and older who did not graduate from high school volunteered, 43 percent of those with a college degree did so; the Center for Information and Research on Civic Learning and Engagement finds similar trends (Kirby et al, 2009). Likewise, rates of voting, support of free speech, and quality of civic engagement increase dramatically with level of education (Baum et al., 2010).

Additional Social Returns

In addition to the returns to society of a more highly educated, productive, and engaged population, there are numerous financial returns to higher educational attainment (Rouse, 2004; Belfield et al., 2012). These include higher tax revenues from higher rates of employment and higher incomes, and, since more highly educated people are more likely to have jobs which provide health insurance and pensions or other retirement plans, higher levels of educational attainment in the population reduce overall dependence on income support programs such as Medicaid and food stamps, as well as a reduction in healthcare and Medicare costs (Baum et al., 2010; Cunningham, n.d.). The public and social costs of poor or discontinued education, resulting in young people who are disconnected to the labor market, are substantial(Levin et al., 2007; Belfield et al., 2012).

In sum, the individual and social benefits to education are significant and pervasive. This evidence suggests that increasing levels of attainment and achievement could have broad and positive effects on a range of important outcomes. However, on various benchmarks of educational success, many U.S. students are falling short.

EDUCATIONAL ACHIEVEMENT AND ATTAINMENT

By fourth grade, about one in three students' scores below the "Basic" level on reading (U.S. Department of Education Institute of Education Sciences National Center for Education Statistics, 2012b) and one in five do so in math (U.S. Department of Education Institute of Education Sciences National Center for Education Statistics, 2012a). By eighth grade, in both reading and mathematics, about one student in four does not meet the Basic achievement standard (U.S. Department of Education Institute of Education Sciences National Center for Education Statistics, 2012a, 2012b), while one student in three scores below Basic in science (U.S. Department of Education Institute of Education Sciences National Center for Education Statistics, 2012c).

In addition, for every 100 students entering ninth grade for the first time, an estimated 22 fail to graduate high school on time (Aud et al., 2013). Of those students who do graduate, 68 percent enroll in postsecondary education immediately after graduating (U.S. Census Bureau, 2011). Even among those who do enroll, many are unprepared for college. Among ACT-takers who graduated high school, 75 percent failed to meet ACT college readiness benchmarks in each of four tested subjects in 2011 (ACT, 2013). Almost a third of youth attending college enroll in remedial courses at the start of college (Bettinger & Long, 2009; Greene & Forster, 2003; Parsad & Lewis, 2003). Clearly, there is room for improvement when it comes to the education of children in the U.S.

DISPARITIES IN EDUCATION

Given the importance of education to multiple outcomes later in life, it is significant that educational success is highly variable across the population. Indeed, large and persistent disparities have been documented (Rothstein, 2004).

Early Disparities in Educational Outcomes Persist through High School and Beyond.

Schooling in the U.S. has historically been seen as helping to equalize opportunity for success. However, research finds that wide disparities not only exist prior to children's entry into formal education, but persist–and in some cases widen–

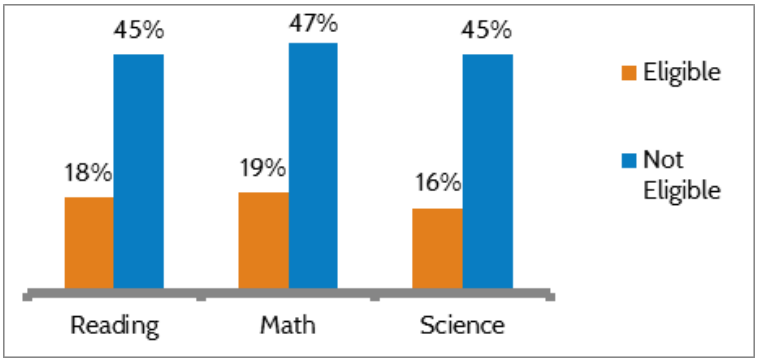
as students progress in their school careers (Halle, Forry, Hair, Perper, Wandner, Wessel, & Vick, 2009; Lee & Burkam, 2002; Figlio, 2007; Reardon, 2011). These disparities are present in cognitive abilities and academic achievement and also in outcomes in the areas of health and safety, risky behaviors, and access to economic resources, human capital, and social capital (Rothstein, 2008). Because children's success in school is jeopardized if they experience threats to safety and health, engage in potentially harmful behaviors, and lack the support and resources of their more advantaged peers, a full review of ISS research and programs needs to include education and non-education indicators and outcomes.

Gaps are Defined by Multiple Dimensions.

Among the broad characteristics associated with these divides are gender, race/ethnicity, and socio-economic status. Immigrant status, family structure, family income, and neighborhood features are also frequently associated with disparities in child outcomes. In practice it can be challenging to disentangle the unique contributions of these characteristics. An additional challenge is that income data are among the most difficult to collect.

Academic achievement disparities by family income. Using eligibility for free or reduced-price school meals as a proxy, lower-income students in eighth grade score lower than non-low-income students on the National Assessment of Educational Progress mathematics, reading, and science test (U.S. Department of Education). The same data collection system shows low-income eighth-graders are more than 40 percent more likely to have had three or more absences in the past month (U.S. Department of Education). The National Household Education Survey uses receipt of SNAP benefits as a poverty proxy; data from that source show poor children in grades one through three are nearly three times more likely to repeat a grade (Child Trends DataBank, 2013a). This data set also shows that poor children in kindergarten through third grade are more than twice as likely to have an individualized education plan for special education needs (Child Trends DataBank, 2013b). Finally, youth from families in the bottom quintile of the income distribution are more than four times as likely as those from families in the top quintile to have dropped out of school in the past year (National Center for Education Statistics, 2012). Disparities in test scores between poor and wealthier students have grown in the past ten years; this gap is now larger than the black-white achievement gap in the U.S. (Reardon, 2011). Some data suggest that the value of school-based formal education is not universally held. For example, in the National Survey of Latinos, youth with a high school education or less and who were not currently enrolled in school said that the lower education attainment of Latinos reflects their obligation to support a family, limited English skills, dislike of school, and the lack of necessity for more education for the career that they want, among other reasons (Lopez, 2009). Other studies suggest, however, that Latino families value education (Andrew & Hauser, 2011; Kao & Thompson, 2003). A recent NCES report also notes Latinos enrolled in postsecondary school in record number following the most recent recession (U.S. Department of Education, 2012).

Figure I.1. Disparities in 8th Grade School Performance (proficient or above) by Eligibility for Free and Reduced Lunch



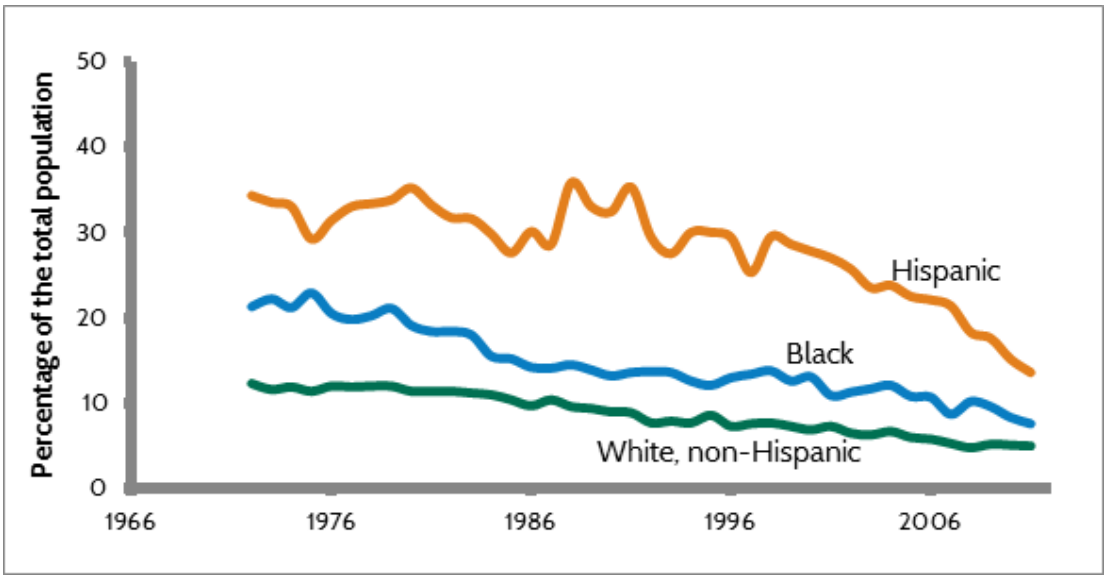
SOURCE: Child Trends DataBank. (2013). Student absenteeism. Child Trends' original analyses of National Assessment of Educational Progress data.

Health disparities by family income. Data from the National Health Interview Survey (NHIS) using receipt of SNAP benefits as a proxy for poverty, find that poor young adults (ages 18-24) are more than twice as likely as those not poor to report two or more symptoms of depression in the past month (Child Trends DataBank, 2013c). NHIS data also show poor children are more likely to have current asthma (Bloom, Cohen & Freeman, 2012) or attention deficit/hyperactivity disorder (NHIS, 2010) than are those from families with incomes at least twice the poverty level. Finally, poor children are more likely to have parents who report their neighborhood is never or only sometimes safe, according to the National Survey of Children's Health (Child Trends DataBank, 2013d).

Academic achievement disparities by race/ethnicity. Black students are 36 percent more likely than whites to have repeated a grade in school; Hispanic students are 63 percent more likely than whites to have done so (Child Trends DataBank, 2013a). Black students are 29 percent more likely and Hispanic students 24 percent more likely than white students to report they missed three or more days of school in the last month (U.S. Department of Education). Hispanic and black students are less likely than whites to have access to a computer at home (Child Trends DataBank, 2013e).

Both black and Hispanic students are at least twice as likely as white students to drop out of high school (Child Trends DataBank, 2013f). when it comes to attaining a bachelor's degree, white students are 75 percent more likely to do so than are blacks and are more than one-and-a-half times more likely to do so than are their Hispanic peers (Child Trends DataBank, 2013g). "Disconnected youth" are those who are neither employed nor in school; black and Hispanic youth are about half again as likely as white youth to be disconnected (Child Trends DataBank, 2013h).

Figure I.2. Trends in High School Dropouts (no diploma or GED, ages 16-24): Disparities by Race/Hispanic Origin.



SOURCE: Child Trends DataBank. (2013). High school dropouts. Child Trends' original analyses of Current Population Survey data.

Risky behavior disparities by race/ethnicity. Among the risky behaviors that can seriously interfere with students' school success are use of drugs and alcohol, pregnancy and unprotected sex, and criminal activity. Overall, there are relatively few differences in substance abuse by race/Hispanic origin; however, white students in tenth grade are more likely than black or Hispanic students to report they smoke, drink alcohol, and use illicit drugs. White students are also more likely to binge drink in twelfth grade than are their black or Hispanic peers (Johnston, O'Malley, Bachman & Schulenberg, 2013). Black and Hispanic male high school students are more likely than white males to be sexually active (Child Trends DataBank, 2013i), and black and Hispanic females are more likely than whites to have a pregnancy during their teens (Child Trends DataBank, 2013j).

Hispanic and black high school students are more likely than whites to report physical fighting (Child Trends DataBank, 2013k). Black youth are nearly four times as likely, and Hispanic youth 80 percent more likely, than whites are to be detained for juvenile offenses (Child Trends DataBank, 2013l), though this can reflect structural factors more than behavior (McCarthy, 1991; Bridges et al, 1987; Parker et al. 2005).

Health disparities by race/ethnicity. Health issues also create divides that influence student success. Hispanic and black children are more likely than their white peers to be obese (Child Trends DataBank, 2013m), to have asthma (Child Trends DataBank, 2013n), to have Chlamydia infections (Child Trends DataBank, 2013o), and to be newly diagnosed with HIV/AIDS (Child Trends DataBank, 2013p). Hispanic females have a higher risk of depressive symptoms, suicidal ideation, and suicide attempts, than their white counterparts (Child Trends DataBank, 2013q). Both black and Hispanic children report higher rates of maltreatment than do their white peers (Child Trends DataBank, 2013s).

Socio-economic disparities by race/ethnicity. Black and Hispanic children are approximately twice as likely as white children to be living in poverty (Child Trends DataBank, 2013t), with the myriad disadvantages that poverty implies. The mothers of black children are only half as likely, and the mothers of Hispanic children only one-third as likely to have completed college as are mothers of white children; black children are twice as likely, and Hispanic children seven times more likely, as white children are to have mothers who did not finish high school (Child Trends DataBank, 2013u).

Discussion and Overview of this Report

It is clear that education is a critical determinant of success and well-being across a broad array of outcome domains. Moreover, it is also clear that very substantial disparities in educational attainment and school achievement exist by family income and race/ethnicity. To improve educational outcomes and reduce disparities, many schools, agencies, funders, and other organizations across the country have sought to identify strategies to improve educational outcomes. One of these approaches provides integrated student supports to help students and their families address barriers to learning; these are also called community schools. The integrated student supports approach provides programs and supports within the school and often draws on community resources to augment school programs.

This report seeks to understand the promise of integrated student supports for improving educational outcomes. It does so by synthesizing information and research from four different streams:

- The perspectives of practitioners in integrated student supports' programs;
- Research studies and theory regarding child development and education;
- New quantitative analyses of high school graduation and post-secondary enrollment;
- Evaluation studies, including outcome and implementation evaluations and cost-effectiveness studies.

The knowledge obtained from each of these approaches is summarized in chapters two through five, and the findings are then summarized and synthesized in a last chapter. Specifically, Chapter II provides an overview of integrated student supports' models as they are provided on the ground by practitioners.

Chapter III provides an overview of child development theory and research to highlight the alignment between this perspective and the integrated student supports approach. This chapter also reviews the very large body of research on the determinants of educational success, to identify a detailed listing of the supports and barriers with established relevance to school achievement and attainment.

Chapter IV augments that review of the research literature by sharing results from multivariate analyses conducted for this project. As with the research review, the goal is to employ a broad perspective to identify critical determinants of educational success, to compare with the elements of the ISS approach. Next, Chapter V examines the evaluation studies on integrated student supports. It summarizes findings from outcome evaluations, cost effectiveness studies, and implementation evaluations.

Finally, Chapter VI summarizes the findings and identifies themes across these varied reviews, for policy, programs, research, and evaluation.

CHAPTER II: DESCRIPTION OF THE INTEGRATED STUDENT SUPPORTS APPROACH

By: Selma Caal, Brandon Stratford, and Rachel Carney

Overview

This chapter describes the integrated student supports (ISS) approach as it appears on the ground. Integrated student supports (ISS) is an emerging field of practice that provides wraparound opportunities or supports with an emphasis on removing academic and non-academic barriers to learning; increasing students' chances to succeed in school; and expanding students' opportunities for positive youth development. Most, but not all, ISS approaches focus on children in disadvantaged families and communities. There is no specific or overarching definition of integrated student supports in the extant literature. Rather, ISS is better described as a school-based approach that seeks to improve outcomes for youth via a set of five components:

1) Needs assessments
2) Coordination of supports
3) Integration within schools
4) Community partnerships
5) Data collection and tracking

These five components guide efforts to provide supports for students, families, and schools, targeting a range of academic and non-academic outcomes that both directly and indirectly impact students' school success.

Before the common elements are reviewed below, it is important to clarify a few terms relative to ISS that will be used throughout this chapter. The term *approach* will refer to a common set of values, which may delineate important domains but does not prescribe particular activities. The term *model* will refer to an organized set of procedures and activities that are designed to achieve a particular outcome or set of outcomes. The term *program* will refer to the actual implementation of the activities that are delineated in a model.[1]

MODELS REVIEW: OBJECTIVE

There are various community and school-based program models that aim to increase the academic success of students with limited educational opportunities who are at-risk for sub-optimal academic outcomes. The majority of these models, however, target educational outcomes by providing supports or opportunities directly related to educational outcomes. The integrated student supports approach, on the other hand, provides wraparound supports, including those not directly related to educational outcomes, to improve the educational outcomes of students.

To gain a better understanding of how ISS school-based models are put into practice, Child Trends conducted a review of ISS program models currently implemented across the country. The information gleaned from this review helped describe various integrated student supports models implemented across the nation; compare and contrast the components across these models; and provide a clear picture of the common core components of the ISS approach. The methods text box below provides a snapshot of the methodology that we used in our review of the models. For a more detailed discussion of our methodology, see Appendix IIA and IIB. This Appendix also provides a list of the criteria we used to identify the models, and a list and brief description of the models we reviewed in this chapter.

1 For example, Communities in Schools is a model with an organized set of activities that they have identified as important in reducing school drop-out. Each of their schools has a CIS program, which implements the model and carries out the procedures and activities that have been prescribed. This distinction between model and program is helpful in distinguishing between discussions of how a set of procedures and activities might relate to particular outcomes versus how they are actually implemented.

Models Review: Methods

The Models. A total of 9 ISS models were included in the review. Together these models operate in about 28 states serving roughly 1.5 million students; most have been in operation for over ten years (see Appendix II.A. for the inclusion criteria and a more detailed description of the models).

Data Collection. Once the nine models were identified, Child Trends performed an extensive document review, which was supplemented with brief interviews of representatives from each of the models. In addition, our research team facilitated a meeting with stakeholders, including representatives from several of the identified models that helped to clarify themes that had begun to emerge throughout the initial data collection process.

Data Analysis. Initial general common themes were identified from the documents' review, which helped form an initial picture of the ISS approach. These themes were further refined after obtaining feedback from stakeholders and conducting key-informant interviews.

MODELS REVIEW: FINDINGS

In general, the review revealed that there is currently no overarching, generally accepted definition of integrated student supports, nor a common name used to describe this approach. Instead it was found that ISS is an *emerging field of practice*, with some shared elements but also significant variation. Prevalent across the ISS models Child Trends reviewed is a commitment to the coordination of an array of prevention and intervention services for students and families to:

- Remove academic and non-academic barriers to learning;
- Increase the chances for students to succeed in school, and;
- Expand students' opportunities for positive youth development.

Integrated Student Supports Models Share Five Common Components

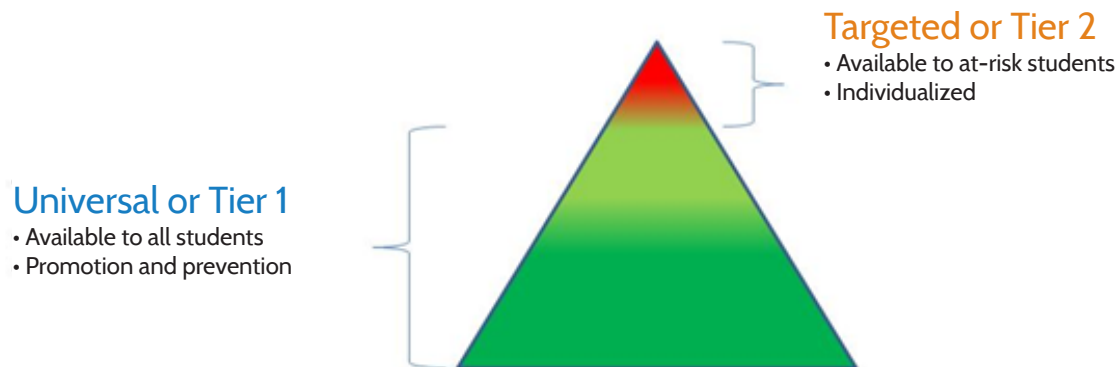
The review of the nine models indicated that the ISS approach to improving student academic outcomes is characterized by five components which serve as guiding principles, rather than prescribed sets of activities or procedures. Although the systematic implementation of these five components varies across the nine models that we reviewed, they are core to an ISS approach and include: 1) needs assessments, 2) coordination of supports, 3) integration within schools, 4) community partnerships, and 5) data collection and tracking. What follows is a brief description of these common elements, which are illustrated in Figure II.1.

Figure II.1. Integrated Student Supports Approach

ISS models are driven by a comprehensive needs assessment. A central element to the ISS approach is the use of both initial and on-going needs assessments. As a participant in the stakeholder meeting stated, the crux of the ISS approach it to "*use a student and school-driven assessment to prompt service delivery that then drives student outcomes.*" Needs assessments can occur at a number of different levels, including: individual students, families, schools, or communities. All nine models that we examined include a community needs assessment. Some models simply determine the needs of those living in the communities while other models also gauge the types of supports already being offered in the community to identify community partners and service gaps. Generally, this community-needs assessment helps determine the types of supports or services that the model will provide.

The vast majority of the models Child Trends reviewed also conduct a school-wide assessment, which is used to select relevant programs and supports to address student needs at the school level. These programs are often referred to as "universal supports," or "tier one" supports, and are generally intended to promote positive outcomes and prevent or reduce negative outcomes across the majority of the student body (see Figure II.2).

Figure II.2. Tiered Supports



After these initial supports are implemented, an individual student assessment may be conducted among students who have been classified as high risk, generally due to behavioral or academic concerns. In most models, teachers, counselors, or other school officials can refer particular students for an individual needs assessment and more intense support, often referred to as "targeted supports" or "tier two" supports. Some models also employ screening tools to assess all students, regardless of their perceived level of risk, to help identify students who might be at risk but who have not yet been identified by teachers or other school staff as needing more targeted supports.

The majority of the models that were reviewed focus primarily on community, school and student needs, while a few also conduct family needs assessments. Most models assess the needs while others assess both the needs and strengths of students, families, schools, and communities. The needs assessment process varied significantly among the models. Some models had a standard procedure across all sites while others tailored the process to the specific site.

A hallmark of the ISS approach is its focus on person rather than place-based supports relative to service provision, which requires that supports be matched to the unique needs of each targeted student or school. In sum, there was a consensus across our data sources that the needs assessment provides the foundation upon which an effective ISS program can be built.

ISS models emphasize the effective coordination of supports. The coordination of supports—in an effort to improve academic outcomes—is another critical element of the ISS approach. As one participant in the stakeholder meeting remarked, "*What distinguishes the work is a unification of the right sorts of resources in alignment.*" Undergirding

this emphasis on the coordination of services and supports is the fundamental belief that both academic and non-academic barriers must be removed in order for all students to achieve academic success. To that end, every model that we reviewed had implemented a system of coordination at each of its sites to coordinate community partnerships and resources. The coordination efforts are specifically designed to ensure that existing supports (e.g., supports provided by the school, the ISS program itself, or community organizations) are made available to those who need them in a seamless manner. Overall, the ISS approach tends to emphasize the importance of adding value through coordination to address identified needs.

To facilitate on-going coordination efforts, the majority of the models assign one coordinator to lead this process, although a few have a team of individuals who work together. As with other common components of the ISS approach, there was variation among the models relative to coordination. For example, most ISS models have a site-based coordinator who is housed at the school; however some are based at the district level. While all the models have a prescribed staffing structure intended to facilitate the coordination of supports, some models allow sites to adapt this structure according to the level of need and the availability of others to help in the coordination (e.g., some models draw upon programs such as AmeriCorps for staffing support).

ISS models are highly integrated within schools. Another important component to the ISS models is the integration of the model within the school. One participant in the stakeholder meeting noted that the integration within the schools is a vital component to the ISS model and notes that this integration can promote change even in the way teachers approach students: "*A real change in the teacher's beliefs about their students. As a result of learning more about the whole child, their attitudes and beliefs have changed…they have developed more empathy for the children.*" Varying levels of integration into the schools were apparent across the nine models Child Trends reviewed, though. This variation is generally characterized by the degree to which school staff are involved with the delivery, coordination, and monitoring of supports. For example, an integral aspect of one model is their emphasis on training school staff to deliver supports while ISS program staff monitor the supports and focus on coordination efforts. In the case of another model, school staff are generally not involved in delivering supports; rather, the school staff work with the ISS coordinator to identify students who may need additional supports.

In addition to the integration of school staff into ISS-related supports, there is also a good deal of variation in the degree of influence that program staff have on the supports and programs that schools offer, which can be reflective of the level of integration of the program within the school. The majority of the models that we reviewed had relatively high influence on the kinds of student supports that schools should offer. For example, it was common for program staff in several of the models to work closely with school principals and to attend school board meetings where they were able to influence school-wide decisions and policies. A key component of successful adoption of the ISS approach is a high level of integration within the school community in order to facilitate a seamless coordination of supports and to influence school climate.

ISS models rely on community partnerships to increase supports for students. Generally, ISS models do not overtly seek to improve community outcomes; rather they view communities as a vital resource to implement the model. All nine ISS models relied on partnerships with community organizations, (e.g. businesses, universities, and service agencies) to address the needs of students and their families. Accordingly, the ISS models we reviewed valued fostering relationships between students, families, schools, and communities.

While collaboration is a common and important component, the level of collaboration with community partners varied among the models; they often varied based on the capacity of the school or the program itself to deliver the needed supports. For example, one model has the capacity to deliver physical and mental health services; as a result, they do not rely on community partnerships to provide those specific supports. That capacity seems to be the exception rather than the rule, though, and the majority of the models that we reviewed did not have the organizational resources or infrastructure to provide supports on their own. Most models rely almost exclusively on community partnerships to address the needs of their specific populations, envisioning their role as a broker of supports; working to connect

schools, students, and families with extant community resources. As one participant of the stakeholder meeting put it, "*This work is about making existing resources work better.*" Of note, these partnerships can be fluid, with relationships being modified according to the ebbs and flows of the identified needs within the school. For example, in some instances, a community partner might broaden or improve the existing school supports until the school incorporates that role into its own structures; other organizations, such as a school-based health center, may become a semi-permanent partner. While the procedures for developing community partnerships varied across the models that we reviewed, the facilitation of these relationships is key to the ISS approach.

ISS models collect data and track progress to achieve academic outcomes. The ISS approach relies heavily on information, as evidenced by the central role that data from the needs assessment plays in the on-going process of matching supports to needs and tracking progress. Consequently, data collection and tracking emerged as a common element across the models we reviewed. As with the other common elements of the ISS approach, this component varied across models and, in some cases, varied across multiple sites implementing the same model. The primary sources of this variation fall within three categories: 1) standardization of data collection procedures, 2) types of data collected, and 3) sources of data. For example, some models have standard performance or outcome measures that are collected across all sites; some allow sites to choose the measures that are most appropriate for their program; and others rely on each site to develop or identify appropriate data collection tools. Relative to the types of data that are collected, some models assess strengths as well as needs; some assess the quality of supports that are provided within the school as well as the needs of students; and some include measures regarding the functioning of the school faculty and staff. Finally, models also varied in terms of their sources of data. Although all of the programs collect data from at least some students and families. A few also collect information from teachers and school staff, service providers (primarily attendance or participation in services), and community members. Overall, the ISS approach emphasizes the role of data in identifying and breaking down academic and non-academic barriers to learning. To that end, data collection -coupled with a system to track supports and link them to targeted outcomes- serves as the central nervous system that guides the delivery of high-quality supports to meet the needs of the school community.

ISS Models Target Academic and Non-Academic Outcomes

The ISS approach targets academic achievement and advancement among students as an ultimate goal, with an emphasis on removing both academic and non-academic barriers to learning at an individual, family, and school level. To that end, the ISS models we reviewed target outcomes that are directly related to academics (e.g., grades, test scores, attendance, and misbehavior), as well as outcomes that are likely to reduce barriers to learning but which are not directly related to academic achievement (e.g., improving nutrition and increasing access to health services) (see Table II.1. for a description of the outcomes commonly targeted across the reviewed models). As one participant in the stakeholder meeting put it, "*There are interim outcomes that vary across sites, but academic outcomes should still be the guiding star.*" The emphasis on targeting outcomes directly or indirectly related to academic achievement aligns well with the research regarding academic achievement reviewed in Chapter III and the original analysis reported in Chapter IV, both of which identify numerous non-academic predictors of academic outcomes. The ISS approach acknowledges that multiple factors affect academic outcomes that reside in multiple ecological contexts of the students' life and these are represented in Figure III.2, which summarizes the domains that are most commonly addressed among the nine models that we reviewed.

ISS Models Deliver an Array of Supports at Multiple Levels

An important aspect of the ISS approach is the coordination of supports targeted to meet the needs of students with the aim to promote positive outcomes in the areas listed in Table II.1.

Table II.1. Common Outcomes and Related Supports

STUDENT-LEVEL	FAMILY-LEVEL	SCHOOL-LEVEL
Physical and mental health • Health services • Nutrition programming • Substance abuse prevention and intervention • Social, emotional, or mental health services • Violence and gang prevention • Pregnancy prevention • Services for pregnant students • Services for justice-involved youth • Recreational programs	Family stability • Crisis support • Services for basic needs • Legal aid • Child care	Positive school climate • Improving relationships between adults and students • Activities to improve school culture
Academic achievement • Early childhood education • Tutoring • Literacy programs • STEM programs • Extended learning opportunities • Summer learning • Cultural, arts, or • Out-of-school time programs • Child care • Mentoring • College readiness • Job readiness • Leadership opportunities • Life skills • Service learning • Services for English language learners	Parent education and parenting behaviors • Adult basic education • Opportunities for school involvement • Parenting workshops • Family resource centers	Improved school effectiveness • Teacher professional development/ training • Curriculum development • Improving systems in schools

Accordingly, the ISS models that we reviewed provided or brokered supports that target students, families, and schools. Supports for students most commonly focus on physical and mental health and increasing students' opportunities to engage in extended learning time (such as afterschool and summer enrichment or tutoring programs). At the family level, supports commonly seek to increase parent engagement in their child's education as well as providing opportunities to advance their knowledge of child development and increase positive parenting behaviors. Additionally, several ISS models provided or brokered assistance for families that were experiencing hardship, such as referrals for health and mental health services or assistance in accessing emergency services and public benefits. Some ISS models included school-level supports, such as professional development for teachers and initiatives to impact the academic and social climate of the school. While many school-based programs might provide one or more of these supports, at the core of the ISS approach is an effort to offer wraparound supports to address needs at the student, family and school levels, rather than focusing on one particular pathway to promoting success.

Discussion and Conclusions

Integrated Student Supports (ISS) is an emerging field of practice that is best described as a school-based approach to promoting students' academic achievement and educational attainment by coordinating a seamless system of wraparound supports at multiple levels that target academic and non-academic barriers to student learning. They may,

for example, seek to enhance students' physical and mental health, increase learning time both during and after school, enhance school effectiveness and improve school climate, address parent education, or provide family counseling and social services for families, all with the goal of improving students' academic outcomes.

While many of the five common components that we identified are present in many school-based efforts to improve academic achievement (e.g., needs assessments, coordination of supports, integration within schools, community partnerships, and data collection and tracking), the ISS approach is unique in bringing all of these components together. The identification of these five components should not serve as a way to compartmentalize the ISS approach but rather as a way for practitioners and researchers to organize the wealth of knowledge that currently exists in a coherent way to help advance the field, allowing successful models to be brought to scale more efficiently.

A strength of this approach that may not be present in many other school-based models is the emphasis on leveraging community resources to remove barriers to learning, to complement services and supports provided within the school setting. Another unique aspect of this approach is the emphasis on assessing needs and relevant outcomes that are both directly and indirectly related to academic and non-academic outcomes, which, not incidentally, research has identified as affecting academic achievement.

A challenge with the ISS approach is that it is difficult to draw strong conclusions about what might contribute to the positive academic outcomes that many of the models we reviewed have documented because there is significant variation in how each model implements these common components. (This represents a challenge for evaluators as well.) While an approach that is based on matching supports to specific needs and reliant on the presence of community partners will necessarily result in variations in the implementation, more work needs to be done to identify the crucial components— both essential supports and best practices—for enhancing educational outcomes.

CHAPTER III: REVIEW OF RESEARCH

By: Dan Principotta, Renee Ryberg, Kristin Anderson Moore, Katherine Muenks, Hannah Schmitz, and Laura Lippman

Overview

Having examined how integrated student supports' models are organized and implemented in communities, we seek to compare this reality with the research literature. Accordingly, this chapter explores the research literature underlying integrated student supports from two perspectives. The first is the alignment between theory and research on how to foster positive outcomes among children and youth. The second is more specific and seeks to review the research literature related to factors that predict educational success.

CHILD DEVELOPMENT THEORY AND RESEARCH

Hundreds of research studies have identified a number of tenets about the development of children and youth that are widely accepted across disciplines (Zaff & Smerdon, 2009). These include:

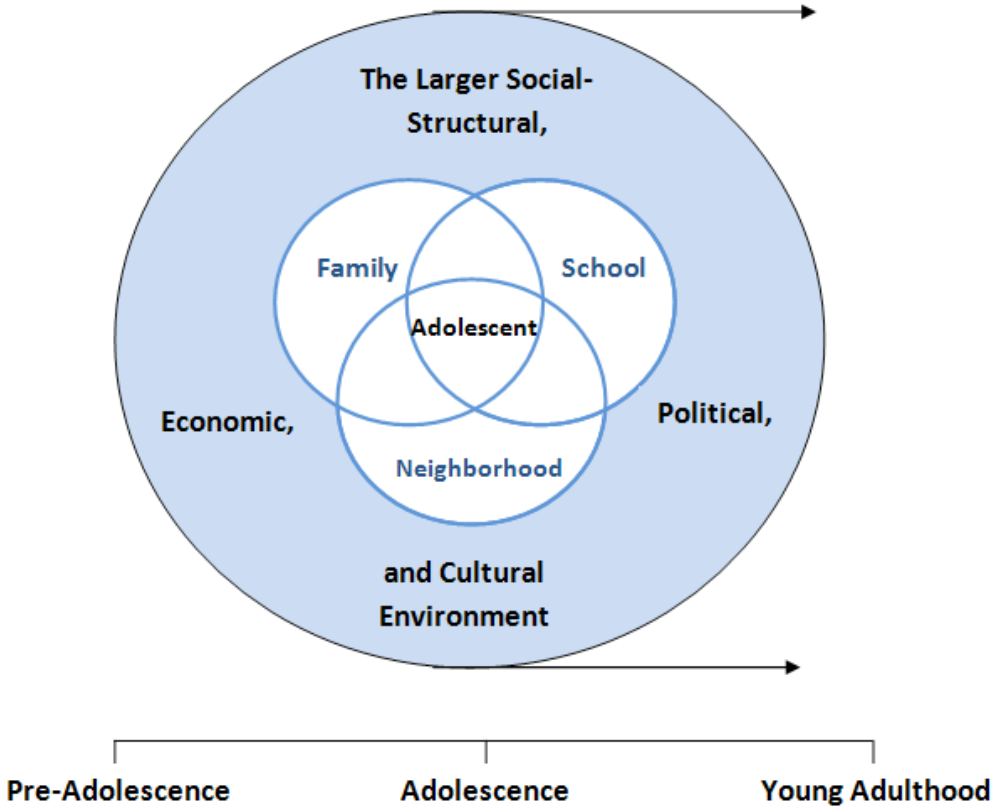
- The whole child perspective. This theory acknowledges that children's development includes multiple domains, including children's:
  - Health;
  - Educational achievement and cognitive attainment;
  - Social and emotional outcomes, and;
  - Behavior.

  Moreover, the whole child perspective recognizes that development in one domain affects outcomes in other domains. That is, problems in one outcome domain often spill over into other outcome domains, while success in one domain can enhance development in another domain. For example, children experiencing health issues may face difficulty achieving in school, while children having difficulty in school may be more likely to engage in delinquent behavior (Moore & Brown, 2003; Moore, 1997).
- A child-centered focus. Each individual child has unique developmental needs, interests and accomplishments. Regimented approaches that treat all children uniformly cannot meet these individual needs; but a tiered approach that provides additional services to students who have greater needs can be helpful, as can having additional staff in a school building who are attentive to the needs and concerns of specific students (Shonkoff & Phillips 2000).
- A lifecourse perspective. Experiences that occur at an earlier life-cycle stage are regularly found to affect development and well-being in subsequent life-cycle stages. For example, researchers regularly find that early childhood experiences, both good and bad, affect success and adjustment during the elementary school years, which in turn affect behavior and learning during middle school and high school, and thereafter (Shonkoff & Phillips 2000; Elder 1998).This implies the value of a strong, stable, ongoing program that supports children across the stages of development.
- The ecological model. This perspective recognizes that the child's development is affected by a range of influences, beginning with the child's own biology and temperament but including family, peers, school, neighborhood, community and the larger society. This model is widely accepted among researchers who study child and adolescent development. More distant (distal) influences such as the larger society are found to have

less influence on development than more direct (proximal) influences such as the family. Moreover, while these factors can have a direct influence on children's development, often the effects are found to interact; that is, the implications of experiencing toxic stress in the family can vary depending upon the characteristics of the school (Bronfenbrenner & Morris 1998). Figure III.1 below represents an adaptation of this model for adolescent development over time.

The bioecological model (Brofenbrenner & Ceci, 2004; Bronfenbrenner & Morris, 2006) extends the ecological model to highlight bidirectional influences between a child (or adult) and the varied contexts in which the person develops. This theory sees development as a process between the child and his or her environments at all levels and recognizes the role of time in development, not only short-term interactions but processes that take place over months and years as well as changes within the larger culture that take place over longer periods.

Figure III.1. Adolescent Development in Context, Over Time.



SOURCE: Jessor, R. (1993). "Successful adolescent development among youth in high-risk settings," American Psychologist,48.

- The importance of families. Children's family experiences represent a proximal influence and an influence at every developmental stage. Hence, it is not surprising that family factors are critical to children's happiness and attainment (Hair, Moore, Garrett, Kinukawa, Lippman, & Michelson, 2005).
- Positive youth development. Programs focused on didactic education and scare tactics have not been found to achieve their desired outcomes, while programs that invest in children and youth to support them and work with them to develop positively have shown much greater success. These programs tend to focus on strengths and

the achievement of positive goals. Positive youth development approaches have been found effective across a number of domains, including teen pregnancy prevention and substance use, and researchers across fields have come to agree that such a framework can enhance multiple outcomes.

- Relationships matter. Researchers have investigated the significance of relationships with other people under varied labels, including attachment, authoritative parenting, parent-child closeness, mentoring, and apprenticeships. The quality and continuity of positive relationships, and the detrimental effect of negative and turbulent relationships, have been repeatedly documented (Moore & Lippman, 2005; Klem & Connell, 2004; Catalano, Berglund, Ryan, Lonczak, Hawkins, 2004; (National Scientific Council on the Developing Child, 2004).

Relative to this broad research base, it is critical to recognize the strong alignment between these tenets and the integrated student supports' models described in Chapter II. Whether the alignment was intentional, a product of experience that evolved over time, or combination of such factors is not clear; but the alignment is clear. Integrated student supports' models place the child – the whole child – at the center of a model that incorporates the school, the family, and the larger community. Students are served over time in a context that recognizes the importance of relationships. This represents a key fact about the integrated student supports model: It is based on broad and generally accepted tenets of research and theory regarding the development of children.

What about the specifics? Based on research studies, are the elements of integrated student supports aligned with the findings of research?

Research on Educational Attainment and Achievement

To identify the predictors of educational attainment and achievement based on educational research, hundreds of studies were reviewed. Using an ecological approach, we assessed the importance of factors at the individual, family, school, peer, neighborhood, and state and policy-levels. We identified the most important factors that, according to the literature, are the strongest predictors of educational success. Additionally, because the goal is to identify inputs into children's development that can be provided, improved, or changed, the focus is on malleable factors. Accordingly, the factors highlighted are those that have the largest observed effect and are malleable.

Methods

We focused our review on longitudinal quasi-experimental studies with control groups and, when available, intent-to-treat randomized controlled trials with educational achievement and high school completion as outcomes. In cases where the literature suggested important factors for which there were no longitudinal studies available, we included quasi-experimental cross-sectional studies and noted this in the text. We also referenced meta-analyses focusing on these same types of studies.

We took special care to identify factors that are malleable–changeable–so that they are amenable to solutions (be they programmatic, practice-based, or at the policy level). Where possible, we also seek to quantify the size of the relationships between the factors we discuss and key educational outcomes of interest.

Using malleability and quality of the supporting literature as criteria, the most promising factors were identified. These factors are concentrated in three domains: individual factors, parent and family factors, and school factors. They are:

Individual Factors

- Behavior in and out of class
- Attendance/engagement
- Academic self-concept/self-efficacy
- Social and emotional competence
- Health and well-being

Family Factors

- Parental expectations
- Parenting style
- Parenting behaviors

School Factors

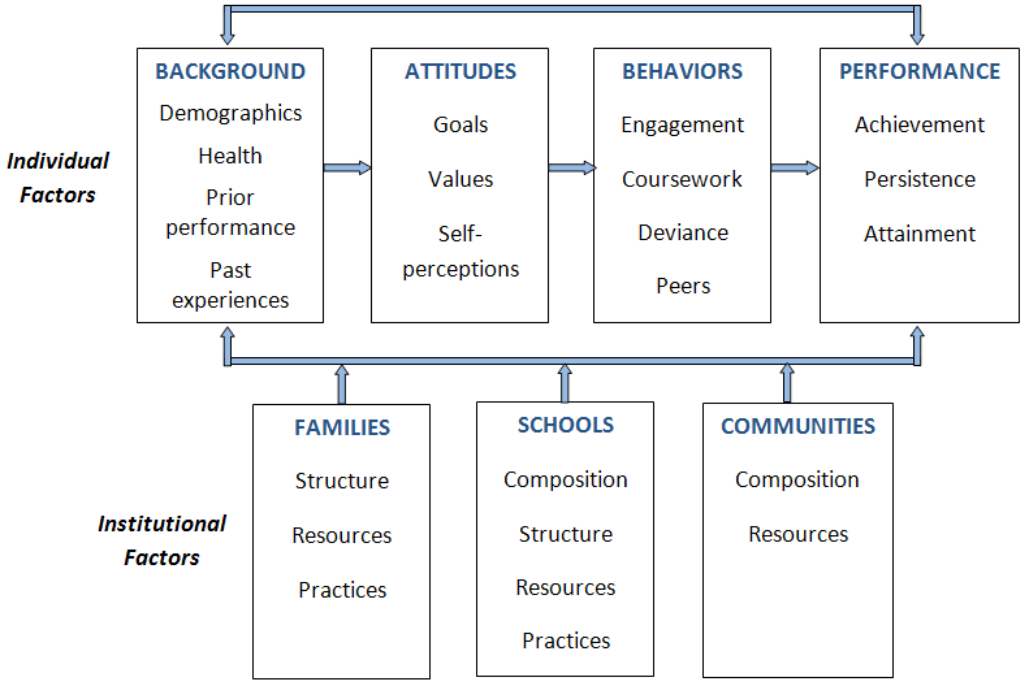
- Effectiveness of teachers
- School climate, specifically:
- Quality of student-teacher relationships
- Academic press (including expectations and goals)
- Average school achievement and attendance
- School-level poverty

What strategies can be undertaken to boost students' educational success? To begin to answer this question it is important to understand what factors are linked to educational success. This helps to explain why one student ends up prepared for and enrolled in college—on the path to economic stability—while another student ends up dropping out of high school, with life prospects that include increased odds of being poor, unemployed, on public assistance, or in prison (Belfield & Levin, 2007; Levin, Belfield, Muennig, & Rouse, 2007).

Explanations as to why one child succeeds educationally while another fails partly lie in the individual abilities, knowledge, attitudes, behaviors, and skills students have or develop—for example, their cognitive abilities, general health, problem-solving skills, academic self-concept, level of engagement, and diligence and persistence (e.g., Duckworth & Seligman, 2005). However, this is by no means the complete set of factors. After all, the contexts in which children grow up have strong influences on their development and academic success over time. Children's parents and families, peers, schools and neighborhoods all influence students' educational success, as does the broader policy environment. Some research, in fact, suggests that growing up in an impoverished environment diminishes the natural variation in student cognitive development that would otherwise be apparent (Turkheimer, Haley, Waldron, D'Onofrio, & Gottesman, 2003). In other words, in the absence of an environment conducive to growth and development, students are unable to reach their potential.

This review of factors tied to educational achievement and attainment covers the relationship between educational success (variously measured as student performance on achievement tests, GPA, high school graduation, or college enrollment) and key factors at the individual, family, peer, school, community, and policy level. This socio-ecological approach aligns well with key conceptual models in education and youth development, such as Rumberger and Lim's (2008) conceptual model of student high school performance (figure III.2), and Jessor's (1993) developmental behavioral science paradigm (figure III.1).

Figure III.2. A Conceptual Model of Student High School Performance.



SOURCE: Rumberger, R. W. and Lim, S. A. (2008). Why Students Drop Out of School: A Review of 25 Years of Research. Santa Barbara: California Dropout Research Project.

INDIVIDUAL FACTORS

Children's success in school is associated with a number of important individual-level factors. In Rumberger and Lim's (2008) conceptual model, factors that influence school performance are divided into three categories: background, attitudes, and behaviors. This section will be organized using that model as a guide. The model includes some non-malleable demographic background factors such as gender and ethnicity, but also includes many malleable factors, such as goals and self-perceptions. The model also consists of both academic and non-academic skills. Academic skills, such as knowledge and prior achievement, as well as inherent intelligence, contribute to important achievement outcomes. However, non-academic skills, such as behaviors and mindsets, are also associated with school performance and may even be stronger predictors of how well children will do in school than cognitive achievement (e.g., Duckworth & Seligman, 2005).

Although measured at the individual level, it is important to emphasize that many of these factors are strongly influenced by contextual and environmental factors. For example, studies suggest that cognitive ability, determined by cognitive or "IQ" measures, for example, is malleable and can be influenced by the home environment (e.g., Turkheimer et al., 2003). Non-academic skills, such as students' mindsets, can also be greatly influenced by the kind of feedback that adults (such as parents and teachers) give children (e.g., Mueller & Dweck, 1998). Thus, it is important to consider that these individual-level factors are also greatly influenced by children's families, schools, and communities.

Background Characteristics

Students' background characteristics, such as demographic variables (i.e., gender and race/ethnicity), immigrant status, and disability status are associated with school-related outcomes as are student health, exposure to traumatic events, and cognitive ability and past academic performance.

Demographics. Many studies suggest that male students are more likely to drop out than female students (Rumberger, 2011). Black and Hispanic children enter school with math knowledge well below their white peers, and these differences persist

throughout school (e.g., Cunha, Heckman, Lochner, & Masterov, 2006). Consequently, dropout rates are higher for blacks, Hispanics, and Native American children than they are for Asian and white students (Rumberger, 2011).

Although these demographic variables matter to a certain extent, they are not malleable, and the relationships between demographic variables and academic outcomes are often driven by social and structural factors. For example, Cunha et al. (2006) found that differences between ethnic groups were significantly reduced after statistically controlling for maternal education, maternal cognitive ability, and family structure. Also, black and Hispanic students may be exposed to additional barriers to educational attainment, such as perceived discrimination. Black students' level of perceived racial discrimination in fifth grade negatively predicted college enrollment. Children who perceived high racial discrimination felt that they did not belong in school, had lower educational expectations, and engaged in more deviant behavior in grades seven and ten than children who perceived low discrimination (O'Hara, Gibbons, Weng, Gerrard, & Simons, 2011), and were thus less likely to enroll in college. This study suggests that perceived racial discrimination can lead to negative motivational and achievement outcomes for minority students. Additional educational barriers for minority children include lower educational expectations and lack of information about preparation for postsecondary education (see Lippman, Atienza, Rivers, & Keith, 2008). Research suggests that among white students, higher grades are associated with higher social status, but among black and Hispanic students, higher grades are sometimes associated with lower social status (Fryer & Torelli, 2010).

English language proficiency. Although there is no consensus on the influence of immigrant status on high school completion, (Rumberger, 2011), a child's English language skills can impact educational success. Three out of four immigrant children (or children with at least one foreign-born parent) are fluent in English (Hernandez, Denton, & Macartne, 2007), and immigrant students with high English-language proficiency have lower high school dropout rates compared to immigrants with limited English-language proficiency (Rumberger, 2011). Students with limited English proficiency can struggle academically (Glick & White, 2003). On the other hand, Genesee, Lindholm-Leary, Saunders, and Christian (2005) reviewed literature related to English language learners in schools in the U.S. and found that although English language learners in early elementary school performed worse on academic measures than non-English language learners, over time performance of the two groups became similar. In addition, for students participating in programs that supported English language acquisition, the longer students stayed in the program, the more positive the outcomes.

Despite this finding, focusing solely on English proficiency while ignoring other language skills may not be the best solution for academic success, as being bilingual is associated with high school completion and college enrollment (Lutz, 2004). Students who were proficient in both English and Spanish were more likely to graduate high school than their peers who spoke only English when controlling for SES, country of origin, generational status, and neighborhood characteristics (Lutz, 2004).

Disability status. Students with learning disabilities and emotional or behavioral disorders are more likely to drop out than students without disabilities, even when statistically controlling for achievement, grade retention, and SES (Reschly & Christenson, 2006). Children who met criteria for attention-deficit/Hyperactivity disorder (ADHD) at 4-6 years of age had lower academic achievement eight years later than demographically-matched children who did not meet criteria for ADHD (Massetti et al., 2008). Reading disability and ADHD status, measured initially when participants were between the ages of 8-18, negatively predicted academic achievement five years later (Willcutt et al., 2007). Other disabilities that are negatively related to school achievement include: dyslexia (Torppa, Poikkeus, Laakso, Eklund, & Lyytinen, 2006), cognitive impairments (Bull, Espy, & Wiebe, 2008), speech impairments (Catts, Fey, Tomblin, & Zhang, 2002), and vision impairments such as farsightedness (Williams, Sanderson, Share, & Silva, 1988).

Health. Health-related factors, such as suffering from chronic illnesses, obesity, and substance abuse, are associated with negative school outcomes. Often, students with health issues frequently miss class, which has negative consequences for their academic performance. Fowler, Johnson, and Atkinson (1985) found that children who suffered from chronic health conditions missed more school and had lower school performance than healthy children. Research suggests that overweight and obese adolescents (Pan, Sherry, Park, & Blanck, 2013) and children who suffer from asthma (Moonie,

Sterling, Figgs, & Castro, 2008) have higher rates of school absenteeism than adolescents of normal weight and those who do not suffer from asthma. Asthma may also be associated with decreased cognitive functioning in children (Stores, Ellis, Wiggs, Crawford, & Thomson, 1998). Elementary children who suffer from early-onset diabetes may also suffer cognitive consequences; research suggests that those students have poorer phonological processing, spelling accuracy, and mathematics performance compared with healthy peers (Hannonen et al., 2010).

Drug and alcohol use are also related to academic outcomes. Studies suggest that adolescents who consume marijuana, cocaine, alcohol, and cigarettes have lower academic achievement than students who do not use drugs (W. H. Jeynes, 2002). Other research shows that substance use in middle school predicts poor academic achievement in high school, although the effects were small (e.g., Fleming et al., 2005).

Another important health-related factor to consider is students' psychological well-being, which includes both poor and positive mental health. In addition to physical health issues, mental health issues, such as depression, can negatively influence children's and adolescents' school performance. Hishinuma, Chang, McArdle, and Hamagami (2012) conducted a longitudinal study and found that depressive symptoms negatively impact subsequent academic performance (measured by GPA) in high school students. Positive mental attitudes, such as being hopeful and optimistic about the future, thinking positively, and having high self-esteem are also important. In high school students, hope was positively associated with school grades controlling for verbal and numerical ability. Hope emerged as a stronger predictor than other positive thinking variables such as self-esteem and positive attributional style, or framing events in a positive light (Ciarrochi, Heaven, & Davies, 2007). In another study that also measured the same three positive thinking variables (hope, self-esteem, and attributional style) in grade seven, only hope significantly predicted academic achievement in grade ten, controlling for cognitive ability (Leeson, Ciarrochi, & Heaven, 2008). Caldwell, Weibe, and Cleveland (2006) found, in a sample of African American adolescents, that perceptions of future certainty—a similar construct to hope and optimism—was related to GPA, controlling for economic, family, and neighborhood variables. Finally, additional variables associated with well-being, including religiosity (Regnerus, 2000), gratitude, and life satisfaction (Lippman et al., 2013), were also found to be positively associated with academic achievement.

Past adverse experiences. Children's past experiences, such as exposure to traumatic experiences or violence during early childhood (e.g., Delaney-Black et al., 2002) and middle childhood (e.g., Thompson & Massat, 2005) are associated with substantial decreases in academic achievement. Maltreated children in kindergarten through grade twelve had academic performance significantly below that of a matched control group (Eckenrode, Laird, & Doris, 1993).

Cognitive ability. Cognitive factors, such as those measured by tests of IQ, are related to academic attainment. While "IQ" is an imperfect and controversial measure of cognitive ability, because it may reflect social or economic opportunity or motivation, the existing literature frequently operationalizes cognitive ability based on IQ test scores (Duckworth, Quinn, Lynam, Loeber, & Stouthamer-Loeber, 2011; Nisbett, 2009). Students with relatively low tested cognitive ability are at risk for dropping out of high school. A 19-year prospective longitudinal study found that cognitive ability measured in elementary school predicted dropout status after controlling for gender, early home environment, quality of care giving, SES, and academic achievement. However, the child's early home environment and quality of care giving emerged as stronger predictors of high school dropout than cognitive ability (Jimerson, Egeland, Sroufe, & Carlson, 2000).

Prior academic achievement. Poor academic achievement is one of the strongest predictors of dropping out of high school (e.g., Barry & Reschly, 2012; Battin-Pearson et al., 2000; Bowers, 2010). Battin-Pearson et al. (2000) found that poor academic achievement was a mediator between a number of predictors, including general deviance, deviant affiliation, school socialization, family socialization, and demographic variables, on high school dropout in grade ten. Other research suggests that mathematics achievement specifically was an important predictor of students' college attendance, and this relationship was especially pronounced for African American and Latino students (Adelman, 1999). A longitudinal study with a primarily African American sample (Ou, Mersky, Reynolds, & Kohler, 2007) examined

a large array of cognitive, motivational, social, and family predictors of high school completion and college enrollment, and one of the strongest predictors that emerged for both outcomes was Iowa Test of Basic Skills (ITBS) reading scores at age 14.

Clearly, students who have low prior achievement are at risk for doing poorly in school in the future and even dropping out of school. Cunha et al. (2006) argue that human skill formation is a multistage process that occurs throughout the life cycle of the child. Their theory incorporates ideas of self-productivity (i.e., the skills produced at one stage increase the skills produced at later stages) and complementarity (i.e., skills produced at one stage raise the productivity of investment at subsequent stages). Thus, children who do not acquire early skills necessary to succeed will continue to lag behind their peers without intervention.

Attitudes Toward Learning

Goals. Children's goal orientations in school have important effects on their motivation and achievement. Specifically, one could distinguish between two types of goals students might hold: mastery or learning goals and performance goals (Dweck & Leggett, 1988). Students with mastery goals tend to focus on learning and skill development. These students may welcome challenge and difficulty, and see them as positive experiences that will allow them to grow and develop their competencies. In contrast, students with performance goals tend to focus on demonstrating their skills to others (or avoiding demonstrating their lack of skills). These students tend to shy away from challenging or difficult tasks because they do not want to appear incompetent to others. For example, a student with a mastery orientation for a science class might set a goal to learn as much as possible and improve his science skills, while a student with a performance orientation for a class might set a goal to earn an "A" to impress his parents, teachers, and peers. Studies consistently suggest that students who hold mastery goals engage in more deep-level processing of information and have higher academic achievement than students who hold performance goals (see Covington, 2000; Wolters, Pintrich, & Karabenick, 2005).

Values. Students who value school and find it worthwhile tend to be more motivated to achieve than students who do not value school. Eccles (1983) outlined four components of task value: attainment value, the personal importance of doing well on the task; intrinsic value, which is the enjoyment that one gets from participating in the task; utility value, or how much the task relates to future goals; and cost, which is defined as the negative aspects of engaging in the task, such as performance anxiety. Several longitudinal studies have shown that task values predict enrollment choices in math, science, and English classes, even after controlling for prior achievement (see Eccles & Wigfield, 2002, 2005). However, task values do not directly relate to performance in these domains.

Intrinsic motivation is a similar construct to value that is often associated with interest. Students who are intrinsically motivated at school tend to be driven by personal interest, enjoyment, curiosity, and a desire to learn rather than by external incentives or rewards, such as school grades. A one-year longitudinal study with third- through eighth-grade students found that intrinsic motivation measured in the fall positively predicted GPA in the spring, controlling for fall GPA. Additionally, fall GPA significantly predicted spring intrinsic motivation, controlling for fall intrinsic motivation, suggesting that intrinsic motivation and academic achievement influence each other in a reciprocal fashion (Corpus, McClintic-Gilbert, & Hayenga, 2009).

Self-perceptions. Academic self-perceptions, which include self-concept, self-efficacy, and competence beliefs, encompass how students feel about their own academic competence or abilities. Research suggests that the more competent students feel, the better they perform in school. A meta-analysis conducted by Huang (2011) found that academic self-concept predicted academic achievement with average correlations ranging from .20 to .27. However, the study did not examine the contribution of any other variables in the analysis. Piciullo (2009) examined a number of motivational and social predictors of achievement, and found that academic self-concept was the strongest predictor of three achievement measures (i.e., math scores, English scores, and GPA), although prior achievement was not statistically controlled for. Caprara et al. (2008) found that student's self-regulatory efficacy, or beliefs about how well they can self-regulate in school, positively predicted graduation status, statistically controlling for SES and

prior performance. In another study, competence beliefs were associated with science test scores and grades when statistically controlling for a number of demographic and motivational variables, including cognitive abilities (Lau & Roeser, 2002). Finally, a study by Lucio, Hunt, and Bornovalova (2012) examined a large number of motivational, behavioral, and social variables predicting high school GPA, and found that one of the strongest predictors was students' academic expectations, or how far students expected to go in school. However, prior achievement was not taken into account, so it is difficult to determine the direction of the relationship between students' academic expectations and achievement.

It is not only important to consider students' competence beliefs, but also their beliefs about how much they can change their ability or improve in school. A longitudinal study conducted by Blackwell, Trzesniewski, and Dweck (2007) found that middle school students' beliefs about whether or not they could change their intelligence predicted academic achievement, with students who felt that they could increase their intelligence demonstrating better academic performance than students who did not feel that they could increase their intelligence.

Engagement. Farrington et al. (2012) suggest that academic behaviors, such as regularly attending class and devoting out-of-school time to studying and schoolwork, are the mechanism through which motivational factors affect school performance. One concept closely aligned with academic behaviors is behavioral engagement. Behavioral engagement is defined as positive conduct and involvement in learning and school-related tasks, and predicts school achievement (Fredricks, Blumenfeld, & Paris, 2004). One aspect of behavioral engagement, consistent attendance in class, was strongly associated with positive academic outcomes, statistically controlling for student and neighborhood demographic characteristics (e.g., Gottfried, 2010). How often a student completes homework was also a strong predictor of high school GPA after statistically controlling for a number of motivational, behavioral, and social variables (Lucio et al., 2012). Similarly, Finn (1993) found that the more students participate in school by attending class, exhibiting positive classroom behavior, and getting involved beyond the typical academic program, the better their academic achievement.

Fredericks, Blumenfeld, and Paris (2004) also distinguished two additional facets of engagement: cognitive engagement and emotional engagement. Cognitive engagement is defined as an investment in learning and preference for challenge. Research suggests that students who are cognitively engaged in school perform better academically (Metallidou & Vlachou, 2007). Lau and Roeser (2002) found that high school students who exhibited high "test engagement," defined as using test-taking strategies and expending effort during a task (closely tied to the concept of cognitive engagement), had higher science test scores than students who were not cognitively engaged, statistically controlling for general ability.

Emotional engagement refers to students' affective reactions in the classroom and feeling a sense of belonging in school. Students who are emotionally engaged in school perform better academically (Klem & Connell, 2004; Ladd & Dinella, 2009; Li, Bebiroglu, Phelps, Lerner, & Lerner, 2008). Lucio et al. (2012) found that high school students' self-reported level of emotional engagement (i.e., whether they found classes interesting, were absorbed in their schoolwork, and found school exciting) was significantly and positively related to GPA, statistically controlling for demographic variables and other motivational variables with a small effect. The "belongingness" aspect of emotional engagement has been found to be missing for many Latina students (P. Gándara, O'Hara, & Gutiérrez, 2004; P. Gándara et al., 2013).

Academic Behaviors

Behavior problems. Students' disruptive behavior in and outside the classroom is associated with negative school outcomes. Students with behavior problems tend to have lower academic achievement and are more likely to drop out of high school than are students who do not have behavior problems. Externalizing behavior in school, which is characterized by aggression, bullying, hyperactivity, and conduct problems, in elementary (e.g., Barry & Reschly, 2012; Henricsson & Rydell, 2006; Jimerson et al., 2000), middle (e.g., Fleming et al., 2005), and high school (e.g., Englund,

Egeland, & Collins, 2008; Jimerson et al., 2000; Lucio et al., 2012) significantly predicted poor academic achievement and a greater likelihood of dropping out, even when controlling for other social, academic, and demographic variables. For example, Jimerson et al. (2000) found that, when controlling for early home environment, early quality of care giving, gender, tested cognitive ability, SES, peer competence, academic achievement, and parent involvement, problem behavior in grade 6 was the strongest predictor of dropout status at age 19. Similarly, Englund, Egeland, and Collins (2008) found that, when controlling for academic achievement at ages 12 and 16, and behavior problems at age 12, behavior problems at age 16 was the strongest predictor of high school dropout. In yet another study, Ou et al. (2007) found that classroom behavior was associated with educational attainment, even after controlling for a large number of other cognitive, motivational, social, and family variables.

Students' risky or delinquent behavior outside of class can also be a risk factor for academic failure and dropout. Research suggests that delinquent behavior, defined as getting in trouble with the law, and general deviance (e.g., drug use and violence) negatively predict academic achievement and high school graduation (Battin-Pearson et al., 2000; Malinauskiene, Vosylis, & Zukauskiene, 2011). Sexual involvement also predicts academic achievement and dropout. Battin-Pearson et al. (2000) found a small but significant relationship between sexual involvement at age 14 and academic achievement at age 14, though sexual involvement was not directly related to high school dropout at age 16. However, research consistently suggests that pregnancy is directly related to high school dropout (e.g., Kane, Morgan, Harris, & Guilkey, 2013; Perper, Peterson, & Manlove, 2010; Rumberger, 1987). It is important to note, though, that there are selection issues with students who are involved with risky behaviors. Teen parents, for instance, are also exposed to a host of other risk factors, such as poor families and dangerous neighborhoods (Hoffman, 1998).

Social competence. Students' socio-emotional competencies with peers and teachers are also associated with school success. Children who are socially competent tend to be academically competent as well. In preschool and kindergarten, emotional knowledge and attention skills predict academic achievement in elementary school, controlling for maternal education, family income, and children's age, sex, and receptive vocabulary skills (e.g., Rhoades, Warren, Domitrovich, & Greenberg, 2011). Additionally, strong social, emotional, and decision-making skills in elementary and middle school are associated with high academic achievement in high school. Fleming et al. (2005) found that teacher-rated social and emotional skills and parent- and child-rated decision making skills in seventh grade were associated with higher test scores and grades in grade 10, controlling for prior test scores and demographic variables. Research also suggests that children who display higher social competence with adults in elementary and middle school are more likely to complete high school (Englund et al., 2008), and this effect is stronger than parental involvement or children's positive attitude toward their teachers. Jimerson et al. (2000) found that students' peer competence in first and sixth grade and at age 16, as rated by teachers, was negatively associated with high school dropout; however, variables such as problem behaviors, quality of care giving, and parent involvement emerged as stronger predictors of high school dropout than peer competence in this study. Finally, social competence (Stepp, Pardini, Loeber, & Morris, 2011) at age 13 was a positive predictor of educational attainment in early adulthood.

Peer competence and other social skills are strongly associated with academic outcomes for children and adolescents. Importantly, studies suggest that social skills are malleable and can increase through training and intervention (see Bandy & Moore, 2011).

Coursework. Coursework refers to the type of courses students take in high school, as well as how rigorous those courses are. Rigorous course taking is associated with better school performance in high school (Leow, Marcus, Zanutto, & Boruch, 2004). When examining school dropout, however, it appears that once other factors are statistically controlled for, coursework does little to influence high school dropout rates (see Rumberger, 2011). That being said, taking rigorous courses in high school is strongly associated with better college and workplace readiness (e.g., see Lippman, Atienza et al., 2008).

Extracurricular involvement. Participation in extracurricular activities is generally related to school success for adolescents. Students who participate in pro-social activities, team sports, performing arts, school-sponsored

activities and academic clubs in tenth grade have higher twelfth grade GPAs than non-participants (Barber, Stone, & Eccles, 2005). The type of activity a student participates in may be related to the outcome(s) they will receive from the program. For example, structured activities may provide more positive influence, than non-structured activities. Additionally, students who participate in interscholastic sports have achievement gains while students who participate in intramural sports do not receive the same benefits (Feldman & Matjasko, 2005).

The level of participation is also important. The "over-scheduling hypothesis" suggests that students who participate in too many activities, or participate with too much intensity, fail to gain additional benefits of participation. However, this hypothesis is still being tested (Feldman Farb & Matjasko, 2012; Mahoney, Harris, & Eccles, 2008).

Recent studies have started to look at the mechanisms behind the relationship between extracurricular participation and improved academic outcomes. The relationship may not be due to participation in the activity itself but rather the relationships with peers, adults, and even the school that are established and built through participation (Feldman & Matjasko, 2005), although this hypothesis needs additional testing. Participation in extracurricular activities may also build a sense of belonging to a school, an important aspect of emotional engagement. This is true for all students, but may be especially important for Latinas, as they report low levels of emotional engagement in school (Gándara et al., 2013).

Employment. Long hours of employment while in high school is related to dropout (see Rumberger, 2011). In general, studies suggest that extensive work involvement (i.e., more than 20 hours per week) is associated with higher dropout rates, substance use, delinquency, and lower school engagement, while moderate work involvement has more negligible effects, but, in at least one study, predicts lower dropout (D'Amico, 1984; Monahan, Lee, & Steinberg, 2011).

How Important Are Individual Factors Overall?

The research literature is rich with studies on individual-level factors and academic achievement and attainment. The majority of these studies present evidence for the contribution of individual factors to school success, with studies finding that individual-level factors are as or more important than more contextual factors. Based on the strength of the literature, as well as the malleability of the factors, we have identified five promising individual-level factors to consider when trying to improve students' academic success:

- Behavior in and out-of class;
- Attendance/engagement;
- Academic self-concept/self-efficacy;
- Social and emotional competence, and;
- Health and well-being.

PARENT AND FAMILY FACTORS

Parent and family factors have a strong influence on children's academic achievement. The family context in which children grow up (e.g., parents' level of education, poverty level, family structure, home environment, immigrant status) as well as the functionality of the family (e.g., parent involvement, educational expectations) influence children's educational outcomes.

Broad family contextual factors, such as parent education level and family income, are strongly related to positive child educational outcomes (Dalton et al., 2009; Dubow, Boxer, & Huesmann, 2009b; Haveman & Wolfe, 1995; Haveman et al., 1991). Although important, these factors do little to explain why, for example, growing up in poverty with a single mother who has only a high school diploma is detrimental to a child's educational success. Parental beliefs and behaviors also influence children's academic outcomes and can help explain the process through which broad family context factors affect children's educational outcomes. For example, parental education level is associated with parental expectations which then relate to parental behaviors, such as reading with the child (Dalton et al., 2009; Davis-Kean, 2005). In a similar vein, low family income contributes to parental emotional distress (such as depression or anxiety) which in turn is related to parenting practices, such as parenting warmth or authoritativeness; additionally, higher family income translates into more resources available for a stimulating environment, such as more books, toy, or puzzles and

more outings to libraries and museums (Linver, Brooks-Gunn, & Kohen, 2002). Both positive parenting practices and stimulating home environments are linked to positive child outcomes (Linver et al., 2002).

We reviewed literature related to broad family contexts and family functioning and discuss below which aspects of each are related to children's educational success.

Family Context Factors Related to Children's Educational Success

Parent educational level. Parents' education level when their child was eight significantly predicted educational and occupational success for the child 40 years later (Dubow et al., 2009b). In a separate study, children's academic performance was found to improve when young mothers (women who were 20 years old or younger when their children were born) with low levels of education (a high school degree or less and low scores on an academic aptitude test) completed additional years of schooling (Magnuson, 2007). A recent report by the Brookings Institute (Isaacs & Magnuson, 2011) reported that an additional year of schooling for mothers would increase math and reading scores for young children by 0.06 to 0.09 of a standard deviation.

Family income. Family income has been strongly linked to educational success and, as such, is used repeatedly as a control variable in nearly all studies looking at educational outcomes. An analysis of data from seven random-assignment studies revealed that young children's academic achievement increased between 0.05 and 0.06 of a standard deviation with an annual income boost of $1,000 (Duncan, Morris, & Rodrigues, 2011). Dahl and Lochner (2012) found similar results concluding that a $1,000 increase in income raised children's academic achievement scores by 0.06 standard deviations. However, other researchers reported that increasing a family's average income throughout a child's early years by $1,000 would be associated with only a 0.015 standard deviation increase in reading and math scores for low-income families (Isaacs & Magnuson, 2011). Thus, although family income has important linkages to achievement and attainment, there is not a general consensus on the size of the effect.

Socioeconomic status. Similarly, socioeconomic status (SES), most often measured by some combination of parent education level, occupational status, and family income, has a medium to strong relationship (with effect sizes ranging from .57 to .70) to academic achievement outcomes (Sirin, 2005). SES when children are in first grade is positively linked to educational attainment when children are 22 (Entwisle, Alexander, & Olson, 2005). In fact, Entwisle and colleagues created a model that accounted for 42 percent of the variance in educational attainment of participants at age 22 and family SES was the strongest predictor of the eight factors included.

Homelessness. Homelessness and mobility during childhood is a major risk factor affecting child educational outcomes. Even when compared to low-income students (a traditionally risky group), homeless or highly mobile students are at a greater risk for low academic achievement (Obradovi· et al., 2009). The academic gap between homeless or highly mobile students and their peers emerges as early as first grade and persists throughout elementary school most likely because homeless or highly mobile students show slower growth in reading and math compared to their peers (Obradovi· et al., 2009).

Immigrant status. Immigrants to the U.S. are diverse; immigrant families come from different countries with differing economic and political climates. They have varying levels of education and economic resources, and have differing reasons for immigrating. Perhaps due to this diversity, the influence of immigration status on educational outcomes is complicated.

Children from immigrant families are less likely to graduate from high school than children with U.S.- born parents (Hernandez & Napierala, 2012). There are two critical caveats to this fact however. First, high school graduation rates and academic achievement varies by ethnicity and country of origin. For example, Asian immigrants are more likely than their native born peers to have higher GPAs, math and reading test scores, and greater educational aspirations (Kao & Tienda, 1995). Additionally, when researchers consider other contributing factors, such as family income and parental education, immigration status seems to enhance educational outcomes with first- and second-generation immigrants becoming more likely to have higher GPAs, higher math scores, and greater educational aspirations (Fuligni, 1997a; Kao & Tienda, 1995). The finding that immigrant status enhances outcomes of first and second

generation immigrants is often referred to as the "immigrant paradox" (Gándara et al., 2013). When even more factors are considered however, such as individual attitudes and academic behavior, parental involvement, and school characteristics, immigrant status becomes insignificant to high school completion and high school math and reading test scores (Glick & White, 2003; Rumberger, 1995). This suggests that immigrants may have protective factors, explained by individual attitudes, academic and parental behaviors, which may be culturally rooted. For example, immigrant families are more likely to value education than non-immigrant families (Fuligni, 1997a). Therefore, it is likely that immigration status itself does not necessarily influence children's educational success, but that other factors, such as cultural differences and economic resources, are at play.

Nonetheless, there are some factors uniquely associated with immigration status, such as a family's reasons for migrating and a student's English-language proficiency (discussed in the Individual Factors section), which can influence educational outcomes. Parental reasons for migration to the U.S. (i.e., for work-related reasons or education-related reasons) is related to adolescent GPA (Hagelskamp, Suajrez-Orozco, & Hughes, 2010). When interviewing Chinese, Haitian, Mexican, and Central American families who migrated to the U.S., Hagelskamp and colleagues found that most immigrants cited work-related reasons for moving; however, children whose parents cited education-related reasons for migrating tended to have higher GPAs.

Family structure. Living with two biological, married parents is advantageous for children and has a positive influence on high school grades, high school graduation, college attendance, and college completion (McLanahan & Sandefur, 1994). Students living in single parent households or in households with step families are more likely to drop out of school than students who live in households with intact families (Rumberger, 2011). Children who grow up in a family with two biological, married parents are more likely to be engaged in school than those living with two-biological parents who are cohabitating, married or cohabitating step families, single parents, or no parents (S. L. Brown, 2004). In the reviewed rigorous research, less common family arrangements, including adoptive parents and same-sex parents, were not investigated. Parental divorce can lead to detriments in cognitive development, even for young, elementary-school-aged children(Kim, 2011).

Family Functioning Factors Related to Children's Educational Success

Parental involvement is especially important to children's educational success. Multiple meta-analyses, and a synthesis of multiple meta-analyses, have found that parental involvement is linked to children's educational success at all levels of schooling (elementary, middle, and high school) and for all ethnicities/races (Fan & Chen, 2001; Hill & Tyson, 2009; W. H. Jeynes, 2005b, 2007; Wilder, 2013). Multivariate longitudinal studies have also linked parental involvement to children's educational success (Barnard, 2004; Jimerson et al., 2000).

Parental involvement encompasses multiple aspects of parents' beliefs and behaviors, including: parent expectations, parenting style, and parenting behaviors (i.e. communication with child about school, checking homework, monitoring activities, participating in parent-teacher organizations, attending school functions).

Parental educational expectations. Parental educational expectations (i.e., parents expecting their children to graduate high school and/or complete postsecondary schooling) of children in first grade is positively linked to children's educational attainment at age 22 (Entwisle et al., 2005). Parental expectations of school behavior, including parents expecting students to do their school work, attend classes, and follow school rules, are positively associated with students' grades (G. L. Bowen, Rose, Powers, & Glennie, 2008). Parental expectation is consistently cited as the strongest parental involvement predictor (Fan & Chen, 2001; Hill & Tyson, 2009; W. H. Jeynes, 2005b, 2007; Wilder, 2013).

Parenting style. Spera (2005) reviewed literature related to parenting styles and found that, overall, authoritative parenting styles are associated with higher levels of student achievement, although the findings differed by culture. Quality mother-child interactions (i.e. interactions where the mother provides encouragement, explanation, and encourages child's independence) in kindergarten are positively associated with high school graduation and GPA (Gregory, 2008).

Parenting behaviors. Positive parenting behaviors such as participating in parent-teacher organizations and having discussions with one's child about school are positively related to academic achievement (W. H. Jeynes, 2005a). Maternal monitoring (i.e. mother knowing where her child is after school or at night) was positively associated with math and language achievement of Hispanic youth (Prelow & Loukas, 2003).

Controlling for previous achievement, all aspects of parental involvement (with the exception of checking homework) are positively related to educational outcomes; however, each aspect has differing levels of influence on educational success. Additionally, Hong and Ho (2005) found that the importance of these aspects varies by race/ethnicity (see Table 1).

Table III.1. Most Important Aspects of Parental Involvement by Race (Hong & Ho, 2005)

WHITE	BLACK	HISPANIC	ASIAN
• Communication • Parental expectations	• Parental expectations (short-term effects) • Parental supervision (long-term effects)	• Communication	• Parental participation • Parental expectations (short-term effect) • Communication (long-term effect)

How Important Are Family Factors Overall?

Despite being strong indicators of educational success, some family contextual factors (i.e. parental education, immigrant status) are not easily altered. Many educational policies attempt to minimize the influence of these non-malleable factors by focusing on intermediate factors that link socioeconomic background with achievement (such as the Free and Reduced-Price Meals Program and charter schools). However, here we have chosen to focus on family factors that are themselves malleable. These malleable factors present opportunities to narrow achievement gaps that are present for students from different contexts.

Parental involvement factors are both strong predictors and malleable. Jeynes (2012) conducted a meta-analysis of school-based parental involvement programs, such as programs designed to improve parent-teacher communication or parent-child reading time, and found that there is a relationship between parental involvement programs and the academic success of students. This suggests that school-based parent involvement programs may be effective tools in promoting student academic success. A synthesis of experimental parental involvement interventions found that some parental involvement programs were effective at influencing educational outcomes; effectiveness depended on program characteristics such as program type and program focus (Mbwana, Terzian, & Moore, 2009). Programs that taught parenting skills (e.g. discipline and limit setting) and programs that provided parents and children with opportunities to participate in activities together were found to be effective. Also, programs that focused on parents and children, rather than on just parents or just children, were found to be effective.

Based on the strength of the literature, as well as the malleability of the factors, we have identified 3 promising family-level factors to consider when trying to improve students' academic success:

- Parental expectations;
- Parenting style; and
- Parenting behaviors.

PEER FACTORS

Students spend an average of 6.6 hours per day at school with other students (National Center for Education Statistics). Thus, peers may be an important influence on students' academic performance. Peers can either positively or

negatively affect students' academic performance through a number of different mechanisms, including reinforcing students' individual characteristics or pressuring them to conform to a group. The magnitude of peer effects may also vary based on gender, personality, and status within the peer group, and increases as students age into adolescence (Bush, Weinfurt & Iannotti, 1994 as cited in Hewstone, Fincham, & Foster, 2005; Ryan, 2000).

In the literature, peer context is frequently operationalized as the demographics and academic abilities of a student's grade level or school, which is far broader than the people with whom a student likely interacts frequently. A few studies, however, have investigated the relationship between a student's immediate network and their academic achievement.

Negative Peer Influence

Peers can be a negative influence on education outcomes through their aspirations and behaviors. For example, students who were identified as at-risk of dropping out in ninth grade were more likely to have friends with low educational aspirations in grade seven (Murdock, Anderman, & Hodge, 2000), which suggests that peers may have similar educational aspirations to one another. Peers may also have an influence on students' academic achievement through their involvement in deviant or delinquent behavior. In addition, adolescents with extreme peer orientation (i.e., were willing to sacrifice talents, school performance, and parents' rules to maintain peer relationships) were more likely to get involved with deviant peers (i.e., peers who drank alcohol, did drugs, and skipped class) and had lower school grades than adolescents who did not have extreme peer orientation (Fuligni, Eccles, Barber, & Clements, 2001).

However, the relationship between peer deviance and school performance may be bidirectional. Kaplan, Peck, and Kaplan (1997) found that students who experienced academic failure in grade seven were more likely to associate with deviant peers and drop out of high school. Similarly, Dishion, Patterson, Stoolmiller, and Skinner (1991) found that academic failure at age 10 predicted involvement with antisocial peers at age 12. Thus, although children's deviant peers may influence their academic performance, failing students may also be more likely to associate with deviant or delinquent peers. Due to the bidirectional relationship of individuals with their peers and environments more generally, it is quite difficult to differentiate the influences of any contextual factors(Manski, 2000).

Positive Peer Influence

Several studies suggest that the simple presence of friends leads to higher achievement. For example, students with reciprocated friendships in late elementary or early middle school tend to have higher GPAs (Altermatt & Pomerantz, 2005; Wentzel & Caldwell, 1997). In addition, being accepted by peers was related to higher GPAs for girls and belonging to a social group in sixth grade was related to higher seventh grade GPAs for both boys and girls. However, these belongingness variables did not predict eighth grade GPA when statistically controlling for sixth grade GPA (Wentzel & Caldwell, 1997). Sixth grade perceived peer academic and social support was not directly related to seventh grade GPA in multivariate analyses (Wentzel, 1998). Among high schoolers, students who are members of a clique have higher math achievement than students who do not belong to any clique (Nichols & White, 2001). Although these studies, for the most part, suggest that the presence of friends is associated with better school achievement, it is unclear whether peers specifically influence students' achievement (and how they might enact this influence) or whether students who tend to be more socially competent also tend to do better in school.

The academic achievement of a student's peers also has a positive relationship to the student's own academic achievement, even when controlling for prior achievement (Altermatt & Pomerantz, 2005). The magnitude of this relationship is small, however. For example, a one standard deviation increase in a student's peer network's academic achievement raised the student's GPA by about 8 percent, or one-fifth of a letter grade (Lin, 2010). The relationship may also differ by subpopulations. A study of first and second generation immigrants found that peer academic support was not directly related to academic performance. The authors attributed the finding to peer characteristics being "channeled through the more proximal (individual) factors" (Fuligni, 1997b).

For Hispanic students, the positive link between friend support and academic outcomes in middle school may be mediated through student-teacher relationships. In other words, students who have more friends also tend to have

better student-teacher relationships and better school achievement. This finding does not support the claim that peers exert a unique influence on school achievement; rather, it suggests that general social competence (i.e., with teachers, peers) may be important (Woolley, Kol, & Bowen, 2009).

How Important Are Peers Overall?

While there appears to be a relationship between peers and academic success, there is very limited rigorous research examining peers' unique effect on academic achievement in school-aged children and youth. The existing literature suggests that peers do exert a small influence on students; however, other factors might be more important. A study of ninth graders on Long Island found that peer influences were significantly related to academic achievement, but had less explanatory power than academic self-concept (Piciullo, 2009).

This finding may seem surprising. It is possible that peers become more influential as students age into late childhood and adolescence (Bush, Weinfurt & Iannotti, 1994 as cited in Hewstone et al., 2005), that peers are more influential in some domains of life than others (Brown, 1999 as cited in Hewstone et al., 2005), or that close friends and peers who are admired matter more than more distant peers (B. B. Brown, 2004). However, it is challenging to disentangle the effects of peers from those of parents, teachers, schools, and neighborhoods. It is also difficult to determine whether peers influence individuals, individuals influence peers, or both are influencing each other simultaneously. Individuals choose their friends, so there are selection effects that researchers need to take into account when studying peers (e.g., Ryan, 2000).

In general, strong, supportive relationships, which include peers, family, and school relationships, are important in a child's life (National Scientific Council on the Developing Child, 2004). However, the current literature does not find that peers exert a strong, unique effect on students' learning.

SCHOOL FACTORS

A number of school-level factors such as the social composition of schools, school size, school type and locale, school resources, school climate, and access to extended learning time and additional programs predict important achievement-related outcomes for children and adolescents. Again, it is important to keep in mind that it is difficult to differentiate the influence of any contextual factors because of the interactions between individuals and their environments.

Social Composition

The social composition of schools, which includes student body socioeconomic status (SES), racial composition, and average school achievement, is related to student academic outcomes. Research suggests that the socioeconomic composition of schools predicts student achievement much more strongly than racial composition (Rumberger & Palardy, 2005).

Socioeconomic status. At the school level, studies have found that schools consisting of students of higher SES have lower dropout rates than those consisting of students of lower SES (e.g., Rumberger & Thomas, 2000), and this effect remained even after statistically controlling for a number of other school-level factors, including: composition, resource, structural, and process variables. *In addition, SES composition of schools had a stronger effect on school dropout rates than ethnic composition.*

At the individual level, students who attended higher-SES schools tended to learn at faster rates than students at lower-SES schools (e.g., Palardy, 2008), even after statistically controlling for individual student-level demographic characteristics. Students at higher-SES schools also had better achievement trajectories (e.g., Rumberger & Palardy, 2005). In contrast, students at high poverty schools had worse achievement outcomes and higher dropout rates than students at low poverty schools (Lippman, Burns, & McArthur, 1996). Furthermore, some research found that school SES was related to students' achievement just as strongly or more strongly than students' individual SES (Rumberger & Palardy, 2005; Rumberger & Thomas, 2000). Placing a student in a school where most students are disadvantaged

increases the probability that he or she will drop out of high school, statistically controlling for demographic and family variables (Evans, Oates, & Schwab, 1992).

However, the research is mixed on whether the association between school SES and academic achievement is of equal magnitude across all SES and achievement groups. While some research finds the relationship between school SES and academic achievement is the same for high-achieving and low-achieving students (Rumberger & Palardy, 2005), others find that student achievement in low-SES schools is more sensitive to school factors than middle- and high-SES schools (Palardy, 2008).

A seminal study in educational research (Coleman et al., 1966) found that the characteristics of the student body of a student's school explained more of the variance in achievement for students of racial/ethnic minorities than characteristics of the school itself or characteristics of the faculty. In addition, student body characteristics were more influential for students of racial/ethnic minorities than white and Asian students.

School academic achievement. Schools' average levels of academic achievement predict students' achievement trajectories and dropout. Specifically, student achievement was positively related to school-level achievement gains from grades 3-6, after statistically controlling for a number of stable student and school effects, with a medium effect size (Hanushek, Kain, Markman, & Rivkin, 2003).

Also, students who move from a school in which most students drop out to one in which less than half of students drop out were significantly less likely to drop out (Gaviria & Raphael, 2001), controlling for demographic variables, and this effect was large.

School Size

Along with the social composition of schools, the size of the school is also important. A large meta-analysis on the relationship between school size and student outcomes found that smaller schools tend to produce better student achievement outcomes and other studies have found that smaller schools have lower dropout rates, particularly for struggling students and those of a lower SES (Bloom & Unterman, 2013; Lee & Burkam, 2003; Leithwood & Jantzi, 2009).

However, it is important to keep in mind that it is unlikely school size alone is influencing school achievement and attainment, but that other important organizational variables that are also related to school size, such as how members of the school community (e.g., teachers, students, staff) communicate with one another, are influencing achievement and attainment. For example, in small schools there may be stronger organizational trust, more personal relations and more frequent contact between students and adults, a less elaborated curriculum, and more positive teacher attitudes toward students (see Bloom & Unterman, 2013; Lee & Burkam, 2003).

School Type and Locale

In regard to school structure, research finds that Catholic schools and other private schools tend to have lower dropout rates than public schools (Rumberger & Thomas, 2000), and this effect is large even after statistically controlling for a number of other composition, resource, structural, and process school-level variables. Research on school locale suggests that urban schools have higher dropout rates than suburban and rural schools (Lippman et al., 1996; Sander & Krautmann, 1995). Students attending high-poverty urban schools are especially vulnerable to negative school-related outcomes, such as low achievement and high dropout rates (Balfanz, Herzog, & Mac Iver, 2007).

However, it is important to note that some researchers find that the effects of these school type and locale variables became small after statistically controlling for the individual and aggregate effects of student background characteristics (Rumberger & Palardy, 2005), so it can be difficult to make causal connections between these variables and students' achievement.

School Resources

The relationship between a school's finances and the success of its students is a hotly debated topic (Hanushek, 1994;

Hedges, Laine, & Greenwald, 1994). While simply "throwing money at schools" has not necessarily been found to lead to improved student outcomes, some factors related to school resources do predict school-related outcomes. For example, schools that provide their teachers with more resources, such as higher teaching salaries and lower student-teacher ratios, tend to have better academic outcomes than schools that provide their teachers with fewer resources (Rumberger & Thomas, 2000).

Additionally, teacher certification (Goldhaber & Brewer, 2000), professional development (Cohen & Hill, 2000), and curriculum rigor (Lee & Burkam, 2003) are associated with student achievement and attainment. Teachers with standard certification, who are given opportunities to implement educational reforms in classrooms, and who work in schools that offer challenging academic courses tend to have students who succeed academically. Bryk (2010) identified, based on longitudinal data, five essential supports for school improvement. These included having a coherent instructional guidance system, strong professional development resources, strong parent-school-community ties, a student-centered learning climate, and strong leadership. All of these factors related positively to student achievement, and schools with strong indicators on most of these supports were 10 times more likely to improve in student attendance and math and reading learning gains than schools without strong supports.

Extended Learning Time and Additional Programs

Another important school-level factor that is related to academic outcomes is the extent to which extended learning time and additional programs are offered by the school.

Additional programs. Programs that go beyond the typical academic curriculum, such as social and emotional learning programs, may benefit students' academic achievement. A large meta-analysis found that students who were part of school-based universal social and emotional programs earned 11 percentile achievement gains over students who did not receive such programs (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011).

Extended learning time. Schools vary in the extent to which they provide time for learning both inside and outside the classroom. A large review of research examined studies assessing extended school day (ESD) programs, extended school year (ESY) programs, and expanded learning opportunity (ELO) programs, and found that these types of programs are generally related to positive academic outcomes for K-12 students if the quality of the programs is high (Redd et al., 2012). However, there were few rigorous experimental designs in the literature examining these types of programs (especially ESD and ESY programs), so it was challenging to make any strong conclusions about their effectiveness. Nonetheless, results suggested that ESD programs were most beneficial to students at risk for academic failure and students from schools with high proportions of minority students. Similarly, ESY programs were most effective when they made use of intercession time to target students who needed extra help. Effective ELO programs were generally multiservice interventions (i.e., that provided a variety of services to participants and families) that were structured, provided individualized attention, culturally appropriate, and had qualified, committed staff.

School Climate

School climate can be conceptualized as consisting of three different components: engagement, safety, and environment (Harper, 2010). Students who attend schools with a positive school climate tend to succeed academically (Harper, 2010).

Engagement. Engagement includes the relationships between students, teachers, and leadership, and participation in school activities (Harper, 2010). Attendance may be the most basic form of school engagement. Research suggests that schools with high attendance rates have lower dropout rates than schools with lower attendance rates (Rumberger & Thomas, 2000), and this effect is moderate even after statistically controlling for other school-level variables. Other research suggests that the rate of school attendance has the strongest relationship with student dropout after academic achievement (Christle, Jolivette, & Nelson, 2007).

Student-teacher relationships are another critical element of school engagement. In schools with high quality teachers (Rumberger & Thomas, 2000) who students perceive as supportive (Croninger & Lee, 2001), and where there are positive student-teacher relationships (Lee & Burkam, 2003), students are less likely to drop out. These effects tended

to be fairly large. Children with a positive attitude toward their teachers are more likely to succeed academically, which suggests the importance of a supportive school climate (Englund et al., 2008). Positive messages about academic success from teachers are also important. A large meta-analysis found that positive student-teacher interactions and supportive communication in school about academic success was related to high school completion with a small to average effect size (Strom & Boster, 2007).

Latina students have been found less likely to report strong student-teacher relationships than all other female subgroups other than Asian students. However, while this finding has not been found for students of other races, having a Hispanic teacher may be important for Latina students. A recent study found that Latina students with a like-ethnicity teacher were more likely to go on to college (Gándara et al., 2013).

Although student-teacher relationships appear to be extremely important, Lee and Burkam (2003) found that the association between student-teacher relations and academic dropout differed by size and sector of the school. Specifically, student-teacher relations tended to be more strongly associated with dropout in public or Catholic schools (as compared to independent schools) and smaller schools.

Safety. In the U.S. Department of Education's Safe and Supportive Schools model, safety encompasses both physical and emotional safety, as well as prevalence of substance use (Harper, 2010). School safety is important because if a student does not feel safe he or she may not even go to school. Not surprisingly, in one study, students' perceptions of school safety were related to achievement after statistically controlling for demographic and motivational variables, although the effect was small (Lucio et al., 2012). In New York City, middle school students who felt unsafe in the classroom scored lower on math tests than those who felt safe, even after controlling for prior achievement among other factors. The effect size of 0.03 of a standard deviation was greater than the independent effect of poverty. Additionally, students who stayed home because they felt unsafe had test scores further reduced by 0.03 of a standard deviation (Lacoe, 2012). Another study suggested that Latino and black students were more likely to attend schools with safety issues, even in kindergarten (Caludia Galindo & Reardon, 2006).

Environment. The school environment includes a school's physical structure, as well as its disciplinary and academic environments (Harper, 2010). Relevant variables such as how the staff dresses, supervises, and interacts with students, and the physical condition of the school itself, are related to dropout rates (Christle et al., 2007).
While little rigorous evidence exists on the influence of discipline policies and techniques on student success, the existing evidence finds zero-tolerance policies and harsh disciplinary consequences such as suspension and expulsion detrimental to students' academic achievement and their likelihood of high school completion (Boccanfuso & Kuhfeld, 2011).

Academic press, an academic orientation where high but achievable goals are set for students, has been studied in a variety of ways, and is generally related to positive academic outcomes. The level of middle schools' academic emphasis, which is characterized by a learning environment that is orderly, serious, and with high expectations for students, is positively related to student achievement in math and reading, controlling for several other organizational school-level variables and SES (Hoy & Hannum, 1997). Another study found that academic emphasis was related to math and reading scores at the school level, statistically controlling for gender, race, ethnicity, SES, and achievement one year earlier, and this effect was moderate to large (Goddard, Sweetland, & Hoy, 2000). Also, Rumberger and Palardy (2005) found that teacher expectations and the academic climate in a school were stronger predictors of achievement than school SES.

The academic orientation of a school may also interact with other domains related to school achievement. For example, a cross-sectional study found that academic press was not directly related to high school math achievement, but is related through collective efficacy, or the teachers' belief that they can positively impact achievement (Hoy, Sweetland, & Smith, 2002). Research also suggests that the relationship between students' perceived social support for academics and academic achievement is contingent on their school's academic press. For example, students with medium levels of academic social support in schools with high levels of academic press learned as much as students with high levels of academic social support in medium press schools (Lee & Smith, 1999).

Racial differences in perception of school climate. Students of different racial and ethnic backgrounds may view school climate, particularly student-teacher relationships, through different lenses. A study specifically examining Hispanic students found that positive perceptions of teacher support led to better school behavior and higher school satisfaction, which positively predicted grades, suggesting that teacher-student relationships were a more proximal predictor of positive school outcomes than supportive home environments for these students (Woolley et al., 2009). Additionally, a recent review of the research (Thapa, Cohen, Guffey, & Higgins-D'Alessandro, 2013) found that while black students view student-teacher relationships as the paramount aspect of school climate, studies have found conflicting results on the importance placed on various elements of student-teacher relationships by Hispanic students.

In light of the mixed findings for Hispanic students, teachers' attitudes toward students may be especially influential for this group. A cross-sectional study found that teachers who valued diverse classrooms had Hispanic elementary students with more positive ethnic identities and lower perceptions of peer discrimination. Strong ethnic identity was positively associated with academic achievement, but only in schools in which Hispanic students were the minority (Brown & Chu, 2012). Similarly, in another cross-sectional study with black and white high school students, positive perceptions of school racial climate were associated with higher student achievement. In general, black students had more negative perceptions of racial climate, and in turn, lower grades than white students (Mattison & Aber, 2007).

A longitudinal study that examined predictors of academic achievement among black males found that background characteristics and student experiences, such as SES and past performance, played an important role in predicting achievement, whereas contextual or structural factors of the school did not. This study suggests that the importance of school-level factors could potentially vary by race/ethnic groups, and may be more important for some populations than others (Davis & Jordan, 1994).

School-Family Interactions

Epstein's (2001) widely cited framework for parental involvement and school engagement suggests that greater coordination between school and home (such as, schools communicating with parents and parents volunteering at schools) supports better outcomes for students. Hoover-Dempsey and Sandler (1997) proposed three major constructs which motivate parents' involvement decisions: parents' idea of what their role ought to be, parents' sense of efficacy for helping their children succeed in school, and the extent to which parents have the opportunity and are invited to be involved. Schools can facilitate parental involvement by encouraging and providing opportunities for parental involvement. School's outreach efforts are directly associated with kindergarteners' math and reading scores (C. Galindo & Sheldon, 2012). However, the relationship between a school's outreach efforts and kindergarteners' math and reading scores is not straightforward. The types of parental involvement schools encourage and the SES level of the school influence the effect such outreach has on math and reading test scores (González & Jackson, 2013) (see Table 2 for more details).

Table III.2. School SES Level and Types of Parental Involvement Encouraged by School as it Relates to Math and Reading Achievement Test Scores (Gonzàlez & Jackson, 2013)

HIGH SES SCHOOLS	LOW SES SCHOOLS
• High levels of parent services (i.e., parenting education programs, family literacy classes) is associated with lower reading and math achievement; SES is average SES in a school	• High levels of parent services (i.e. parenting education programs, family literacy classes) is associated with gains in reading
• Providing parents with less influence in decision making (such as decisions regarding selecting textbooks, establishing policies for grading) is associated with increased math achievement	• Providing parents with less influence in decision making (such as decisions regarding selecting textbooks, establishing policies for grading) is associated with increased math achievement
• Greater effort to communicate with parents is associated with gains in reading and math	
• Greater effort to engage families in volunteering is associated with gains in reading	

How Important Are School Factors Overall?

During the average of 6.6 hours per day that students spend in school (National Center for Education Statistics), students' educational success is influenced not only by their educational lessons, but also by the school's characteristics, composition, and climate. Based on the strength of the literature, as well as the malleability of the factors, we have identified four major promising school-level factors to consider when trying to improve students' academic success:

- Effectiveness of teachers;
- School climate, specifically:
- Quality of student-teacher relationships
- Academic press (including expectations);
- Average school achievement and attendance, and:
- Poverty.

NEIGHBORHOOD FACTORS

The neighborhoods in which children grow up are related to children's educational success, although effect sizes tend to be small.

Characteristics of Neighborhoods that Relate to Educational Success

Negative characteristics. Growing up in a neighborhood with high levels of poverty, unemployment, or neighborhood violence is linked to relatively poor educational achievement and attainment (Ainsworth, 2002; G. L. Bowen et al., 2008; Crowder & South, 2003; Fauth, Leventhal, & Brooks-Gunn, 2007; Leventhal & Brooks-Gunn, 2004; Milam, Furr-Holden, & Leaf, 2010; Snell et al., 2013; Woolley & Grogan-Kaylor, 2006). Similarly, lower levels of neighborhood education and social organization are tied to diminished educational outcomes among children (N. K. Bowen, Bowen, & Ware, 2002; Crowder & South, 2003). Physical aspects of neighborhoods, such as neglected buildings or poor lighting, are also linked to academic achievement (Woolley et al., 2008).

Positive characteristics. Conversely, when neighbors have strong connections within and outside their community, and when neighborhoods have higher proportions of college graduates or white-collar workers, students are more likely to achieve educational success (Ainsworth, 2002; Bryk, Sebring, Allensworth, Luppescu, & Easton, 2010; Woolley et al., 2008).

How Neighborhoods Affect Educational Success

There are multiple routes by which neighborhoods might influence student outcomes - for example, by influencing the availability, affordability, and quality of neighborhood institutions and resources such as child care, recreational activities, libraries, or schools. Children in more advantaged neighborhoods have access to higher-quality schools and child care institutions compared to children in disadvantaged neighborhoods (Dupere, Leventhal, Crosnoe, & Dion, 2010). Additionally, neighborhoods influence parental involvement. Catsambis and Beveridge (2001) found that there was a positive association between parental expectations and mathematic achievement, but that disadvantaged neighborhoods weakened that association. Neighborhoods also influence parental monitoring and disciplinary techniques, which, in turn, influence academic outcomes (N. K. Bowen et al., 2002; Fauth et al., 2007).

Ainsworth (2002), used regression analysis to investigate the relationship between neighborhood characteristics and educational outcomes after controlling for a variety of other influences, such as family socioeconomic status, parental involvement, and teacher quality. This study found that having high-status residents in a neighborhood predicted the amount of time students spent on homework and math and reading achievement scores. Additionally, having residential stability within a neighborhood predicted time spent on homework

Other studies randomly assigned families to receive housing vouchers that enabled them to move from high- to low-poverty neighborhoods. The results of these studies were mixed. In some studies, educational outcomes improved for boys, but no significant impact was found for girls (Leventhal & Brooks-Gunn, 2004; Snell et al., 2013). In others, positive outcomes were found for girls while boys experienced detrimental outcomes (Kling, Liebman, & Katz, 2007). In still others, academic achievement actually dropped off after the move, perhaps because of decreased social connections in the new neighborhood (N. K. Bowen et al., 2002; Fauth et al., 2007). This approach avoids selection bias but the findings are not clear-cut.

Of course, an alternative approach to moving students out of a distressed neighborhood is to intervene by improving neighborhood conditions. The first major initiative designed to do just that was the Harlem Children's Zone (HCZ). The HCZ is a non-profit organization that takes a community-wide and life span approach (often referred to as "cradle to career") in supporting community needs by improving educational options and providing social services to the whole neighborhood. However, researchers studying the effectiveness of the HCZ on academic achievement concluded that high-quality schools produced improved academic achievement of students; these analyses indicate that community supports did not contribute to the achievement gains, an important finding that warrants further analysis and assessment (Dobbie & Fryer, 2011; Whitehurst & Croft, 2010).

How Important Are Neighborhood Factors Overall?

Overall, education stakeholders should keep in mind that the magnitude of the effects of strengthening neighborhoods on student outcomes are small, and typically smaller than interventions focused on students, parents, or schools. Leventhal and Brooks-Gunn (2000) estimated neighborhood effects account for only about 5 percent of the variance in child outcomes. Of course, it may be easier to intervene at the neighborhood level than at the individual or family level; and strengthening neighborhoods can have a wide range of effects outside of education, by improving economic conditions, health outcomes, and quality of life for residents.

STATE AND FEDERAL POLICY FACTORS

On the most macro level, this review examined the relationship between state and federal policies and students' educational outcomes. There are myriad educational policies at the state- and federal-level, not to mention district and school-level policies. We chose to focus specifically on school funding, compulsory attendance age, school calendar, the Dream Act, and high-stakes testing, as these policies have gained interest in the research community and some of these polices have the potential to be modified at the school level.

School Funding

There is a popular sentiment that as the U.S. has continued to pour more money into education, outcomes such as test scores and graduation rates have plateaued. When looking at simple trends over time, this is true (U. S. Senate Budget Committee, 2011); however, the demographics of students in the U.S have shifted and income inequality has increased. Today, students are more likely to be of Hispanic origin, have a disability, or be an English Language Learner than in the past–groups who typically have lower educational achievement (Aud et al., 2013; U.S. Department of Education. Institute of Education Sciences. National Center for Education Statistics. National Assessment of Educational Progress (NAEP), 2013); students who are poor have similarly lower educational achievement (Child Trends, 2013). Once the changing demographic composition of the country is taken into account, relatively flat test scores and graduation rates are actually a positive outcome.

At the state level, correlations illustrate a weak relationship between graduation rates and per-pupil expenditures. States that spend more money on education per student generally have higher graduation rates, with exceptions (U.S. Senate Budget Committee, 2011).

At the district level, multivariate analyses found a relationship between funding levels and graduation rates in the South. The influence of funding levels is positive and significant, though not as large as the negative influence of the percentage of poor or minority students. Between-state differences in graduation rates were larger than within-state differences in graduation rates in the South. This finding indicates that the state context, including the educational policy context, has a considerable influence on graduation rates, though the details of the state-level contexts are unknown (Houck & Kurtz, 2010).

Beyond the total dollar amount, greater spending equality between school districts is related to a narrowing of the gap in SAT scores between children of more- and less-educated parents (Card & Payne, 2002). Educational spending is also related to non-academic outcomes, such as the teen birth rate (Moore, Terzian, Dariotis, & Harbin, Under review).

State-Mandated Compulsory Attendance Age

The U.S. does not have a federally-mandated compulsory school attendance age. The age at which students can drop out of school varies from state to state. This variation allows for analyses to examine the relationship between compulsory attendance age and students' educational attainment. Since low-income students and black and Hispanic students have higher dropout rates (Aud et al., 2013), these laws may have more influence on those populations. As of 2010, 20 states required students to enroll in school until age 16, ten states required students to be enrolled until age 17, and 21 states required students to enroll until age 18 (National Center for Education Statistics). A recent study found that raising the compulsory age above 16 increased the average years of schooling by 0.13 years, or about six weeks. In addition, raising the compulsory age to 17 or 18 decreased the dropout rate and increased enrollment in postsecondary institutions (Oreopoulos, 2009).

Requiring students to stay in school longer has additional, non-academic benefits, such as lowering the frequency of teen births (Black, Devereux, & Salvanes, 2008), reducing juvenile arrest rates (Anderson, 2012) (though potentially increasing in-school crime (Gilpin & Pennig, 2012)), and improving the educational attainment of the students' children (Oreopoulos, Page, & Stevens, 2004).

School Calendar

Stretching the existing number of school days to include attending class in the summer without adding additional seat time is one way that educators have tried to combat "summer learning loss." This technique, however, has not been linked to improved academic achievement(McMullen & Rouse, 2012). Adding additional meaningful learning time to the school year has been linked to improved academic achievement, however (Aronson, Zimmerman, & Carlos, 1998; Patricia Gándara & Fish, 1994; Redd et al., 2012).

DREAM Act

While the national DREAM Act has not been passed by Congress (as of the writing of this report), several states have enacted laws that offer in-state tuition to undocumented immigrants. An evaluation of these policies found that the laws decreased high school dropout rates for likely undocumented Mexican immigrants by seven percent, while dropout rates for white, black, and Hispanic youth remained unchanged (Potochnick, 2011).

Accountability and High-Stakes Testing

In the current educational climate, there is much emphasis on high-stakes testing, whether it is for teacher effectiveness ratings, grade promotion, or graduation requirements. As this policy is evolving with the Common Core standards, it is important to monitor it impacts on students' educational success. This is especially true for low-income and racial/ethnic minority youth, as the Common Core standards are likely to be especially pertinent to low-income and minority students (Griffith & Sensenig, 2013). Here we look specifically at high-stakes testing as it applies to grade retention and graduation requirements.

Grade retention. Some states have implemented policies in which a student must pass a test in certain grades (i.e., 3, 6, 8) in order to be promoted to the next grade level. There are exceptions to the test, including disability status. When a student is retained, they may be offered additional supports. For example, in Florida and Chicago, students are offered summer schooling and additional supports such as access to a highly-rated teacher (in Florida) or afterschool programs (in Chicago). In Chicago, the principal has discretion over other aspects of the students' experience, such as whether or not they repeat the grade with other repeaters or with the same teacher (Allensworth, 2005; Greene & Winters, 2007; Roderick & Nagaoka, 2005; Schwerdt & West, 2013; Winters, 2012).

Florida and Chicago serve as natural experiments in grade retention because they recently implemented policies that require students to meet a certain test score in order to be promoted to certain grade levels. Results are mixed across grade levels and studies. Retained third graders in Florida and Chicago had at least short-term achievement higher than that of their socially promoted peers, but this advantage faded over time. (Greene & Winters, 2007; Roderick & Nagaoka, 2005; Schwerdt & West, 2013; Winters, 2012). However, according to one study, by the seventh grade, students who had been held back scored 0.18 standard deviations higher in reading and 0.17 standard deviations higher in math than their socially promoted peers (Andrew, 2013; Winters, 2012).

Among sixth graders, a Chicago study found no differences between retained students and promoted students with similarly low levels of achievement, and another study found that retained students performed more poorly(Brian A. Jacob & Lefgren, 2002; B. A. Jacob & Lefgren, 2004; Roderick & Nagaoka, 2005).

The implementation of a policy in Chicago that required students to reach a certain test score before being promoted to high school predictably led to more students being held back, but also led to improved student achievement. Taken together, due to the small number of students retained, the policy decreased dropout rates by less than half of a percentage point (Allensworth, 2005). The findings of studies on retention may be misleading, however, as more in-depth analyses have shown that teacher react to policies by changing their practices regarding who they retain, special education, and the emphasis placed on non-tested subject matter.

Exit exams. There is much controversy about exit exams (a required test that must be passed in order to graduate from high school). Proponents argue that exit exams protect the value of a high school diploma and motivate students to perform. Opponents dispute this claim and argue that exit exams drive down graduation rates (Greene & Winters, 2004; Brian A. Jacob, 2001). Research generally shows that exit exams lower graduation rates, especially for low-income and minority students (Dee & Jacob, 2006; Martorell, 2004; Reardon, Atteberry, Arshan, & Kurlaender, 2009; Warren, Jenkins, & Kulick, 2006). The influence of exit exams varies by race/ethnicity, poverty, and difficulty of exams and seems to be stronger than that of course requirements for graduation (Dee & Jacob, 2006).

Nationally, research has found that states with exit exam requirements have lower graduation rates and higher GED test-taking rates. The relationships are stronger for states with more difficult exams, as well as states with higher

levels of poverty and racial and ethnic minority students (Warren et al., 2006). Research has also found surprising results for native-born Hispanic females. Hispanic females who experienced exit exams were more likely to attend post-secondary education and had higher employment rates (Dee & Jacob, 2006). This relationship needs further investigation. It is instructive to consider California and Texas as case studies.

When California made its exit exam mandatory for graduation, there were small or no effects on student achievement, but large negative effects on graduation rates for low-achieving students. Researchers estimate that approximately four percent of "all high school students fail to receive a diploma as a result of the exit exam requirement." This effect is attributed to the decline in graduation rates for low-achieving minority students; specifically, the graduation rates of low-achieving black (19 percentage point decline), Hispanic (15 percentage point decline), and Asian students (15 percentage point decline). Female students are also disproportionately affected by the requirement. The authors attributed this racial and gender inequality to stereotype threat (when student's perceive that they are expected to do poorly based on their race or gender, and actually underperform as a result) (Reardon et al., 2009).

In Texas, students are allowed to take the exit exam multiple times throughout their high school career until they pass. An initial failing score does not seem to discourage students from taking the test again or from dropping out of high school. However, about one percent of students do not graduate because they do not pass the exit exam at any point. Again, this rate is higher for minority and low-income students (Martorell, 2004).

How Important Are Policies Overall?

State, and, to a greater extent, national policies are the most distal inputs reviewed in this study. Potentially due to the distance between high-level policies and individual students' educational outcomes, the effect sizes of policies are relatively small. At the same time, changing a policy which has even a small effect on hundreds of thousands or millions of students will have an influence on students' outcomes at the national level. Black and Hispanic students are especially likely to be influenced by some policies. That being said, integrated student supports are unlikely to change national and state policies but must work within them.

Discussion and Conclusions

In this chapter, we have held the components of integrated student supports, as they exist in communities, against the tenets of child development research and the findings of empirical research on education. The alignment of theory and research on children's development with the principles underlying ISS approaches is impressive. ISS programs build on the ecological model to recognize that family, peers and schools matter, on the whole child perspective to recognize the importance of health, behavior, and socioemotional development for education, on the lifecourse model to acknowledge that ongoing programming is needed, on a positive youth development perspective to focus on assets and supportive programming, and they focus on family and relationships, as confirmed by substantial bodies of research.

In addition through our review of hundreds of empirical studies, we identified a number of factors that, due to their malleability and statistical significance, appear to be promising points of focus for stakeholders interested in improving educational success. However, we note that the effects of most of these factors are small or very small. These factors are concentrated in three domains: individual factors, parent and family factors, and school factors.

In the individual domain, the following factors have strong relationships with school success:

- Behavior in and out-of class;
- Attendance/engagement;
- Academic self-concept/self-efficacy;
- Social and emotional competence; and
- Health and well-being.

In the parent and family arena, these factors look promising:

- Parental expectations;
- Parenting style, and;
- Parenting behaviors.

In schools, the following factors are strongly related to academic success:

- Effectiveness of teachers;
- School climate, specifically:
  - Quality of student-teacher relationships
  - Academic press (including expectations);
- Average school achievement and attendance; and
- Poverty.

Factors in the other areas of influence that we investigated (peers, neighborhoods, and policy) are also related to academic success. At the peer level, these factors include peer deviance and peer academic performance; at the neighborhood level, neighborhood poverty, violence, and connection; at the policy level, compulsory school attendance age, additional learning time, and high-stakes testing. However, these factors are more distal than the factors discussed above, and thus their influence on educational success is smaller. For this reason, based on available research, we recommend that interested parties looking to improve school success focus on the individual, parent, and school factors discussed above.

CHAPTER IV: PRESENTATION OF NEW ANALYSES

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Overview

Based on the review of empirical research presented in Chapter III, we recognized that very few studies examining predictors of high school graduation have simultaneously looked across a broad array of factors. The vast majority of studies we reviewed focused on specific influences on education success (school climate, for example) rather than scanning across contexts.

In this chapter, we attempt to address this gap in the literature by performing analyses that cut across contexts and domains of development to predict high school completion. As a secondary analysis, we also look at predictors of enrollment in postsecondary education. However, a child's development does not occur in a vacuum. Children interact with the world around them, including families, peers, and schools. By including many variables representing various contexts into a single model, we have attempted to model educational success in a realistic developmental setting.

Our goal is to identify malleable factors that are associated with the largest direct effects on educational outcomes. These factors can then be compared against the components included in integrated student supports' programs.

This modeling technique allowed us to identify key malleable predictors of educational success, those that matter above and beyond other factors. The factors that were most predictive of high school completion and postsecondary enrollment are not all academic, but cover a variety of contexts of development: social development, cognitive development, families, and schools.

Factors are malleable if they can be readily influenced through policy, programmatic interventions, or other means. For example, gender may be associated with graduation rates. An individual's gender, however, is typically not malleable, although how teachers treat students of different genders can be. It would, perhaps, be better to recognize that school climate is related to graduation rates, given that school climate is under the purview of school staff and leaders, and this is malleable, whereas gender is not.

In general, we found many statistically significant predictors of high school completion and postsecondary enrollment that span developmental contexts. Most of these predictors, however, have very small effects on the examined educational outcomes, once all other factors are taken into account. The predictors with relatively larger effects tend to be behavioral, rather than attitudinal. For example, the predictor of high school completion with the largest effect size was not having a child or expecting a child by tenth grade. Predictors also vary by racial/ethnic subgroups and outcomes.

These findings suggest that myriad factors affect educational attainment. Thus, they appear to align well with the broad focus of integrated student supports' approaches. This chapter is organized into three main sections. First, we discuss the results of our model predicting high school graduation. As in Chapter III, results are organized according to the following ecological domains: individual, family, peer, and school. In the initial section, we include a discussion of differences in predictors by racial/ethnic subgroups. Next, we discuss our secondary analyses which pertain to a similar statistical model predicting postsecondary enrollment. We then include a global discussion section that highlights the malleability of factors we identified as important for educational success. Finally, we close with a discussion of the implications of our results, the limitations of our analyses, and directions for additional research .

Methodology

In order to identify the malleable factors with the largest effects on high school graduation and postsecondary enrollment, we created statistical models using a nationally representative sample of students in the U. S. Our analyses were based on data from the National Educational Longitudinal Study of 1988 restricted-use data files (NELS:88, hereafter referred to as NELS). NELS is a longitudinal study that collected nationally representative data on a large sample of individual students, their parents, teachers, and schools, from a single-grade cohort of students over time. Students from the 8th grade class of 1988 were followed for 12 years after their completion of eighth grade (seven years after they would have entered postsecondary education, if they had graduated high school on-time and enrolled in a postsecondary institution in the first fall semester thereafter).

The NELS outcome variables of interest were on-time high school completion and postsecondary enrollment. On-time high school completion is defined as earning a high school diploma in sequence (four years after eighth grade) or earlier. Postsecondary enrollment refers to enrollment in any type of postsecondary education within the time period of the study, or eight years after on-time high school completion. Predictor variables include individual, parent and family, peer, and school factors. Community and policy factors were not available in NELS to include in the models.

The NELS data files contain over 7,500 variables. Based on our literature review (see Chapter III), we selected or created 154 high-potential variables from NELS. Some of these variables are individual items while others are scales containing multiple items measuring the same construct. We ran a series of logistic regressions to select the most powerful predictors of high school completion to include in our final models. Selecting fewer variables helped us avoid multicollinearity in the final models. In this series of multiple regression analyses employing complex sampling structure to address the nesting of the sample members in schools, employing multiple imputation, we modeled high school completion as a function of each candidate predictor variable separately, controlling only for gender, race, and socioeconomic status. We kept candidate variables in the final model if they were statistically significant predictors of high school graduation and they had an effect size that was small, medium, or large (see Appendix IVA for definitions). Several additional variables were included in the final model based upon recommendations from our advisory group.

We included 58 explanatory variables simultaneously in a final set of logistic regressions predicting high school completion and postsecondary enrollment. These models showed which factors directly predicted the outcomes and the size of the effect each factor had after taking into account the influence of each other factor. In the text, we discuss factors that are significant at the 0.05 level. We also discuss whether factors reached the small effect size threshold. An effect size is considered small if its OR is in the range of 1.44-2.47, medium in 2.48-4.25, and large if greater than 4.25 (Chinn, 2000). An-depth discussion of the methods behind our analysis can be found in Appendix IVA.

FACTORS PREDICTING HIGH SCHOOL GRADUATION

Individual Factors

Academic achievement. As expected, academic achievement predicts high school graduation (see table IV1, model 2). Both of our measures of academic achievement—a standardized math achievement test score from 8th grade and student-reported 8th grade GPA—were significant predictors of on-time graduation. The math test score had a small effect size while GPA did not meet our cut-off for small effects.

Attitudes toward learning. Our literature review found that academic self-concept, self-efficacy, and social and emotional competence were important. Our analyses were not able to directly test this hypothesis, as variables in NELS did not line up exactly with these concepts. Of the variables we were able to test, however, internal locus of control, importance of good grades to student, and the student thinking that the subjects he/she is taking are interesting were

significant predictors of graduation. However, no factors in this category had effect sizes that reached the criteria for a small effect size.

Academic behaviors. Academic behaviors were found to be very important in our literature review, with behavior in and out of class and attendance/engagement emerging as two of the most promising factors. Our analyses lend support to this claim. Experiencing few disciplinary issues, often completing homework, often being attentive, and rarely being absent were all significantly predictive of graduating high school on time. However, these effect sizes did not reach our cut-off for small effects.

Extracurricular involvement. The research reviewed in Chapter III found that participating in extracurricular activities is generally related to strong academic performance. Our analyses support this conclusion: participating in extracurricular activities in tenth grade is related to higher odds of graduation. Spending five or more hours on extracurricular activities met the threshold for a small effect. No statistically significant relationship with high school graduation was found for eighth grade extracurricular participation or tenth grade hours worked at a job.

Interpreting Odds Ratios and Effect Sizes

We present results from our models in the form of odds ratios. An odds ratio of one means there is no independent effect of the predictor variable on the outcome variable. An odds ratio statistically significantly higher than 1 signifies a positive relationship between a predictor and an outcome. To facilitate comparisons, we have recoded all independent variables so that their relationship with the outcome is in the positive direction.

Effect size refers to the magnitude of the relationship between a predictor and an outcome. The larger the effect size, the larger the effect that the predictor has on the outcome. In the text, we discuss whether effect sizes met cutoffs for small, medium, and large, as defined in the literature. Note that many effect sizes are very small. For more information, see Appendix IVA.

Individual-level risk factors. Finally, our analyses examined several individual-level risk factors. In contrast to our literature review, we did not find that having a disability was related to high school completion. Not having or expecting a child in tenth grade, however, was the predictor with the largest effect size (medium) of all factors examined. A student without a child had 3.80 times higher odds of graduating high school on time than did a student with or expecting a child.

Family Factors

Family-level factors were found to be very important in the literature review. We hypothesized that parental educational expectations, parenting style, parenting behaviors, and parent involvement in schools would predict high school graduation. These predictions were not well supported by our analyses.

Having a traditional family composition of a biological mother and father in eighth grade was significantly related to high school completion, though the effect size did not meet the threshold for small (OR=1.36).[2] Immigration status and being homeless in the past two years, surprisingly, were not related to graduation.

In the domain of parental expectations, involvement, and behavior, one factor was significantly related to high school completion: parents not checking homework in eighth grade. While this finding may seem counter-intuitive, it may be that parents of eighth graders only check homework for students who are struggling. This effect did not meet the threshold for a small effect size. Similarly, regarding parental involvement in school, only one factor was significant: parent does not contact school about academics. This effect did not meet the threshold for a small effect size.

Peer Factors

Based on the research reviewed, we did not expect that peer factors would be strongly predictive of on-time high school completion. The analyses revealed, however, that having a small number of close friends who dropped out of high school and having a positive peer academic influence predict high school graduation, though with less than small effects.

2 Less common family compositions, such as adoptive or same sex parents, were not tested in this analysis due to small sample sizes.

School Factors

At the school level, the reviewed literature states that average school achievement and school climate are related to academic success. While we did not have a direct measure of average school achievement, we predicted that measures of school climate would be predictive of high school completion. Students who attended a school with a higher percentage of students who did not receive Free and Reduced-Price Meal services were more likely to graduate, though this effect did not meet the threshold for small. None of our measures of school climate were significantly related to high school graduation.

Many important factors, few large effects

Eighteen factors in the model emerged as significant predictors of high school completion, net of all other factors included in the model. Their effect sizes ranged from 1.12 to 3.80.
Three of these predictors had small or larger effect sizes. In descending order, the predictors with the largest effect sizes were:

- Not having or expecting a child in tenth grade;
- Spending five or more hours per week on extracurricular activities; and
- Eighth grade math test score.

The fifteen other factors, with less-than-small effect sizes were:

- Traditional family composition;
- Being rarely absent;
- Spending up to four hours per week on extracurricular activities;
- Eighth grade GPA;
- Importance of good grades to student;
- Absence of close friends who dropped out;
- Internal locus of control;
- Often being attentive in class;
- Percentage of students who do not receive Free and Reduced-Meals;
- Completing homework often;
- Parent rarely checking homework;
- Parent not contacting school about academics;
- Student thinking the subjects he/she is taking are interesting/challenging;
- Having few disciplinary issues; and
- Positive peer academic influence.

Table IV.1. Predictors of High School Graduation of 1988 Eighth Graders

Predictors	Model 1: High school graduation (8th grade variables only) Coeff.	SE	p	OR	UCI	LCI	Model 2: High school graduation (8th and 10th grade variables) Coeff.	SE	p	OR	UCI	LCI
Individual-level factors												
Academic Achievement												
Math standardized score (8th)	0.43	0.068	***	1.54	1.76	1.35	0.37	0.0744	***	1.45	1.67	1.25
GPA (8th)	0.39	0.072	***	1.48	1.70	1.28	0.23	0.0666	***	1.25	1.43	1.10
Attitudes Towards Learning												
How far student thinks he/she will go in school (8th)	0.11	0.065		1.11	1.27	0.98	0.07	0.0676		1.07	1.22	0.94
Sureness of going farther than HS (8th)	0.11	0.058		1.11	1.25	0.99	0.04	0.0605		1.04	1.17	0.92
Internal locus of control (8th)	0.13	0.064	*	1.14	1.29	1.00	0.18	0.071	*	1.19	1.37	1.04
Willingness to ask questions in class (8th)	-0.06	0.048		0.94	1.04	0.86	-0.03	0.0547		0.97	1.08	0.87
Self concept (8th)	-0.03	0.058		0.97	1.09	0.87	-0.08	0.0649		0.92	1.04	0.81
Importance of good grades to student (10th)							0.21	0.0552	***	1.23	1.37	1.11
Student believes it is okay to ask challenging questions (10th)							-0.18	0.1531		0.83	1.12	0.62
Student believes it is okay to help others with school work (10th)							0.01	0.16		1.01	1.38	0.74
Student believes it is okay to solve problems using new ideas (10th)							-0.07	0.1821		0.93	1.33	0.65
Student believes it is okay to work hard for good grades (10th)							#	0.2633		1.00	1.68	0.60
Student thinks the subjects he/she is taking are interesting/ challenging (10th)							0.13	0.0555	*	1.14	1.27	1.02
Academic Behaviors												
Student has experienced few disciplinary issues (8th)	0.26	0.050	***	1.29	1.43	1.17	0.12	0.0516	*	1.13	1.24	1.02
Student comes to class prepared (8th)	0.02	0.051		1.02	1.13	0.92	-0.04	0.0556		0.96	1.08	0.87
Teacher rating: Student does homework often (8th)	0.18	0.059	**	1.19	1.34	1.06	0.16	0.065	*	1.17	1.33	1.03
Teacher rating: Student is often attentive (8th)	0.11	0.057	*	1.12	1.25	1.00	0.17	0.0619	**	1.19	1.34	1.05
Teacher rating: Student is rarely disruptive (8th)	0.03	0.058		1.03	1.16	0.92	0.05	0.0607		1.05	1.18	0.93
Teacher rating: Student is rarely absent (8th)	0.35	0.052	***	1.42	1.57	1.29	0.26	0.0563	***	1.30	1.45	1.16
Teacher rating: Student is rarely tardy (8th)	-0.08	0.052		0.93	1.03	0.84	-0.04	0.0562		0.96	1.07	0.86
Teacher rating: Student works hard (8th)	#	0.060		1.00	1.12	0.89	-0.01	0.0643		0.99	1.13	0.88
Ever took an AP course (10th)							0.17	0.1548		1.18	1.60	0.87
Never took remedial courses in math or English (10th)							0.22	0.1217		1.24	1.58	0.98
Extracurricular Involvement												
Student participates in non-school extracurriculars (8th)	0.09	0.126		1.10	1.40	0.86	0.04	0.1303		1.04	1.35	0.81
Student participates in school sponsored extracurricular activities (8th)	0.12	0.147		1.12	1.50	0.84	0.04	0.1578		1.04	1.41	0.76
Time spent on extracurricular activities (10th) (none)												
More than 0 and less than 4 hours per week							0.25	0.1161	*	1.29	1.62	1.03
5 or more hours per week							0.72	0.1616	***	2.05	2.81	1.49
Hours worked per week during school year (none) (10th)												
10 or fewer hours per week							0.17	0.1841		1.18	1.69	0.82
11 or more hours per week							-0.09	0.1158		0.92	1.15	0.73
Risk Factors												
Student does not have a disability (8th)	-0.06	0.149		0.94	1.26	0.70	-0.07	0.1564		0.93	1.27	0.69
Student did not use a drug within the last 30 days (10th)							0.18	0.1207		1.19	1.51	0.94
Not having or expecting children of your own (10th)							1.34	0.2242	***	3.80	5.90	2.45
Family-level factors												
Family Context												
Student was not born in the US (8th)	-0.15	0.261		0.86	1.43	0.51	0.09	0.2485		1.09	1.77	0.67
Traditional family composition (biological mother + father) (8th)	0.53	0.106	***	1.70	2.09	1.38	0.31	0.111	**	1.36	1.69	1.09
Family was not homeless in past 2 years (10th)							0.10	0.5758		1.11	3.42	0.36
Parental expectations, involvement, and behavior												
Student talks to father about planning for HS program (Never) (8th)												
Once or twice	0.08	0.124		1.09	1.39	0.85	0.12	0.1329		1.12	1.46	0.87
Three or more times	-0.20	0.155		0.82	1.11	0.61	-0.04	0.1615		0.96	1.32	0.70
Student talks to mother about planning for HS program (Never) (8th)												
Once or twice	0.10	0.165		1.11	1.53	0.80	0.01	0.1815		1.01	1.45	0.71
Three or more times	-0.20	0.214		0.81	1.24	0.54	-0.19	0.2366		0.83	1.32	0.52
Parent knows parents of child's friend (8th)	0.01	0.117		1.01	1.27	0.81	0.02	0.1254		1.02	1.30	0.80
Parent has discussions with child about HS (8th)	0.05	0.052		1.05	1.16	0.95	0.04	0.0542		1.05	1.16	0.94
Parent has high expectations of students' educational attainment (8th)	0.06	0.073		1.06	1.22	0.92	-0.03	0.072		0.97	1.11	0.84
Parent has rules about homework, GPA, and chores (8th)	0.01	0.055		1.01	1.13	0.91	#	0.0561		1.00	1.11	0.89
Parent talks to child often about post-HS plans (8th)	0.04	0.060		1.04	1.17	0.92	0.05	0.0644		1.05	1.20	0.93
Student has discussions with parents about school (8th)	0.10	0.079		1.11	1.29	0.95	0.04	0.0825		1.04	1.22	0.88
Student perception about rules about TV, friends, and chores (8th)	0.02	0.056		1.02	1.14	0.91	#	0.059		1.00	1.12	0.89
Student reports parent rarely checks his/her homework (8th)	0.12	0.053	*	1.13	1.26	1.02	0.14	0.0563	*	1.15	1.29	1.03
Parent involvement in school												
Parent attends parent-teacher organization meetings (8th)	-0.06	0.132		0.94	1.22	0.73	-0.14	0.1407		0.87	1.15	0.66
Parent is involved in parent teacher organization meetings (8th)	0.12	0.077		1.13	1.32	0.97	0.11	0.0803		1.12	1.31	0.96
Parent does not contact school about academics (8th)	0.13	0.058	*	1.14	1.28	1.02	0.14	0.0583	*	1.15	1.28	1.02
Parental involvement (8th)	0.06	0.049		1.06	1.17	0.96	0.03	0.0496		1.03	1.13	0.93
Peer-level factors												
Absences of close friends who dropped out of school (10th)							0.18	0.0402	***	1.20	1.29	1.11
Positive peer academic influence (10th)							0.12	0.0538	*	1.12	1.25	1.01
School-level factors												
School characteristics												
Student attends a private school in 8th grade (compared to a public school)	-0.03	0.203		0.97	1.44	0.65	-0.08	0.203		0.92	1.38	0.62
Percent of students who do not receive FRPM (8th)	0.16	0.058	**	1.17	1.32	1.05	0.16	0.0594	**	1.18	1.32	1.05
School climate												
School engagement (8th)	-0.04	0.050		0.96	1.06	0.87	-0.04	0.0571		0.96	1.07	0.86
Poor school environment (8th)	-0.04	0.050		0.96	1.06	0.87	0.01	0.052		1.01	1.12	0.91
Students are not expected to do homework (8th)	-0.04	0.071		0.96	1.11	0.84	-0.07	0.0711		0.94	1.08	0.81
Teachers do not press students to achieve (8th)	0.07	0.069		1.07	1.22	0.93	0.06	0.0698		1.07	1.22	0.93
There is conflict between teachers and administrators (8th)	0.08	0.049		1.09	1.20	0.99	0.09	0.0503		1.09	1.21	0.99
Parents are notified of unexcused absences on the same day the absence occurs (10th)							-0.01	0.1255		0.99	1.27	0.78
Students report that teachers expect student to succeed in school (10th)							-0.02	0.0539		0.98	1.09	0.88
Demographic control variables												
Gender (Female)	-0.28	0.114	*	0.76	0.95	0.61	-0.15	0.1202		0.86	1.09	0.68
Race/ethnicity (White)												
Black	0.26	0.188		1.30	1.87	0.90	-0.01	0.1876		0.99	1.43	0.69
Hispanic	0.01	0.169		1.01	1.41	0.73	-0.10	0.1855		0.90	1.30	0.63
Other	-0.10	0.173		0.90	1.27	0.64	-0.31	0.1785		0.73	1.04	0.52
Socio-economic status	0.44	0.093	***	1.55	1.85	1.29	0.39	0.0933	***	1.47	1.77	1.23

Rounds to zero
* p<0.05 ** p<0.01 *** p<0.001
N= 10,830
SOURCE: 1988/2000 National Education Longitudinal Study (NELS) Restricted Use Data Files

PREDICTING HIGH SCHOOL COMPLETION FOR RACIAL/ETHNIC SUBGROUPS

Due to smaller samples of black and Hispanic students, we reduced the variable set when running subgroup analyses.[3] When we re-ran the results for the overall sample of students, they were very similar.[4] Despite reducing the variable set, the reduced power available when running analyses on a smaller sample (n=900 for black students, n=1,410 for Hispanic students) may lead to some factors being statistically insignificant predictors.

Predictors of High School Completion for Black Students

Individual factors. At the individual level, five factors emerged as predictors of high school completion for black students (see Table IV.2., Model 2a). With small effect sizes, teachers reporting that the student often completes homework and participates in extracurricular activities up to four hours per week in tenth grade were predictive of on-time graduation.

With a medium effect size, students who participate in non-school extracurricular activities in eighth grade were less likely to graduate from high school on time. This finding appears to be in contrast with the finding that students who participate in extracurriculars up to four hours per week in tenth grade are more likely to graduate on time. The key difference here may be the sponsor of the activities in eighth grade or that participation is more common in eighth grade.

With large effect sizes, the odds of black students who took an AP course by tenth grade graduating from high school on time were 4.3 times that of students who did not take an AP course. The predictor with the largest effect on graduation was not having or expecting a child in tenth grade. The odds of graduating for black students who did not have a child by tenth grade were 4.5 times that of black students who had a child.

Extra-individual factors. None of the factors at the family, peer, or school levels were predictive of high school graduation for black students.

Predictors of High School Completion for Hispanic Students

Individual factors. Eight individual-level factors predicted high school completion for Hispanic students (see Table IV.2., Model 2b). Many of these factors had less than small effect sizes. The attitudinal predictors, all with less than small effect sizes, were internal locus of control and importance of good grades to student. Behavioral predictors in this category were experiencing few disciplinary issues, often completing homework, and rarely being absent. Students thinking the subjects he/she is taking are interesting/challenging predicted high school completion for Hispanic students with a small effect size.

With a large effect size, not having or expecting a child by tenth grade was the predictor with the largest effect size. The odds of high school graduation for a Hispanic student without a child were 7.7 times that of a Hispanic student with a child.

Extra-individual factors. No family or school factors predicted high school graduation for Hispanic students. Having a positive peer academic influence was predictive; however, the effect size did not meet the threshold for small.

Differences in Magnitude of Predictors

The magnitude of the impact of most predictors is similar for the three groups of students: all students, black students, and Hispanic students. There are some interesting, and potentially policy-relevant differences, however:

- Students thinking that the subjects they take are interesting/challenging had larger impacts on Hispanics' graduation rates than that of the general study body or black students.
- Often completing homework had a larger impact on the graduation rates of black students than that of the general student body.

3 Based on the magnitude of the odds ratios listed in Appendix Table IVA-1., the following variables were dropped: parent involvement in parent teacher organization meetings, student believing it is okay to solve problems using new ideas, teachers not pressing students to achieve, parental educational expectations, self-concept, student's sureness of continuing education after high school, teacher-rated student's hard work, teacher-rated student attentiveness, teacher-rated student disruptiveness, student talking to father about planning for high school program, parent often talking to child about post-high school plans, and student having discussions with parents about school.

4 In the full-sample model with fewer variables, two variables lost significance: positive peer academic influence and students thinking the subjects they are taking are challenging/interesting. Two variables became significant predictors of high school completion: student educational expectations and working up to 10 hours per week.

Table IV.2. Predictors of High School Graduation of 1988 Black and Hispanic Eighth Graders

Predictor	Model 2a: High school graduation Black students (8th and 10th grade variables) Coeff.	SE	p	OR	UCI	LCI	Model 2b: High school graduation Latino students (8th and 10th grade variables) Coeff.	SE	p	OR	UCI	LCI
Individual-level factors												
Academic Achievement												
Math standardized score (8th)	0.59	0.394		1.81	3.92	0.84	0.18	0.162		1.19	1.64	0.87
GPA (8th)	0.33	0.171		1.39	1.94	0.99	0.29	0.180		1.34	1.91	0.94
Attitudes Towards Learning												
How far student thinks he/she will go in school (8th)	-0.05	0.149		0.95	1.27	0.71	0.10	0.117		1.10	1.39	0.88
Sureness of going farther than HS (8th)												
Internal locus of control (8th)	0.29	0.175		1.33	1.88	0.95	0.21	0.104	*	1.23	1.51	1.01
Willingness to ask questions in class (8th)	-0.07	0.144		0.93	1.23	0.70	0.09	0.108		1.09	1.35	0.89
Self concept (8th)												
Importance of good grades to student (10th)	#	0.168		1.00	1.38	0.72	0.31	0.138	*	1.37	1.80	1.05
Student believes it is okay to ask challenging questions (10th)	0.75	0.427		2.11	4.87	0.91	0.21	0.469		1.24	3.11	0.49
Student believes it is okay to help others with school work (10th)	0.51	0.448		1.66	4.00	0.69	-0.02	0.534		0.98	2.78	0.34
Student believes it is okay to solve problems using new ideas (10th)												
Student believes it is okay to work hard for good grades (10th)	-1.69	1.862		0.19	7.13	#	0.84	1.060		2.32	18.52	0.29
Student thinks subjects he/she is taking are interesting/ challenging (10th)	0.02	0.149		1.02	1.36	0.76	0.43	0.112	***	1.53	1.91	1.23
Academic Behaviors												
Student has experienced few disciplinary issues (8th)	0.13	0.125		1.14	1.46	0.90	0.21	0.096	*	1.23	1.49	1.02
Student comes to class prepared (8th)	0.04	0.163		1.04	1.43	0.76	-0.04	0.108		0.97	1.19	0.78
Teacher rating: Student does homework often (8th)	0.58	0.120	***	1.78	2.25	1.41	0.24	0.124	*	1.28	1.63	1.00
Teacher rating: Student is often attentive (8th)												
Teacher rating: Student is rarely disruptive (8th)												
Teacher rating: Student is rarely absent (8th)	0.25	0.165		1.28	1.77	0.93	0.27	0.130	*	1.31	1.69	1.02
Teacher rating: Student is rarely tardy (8th)	-0.01	0.105		0.99	1.21	0.80	-0.11	0.094		0.90	1.08	0.75
Teacher rating: Student works hard (8th)												
Ever took an AP course (10th)	1.47	0.521	**	4.33	12.01	1.56	0.13	0.336		1.14	2.21	0.59
Never took remedial courses in math or English (10th)	0.70	0.356		2.01	4.03	1.00	0.01	0.287		1.01	1.76	0.57
Extracurricular Involvement												
Student participates in non-school extracurriculars (8th)	-0.91	0.334	**	0.40	0.77	0.21	0.05	0.290		1.05	1.85	0.59
Student participates in school sponsored extracurricular activities (8th)	0.79	0.521		2.21	6.14	0.80	-0.29	0.304		0.75	1.35	0.41
Time spent on extracurricular activities (10th) (none)												
More than 0 and less than 4 hours per week	0.83	0.340	*	2.28	4.45	1.17	0.26	0.302		1.29	2.34	0.72
5 or more hours per week	0.30	0.500		1.35	3.61	0.51	0.56	0.323		1.75	3.29	0.93
Hours worked per week during school year (none) (10th)												
10 or fewer hours per week	0.75	0.823		2.11	10.58	0.42	-0.06	0.439		0.94	2.22	0.40
11 or more hours per week	0.30	0.327		1.35	2.57	0.71	-0.19	0.283		0.83	1.44	0.47
Risk Factors												
Student does not have a disability (8th)	-0.51	0.402		0.60	1.32	0.27	0.02	0.350		1.02	2.02	0.51
Student did not use a drug within the last 30 days (10th)	-0.14	0.348		0.87	1.72	0.44	0.38	0.337		1.46	2.83	0.75
Not having or expecting children of your own (10th)	1.51	0.462	**	4.51	11.16	1.83	2.04	0.539	***	7.70	22.13	2.68
Family-level factors												
Family Context												
Student was not born in the US (8th)	0.67	1.054		1.95	15.40	0.25	0.30	0.328		1.35	2.57	0.71
Traditional family composition (biological mother + father) (8th)	0.04	0.313		1.04	1.93	0.57	0.38	0.227		1.46	2.27	0.93
My family was not homeless in past 2 years (10th)	0.54	2.565		1.72	262.84	0.01	1.33	1.113		3.78	33.51	0.43
Parental expectations, involvement, and behavior												
Student talks to father about planning for HS program (Never) (8th)												
Once or twice												
Three or more times												
Student talks to mother about planning for HS program (Never) (8th)												
Once or twice	-0.05	0.540		0.95	2.74	0.33	-0.22	0.384		0.80	1.71	0.38
Three or more times	-0.62	0.533		0.54	1.52	0.19	-0.10	0.362		0.90	1.83	0.44
Parent knows parents of child's friend (8th)	0.01	0.274		1.01	1.73	0.59	-0.36	0.255		0.70	1.15	0.42
Parent has discussions with child about HS (8th)	-0.05	0.126		0.96	1.22	0.75	0.13	0.087		1.14	1.36	0.96
Parent has high expectations of students' educational attainment (8th)												
Parent has rules about homework, GPA, and chores (8th)	0.26	0.143		1.29	1.71	0.98	-0.10	0.129		0.91	1.17	0.70
Parent talks to child often about post-HS plans (8th)												
Student has discussions with parents about school (8th)												
Student perception about rules about TV, friends, and chores (8th)	0.07	0.126		1.07	1.37	0.84	-0.06	0.122		0.94	1.19	0.74
Student reports parent rarely checks his/her homework (8th)	0.29	0.186		1.34	1.93	0.93	0.21	0.122		1.23	1.56	0.97
Parent involvement in school												
Parent attends parent-teacher organization meetings (8th)	0.34	0.279		1.40	2.42	0.81	-0.37	0.255		0.69	1.13	0.42
Parent is involved in parent teacher organization meetings (8th)												
Parent does not contact school about academics (8th)	0.07	0.208		1.07	1.61	0.71	0.07	0.111		1.07	1.33	0.86
Parental involvement (8th)	-0.21	0.125		0.81	1.03	0.63	0.23	0.120		1.25	1.58	0.99
Peer-level factors												
Absences of close friends who dropped out of school (10th)	#	0.119		1.00	1.26	0.79	0.16	0.128		1.17	1.50	0.91
Positive peer academic influence (10th)	0.16	0.178		1.18	1.67	0.83	0.31	0.126	*	1.36	1.74	1.06
School-level factors												
School characteristics												
Student attends a private school in 8th grade (compared to a public school)	1.78	1.031		5.90	44.53	0.78	0.65	0.544		1.91	5.55	0.66
Percent of students who do not receive FRPM (8th)	0.11	0.137		1.11	1.46	0.85	0.04	0.111		1.04	1.29	0.84
School climate												
School engagement (8th)	-0.03	0.168		0.97	1.34	0.70	-0.05	0.141		0.95	1.26	0.72
Poor school environment (8th)	0.15	0.139		1.17	1.53	0.89	0.01	0.140		1.01	1.33	0.77
Students are not expected to do homework (8th)	0.04	0.133		1.04	1.35	0.80	-0.06	0.121		0.94	1.19	0.74
Teachers do not press students to achieve (8th)												
There is conflict between teachers and administrators (8th)	0.17	0.121		1.18	1.50	0.93	0.09	0.120		1.10	1.39	0.87
Parents notified of unexcused absences on same day absence occurs (10th)	0.21	0.374		1.23	2.57	0.59	0.16	0.385		1.17	2.49	0.55
Students report that teachers expect student to succeed in school (10th)	#	0.155		1.00	1.36	0.74	-0.22	0.119		0.81	1.02	0.64
Demographic control variables												
Gender (Female)	-0.35	0.340		0.70	1.37	0.36	-0.18	0.307		0.83	1.52	0.46
Socio-economic status	0.01	0.275		1.01	1.73	0.59	0.82	0.193	***	2.26	3.31	1.55

Rounds to zero

* p<0.05 ** p<0.01 *** p<0.001

N for black students=900, N for Latino students=1,410

SOURCE: 1988/2000 National Education Longitudinal Study (NELS) Restricted Use Data Files

- Taking an AP course had a larger impact on the graduation rates of black students than that of the general student body or Hispanic students.
- The detrimental impact of participating in non-school extracurricular activities, such as scouting, youth groups, or summer programs, in eighth grade was larger for black students than Hispanic students or the overall student body. There was no relationship between participating in non-school extracurricular activities for Hispanic students or the general student body.
- Socioeconomic status had a larger impact on the odds of graduation for Hispanic students than the general student body or for black students.

FACTORS PREDICTING POSTSECONDARY ENROLLMENT

While graduating from high school increases students' chances of success later in life, a postsecondary degree is even more powerful at predicting their long term success and health, as emphasized in Chapter I of this paper. In this analysis, postsecondary enrollment refers to enrollment in any type of postsecondary education within eight years after on-time high school completion. The analysis focuses on enrollment, rather than completion, because it is more directly related to secondary schooling.

Predictors of postsecondary enrollment have smaller effect sizes

Seventeen factors significantly predicted postsecondary enrollment. Their effect sizes ranged from 1.09 to 2.48. Two of these predictors had small or larger effect sizes.

The predictive factor with the largest effect size was attending a private school in 8th grade followed by talking with mother 1 or 2 times about planning for high school.

The fifteen other factors, with less-than-small effect sizes were:

- Never taking remedial math or English;
- Spending 5 or more hours per week on extracurriculars;
- Taking an AP course;
- Eighth grade math test score;
- Student educational expectations;
- Parental educational expectations;
- School engagement;
- Teachers not pressing students to achieve;
- Importance of good grades to student;
- Absence of close friends who dropped out;
- Working hard;
- Internal locus of control;
- Positive peer academic influence;
- Being rarely absent; and
- Parent involvement in school

Individual Factors

Academic achievement. Academic achievement, as measured in eighth grade, did not have as clear a relationship with postsecondary enrollment as it did with high school graduation (see Table IV.3., Model 4). A standardized math test was significantly related to enrollment, while GPA was not. The effect size associated with the math score was less than small.

Attitudes towards learning. Few factors in the domain of attitudes towards learning were significantly related to postsecondary enrollment. The factors that are significant predictors are framed in a more long-term perspective: how far a student thinks he/she will go in school, internal locus of control, and importance of good grades to students. None of these factors, however, met the cut-off for a small or larger effect size.

Academic behaviors. The teacher-reported behaviors of rarely being absent and working hard were significant predictors of postsecondary enrollment, with less than small effect sizes. In addition, taking an AP course and not taking remedial courses in math or English predicted enrollment. The effect sizes associated with course taking were larger than those for the teacher-reported behaviors, but they were less than small.

Extracurricular participation. Regarding extracurricular participation, spending five or more hours per week in tenth grade was linked with improved odds of enrolling in postsecondary education with a slightly less than small effect size. Participating for less than four hours, working, and eighth grade participation had no influence on enrollment.

Individual-level risk factors. None of our three risk factors predicted postsecondary enrollment. This includes not having or expecting a child in tenth grade—the factor with the largest effect size when predicting high school completion.

Family Factors

Very few family-level factors predicted postsecondary enrollment. Students who talked with their mother once or twice about planning for high school (compared with zero discussions) were more likely to enroll in postsecondary education than students who did not talk to their mother at all about planning for high school. This effect size was small. Students whose parents had high expectations for their educational attainment and whose parents were involved in their schools in eighth grade were also more likely to enroll in postsecondary education, though effect sizes were less than small for these two factors.

Peer Factors

Both of the examined peer factors predicted enrollment in postsecondary education. Having a small number of close friends who dropped out and having positive peer academic influence were related to enrollment, though effect sizes did not meet the cutoff for small effects.

School Factors

Although school climate factors did not influence high school graduation, it appears that they are associated with postsecondary enrollment. Students who perceived their school to have high levels of school engagement were less likely to enroll in postsecondary institutions. This effect was less than small.

Students who reported that teachers in their school do not press students to achieve were more likely to continue their education after high school. Again, this factor had an effect size smaller than the threshold for small effects. One potential explanation for this counterintuitive finding is that if a student perceives low academic press, they may already have a high internal drive to achieve.

Though private school students were not more likely to graduate from high school, they were more likely to enroll in postsecondary education than public school students, with a small effect size.

Table IV.3. Predictors of any Postsecondary Enrollment of 1988 Eighth Graders

	Model 3: Postsecondary Enrollment (8th grade variables only)						Model 4: Postsecondary Enrollment (8th and 10th grade variables)					
Predictors	**Coeff.**	**SE**	**p**	**OR**	**UCI**	**LCI**	**Coeff.**	**SE**	**p**	**OR**	**UCI**	**LCI**
Individual-level factors												
Academic Achievement												
Math standardized score (8th)	0.36	0.072	***	1.44	1.66	1.25	0.30	0.075	***	1.35	1.57	1.17
GPA (8th)	0.15	0.059	**	1.17	1.31	1.04	0.06	0.062		1.06	1.19	0.94
Attitudes Towards Learning												
How far student thinks he/she will go in school (8th)	0.27	0.059	***	1.30	1.46	1.16	0.24	0.059	***	1.28	1.43	1.14
Sureness of going farther than HS (8th)	0.12	0.056	*	1.13	1.26	1.01	0.09	0.056		1.10	1.22	0.98
Internal locus of control (8th)	0.13	0.057	*	1.14	1.28	1.02	0.13	0.057	*	1.14	1.27	1.02
Willingness to ask questions in class (8th)	0.07	0.047		1.07	1.17	0.97	0.07	0.047		1.08	1.18	0.98
Self concept (8th)	-0.05	0.057		0.95	1.07	0.85	-0.07	0.057		0.94	1.05	0.84
Importance of good grades to student (10th)							0.15	0.049	**	1.16	1.28	1.05
Student believes it is okay to ask challenging questions (10th)							-0.22	0.194		0.80	1.17	0.55
Student believes it is okay to help others with school work (10th)							-0.04	0.204		0.96	1.43	0.64
Student believes it is okay to solve problems using new ideas (10th)							0.05	0.186		1.05	1.51	0.73
Student believes it is okay to work hard for good grades (10th)							-0.16	0.259		0.85	1.41	0.51
Student thinks the subjects he/she is taking are interesting/ challenging (10th)							0.06	0.056		1.06	1.18	0.95
Academic Behaviors												
Student has experienced few disciplinary issues (8th)	0.13	0.046	**	1.14	1.24	1.04	0.09	0.047		1.09	1.20	1.00
Student comes to class prepared (8th)	-0.05	0.044		0.95	1.04	0.87	-0.07	0.047		0.93	1.02	0.85
Teacher rating: Student does homework often (8th)	0.04	0.066		1.04	1.18	0.92	0.02	0.064		1.02	1.16	0.90
Teacher rating: Student is often attentive (8th)	-0.01	0.060		0.99	1.11	0.88	#	0.060		1.00	1.13	0.89
Teacher rating: Student is rarely disruptive (8th)	#	0.051		1.00	1.11	0.91	0.01	0.051		1.01	1.11	0.91
Teacher rating: Student is rarely absent (8th)	0.15	0.047	**	1.16	1.27	1.05	0.11	0.046	*	1.11	1.22	1.02
Teacher rating: Student is rarely tardy (8th)	-0.04	0.054		0.96	1.06	0.86	-0.01	0.053		0.99	1.10	0.89
Teacher rating: Student works hard (8th)	0.15	0.072	*	1.17	1.34	1.01	0.13	0.066	*	1.14	1.30	1.01
Ever took an AP course (10th)							0.31	0.125	*	1.37	1.75	1.07
Never took remedial courses in math or English (10th)							0.36	0.098	***	1.44	1.74	1.19
Extracurricular Involvement												
Student participates in non-school extracurriculars (8th)	0.08	0.115		1.08	1.35	0.86	0.02	0.118		1.02	1.29	0.81
Student participates in school sponsored extracurricular activities (8th)	-0.03	0.158		0.97	1.32	0.71	-0.06	0.155		0.94	1.28	0.69
Time spent on extracurricular activities (10th) (none)												
More than 0 and less than 4 hours per week							0.08	0.104		1.08	1.33	0.88
5 or more hours per week							0.36	0.144	*	1.43	1.90	1.08
Hours worked per week during school year (none) (10th)												
10 or fewer hours per week							0.09	0.150		1.09	1.46	0.81
11 or more hours per week							-0.01	0.098		0.99	1.21	0.82
Risk Factors												
Student does not have a disability (8th)	0.08	0.129		1.08	1.39	0.84	0.08	0.132		1.08	1.40	0.83
Student did not use a drug within the last 30 days (10th)							-0.08	0.098		0.92	1.12	0.76
Not having or expecting children of your own (10th)							0.13	0.227		1.14	1.77	0.73
Family-level factors												
Family Context												
Student was not born in the US (8th)	0.23	0.235		1.26	1.99	0.79	0.24	0.243		1.27	2.04	0.79
Traditional family composition (biological mother + father) (8th)	0.04	0.099		1.04	1.26	0.86	-0.03	0.098		0.98	1.18	0.81
Family was not homeless in past 2 years (10th)							-0.08	0.527		0.93	2.60	0.33
Parental expectations, involvement, and behavior												
Student talks to father about planning for HS program (Never) (8th)												
Once or twice	-0.19	0.123		0.83	1.05	0.65	-0.21	0.123		0.81	1.03	0.64
Three or more times	-0.26	0.150		0.77	1.04	0.58	-0.20	0.153		0.82	1.10	0.60
Student talks to mother about planning for HS program (Never) (8th)												
Once or twice	0.39	0.188	*	1.47	2.13	1.02	0.40	0.183	*	1.49	2.14	1.04
Three or more times	0.34	0.218		1.40	2.15	0.92	0.41	0.211		1.50	2.27	0.99
Parent knows parents of child's friend (8th)	0.15	0.105		1.17	1.43	0.95	0.16	0.108		1.17	1.45	0.95
Parent has discussions with child about HS (8th)	#	0.054		1.00	1.11	0.90	#	0.054		1.00	1.11	0.90
Parent has high expectations of students' educational attainment (8th)	0.27	0.055	***	1.30	1.45	1.17	0.23	0.055	***	1.26	1.40	1.13
Parent has rules about homework, GPA, and chores (8th)	-0.08	0.052		0.93	1.03	0.84	-0.08	0.053		0.92	1.02	0.83
Parent talks to child often about post-HS plans (8th)	0.08	0.050		1.09	1.20	0.99	0.08	0.050		1.08	1.19	0.98
Student has discussions with parents about school (8th)	0.02	0.072		1.02	1.17	0.89	-0.04	0.071		0.96	1.11	0.84
Student perception about rules about TV, friends, and chores (8th)	0.02	0.047		1.02	1.12	0.93	0.01	0.048		1.01	1.11	0.92
Student reports parent rarely checks his/her homework (8th)	0.05	0.051		1.06	1.17	0.95	0.06	0.051		1.06	1.17	0.96
Parent involvement in school												
Parent attends parent-teacher organization meetings (8th)	0.08	0.114		1.09	1.36	0.87	0.08	0.113		1.08	1.35	0.87
Parent is involved in parent teacher organization meetings (8th)	0.05	0.057		1.05	1.17	0.94	0.04	0.057		1.04	1.16	0.93
Parent does not contact school about academics (8th)	-0.05	0.050		0.95	1.05	0.86	-0.06	0.052		0.94	1.04	0.85
Parental involvement (8th)	0.10	0.047	*	1.11	1.22	1.01	0.09	0.045	*	1.09	1.20	1.00
Peer-level factors												
Absences of close friends who dropped out of school (10th)							0.14	0.040	***	1.15	1.24	1.06
Positive peer academic influence (10th)							0.12	0.047	**	1.13	1.24	1.03
School-level factors												
School characteristics												
Student attends a private school in 8th grade (compared to a public school)	0.48	0.191	*	1.62	2.35	1.11	0.49	0.194	*	1.64	2.39	1.12
Percent of students who do not receive FRPM (8th)	0.07	0.052		1.08	1.19	0.97	0.09	0.051		1.09	1.21	0.99
School climate												
School engagement (8th)	-0.15	0.048	**	0.86	0.94	0.78	-0.17	0.051	***	0.84	0.93	0.76
Poor school environment (8th)	0.01	0.044		1.01	1.10	0.92	0.02	0.043		1.02	1.11	0.94
Students are not expected to do homework (8th)	-0.06	0.056		0.94	1.05	0.84	-0.07	0.055		0.93	1.04	0.83
Teachers do not press students to achieve (8th)	0.14	0.065	*	1.15	1.31	1.02	0.15	0.065	*	1.16	1.32	1.03
There is conflict between teachers and administrators (8th)	0.01	0.054		1.01	1.12	0.91	-0.01	0.055		0.99	1.11	0.89
Parents are notified of unexcused absences on the same day the absence occurs (10th)							-0.01	0.102		0.99	1.21	0.81
Students report that teachers expect student to succeed in school (10th)							-0.02	0.054		0.98	1.09	0.88
Demographic control variables												
Gender (Female)	0.24	0.095	*	1.27	1.54	1.06	0.27	0.100	**	1.31	1.59	1.08
Race/ethnicity (White)												
Black	0.55	0.186	**	1.74	2.50	1.21	0.38	0.192	*	1.46	2.12	1.00
Hispanic	0.72	0.148	***	2.06	2.76	1.54	0.70	0.146	***	2.02	2.68	1.51
Other	0.55	0.182	**	1.74	2.48	1.22	0.47	0.178	**	1.60	2.28	1.13
Socio-economic status	0.94	0.081	***	2.55	2.99	2.17	0.91	0.081	***	2.48	2.90	2.11

Rounds to zero
* p<0.05 ** p<0.01 *** p<0.001
N= 10,830
SOURCE: 1988/2000 National Education Longitudinal Study (NELS) Restricted Use Data Files

Discussion

The goal of these analyses was to expand upon existing research and to provide policymakers, funders, researchers, and practitioners evidence regarding malleable factors, if any, that have a large influence on students' educational success across domains and contexts of development. Using a longitudinal, nationally representative dataset, we performed multivariate analyses to predict high school completion and enrollment in postsecondary education.

Based on the prior research reviewed in Chapter III, we hypothesized that certain individual, family and school factors would predict high school graduation. Our analyses revealed fewer significant predictors of educational success than the literature. This was expected, however, because our models took many factors into account at the same time. This is, of course, how real life unfolds, and our findings reflect this in that we find numerous influences, most of which have very small effects.

For each outcome (on-time high school completion and postsecondary enrollment), a few significant predictors exhibited small, medium, or large effect sizes. These are put into the ecological model in Exhibit IV.1 below.

For high school graduation, the predictive factors with the largest effect sizes were, in descending order:

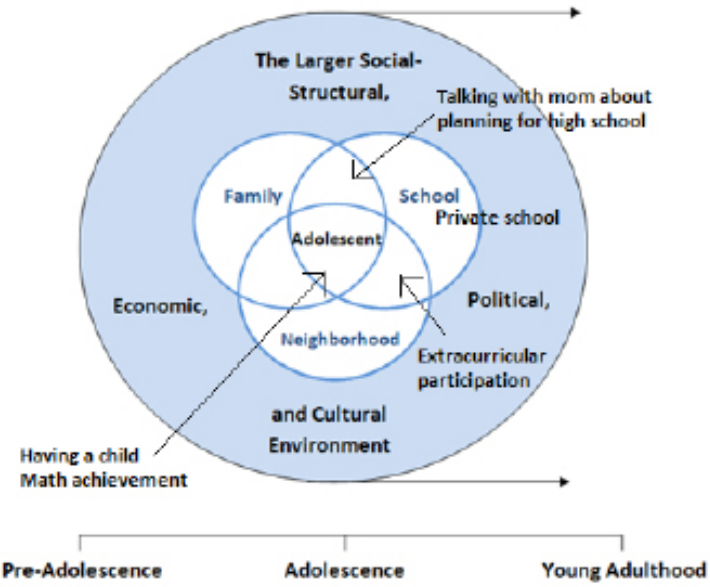
- Not having or expecting a child in tenth grade;
- Spending five or more hours per week on extracurricular activities in tenth grade; and
- Eighth grade math test score.

For postsecondary enrollment, the predictive factors of postsecondary enrollment with the largest effect sizes, in descending order were:

- Attending a private school in eighth grade; and
- Talking with mother one or two times about planning for high school (compared to 0 times).

While there is no overlap between the predictors of high school graduation and postsecondary enrollment with small or larger effect sizes, there is some overlap between the significant predictors with less than small effect sizes. Prior achievement, as measured by a standardized math score, internal locus of control, importance of good grades to student, teacher-rated attendance, extracurricular participation of five hours per week or more in tenth grade, not having close friends who dropped out, and positive peer academic influence predicted both high school graduation and postsecondary enrollment.

Figure IV.1. Summary of Findings in Adolescent Development in Context, Over Time.



SOURCE: Adapted from: Jessor, R. (1993). "Successful adolescent development among youth in high-risk settings," *American Psychologist*, 48.

Almost all of these shared significant predictors are malleable, meaning that programs, policies, and practices can work to augment these characteristics or behaviors in students and thus improve their educational outcomes. For example, extracurricular participation could be improved by making more programs available to students and working to make those programs easily accessible to students with transportation issues and limited resources.

There are also some distinctions between the predictors of high school completion and postsecondary enrollment. The largest risk factor for high school completion was having a child in tenth grade. In the model predicting postsecondary enrollment, having a child was not related to enrollment. The lack of apparent relationship between this risk factor and postsecondary enrollment could be explained by interactions with other non-measured factors. For example, as having a child is prohibitive to completing high school, it may also lead to poor grades later on in high school. Having poor grades may prohibit a student from continuing studies past high school, rather than having a child itself. In addition, there may be less of a stigma attached with having a child after high school. College campuses may offer childcare, which allows a parent to continue education.

Non-Malleable Factors

Demographic factors, such as gender and race were significant predictors of postsecondary enrollment, but were not significant predictors of high school graduation. Once all of the other factors in the model were taken into account, students of all other races were more likely to enroll in postsecondary education than white students. Socioeconomic status had a larger effect size when predicting postsecondary enrollment than when predicting high school completion and this is no doubt related to the financial hurdles of affording college for those from low SES backgrounds. Interestingly, socioeconomic status was not predictive of high school completion for black students.

Sensitivity Analyses

Though results were not discussed in the text, we ran two series of models on the same sample. One set of models uses predictors measured in eighth grade only. Another set of models uses the same set of predictors measured in eighth grade and adds additional predictors measured in tenth grade. Findings were very similar between the two sets of models. This stability over time indicates that early factors do matter—even when later, more recent factors are taken into account. At the same time, our models showed larger effect sizes for the more immediate outcome of high school completion than the later outcome of postsecondary enrollment.

Limitations. One major limitation of this analysis is the amount of time that has passed since the data were collected. NELS collected data on the eighth grade class of 1988. Today, in 2013, these students are approximately 38 years old. There have been many demographic and political changes in the U.S. in the past several decades. For example, in 1990, twelve percent of children ages 0-17 in the U. S. were of Hispanic origin. In 2012, Hispanic children made up almost 24 percent of the population of children (Federal Interagency Forum on Child and Family Statistics, 2013a). The timing of the data must be kept in mind when interpreting findings, especially for the Hispanic subgroup.
Another limitation of this analysis is that we could only include factors in our model that NELS assessed. Ideally, we would like to test all of the factors that our literature review supported as important predictors of educational outcomes. For example, our literature review found that academic self-concept, self-efficacy, and social and emotional competence were important predictors of educational success, but we were not able to test the strength of their association with educational outcomes using NELS. While NELS is a very comprehensive survey, it was not necessarily designed to answer our particular research question.

In order to include a comprehensive assessment of youth's development, we included a large number of predictor variables in our models. Although this allowed us to identify the most predictive variables, it may have masked the predictive power of other variables. That is to say, hypothetically, if you were only looking at parental involvement, it would be a significant predictor of educational success. Once a plethora of other variables are included in the model, however, this factor loses significance.

There are many analytical techniques that can be used to identify predictive factors. Our goal was to identify the largest malleable direct predictors of educational success. One limitation of this approach was that we did not look at any indirect effects. It is possible that some of the variables that are insignificant in our models do predict educational success indirectly, through other pathways.

Strengths. Despite its limitations, we chose to use NELS because of its comprehensive, longitudinal nature. The survey includes measures over a 12-year span from a variety of perspectives, including students, parents, teachers, and principals. Because of the longevity of this study, future continuations of the presented analyses could include postsecondary completion as an additional educational outcome.

Additional, supplemental data sources that could add to the comprehensiveness of this line of inquiry include the National Longitudinal Study of Adolescent Health (Add Health), which would allow for more in-depth analyses of peer networks, and the Education Longitudinal Study (ELS), which is a more recent survey of adolescents, built from the same framework as NELS, but begins surveying students in high school rather than middle school. Other longitudinal surveys of youth include the National Longitudinal Survey of Youth (NLSY97) and the PSID, but they do not include the wealth of relevant variables as the other surveys. None of the large-scale, nationally representative longitudinal surveys include strong, varied measures of the internal competencies that are missing in NELS, such as academic self-concept and social and emotional competence.

Conclusions

A child's development does not occur in a vacuum. Children interact with the world around them, including families, peers, and schools. By including many variables representing various contexts into a single model, we have attempted to model educational success in a realistic developmental setting.

This modeling technique allowed us to identify key malleable predictors of educational success, those that matter above and beyond other factors. The factors that were most predictive of high school completion and postsecondary enrollment are not all academic, but cover a variety of contexts of development: social development, cognitive development, families, and schools.

Certain behaviors are strong predictors of on-time high school completion and enrollment in postsecondary education. These predictive behaviors are malleable. Teen pregnancy can be reduced through programs and policies. For example, high quality early childhood programs have been proven to reduce subsequent teen pregnancies (Ball & Moore, 2008). Participation in extracurricular activities could potentially be augmented at the school level by increasing afterschool offerings. In addition, there are programs available that encourage parental involvement, though their effects on educational outcomes are mixed (Terzian & Mbwana, 2009).

It is important to keep in mind that there are some differences in predictors of the two educational outcomes. When a program or school is looking to improve educational outcomes for its students, it is important to consider the specific outcomes desired. Policies, practices, and interventions should align to improve predictors that are linked to the particular outcomes of interest on both outcomes.

CHAPTER V: REVIEW OF EVALUATION EVIDENCE ON OUTCOMES, COST-EFFECTIVENESS, AND IMPLEMENTATION

By: Kristin Anderson Moore, Mary Terzian, and Brandon Stratford

Chapter Overview

Information triangulated in the previous chapters indicates that, in broad strokes, integrated student supports' programs as implemented in communities generally align with theory and research in child development and with the findings of empirical research, indicating that many factors each have rather small associations with educational outcomes. The advice that can be drawn from this knowledge base is thus supportive of the ISS approach but not very specific. Accordingly, we turn to an assessment of evaluation studies. Are these broad ISS program models effective? We review three types of evaluation research in this chapter:

- Rigorous outcome evaluation research (to assess program effects);
- Cost-effectiveness research (to assess return on investment; and
- Implementation research (to assess whether better implementation relates to stronger program effects).

Part I: Rigorous Outcome Evaluation Research

Overview

Child Trends reviewed findings from the most rigorous outcome evaluations for a group of key academic and non-academic outcomes. To identify eligible evaluations, researchers screened dozens of studies to assess whether they met the level of study rigor required for the review. For a brief summary of the criteria we used to evaluate study rigor, see the "Methods" box below (or, for greater detail, see Appendix V.A., which includes a flow chart to describe how studies were selected). Only randomized-controlled trials (RCTs) – studies which randomly assign schools to a treatment and control group - and rigorous, quasi-experimental design (QED) evaluations using a matched-comparison group were eligible for inclusion in this evidence review.

Findings suggest that the ISS approach may promote positive academic outcomes, related to increased student progress, increased school attendance, and improved academic achievement – particularly with regard to math achievement and GPA. Findings for reading and ELA achievement are mixed; and findings for non-academic outcomes are less promising, although these outcomes were assessed less frequently than academic outcomes.

This evidence review is based on a small number of evaluations (11 total) and an even smaller number of ISS models (three total), posing a significant limitation. Therefore, strong conclusions cannot be drawn, only tentative conclusions which provide initial evidence on the potential of the ISS approach for improving academic outcomes and informing future research. Nevertheless, given the growing interest in this approach, the already large number of schools implementing this approach nationwide, and the number of models with pending RCTs,[5] this review of rigorous outcome evaluations is well-timed.

Screening Process

To identify these evaluations, Child Trends searched for published and unpublished evaluations of local and national models described in literature reviews, web sites for the Coalition for Community Schools and for specific ISS models, and search engines such as Google Scholar. After constructing a list of evaluated models, we interviewed individuals who

5 Additional ISS models currently being evaluated include: Beacons, Elev8, Say Yes to Education, University Assisted Community Schools; and two RCTs and one QED involving CIS: one i3 evaluation of Diplomas Now program, of which CIS is a part and two evaluations (one RCT and one QED) of CIS, being done as part of Social Innovation Fund.

might be able to point us to additional evaluations online and help us to locate unpublished evaluations. Despite diligent efforts, we were unable to retrieve some 49 publications identified from literature reviews, by key informants, or by other sources. It is difficult to discern, though, whether these publications are outcome evaluations or merely allude to findings from evaluations in general.

Methods

To examine the study rigor of RCT evaluations, we applied criteria developed by Child Trends for our database of random assignment, intent-to-treat evaluations called the Lifecourse Interventions to Nurture Kids Successfully database (LINKS eligibility criteria can be accessed online at http://www.childtrends.org/what-works/). To examine the study rigor of QED evaluations, we applied criteria developed for the HHS teen pregnancy prevention and research evidence review (study protocol available at http://www.hhs.gov/ash/oah/oah-initiatives/teen_pregnancy/db/eb-programs-review-v2.pdf. Non-experimental evaluations were immediately excluded from our review of outcome evaluations and from the review of implementation evaluations.

Overall, all studies included in this evidence review (N=11) met the following criteria:*
a) Intent-to-treat (ITT) analysis – all subjects randomly assigned are retained in the analysis, not just active participants
b) Experimental Design (randomized-controlled or quasi-experimental, with matched-comparison group)
c)No serious problems with confounding (such as only 1 school per condition)

Additional requirements for QED studies included:
a) Attrition rates meet standards set by the Pregnancy Prevention Research and Evidence Review, available at: http://www.hhs.gov/ash/oah/oah-initiatives/teen_pregnancy/db/eb-programs-review-v2.pdf.
b) Groups must be equivalent on age/grade, gender, race/ethnicity and outcome measure at baseline
c) Analyses control for age/grade, gender, and race/ethnicity and, if more than one time point, control for pretest outcome measures (or propensity score).

*Items b and c were also used to screen studies for the review of implementation-related effects.

Evaluations Summarized for Review

This evidence review identified 36 outcome evaluations (excluding unpublished evaluations that we were unable to obtain from key informants). Of these evaluations, less than one-third (n= 11) met our study inclusion criteria. These evaluations corresponded with only three ISS models: Communities In Schools (CIS); Comer School Development Program (Comer SDP); and City Connects (CCNX).
A summary of these evaluations is offered below:

- RCT evaluations (n=4)
  - 1 RCT evaluation of the full Comer SDP model conducted in Prince George's County (Comer, 1999); and
  - 3 RCT evaluations of the partial, or case-managed portion, of the CIS model, conducted as part of a multi-site evaluation in Austin, Jacksonville, and Wichita (ICF International, 2010a, 2010b, 2010c) that compared high-risk students randomly assigned to receive level 2 intensive services with students receiving general level 1 supports; and
- QED evaluations (n=7)
  - 1 national, multi-site evaluation of the full CIS model (ICF International, 2008);
  - 1 evaluation of the Comer SDP model in Chicago (Comer, 2000); and
  - 5 evaluations of the CCNX model (4 of which employ propensity score analyses).
    - 2 unpublished evaluations examining the long-term effects of the model, conducted in Boston (Walsh et al., under review.; Walsh, under review);

- 1 published evaluation examining the long-term effects of the model from later elementary school to middle school conducted in Boston (Center for Optimized Student Support, 2012); and
- 2 published evaluations examining the effects of the model from early elementary school to later elementary school (Center for Optimized Student Support, 2010; 2008-09).

Of the 11 evaluations, 8 evaluated the opportunity to attend a school with an ISS model (evaluating the effects of a full ISS model), while 3 RCTs (evaluating CIS) evaluated the opportunity to participate in case-managed ISS in addition to school-wide ISS (an evaluation of a partial ISS model).

Findings

Below we present findings for academic and non-academic outcomes at the student, family, and school levels. We summarize these findings in Tables V.1. and V.2., by indicating the number of evaluations with significant effects[6] relative to the total number of evaluations for a given outcome. An evaluation was deemed to have a significant effect on a given outcome if the majority of outcome measures for that outcome were significant (at $p<.05$). The only exception to this rule was if the program effect was delayed (significant at the last follow-up point but not significant for previous follow-up points). When an evaluation had mixed findings (for example, when the program had significant positive effects at posttest but non-significant or significant negative effects at the first follow-up), it was not counted as an evaluation with significant findings in the tables presented. Also, because RCT studies represent the "gold standard" of evidence and QED studies adhere to a weaker standard, we summarize findings for RCTs and QEDs separately.

Academic Outcomes

To assess the potential of ISS models for reducing academic disparities, we assessed program effects on academic outcomes. [7] To maximize the number of effects reviewed for each outcome measure, we limited our review to the most commonly-measured academic outcomes related to student progress, school attendance, and academic achievement, and combined school-level with student-level measures.

Promising Effects

Overall, effects on academic outcomes are promising, though QED studies yield more promising findings than RCT studies. Specifically, QED findings consistently indicated significant, positive effects on student progress (3 out of 4 evaluations), school attendance (3 out of 3 evaluations), overall GPA (2 out of 2 evaluations), and reading achievement /English Language Arts (ELA) test scores (4 out of 6 evaluations).

In contrast, positive RCT findings were less frequent. For math achievement, 1 out of 4 evaluations had at least one significant impact. Impacts on other outcomes were also found to be sparse, with significant impacts found for 0 out of 2 evaluations of student progress, 1 out of 4 evaluations of school attendance, 0 of 3 evaluations of reading achievement, 1 out of 4 evaluations of math achievement, and 0 out of 4 evaluations of grade point average. (Keep in mind that the RCT evaluations of Communities In Schools contrast level 2 services versus general level 1 services, and this represent a partial test of the CIS model.)

a) Student progress (credit completion, grade retention, high school dropout, and promoting power). Two RCT evaluations of Communities In Schools (CIS) found that the opportunity to participate in intensive case-managed supports, in addition to school-wide supports, has fading impacts on credit completion at posttest, finding positive, significant impacts for credit completion at posttest but non-significant effects at the next follow-up (ICF International, 2010a; 2010c). A national QED evaluation of CIS found significant effects on promoting power (the proportion of students who are promoted to the next grade on time) after 3 years of implementing the model (ICF International,

6 When discussing both RCT and QED evaluations together, this chapter employs the term "program effect" to describe the effects of QED evaluations and the impacts of RCT evaluations.

7 Findings are only reported for full samples. Findings for subgroup analyses are not reported in this report, as subgroup effects for race/ethnicity and student socioeconomic status (SES) were rarely reported.

2008). Finally, one out of 2 QED evaluations of City Connects found long-term effects on grade retention (City Connects, 2010) and one evaluation found significant effects on high school dropout (Walsh et al., forthcoming).

b) School attendance (chronic absenteeism, absenteeism, and attendance rate). Findings for this outcome were also promising, but QED evaluations were more likely to result in positive, significant effects than RCT evaluations. Overall, 1 out of 4 RCT evaluations compared to 3 out of 3 QED evaluations had at least one significant effect on a measure of school attendance. Findings for chronic absenteeism, were positive for both analysis of City Connects (CCNX) to assess change from 2nd to 10th grade, significant, long-term reductions were found (Walsh et. al., under review). Findings for percent of days absent were mixed, however, with 0 out of 2 RCT evaluations of Communities in Schools (CIS) finding significant impacts and 1 out of 1 QED evaluations (for CCNX) finding promising, significant long-term effects eight years after post-test. Finally, findings for attendance were less clear, with 2 out of 3 evaluations (1 out of 2 RCTs[8] and 1out of 1 QED) finding significant improvements in school attendance rates, measured as the percent of students with at least 90 percent attendance.

c) Academic achievement (reading/ELA achievement, math achievement, and GPA). Overall, findings based on QED evaluations seem promising, but findings based on RCT evaluations are not as consistently positive. Program improvements were found for the majority of evaluations assessing math achievement (4 out of 6 QED evaluations, though just 1 out of 4 RCT evaluations). Program effects on reading/ELA achievement were mixed: although 3 out of 3 QED evaluations of CCNX had effects on reading report card scores, program effects were less consistent for standardized test scores of ELA and reading (0 out of 3 RCT evaluations of the CIS program and 2 out of 6 QED evaluations of the CCNX and Comer SDP models). No effects were found for school-level mean GPA, based on 0 out of the 4 RCTs evaluations of the CIS and Comer SDP models). In contrast, 2 out of 2 QED evaluations found long-term effects for student-level GPA, with students attending CCNX schools having higher overall GPAs then students not attending CCNX schools. It should be noted that measures of academic achievement vary (for example, a standardized test for Kansas may not be the same as one for Texas); therefore summary findings for different standardized tests may be less reliable than those for other measures.

Table V.1. Program Effects on Academic Outcomes (Student/School Level)

OUTCOME MEASURES	RCTS	QEDS
Student Progress	**0 out of 2 with at least 1 significant (sig.) impact**	**3 out of 4 with at least 1 significant (sig.) effect**
Cumulative Promotion Index (a measure of graduation rate)	0 out of 0 (not assessed)	n/a (assessed for CIS at school level, but no sig. test provided)
Credit completion	0 out of 2 (two mixed for CIS-Austin and CIS-Wichita, school level)	0 out of 0 (not assessed)
Grade Retention	n/a (assessed for CIS-Jacksonville at school level, but no sig. test)	1 out of 2 (sustained student-level effects for CCNX)
Dropout	n/a (assessed for CIS-Austin at school level, but no sig. test)	1 out of 1 (sustained student-level effects for CCNX)
Promoting power[9] (proxy for dropout)	0 out of 0 (not assessed)	1 out of 1 (assessed after three years of CIS, school level)

8 Note: The RCT for CIS that found significant improvements in attendance worked for 2 out of 3 age groups (it improved attendance among elementary and high school students, but not among middle school students).

9 Promoting power is the ratio of seniors enrolled in a high school to the number of freshmen four years earlier

OUTCOME MEASURES	RCTS	QEDS
School Attendance	**1 out of 4 with at least 1 sig. impact**	**3 out of 3 with at least 1 sig. effect**
Absenteeism (number of days absent)	0 out of 2 (for CIS-Jacksonville and Comer SDP, school level)	1 out of 1 (sustained student-level effect for CCNX; this evaluation also measured chronic absenteeism)
Chronic absenteeism (10% or more of school days in a year)	0 out of 0 (not assessed)	2 out of 2 (sustained student-level effects for CCNX)
Attendance rate (percent of students with at least 90% attendance)	1 out of 2 (one delayed impact for CIS-Wichita, one mixed for CIS-Austin, school level)	1 out of 1 (assessed after three years of CIS, school level)
Reading and ELA Achievement	**0 out of 3 with at least 1 sig. impact**	**4 out of 6 with at least 1 sig. effect**
Reading/ELA test scores	0 out of 3 (all non-significant)	4 out of 6 (sustained student-level effects for CCNX)
Reading/ELA report card scores or GPAs	0 out of 0 (not assessed)	3 out of 4 (sustained student-level effects for CCNX)
Math Achievement	1 out of 4 with at least 1 sig. impact	4 out of 6 with at least 1 sig. effect
Math test scores	1 out of 4 (delayed impact for CIS-Wichita, school level)	4 out of 6 (three sustained student-level effects for CCNX, one effect for CIS)
Math report card scores or GPAs	0 out of 0 (not assessed)	3 out of 4 (sustained student- and school-level effects for CCNX)
Overall Grade Point Average (GPA)	**0 out of 4 with at least 1 sig. impact**	**2 out of 2 with at least 1 sig. effect**
Overall GPA	0 out of 4 (1 mixed, due to fading impacts, for CIS, and 3 non-significant, for CIS and Comer SDP, school level).	2 out of 2 (sustained student- and school-level effects for CCNX)

Non-Academic Outcomes

To gather evidence for the ISS theory of change and corroborate findings from our literature review and data analysis, we also assessed effects on non-academic outcomes at the student-, family-, and school level. As noted earlier, while these outcomes are measured less consistently, findings for these research-based non-academic outcomes look less promising than those for academic outcomes. These outcomes include school attachment, conduct problems, social and emotional or life skills, health and safety, parent-child relationship, parenting behaviors, parent-school involvement, positive student-teacher relationship, school-climate and effective teaching.

Effects on Student, Family, and School Level Non-Academic Outcomes are Weak

Shown in Table V.2. below are the non-academic outcomes reviewed, example items, and the number of evaluations found to have consistently positive and significant effects out of the total number of included evaluations. We reviewed findings for the student-level outcomes of school attachment, conduct problems, social and emotional learning (SEL) or

life skills, and health and safety. School attachment was considered a non-academic outcome because measures of this construct do not directly measure the proximal antecedents of educational attainment: academic achievement, attendance, and graduation-related measures, such as credit completion and promoting power. In addition, findings for family- and school-level outcomes were reviewed (e.g., parent-school involvement and positive school climate). Overall, limited evidence for the effects of ISS models on non-academic outcomes was found. For example, none of the 4 RCT evaluations for the Comer SDP or CIS models and only one QED evaluation for Comer SDP found significant, positive effects on school attachment (the Comer QED reported 3-year effects). With regard to school behavior problems, only 2 out of 8 evaluations (4 RCT and 4 QED evaluations associated with the CIS, Comer SDP, and CCNX models) found significant effects. Several evaluations assessed effects on SEL/Life Skills or health and safety outcomes (in this case, depression and substance use); however, none found significant effects. Only 3 evaluations assessed family-level outcomes (all RCT evaluations of CIS assessed impacts on parent-child relationships) and only 2 (1 RCT and 1 QED) assessed school-level outcomes. No family or school level effects were found to be significant.

Table V.2.: Non-Academic Outcomes (Student, Family, and School Level)

OUTCOME MEASURES	RCTS	QEDS
Student-Level, Non-Academic	**0 out of 4 with at least 1 significant impact**	**3 out of 6 with at least 1 significant effect**
School attachment (e.g., pride in school, belonging to school, academic values, academic engagement, work habits)	0 out of 4 RCTs (3 non-sig. for school/ community involvement and 1 non-sig. for time spent doing homework or free reading)	1 out of 1 QED (sig. for work habits, report card scores, and for effort and report card scores, after three years of program.
School behavior problems (e.g., classroom misbehavior, disciplinary referrals, suspensions, bullying)	0 out of 4 RCTs (1 RCT sig. for acting out behaviors; 2 non-sig. for referrals and suspensions, 1 non-sig. for suspension, 3 non-sig. for behavioral measures; and 1 sig. for classroom misbehavior)	2 out of 4 QEDs (2 QEDS sig. for behavior report card scores, 1 QED with mixed findings, and 1 QED with non-sig. effects)
Social and emotional learning or life skills (e.g., self concept, anger control, self efficacy)	0 out of 4 RCTs (3 RCTs non-sig. for self concept; 1 RCT non-sig. for ethnic pride, anger control, self efficacy)	0 out of 0 (not assessed)
Health and Safety (e.g., physical, mental, mental health, substance use, and reproductive health)	0 out of 1 RCT (non-sig. for depression and substance use)	0 out of 1 QED (1 QED non-sig. for depression)
Family-Level, Non-Academic	**0 out of 3 with at least 1 significant impact**	**0 out of 0 with at least 1 significant effect**
Academic support (e.g., discussing school with student, conveying high expectations, and involved in school)	0 out of 0 (not assessed)	0 out of 0 (not assessed)
Positive parenting (e.g., authoritative parenting, parental monitoring and supervision, discipline, and communication of clear behavioral expectations)	0 out of 0 (not assessed)	0 out of 0 (not assessed)
Positive parent-child relationship (e.g., closeness, caring, supportiveness, availability, and involvement)	0 out of 3 RCTs (non-sig. for family relationships/parental involvement)	0 out of 0 (not assessed)

School-Level, Non-Academic	0 out of 1 with at least 1 sig. impact	0 out of 1with at least 1 sig. effect
Positive student-teacher/staff relationships (e.g., aggregate score of students' perception of caring and fairness)	0 out of 1 RCTs (0 out of 4 measures of quality of student-relations with staff, based on school-level means, were sig.). Note: This study also assessed positive school climate.	0 out of 1 QED (1 out of 6 measures of social and academic relationships with adults at school, based on school-level means, was sig.) Note: This study also assessed positive school climate.
Positive school climate (e.g., aggregate score of students' perception of safety and caring)	0 out of 1 RCT (1 out of 10 measures of academic and social climate was sig.)	0 out of 1 QED (2 out of 7 measures of academic climate and 2 out of 7 measures of social climate were sig.)

Discussion and Conclusions Regarding Outcome Evaluations

An extensive search identified only 11 rigorous (randomized controlled and quasi-experimental) evaluations, corresponding to three ISS models: (1) CIS, with 3 RCTs and 1 QED; (2) Comer SDP, with 1 RCT and 1 QED; and (3) CCNX, with 5 QEDs. Based on these evaluations, several initial conclusions are possible:

- Most quasi-experimental evaluations found improvements in student- or school-level academic measures of student progress, attendance/absenteeism, and academic achievement; but significant impacts were considerably less common when evaluations employed more rigorous random assignment methods.
- Few evaluations found improvements on non-academic outcomes for students.

Few evaluations assessed family- and school- level factors (such as family-school involvement or school climate) and non-academic, student-level factors (such as school behavior problems) incorporated in the theory of change and found to be important in our review of the research. (Readers should keep in mind that the RCT evaluations of Communities In Schools assessed the impact of level 2 intensive services relative to level 1 general services (not a no-service control group).

To build the outcome evaluation evidence base for the ISS approach, the following research activities are needed:

- Evaluations that assess effects on a more comprehensive set of non-academic and academic student-, family-, and school-level measures;
- Efforts to apply greater uniformity across outcome evaluations in terms of measures, methods, and rigor;
- Efforts to fund panel studies, similar to those conducted for CCNX, to assess long-term effects or impacts on key, student-level academic outcomes; and
- Evaluations that assess how program effects vary by race/ethnicity and student SES to assess whether integrated student supports may be an effective strategy for narrowing the achievement gap.

Part II: Cost-Effectiveness Studies

Estimating the cost effectiveness of social interventions is a recent, rapidly-evolving field. Three cost-effectiveness studies of integrated student supports' models have been identified – Communities In Schools, the Children's Aid Society, and Elev8. While these studies share common elements, they also differ in important ways. Most importantly, all three studies find integrated student supports have a very positive return on investment. The payback takes some time to accrue, but the benefits relative to the costs are large enough that, even if they are overestimated in some ways, it seems clear that a dollar invested in an integrated school supports model has a return considerably great than one dollar.

"The Economic Impact of Communities In Schools" was completed by Economic Modeling Specialists Inc (EMSI, 2012). The estimate relies on data on high school dropout from a quasi-experimental study using CIS performance management data combined with data from other studies on educational persistence after high school. These estimates are used to calculate income over a 53-year time period. Also, as education is correlated with better social

outcomes, the value of improved health through less smoking and alcohol use, as well as less crime, unemployment and welfare are estimated. Benefits to both the individual and to society are estimated. The CIS investment is calculated as the amount spent annually to coordinate and provide supports in schools; as such, it does not include the cost of supports in the community that are provided to CIS students. The benefit-cost ratio is estimated to be 11.6, that is, there is an estimated return of $11.60 for every one dollar invested. The investment is estimated to reach a break-even point after nine years.

"Measuring Social Return on Investment for Community Schools – A Practical Guide" was completed in 2013 by The Finance Project (Martinez, L. et al., 2013). It is designed to stimulate investigation of the social, education, and health benefits of social interventions by providing a case study of the Children's Aid Society's community school. The study assessed elementary and middle schools with data from 2007 through 2010 that were full-service schools – that is, they provided physical and mental health services, parent education and engagement, and other supports. Cost data were collected for programs, in-kind services and administrative costs. Five similar schools were used as comparison schools. Outcomes were assessed for preschool children, students, families, and the school community. These outcomes were "monetized", which is always a challenge for cost-benefit studies to estimate the dollar value of a high school or college degree and the probability that a program causes an increase in degree attainment. Next, estimates of "deadweight" are subtracted to retain only the value resulting from the program. A net present value was calculated for a period of five years (recognizing that some benefits accrue over a lifetime), and represents the numerator relative to a denominator that sums costs. The social return on investment was calculated to be 10.30 for an elementary school and 14.80 for a middle school. In other words, an investment of one dollar returns an estimated $10.30 or $14.80.

A third report, Elev8 – "Oakland Community School Costs and Benefits: Making Dollars and Cents of the Research", prepared by the Bright Research Group, provides two distinct estimates (DeNike & Ohlson, 2013). The first assesses the value of all services and funds that are leveraged by the middle school sites, such as school-based health centers, extended learning, and mental health services, because the sites provide a coordinator and a location for creating partnerships and providing supports. The return on a dollar invested from this perspective is $4.40. The second estimate reflects the effect of the initial investment by Atlantic Philanthropies for all of the supports offered on long-term outcomes, including the value of improved outcomes for participants and the value of societal savings. These estimates are based on extrapolations from other research examining the long-term return on investment derived from similar initiatives. The return on a one-dollar investment, made in the initial Atlantic Philanthropies investment, based on this approach is $9.96. If all costs (all investments made in the program, not just the initial investment) are included in the calculation, the return on investment falls to $4.39, which is still a very positive return on investment.

In sum, all of these studies calculate very positive estimates of the return on investment, sufficiently positive that, even if the estimates turned out to be overly optimistic, there is almost certainly a positive payback for the investment made.

All three of these studies examine alternative estimation strategies, and each finds that their basic conclusion of a very positive return on investment is upheld. For example, the discount rate is varied in the CIS study, and the "deadweight" estimate is varied in the Children's Aid Society study. A more difficult task is estimating the effect of the program on outcomes, particularly high school graduation, in the absence of data from an experimental study. In addition, estimating the effect of high school graduation on later life outcomes is extremely challenging. What is the effect of a high school diploma on income and health that can be attributed to participation in an ISS program? Moreover, it is very challenging to assess the economic value of preventing crime, smoking, drug use, incarceration, welfare, and unemployment. Even with an experimental study, assumptions need to be made about how short-term impacts will alter social and economic trajectories into adulthood. The nature of these assumptions can drive the findings, so it is important that all three studies examined the implications of varied assumptions and found substantively similar conclusions.

It is also important to note the assumption made in all three studies that the cost of community supports is not a cost of the ISS program. This is an assumption that is aligned with the theory of change for integrated student supports. Specifically, the cost of supports provided by the ISS program are included as costs (as are administrative and coordination costs); but the cost of supports in the community are seen as already available. Such costs could include health care, government benefits, and supports for parents and families. An unexamined question is whether or to what extent these supports are actually available at no incremental cost. Some or many of the supports provided to students may indeed be available at no incremental cost. However, the extent to which this assumption is accurate needs assessment. In addition, it is possible that ISS represents a particularly efficient service delivery mechanism. Alternatively, there may be opportunity costs for the community associated with ISS use of services. These possibilities also warrant examination.

Next, we share the treatment on the treated (that is, TOT, not ITT) findings from our review of program participation on academic outcomes. Participation was measured in different ways. For example, as a participant receiving a minimum amount of ISS supports, as a participant in a school implementing ISS with high-quality, or as a participant in specific ISS activity. Though these findings are less rigorous, we present them to supplement findings from our evidence review.

Part III: The Effects of Program Implementation on Academic Outcomes

Overview

Child Trends also sought to better understand which aspects of ISS models might be contributing to the positive results that were reported. With this in mind, we examined non-experimental evaluations that focused on exposure to specific ISS activities and evaluations that included a measure of implementation quality. Findings relative to specific ISS activities varied by academic outcome; however, associations were generally positive or neutral. Regarding implementation quality, high-quality implementation was associated with more positive academic outcomes, while partial implementation was associated with no difference in outcomes compared to business as usual.

Methods

We identified studies that: a) met criteria for the outcome evaluation review but lacked a comparison group, b) included academic outcomes, and c) examined one of the following aspects of implementation:

- Effects of specific ISS-related activities;
- Amount of exposure (dosage);
- Overall implementation quality.

The ability to scale-up effective interventions beyond the schools and communities in which they were originally developed is increasingly recognized as an important step in achieving better outcomes for all young people. As programs with a proven track record in one location are brought to new schools and communities, implementation quality has emerged as a critical factor in achieving success across settings. Few evaluations of ISS models have looked at the links between implementation quality and student outcomes. However, among programs that target expanded learning opportunities, out-of-school time and early childhood education, a body of research examining the effect of implementation quality on child and adolescent outcomes demonstrates that high-quality implementation is crucial (Durlak, 2010; Durlak & DuPre, 2008; Redd et. al., 2012). The emerging field of ISS has recently begun to examine those links and the preliminary findings that are discussed in this section corroborate the results from other fields. Implementation quality matters.

Studies Reviewed

Evaluations included here were conducted among schools implementing an ISS approach and explored various aspects of implementation. Some of these non-experimental evaluations focused on specific ISS activities, some included measures of implementation quality, and one explored the relationship between the amount of exposure and academic outcomes over time. Below, we describe each of the program evaluations that were included in our review:

- Communities In Schools (CIS) evaluations in Austin, Texas, and Wichita, Kansas, both examined the value-added of exposure to intensive case management among high school students.

- Beacon sites in San Francisco focused on extended learning activities for students in kindergarten through twelfth grade.
- Schools Uniting Neighborhoods (SUN) in Multnomah County, Oregon, looked at extended learning activities only among high school students.
- Redwood City Community Schools in California explored relationships between academic outcomes and three different ISS activity types (support services, extended learning, and family engagement) as well as varying combinations of all three among elementary and middle school students.
- City Connects schools in Boston examined the relationship of attending a City Connects school with academic outcomes based on the amount of time students were exposed to the program (i.e., how many years they attended a City Connects school).
- Comer SDP schools in Maryland and Chicago explored the relationship of implementation quality with academic outcomes and school social climate.
- Communities In Schools (CIS) National Evaluation explored the relationship of implementation quality with academic outcomes.

Specific ISS Activities

Participation in learning activities is positively associated with credit completion and attendance; findings are mixed for support services. The findings from these non-experimental evaluations are mixed. Five evaluations looked at academic credit completion and attendance. Three evaluations examined both academic credit completion and attendance and two evaluations looked exclusively at attendance.

Analyses of the high school students in the experimental group who received intensive case management services in CIS schools in Austin and Wichita were compared with students in the control group who did not. (Specifically, students in the treatment group who did not actually receive services were removed from the treatment group sample, and students in the control group who did receive services were removed from that sample.) In this analysis, no association was found between intensive services and increased academic credit completion or improved attendance.

Among high school students attending SUN schools, evaluators found that regular participation in extended learning activities was associated with greater gains in credit completion and improved attendance. Among high school students attending Beacon sites, evaluators also found that regular participation in extended learning activities was associated with higher rates of attendance. While evaluators of the Redwood City community schools failed to find any associations with extended learning, family engagement, or supportive services (which would include case management) after one year, they did find that those who participated in a combination of support services and extended learning for at least 2 out of 3 years gained an average of 2 days of attendance. In summary, students who participated in more hours of extended learning activities tended to complete more academic credits and have better school attendance, while supportive services (such as case management) were only associated with better attendance when combined with extended learning activities.

Participation in specific ISS activities is related to mixed but promising findings for math achievement. Findings from these evaluations are mixed and therefore do not support a strong link between specific ISS activities and math achievement. Two evaluations examined associations between intensive case management and math scores, one evaluation looked exclusively at extended learning activities, and two studies looked at combinations of support services, extended learning, and family engagement activities.

Among high school students attending SUN schools, evaluators found no association between regular participation in extended learning activities and improved math scores. Similarly, among high school students attending CIS schools in Austin who received intensive case management services, no association with math scores was found compared with students in the control group who did not receive services. Similarly, analyses of high school students attending a CIS school in Wichita who received intensive case management services found a slightly negative association with math scores relative to members of the control group who did not receive services, although only 61 students were included in the analysis and the presence of a student with an extreme score likely explains the unexpectedly negative

relationship. On a more positive note, evaluations of the Redwood City community schools indicated that students whose families participated in at least two years of family engagement activities, or who participated in at least two years of extended learning combined with at least two years of support services had higher growth in math scores. In summary, three evaluations that examined ISS activities in isolation found no significant associations. However, the evaluation from Redwood City found a positive association with the combination of support services and extended learning as well as family engagement alone.

Participation in specific ISS activities, alone, or in combination, is not related to improved reading achievement. The findings from this set of evaluations do not support an association between ISS activities related to extended learning, support services, or family engagement and reading achievement. Two evaluations looked exclusively at the association with intensive case management, one looked specifically at extended learning, and two studies looked at varying combinations of support services, extended learning, and family engagement.

In fact, none of the five studies looking at associations between ISS and reading achievement found significant associations. Among high school students attending SUN schools, evaluators found no association between regular participation in extended learning and improved reading scores. In an analysis of high school students attending CIS schools in Austin and Wichita, no positive associations were identified between intensive case management and reading scores. The Redwood City evaluations found no significant association between support services, extended learning, family engagement, or any combination of ISS activities and English scores. Overall, there was no evidence from these studies that exposure to specific ISS activities is associated with improvements in reading.

Participation in family engagement or extended learning activities may be related to English language proficiency among English language learners. Evaluations of the Redwood City community schools indicate a positive relationship between ISS activities and English proficiency. The Redwood City evaluations were the only ones to examine English language proficiency as an outcome and they found a positive association between family engagement and English proficiency for English Language Learners (ELL). Interestingly, they noted that the relationship between ISS activities and English proficiency varied by school level. For elementary school students, only family engagement was associated with English proficiency, whereas for middle school students it was participation in extended learning activities that was significant.

Amount of Exposure to an ISS Program

Salutary effects of ISS activities may be cumulative. Evaluations of exposure, or dosage, are useful in estimating whether a particular amount of exposure to an intervention is necessary in order to experience a benefit. Such studies can also indicate whether benefits accrue to individuals as they progress through a program or whether there is a plateau effect whereby they reach a certain level and do not experience any further benefits. An evaluation of the City Connects program in Boston examined exposure to the overall model over four to five years. When evaluators compared results combining all students who had ever attended a City Connects school to the results they obtained when they accounted for the number of years that each student spent in a City Connects school, they found several positive relationships between exposure to the program over time and academic outcomes. In particular, the more time students spent in City Connects schools, the higher their scores on English tests in 6th and 7th grade and math tests in 3rd and 8th grades compared to students in comparison schools. Those relationships were not significant when the amount of exposure was not taken into account. Overall, while these findings are from a single evaluation of one ISS model, they are promising and suggest that the salutary effects of ISS approaches may be cumulative.

Overall Implementation Quality

Tools to measure implementation quality can provide guidance for new programs and point to areas that require additional attention among more established programs. Two models included in this review have developed tools to measure overall implementation quality that they have used to examine the relationship between how well a program is implemented and academic outcomes for students. Both tools focus primarily on assessing processes that have been identified as important from both a theoretical and practical perspective. Of note, the developers of the

CIS rubric remarked that they chose not to assess characteristics related to the school setting because many of those characteristics depend on school and school district policies and practices and are beyond the control of CIS program staff. Rather, they focused on the processes that were thought to be critical for success. Because the SDP Comer Schools model is implemented by school staff, their index does assess general school processes that are considered to play a critical role in successful implementation.

High-quality implementation is associated with improved academic outcomes. Studies that examined the relationship between implementation quality and academic outcomes employed either an implementation index or a rubric to characterize the level of implementation in a school, based on various core components of the particular model. Among the three evaluations that are included in this review, two characterized schools along a continuum and one classified schools' implementation quality as either high or low based on a defined cut point. The lack of uniformity in characterizing schools makes it difficult to compare across studies. However each method provides important information.

Among CIS schools, findings vary by school type and are generally positive. The Communities In Schools rubric, completed by CIS site coordinators, characterizes schools based on five key domains (e.g., needs assessment, planning, referrals, services, monitoring and adjustment). The rubric consists of 22 items and is intended to mirror the chronology of processes that are critical when implementing CIS within a school, addressing both Level 1 "universal" services and Level 2 "intensive" services. The needs assessment section assesses the frequency with which needs assessments are administered; the variety of data sources included; and which data are used to prioritize overall needs. The planning section confirms the existence of an annual operations plan and assesses the variety of information used to inform the plan for both levels of service. The referrals section assesses the variety of ways that a student can be referred for Level 2 services (e.g., self referral, CIS staff make a referral, school staff). The services section assesses how many of the five basic needs (e.g., relationships with caring adults, physical and emotional safety, physical health, marketable skills, a chance to give back to peers and the community) are addressed via Level 1 and Level 2 services; the percentage of students who participate in services at each level; and the amount of time the CIS site coordinator spends coordinating the services. The monitoring and adjusting section assesses how often CIS reviews student progress for those students who have participated in either Level 1 or Level 2 services. Response options vary in order to reflect a range of possible responses (based on practical expectations of what is considered possible), and response values range from 0 to 5, with "ideal" responses given a value of 5 points.

A nationwide evaluation of Communities In Schools (CIS) using these rubrics found that schools implementing the whole CIS model at a high level (they received a score of at least 70 out of 100) generally had better outcomes compared to schools with no CIS program, though the specific patterns varied. When comparing high-quality CIS schools to similar non-CIS schools, the study found: a) positive associations over time with attendance and reading scores among elementary schools but no change in math scores; b) a positive association over time with math scores and no change in attendance or reading scores among middle schools; and c) a positive association with graduation rates, no change in attendance or math scores, and a small negative association over time with reading scores among high schools. Most striking, however, is the fact that schools which implemented the CIS model with lower quality (i.e., they received a score below 70) did not perform any better than their non-CIS peer schools. Of note, both high-quality and low-quality CIS schools often started with academic outcomes that were below those of their comparison schools, however high implementing schools almost invariably caught up to, and often surpassed, their peer schools by the end of three years.

Among Comer SDP schools, findings are mixed regarding academic outcomes and generally positive for school climate. SDP Comer Schools has developed an implementation index that characterizes schools based on the underlying theory of their model, which emphasizes improving interpersonal relationships within the school and enhancing the social climate. The index, which is completed by school staff, consists of ten items that assess the effectiveness of: 1) the School Planning and Management Team, 2) the Social Service Team, 3) the Parent Teacher

Association, 4) the school improvement plan, and 5) communication between teams. Items also address: 6) the use of child development knowledge throughout the school, 7) whether decisions are made by consensus, 8) the commitment level of team members to improving the school, 9) the degree to which all members of the school community were included in decisions, and 10) the extent to which various cultural and racial groups receive particular attention. In contrast to the rubric developed by CIS, the Comer Schools Implementation Index does not gather information on specific actions, but rather assesses the perceptions of the school staff relative to the functioning of various teams that are expected to work collaboratively in implementing the SDP Comer model.

Two evaluations of the Comer SDP model revealed some mixed findings regarding the association between implementation quality, as defined above, and academic outcomes. Both of these studies used a continuous variable for implementation quality that was based on an 11-item scale. In the Comer SDP evaluation in Prince George's County, Maryland – which collected data from successive cohorts of middle school students over the course of four years – a positive relationship was found between implementation quality and attendance. However, they found that higher quality implementation was also associated with slightly lower standardized math scores. Of note, while they collected data for four years, no individual student had more than two years of data because the middle schools in the study consisted only of seventh and eighth grades and no follow-up was done once students moved on to high school. In the Comer SDP study in Chicago– which followed a group of fifth and sixth grade students over four years – the evaluators averaged the implementation quality score over all four years for each school. When comparing the average academic performance of students who attended a Comer school in Chicago to the average academic performance of students who did not, they found significant improvements in reading and math scores. However, there was no statistically significant relationship between improved scores and implementation quality. Of note, several comparison schools also received high scores on the implementation index, making it difficult to attribute such scores to participation in the Comer intervention. The evaluators did note that implementation scores were strongly associated with students' positive perceptions of their schools' social and academic climate and that academic gains did not become significant until the third year of exposure to the model, suggesting that the improvements in school climate that were seen in year one laid the foundation for academic success over time. Unfortunately, they did not perform an analysis to assess whether implementation quality mediates the effect of the model on students' academic success, making it impossible to validate this hypothesis.

Participating in a program with high-quality implementation may help to narrow the achievement gap between poor and non-poor students. In light of the paucity of evaluations examining implementation quality and academic outcomes, a fourth evaluation is included here with the caveat that the composition of the comparison schools was deemed too dissimilar to that of the intervention schools to draw any conclusions, and the analyses did not control for individual student demographic characteristics. Having said that, the findings from the evaluation of the Tulsa Area Community School Initiative corroborate those of the more rigorous evaluations described above and suggests some important implications relative to amelioration of the achievement gap between lower and higher income students. The primary analyses in this evaluation compared intervention to comparison schools and found no difference in academic outcomes. However, when the evaluators singled out schools with high-quality implementation (as measured by the Community School Development Scale) they found those schools outperformed their peer schools. Most strikingly, they found that poor and non-poor students performed at similar levels in schools with high-quality implementation, while the gap between poor and non-poor students was significant in schools with partial implementation as well as in comparison schools. Not only did the achievement gap disappear for math, and nearly disappear for reading, but the average performance at schools with high-quality implementation rivaled that of the wealthiest schools in the district, despite a nearly 72 percent difference in poverty levels. While this study has several limitations, the findings support results from the more rigorous studies described above relative to the importance of high-quality implementation.

Conclusions Regarding the Implementation Evaluations

Although the evidence base on implementation is only emerging, it echoes findings in other fields, including studies of early childhood programs and after-school programs:

- High-quality implementation is key to achieving positive outcomes;
- Low-quality implementation is the same as no implementation;
- The benefits of the ISS approach are likely to accrue over time;
- It is not yet clear what supports or practices, or which combinations of supports or practices; and affect what outcomes and which students are most likely to benefit.

Evidence is emerging to indicate that implementation of particular elements in ISS models, including the composition of activities that models choose to emphasize, can influence the effect of ISS programming on students' academic outcomes. Associations between exposure to specific ISS-related activities and academic outcomes suggest that relationships may vary relative to the outcome of interest, though, and ISS activities may have synergistic relationships that are not captured when those relationships are examined in isolation.

While the findings regarding specific program elements are complex, initial findings on implementation quality appear to be clear and echo previous findings relative to the importance of implementation quality in early childhood education and out-of-school time programming (Moore & Hamilton, 2010; Burchinal, et al., 2009). High-quality implementation appears to be a key to program success, while partial implementation is associated with academic outcomes that are similar to, or worse than, their peer schools.

More rigorous evaluations are required to confirm the findings presented here, especially the possibility that ISS approaches may reduce the achievement gap between poor and non-poor students, an issue that has proven largely intractable.

SUMMARY AND DISCUSSION

Conclusions Regarding Evaluations of ISS Models

Rigorous evaluations of integrated student supports' approaches are limited, and there is only one large-scale evaluation that randomly assigned schools to an ISS model. Rather, students are randomly assigned in the way that is most feasible – all students receive the basic ISS supports, and those students who are in need of intensive supports are randomly assigned to receive these intensive supports, and their outcomes are compared. To really test the ISS models, it would be ideal to randomly assign a sample of schools to either implement the ISS model or not and assess impacts on educational outcomes at the school level and the student level (Bloom, H. 1999; 2005). Such a study would be very expensive but very informative.

At present, it appears that the ISS approach can improve academic outcomes, and cost effectiveness studies suggest that the approach has a substantial return on investment. Moreover, it is clear that programs implemented with quality have better student outcomes. However, the specific supports or combinations of supports and the best practices for service delivery that produce positive outcomes has not been established based on empirical research or evaluation. Hence, this is one time that a call for further research and especially evaluation is well-warranted.

Summary

This report has drawn from multiple sources of research and information to assess the evidence base for integrated student supports (ISS) as an approach to enhancing educational outcomes and reducing educational disparities. This section of the report summarizes the main findings of each research approach. Following that, we provide a logic model for ISS approaches and suggest several conclusions and next steps.

Integrated Student Supports' Programs in the U.S.

Integrated Student Supports (ISS) is an emerging field of practice that is best described as a school-based approach to promoting students' academic achievement and educational attainment by coordinating a seamless system of wraparound supports at multiple levels, including the student, the family, the school, and the community, that target student's academic and non-academic barriers to learning. Five common components were identified across many if not all school-based efforts to improve academic achievement:

- Needs assessments;
- Coordination of supports for students;
- Integration of supports within schools;
- Community partnerships; and
- Data collection and tracking.

The ISS approach is unique in bringing all of these components together. A strength of this approach that may not be present in many other school-based models is the emphasis on leveraging community resources to remove barriers to learning (in addition to services and supports provided by the program), which reduces program costs. Another unique aspect of this approach is the emphasis on assessing needs and monitoring relevant outcomes that are both directly and indirectly related to academic and non-academic outcomes. Given substantial research evidence that numerous non-academic factors that influence educational achievement, addressing non-academic risks represents an important element of the ISS approach.

It is difficult, though, to draw specific conclusions about what might contribute to positive academic outcomes because there is significant variation in how each model actually implements these common components. An approach that is based on matching supports to specific needs and is reliant on the presence of community partners

will necessarily result in variations in implementation. Nevertheless, more work needs to be done to identify best practices and assess the crucial elements of each of the five components so that fidelity can be achieved and/or effective modifications can be made to the approach.

Review of Previous Research on Educational Attainment

Child Trends assessed two types of research in its review of the integrated student supports approach – principles of child and youth development deeply grounded in decades of research, and quantitative research on educational attainment. While the findings from quantitative studies are complex, conclusions on the alignment of the ISS approach with foundational principles of child and youth development are straightforward.

Theory and Research on Child Development. The organizing framework of ISS is solidly grounded in research and theory about child and youth development. The ISS approaches that we examined:

- Are all built on the ecological and bioecological model. ISS recognizes that the development of a child is affected by a range of proximal and distal influences and contexts, and that multiple influences can be leveraged to enhance the development of a child or adolescent over time.
- Accept a "whole child" perspective. That is, success is not simply defined by educational outcomes such as grades, but by positive development across developmental domains. Positive development for a child or youth represents health and safety, socioemotional development, behavior, and relationships, as well as academic achievement and educational attainment. Further, the ISS approach recognizes that a student's educational success is affected by non-academic influences. That is, school achievement reflects not only educational inputs but also students' physical and mental health, behavior, and social relationships. This represents an important distinction from some approaches to educational success that focus entirely or primarily on educational inputs.
- Are student-centered. The focus is on the development of the student as a unique person, not just their test scores.
- Recognize individual differences, particularly in terms of student needs and risks. This may be manifest in a tiered system in which higher-risk students are provided with more intensive supports or it may be reflected in supports that meet the individual needs of students.
- Recognize the importance of the family. A core component of ISS models is engaging and involving the families of students in varied and positive ways.
- Draw on resources in the community to support students and families.

As noted above, all of these practices are solidly based in substantial bodies of research. Thus, the overarching framework of ISS is research-based.

Review of Quantitative Research on Education. Child Trends also examined hundreds of empirical articles on the factors that predict educational outcomes. The goal of this assessment was to examine whether the findings from this research base align with the specific supports delivered in ISS programs developed by practitioners working in the field. The review of published research provided in Chapter III identifies a number of specific factors that, due to their malleability and significance, appear to be promising points of focus for stakeholders interested in improving educational success. These factors are concentrated in three domains: individual factors, parent and family factors, and school factors.

In the individual domain, the following factors have strong relationships with school success:

- Student behavior in and out-of class;
- Attendance/engagement;
- Academic self-concept/self-efficacy;
- Social and emotional competence; and
- Health and psychological well-being.

In the parent and family arena, these factors look promising:

- Parental expectations;
- Parenting style; and
- Parenting behaviors.

In schools, the following factors are strongly related to academic success:

- Effectiveness of teachers;
- School climate, specifically:
  - Quality of student-teacher relationships
  - Academic press (academic orientation with high expectations);
- Average school achievement and attendance; and
- Poverty in the student body.

Factors in the other areas of influence that we investigated (peers, neighborhoods, and policy) are also related to academic success. However, these factors are more distal than the factors discussed above, and thus their influence on educational success is smaller. For this reason, the review of available research recommends that interested parties looking to improve school success focus on the individual, parent, and school factors discussed above. We recognize that a lack of alignment may reflect the weaknesses of data and research as much as a true lack of alignment. Having acknowledged that, it appears that there is a broad correspondence between the ISS approach and the findings of research in education. Specifically, the research literature suggests that numerous factors have implications for educational success; many of these factors are non-academic factors; and very few have large effects, suggesting that an array of supports is indeed relevant to educational success.

New Analyses of Educational Attainment

Our review of available research described above found many studies; but most analyses tended to concentrate on just one or two factors that might influence academic achievement or attainment. Almost no published studies include the full range of potential influences. To fill this gap, Child Trends conducted a number of multivariate, longitudinal analyses to examine high school completion and enrollment in postsecondary education using the National Educational Longitudinal Survey. The goal of these analyses was to expand upon existing research and to provide evidence regarding the malleable factors that have the largest influence on students' educational success across domains and contexts of development.

Based on the available research literature, summarized above, we identified specific individual, family, and school factors hypothesized to predict high school graduation. However, our analyses revealed fewer significant predictors of educational success than found in the literature. This reflects the fact that our statistical models took account of numerous factors at the same time. Nevertheless, a substantial number of predictors were identified, which highlights again the reality that school success is a product of myriad and varied influences. This may reflect a reality in which each factor has only a small influence or a situation in which a given factor matters for only some students but it has a quite large effect on those few students.

For each outcome (on-time high school completion and postsecondary enrollment), a few significant predictors exhibited small, medium, or large effect sizes.

For high school graduation, the predictive factors amenable to policy intervention by our definition and with the largest effect sizes were, in descending order:

- Not having or expecting a child in tenth grade;
- Spending 5 or more hours per week on extracurricular activities in tenth grade; and
- Eighth grade math test score.

These factors are malleable. Teen pregnancy can be reduced through programs and policies. For example, high-quality, early childhood programs have been found to reduce teen pregnancies, as have a number of comprehensive

approaches provided to adolescents. Participation in extracurricular activities could potentially be augmented at the school level by increasing afterschool offerings. In addition, there are programs available that encourage extracurricular activities but findings regarding educational outcomes are mixed.

For postsecondary enrollment, the factors with the largest effect sizes, net of other variables in the model, were, in descending order:

- Attending a private school in eighth grade; and
- Talking with her/his mother at least one or two times about planning for high school (compared to never).

While talking with a parent seems like it should be rather malleable, policies designed to affect attendance at a private school (or a high-quality public school) in eighth grade ought to be achievable as well.

Some additional factors were found to predict both high school graduation and postsecondary enrollment, but they tend to have smaller effect sizes. These include:

- prior achievement, as measured by a standardized math score;
- internal locus of control;
- importance of good grades to the student;
- teacher-rated attendance of the student;
- extracurricular participation of 5 hours per week or more in tenth grade;
- not having close friends who dropped out; and
- positive peer academic influence.

Nearly all of these factors that predicted both high school graduation and postsecondary enrollment are malleable, meaning that programs, policies, and practices can work to augment these characteristics or behaviors in students and thus improve their educational outcomes. For example, extracurricular participation could be improved by making more programs available to students and working to make those programs easily accessible to students with transportation issues and limited resources.

Importantly, a number of these malleable predictors are incorporated into the theory of change for integrated student supports' programs.

Some distinctions between the predictors of high school completion and postsecondary enrollment warrant note. The largest risk factor for high school completion was having a child in tenth grade. In the model predicting postsecondary enrollment, having a child in tenth grade was not related to enrollment. Socioeconomic status had a larger effect size when predicting postsecondary enrollment than when predicting high school completion, which presumably reflects the financial hurdles of affording college. Interestingly, socioeconomic status was not predictive of high school completion for black students, though it was for white and Hispanic students.

Evaluation Research

Like the research literature that might inform the identification of needed supports, the evaluation research base is also still emerging. Only a handful of experimental evaluations have been completed. It is, of course, difficult to evaluate a school-based model because it is enormously costly and challenging to randomly assign entire schools. Therefore, evaluations, e.g., the Communities in Schools study, have examined the relative efficacy of being in the more intensive level of the program compared with being in the less intensive all-school program, or they have conducted quasi-experimental evaluations which cannot support causal conclusions. Drawing on this relatively small stock of evaluations nevertheless supports a set of conclusions:

- Most evaluations, particularly the quasi-experimental evaluations, found improvements in academic outcomes, including measures of academic achievement.
- Less promising findings have been found for non-academic outcomes, which represent the pathways by which academic outcomes are to be achieved, though these were less frequently assessed, so the evidence base is weaker.

- Research- and theory-based family- and school-level factors and non-academic, student-level factors (as identified in Chapters II and III, and IV) have not been widely assessed. This represents a major weakness, in that these elements appear in the conceptual model underlying the approach.

Several outcome evaluations are in process, fortunately. Four ISS models are currently being evaluated in quasi-experimental studies. These include Beacons, Elev8, Say Yes to Education, and University Assisted Community Schools. Two random assignment evaluations and one quasi-experimental evaluation, all involving Communities in Schools, are also under way. One is an i3 evaluation funded by the U.S. Department of Education of the Diplomas Now program, a consortium of City Year, Talent Development, and Communities in Schools, being conducted by MDRC as a random assignment study. The other experimental evaluation of which Communities in Schools is a part is being done as part of the Edna McConnell Clark Foundation's Social Innovation Fund and will evaluate CIS's intensive, or Tier 2, supports. A quasi-experimental evaluation comparing schools with the comprehensive CIS model to those without is also being conducted by MDRC as a part of the Social Innovation Fund work.

To date, only three studies of cost effectiveness have been completed. All three report very large returns on investment. The precise assumptions made in these studies and the specific methods employed are difficult to discern from the public reports; but they appear to differ considerably, and there would be value to the field in visiting these models and discussing the assumptions jointly. For example, how does each model estimate the value of obtaining a high school degree for future outcomes at age 20, 25, 40 or 50? In the absence of data on program impacts from a random assignment experimental evaluation, it is also a challenge to ascertain how much of any measured improvements are due to the program. Needless to say, only those improvements related to the ISS program should be tallied in a measure of cost effectiveness; however, in the absence of experimental data, it is necessary to estimate this as best as one can, which requires assumptions.

One common decision across the cost effectiveness studies is that the costs of implementing an ISS model include the coordination work and the supports provided to students in the ISS program but not the cost of supports provided to students that are available in the community. This decision is well-aligned with the conceptual model underlying integrated student supports. That is, the model posits that supports are available in the community that can be accessed to benefit students and therefore the cost of these supports should not be counted as a program cost. It bears asking, though, whether communities actually have unused capacity that can be accessed by ISS programs. Are there truly no incremental costs to the larger community or to taxpayers? And, are there opportunity costs to the community for the services used by ISS programs? Since benefits to the community in terms of crime and taxes are included in the estimation, it behooves the field to consider carefully whether and how much the cost of community supports should be incorporated.

Having acknowledged these reservations, the organizations that have conducted evaluations and requested assessment of their cost effectiveness deserve recognition for their leadership. In addition, it must be noted that all three estimates of cost effectiveness are very large. Even if some of the assumptions are generous, it seems probable that investing a dollar in an ISS model generates a return on that investment that exceeds one dollar, perhaps substantially more.

Finally, a limited set of non-experimental implementation evaluations has examined the features of ISS programs that are associated with more positive outcomes. The findings regarding specific program elements are complex and tend to vary across the several studies. However, initial findings regarding implementation quality appear to be clear, and the findings echo previous findings relative to the importance of implementation quality in early childhood education and out-of-school time programming. High-quality implementation appears to be key to program success, while poor implementation is associated with student academic outcomes that are similar to, or perhaps worse than, the outcomes of students in peer schools.

A Theory of Change

Below, we share an Integrated Student Supports Theory of Change that summarizes our understanding of the goals sought and how, in general terms, ISS programs seek to reach those goals. See Figure V1.1.

Practitioners agree that the ultimate goal (shown on the far right) of ISS models is educational achievement, including both graduation from high school and attainment of a post-secondary degree or certificate. While academic outcomes thus stand out as having clear priority as the long-term outcome, both non-academic and academic short-term outcomes are seen as the pathway to achieving those long-term outcomes. These academic outcomes include earlier and ongoing school success, while non-academic outcomes range across a wide variety of issues and vary depending upon the age group served. Based on the supports provided in varied ISS programs, such non-academic outcomes can include physical health, mental health, and behavior.

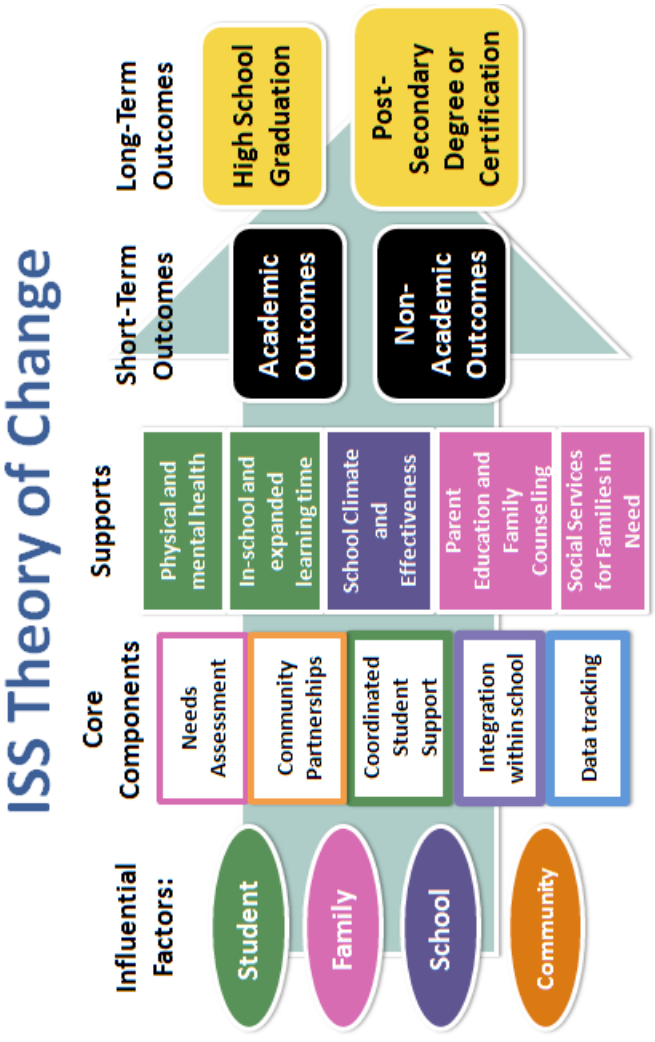
To enhance academic and non-academic short-term outcomes, ISS programs offer a range of supportive services. These include physical and mental health services, in-school and expanded learning time; school climate and school effectiveness improvement efforts, parent education and family counseling, and social services for families with needs.

These supports reflect the core components and are delivered in accordance with the principles set out in the core components. Specifically, ISS programs conduct needs assessments, build community partnerships, provide coordinated student supports, work hard to integrate programs and supports for the child within the school, and engage in data tracking to inform ongoing efforts.

Finally, this theory of change highlights varied influential factors, including the student him or herself. In addition to the school, the importance of families and the community are also recognized.

The importance of this model lies in its recognition of emphasis on non-school influences and non-academic student factors that affect academic outcomes. This perspective is very much in accord with research, but, with important exceptions, it does not appear to be typical of many contemporary U.S. schools, which focus primarily on offering academic content.

Figure VI.1. Integrates Student Supports Theory of Change



Conclusions

Based on this extensive review, it appears that ISS represents a promising approach. It is based on well-grounded tenets of child development research and theory and is well-aligned with the major principles of that field, as well as the positive youth development field. In the school setting, programs have been built based on the needs in communities as identified by thoughtful and experienced practitioners, often with community input. While program models vary, they share a common commitment to a school-based approach that coordinates a seamless system of wraparound supports to address academic and non-academic barriers to learning. In broad strokes, the ISS program approach that has emerged over time is well-attuned to the findings of research.

However, it is not possible to reach a definitive conclusion with regard to the specific supports and practices used across ISS approaches. While particular program models offer specific supports and employ specific practices, the overall integrated student supports approach has not delineated a set of specific supports and practices that are based in research or evaluation. For example, research conducted for this review found that becoming a parent during the high school years greatly increased the likelihood of high school dropout, over and above the influence of other factors. However, programs to prevent teen pregnancy are not a core component of the ISS approach. Should they be? If so, what programs should be implemented in which grades? This is only one example. ISS models would benefit from developing an evidence-based set of specific supports and best practices for service delivery.

Implementation evaluation studies, which could help ascertain which elements of ISS models represent core components and which are optional or adaptable, have been sparse and inconclusive. Accordingly, it is not clear whether or which of the supports provided in integrated student supports programs represent the best or most appropriate or complete set of supports. It might be argued that the provision of particular supports is driven by the needs assessment for a given school or student. It might also be argued that an array of relevant supports should be identified and provided as needed. Alternatively, a basic set of necessary supports might be identified, with additional supports provided as needed.

The limited set of experimental and quasi-experimental evaluations currently available suggests that integrated student supports models can be effective approaches to improving academic outcomes; but this is also an emerging evaluation literature, heavily dependent on findings from quasi-experimental studies. Moreover, the effects of the ISS approach on non-academic outcomes has not been adequately studied. Since these social, emotional, health, and behavioral outcomes appear to represent pathways to many of the academic outcomes that represent the ultimate goal of ISS models, the lack of this evidence represents an important knowledge gap.

Similarly, available research suggests that higher quality implementation is associated with better outcomes for students. However, evaluation evidence from implementation evaluations about whether and which specific practices contribute to better outcomes is very mixed and inconclusive. Since this is also a gap in terms of basic research, the need for research and evaluation evidence on the value of particular practices is especially noteworthy.
It may be that ISS models should offer certain specific mandatory supports plus an array of optional supports. Alternatively, perhaps a fixed set of supports is necessary. On the other hand, it may be that it isn't so much the specific supports that are offered as it is the use of a clear set of best practices for delivering supports and working with students that is critical. Most likely, a hybrid is required. For ISS to become a coherent and consistently effective model, though, such questions need to be addressed.

In addition, the integrated supports field has just three studies of cost effectiveness, and they are rather different in their methods and assumptions, except that they do not include supports provided at the community level in their estimates of cost. This exclusion is well-aligned with the theory of change underlying the integrated schools model, but policy makers interested in replication or scale-up should recognize that community supports are assumed to be available in the community at no cost to the integrated student supports program.
Recommendations for Research and Evaluation

While promising, the ISS approach has a number of research and evaluation needs that need to be addressed for this approach to cohere as a field. Research and evaluation are only emerging and need greater support.

The ISS approach is hindered by an evidence base that is limited and incomplete. Few highly rigorous impact evaluations have been conducted. Although several additional evaluations are in the field at present, including a new experimental evaluation of Communities in Schools, only a handful of outcome or implementation evaluations have been done or are being completed. Ideally, because ISS models are by definition a school-level approach, a random assignment evaluation would be conducted at the school level. Such an evaluation would be quite expensive and challenging to conduct. But, it is important to know whether students in ISS schools experience positive impacts. Moreover, relative to the sums spent on education in the U.S., a very rigorous assessment of this promising model seems warranted. Outcomes for students and for the school as a whole could be examined.
In addition, richer data need to be collected in evaluations and national surveys on the supports provided and practices employed that can inform decisions about what fosters achievement. Greater uniformity and rigor in terms of the measures used would be fruitful in that findings could be compared across different studies using varied methods. This would help to build the knowledge base.

Also, more attention to socioeconomic, gender, geographic, and race/ethnicity subgroups would be valuable. For example, research on Hispanics is surprisingly thin. Available research indicates that the factors that influence educational outcomes differ, with certain predictors of educational success having been found more important for this subgroup. Bilingual Hispanic students tend to fare more favorably than monolingual students who speak only English or Spanish. In addition, first and second generation immigrants tend to out-perform native students. However, Latina children, in particular, have been found to report low levels of educational engagement and poor student-teacher relationships, both of which are related to educational success. Extracurricular involvement and having a Hispanic teacher may help boost their educational engagement; but many Hispanic students enter school with fewer academic skills than their peers, and they are more likely to attend schools with safety issues. Additional research to extend this understanding would be valuable.

It is also important to ascertain the elements of integrated student supports that matter. While several studies have examined this, it appears to be a very complex question which will require additional research and the development of fidelity measures. In particular, it would be helpful to know whether some supports that are elements of the ISS approach are not necessary and can be dropped or replaced by other elements that are more essential. It is also important to understand best practices for service delivery and working with students. If a large-scale random assignment or quasi-experimental evaluation were conducted, collecting rich information on program inputs and outputs along with student outcomes would provide crucial information about the value of varied program elements – the critical mediators that affect student outcomes. Also, information on non-academic short-term outcomes is needed, as well as information on short-term academic outcomes. And, evaluations need to follow students (at least older students) over time to ascertain which students graduate and whether they pursue post-secondary education. Even in the absence of a random assignment evaluation, performance management information could be analyzed to identify elements associated with more positive outcomes. Hopefully, cut-off points could be identified, to indicate how much of a given resource is most productive, and subgroups could be examined, to explore whether some program elements are more critical for some groups than for others.

The cost of programs and their cost effectiveness are critical issues for taxpayers and policy makers. To date, only three studies comparing costs relative to benefits have been identified, and they employ quite different methods and assumptions. The field needs to debate which costs should be ascribed to ISS programs. Should the cost of supports available in the community be counted as ISS costs? Should some of these costs be counted as ISS costs? If so, which ones? In addition, researchers need to develop stronger models of the benefits associated with ISS programs. What outcomes should be tracked? How should the incremental effect of ISS be determined? Such models are best developed on the basis of evidence from experimental evaluations, which is another reason to conduct additional experimental studies.

In sum, ISS is a promising, student-centered, whole-child approach to improving educational outcomes for children and youth. For ISS to develop fully into a proven educational intervention it is necessary to strengthen the research and evaluation base at all levels.

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APPENDIX

Appendix: II. A. Methodology

The Models

In total, nine ISS models were included in this review:

- Beacon Initiative
- Children's Aid Society Community Schools
- City Connects
- Comer School Development Program
- Communities In Schools
- CoZi Initiative
- Say Yes to Education
- School of the 21st Century
- University-Assisted Community Schools.

Together these models operate in about 28 states serving roughly 1.5 million students; most have been in operation for over ten years. See Appendix II.B. for a more detailed description of each model.

Identification Of The Models

After an initial review of the current literature on integrated student supports, the following inclusion criteria were established for the inclusion of the ISS models Child Trends reviewed, including that the models had to:

1) operate or have been adapted in more than one state;
2) serve students from preK – 12th grade at the school site; and
3) utilize community partners to provide supports to students and families.

An initial list of known, operating models was gathered from previous reviews of community schools and integrated student supports' models. [10] [11] [12] [13]Other models were uncovered through searches of electronic databases, from experts in the field, and by reviewing the Coalition for Community Schools database.

Data Collection and Analysis

A list of ten national models was established, data were collected through an extensive document review available for each model. Data were recorded in a matrix that described the following elements of each model: general description of the program; degree of scale up (number of cities or sites where operational); whether it was a member of the Coalition for Community Schools, the target population including demographic information of participants; logic model and theory of change; targeted outcomes; indicators of program success; key program components; community partnerships; needs assessment process, level where conducted, and frequency; use of needs assessment to inform

10 Dryfoos, Joy. "Evaluation of Community Schools: findings to date". Accessed through the Coalition for Community Schools.

11 Potapchuk, William R. (2013) "The role of Community Schools in place-based initiatives". Coalition for Community Schools, Institute for Educational Leadership; PolicyLink; West Coast Collaborative. <http://www.communityschools.org/resources/place_based_initiatives.aspx>.

12 Blank, M.J., Melaville, A., Shah, B. P. (2003). "Making the difference: Research and practice in Community Schools." Coalition for Community Schools, Institute for Educational Leadership. <http://www.communityschools.org/assets/1/Page/CCSFullReport.pdf>

13 Hemmerich, Iris. (2012)."A resource guide for understanding Community Schools: Community School evaluations". Urban Strategies Council.

service delivery; supports offered; coordination of supports (system, staff members); place of supports (where supports are received); program evaluations which have been conducted; major findings from evaluations.

A total of nine interviews were conducted with key informants, one from each model. An interview protocol with open-ended questions was developed, which asked respondents to describe their model in more detail (e.g. target population, outcomes, activities, core components, etc) and to confirm the data that Child Trends gathered through the document review phase and to gain a deeper understanding of the common elements emerging from the data collection phase–needs assessment, coordination process, integration with schools, community partnerships, and data tracking and collection. These interviews helped to refine the emerging ISS model and common components, outcomes, and supports.

Once the data were complete, common themes were identified across the models to form an initial picture of the ISS approach, including specific elements, supports offered, and outcomes targeted (both aspiration and measured for impact). This information was presented to key stakeholders from these models and the field of holistic student support. Stakeholders provided feedback and provided valuable information on their corresponding ISS model. The general themes identified prior to this stakeholder meeting were further refined, which allowed to make comparisons across the models.

Appendix II.B. Programs

Beacons

Beacons emphasize the view that positive outcomes for youth result from opportunities to develop their talents and potential. In combination with community wide support supports and closer connections between home and school, these opportunities are intended to improve the learning and development of young people. Located in public school building, Beacons are community centers that offer a range of activities and supports to participants before and after school, in the evenings, and on weekends. Each Beacon is developed locally and operated by community organizations that work with neighborhoods residents to create programs that meet local needs and strengths. Beacons were established in 1992 and serve students in K-12. http://www.ydinstitute.org/initiatives/beacons/index.html

Children's Aid Society Community Schools

Founded in 1992, CAS Community Schools are based on a "developmental triangle," which calls for a strong instructional program, expanded learning opportunities through enrichment and supports designed to remove barriers to students' learning and healthy development, so that they can thrive academically and socially. The schools offer a comprehensive, integrated approach to education that extends the hours, supports and partnerships of traditional public schools. Most Children's Aid Society schools are open all day and well into the evening, six days per week, year-round. The Children's Aid Society founded the National Center for Community Schools, which has provided technical assistance to up over 15,000 community school adaptations nationally and internationally since 1994. CAS Community Schools serve students in PreK-12. http://www.childrensaidsociety.org/community-schools

City Connects

City Connects is an evidence-based practice that addresses the out-of-school barriers to learning, especially those imposed by poverty. City Connects is its defined, systematic practice that optimizes and transforms traditional school structures and processes aimed at addressing the non-academic needs of students. City Connects collaborates with each teacher and other school staff to systematically identify the strengths and needs of every student across academic, social/emotional/behavioral, health, and family domains. Supports are tracked individually in an electronic database, allowing for outcome evaluation and fidelity of implementation measurement. City Connects, formerly Boston Connects is supported by the Boston College Center for Optimized Student Supports. City Connects is active in preK-8 schools and in a high school pilot program. http://www.bc.edu/schools/lsoe/cityconnects/

Comer School Development Program

Dr. James P. Comer and his colleagues at the Yale Child Study Center began to create the School Development Program (SDP) in 1968. The SDP is the first reported school intervention program in which the test scores, behavior, and attendance of poor and/or socially marginalized students improved dramatically. Also, it was the first intervention in which the application of child and adolescent development principles was used school-wide to create interactions and/or relationships that prepared students to learn and to begin to take responsibility for their own learning; and enabled teachers, school staff and administrators to support student personal development and learning. The SDP aims to facilitate student growth along six developmental pathways needed for school success: social-interactive, psycho-emotional, ethical, cognitive, linguistic, and physical. http://medicine.yale.edu/childstudy/comer/index.aspx

Communities In Schools

Communities In Schools (CIS) works within the public school system, determining student needs and establishing relationships with local businesses, social service agencies, health care providers, and parent and volunteer organizations to provide embed needed resources within schools. CIS aims to surround students in a community of support, empowering them to stay in school and achieve in life. The CIS network has been in operation for more than 30 years and is made up of 200 local affiliates nation-wide serving the lowest performing schools and students most vulnerable of dropping out. http://www.communitiesinschools.org/

CoZi Initiative

This initiative is a combination of Dr. James P. Comer's School Development Program (SDP) and Dr. Edward F. Zigler's School of the 21st Century (21C). CoZi offers a set of comprehensive family support supports linked to the school through a child-centered, collaborative decision-making structure. CoZi brings all the adults in the community—teachers, parents, childcare, and service providers—to the same table, where they can plan together and share information in a comprehensive way. The guiding principles of the SDP and 21C encourage the forging of a common mission, which keeps the child's development at the heart of all planning and decision-making.

Say Yes to Education

Say Yes to Education, Inc. is a national non-profit committed to dramatically increasing high school and college graduation rates for our nation's inner-city youth. They provide comprehensive supports, including the promise of a tuition scholarship, aligned with what research indicates is needed to enable every child to achieve his or her potential. Say Yes' promise and supports begin when a child enters kindergarten and continue through college graduation. Say Yes partners with every sector of the community from government organizations, the school district, and higher education institutions to community-based organizations, businesses, and faith-based organizations to ensure a collaborative effort is made to dramatically increase high school and college graduation rates, as well as create a city-wide transformation. http://www.sayyestoeducation.org/

School of the 21st Century

Based at Yale University, the 21C program develops, researches, networks, and supervises a national model that links communities, families, and schools. 21C is based on six guiding principles: strong parental support and involvement, universal access to child care, non-compulsory programs, and focus on the overall development of the child, high-quality programming, and professional training for child care providers. 21C has 1,300 schools operating in the U.S. and was established in 1989. http://www.yale.edu/21c/index2.html

University-Assisted Community Schools

Established in 1992, University-Assisted Community Schools educate, engage, empower, and serve all members of the community in which the school is located. At the same time, working with community members to create and sustain University-Assisted Community schools provides a powerful means for universities to advance teaching, research, learning and service, as well as the civic development of their students. University Assisted

Community Schools engages students in K-12 in real world; community problem solving that is integrated into the school curriculum as well as through extended day programs. https://www.nettercenter.upenn.edu/programs/university-assisted-community-schools

Appendix IV.A. Technical Appendix

This technical appendix provides methodological details about our analyses. It includes a discussion of our data source, how we generated variables for analysis, how we ran our models, how we estimated standard errors in our models and how we generated variables for analysis.

Data source: NELS. For additional methodological information on NELS, see the following methodology report from NCES which contains information on sampling, questionnaire design, data collection, and weighting for NELS.

Haggerty, C., Dugoni, B., Reed, L., Cederlund, A., & Taylor, J. (1996). National Education Longitudinal Study: 1988-1994 Methodology Report (NCES 96-174). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC. Retrieved June 20, 2013, from http://nces.ed.gov/pubs/96174.pdf

Recoding variables. Due to the multitude of variables available in NELS, many variables were combined into scales or indices to align with the literature's conceptualization of factors. In addition, continuous variables have been standardized so that a one-point gain is equal to a one-standard-deviation gain. Appendix IVB provides details on all variables created and used in the analyses.

To ease interpretation, we also recoded all predictor variables so that their relationship with the outcome is in the positive direction, based on the initial analyses presented in table IVA-1. For example, instead of reporting the odds ratio associated with having a child while in high school, we present the odds ratio associated with not having a child while in high school.

While community-level variables are available from alternative sources, such as the American Community Survey, and can be merged with NELS using zip codes, they are not included in this analysis because the literature review found that they generally have small effects on educational outcomes.

Variable selection. We ran a series of logistic regressions in order to narrow down the most powerful predictors of high school completion. Each model predicted on-time high school completion as a function of demographic control variables and one variable of interest. This approach provided information on the effect of each variable of interest controlling for demographics, but not for any other variables. Across the models, sample sizes ranged from 7,840 to 10,830 students, representing about 2.1 million to 2.8 million students nationwide.

Once a logistic regression was run for each of the variables of interest, we ranked the variables according to their odds ratios. The variables which demonstrated an effect size considered small (OR 1.44-2.47), medium (OR 2.48-4.25), or large (OR >4.25; as compared to negligible) were included in the next round of modeling (Chinn, 2000).

Additional variables, which did not make the effect size cutoff, but were substantively important, meaning they showed theoretical promise or were suggested for inclusion by our advisory group, were also included in the model. See table IVA2 for results of this series of logistic regressions. See table IVA3 for descriptive statistics of the chosen variables.

In order to calculate descriptive statistics for the final variables, we combined strata when necessary to avoid having singleton PSUs in the sample. We also created two new strata due to singleton PSUs in the Hispanic and black subsamples.

Table IVA-1. Rank-Ordered Odds Ratios of Predictors of High School Graduation of 1988 Eighth Graders

Predictors	OR	LC	UC	Sig
Not having or expecting children (10th)	10.50	6.26	17.62	*
5 or more hours spent on extracurriculars per week (10th) (compared to none)	4.76	3.61	6.27	*
GPA (8th)	2.60	2.31	2.91	*
Ever took an AP course (10th)	2.56	1.97	3.34	*
Math standardized score (8th)	2.48	2.19	2.80	*
Family was not homeless in past 2 years (10^{th})	2.45	1.12	5.39	*
Never took remedial courses in math or English (10th)	2.41	2.00	2.91	*
Student participates in school sponsored extracurricular activities (8th)	2.20	1.61	3.02	*
Student believes it is okay to work hard for good grades (10th)	2.18	1.44	3.28	*
Student does not have a disability (8th)	2.15	1.65	2.78	*
Traditional family composition (biological mother + father) (8th)	2.11	1.72	2.59	*
Student has talked to mother about planning for high school program three or more times (compared to not at all)	2.08	1.48	2.92	*
More than 0 and less than 4 hours spent on extracurriculars per week (10th) (compared to none)	2.07	1.69	2.53	*
Student has talked to mother about planning for high school program once or twice (compared to not at all) (8th)	2.07	1.50	2.84	*
Teacher rating: Student does homework often (8th)	2.03	1.86	2.21	*
Teacher rating: Student works hard (8th)	2.00	1.83	2.19	*
Student believes it is okay to help others with school work (10th)	1.93	1.47	2.54	*
Teacher rating: Student is often attentive (8th)	1.88	1.73	2.05	*
Student has experienced few disciplinary issues (8th)	1.86	1.71	2.02	*
Student has talked to father about planning for high school program once or twice (compared to not at all) (8th)	1.84	1.48	2.27	*
Student did not use a drug within the last 30 days (10^{th})	1.79	1.47	2.18	*
Student is rarely absent (8th)	1.74	1.58	1.91	*
How far student thinks he/she will go in school (8th)	1.70	1.52	1.90	*
Importance of good grades to student (10th)	1.69	1.56	1.83	*
Attends private school (compared to public) (8th)	1.67	1.19	2.33	*
Student has talked to father about planning for high school program three or more times (compared to not at all) (	1.66	1.25	2.20	*
Student believes it is okay to ask challenging questions (10th)	1.64	1.28	2.11	*
Sureness of going on to further education after high school (8th)	1.57	1.43	1.73	*
Absences of close friends who dropped out of school (10th)	1.57	1.45	1.70	*
Parents' expectations of students' educational attainment (8th)	1.55	1.38	1.75	*
Worked 10 or fewer hours per week (compared to none) (10th)	1.54	1.13	2.09	*
Student participates in non-school sponsored extracurricular activities (8th)	1.52	1.18	1.94	*
Student has internal locus of control (i.e., student feels in control of his/her own life) (8th)	1.52	1.32	1.73	*
Student comes to class prepared (8th)	1.50	1.35	1.66	*
Positive peer academic influence (10th)	1.48	1.36	1.62	*
Student thinks the subjects he/she is taking are interesting/challenging (10th)	1.48	1.36	1.62	*
Teacher rating: Student is not often disruptive (8th)	1.47	1.35	1.61	*
Student believes it is okay to solve problems using new ideas (10th)	1.46	1.11	1.92	*
Student has discussions with parents about school (8^{th})	1.40	1.25	1.57	*
Teaching rating: Student is rarely tardy (8th)	1.37	1.21	1.55	*
Student was not born in the United States	1.34	0.79	2.26	
Parent does not contact school about academics	1.32	1.18	1.48	*
Self-concept (8^{th})	1.31	1.20	1.44	*
Parent attends parent-teacher organization meetings (8^{th})	1.28	1.04	1.58	*
Students report that teachers expect student to succeed in school (10th)	1.27	1.16	1.39	*
Parent is involved in parent teacher organization meetings (8^{th})	1.26	1.13	1.40	*
School engagement (8th)	1.25	1.13	1.39	*
Parent knows parents of child's friend (8^{th})	1.23	0.96	1.59	
Parental involvement (8th)	1.19	1.09	1.29	*
Student perception about rules about TV, friends, and chores	1.16	1.05	1.28	*
Parent talks to child often about post-HS plans (8^{th})	1.16	1.07	1.25	*
Percent of students at school who do not receive FRPM (8th)	1.13	1.01	1.25	*
Parent has discussions with child about HS (8^{th})	1.12	1.04	1.21	*
Parents are notified of unexcused absences on the same day the absence occurs	1.12	0.89	1.41	
Willingness to ask questions in class (8th)	1.10	1.00	1.21	
Student reports parent rarely checks his/her homework (8th)	1.09	1.00	1.19	
Student reported negative school environment (8th)	1.07	0.97	1.19	
School reported: Conflict between teachers and administrators	1.05	0.97	1.15	
Parent has rules about homework, GPA, and chores (8th)	1.02	0.93	1.11	
School reported: Students are not expected to do homework	1.02	0.93	1.12	
School reported: Teachers do not press students to achieve	1.01	0.92	1.11	
Worked 11 or more hours per week (compared to none) (10^{th})	0.82	0.67	1.02	

* p<.05

Notes: For sample sizes (n) see Table IVA-2.

SOURCE: 1988/2000 National Education Longitudinal Study (NELS) Restricted Use Data Files

Table IVA-2. Descriptive Statistics of 1988 Eighth Graders

	All Students				Black Students				Latino Students			
		Weighted				Weighted				Weighted		
Predictors	N	N	Mean	SE	N	N	Mean	SE	N	N	Mean	SE
Individual-level factors												
Academic Achievement												
Standardized math test score (8th)	10,440	2,812,400	50.96	0.215	850	298,300	45.25	0.589	1,330	308,300	46.52	0.428
GPA (8th)	10,740	2,900,000	3.88	0.016	890	322,000	3.69	0.058	1,390	322,400	3.71	0.044
Attitudes Towards Learning												
How far student thinks he/she will go in school (8th)	10,750	2,894,300	4.55	0.023	880	313,100	4.49	0.101	1,390	321,600	4.32	0.067
Sureness of going farther than HS (8th)	10,680	2,877,100	3.48	0.013								
Internal locus of control (8th)	10,410	2,797,500	15.26	0.055	830	293,400	14.82	0.220	1,340	308,700	14.64	0.177
Willingness to ask questions in class (8th)	10,240	2,740,600	9.42	0.036	800	274,300	9.38	0.167	1,310	302,900	9.06	0.119
Self concept (8th)	10,290	2,766,300	13.38	0.048								
Importance of good grades to student (10th)	10,030	2,636,900	3.40	0.011	790	280,500	3.59	0.038	1,250	279,200	3.45	0.029
Student believes it is okay to ask challenging questions (10th)	10,380	2,735,100	0.93	0.004	850	300,000	0.93	0.011	1,290	291,600	0.91	0.010
Student believes it is okay to help others with school work (10th)	10,390	2,737,100	0.93	0.004	850	300,100	0.91	0.013	1,300	292,500	0.91	0.011
Student believes it is okay to solve problems using new ideas (10th)	10,390	2,736,200	0.93	0.003								
Student believes it is okay to work hard for good grades (10th)	10,390	2,737,000	0.98	0.002	850	300,300	0.98	0.005	1,300	292,500	0.98	0.005
Student thinks subjects he/she is taking are interesting/ challenging (10th)	9,840	2,579,900	2.76	0.010	770	268,600	2.90	0.036	1,170	262,900	2.80	0.028
Academic Behaviors												
Student has experienced few disciplinary issues (8th)	10,650	2,860,200	5.08	0.027	850	299,100	4.72	0.116	1,380	319,800	4.83	0.123
Student comes to class prepared (8th)	10,240	2,756,500	6.36	0.037	780	281,300	6.11	0.190	1,300	301,600	6.24	0.091
Teacher rating: Student does homework often (8th)*	10,200	2,777,900	1.81	0.007	850	308,900	1.72	0.030	1,260	282,800	1.76	0.017
Teacher rating: Student is often attentive (8th)*	10,190	2,777,700	1.80	0.008								
Teacher rating: Student is rarely disruptive (8th)*	10,200	2,779,100	1.88	0.005								
Teacher rating: Student is rarely absent (8th)*	10,200	2,778,400	0.89	0.005	840	307,100	0.90	0.015	1,260	284,100	0.83	0.018
Teacher rating: Student is rarely tardy (8th)*	10,190	2,775,900	1.94	0.005	840	307,700	1.88	0.028	1,260	283,800	1.91	0.012
Teacher rating: Student works hard (8th)*	10,200	2,779,000	1.75	0.008								
Student ever took an AP course (10th)	10,170	2,671,700	0.28	0.007	810	285,400	0.31	0.032	1,260	281,100	0.27	0.021
Student never took remedial courses in math or English (10th)	10,210	2,683,400	0.75	0.007	830	289,700	0.76	0.026	1,270	282,900	0.66	0.028
Extracurricular Involvement												
Student participates in non-school extracurriculars (8th)	9,920	2,663,500	0.80	0.007	760	269,500	0.78	0.031	1,250	287,700	0.72	0.021
Student participates in school sponsored extracurricular activities (8th)	10,080	2,697,800	0.90	0.005	770	274,900	0.89	0.027	1,270	287,100	0.86	0.015
Time spent on extracurricular activities (10th) (none)	10,260	2,703,300	0.38	0.008	830	296,800	0.39	0.035	1,260	283,500	0.48	0.024
More than 0 and less than 4 hours per week	10,260	2,703,300	0.37	0.007	830	296,800	0.40	0.032	1,260	283,500	0.35	0.021
5 or more hours per week	10,260	2,703,300	0.25	0.007	830	296,800	0.21	0.031	1,260	283,500	0.17	0.015
Hours worked per week during school year (none) (10th)	9,790	2,584,900	0.42	0.008	760	267,700	0.54	0.033	1,140	260,300	0.52	0.025
10 or fewer hours per week	9,790	2,584,900	0.18	0.006	760	267,700	0.13	0.026	1,140	260,300	0.12	0.013
11 or more hours per week	9,790	2,584,900	0.40	0.008	760	267,700	0.33	0.031	1,140	260,300	0.36	0.025
Risk Factors												
Student does not have a disability (8th)	10,170	2,754,700	0.85	0.007	830	293,700	0.84	0.031	1,260	292,100	0.84	0.025
Student did not use a drug within the last 30 days (10th)	9,030	2,380,600	0.59	0.008	670	243,100	0.75	0.033	1,050	234,600	0.54	0.025
Student does not have and is not currently expecting a child (10th)	10,730	2,894,900	0.96	0.004	880	319,600	0.91	0.015	1,390	321,500	0.95	0.008
Family-level factors												
Family Context												
Student was not born in the US (8th)	10,130	2,752,800	0.04	0.003	820	291,200	0.03	0.013	1,230	286,500	0.13	0.014
Traditional family composition (biological mother + father) (8th)	10,710	2,889,300	0.67	0.009	890	320,600	0.44	0.030	1,380	318,500	0.66	0.026
Family was not homeless in past 2 years (10th)	10,180	2,655,700	1.00	0.001	830	282,500	1.00	0.002	1,280	285,300	0.99	0.025
Parental expectations, involvement, and behavior												
Student talks to father about planning for HS program (Never) (8th)	10,550	2,847,000	0.26	0.008								
Once or twice	10,550	2,847,000	0.43	0.008								
Three or more times	10,550	2,847,000	0.31	0.008								
Student talks to mother about planning for HS program (Never) (8th)	10,650	2,872,100	0.11	0.006	870	310,100	0.10	0.025	1,370	318,700	0.13	0.015
Once or twice	10,650	2,872,100	0.37	0.007	870	310,100	0.31	0.029	1,370	318,700	0.40	0.025
Three or more times	10,650	2,872,100	0.52	0.008	870	310,100	0.59	0.033	1,370	318,700	0.47	0.021
Parent knows parents of child's friend (8th)	9,830	2,681,800	0.78	0.007	760	277,000	0.69	0.028	1,190	278,100	0.68	0.025
Parent has discussions with child about HS (8th)*	10,060	2,726,900	5.11	0.017	810	282,700	5.17	0.056	1,220	284,600	4.96	0.072
Parent has high expectations of students' educational attainment (8th)*	10,220	2,774,200	4.42	0.031								
Parent has rules about homework, GPA, and chores (8th)*	9,950	2,697,500	2.53	0.011	790	277,800	2.68	0.042	1,190	277,100	2.53	0.043
Parent talks to child often about post-HS plans (8th)*	10,250	2,782,400	3.21	0.013								
Student has discussions with parents about school (8th)	10,500	2,829,200	5.57	0.038								
Student perception about rules about TV, friends, and chores (8th)	10,710	2,877,400	5.77	0.032	870	306,500	5.87	0.146	1,390	322,900	5.95	0.085
Student reports parent rarely checks his/her homework (8th)	10,770	2,900,400	1.90	0.015	880	314,100	1.78	0.058	1,400	323,700	1.92	0.042
Parent involvement in school												
Parent attends parent-teacher organization meetings (8th)	9,940	2,698,300	0.36	0.010								
Parent is involved in parent teacher organization meetings (8th)*	9,860	2,677,800	0.60	0.018	760	270,600	0.64	0.054	1,200	280,300	0.42	0.039
Parent does not contact school about academics (8th)*	9,910	2,688,900	5.67	0.026	780	277,000	5.77	0.130	1,200	274,700	5.69	0.079
Parental involvement (8th)*	7,840	2,107,400	2.13	0.025	670	239,500	2.10	0.094	1,020	234,500	2.11	0.093
Peer-level factors												
Absences of close friends who dropped out of school (10th)	10,000	2,642,300	3.73	0.009	780	281,300	3.67	0.032	1,180	268,500	3.60	0.030
Positive peer academic influence (10th)	9,800	2,594,400	8.49	0.038	760	273,100	8.95	0.166	1,150	263,500	8.49	0.125
School-level factors												
School characteristics												
Student attends a private school in 8th grade (compared to a public school)	10,830	2,921,500	0.12	0.009	900	325,400	0.06	0.016	1,410	324,800	0.11	0.023
Percent of students who do not receive FRPM (8th)	10,640	2,861,200	24.50	0.952	890	322,000	42.85	2.996	1,360	312,500	40.36	3.116
School climate												
School engagement (8th)	10,380	2,788,900	8.64	0.040	820	294,300	8.84	0.136	1,320	305,000	8.58	0.102
Poor school environment (8th)	10,390	2,796,800	8.05	0.036	810	292,200	7.72	0.097	1,330	307,600	7.96	0.076
Students are not expected to do homework (8th)	10,660	2,875,100	1.54	0.029	890	321,500	1.50	0.062	1,370	312,900	1.55	0.059
Teachers do not press students to achieve (8th)	10,670	2,878,200	1.57	0.028								
There is conflict between teachers and administrators (8th)	10,660	2,875,000	1.53	0.028	880	320,600	1.61	0.097	1,370	312,900	1.45	0.058
Parents notified of unexcused absences on same day absence occurs (10th)	8,660	2,154,700	0.66	0.018	670	230,400	0.59	0.049	950	184,400	0.68	0.034
Students report that teachers expect student to succeed in school (10th)	9,780	2,566,000	2.82	0.013	760	266,200	2.99	0.060	1,160	260,100	2.85	0.029
Demographic control variables												
Gender (Female)	10,830	2,921,500	0.50	0.007	900	325,400	0.52	0.031	1,410	324,800	0.52	0.024
Race/ethnicity (White)	10,580	2,841,500	0.71	0.013								
Black	10,580	2,841,500	0.11	0.010								
Hispanic	10,580	2,841,500	0.11	0.009								
Other	10,580	2,841,500	0.06	0.006								
Socio-economic status	10,820	2,919,800	-0.09	0.020	900	325,400	-0.44	0.052	1,410	324,800	-0.53	0.062
Outcome variable												
On time high school completion	10,820	2,920,100	0.79	0.008	900	325,400	0.72	0.032	1,400	323,900	0.67	0.024
Postsecondary enrollment	10,820	2,919,000	0.78	0.008	890	324,800	0.75	0.027	1,400	324,700	0.74	0.023

Notes: Variables marked with an astrick (*) had stratum with only one PSU in the analysis of the subgroups; SAS dropped that PSU when calculating the standard error for these variables.
SOURCE: 1988/2000 National Education Longitudinal Study (NELS) Restricted Use Data Files

Imputation. In order to retain as many high-risk cases as possible in the dataset, we performed both single and multiple imputation on the independent variables selected for inclusion in our final set of models.

Single imputation involves assigning the population mean to cases that legitimately skipped an item. This procedure allows the individuals to be included in the sample while their response to the item does not affect the modeling results. Students with legitimate skips in tenth grade were high school dropouts, who were given a separate questionnaire with different items. Of the tenth grade variables with legitimate skips, we assigned means where it was not logical for a respondent to have a value. For example, it is not logical for a student to have a value for whether or not parents are notified of their unexcused absences if the student does not attend school. In this case, the respondent would have the population mean value assigned to them in a single imputation.

Multiple imputation was performed for independent variables with missing data due to refusals to respond, multiple responses, or "do not know" responses and items for which dropouts would plausibly have values (see above paragraph) so that we can draw valid inference from the imputed data (Little & Rubin, 1987). Multiple imputation uses all of the other variables in the model to predict for the missing value of the variable of interest. Each missing value was imputed five times and five imputed datasets were generated so that sampling error could be taken into consideration. Logistic regressions were conducted for each of the five imputed datasets and regression results after imputations were pooled using Rubin's combination rule (Rubin, 1987).

Full models. The 58 variables selected in the process explained above and imputed are the final 58 variables used in the final series of logistic regressions.

For each outcome, there are two logistic regressions testing direct effects of the predictive variables. The first model includes variables assessed in eighth grade only. This models the outcome for all eighth grade students. The second model includes all 58 variables: those assessed in eighth grade and those assessed in tenth grade. Two separate models were used in order to examine the influence of middle and high school factors separately.

The series of two models was run predicting on-time high school completion (Models 1 and 2) and predicting postsecondary enrollment (Models 3 and 4). Model 2 was run again on two racial/ethnic subgroups, black students (Model 2a) and Hispanic students (Model 2b), in order to examine whether the same factors were important for students of different racial/ethnic backgrounds. These results are presented below.

Subgroup models. Due to smaller samples of black and Hispanic students, we reduced the variable set when running subgroup analyses. We re-ran the results for the overall sample of students, and results were very similar.

In order to compare across subgroups, we examined regression coefficients between the different models. Based on Clogg, Petkova, and Haritou's (1995) method, we calculated a z-score using the betas from the different models, in sets of twos.

Interpreting findings. We present results from our models in the form of odds ratios. An odds ratio of one means there is no independent effect of the predictor variable on the outcome variable.

An odds ratio statistically significantly higher than one signifies a positive effect of a predictor on an outcome. Imagine, for example that 75 percent of females complete high school, and 50 percent of males do. That would mean females' odds of completing were 3:1 (three complete for every one that does not), and males were 1:1 (one completes for every one that does not). So, in our hypothetical example, the high school completion odds ratio for being female compared with being male would be 3:1/1:1, which equals three. In other words, the (hypothetical) odds that a female will complete high school are three times the odds that a male will do so. This could also be stated as follows: the odds of a female completing high school are 300 percent that of a male, or 200 percent higher than a male's.

An odds ratio below 1 signifies a negative effect. To continue our hypothetical example, the effect on high school completion of being male, relative to being female, would be 1:1/3:1, which equals 0.33. This could be stated as the odds of a male completing high school are one-third that of a female, or that the odds for males are 33 percent of

those for females, or that the odds for males are 67 percent less than that of females.
Odds ratios below one are generally harder for readers to interpret. Furthermore comparing the magnitude of negative and positive effects is not straight forward. This is partially the result of odds ratios for negative effects being bound between 0 and 1, while positive effects range from just above 1 to infinity. As a result, it is difficult for readers to compare the magnitude of a negative effect to that of a positive effect.

To facilitate comparisons between effect sizes of variables that are negatively related with high school completion, and those of variables that are positively related with completion, we have recoded all independent variables so that their relationship with the outcome is in the positive direction, based on the initial series of regressions. For example, instead of reporting the odds ratio associated with having a child while in high school, we present the odds ratio associated with not having a child while in high school.

Note that the effects of continuous variables explored in our logistic regressions are also presented as odds ratios. All continuous variables have been standardized so that a ratio is between the odds of, for example, completing high school at value X on the continuous variable's scale, and the odds of completing college at one standard deviation higher on the scale.

Odds ratios are listed as statistically significant at the $p<.05$, $p<.01$, and $p<.001$ levels in the tables. These levels are demarcated by one, two, or three asterisks, respectively. Results are only discussed in the text if they reach the $p<.05$ threshold. This means that results are only discussed if the probability that they are due to chance from sampling error is less than one in 20.

Sampling error. NELS is a complex survey. As a result, regular variance estimation strategies would underestimate the margins of error associated with estimates. Thus, we estimated standard using Taylor series approximations, with replication (WR).

The variance estimation formulas we used require at least two primary sampling units (PSU) in each stratum because estimates of the variances are calculated using the between-primary sampling unit within-stratum variance component. When running the NELS logistic regressions, due to weighting, some observations were omitted from the analysis and therefore there were missing values. This resulted in empty clusters (or strata with only one PSU rather than the necessary two). In order to compute the variance contribution for the strata (the square of the taylorized deviation), we used "PROC SURVEYMEANS" and "PROC SURVEYFREQ" in SAS for the descriptive statistics, which dropped strata with only one PSU. The standard error precision is to approximately the thousandths place.

Appendix IV.B. Variable Descriptions

Outcome Variables	
Variable	**Description**
On-time high school completion	Derived variable indicating whether the student graduated with their class of 1992 or earlier (coded as on-time), or did not graduate or graduated late.
Any post-secondary enrollment	This variable comes from a derived variable and was created by looking at the number of postsecondary institutions attended by 1993 and whether participants attended any postsecondary institutions since 1993 (y/n).
Demographic Controls	
Variable	**Description**
Gender	Students were asked their sex (male or female).
Race/ethnicity	Participants were asked to select one or more race that best described them. Categories were combined to create the following categories: white (not Hispanic), black (not Hispanic), Hispanic or Latino, and other (which includes American Indian or Alaska Native, Asian or Pacific Islander, and more than one race).
Socioeconomic status (8th)	Standardized derived continuous variable combining information on the father's education level, mother's education level, father's occupation, mother's occupation, and family income when the student was in 8th grade.
Individual-Level Factors	
Variable	**Description**
Teacher rating: student is rarely absent (8th)	Two teachers of the student were asked whether the student was frequently absent (y/n). Teachers who responded don't know were counted as missing. The average of the teachers' responses was calculated for the overall score. If one teacher was missing then the student's score was determined by the teacher who did respond. Scores were reverse coded to indicate rare absences and this variable was standardized.
Math standardized score (8th)	Standardized score on NELS-administered mathematics achievement test.
Student has experienced few disciplinary issues (8th)	Students were asked how often the following happened to them in the first semester of the 1988 school year (never, once or twice, more than twice): student was sent to office for misbehavior; parents received a warning about the student's behavior; student got into a physical fight with another student. Student responses were reverse coded and then added together to create a discipline issues index with higher numbers indicating fewer discipline issues. The index was then standardized.

GPA (8th)	Students were asked to describe their grades since 6th grade in a variety of subjects as Mostly As, Mostly Bs, Mostly Cs, Mostly Ds, Mostly Below D, or Not Graded. Responses for English, math, science, and social studies were then averaged together. The index was then standardized.
Teacher rating: student is attentive (8th)	Two teachers of the student were asked whether the student was consistently inattentive (y/n). Teachers who responded don't know were counted as missing. The average of the teachers' responses was calculated for the overall score. If one teacher was missing then the student's score was determined by the teacher who did respond. Higher scores indicate more attentive students. The index was then standardized.
Teacher rating: student is rarely disruptive (8th)	Two teachers of the student were asked whether the student was frequently disruptive (y/n). Responses were re-coded so that higher scores indicated the student rarely disruptive. Teachers who responded don't know were counted as missing. The average of the teachers' responses was calculated for the overall score. If one teacher was missing then the student's score was determined by the teacher who did respond. The index was then standardized.
Math standardized score (8th)	Standardized score on NELS-administered mathematics achievement test.
Student has experienced few disciplinary issues (8th)	Students were asked how often the following happened to them in the first semester of the 1988 school year (never, once or twice, more than twice): student was sent to office for misbehavior; parents received a warning about the student's behavior; student got into a physical fight with another student. Student responses were reverse coded and then added together to create a discipline issues index with higher numbers indicating fewer discipline issues. The index was then standardized.
GPA (8th)	Students were asked to describe their grades since 6th grade in a variety of subjects as Mostly As, Mostly Bs, Mostly Cs, Mostly Ds, Mostly Below D, or Not Graded. Responses for English, math, science, and social studies were then averaged together. The index was then standardized.
Teacher rating: student is attentive (8th)	Two teachers of the student were asked whether the student was consistently inattentive (y/n). Teachers who responded don't know were counted as missing. The average of the teachers' responses was calculated for the overall score. If one teacher was missing then the student's score was determined by the teacher who did respond. Higher scores indicate more attentive students. The index was then standardized.

Teacher rating: student is rarely disruptive (8th)	Two teachers of the student were asked whether the student was frequently disruptive (y/n). Responses were re-coded so that higher scores indicated the student rarely disruptive. Teachers who responded don't know were counted as missing. The average of the teachers' responses was calculated for the overall score. If one teacher was missing then the student's score was determined by the teacher who did respond. The index was then standardized.
Teacher rating: Student does homework often (8th)	Two teachers of the student were asked whether the student rarely completed homework (y/n). Higher scores indicated the student frequently did homework. Teachers who responded don't know were counted as missing. The average of the teachers' responses was calculated for the overall score. If one teacher was missing then the student's score was determined by the teacher who did respond. The index was then standardized.
Student comes to class prepared (8th)	Students were asked in 8th grade how often they came to class without: pencil or paper (when needed), books (when needed), and homework done (when assigned). Responses were usually, often, seldom, and never. Responses were combined to create a new preparedness variable so that higher scores indicated a higher level of preparedness for class. The index was then standardized.
How far student thinks he/she will go in school (8th)	In 8th grade, students were asked, how far in school they thought they would get (as things stood then). Responses were: won't finish HS, will finish HS, voc./tech school, will attend college, will finish college, and higher school after college. This variable was treated as a continuous variable and was then standardized.
Teacher rating: student usually works hard (8th)	Two teachers of the student were asked if the student worked hard for good grades (y/n). Teachers who responded don't know were counted as missing. The average of the teachers' responses was calculated. If one teacher was missing then the student's score was determined by the teacher who did respond. Higher scores indicate teachers thought the student did work hard for good grades. The index was then standardized.
Importance of good grades to student (10th)	In 10th grade, students were asked how important good grades were to them. Responses were not important, somewhat important, important, and very important. The variable was then standardized.

Student thinks the subjects he/she is taking are interesting/challenging (10th)	In 10th grade, students were asked whether they agree or disagree that the subjects they take are interesting and challenging. Responses were strongly agree, agree, disagree, and strongly disagree. The variable was reverse coded so that higher scores indicated more interest. The variable was then standardized.
Locus of control (8th)	Students were asked how they felt about the following statements: I don't have enough control over the direction my life is taking; in my life, good luck is more important than hard work for success; I am able to do things as well as most other people*; every time I try to get ahead, something or somebody stops me; my plans hardly ever work out, so planning only makes me unhappy; when I make plans, I am almost certain I can make them work*; chance and luck are very important for what happens in my life. Responses were strongly agree, agree, disagree, strongly disagree, and strongly disagree. Question indicated by an asterisk (*) were reverse coded and responses were added together so that higher scores indicated a stronger locus of control (i.e., students felt they were in control of their life). The index was then standardized.
Sureness of going farther than HS (8th)	In 8th grade, students were asked how sure they were that they would go on for further education after leaving HS. Responses were very sure, probably will, probably won't, and very sure won't. Responses were reverse coded so that higher scores indicated student was very sure he or she would go on for further education. The index was then standardized.
Willingness to ask questions in class (8th)	Students were asked whether they were often afraid to ask questions in math, English, science, and social studies classes. Responses were strongly agree, agree, disagree, or strongly disagree, with higher scores indicating students were willing to ask questions in class. Responses were added together to create an index of reluctance to ask questions. The index was then standardized.
Self-concept (8th)	Students were asked how they felt about the following statements: I feel good about myself*; I feel I am a person of worth, the equal of other people*; on the whole, I am satisfied with myself*; I certainly feel useless at times; at times I think I am no good at all; I feel I do not have much to be proud of. Response options were strongly agree, agree, disagree, and strongly disagree. Responses were added together to create the self-concept index. The index was then standardized.

Teacher rating: student is rarely tardy (8th)	Two teachers of the student were asked if the student was frequently tardy (y/n). Teachers who responded don't know were counted as missing. The average of the teachers' responses was calculated for the overall score. If one teacher was missing then the student's score was determined by the teacher who did respond. High scores indicate the student was rarely tardy. The index was then standardized.
Hours worked per week during school year (compared to none) (10th)	Student was asked how many hours he/she usually worked each week on the current or most recent job during the current school year. Categories were combined so that student responses became: did not work during school year, worked less than 10 hours per week, or worked 11 or more hours.
Never took remedial courses in math or English (10th)	Students were asked in 10th grade if they had ever taken remedial courses in math and English (y/n). If they answered yes to either math or English they were counted as having taken remedial courses. If both were missing the student was counted as missing. If they answered no to both math and English they were counted as having never taken remedial courses.
Student believes it is okay to work hard for good grades (10th)	Students were asked if they thought it was okay to work hard for good grades (y/n).
Student believes it is okay to ask challenging questions (10th)	Students were asked if they thought it was okay to ask challenging questions (y/n).
Student believes it is okay to solve problems using new ideas (10th)	Students were asked if they thought it was okay to solve problems using new ideas (y/n).
Student believes it is okay to help others with school work (10th)	Students were asked if they thought it was okay to help other students with their schoolwork (y/n).
Ever took an AP course (10th)	Students were asked in 10th grade if they had ever participated in Advanced Placement programs (y/n).

Sureness of going farther than HS (8th)	In 8th grade, students were asked how sure they were that they would go on for further education after leaving HS. Responses were very sure, probably will, probably won't, and very sure won't. Responses were reverse coded so that higher scores indicated student was very sure he or she would go on for further education. The index was then standardized.
Willingness to ask questions in class (8th)	Students were asked whether they were often afraid to ask questions in math, English, science, and social studies classes. Responses were strongly agree, agree, disagree, or strongly disagree, with higher scores indicating students were willing to ask questions in class. Responses were added together to create an index of reluctance to ask questions. The index was then standardized.
Self-concept (8th)	Students were asked how they felt about the following statements: I feel good about myself*; I feel I am a person of worth, the equal of other people*; on the whole, I am satisfied with myself*; I certainly feel useless at times; at times I think I am no good at all; I feel I do not have much to be proud of. Response options were strongly agree, agree, disagree, and strongly disagree. Responses were added together to create the self-concept index. The index was then standardized.
Teacher rating: student is rarely tardy (8th)	Two teachers of the student were asked if the student was frequently tardy (y/n). Teachers who responded don't know were counted as missing. The average of the teachers' responses was calculated for the overall score. If one teacher was missing then the student's score was determined by the teacher who did respond. High scores indicate the student was rarely tardy. The index was then standardized.
Hours worked per week during school year (compared to none) (10th)	Student was asked how many hours he/she usually worked each week on the current or most recent job during the current school year. Categories were combined so that student responses became: did not work during school year, worked less than 10 hours per week, or worked 11 or more hours.
Never took remedial courses in math or English (10th)	Students were asked in 10th grade if they had ever taken remedial courses in math and English (y/n). If they answered yes to either math or English they were counted as having taken remedial courses. If both were missing the student was counted as missing. If they answered no to both math and English they were counted as having never taken remedial courses.
Student believes it is okay to work hard for good grades (10th)	Students were asked if they thought it was okay to work hard for good grades (y/n).
Student believes it is okay to ask challenging questions (10th)	Students were asked if they thought it was okay to ask challenging questions (y/n).

Student believes it is okay to solve problems using new ideas (10th)	Students were asked if they thought it was okay to solve problems using new ideas (y/n).
Student believes it is okay to help others with school work (10th)	Students were asked if they thought it was okay to help other students with their schoolwork (y/n).
Ever took an AP course (10th)	Students were asked in 10th grade if they had ever participated in Advanced Placement programs (y/n).
Not having or expecting children of your own (10th)	Students were asked if they had any children of their own. Students who answered yes or no, but expecting were counted as having child or expecting in 10th grade and those who answered no were counted as not having or expecting a child in 10th grade.
Student did not use a drug within the last 30 days (10th)	Students in 10th grade were asked: how many times in the last 30 days they had had alcohol beverages to drink (beer, wine, wine coolers, and liquor), how many times they used marijuana, and how many times they took cocaine in any form. If students said they used any of these drugs one or more times they were counted as having used a drug within the last 30 days. If they indicated they had not used any of these drugs within the last 30 days they were counted as not using a drug within the last 30 days.
Student does not have a disability (8th)	Parents were asked if, in their opinion, their child had any of the following: visual handicap (not corrected by glasses), hearing problem, deafness, speech problem, orthopedic problem (i.e. club foot, cerebral palsy, polio, absence of arm or leg), other physical disability, specific learning problem (i.e. dyslexia or other reading, spelling, writing, or math disability), or emotional problem. Parents answered yes or no to each question. If a parent was missing for one question then they were counted as missing. Otherwise, if a parent answered yes to any of the disabilities listed the student was counted as having a disability. If a parent answered no to all disabilities the student was counted as not having a disability.
Participated in school sponsored extracurricular activities (8th)	Students were asked if, during the current school year, they participated as a member, officer, or not at all in the following activities: science fairs, varsity sports, intramural sports, cheerleading, band/orchestra, chorus/choir, dance, history club, science club, math club, foreign language club, debate/speech team, drama club, academic honors society, student newspaper, student yearbook, student council, computer club, religious organization, or vocational education club. If a student's response was missing in any of the categories he or she was counted as missing. If they participated in any of the above as a member or officer they were counted as having participated in school sponsored extracurricular activities.

Time (hours per week) spent on extracurricular activities (10th)	Students were asked: how much time in a typical week they spent on all school-sponsored extracurricular activities. Categories were reduced so that students could have spent no time, four or fewer hours, or five or more hours on extracurricular activities.
Student participated in extracurricular activities not sponsored by school (8th)	Students were asked if, during the current school year, they participated as a member, officer, or not at all in the following activities: scouting, religious youth group, hobby clubs, neighborhood clubs or programs, boys' clubs or girls' clubs, non-school team sports, 4-H club, Y or other youth groups, summer programs (i.e., workshops or institutes in science, language, drama), any other outside-school activities. If a student's response is missing in any of the categories he or she is counted as missing. If they participated in any of the above as a member or officer they were counted as having participated in school sponsored extracurricular activities.
Family-Level Factors	
Variable	**Description**
Traditional family composition (biological mother + father) (8th)	This variable indicates the family or household composition and is based on student responses to questions about who lives in the same household as the student (options were father, other male guardian, mother, other female guardian, brothers, sisters, grandparents, other relatives, and non-relatives). Categories were combined into: mother and father or other composition.
Parent has rules about homework, GPA, and chores (8th)	Parent-reported whether or not there were family rules for the eighth grader about: (1) maintaining a certain grade average, (2) doing homework, and (3) doing household chores. Higher scores indicate more rules. The index was then standardized.
Parent knows parents of child's friend (8th)	Parents were first asked who their child's closest friend was and then indicated if they knew the friend's parent (y/n). Missing cases were counted as missing, as were cases in which the parent did not know the child's closest friend.
Parent has high expectations of students' educational attainment (8th)	Parent-reported how far in school they expected their child would go in school. Options were: less than a HS diploma, HS degree (or GED); vocational school, less than 2 years of college, or some college; finish a 2 year program; finish a 4 or 5 year program; MA; PhD or MD. We treated this variable as continuous and standardized this variable.

Parent has discussions with child about HS (8th)	Parent-reported frequency (not at all, rarely, occasionally, or regularly) of discussing school experiences and high school plans with child. Scores were added together to create one index with high scores indicating more discussion. The index was then standardized.
Parent talks to child often about post-HS plans (8th)	Parent-reported frequency (not at all, rarely, occasionally, or regularly) of discussing educational plans after high school with child. The variable was standardized.
Parent is involved in parent teacher organization (8th)	Parent-reported whether or not they (1) belong to a parent-teacher organization and (2) take part in the activities of a parent-teacher organization. Scores were added together to create an index with high scores indicating more parental involvement. The index was then standardized.
Parent attends parent-teacher organization meetings (8th)	Parent-reported whether or not they attend meetings of a parent-teacher organization (y/n).
Student perception about rules about TV, friends, and chores (8th)	Student-reported frequency (often, sometimes, rarely, never) of parents (1)requiring them to do work or chores around the home, (2) limiting the amount of time they can spend watching TV, and (3) limiting the amount of time going out with friends on school nights. Variables were reverse coded and added together to create an index with high scores indicating more rules. The index was then standardized.
Student reports parent does not check his/her homework (8th)	Student-reported frequency (often, sometimes, rarely, never) of parents checking on whether or not they have done their homework. The variable was standardized.
Parent does not contact school about academics (8th)	Parent-reported frequency (none, 1-2 times, 3-4 times, more than 4 times) of contacting child's school since Fall semester about child's academic performance and academic program for 1988 school year. Variables were re-coded and scores were added together so that high scores indicate little contact. The index was then standardized.
Student has discussions with parents about school (8th)	Students were asked how often (not at all, once or twice, or 3 or more times) they: talked to mother about planning high school program, discussed selecting courses/ programs at school with parent(s), discussed school activities or events with parent(s), discussed things studied in class with parent(s). Scores were added together to create new index with higher numbers indicating more discussion. The index was then standardized.

Student talks to mother about planning for HS program (compared to not at all) (8th)	Students were asked how often (not at all, once or twice, or 3 or more times) they talked to their mother (or female guardian) about planning for high school program.
Student talks to father about planning for HS program (compared to not at all) (8th)	Students were asked how often (not at all, once or twice, or 3 or more times) they talked to their father (or male guardian) about planning for high school program.
Parental involvement (8th)	Students were asked if, since the beginning f the school year, their parents had done any of the following (y/n): attend a school meeting, phoned or spoken to the teacher or counselor, visited the student's class, or attended a school event (i.e., play, sports competition, concert) where the student participated. Responses were added together so that higher scores indicated more parental involvement. The index was then standardized.
Family was not homeless in past 2 years (10th)	Students were asked if, in the last two years, their family had ever been homeless for a period of time (y/n).
Student was not born in the US	Parents were asked if their child was born in the United States, in Puerto Rico, or in another country. Students who were born in the United States or Puerto Rico were considered born in the US and students who were born in another country were considered not born in the US.
Peer-Level Factors	
Variable	**Description**
Positive peer academic influence (10th)	Students were asked: among friends you hang out with, how important is it to attend classes, study, get good grades, finish high school, and continue their education past high school. Responses were: not important, somewhat important, or very important. The scores were added together to create the positive peer academic influence index with high scores indicating a more positive peer influence. The index was then standardized
Number of close friends who are still in school (10th)	In 10th grade, students were asked how many of their close friends had dropped out of school without graduating. Response options are: none of them, some of them, most of them, and all of them. Responses were then reverse coded so that a higher value indicates fewer friends dropped out (more friends still in school). The variable was then standardized.

School-Level Factors	Note: For this section, questions that were reverse coded are denoted with an asterisk (*).
Variable	**Description**
School engagement (8th)	Students were asked a series of questions about how much they agreed with statements about their school (strongly agree, agree, disagree, strongly disagree). Questions related to school engagement were included in this index, including: students get along with teachers*, there is real school spirit*, teachers are interested in students*, teachers praise hard work*, student feels "put down" by teachers in class, and teachers listen to what students have to say*. Students' responses to the six questions were added together to create the school engagement index. High scores indicate higher school engagement. The index was then standardized.
Poor school environment (8th)	Students were asked a series of questions about how much they agreed with statements about their school (strongly agree, agree, disagree, strongly disagree). Questions related to school environment were included in this index, including: rules for behavior are strict*, discipline is fair, other students disrupt class*, disruptions by other students get in the way of learning*, misbehaving students often get away with it*. Students' responses to the five questions were added together to create the school environment index. High scores indicate a poor school environment. The index was then standardized.
Percent of students who do not receive FRPM (8th)	Schools were asked how many students in their school participated in the Free and Reduced-Priced Lunch program. This number was then divided by the number reported for total student enrollment as of October 1, 1987 in the school and multiplied by 100 to get a percent. The percent was subtracted from zero and 100 was added in order to reverse code the percent so that low numbers indicate many students participated in the FRPM program and high numbers indicate few students participated in the program. This variable was then standardized.
There is conflict between teachers and administrators	Schools were asked how much conflict between teachers and administrators defined the climate of their school. There were five response categories ranging from not at all accurate to very much accurate. High scores indicated conflict between teachers and administrators very much defined the climate of their school. This variable was standardized.

Teachers do not press students to achieve	Schools were asked how much teachers at the school encouraging students to do their best defined the climate of their school. There were five response categories ranging from not at all accurate to very much accurate. Responses were reverse coded so that high scores indicated that teachers at the school encouraging students to do their best did not define the climate of their school. This variable was standardized.
Students are not expected to do homework	Schools were asked how much students being expected to do homework defined the climate of their school. There were five response categories ranging from not at all accurate to very much accurate. Responses were reverse coded so that high scores indicated that students being expected to do homework did not define the climate of their school. This variable was standardized.
Type of 8th grade (public vs. private)	This variable was based on a variable created by NELS which classifies the type of school into public, Catholic, other religious, and nonsectarian private schools, as reported by the school administrator. We collapsed the categories into public and private (which include Catholic, other religious, and nonsectarian private schools).
Parents are notified of unexcused absences on the same day the absence occurs	Schools were asked how soon parents were notified of unexcused student absences. Responses were not notified, same day, after a day or two, within the first week, or at the end of the semester. We collapsed categories so that responses of not notified, notified after a day or two, notified within the first week, and notified at the end of the semester constituted parents not being notified of unexcused absences on the same day the absence occurs.
Students report that teachers expect student to succeed in school (10th)	Students were asked if they agreed that teachers caring about them and expecting them to succeed in school was why they went to school. Responses were strongly agree, agree, disagree, and strongly disagree. Responses were reverse coded so that higher scores indicated students feeling the teacher expecting them to succeed was a strong reason they attended school. This variable was standardized.

Appendix V.A. Criteria for Study Inclusion