

THE STRUCTURE AND CLIMATE OF SIZE:  
SMALL SCALE SCHOOLING IN AN URBAN DISTRICT

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Doctor of Philosophy

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January 2010

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## ABSTRACT

The Structure and Climate of Size: Small Scale Schooling in an Urban District

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Doctoral Advisory Committee Chair: Dr. Will J. Jordan

This study explores mechanisms involved in small scale schooling and student engagement. Specifically, this study questions the validity of arguments for small scale schooling reforms that confound the promised effects of small scale schooling *structures* (such as smaller enrollments, schools-within-schools, and smaller class sizes) with the effects of the *school climates* assumed to follow from these structural changes. Data to address this issue was drawn from the Philadelphia Educational Longitudinal Study – one of the few publically-available datasets to include student-level measures of school-within-a-school participation and relative quality – and supplemented by school-level data from the National Center for Education Statistics’ Common Core of Data. Regression analyses were designed to examine whether academic press and/or personalized teacher-student relationships – two aspects of school climate often associated with small scale schooling – mediate the relationships between small scale schooling structures and student engagement.

The results suggest a pattern of widespread connections between small scale schooling structures and students’ emotional engagement in school, but only a loose connection between these structures and students’ behavioral engagement in school. Furthermore, school climate does, in fact, mediate many of the relationships between small scale schooling structures and

emotional engagement; however, it does not fully mediate the relationship between small scale schooling structure and behavioral engagement. Findings relating student engagement to the quality of small learning communities relative to others in the same school suggest that comprehensive schools that are broken down into smaller within-school units may create a new mechanism for tracking students. Those who participate in relatively high quality small learning communities like school more and participate in more extracurricular activities/sports than students who participate in relatively low quality small learning communities or in no small learning community at all. These relationships are not mediated by school climate. Overall, the findings of this study suggest that the results of small scale schooling reforms are largely dependent on the school climates where they are instituted.

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## CHAPTER 1

### INTRODUCTION

Our public schools are not adequately preparing enough of our children for their adult lives. Classes entering high school in the past decade have only graduated 70 percent to 75 percent of students nationwide (Swanson, 2009; Wirt et al., 2004). The dropout rates for students placed at risk are even higher. Almost half of all Black, Latino, and Native American students do not complete a high school education (Swanson, 2009; Orfield et al., 2004). Students from low income families are twice as likely to drop out of high school as those from middle income families and more than five times as likely to drop out as students from high income families (Wirt et al., 2004).

The high number of students who drop out of school results in a large segment of the population unlikely to earn enough to fully support themselves and their families. The rate of return to graduating from high school, rather than dropping out, is now higher than ever at greater than 50 percent (Heckman, Lochner, & Todd, 2008). Individuals without a high school degree also experience a number of negative indirect consequences of not having even a basic education degree, including a greater likelihood of becoming involved in illegal activities (Jarjoura, 1993; Coalition for Juvenile Justice, 2001; Hoffmann, 2002) and experiencing poorer health and inadequate health care (Molla, Madans, & Wagener, 2004; Thrane, 2006).

The problem of public school failure is not only an individual issue. Businesses cannot find trained workers with basic literacy and problem-solving skills (see Forsyth, 3/26/08; U.S. Department of Education, 10/8/2004). Democratic institutions falter as individuals without a high school degree vote at substantially lower rates (Levine & Lopez, 2002) – and when those who do vote do not have the civics education or critical thinking skills to evaluate political

rhetoric (Schlozman, Verba, & Brady, 1999; Galston, 2007). Public school failure is thus a problem that belongs to all of us.

School reformers of various educational philosophies and political ideologies ultimately want the same end result – better schooling for our children. But they do not all agree on exactly which parts of the system are broken: some point to classroom practices and curricula (Lipman, 1997; Finn, Ravitch, & Fancer, 1984), others to unsupportive school climates and alienating school cultures (Loukas & Murphy, 2007; Shouse, 1996), and still others point to problems beyond the walls of schools, in the community (DeSena & Ansalone, 2009), in the home (Kaplan, Liu, & Kaplan, 2000; Hill & Tyson, 2009), and in broader political systems (Cookson, 1994; Berliner & Biddle, 1996).

One of the most common critiques of public schools is that the educational atmosphere provided in large, bureaucratic high schools is too impersonal, directly contributing to the student apathy and anomie that ultimately leads to complete disengagement from school (Fine, 2000; Antrop-Gonzalez, 2006; McPartland, Balfanz, Jordan, & Legters, 1998; McPartland, Jordan, Legters, & Balfanz, 1997; Lee, Bryk, & Smith, 1993; Lee & Smith, 1994; Lee, Smith, & Croninger, 1995; Zvoch, 2006). To change this impersonal school context, a large number of policymakers and education leaders have turned to reform strategies designed to create more personal, supportive school environments.

Small scale schooling reforms have taken on a number of forms, generally falling within three categories: creating new, small whole schools; restructuring comprehensive schools into smaller schools-within-a-school; and the adoption of class size reduction policies. Many of the nation's lowest performing cities have turned to the small schools movement for answers to their educational shortcomings, from low achievement to high levels of disengagement and dropout.

Amongst these are school districts in Baltimore, Chicago, Detroit, New York City, Seattle, and Philadelphia (Antrop-Gonzalez, 2006). School restructuring has been supported as a prevention/intervention strategy by multiple philanthropic organizations, including the Bill and Melinda Gates Foundation and the Annenberg Foundation (Antrop-Gonzalez, 2006; Ready, Lee, & Welner, 2004). While private foundations have funded greater attention to creating small schools, the structuring of more intimate schooling experiences as a major reform has also included the reduction of class sizes. State education policies in the past three decades have almost all included some attention to class size reduction (Brewer et al., 1999; Ehrenberg et al., 2001; Hertling et al., 2000; Mitchell & Mitchell, 2000; Mitchell, 2000, 2001b; Parrish & Brewer, 2000; Ritter & Boruch, 1999; Stecher et al., 2001).

Small scale schooling reforms are built on a few key assumptions. The first is that educational environments – whether classrooms, small learning communities, or entire schools – are more supportive when there are fewer students involved. There are a number of mechanisms that may play into the benefits of small scale schooling. Students cannot get lost in the crowd, decreasing the potential for feeling like nobody knows or cares about them at school. Fewer students per teacher opens up greater access to individualized instruction time; it also gives teachers greater opportunity to develop relationships with each student, catching those in the process of disengaging from school.

The second major assumption of small scale schooling reforms is that greater academic press from teachers will push students to succeed – and that this academic press is best achieved in small, manageable groups of students. Having more time with teachers means having a better chance of receiving help when students need it. A more intimate educational world also means

more public visibility – which can both motivate good work and deter failure. In a small school, students cannot simply disappear without anyone noticing.

The third key assumption is that changing the structure of schooling and creating a smaller learning context will lead to changes in the processes of schooling. Advocates of small scale schooling claim that more intimate learning environments enable a host of educational practices that are prohibited by large, impersonal school structures – it is these practices that are then responsible for the changes to student outcomes that are engendered by small scale schooling. However, this presumption relies upon a theoretical leap of faith: do structures really determine practice? Or are there cultural influences, as well – and, if so, are these cultural influences necessarily changed when the school structure changes? These issues and others involved in questioning this third key assumption to the small scale schooling debate will be discussed further in the section on theory in Chapter Two.

This study questions all three of these assumptions. In light of such well-supported reforms, this study examines the primary argument behind small scale schooling reforms: do smaller schooling *structures*, such as small enrollments and lower student-teacher ratios, relate directly to student engagement? Or are school effects on student engagement in small scale schooling more attributable to school *climate*?

### Defining Key Terms

There are a number of terms signifying concepts that are instrumental to the argument and empirical analyses presented in this study; this section introduces each in turn and explains how they are used in these analyses.

#### *Small Scale Schooling*

This study is interested in *educational scale* – that is, the overall size of students’ environments at school, whether classroom, small learning community, or entire school. The term “small scale schooling” is used to loosely indicate any one of these school contexts with relatively few students per unit (e.g., fewer students per teacher than the norm; a smaller school enrollment). The term is used less often in the literature than more specific phrases, such as “small school” or “small class size;” however, “small scale schooling” as a term has the benefit of being more inclusive of multiple educational units – it can be used to reference small schools, learning communities, and classes at the same time. Because each of these small scale schooling structures rely upon similar mechanisms, the assumptions about which are questioned in these analyses, the term is quite useful for this study.

### *Small Schools*

There is little consensus about the maximum number of students who can be enrolled at a school that is still considered “small.” Researchers and advocates of small schools tend to suggest enrollment sizes between 250 and 500 students. The Chicago Small Schools Coalition recommends “preferably no more than 500 students in high schools” (Fine, 1998, p. 3); however, the co-director of the Chicago Small Schools Workshop, Michael Klonsky (1996) has asserted that all schools, regardless of grade level, should have an upper limit between 250 and 300 students. Meier (1995) also recommends that schools should not be “larger than a few hundred” (p. 117).

Administrators tend to suggest slightly bigger caps on small school enrollments. For example, the National Association of Secondary School Principals (1996) has advocated for “self operating units of no more than 600 students” (p. 46) as a guide for high school size. Chicago high schools that are designated as “small” by district officials have a maximum enrollment size

of 600 students (Chicago Public Schools, 2009). New York City’s small secondary high schools enroll “about 500 students” each, according to officials at the school district (New York City Department of Education, 2009).

The main defining, nominative element of small schools is certainly a small enrollment; however, some individuals caution against focusing on enrollment size to the exclusion of the accompanying changes in educational processes. In addition to small enrollment, advocates often enumerate the following additional core qualities of small schools:

- a personalized environment where students and teachers know each other
- a rigorous, relevant curriculum
- teachers who share similar educational philosophies
- autonomy over curriculum, budget, personnel, and other organizational decisions, and
- inclusive student bodies of students who choose to enroll (Azcoitia, 1995; Fine, 1994; Klonsky, 1996; Wasley et al., 2000).

#### *Schools-Within-A-School and Small Learning Communities*

The term “schools-within-a-school” (SWS) has been applied to a number of restructuring models – to the point that it has been criticized of having become a fairly ambiguous term (Cotton, 1996; Meier, 1995; Ready, Lee, & Welner, 2004). At its base, the term refers to the division of an existing large school into multiple school units within the same physical building. Barker and Gump (1964) argued the benefits of using a “campus model” for high schools decades ago. Their ideal structure had students

Grouped in semiautonomous units for most of their studies, but [they] are usually provided a school-wide curricular program. The campus school provides for

repeated contacts between the same teachers and students; this continuity of associates probably leads to closer social bonds. A common sense theory is that the campus school welds together the facility advantages of the large school and the social values of the small school. (pp. 201-202).

There are two elements of Barker and Gump's early vision for the campus model that have been highly debated and now form major differences between various SWS models. Some researchers and advocates have promoted the vital importance of a full restructuring in which all students and teachers are assigned to a single school within the host school (Ready, Lee, & Welner, 2004). Others have studied the implementation of partial models, in which a portion of a large school's students belong to one or two separate schooling units, while the majority remain in the regular, large school program (Lee, Ready, & Johnson, 2001; Stern, Raby, & Dayton, 1992; Muncey & McQuillan, 1996).

The other key difference between SWS models is the degree to which each school within the host school is autonomous – that is, has the ability to create and execute school-level policies and the ability to report directly to district-level administrators without first going through another administrator within the host school. Some scholars use the term “schools-within-a-school” to refer only to those models that afford this autonomous authority to the schools within the host school (Ready, Lee, & Welner, 2005; Raywid, 1995); however, very few SWS implementations have created autonomous structures within the larger school (see Lee, Ready, & Johnson, 2001).

Regardless of whether a SWS is full or partial, autonomous or not, other key elements often found in definitions involve organizational or curricular themes. Career academies, which can be considered SWS, are particularly popular; these SWSs offer special classes, internships,

and other experiences tailored to particular career tracks, such as health sciences or business (Oxley, 1994; Raywid, 1995; Stern, Raby, & Dayton, 1992). Ninth grade academies are another SWS model that has gained much support over the years as the transition to high school has been identified as a particularly crucial developmental hurdle for students placed at risk. Schools with this SWS model group freshmen together not only for classes, but also for additional supports such as special advisories, guidance counseling, and other experiences that afford additional support to students as they transition from middles to high school (see McPartland et al., 1996).

Philadelphia's SWSs represent a range of implementation models. Some offer career themes, some cater specifically to ninth grade students, and some offer special pedagogical and curricular designs to assist students with difficulty achieving in large school structures. In the past, these schools were referred to as "charters" – which has become rather confusing given the fact that Philadelphia has also embraced the charter school movement. For example, charter schools may overlap with SWS implementation – charter schools can certainly offer SWS structures. The term "charter" to refer to these SWSs has therefore been replaced in the local lexicon by the term "small learning community." In this study, SWS will be used as an umbrella term to refer to any of the many possible implementation models described in the wider scholarly literature; small learning community will be used to reference Philadelphia's particular cache of SWS implementations, in keeping with the local terminology.

### *Small School Structures*

The three types of small scale schooling previously defined – small schools, schools-within-a-school, and small classes – are all referred to as small school structures in this study. These structural aspects of educational scale all arrange students into particular organizational units in which they experience their schooling. In other words, school *structure* refers to the

deliberately determined organization of the school – how students, teachers, classes, and other aspects of schooling are ordered for the lived process of schooling. The construct of structure itself will be further explicated in the theory section of Chapter Two.

### *Small School Climate*

Contrasted with small school structure in this study is small school climate. This term refers to the common experiences, thoughts, and feelings of school members that are presumed to contribute to school-related behaviors. The concept of organizational climate has a long and oft-debated place in sociological and psychological research (see reviews and discussions by James & Jones, 1974; Schneider, 1975; Glick, 1985; and Schein, 1992). For the purposes of this study, the term “small school climate” refers specifically to two shared aspects of schooling experiences that are often associated with small scale schooling: academic press and the personalization of teacher-student relationships.

School culture – a concept that is closely related to school climate – has been widely studied by anthropologists of education. Although they are distinct constructs, both school climate and school culture are important to the current study’s contribution to understanding the mechanisms by which small scale schooling engages students. School climate can be understood as a single snapshot of a deeper, more complex culture, capturing the “what” that happens in school (the expressed experiences, beliefs, and feelings of school members), but not “why” these things happen the way they do (which involves the values, norms, and other taken-for-granted assumptions that shape school-based events, processes, and experiences) [Schneider & Gunnarson, 1996]. The theoretical framework of this study relies upon current debates in the social sciences between structure and culture; however, for methodological reasons, it is school

culture's conceptual cousin, school climate, that is used in this study's analytical examination of small scale schooling. Chapter Two describes these debates and constructs more fully.

### *Academic Press*

The concept of press – a broader social psychology construct which was extended to specify academic press – generally refers to a compelling quality of an environment or object that signals to an individual to take some specific sort of action (Lewin, 1936). Academic press is the set of forces or practices embedded in a school's normal routine that prompt teachers to set rigorous academic expectations and prompt students to work towards achieving these academic goals (Pace & Stern, 1958). In this way, academic press has come to be considered a vital dimension of school culture and climate that is generated through the normative values adopted by members of the school (McDill, Natriello, & Pallas, 1986).

### *Student Engagement*

The term “engagement” has a relatively brief history in educational research. A review in 1985 found only two studies that used the term (see Mosher & McGowan, 1985), though the highly-related concept of academic motivation has been a foundational mechanism of learning theories for quite some time (Appleton et al., 2008). Over the few decades that the term has been in use, scholars have used it in ways that have proliferated multiple definitions and overlapping constructs; a few of these definitions are particularly influential in the current study. Newmann, Wehlage, and Lamborn (1992) define student engagement as the “psychological investment in and effort directed toward learning, understanding, or mastering the knowledge, skills, or crafts that academic work is intended to promote” (p. 12). Marks (2000) defines student engagement as the “psychological process involving the attention, interest, investment, and effort students expend in the work of learning” (pp. 154-155). Both of these definitions emphasize the idea that

engagement is a continual process involving multiple means of connecting with learning and that there are behavioral, affective, and cognitive processes at work.

This study thus adopts a three-dimensional construct of engagement, following recent reviews of the literature that point out a consistent theme of multidimensional definitions (Fredericks et al., 2004; Jimerson et al., 2003). Fredricks et al. (2004) trace three aspects of school engagement that have been identified in the literature: a) emotional engagement, which involves student attitudes, interests, and values; b) cognitive engagement, which includes students' motivational goals and self-regulation; and c) behavioral engagement, which comprises student conduct. These three dimensions are the focus of this study.

#### The Philadelphia Case Study

This study addresses questions about how the structure and climate of small scale schooling reforms relate to each other and to student engagement using a quantitative case study of an urban district that has focused its school reform efforts on educational scale: The School District of Philadelphia.

Small scale schooling reforms have received a lot of attention from urban school districts in the past quarter century. Restructuring into smaller educational units has featured heavily in major reforms in New York City, Chicago, and other cities in need of dramatic educational change. Because most of these reforms – including those in Philadelphia – have been at least partially funded by major philanthropic initiatives, evaluations of the processes and outcomes have generally accompanied the efforts, at least for the duration of the various grants awarded. Seldom do these evaluations delve deeply into the mechanisms at work in the reforms. Studies look for noteworthy changes in student engagement and achievement, as well as differences in the schooling processes – are teachers using more varied pedagogies in the classroom? Has

attendance increased? Do students feel more supported by their teachers? But the connections between restructuring, changing practices, and student outcomes are hardly ever examined in full.

Philadelphia offers a case study of restructuring into small scale schooling in which these connections can be examined. Three waves of small scale schooling have taken center stage in Philadelphia's public school district over the past two decades. The following section will describe these reform efforts in order to ground the analyses of this study in their policy context. After describing the forms of small scale schooling envisioned, various barriers to implementation will be discussed. Early outcomes from previous studies will then be described, with particular attention paid to the gaps that will be filled by the current set of analyses. Finally, the unique advantages that Philadelphia's reforms offer as a quantitative case study will be described.

#### *Philadelphia's Brand of Small Scale Schooling.*

The Small Schools Movement officially came to Philadelphia in the late 1980s. Some comprehensive high schools already had schools-within-schools (known locally then as "charters"): as of 1988, twelve percent of public high school students were enrolled in fewer than 30 charters. Up until Superintendent Constance Clayton's comprehensive charter reforms, however, their existence within particular schools was unsystematic and lacking in district support. In 1988 an official plan to break the District's 22 comprehensive high schools into charters was unveiled with the lofty goal of transforming "all elements of the educational process, including instruction, administration, and curriculum" (McMullan, Sipe, & Wolf, 1994, p. 1).

The structural side of these reforms involved both schools-within-schools (i.e., charters) and smaller class sizes. The opening statement of the Philadelphia Schools Collaborative Restructuring Guidelines states the purpose of the reforms was the “creation of smaller educational and social units, such as ‘schools within a school’ or house plans” (McMullan, Sipe, & Wolf, 1994, p. 7). While the focus was certainly on creating school-level changes in the scale of students’ experiences, Guideline 5 instructs the District and schools to “devise ways to reduce substantially the average class size in some course areas” (McMullan, Sipe, & Wolf, 1994, p. 7). Michelle Fine, renowned education researcher and activist, was one of the key designers of the reform vision. She describes the Philadelphia charters as ideally having the following parameters:

Anywhere from 200-400 students constitute a charter, with 10 to 12 core teachers who work together from ninth (or tenth) grade through to graduation. The charter faculty enjoy a common preparation period daily, share responsibility for a cohort of students, and invent curriculum, pedagogies, and assessment strategies that reflect a common intellectual project. Students travel together to classes...With teachers, counselors, and parents, they constitute a semiautonomous community within a building of charter...[T]he student body must be, by definition, heterogeneous (pp. 17-18).

The reform vision went beyond the structural side of small scale schooling. The practices of educating Philadelphia’s students were also designed for the purpose of “creating more challenging and supportive instructional communities for students than the large, and largely impersonal, comprehensive high school” (McMullan, Sipe, & Wolf, 1994, p. 7). Both of the small scale climate constructs under investigation in these analyses – academic press and the

personalization of teacher-student relationships – are included in the original reform plans. In fact, the second of Philadelphia Schools Collaborative’s Restructuring Guidelines is aimed explicitly at creating more personalized relationships for students at school – “Take steps to increase sustained adult contact” (McMullan, Sipe, & Wolf, 1994, p. 7). The guidelines also press for “development of a more rigorous and integrated academic curriculum, taught using a variety of instructional strategies that encourage active and creative participation of students in analyzing, understanding and mastering ideas and information” (McMullan, Sipe, & Wolf, 1994, p. 7). Increasing the academic press was a direct goal in this first round of small scale schooling reforms.

The second wave of these small scale schooling reforms came in 1995, just months after Superintendent David Hornbeck took over the district. Provisions for the establishment of small learning communities focused on improving school climate were included in his Children Achieving reform agenda, taking Superintendent Clayton’s previous efforts towards instituting small learning communities in Philadelphia to scale. According to the press release announcing the Annenberg Foundation’s major grant award to Philadelphia, Children Achieving included two fundamental ideas that align with the climate presumed to follow from SLCs: “The schools will arrange their resources so that each child shall be known well” and “the academic expectations for each child shall be uncompromisingly high” (Nickel, 1995). This second wave stalled when a fiscal crisis and political tensions forced major cut-backs to the operational budget of the school district.

Across three Superintendents over the past three years, the School District of Philadelphia has reinvigorated its restructuring agenda. This third wave has involved little outside funding beyond a three-year evaluation grant from the Carnegie Corporation. The

awardee, Research for Action, is currently using a case study approach to examine issues of school choice, public/private collaborations, teacher practices, and student enrollment and performance across five high schools representing the various high school configurations in Philadelphia. This recent, barely funded reform effort has focused on creating additional small schools, rather than focusing on small learning communities within larger comprehensive high schools. According to Research for Action, 32 of the District's 62 public high schools now fit the District's definition of "small" (which, at 700 or fewer students, is slightly higher than the usual operationalizations offered by small school advocates).

It is important to note that across all three waves of restructuring reforms, descriptions of reform efforts have tended to reflect the *desired* characteristics of the Philadelphia small learning communities and small schools, not their *actual* implementation (as pointed out by Raywid, 1995, p. 18). The current designation of all high schools as either "small" (fewer than 700 students), "medium" (700-1,000 students), or "large" (more than 1,000 students) is one of the few hard and fast descriptions of actual small scale structures as they exist on the ground in Philadelphia (see the School District's official guide for high school admissions).

### *Challenges to Implementing SLCs*

Funding, leadership, and resistance to the reform efforts have all contributed barriers to full implementation of the vision set forth in each wave of small scale schooling reforms in Philadelphia. These issues are discussed in the following section.

#### *Funding.*

The small scale schooling reform of the late 1980s was initially funded in large part by a series of grants from the Pew Charitable Trusts totaling \$16.5 million. At the time, this was the

largest foundation investment in a single school district's reform agenda ever awarded in the United States (McMullan, Sipe, & Wolf, 1994, p. 6).

Then in January 1995 – seven years after small scale schooling reforms began – a new Superintendent, David Horbeck, won a piece of the Annenberg Challenge's half-billion dollar gift to American public education. A \$50 million grant was made through the Annenberg Foundation to the School District of Philadelphia to support a citywide systemic reform plan called Children Achieving. This reform agenda was to sustain the small scale schooling efforts of the previous administration with the \$50 million grant and required matching funds of \$100 million from private and public grants (Nickel, 1995). Brown University President and advisor to the Hon. Walter H. Annenberg stated that “the belief in the value of small learning communities is amply supported in the literature and in the experiences of many school systems, including Philadelphia” (Nickel, 1995). The Philadelphia community – local foundations, businesses, and other key stakeholders – managed to pull together \$91 million of the required \$100 million in matching fund over the first school year of the five year grant (Innerst, 2000).

The state of Pennsylvania has not been nearly as supportive of educational reforms in Philadelphia as the national and local philanthropic community. When Hornbeck became Superintendent in 1994, he had the backing of local corporate and civic leaders; he also had the political backing to finance his big plans for comprehensive school reforms. With the governor, state legislature majorities, and the mayor all Democrats, Hornbeck was counting on substantial financial contributions from both the City and the State. But the political willpower (and coffers) for expensive additions to school budgets decreased dramatically three months into Hornbeck's superintendency. Pennsylvanians elected a Republican governor and Republican majorities to the state legislature: cutting government spending took precedence in their agendas (Boyd &

Christman, 2003, pp. 105-106). By suspending the state's school finance formula in 1993 (which led to an almost 6% decrease in real dollars supporting public education in Philadelphia), the state largely hindered Philadelphia's ability to implement Hornbeck's Children Achieving agenda (Boyd & Christman, 2003; Messacappa, 2001).

The corporate sector, while a major supporter of the initial small scale schooling reforms, steadily backed out during the second decade of reform efforts. Citing numerous interviews with local business leaders, Cuban and Usdan (2001) describe the competing interests and shifting corporate models that shaped the withdrawal of corporate sponsorship of Philadelphia's educational reform. After the initial support and the successful fundraising for the Annenberg Challenge, business leaders began to realign their loyalties away from the local educational agenda. The Republican governor's pro-business economic development agenda appealed more and more to Philadelphia businessmen, even if that meant bowing down to Governor Ridge's side in an embittered battle with Superintendent Hornbeck. At the same time, local businesses were increasingly replaced with national and international corporations with little to no vested interest in improving local conditions. The net result was a majority of the corporate sector – powerful stakeholders, both monetarily and politically – withdrawing from the small scale schooling endeavors in Philadelphia (Cuban & Usdan, 2001, pp. 109-112).

Between 2002 and 2007 the School District of Philadelphia was able to create or restructure schools into 26 small high schools, starting either from large comprehensive schools or substantially altering existing small schools (Reumann-Moore & Hartmann, 2007). This third wave of small scale restructuring was not supported by significant outside funding, but through the provision of select existing resources from the School District, including principal selection and planning resources, as well as increased flexibility and autonomy in staffing and curriculum

decision-making (Reumann-Moore & Hartmann, 2007). The current small scale schooling reforms remain largely underfunded and rely as much on the restructuring of the School District's operational budget as on the restructuring of practices and policies.

*Leadership.*

The reform efforts in Philadelphia to divide large high schools into smaller schools-within-schools have been driven by both official policies of top school officials and the largely voluntary implementation of teachers. The restructuring efforts of Superintendent Clayton's first wave were overseen by an independent organization, the Philadelphia Schools Collaborative, which was established specifically for this purpose. However, while Superintendent Clayton mandated that the reforms would take place district-wide, she also insisted that teachers would have to volunteer to begin implementation. This attempt to reap the benefits of both official bureaucratic sanction and teacher-led endorsement has been called "a top down mandate calling for bottom-up reform" (Raywid, 1995, p. 14).

Superintendent Clayton's successor, David Hornbeck, dissolved the Collaborative's leadership seven years into the reforms in order to involve the District more directly. Rather than clarifying the ambiguity surrounding the mandate to reform, this move raised fears that what bottom-up momentum did exist would be smothered by a more bureaucratic, standards-driven process (Smith & O'Day, 1991; Klonsky, 1995). Hornbeck's overall vision for a comprehensive, systemic overhaul of the local public education system was an intense, almost entirely top-down process, leading to what Boyd and Christman (2003) called "reform overload." The complexity of the reforms entailed an overwhelming number of mandates that were too-often unfunded and had been designed almost entirely without school-level input. Thus, while district administrators were clear as to what changes were expected, the gap between official

expectations and support provided by administrative leaders may have been too wide to allow successful implementation.

The most recent wave of small scale schooling reforms has rested on fairly strong priorities communicated by District administration. In a letter to all staff members in 2005, Superintendent Vallas reaffirmed the District's commitment to small scale schooling. "By 2008, the District's reorganization into a seamless pre-K to 8 and 9 to 12 school structure with high quality, small school options, will be complete" (Vallas, 2005). In this same email, Superintendent Vallas offers a frank admission about their inability to reduce class sizes.

As I visit classrooms and meet with teachers, students and parents, I am always asked why class size isn't smaller. Obviously, that it is not because I don't believe in the importance of reducing the student-teacher ratio. It would cost upwards of \$250 million dollars in annual recurring expenses to implement any significant class size reduction in the District, and that level of funding will not be available unless and until there is significant education funding reform at the state level (Vallas, 2005).

After Superintendent Vallas resigned, these priorities and fiscal realities were reiterated across multiple documents of the School Reform Commission, Interim Chief Executive Officer Tom Brady, and current Superintendent Arlene Ackerman. Reducing class sizes in high schools was urged in the School Reform Commission's priorities in 2007 (School District of Philadelphia, 2007) and the 2009 fiscal year budget included a substantial portion earmarked to support the creation of small high schools (School District of Philadelphia, 2008). Despite recent clarities in leadership expectations, the continued lack of funding poses impossibly tight

restrictions on reform agendas. In addition to unfunded mandates and “reform overload,” explicit resistance to changes have also hindered progress.

*Resistance to reform.*

It is not surprising with the historical lack of clear and effective leadership that resistance to the reforms has come from all sides. Zane (1994) summed up the early reform process as “layered with ambivalence by the union, the district, and the high schools themselves” (p. 132). The District mandated that all comprehensive high schools be converted to charters; it did not turn the same insistence on restructuring back on itself. The initial evaluation found that the Collaborative was “by and large, unsuccessful in convincing particular administrative departments to modify or re-think policies, procedures and expectations in support of restructuring” (McMullan & Wolf, 1991, p. x). At the same time, District officials praised the work of the Collaborative and continued to voice expectations that schools restructure themselves. Clark (1994) pointed out that such ambiguity between words and actions indicated that the District was “[not] clear whether the high school reform is an indication of a central change in district operations or just another in a long line of projects” (p. 44). Not only did this set a poor example to school communities that were expected to re-think their own practices, but it also failed to create a supportive administrative atmosphere conducive to change for those willing to attempt it.

Although the primary teachers’ union, the Philadelphia Federation of Teachers, was involved in the creation of the Collaborative, the unions did not agree with many of the founding assumptions and practices deemed necessary to create effective charters. In fact, Klonsky (1995) named them “the most vocal critic of charters” (p. 9). Their primary objections involve the drastic changes in how the charter reforms would restructure the personnel decision-making

process. In order for charters to operate as semi-autonomous units offering a more academically pressing, cohesive learning experience to students, teachers would be assigned to particular charters. Rather than making staffing decisions by seniority, teachers would be assigned according to how their strengths aligned with charter themes. The unions objected strongly to this aspect of the restructuring efforts and insisted that staffing and transfer rights remain on a seniority basis (Schwartz, 1994). This severely limited the ability of schools to create self-contained charters staffed with teachers whose expertise lay in the thematic area of the charter. The teachers' resistance to changing the personnel policies of the District may also have created pockets of resistance to the entire reform effort at individual schools.

During Hornbeck's administration, the cost of clear direction from District leaders was the loss of buy-in from educators on the ground. The massive reform vision articulated by the School District "resulted in rampant frustration and alienation among principals. They felt angry, disempowered, and disrespected as they received one directive after another that had not been shaped by their input and that was not accompanied with the necessary supports for implementation" (Boyd & Christman, 2003, p. 105). Implementation continued, even with less than enthusiastic support from practitioners or from state politicians.

### *Early Outcomes*

Despite the multiple layers of implementation barriers experiences across all three waves of small scale schooling reforms, a number of substantial scale-related changes have occurred in the way Philadelphia schools educate students. Many of these reform efforts have been accompanied by evaluations of school process and student outcomes, which are summarized here, paying particular attention to secondary school reforms – the focus of this study.

#### *Class size.*

The majority of the attention on class sizes in Philadelphia has been directed towards the earliest grades; consequently, evaluations of these reform efforts have also focused on the immediate effects in student and school outcomes in the early years.

However, recent pressure from parents, educators, and other activists has garnered some resources from the District. A “Class Size Hotline” was opened by the District for parents, teachers, and other concerned citizens to report class sizes larger than the contractual maximum of 33 students. The fact that such communication pathways are devoted to maintaining the legal maximum, rather than pushing for class sizes that could reasonably be called “small,” suggests that this aspect of small scale schooling has not quite taken hold in the city.

*Small learning communities.*

Despite the lack of clear leadership and active resistance from certain key stakeholders, the results of implementing charters in Philadelphia comprehensive high schools was deemed a success by early evaluations. Analyses found significantly greater attendance, better rates of passing major subjects, increased likelihood of earning enough credits for advancement, and increased likelihood of remaining in school during the school year for students who attended charters, as compared to their non-charter peers; the differences remained statistically significant after controlling for select demographics (student gender and race/ethnicity) and previous educational experience (repeating a grade, special education, prior attendance levels, age/grade congruence, and Chapter 1 eligibility; McMullan, Sipe, & Wolf, 1994, p. 40).

Though these overall trends paint a highly positive picture, providing some evidence in support of the schools-within-schools model, closer examination reveals some troubling patterns. Drawing on McMullan, Sipe, and Wolf’s (1994) analyses of student course rosters, Raywid (1995) pointed out that there was a fundamental lack of clarity surrounding the degree to which

charters should be semi-autonomous, comprising their own fairly self-enclosed communities within larger buildings, resulting in highly uneven implementation.

Some are extensively developed programs reflecting a great deal of separateness, autonomy, and distinctiveness. They have their own students, teachers, programs, and identities. Other charters, however, seem to exist largely in name only – i.e., they represent only partial assignments for their teachers, there is little by way of theme or special program, and their students, although officially part of a charter, take few of their courses within it (pp. 11-12).

As data collection for the dataset used in these analyses began, Michelle Fine estimated that the vast majority of Philadelphia's charters were "mediocre," with only 10% to 15% "exceptional" (Fine, 1994, p. 13). She also noted that "[t]here are still some schools in which charters look a lot like tracks" (1994, p. 18). Many of the charters that existed prior to 1988 were career academies, magnet schools, and college prep programs with admissions requirements that screened out low-achievers (Raywid, 1995, pp. 41-42). Consequently, evaluators of early charter enrollment trends found that "special education students, over-age students and students repeating their current grade are less likely than students who do not share these risk factors to be assigned to charters" (McMullan, Sipe, & Wolf, 1994, p. 26). These trends thus beg the question whether the early positive outcomes found for Philadelphia's charters should be most accurately attributed to participation in a school-within-a-school or to self-selection bias in students attending particular charters.

#### *Small schools.*

Comprehensive examination of the impact of small schools on student outcomes in Philadelphia has not been completed to date, though Research for Action has done some

preliminary analyses with plans to release the results of a full quantitative study in the near future (Hartmann, Maluk, & Reumann-Moore, 2008). In one case study of five small Philadelphia high schools, researchers found that the students and parents interviewed “equated smaller schools with safety, fewer ‘distractions’ and more individual attention and support” (Hartmann, Maluk, & Reumann-Moore, 2008, p. 2). The same study found a strong pattern of close, positive relationships between teachers and students at small high schools. “Teachers know most of their students and students feel known and recognized by their teachers, not only when they have challenges but for their successes as well” (p. 3). However, this study did not include any comparisons to large high schools – a major weakness in drawing systematic conclusions for the reform efforts across the entire district.

Another set of analyses conducted by the team at Research for Action used a survey of 1,521 teachers at 41 out of 59 high schools in Philadelphia. Analyses offer some evidence that small high schools in Philadelphia (those with fewer than 700 students) offer greater academic press and more personalized student-teacher relationships than large high schools (those with more than 1,000 students). Two thirds (67%) of teachers at small neighborhood high schools reported that half or more of the teachers at their school talk with students about their lives at home, compared to half (51%) of those at large high schools. Twenty-eight percent of teachers in small high schools strongly agreed that their school’s leadership sets high standards for learning, compared to 15% of teachers in large high schools. Both of these constitute statistically significant differences.

As for teacher perceptions about student engagement, the researchers conclude that “[a]lthough teachers in small neighborhood high schools were more positive about student engagement than teachers in large neighborhood high schools, it is important to note that overall,

most teachers reported that apathy, class cutting, and dropping out were problems at their schools” (p. 10). None of these analyses examined the degree to which differences in student engagement might be related to the differences in school climate, versus the differences in school size.

### *The PELS Advantage*

The data for this study describe the experiences of students in the School District of Philadelphia in the midst of the second wave of restructuring, one decade after the City began restructuring its comprehensive high schools. Although these data are now ten years old, the lessons that can be learned from this particular dataset offer three fairly unique advantages. The first two are methodological. The datasets used for these analyses include measures of student participation in small learning communities (Philadelphia’s term for schools-within-schools) – which is rare enough to find (McMullan, 1994) – but they also include measures of tracking by relative quality of SLCs within schools. Quantitative data for investigating widespread patterns in the degree to which schools-within-schools mimic tracking is incredibly difficult to find, making the empirical conclusions to be gained through these analyses a noteworthy addition to the literature.

The second methodological advantage stems from the datasets’ measures of school climate. Students’ perceptions of their schools’ academic press and the personalization of teacher-student relationships allow the effects of these constructs on the relationships between educational scale and student engagement to be examined in ways not possible with more up-to-date school and district records. These two aspects of the data will allow an examination of the issues involved in educational scale that have not been thoroughly explored elsewhere.

The third advantage of this Philadelphia case study, on the other hand, relates directly to continued practice. The School District of Philadelphia has recently rekindled its restructuring efforts. With the results of a two-year evaluative grant at a local nonprofit, Research for Action, to be released in 2009, re-examining the impact of the initial phase of restructuring seems appropriate. The data from one decade after the initial restructuring reforms began allows analyses to move past initial gains and reflect on more lasting impact; by focusing on possible pathways of this impact (namely, academic press and personalization of teacher-student relationships), this study may be able to lend data-driven focus to the current continuation of restructuring reforms in this City while providing important lessons to other school districts.

#### Statement of the Problem

This study considers recent trends in educational policy designed to address the shortcomings of public school failure by examining the results of high school restructuring in one large, poorly funded urban city. This quantitative case study will assess the effectiveness of creating smaller educational contexts for high schools students. The general logic behind the small schools movement is that smaller schools naturally engender a more personalized experience for students – which, in turn, is supposed to create an atmosphere that encourages greater student engagement in their own learning. But as Elmore (1995) and others have pointed out, the size of the school alone is unlikely to foster personalized experiences for students.

To that end, this study examines three aspects of the size of an educational context: total school enrollment, teacher-student ratio, and participation in a school-within-a-school. In addition, two mediators of educational context size will be assessed: personalized student-teacher relationships and academic press.

#### *Research Questions*

In addressing the effectiveness of the small scale schooling reform initiative in Philadelphia, this study asks two research questions:

1. What is the relationship between the structural aspects of educational scale and student engagement?
2. Does the climate of the school explain these relationships between school structure and student engagement<sup>1</sup>?

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<sup>1</sup> In this study, the structural aspects of educational scale that will be examined include school enrollment, participation in a school-within-a-school, and teacher-student ratio. “Student engagement” will involve indicators of three dimensions – cognitive, affective, and behavioral (Fredericks et al., 2007). Two aspects of climate will be considered: personalization of student-teacher relationships and academic press.

## CHAPTER 2

### LITERATURE REVIEW & THEORETICAL FRAMEWORK

Small scale schooling works on a logic familiar to school reformers across trends and timelines: education can interrupt the societal reproduction of inequality. Like many reformers, those in favor of small scale schooling argue that the school can and should act as an ameliorative institution – a site for counterbalancing the inequities many youth face in their experiences within other contexts (e.g., families, peer groups). As the single public institution available for directly touching the lives of all American youth, the school is in a position to act as a buffer to risk factors established in a broader system of social inequality.

And yet many of the schools serving our most disadvantaged youth are set up as large, impersonal, bureaucratic institutions. Public education in the United States has long been built on the premise that schools – and in particular, teachers – can have a meaningful impact on the lives of children.<sup>2</sup> The sizes of schools and classes play a pivotal role in structuring the ways in which students and teachers can connect with one another over the course of the school day; educational scale is an important factor in determining the power schools have in influencing students' lives.

To develop the framework used in this study, this chapter will examine the intersections in the empirical literature concerning student engagement and small scale schooling. After briefly describing the importance of student engagement as a set of constructs in understanding student success, the three strands of small scale schooling examined in this study – small schools, small learning communities, and small classes – will be discussed, in turn. Connections

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<sup>2</sup> There have been radically opposing views as to whether schools have served primarily to sort students along lines of social inequality (Collins, 1971; Bowles & Gintis, 1976) or to provide a means of social mobility (Weber, 1946); however, both sides of the argument attribute a certain power to schooling in ordering the socioeconomic status of students and, therefore, the socioeconomic organization of society.

between these reform models and student engagement will be described and the gaps in our current understanding of these structures of educational scale will be highlighted throughout the chapter.

### Student Engagement

Student engagement has long been held as a clinch pin in educational achievement. Studies have demonstrated a significant relationship directly between student engagement and student persistence to degree (Croninger & Lee, 2001; Finn, 1989; Lee, Smith, & Croninger, 1995; Alexander, Entwisle, & Kabbani, 2001); others have connected greater student engagement to higher student achievement (Finn, 1989; Finn, 1993; Bryk & Driscoll, 1988; Lee & Smith, 1993, 1995; Klem & Connell, 2004), which has in turn been extensively linked to student persistence (see Battin-Pearson, 2000; Rumberger, 1995; Lan & Lanthier, 2003).

Fredricks et al. (2004) trace three aspects of school engagement that have been identified in the literature: a) emotional engagement, which involves student attitudes, interests, and values; b) cognitive engagement, which includes students' motivational goals and self-regulation of learning; and c) behavioral engagement, which comprises student conduct. The concept of student engagement is cited as being so popular due to the fact that "engagement is presumed to be malleable, responsive to contextual features, and amenable to environmental change" (Fredricks et al., 2004, p. 59). Various school reform efforts at multiple levels of intervention, from students' immediate experiences within the classroom (Ryane & Patrick, 2001; Kelly & Turner, 2009), to school-wide efforts (McPartland et al., 1998; Lee & Smith, 1995), to school-home relationships (Barton et al., 2004; Domina, 2005), have concentrated on raising student engagement.

Behavioral engagement in school has been measured in a number of ways. Some researchers have focused on indicators of student conduct, such as homework completion (Birch & Ladd, 1997; Finn et al., 1995), obeying school or classroom rules (Finn et al., 1995; Finn & Rock, 1997), and attendance and tardiness (Finn, 1993). Others have looked at student participation in classroom activities (Finn et al., 2005; Wellborn & Connell, 1987) and in extracurricular activities (Finn & Rock, 1997).

Finn (1993) used the nationally-representative National Educational Longitudinal Study of 1988 (NELS:88) to examine the relationships between behavioral engagement and academic success. In one set of analyses, Finn used attendance rates, classroom behavior, and participation in extracurricular activities to operationalize behavioral engagement and standardized test scores to operationalize academic success. The analysis of 15,737 eighth-graders' data revealed strong, significant relationships between behavioral engagement and academic achievement, after controlling for students' gender, race, and socioeconomic status. The relationship was also significant as a quadratic trend, which suggests a greater return of high levels of behavioral engagement than on moderate levels.

A second set of analyses in this study looked specifically at students placed at risk by race, home language, or socioeconomic status. Finn divided 5,945 students meeting these criteria into three groups – “successful,” “passing,” and “unsuccessful” – according to how often they attended class, were on time, were prepared for class, took part in class activities, did not disrupt lessons, completed homework, and participated in extracurricular activities. Levels of participation in school significantly predicted reading and mathematics achievement test scores for this sample of at-risk students.

Using the NELS:88 dataset, Finn and Rock (1997) conducted a similar analysis of 1,803 middle and high school students placed at risk by race and socioeconomic status. The sample was divided into students who were “resilient” (academically successful), “nonresilient completers” (academically unsuccessful, but graduated), and “nonresilient dropouts.” Resilient students were found to have significantly higher teacher-reported behavioral engagement than nonresilient students, as demonstrated by having a better work ethic, attending at higher rates, and being more attentive and cooperative in class.

Emotional engagement in school has also been assessed via a number of mainly self-report constructs. Much of this research is grounded in psychological theories of how motivation works in shaping behavior (Legault, Green-Demers, & Pelletier, 2006). Students’ self-efficacy (Bandura, 1991; Patrick, Skinner, & Connell, 1993), identification with school (Finn, 1989; Voekl, 1997), and satisfaction with schooling (Steinberg, Brown, and Dornbush, 1996) have all been demonstrated to relate positively with academic achievement. Students’ sense of belonging has also been shown to be particularly salient for students placed at risk. For example, Gonzalez and Padilla (1997) separated data concerning 2,169 Mexican American students from three high schools into two groups based on grades: high achievers and low achievers. The only student characteristic to significantly predict which group students belonged to was their sense of belonging at school.

Supportive relationships with teachers have been shown to boost the emotional engagement of students. Hallinan (2008) conducted cross-sectional analyses on 35,132 public middle and high school students and longitudinal analyses of 1,458 Catholic school students in Chicago to examine the relationships between teacher support, students’ emotional engagement, and academic achievement. Hallinan used an index of items to create a single variable capturing

how much students like school to operationalize emotional engagement. Both cross-sectional and longitudinal analyses revealed strong, significant, positive relationships between how much students like school and academic achievement. Furthermore, the analyses demonstrated that teacher support – one of the assumed mechanisms of small scale schooling effects – has a strong influence on student attachment to school, even after controlling for students’ previous interest in school.

While recent reviews of the concept of student engagement have focused on the lack of clear conceptual and methodological consensus within and across the disciplines interested in the related phenomena (see Fredericks et al., 2004; Appleton et al., 2008), the empirical evidence is clear: student engagement, whether behavioral or emotional, is clearly positively related to student achievement. As one of the key mechanisms of student achievement and degree attainment, student engagement is a proximal outcome of great interest in understanding small scale schooling reforms. Small scale schooling targets student engagement as a key force in student success by working to create more engaging educational atmospheres; student engagement will thus be the student outcome of interest in this study of small scale schooling effects. Each of these three dimensions of student engagement will be considered in this study: emotional engagement will be assessed via the degree to which students like school, cognitive engagement will be assessed via students’ effort at school<sup>3</sup>, and behavioral engagement will be assessed via students’ absenteeism and tardiness.

The following section will describe the logic behind small scale schooling reforms, summarize the empirical findings relating small scale schooling reforms to student engagement,

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<sup>3</sup> Unfortunately, the available data describing students’ effort in school and specifically in math classes did not have sufficient construct validity and reliability to be included as a dependable measure of cognitive engagement; other variables to indicate students’ cognitive engagement were unavailable in the dataset and so this dimension was dropped from the analyses; see Chapter Three for further details.

and draw conclusions on the gaps in the currently available literature. Small scale schooling has taken a number of forms, both in suggested policy and in practice. For example, some educators have advocated for ethnocentric small schools for urban minority students (Antrop-Gonzalez, 2006; Belgarde, 2004; Buchanan & Fox, 2004; Fine, 2000, 2005; and Yancey, 2004) and other forms of small schools housed within individual, small buildings. Others have advocated for applying small school logic and empirical backing to smaller learning environments within large schools – called schools-within-schools – similar to schools within universities (see Fine, 1994; Lee, Ready, & Johnson, 2001). Still others focus less on the size of the school and more on the size of the classroom experience (see Mitchell & Mitchell, 2003). The details of these arguments are thus presented here in terms of these three organizational structures: small schools, the school-within-a-school model, and small classes.

#### The Argument for Small Schools

School effects literature concerning small schools has been deemed conclusive: smaller schools are better for students. Cotton's (1996) synthesis of small schools research concluded that "the jury's no longer out" on the positive benefits of small schools. Raywid's (1999) review of the literature on small schools reported that the quantitative evidence has "firmly established small schools as more productive and effective than large ones" (p. 2) – a conclusion that "we have confirmed with a clarity and at a level of confidence rare in the annals of education research" (p. 2).

The primary rationale behind the small schools movement is that smaller size (in school and presumably, if not always explicitly, in class size) fosters a greater sense of community, building an environment that promotes personalized, caring relationships for students with their peers and their teachers. School cultures built on community and caring for fellow individuals in

turn nurture students' engagement in their educational experiences, increasing a number of student outcomes, including student achievement and degree attainment.

Small schools are particularly promising as a prevention/intervention reform strategy for closing the educational gaps in urban centers. A substrand of the small school effects literature has focused on questions of the increased equity afforded by small schools. The questions have been asked in a variety of ways: Does school size influence school performance differently in schools with various types of student bodies? Does school size influence students with various levels of risk (e.g., poverty, previous academic trouble, etc.) differently? While the primary outcomes in these studies have tended to be achievement oriented, rather than focused on student engagement or other behaviors, the pattern clearly shows that small schools are not only good for students, but are even better for those most in need of support.

Friedkin and Necochea (1988) used school-level data from the California Assessment Program to examine whether the relationship between school size and achievement is dependent on socioeconomic status. Analyses found that the relationship goes from negative to positive as school socioeconomic goes from low to high, suggesting that students from low socioeconomic backgrounds achieve at higher levels in smaller schools, whereas students from high socioeconomic backgrounds achieve at higher levels in larger schools. Furthermore, the relationship between school size and school achievement was much stronger in low socioeconomic schools than in high socioeconomic schools. These results have been replicated using data from Alaska (Huang & Howley, 1993), West Virginia (Howley, 1995, 1996), Ohio, Georgia, and Texas (Howley & Bickel, 1999). The Matthew Project, which analyzed data from Ohio, Georgia, Texas, and Montana, found that schools with enrollments less than the state

median reduced the influence of poverty by 30% to 50%, compared to the influence of poverty in schools with enrollments above the state median (Howley & Bickel, 1999, p. 16).

Lee and Smith (1997) report similar patterns at the student level. Using data from the National Education Longitudinal Study of 1988, Lee and Smith addressed two questions related to the equity involved in school size: 1) “In which size high school is learning most equitably distributed?” and 2) “Are size effects consistent across high schools defined by their social compositions?” (p. 205). Analyses found that higher socioeconomic students learned more than lower socioeconomic students in virtually all schools, regardless of school size; however, achievement gains were distributed more equitably in schools with smaller sizes than in larger schools – that is, the gap was smaller in small schools than in large schools. Furthermore, school size mattered more in schools with a greater percentage of low socioeconomic students than in those with fewer low socioeconomic students.

Lee and Smith’s (1997) analyses also included an examination of the racial gaps in achievement gains according to school size. Results revealed a close in the gap at small schools for both reading and mathematics; schools with high concentrations of minority students produce greater student achievement gains when they enroll 600 to 900 students than when they enroll either less than 600 or more than 900, with the largest schools (1,500 students plus) producing very low gains for students of any racial background, as well as a substantial gap between white and minority students.

Lee and Smith had previously (1993) examined data on eighth graders using the National Longitudinal Study of 1988 to determine whether school restructuring towards smaller, more communal middle schools was related to the equity of achievement and engagement distributions. Results found that students attending smaller schools did, in fact, demonstrate

greater engagement in school; these schools also had more equitable distributions of achievement across students with varying degrees of two types of risk: SES and previous academic achievement. Lee and Smith's (1995) study using the National Education Longitudinal Study of 1988 data to examine distributions of equity along school size in high schools found similar results: not only was smaller high school size related to greater student engagement and achievement, low socioeconomic had less of an impact on student engagement and achievement in smaller schools than in larger schools. In effect, small schools somehow buffer the otherwise negative effects of student risk related to poverty and previous academic track record.

The educational equity afforded through small schools has become one of the major empirically-driven draws for educational policymakers. However, as Ready, Lee, & Welner (2004) have pointed out, these reforms seem to be ahead of the research (p. 1995) and a number of questions regarding the appropriateness and effectiveness of practice in small schools remain. Elmore (1995) points out that “most school reformers and practitioners take for granted that changes in structure produce change in teaching practice, which in turn produce changes in student learning” (p. 23). This has certainly been the case in the use of small school restructuring. All too often, large schools are restructured in *size only*, without adequate attention to reforming the *school culture* to reflect the desired goals of building community and more personalized experiences for students (Antrop-Gonzalez, 2006; Creemers & Reezigt, 2005). Michelle Fine (2001) has described small schools that still operate under their former “big school” policies, practices, and pedagogies as “big schools in drag.” A restructuring tactic commonly used in large, underfunded school districts – schools-within-schools – is described in the following section.

### The Schools-Within-A-School Model

Breaking large, alienating schools into smaller, more personal learning communities within the same physical building has been proposed as a solution to the financial and spatial impracticality of creating new discrete small schools in urban districts (McPartland, Balfanz, Jordan, & Legters, 1998; Christman & MacPherson, 1996; Fine, 1994; Lee, Ready, & Johnson, 2001; Meier, 1995; Ready, Lee & LoGerfo, 2000). And yet, much of the empirical work on small schools does not directly address the question of whether schools-within-schools operate similarly to small whole schools or whether they produce the same student outcomes. Cotton (1996) included 103 documents in a review of the literature on small schools; only eleven primary and secondary sources dealt specifically with the SWS model. Considering that many underfunded urban districts adopt the schools-within-schools model of restructuring large schools into smaller learning communities – and often do not fully implement a structure conducive to a substantially more personalized schooling experience – this lack of empirical consideration is highly problematic (see Ready, Lee, and Welner, 2004, and McMullan, 1994 for discussion of the reasons why implementing schools-within-schools is often highly problematic).

There is also a growing body of evidence that suggests that the SWS model does not parallel small whole schools in either educational processes or student outcomes. For example, the American Institutes for Research and SRI International were commissioned to evaluate schools that restructured with the aid of a major philanthropic contributor to the Small Schools Movement: the Bill & Melinda Gates Foundation. Initial findings revealed that SWS schools did not experience the same improvements in school climate and student outcome experienced in new start-up small schools (AIR/SRI, 2006).

There appear to be multiple mechanisms through which the SWS model might lead to a more stratified set of school structures. Shear et al. (2008) reported that schools funded by the Bill & Melinda Gates Foundation allowed teachers (to the extent possible) to decide who would be assigned to teach within each SWS. This led to a clustering effect whereby teachers in some schools self-selected into SWSs along lines of expertise. “For example, at one school, most of the teachers from the International Baccalaureate program all joined one [SWS] together, creating a more academically-rigorous [SWS] than others in the same school” (p. 2018).

Giving teachers the ability to choose their SWS has been shown to create unevenly rigorous SWSs within the same host school; giving students the option of choosing their SWS has been shown to solidify these tracks. Ready and Lee (2006) found that highly engaged students tend to choose the more academically challenging SWS available and those who are less motivated choose less demanding SWSs. Conchas and Clark (2002) studied two California career academies that use the school-within-a-school model. The researchers were interested in the SWS model’s potential to both mediate social and academic disparities while, at the same time, possibly creating conditions that further racial/ethnic and other divides. The study found that the uneven recruiting practices of the two academies – and the resulting differences in student population – led to differences in SWS culture that ultimately resulted in disparities in student outcomes that mimic those found across academic tracks. Combined, the two processes of self-selection (into the teaching corps and into the student bodies of SWSs) may merge to offer the worst academic atmosphere to those who need the most support.

While the empirical work that currently exists seems to suggest that the SWS model does not necessarily reproduce the same student outcomes that have been associated with small whole schools, there has been little systematic investigation of overall patterns related to the SWS

model. A decade ago, in the Fall of 1998, Lee, Ready, and Johnson (2001) conducted a national search for high schools that had been fully divided into SWSs, using snowball sampling and extensive telephone interviews. The research team was able to identify only 55 such schools in the United States – a result that has since been widely used to highlight one of the major barriers to systematic examination of the SWS model. Another national review published the following year, commissioned by the U.S. Department of Education, yielded 110 peer-reviewed articles and professional evaluations of SWSs published during the 1990s (Abt Associates, 2002). Of these, only 55 were deemed rigorous enough to be included in the review; only a third (19) of those included reported quantified data on student outcomes related to enrollment in an SWS; and only five used experimental or quasi-experimental methods to examine SWS effects.

These reviews and the recent literature suggest that one of the major barriers to evaluating the SWS models as a whole is the dearth of *examinations of patterns* across SWS implementations. The vast majority of the literature on the SWS model of small scale schooling relies on case studies and evaluations of single or small groups of schools (Abt Associates, 2002). Deep ethnographic work and comparative case studies add great value to empirical knowledge by illustrating the possibilities afforded through SWS arrangements and uncovering why, exactly, the reform model succeeds in some case and does not in others. However, researchers in the educational field have yet to rigorously examine whether and the degree to which these qualitative relationships exist across large swaths of the public education system in the United States. With the SWS model being implemented at high rates, funded through millions of philanthropic, federal, and local government dollars, such critical examination of the reform's empirical foundations is desperately needed.

### The Small Class Caveat

One of the major pinnacles of the small scale schooling argument is that smaller size leads to more personalized experiences for students – due in large part to increased quantity and better quality of interaction with teachers. However, a school or learning community of 300 students may still comprise overcrowded classrooms with high teacher-student ratios. Small class sizes cannot be assumed of small schools; nor should their effects be confounded in examinations of small school effectiveness.

There has been much study of small class effects; classroom size reduction (CSR) policies have received wide attention, much like the reform efforts to create small schools. Although there are some skeptics as to the true effectiveness of small classes (e.g., Hanushek, 1998), the majority of the empirical evidence has found favorable effects of class size on student outcomes.

Perhaps the most well-known of the class size research studies have involved experimental or quasi-experimental interventions and evaluations of small and large class size effects. In 1985, Tennessee began an extensive random-assignment experiment to test whether small class sizes in the early grades has immediate and/or long-term benefits for students' educations. In the first year of the Student/Teacher Achievement Ratio experiment (Project STAR), more than 6,000 students were randomly assigned to either small classes (13-17 students), large classes (22-27 students), or large classes with a teacher's aide kindergarten; the third group was eliminated after the first year, however, students maintained their small or large class assignment through the third grade. Teachers were also randomly assigned within the 79 schools participating the first year of the experiment.

The experiment yielded analyses on a wide variety of small class effects. Most often cited are the achievement effects: students assigned to small classes during Project STAR performed significantly higher on the Stanford Achievement Test in both reading and mathematics than those assigned to regular classes in each grade of the experiment (Finn & Achilles, 1990; Mostellar, 1995). A number of evaluations of the experiment, as well as secondary analyses of the data, have also shown that students who were randomly assigned to the small classes were more engaged in learning than those who experienced larger classroom settings (Evertson & Folger, 1989; Finn et al., 1989; Finn, Pannozzo, & Achilles, 2004). In Finn and Achilles' (1999) review of empirical studies using Project STAR data, they cite consensus among a number of analyses that show a negative relationship between class size and a number of student engagement measures. That is, as class size increases, students have been found to spend less effort on educational activities, initiate talking in class activities less often, become less attentive and more withdrawn in class, and become more disruptive (p. 98).

Students who participated in Project STAR were also followed into their later schooling years through two additional phases. The Lasting Benefits Study began in 1989 when Project STAR participants were integrated into regular classrooms, allowing them to be compared to their peers who had not participated in small classes during grades K-3. Analyses of students who participated in Project STAR have shown that being educated in a small class for the first four years of elementary school greatly improves the likelihood of graduating from high school, with the odds of graduation increasing by 80% . For low socioeconomic students, three years in small classes increased the odds of graduating by 67% and four years more than doubled the odds of completing a high school degree (Finn, Gerber, & Boyd-Zaharias, 2005, p. 220). This

amounts to a substantial impact of early small class size on the ultimate act of disengagement from school much later in students' lives.

Wisconsin replicated Tennessee's STAR Project with its own Student Achievement Guarantee in Education (SAGE) Program (Maier et al., 1997; Molnar, Smith, & Zahorik, 1998). Beginning in the Fall of 1996, SAGE reduced the student-teacher ratio to 15:1 in select Wisconsin kindergarten through third grade classrooms, with some classrooms having one teacher for 15 students and others having two teachers for 30 students. Thirty schools across 21 districts were included in the SAGE Program; there were between 14 and 17 comparison schools in those same districts over the course of the Program.

The SAGE Program was executed in a manner that diverged from Project STAR's model in two key ways. First, in addition to implementing this classroom size reduction policy, participating schools were required to implement a rigorous curriculum, provide extracurricular activities before and after school, and execute professional development for teachers. The SAGE Program was also slightly different from the Project STAR in that it was quasi-experimental – SAGE used naturally occurring classrooms, rather than randomly assigning students and teachers to experiment and control groups.

Results from the SAGE Program mirror those found for Project STAR. Evaluations of the SAGE Program found evidence of increased engagement in the small classes. Observational data collected from three case studies of the third year of the Program revealed a pattern of “voluntary compliance” in students enrolled in small classes. “Students demonstrated voluntary compliance in two ways: first, they appeared to be independently focused academically, and secondly, they were willing, almost eager, to help their fellow students” (Molnar, Smith, & Zahorik, 1998, p. 58). Teacher logs, questionnaires, and interviews also suggested that students

in small classes received more individual attention than those in the larger comparison classrooms. Teachers spent more time on one-on-one tutoring, small group activities, and hands-on activities in small classes than in large classes; they also spent less time on discipline (Molnar, Smith, & Zahorik, 1998, p. 54).

Like small schools, the effects of small classes appear to be particularly strong for students placed at risk, regardless of the unit of analysis examined. Students who are economically disadvantaged have been shown to attain higher academic achievement when they are educated in smaller classes (see Robinson's, 1999, review). Betts and Shkolnik (1999) found that teachers leading classes with below-average students reacted more strongly to class size reductions (i.e., changed their pedagogies more dramatically) than those with average or above-average students. Other studies have found that controlling for class ability level – an important contextual factor in considering achievement gains – actually leads to larger, significant estimates of the relationship between class size and student learning (Shkolnik & Betts, 1998; Betts & Shkolnik, 1999).

Based on data from Project STAR, Krueger and Whitmore (2001) found that class size is moderately powerful in closing the achievement gap between White and Black students across a number of outcomes. If all students were educated in small class kindergarten through third grade, these analyses predict that the Black-White gap in standardized test scores would decrease by 38% during the years spent in small classes and would decrease by 15% in subsequent years spent in large classes; the Black-White gap in taking a college entry exam (the SAT or ACT) would decrease by 60%. In a review of the empirical literature based on Project STAR data, Finn and Achilles (1999) point out that the benefits of small classes are not only substantially

greater for racial/ethnic minority students, but also for students attending inner-city schools (p. 98).

While powerful due to its random-assignment design, Project STAR and similar class size reduction experiments have only examined the direct effects of small classes on early education. In one review of the literature on class size effects on student engagement, Finn et al. (2003) cite the need for studies of these relationships for older students as a high-priority topic for future research (pp. 352-353). This is particularly problematic given the evidence that the positive effects of being educated in a small class for the first half of elementary school seem to erode after several subsequent years in large classes. The Lasting Benefit Study, which followed Project STAR participants after the experiment ended, found that differences in student engagement between students participating in small classes and those in large classes appear to persist the year after small class instruction ends (Finn et al., 1989) and for several additional years of large class instruction (Nye et al., 1993); however, the effects are no longer present by the time the students reached the end of middle school (Voelkl, 1995). This suggests that the narrow focus on early education in class size reduction policies and empirical research will not yield the lasting benefits hoped for by educators.

One study of middle school and high school students does tie class size to teacher support of individual students. Betts and Shkolnik (1999) examined data from the Longitudinal Study of American Youth, which followed students from approximately 100 nationally-representative middle and high schools from the fall of 1987 to the spring of 1990. Analyses of 2,170 math classes in grades 7 through 12 were conducted to determine whether teachers provide more supportive classroom atmospheres in smaller classes than in large classes. While teachers did not spend more time covering new material when class size was low, they did spend less time on

group instruction and more time on individual instruction. According to the final predictive models yielded by this analysis, teachers with classes of 30 students spend 7.4 minutes less with each student per class than those with classes of 20 students (Betts & Shkolnik, 1999, p. 198). This statistically significant difference in pedagogy adds up to more than half an hour less one-on-one time per week and approximately two and a half hours less per month.

Although the conclusions of evaluations and secondary analyses of these interventions have been almost exclusively in favor of small class size, analyses of the STAR experiment have also been criticized for not paying enough attention to the methodological limitations of the STAR experiment before suggesting costly educational policies (Hanushek, 1999). Defenders of CSR policies have responded to this criticism by pointing out that the cost-benefit analyses that have informed such criticisms have ignored the long-term benefits of small classrooms: students who spend three or four years in small classes at the beginning of their educational careers graduate from high school at higher rates and are more likely to go to college (Finn, Gerber, & Boyd-Zaharias, 2005). Educators and policymakers must consider these long-term financial impacts when tallying the financial pros and cons of CSR policies (e.g., Krueger, 2003).

Class size has vital implications for the small schools movement – implications that are seldom born out in empirical studies. Smaller classes have been demonstrated to make a significant impact on the quality of the classroom learning environment (Mitchell & Mitchell, 2003, p. 139), with a maximum ratio of 17 students per teacher generally determined to produce the most effective classroom atmospheres (Mitchell & Mitchell, 2003). With the small school philosophy is built around increasing the quantity of high quality interaction between students and their teachers, it is surprising that the nuance of class size has so often escaped the attention of the vast majority of researchers concerned with the recent small schools reforms: one would

expect to see the interactions between class size and school size examined more often in size effects studies (e.g., Betts & Shkolnik, 1999).

The necessity of teasing out the separate influences of *school* size and *class* size on student experiences and outcomes is particularly relevant given the uneven application of class size reduction policies. Just as small school restructuring has been applied inauthentically, class size reduction has also become widely usurped as a quick fix. Although most states have prioritized class size reduction on paper, this reform has remained largely symbolic as states disable the policy in various ways. Several states have adopted policies that reduce the ideal class size without offering adequate funding to realize these goals (Mitchell & Mitchell, 2003): most states that have adopted class size reduction policies have ignored the empirically-backed suggestion of 17 students per teacher and instead target ideal class sizes between 20 and 25 (Hertling et al., 2000; Mitchell, 2000; Parrish & Brewster, 2000). In addition to lack of adequate funding, the means for implementing class size reductions often include methods that “sharply undercut the professed goal of improving operational effectiveness” (Mitchell & Mitchell, 2003, p. 123), such as hiring teachers who have yet to be fully trained and using inadequate spaces to create additional classrooms.

#### The Mechanisms of Small Scale Schooling: School Climate

What, exactly, is it about small scale schooling that proponents argue engages students? This section will outline the arguments and empirical evidence suggesting that small school scaling engages students via two means: the personalization of student-teacher relationships and academic press.

##### *Personalization of Teacher-Student Relationships*

The arguments of researchers in favor of smaller, more communal high schools seem to

be borne out by the empirical evidence. One of the basic tenets of small schools is that they create personalized learning environments for students. Smaller schools have been shown to be more likely to have a communal organizational structure (Bryk & Driscoll, 1988; Bryk et al., 1993) in which teachers are more likely to be personally invested in their students' learning (Lee & Loeb, 2000). Small schools have also been shown to foster improvements in teacher-student relationships across a number of case studies (Fine, 2000; Antrop-Gonzalez, 2006; McPartland et al., 1998; McPartland et al., 1997; Oxley, 1994; Clinchy, 2000) and in quantitative analyses (Crosnoe, Kirkpatrick, & Elder, 2004; Lee, Bryk, & Smith, 1993; Lee & Smith, 1994; Lee, Smith, & Croninger, 1995; Lee & Loeb, 2000).

A number of analyses of Project STAR data have shown at least one change in teacher practices from large classes to small: teachers spend less time on classroom management and discipline problems, using the freed-up time on increased instruction (Achilles et al., 1995; Molnar, Smith, & Zahorik, 1999). Johnston (1990) used the Project STAR data to analyze whether class size was specifically related to the personalization of teacher-student relationships. The analyses found that teachers in small classes were more knowledgeable of students as individuals – their academic performance, personalities, and home lives. “Kindergarten through third grade teachers reported that more time was now available to listen to children, to get to know their personal lives and concerns” (p. 12). Small class teachers also reported that having more personalized relationships with students often led to substantial increases in student trust in teachers as resources for dealing with personal problems. Teachers of small classes commented that “children were more willing to approach the teacher...they frequently initiated conversation with teachers about personal matters” (p. 13).

Kiser-Kling (1995) reported similar findings from North Carolina's Success Starts Small initiative. Grade 1 teachers in an elementary school spent several years teaching small classes of approximately 15 students before being switched to large classes of about 24 students.

Interviews with teachers revealed a pattern of personalized relationships flourishing in small classes and not developing to the same extent in large classes.

Improving student-teacher relationships, in turn, has been linked to a number of positive student outcomes (Lee, Smith, & Croninger, 1995; Aness, 2000; McPartland et al., 1998).

Greater interaction with more personalized relationships with teachers has been shown to increase student engagement across many studies (Felner et al., 1997; Connell & Wellborn, 1991; Skinner & Belmont, 1993; Solomon et al., 2000; Marks, 2000; Klem & Connell, 2004; Fine, 2000). Strong student-teacher relationships have also been related to increased levels of student learning (Sanders & Jordan, 2000; Mahoney & Cairns, 1997; Finn, 1989), which has been shown to mediate relationships between many risk factors and student dropout (Battin-Pearson et al., 2000).

Although there is some evidence of differences in teaching strategies across class size, with small classes benefitting from more individualized instruction, a number of studies have found little to no difference in teaching practices (e.g., Bohrnstedt, Stecher, & Wiley, 2000; Molnar et al., 2000; Stasz & Stetcher, 2002; Wang & Stull, 2000). Stasz and Stetcher (2002) attribute this to the enduring nature of teaching practices: "teaching practice is resistant to change and...teachers adapt their practices slowly and marginally as new materials and techniques are introduced" (p. 29). This is an important empirical patterns and observational note as reform policies rely on changes in *structure* (such as school or class size) without explicitly engaging in efforts to reform the teacher practices that lead to changes in school *climate and culture*.

### *Academic Press*

Another basic characteristic listed by many proponents of small schools is an academic culture of high expectations combined with the support for students to meet their goals; in other words, increased contact with teachers is assumed to only be beneficial so long as it supports students achieving academically and personally at high levels. Academic press is the practice of clearly communicating high expectations for students and holding students accountable for their gains in achievement (Pace & Stern, 1958; Murphy et al., 1982).

Students who experience high levels of academic press at school have been shown to demonstrate a greater sense of belonging to school (Ma, 2003), an enhanced student self-concept (Sebring et al., 1996), and higher levels of engaged behaviors, with students at schools with higher academic press spending more time on academic tasks and exhibiting greater effort (Sebring et al., 1996; Bandura, 1991). Like many aspects of school structure and climate, academic press has been shown to be particularly salient for student achievement in low-income schools (Shouse, 1996).

Proponents of small scale schooling attribute successes in raising student engagement in part to increases in academic press. But do small schools and classes actually offer greater academic press as a matter of course? Wasley et al. (2000) studied small schools in Chicago using a mix of quantitative surveying and qualitative methods; they found evidence that teachers had higher expectations for their students in smaller schools than in large schools.

The growing evidence of tracking across SWSs within the same host school suggests that perhaps not all SWSs provide meaningful degrees of academic press. Shear et al. (2005) surveyed teachers and students at seven high schools before and after being converted into 26 SWSs. A school culture subscale measuring high expectations showed significant differences

from the year before conversion to two years post-conversion; however, there were no significant differences found in the rigor of teacher assignments in either English Language Arts or mathematics.

*Climates with Both Personalized Support and Academic Press*

An evaluation of reform efforts during the 1990s in Chicago elementary and middle schools found that academic press is strongly related to student achievement, which has been shown to mediate school dropout (Lee et al., 1999). The Chicago Annenberg Challenge increased attention to building more personalized, supportive relationships between students and teachers, alongside a push for clearly communicated high expectations and academic accountability from central administration. The evaluation used hierarchical modeling of survey and standardized test scores of more than 28,000 students and more than 5,000 teachers in 304 schools. The analyses revealed that students with the highest levels of social support increased their reading and math achievement about twice as much as their peers with the lowest levels of social support, after taking into account differences in individual demographics and school characteristics. However, the differences were also sharp when comparing those who experienced either high levels of social support and low levels of academic press or vice versa (Lee et al., 1999).

Analyses of a 1994 citywide survey of Chicago students found that while personalized student-teacher relationships and academic press each has a slight, positive relationship with student engagement, those who experienced both were substantially more engaged than those who experienced only one of the two, or who experienced neither (Sebring et al., 1996).

Shouse (1995) points out that the theoretical examination has not kept up with the empirical attention paid to demonstrating the academic benefits of school climates characterized

by communal values and caring relationships. “While some studies report significant achievement effects for school ‘communality’ (Bryk and Driscoll, 1988; Bryk, Lee & Holland, 1993), the theoretical connection between social cohesiveness and academic effectiveness is unclear” (p. 4). Shouse cites this theoretical ambiguity as cause for treating “sense of community” and academic press independently. The small scale schooling research is largely based upon these two constructs as the presumed result of structural reforms related to size – smaller classes and smaller schools involve greater academic press and more personalized relationships. This research therefore provides a suitable empirical space for examining whether these aspects of school climate work independently, together, or both to improve the academic effectiveness of schooling.

#### Reforming the School Context of Student Engagement

It appears that entire urban school districts – often those most desperate to re-engage large portions of their student populations – are implementing small schools reform in ways that do not quite align with the theory advocated by proponents; what’s more, the empirical justification for the implementation choices is less than compelling. While we do know some important pieces of the school context puzzle, there are still major parts of small schools reform that remain to be examined.

We know that students in small schools participate more in school (Crosnoe, Johnson, & Elder, 2004), demonstrate higher attachment to school (Lee, 2000; Borland & Howsen, 2003), demonstrate higher academic achievement (Crosnoe, Johnson, & Elder, 2004; McNeely, Nonnemaker, & Blum, 2002), and are more likely to graduate (Finn, Gerber, & Boyd-Zaharias, 2005); we also know that students who are educated across multiple years in small classes demonstrate higher academic achievement (Borland, Howsen, & Trawick, 2005; Finn et al.,

2001; Nye, Hedges, & Konstantopoulos, 2000) and are more likely to graduate (Finn, Gerber, & Boyd-Zaharias, 2005).

But how do these findings match up with the results of an urban reform that must cut corners to be practical? Do schools-within-schools replicate the same increases in student engagement that small whole schools have demonstrated? Does the size of the educational context alone relate to student engagement, or are student-teacher relationships and academic press key elements of successful small scale schooling? And when all of these factors are taken into consideration, can small schools compensate for risks found in outside contexts? The second half of this chapter is devoted to describing the theoretical considerations underlying this study's examination these issues related to small scale schooling.

### CONCEPTUAL LENSES

The main purpose of this study is to question the logic behind small scale schooling reform implementation by investigating the relative importance of school climate to school size effects. Examining the foundational logic of these reforms requires a conceptual understanding of how reform efforts purport to affect change in schools, how schooling fits into the development of students, and how schools contribute to the engagement of students in their schooling experiences. The conceptual framework of this study thus draws upon a number of scholarly debates that shape our understanding of how schools work: theories of structure and culture in the social sciences, theories of organizational climate and culture, ecological theories of human development, and various conceptual models of student engagement (see Appendix A for a set of visual representations of the theoretical framework applied to this study).

#### Structure, Culture, and Education Reform

The basic premise under investigation in this study is that smaller school *structures*

somehow engender more supportive school *climates*, which in turn explains why smaller scale schooling is associated with greater student engagement in school. This presumption is widely built into the arguments for small scale schooling and seldom backed by empirical patterns of evidence. The juxtaposition of structure and climate in the scholarly debate on school size and classroom size implicitly relies upon broader understandings of how structure and culture work together to fashion social experiences<sup>4</sup>. Proponents of small scale schooling largely argue that changing a structural aspect of schooling – namely, size – will lead to changes in school culture; the changes in school culture that result from changes in school structures in turn lead to changes in school climate, which affect students’ engagement, learning, behaviors, and their schooling experiences in general.

This causal relationship in which structure determines culture follows the traditional presumptions laid forth by sociologists. However, this is certainly not the only way of conceptualizing the relationships between structure and culture upon which small scale schooling reforms are built. The following section will illustrate the problematic theoretical foundation of presuming that school structure leads to school culture before laying out an alternative view of structure and culture that forms the basis for this study’s empirical explication. Each set of understandings of these key sociological concepts will be applied to the small scale schooling reforms, in turn, in order to clearly illustrate the gaps in applied theoretical understanding that are addressed by the current study.

Structure and culture are key concepts in social science – and yet their use is not nearly as explicit or coherent across, or even within, fields as one might expect of such crucial theoretical building blocks. There is a tendency in sociology to see structure as something that is not only

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<sup>4</sup> The relationship between the constructs of “climate” and “culture” will be further explicated in the following section on organizational climate and culture; the decision to study school climate, rather than school culture, will be explained in the Methodology chapter.

distinct from culture, but also *determinative* of culture – even when the precise definitions and sites of production vary (Hays, 1994). On the other hand, scholars who take a semiotic approach to understanding social phenomena (e.g., anthropologists) tend to see culture as the primary site of structuring – to somewhat oversimplify for the purposes of illustration, *culture creates structures* (see Hays, 1994; Sewell, 1992 for discussion). In order to empirically examine the logic behind small scale schooling reforms, the analyses in this study ultimately adopts an integrated view of structure and culture that bridges the determinism gap in order to examine whether educational scholars and practitioners can accurately argue that changes to structure – and not culture – determine student outcomes.

Sociologists have a long history of defining “social structure” by contrasting it with “culture” in trying to figure out why our social world is the way that it is (see Berger, 1991; Kane, 1991; Hays, 1994); and yet, the definitions of what, exactly, is being compared have varied widely across sociologists. Some scholars have placed the meaning of social structures within material circumstances (Berger, 1981) or systems of production (Willis, 1977); others have looked to institutions such as the state, classes, and other axes of power (Gusfield, 1981; Bellah et al., 1987); and still others have focused their conceptualization of social structure on the power relationships between these institutions (Skocpol, 1979; Geertz, 1973). Despite this lack of consensus of what, exactly, constitutes social structures, many sociologists fall into a structural argument that defines social structure in terms of determinism: social structures are the elements of life – be them social relations, material resources, institutions, etc. – that are largely responsible for determining the patterns of social life. Following this argument, culture is then contrasted with the hard, observable, immutable aspects of life, comprising instead the artifacts and ways of life established by these determining structures (Hays, 1994). Although extreme

forms of the structuralist argument may not be as popular in sociology as they once were, the underlying tension between a determining structure and a determined culture is still widely – if implicitly – prevalent (see Hays, 2000).

The basic argument in favor of small scale schooling reforms can stand as a prime example of the current influence of structuralist thinking in the social sciences. The typical argument in favor of small schools or small classes is that having fewer students in the educational environment will mean that each student will have a more personalized experience and that teachers will be able to manage to press each student academically, neither of which is possible in large, fairly anonymous schools. The fact that greater access to teachers might not actually result in better relationships with those teachers is not factored into this assumption because the structuring of schooling is presumed to determine the culture offered within that structure.

However, not all researchers of educational scale have assumed that a unidirectional structural determinism is at work in small scale schooling. A number of researchers in the field of education have recognized a fundamental flaw in this argument in that schools small in size alone are not necessarily small in climate (Elmore, 1995; Fine, 2001). In order to approach the issue of small scale schooling and its relationship with student engagement in a fundamentally different way, the theoretical underpinnings must shift to include the possibility that student outcomes are not primarily determined by structural forces, but are also affected by the school cultures that are built through more than structural arrangement. A set of new articulations of the relationships between structure and culture have formed over the past two decades that allow for these possibilities without losing the essential power behind structural and cultural thinking. William Sewell and Sharon Hays have both contributed substantially to ways of conceptualizing

the social world that neither reduce phenomena such as schooling to purely structural determinism nor to isolated cultural acts: they have both deconstructed the extreme and opposing stances on structure and culture in order to create alternative, integrated theoretical frameworks.

Their complementary views rest on three major deviations from traditional theories of structure. First, social structures are described as being dual in nature, which is to say that they are both structuring and themselves structured. Second, structure and culture are not diametrically opposed, but in fact fully dependent on one another. Third, neither structure nor culture is more observable, objective, or – ultimately – “real” than the other. Each of these elements of their re-articulations of the concepts of structure and culture has important implications for how small scale schooling reforms are studied and understood; as such, they will be summarized here and before the combined theoretical lens is applied to a possible rendering of the small scale schooling debate’s foundational logic.

Neither Sewell nor Hays is the first to propose that structures have a dual existence. Giddens (1981) has emphatically argued that structures are “both the medium and the outcome of the practices which constitute social systems” (1981, p. 27). For Bourdieu, *habitus* acts as the site where “mental structures” meet “the world of objects” and are “constructed in the practice of a world of objects constructed according to the same structures” (Bourdieu, 1977, p. 91). It is in these and similar traditions that Sewell and Hays find the most compelling understandings of “social structure” in that they do not remove human construction and maintenance from the formation of structures. To say that social structures are both structuring of other social phenomena as well as themselves structured by pre-existing structures can be taken to an extreme version of determinism – which is the precise structuralist argument that frustrates these two scholars.

But this structural determinism can only exist if one presumes, as many sociologists do, that structure and culture invoke fundamentally distinct social processes. Sewell (1992) has, in fact, called the rigid causal determinism that follows from this presumption “the most fundamental problem” of structural arguments (p. 2). The second point essential to Sewell’s and Hays’ theories of structure and culture emphasizes and resolves the false binary opposition of the two constructs in a bid to remove the unidirectional causal relationship between the two: structure does not determine culture alone and culture does not determine structure alone. Rather, structure and culture are mutually and recursively determined by each other as human agents make the myriad conscious and subconscious decisions that constitute everyday living. While both Sewell and Hays arrive at a framework that incorporates culture as part of both the structuring and structured patterning of social life, they take slightly different paths towards their dual constructs of social structure.

Sewell takes Giddens’ work as a starting point, examining the strengths and weaknesses of Giddens’ (1984) conceptualization of structure as “rules and resources, recursively implicated in the reproduction of social systems” (p. 377). Although he takes issue with the lack of explication behind this definition, Sewell agrees with the basic necessity of a dually-defined concept of structure and he ultimately defines structure as “composed simultaneously of schemas, which are virtual, and of resources, which are actual [and in which] schemas are the effects of resources, just as resources are the effects of schemas [and they] mutually imply and sustain each other over time” (p. 13). The decision to switch to the term “schemas” from Giddens’ original “rules” was based on the desire to highlight what Giddens’ never elucidates: an agent carries out behaviors by drawing on a cultural array of knowledge, preferences, and options for behavior (Sewell, 1992, p. 7). In order to function as such, structures must therefore

encompass both the sources of power that agents can draw upon (i.e., resources) as well as the socially-derived and reinforced cultural schemas that guide the use of these resources in particular ways.

Hays (2000) commented that “the theoretical misstep of separating ‘structure’ and ‘culture’ is one of the principal conceptual problems that keeps sociologists from recognizing the power and centrality of culture” (p. 597). Her conceptualization of social structures is similar to Sewell’s in that they both rely on dual processes – one of which invokes the traditionally separate phenomena known as “culture.” Hays argues that “social structure consists of *two* central, interconnected elements: systems of social relations and systems of meaning” (1994, p. 65). In addition to the more traditional element of social relations (i.e., power relationships and their theoretical accoutrement), Hays insists that systems of meaning – otherwise known as culture – is essential to social structures.

If one wants to understand the resilient patterns that shape the behavior of any individual or group of individuals, both the cultural and the relational milieu must be taken into account...The history of social analysis makes it clear that these two systems always work together: social phenomena can never be fully explained by simply referring to one or the other (p. 66).

By folding cultural systems of meaning into social structures, Hays includes culture as part of the reifying structuring of new social structures – in which culture becomes part of the determining power of social structures.

The natural consequence of these first two newly re-articulated points is an emphasis on the epistemological consequences for social analysis. When structure and culture are posed as binary oppositions, they become tangled up in an entire network of dichotomized attributes:

structure comes to be signified as “hard,” primary, immutable, and objective, whereas culture is posed as “soft,” secondary, malleable, and subjective (see Sewell, 1992; Hays, 2000). As a direct result of these contrasts, sociologists easily find themselves mired in the conclusion that structures can be empirically examined, whereas culture can only be understood as part of a subjective dimension of experience. This places culture outside the realm of scientific inquiry, removing it from any possible empirically-driven understanding of social phenomena.

By acknowledging the necessity of both relational structures and cultural systems to social analysis, Hays and Sewell update the traditional views of structure in a manner that allows for new empirical examinations of existing social phenomena. If it is true, as Hays (2000) states, that “culture operates according to socially constructed logics that are no less ‘real’ than the built environment they permeate. And cultural structures are no more malleable or inaccessible than the long list of social forms that have been referred to as ‘social structure,’” (p. 597), then they cannot be accurately described as unobservable.

Could this new structural-cultural framework be applied to a social analysis of small scale schooling outcomes? Such an analysis would need to consider the influence of not only the structural features of small scale schooling (e.g., the number of students in a school, in a classroom, participation in an SLC), but also the cultural features often associated with small scale schooling (e.g., the degree to which relationships are personalized, the extent to which students are pressed to achieve academically). Removing the false dichotomy between structure’s observable objectivity and culture’s hidden subjectivity opens the influence of each on social phenomena, such as engagement in schooling, to sociological examination. While this study does not directly measure culture, per se, its examination of climate parallels the possible relationships between structure and culture outlined here. The following section more fully

describes the distinctions between culture and climate and begins to explain why assessing climate is important to analyses of small scale schooling reform, as well as the broader structure-culture debates<sup>5</sup>.

### Organizational Climate and Culture

In this study, the nature of the relationship between two dimensions of the school context – structure and climate – are key. The reform efforts under analysis assume that school structure has a powerful enough relationship with student behaviors to significantly contribute to student engagement – the number of students in the school and in each classroom, and the arrangement of those students and classes into schools-within-schools, is presumed to engage students to different degrees. This study questions whether structure alone is sufficient in school context explanations of student engagement – in what ways are those explanations dependent on the climate that exists within schooling structures?

In this study, school *structure* refers to the deliberately determined organization of the school – how students, teachers, classes, and other aspects of schooling are ordered for the lived process of schooling. School *climate* refers to the common experiences, thoughts, and feelings of school members that are presumed to contribute to school-related behaviors. The concept of organizational climate has a long and oft-debated place in sociological and psychological research (see reviews and discussions by James & Jones, 1974; Schneider, 1975; Glick, 1985; Van Hoewijk, 1988; and Schein, 1992); the following section will provide some of the theoretical background of the concept and contrast it with organizational *culture*, for clarity's sake, as organizational culture is often confused with organizational climate and the former will not be assessed in this study.

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<sup>5</sup> Again, the decision to examine organizational climate, to the exclusion of organizational culture, is also articulated and explained in the methodology section.

Definitions of organizational climate and culture vary widely across scholars. Ashforth (1985) conceptualizes culture as shared assumptions and ideologies, contrasting it with climate's shared perceptions of behavior. Schein (1985) contends that culture refers to "the deeper level of basic assumptions and beliefs that are shared by members of an organization, that operate unconsciously, and that define in a basic 'taken-for-granted' fashion an organization's view of itself and its environment" (p. 6). Climate, on the other hand, refers to "a reflection and manifestation of cultural assumptions" (1992, p. 230) in organizational members' expressed opinions and behaviors. Denison (1996) defines climate as "a situation and its links to thoughts, feelings and behaviours of organisational members. Thus it is temporal, subjective and often subject to direct manipulation by people with power and influence," as compared to culture, which is "an evolved context (within which a situation may be embedded). Thus, it is rooted in history, collectively held, and sufficiently complex to resist many attempts at direct manipulation."

Despite a lack of conceptual clarity born of interchangeable use across many scholarly works (Hoy, 1990; Guldenmund, 2000; Denison, 1996), there are a couple of elements to the concepts' relative definitions that meaningfully distinguish organizational *climate* from organizational *culture*.

#### *Temporality.*

One of the most pervasive – if not the most straightforward – elements used to distinguish between climate and culture is the contention that culture persists over time and across transient organizational members. Climate, on the other hand, is usually conceptualized as a more superficial organizational attribute that describes an organization and the experiences of its members at a fixed or relatively brief moment. Organizational culture, on the other hand,

is demonstrated over time, displaying a certain permanence that is not even considered in establishing organizational climate.

While most theorists include some variation of this distinction in their definitions and comparisons of the two constructs, not all agree on the implications for the relationship between organizational climate and culture. The directionality of the climate/culture relationship continues to be contested after decades of theoretical postulation (Guldenmund, 2000). For example, Schein (1992) talks of climate as organizational culture in the making. According to this conception, climates – the lived experiences and reactions to the organizational setting of a set group of people at a given point in time – accumulate to create cultural assumptions and values. Climate becomes culture. On the other hand, Guldenmund (2000) concludes that the majority of current scholarly work contends that “organisational culture expresses itself through organizational climate” (p. 221), making climate the product – rather than the building block – of culture.

A third, underarticulated option is that the relationship between climate and culture is recursive. It is entirely possible that the momentary thoughts, feelings, and opinions held and expressed by organizational members – climate – both serves to create, maintain, and even change the long-term organizational culture and, at the same time, is influenced by the standing culture. This possibility contributes greatly to the decision to focus exclusively on school climate within this study – the consideration of both climate and culture would require a depth of examination beyond the scope of a single research project.

#### *Methodology.*

Organizational climate and culture can be largely distinguished upon disciplinary lines. Traditionally, climate has been the preferred construct of organizational psychologists and

sociologists, whereas conceptualizations of culture originated in anthropology. The divergent disciplinary originations have led some researchers (e.g. Glick, 1985) to consider methodology as the defining distinction between organizational climate and culture. In describing the differences between the two, Hoy (1990) discusses how the nature of culture demands a particular methodological approach. “To study culture one must understand the complex clustering of symbols people use to give meaning to their world (Geertz, 1973), a problem that is probably best addressed through an ethnographic approach” (p. 160). This contrasts sharply with quantitative researchers who “assume that organizations are rational instruments to accomplish purpose...[who] tend to be interested in...how the climate influences organizational outcomes” (p. 160).

Measuring organizational climate, therefore, is also quite different from assessing organizational culture. Climate tends to be measured using survey assessments and quantified administrative data, such as staff years of experience. Scholars interested in organizational climate tend to use quantitative methods, such as multivariate regression, to determine the ways climate is related to various outcomes in light of other factors. Culture, on the other hand, is often assessed through direct observation of overt manifestations, as well as through analysis of indirect indicators of assumptions. These analyses tend to look at culture as an end product of other events, processes, and behaviors.

#### *Climate and Culture in School-Effects Research*

After reviewing the literature on organizational climate and culture, Hoy (1990) declares school-effects research unfit and not yet ready for either construct. “The research rooted in the school-effects literature is confusing and lacks any kind of theoretical consistency. Confusion becomes chaos when school-effects research masquerades as studies of climate or culture” (p.

163). Nearly two decades later, the lack of conceptual clarity is still pervasive enough to preclude any easy incorporation of a fused framework into school effects research.

Following Schneider and Gunnarson's (1996) example, this study will consider school climate as the "what" that happens in school (the expressed experiences, beliefs, and feelings of school members) and will consider school culture to reflect "why" things happen the way they do (the values, norms, and other taken-for-granted assumptions involved in shaping school-based events, processes, and experiences). The goal of the study is to establish, with some empirical clarity, the widespread patterns in relationships between small scale schooling structures and student engagement, as well as the degree to which these relationships are explained by other aspects of the school context. In order to establish whether these patterns of relationships exist not only in one or two schools – which may be the exception in either direction – but across a larger swath of schools, this study focuses on climate, rather than culture. The relationships between school contexts and student engagement have been examined in a wide body of ethnographic studies; this set of analyses takes these findings and builds upon them: we know that certain schools have created certain contexts that relate to student engagement in certain ways – how widely does this happen? How highly correlated are these contexts with these student outcomes? Do these patterns of relationships continue to exist when you only consider structure or are they attributable to other aspects of schooling?

Assessing school culture within these parameters would either require a series of ethnographic analyses or, at the very least, a mixed-methods approach; either option would require both a broader and more intense research program than a single dissertation study. As this study is the first step towards a more nuanced understanding of the how school context encourages student engagement in small scale schooling and as the relationship between school

climate and culture is not the focus of this particular set of analyses, these analyses include school climate as a major construct of interest and exclude school culture. While school culture is important in its own right and its connection to the relationships between school structure and student engagement no doubt warrant examination as much as school climate's, the influence of school culture is simply beyond the scope of this particular study.

### Human Development and the Role of Student Engagement

This study is centered around the comparative contributions of various aspects of the school context on student engagement. The theoretical framework thus includes a way of understanding the relationships between student engagement in school and the various contexts experienced by students. This section will discuss the leading theories for explaining how students become, remain, and sometimes stop being engaged in their schooling.

The predominant frameworks in educational research that are currently used to explain student engagement (as well as other student outcomes) rely heavily on explanations involving the various contexts that influence students' experiences – particularly the family, the community, peer groups, and schools. This perspective – that context influences individuals' development – can be understood as an ecological standpoint. In his seminal work, *The ecology of human development*, Bronfenbrenner (1979) states that

The ecology of human development involves the scientific study of the progressive, mutual accommodation between an active, growing human being and the changing properties of the immediate settings in which the developing person lives, as this process is affected by the relations between these settings, and by the larger contexts in which the settings are embedded (p. 21).

As youth spend six or more hours in the school setting, any ecological analysis of students attending school must consider the influence of this context in students' development.

Sheridan and Gutkin (2000) reframed ecological theory specifically in terms of the contexts and processes of schooling and came up with a list of four primary assumptions endemic to the perspective:

1. Students exist inseparably within multiple social systems.
2. Negative student outcomes are not “diseases” located within the student, but are indicative of a problem within the social systems involved in that student's development.
3. These problems often involve a mismatch between the student's abilities and the demands of the various social systems.
4. Interventions must aim to resolve these problems in order for the social systems – including schools – to contribute positively to the student's development.

According to these assumptions, any valid explanation of student engagement should consider not just one or another social system in which students live, but the cumulative experiences within all of them. With empirical work substantiating the individual impacts of multiple contexts on student engagement, it makes sense for further steps to be taken to consider the effects of school reforms in the face of students' experiences in multiple settings. While evaluating the relationships involved in school reform necessitate placing one context – schooling – at the forefront, this study does not presume that schools are the only – or even, necessarily, the most important – context that shapes the students' educational experiences. To that end, this study will evaluate Philadelphia's application of small schools reform only after

controlling for students' background characteristics, as well as their experiences related to education at home and in their peer groups.

Although there is largely consensus on the importance of student engagement in positive student outcomes, the processes involved in engagement – and, conversely, disengagement – vary widely across studies. A wide range of loci of disengagement have been targeted across studies, including family socialization, the influence of peer groups, and the availability of positive neighborhood role models and resources. The literature on student dropout – a well-studied, extreme act of disengagement from school – provides three explanatory models for understanding the most extreme act of disengaging from school: the frustration-self-esteem model, deviance theories of social control and the cognitive evaluation model, and the participation-identification model. All include the concept of engagement as the most proximal cause of dropping out of school; where they differ is in the more distal causes of disengagement (see Appendix B for a graphic representation of these mechanisms). The following section will briefly outline each theoretical camp in turn, before summarizing the ways in which small schools might influence each hypothesized causal mechanism.

The frustration-self-esteem model posits a three-stage recursive process for explaining disengagement: (a) poor performance at school leads to (b) a lowered sense of self-efficacy and academic ability, which in turn sets the stage for (c) the development of an oppositional stance towards school – which is attributed as the ultimate cause of academic failure and withdrawal from school (Elliott & Voss, 1974; Bernstein & Rulo, 1976; Newcomb et al., 2002). In an interesting application, given the push for schools to raise standards for student achievement, McDill, Natriello, & Pallas (1986) argue that raising standards for academic achievement is likely to increase the numbers of students experiencing academic failure, which in turn may

increase rates of student dropout. LeCompte and Dworkin (1991) offer a unique twist to the frustration-self-esteem by shifting the focus away from mere academic frustration by describing the process of dropping out of school as brewing in students' realizations that schooling will not provide them with sufficient tools for social mobility.

The second set of explanatory models are built on social control theory, which contends that social controls (such as families and peer groups) are responsible for keeping individuals' behaviors in line with societal expectations and norms; in the absence of such control, deviant behaviors go unchecked (Hirschi, 1969; Elliott, Ageton, & Canter, 1979). Building off of social control theory, Deci and Ryan (1985) propose cognitive evaluation theory, in which an individual's perceptions of others' behaviors shape a person's motivations and, therefore, behaviors. Vallerand (1997) summarized the application of this model to school dropout with a four-part explanatory model in which (a) influential members of a student's schooling experiences shape the student's self-perceptions of competence and autonomy, which in turn (b) build self-determined school motivation, (c) intentions toward school completion, and eventually (d) the decision to persist or drop out. Scholars using social control and cognitive evaluation theories have focused on three primary mechanisms of social control outside of school: the family (Fagan & Jones, 1984; Hill & Stafford, 1977; Cairns et al., 1989), student's peer groups (Gutierrez & Montalvo, 1984), and the community (Wilson, 1987; Crane, 1991; Jencks & Mayer, 1990; see Vartanian & Gleason, 1999).

The third major explanatory framework – the participation-identification model – focuses explicitly on the environment of the school as the primary causal factor of disengagement. The basic premise of this model is that students who participate widely in school-related activities develop an identity around school that strongly encourages them to overcome barriers to staying

in school. By extension, certain school structures, cultures, and climates are more conducive to the development of such an identity by offering opportunities for and then encouraging participation. According to Finn's (1989) formulation, participation happens at four levels: basic school requirements (such as attendance), the academic work of class, extra-curricular activities, and school governance. Being successful at these forms of participation depends on opportunity, the quality of guidance at home and at school, and student ability; thus Finn begins to incorporate some of the elements from social control and cognitive evaluation theories, as well as the frustration-self-esteem model.

Small scale schooling proposes to change the way formal education happens in ways that would interrupt each of these possible pathways to disengagement. Small schools and small classrooms offer greater attention to students, engendering better academic achievement to prevent the frustration of academic failure; they afford greater social control through the public accountability of small communities; at the same time, these communities create greater connections amongst and between students and teachers, providing an atmosphere in which educators can empower students to take their educations seriously; school cultures built upon this community atmosphere encourage students to actively participate in their own educations and thus to build positive identities around being learners. These are all ways in which small schools can potentially influence student engagement – and thus persistence to degree.

## CHAPTER 3

### METHODOLOGY

The primary purpose of this study is to tease apart the associations between the structural aspects of small scale schooling and two aspects of school climate often associated with these reforms – academic press and personalization of teacher-student relationships – as they relate to student engagement. The two main research questions examined in this study are the following:

1. What is the relationship between the structural aspects of educational scale and student engagement?
2. Does the climate of the school explain these relationships between school structure and student engagement?

Addressing these questions will involve a quantitative modeling of data describing students' experiences, contexts, attitudes, and behaviors. The nature of the data and methodology used in this study, including data sources, the sample, variables and variable construction, descriptive and bivariate analyses, and a description of the predictive analytical methodology, is described in detail in this chapter.

#### Data

##### *Data Sources*

This study addresses the research questions using data from two datasets: the Philadelphia Educational Longitudinal Study (PELS), which contains student-level and some limited school-level data, and the national Common Core of Data (CCD), which contains school-level data. The two levels of data are linked via the school each student attended during the fourth wave of data collection for the PELS. Descriptions of each dataset are provided below:

##### *The Philadelphia Educational Longitudinal Study (PELS).*

Led by Dr. Frank Furstenberg at the University of Pennsylvania, PELS tracked public school students and their parents through students' high school and post-high school years in the School District of Philadelphia (SDP) from 1996 to 2004. The scope of the study was wide, with topics spanning from direct schooling attitudes, experiences, and expectations to broader educational concerns (such as sexual behavior and civic engagement)<sup>6</sup>. Data on these topics were collected via annual telephone surveys with students and their parents.

The PELS sample was selected in such a way as to capture the feeder patterns of neighborhood middle-schools into neighborhood high schools. A two-step cluster sampling technique was used at the beginning of data collection to randomly select students within randomly chosen schools. Forty-five of the 93 SDP schools with eighth grades were chosen at random and 2,938 students were randomly chosen from the student populations of the selected schools. Approximately 50% of those contacted participated in the initial round of data collection. Although the sample had slightly better attendance and test scores and were slightly less likely to be receiving public assistance than those not included in the study, the sample is fairly representative of the entire student cohort for the district (Neild & Weiss, 1999). The one major exception is that later waves over-sample students who have dropped out of high school in order to collect sufficient data for analyses on this topic. The overall PELS sample is therefore fairly representative of the School District of Philadelphia.

With 1,470 student-parent dyads, the original PELS sample includes slightly more than 10% of the eighth graders in the SDP from the 1995-1996 school year. Approximately 70% of the original sample was retained during the second wave of data collection; additional participants were added to successive waves to oversample particular populations of students,

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<sup>6</sup> See Appendix C for a detailed list of the variables pulled from this dataset.

such as students who dropped out of high school. By the 12<sup>th</sup> grade wave of data collection (assuming on-time grade promotion), the number of students in the sample was 1,169<sup>7</sup>.

The original data collection was primarily funded by The William Penn Foundation; data is currently housed at the Philadelphia Education Fund and is made available to members of the scholarly community who wish to conduct further analysis.

*The Common Core of Data (CCD).*

The National Center of Educational Statistics collects data annually on all of the primary and secondary schools, school districts, and local educational agencies in the public school system of the United States. The CCD includes descriptive information on schools and school districts, data on students and staff, and fiscal information. Data is collected via surveys sent to state departments of education; the majority of entries come from records maintained at the state level. Data on the schools attended by PELS participants were collected via the CCD's publicly-accessible web portal in order to be used in this study<sup>8</sup>.

*Sample*

The analyses in this study pull from a sample of 896 students within 45 schools in the School District of Philadelphia<sup>9</sup>.

Student data from Waves Two and Four of the PELS dataset and parent data from Wave Four are used in this study. The majority of student-level variables use data from Wave Four, in which on-time students describe their experiences in the tenth grade and parents describe their relationships with their students over that year. Wave Two – collected during the beginning weeks of ninth grade – focused on the transition from middle to high school and provides the

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<sup>7</sup> See the Sample section of this chapter for further information on the students and schools included in these analyses.

<sup>8</sup> See Appendix C for a complete, detailed list of variables pulled from this dataset for these analyses.

<sup>9</sup> The Power subsection of the Predictive Analyses section gives important information on methodological constrictions influencing sample size in this study.

controls for student engagement at the beginning of high school. Controlling for the previous level of student engagement is particularly important, given the cross-sectional design of the analyses; therefore, only students (and their parents) who were retained from Wave Two to Wave Four were included in these analyses.

#### *Missing values.*

Analyses deleted missing cases pairwise in all bivariate and multivariate analyses. This method allows for the retention of all possible students in each of the analyses and is a reasonable means of dealing with missing values<sup>10</sup>.

#### *Variables*

This section will outline the key concepts employed in this study and describe the manner in which they are used in the context of these analyses. (Appendix C offers a summary table aligning concepts, constructs, sources, and the survey items used to operationalize each and Appendix D offers a data dictionary detailing the survey items and responses, both as they were originally collected and as they were recorded for use in this study).

#### *Student engagement.*

The current study proposes a multi-dimensional understanding of student engagement (based on work by Fredericks et al., 2004). Items to operationalize three dimensions – cognitive, emotional, and behavioral engagement – were selected for examination as to suitability for analysis. Each of the measures was constructed as both a control variable using data from the beginning of ninth grade and as a dependent variable using the same items from the tenth grade wave.

The items explored for use as cognitive engagement variables measure academic effort: students were asked to rate the degree to which they work hard to do their best at school and,

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<sup>10</sup> Consequently, the exact sample size varies by analysis; analytic sample sizes are noted in all tables of results.

more specifically, the degree to which they try their hardest to do well in math class. Cronbach's alpha for these items is only 0.574 and Pearson's  $r = .403$  (explaining 16% of the covariance) in tenth grade; the reliability is even lower at the beginning of 9<sup>th</sup> grade, with Cronbach's alpha = .455 and Pearson's  $r = .295$  (explaining 9% of the covariance). Thus, there is insufficient reliability amongst these items to justify a scale measuring cognitive engagement.

These were the only items approximating cognitive engagement available in both the pre-high school wave and the tenth grade wave of data. Asking individuals to rate their own effort towards an activity with great social consequences, such as school and particular classes, may likely involve some degree of response bias: students may rate their own effort as greater than it was to "please" the educators collecting the data. This possibility of response bias suggests a need for a scale to measure cognitive engagement in order to triangulate the reliability of students' responses. As there are no other survey items appropriate for measuring this construct, a scale could not be created. Rather than using a single item – for which reliability cannot be determined – for modeling cognitive engagement, this dimension of student engagement was dropped from the analyses.

Measures of emotional engagement, on the other hand, exhibited sufficient internal reliability and construct validity to justify the creation of scales for an outcome and a control variable. Six items were entered into a confirmatory principal components analysis (with a varimax rotation): the degrees to which students find school interesting, look forward to school, enjoy school, are bored at school (reverse coded for alignment of directionality), and the two student effort variables originally explored for cognitive engagement. The Kaiser criterion for computing Eigenvalues was used to determine the number of factors representing separate constructs in the data (see Gorsuch, 1983; Fabringer et al., 1999). Analysis confirmed two

separate constructs with Eigenvalues greater than one, with the first four items loading onto one factor and the two discarded cognitive engagement items loading onto the other. All items exhibited factor loadings of 0.6 or higher. These results suggest robust construct validity for emotional engagement measured with these items as a separate and distinct construct from student effort.

Reliability of the scale is also sufficient, with Cronbach's alpha = .726 and a mean Pearson's  $r = .402$  (explaining 26% of the covariance) in tenth grade and Cronbach's alpha = .700 with a mean Pearson's  $r = .377$  (explaining 25% of the covariance) in the beginning of ninth grade. Therefore, the resulting factor scores were saved using the Anderson-Rubin method, which standardizes the variable to a mean of zero and a standard deviation of one.

A single item is used to measure students' behavioral engagement in school: the number of extracurricular activities or sports in which the student participates. Counts of extracurricular activities/sports are not as subjective as self-reports of effort or enjoyment of school; as such, this item alone is deemed sufficient for indicating one aspect of behavioral engagement in school. Participation in extracurricular activities/sports is self-reported by students in surveys about tenth grade and in surveys about the very beginning of ninth grade.

#### *Family context controls.*

The analyses control for the influence that family context may have on student engagement by including a scale constructed from four variables: parent satisfaction with student's grades, parent satisfaction with student's effort at school, student's willingness to discuss school with parent, and student willingness to show parent homework.

Unrotated principal components analysis confirmed a single factor with an Eigenvalue greater than one; all four variables loaded onto this component with factor loadings of .6 or

higher, suggesting robust construct validity. Reliability of the scale is also sufficient, with Cronbach's alpha = .881 and a mean Pearson's  $r = .596$  (explaining 23% of the covariance). The resulting factor scores were saved using the Anderson-Rubin method, which standardizes the variable to a mean of zero and a standard deviation of one.

*Peer group context controls.*

The analyses also control for the possible influence of peer groups on student engagement by including two scales (constructed from five variables) and one additional measure.

Six variables were examined for construct validity: the frequency of student discussions with friends about things learned in school, the frequency of student discussions with friends about grades, the frequency of studying with friends after school, the proportion of friends who think it's important to get good grades, the proportion of friends who think it's important to finish high school, and the proportion of friends who participate in extracurricular activities or sports.

Principal components analysis with a varimax rotation confirmed two factors with Eigenvalues greater than one: friends valuing of school and friends discussion of school. The expected five items all loaded onto their respective constructs with factor loadings of .7 or higher, suggesting robust construct validity. Internal reliability for the three items describing how often students discuss school with their friends is adequate, with Cronbach's alpha = .664, with a mean Pearson's  $r = .363$  (explaining 43% of the covariance). Internal reliability for the two items describing the degree to which students value school is also adequate, with Cronbach's alpha = .686, with a mean Pearson's  $r = .537$  (explaining 26% of the covariance). Factor scores

were saved using the Anderson-Rubin method, which standardizes the scores to a mean of 0 and a standard deviation of 1.

The proportion of friends at school who are involved in extracurricular activities or sports did not load onto either of these factors; consequently, the variable was standardized to a mean of 0 and a standard deviation of 1 and entered as an individual variable in peer influence blocks.

*Educational scale.*

Three main variables capture educational scale in this study: school enrollment size, student participation in a school-within-a-school (called “small learning communities” in Philadelphia), and student-teacher ratio.

Two additional dummy variables were constructed to capture whether a student participated in a relatively high quality or a relatively low quality small learning community. The idea here is to capture whether participating in a small learning community is advantageous over not participating in one, even if the quality of the small learning community is relatively low compared to others within the same host school. In other words: does it matter, in terms of student engagement, if the small learning communities in a school have varying levels of quality?

Three variables describing SLC quality relative to the others in the host school were available in the PELS data. Students were asked whether they strongly agree, agree, disagree, or strongly disagree that students in other SLCs in the same school have better teachers, better materials (like books or lab equipment), or have cleaner and better-kept space. In order to determine whether the three could be considered measures of the same construct (quality), a factor analysis examined their construct validity and internal reliability. Construct validity is sound with all three variables loading onto a single construct in a principal components analysis:

a single factor was confirmed, with an Eigenvalue = 1.88 and all three variables loading onto it with factor loads of .75 or higher. The items also exhibit internal reliability, with Cronbach's alpha = .703 and a mean Pearson's  $r = .442$  (explaining 21.6% of the covariance).

Each of the three variables was then recoded into a dummy variable with 1 coded for strongly disagreeing or disagreeing (and thus ranking the SLC participated in as the best in the school along each dimension of quality). Students who rated their SLC as having the comparatively best teachers, materials, or space were coded as participating in a high quality SLC, with all other students coded 0 for this dummy variable; students who ranked their SLC as not being comparatively the best along any of these dimensions of quality were coded as participating in a low quality SLC, with all other students coded 0 for this dummy variable.

#### *School climate.*

Two aspects of school climate are examined in the models of this study – academic press and the personalization of teacher-student relationships. Eight measures of academic press were examined for construct validity and internal reliability: the degree to which students in school feel it's important to attend all classes, to attend every day, to pay attention in class, to do homework, to get good grades, and the degree to which most teachers expect students to do their best, most teachers care if students don't do their work, and most teachers expect good work from students.

Principal components analysis with a varimax rotation confirmed two factors with Eigenvalues greater than one related to academic press: one including the items describing the student body and one including the items describing teachers. The factor describing student body academic press demonstrates high internal reliability with Cronbach's alpha = .881 and a mean Pearson's  $r = .596$ , explaining 23% of the covariance. The reliability of the factor

describing teacher academic press is adequate with Cronbach's alpha = .633 and a mean Pearson's  $r = .633$ , explaining 10% of the covariance. Factor scores were saved using the Anderson-Rubin method, which standardizes the variable to a mean of 0 and a standard deviation of 1.

Personalization of teacher-student relationships is measured using a single variable: the student-reported proportion of teachers who would know the student's name. The internal reliability of this item combined with an additional measure – the degree to which students feel like nobody at school cares about him or her – was too low to be considered as a scale (Cronbach's alpha was less than .5); it was therefore dropped and the proportion of teachers who would know the student's name was standardized to a mean of 0 and a standard deviation of 1.

#### *School controls.*

The student body racial composition is controlled for in all models, as is students' planned attendance at a school of choice. In Philadelphia, students are guaranteed a spot in their neighborhood school and may apply to attend any of a wide-number of options outside their neighborhood school. There has been some concern in Philadelphia and others school districts that school choice results in the best students opting to attend the best resourced, most supportive schools – essentially, students who are highly engaged in schooling may self-select into the most engaging school contexts. To control for the degree to which this may be the case in the data used for these analyses, a variable indicating whether a student applied to attend a school other than the neighborhood high school is included in all analyses. This approximates whether or not a student exercised choice to self-select into a particular school context.

#### *Student background characteristics.*

Students' race/ethnicity, sex, and socioeconomic status are controlled for in all models.

Race/ethnicity and sex were asked directly on the student surveys, however no direct measure of socioeconomic status (such as household income) was available. Instead, parent's highest level of education was used to approximate socioeconomic status. The parent who completed the survey attached to each student in the study was deliberately selected to be the parent who is most involved in the student's education and this is the parent whose highest level of education is used – in some cases it is the father/stepfather, but in most cases it is the mother/stepmother; infrequently, a guardian or grandparent completed the parent survey.

## Methodology

### *Descriptive Analyses*

The distribution of each variable was assessed to ensure that the data meet the mathematical requirements of more advanced analyses – though standardizing most variables normalizes their distributions. Only four variables did not exhibit normal distributions: Parent education level is skewed, with the average parent having only a high school degree or less and 68% of parents having no more than some college ( $M = 1.61$ ,  $SD=0.83$ ); parent education level is also slightly kurtotic (see Table 3.1). The degree to which students report their friends think school is important is negatively skewed and highly kurtotic, with more students exhibiting apathy than excitement about school (see Table 3.1). More students reported perceptions of low expectations from teachers than high expectations (see Table 3.1) and more students were engaged in few extracurricular activities upon entering the ninth grade than were engaged in many (see Table 3.1). This is not a problem as each of these variables (with the exception of parent education level) was standardized before being included in multivariate analyses. (See Tables 3.1 through 3.7 for full data on the distributions of variables included in these analyses).

Table 3.1  
Univariate Analyses of Continuous Variables

<b>Variable</b>	<b>N</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Mean</b>	<b>SD</b>	<b>Skewness</b>	<b>SD</b>	<b>Kurtosis</b>	<b>SD</b>
<i>Dependent Variables</i>									
Emotional Engagement	881	-3.54	2.14	0.18	0.99	-0.45	0.08	0.71	0.17
Behavioral Engagement	876	0	3	0.75	0.92	1.02	0.08	0.03	0.17
<i>Control Variables</i>									
Parents Education	896	1	4	1.61	0.83	1.34	0.08	1.13	0.16
% Not White at School	896	38.55	99.74	81.65	21.92	-0.79	0.08	-0.95	0.16
Parents Influence	896	-2.82	1.75	-0.05	1.02	-0.59	0.08	-0.35	0.16
School Important to Friends	896	-4.82	1.02	0.01	0.98	-1.92	0.08	4.23	0.16
Friends Discuss School	896	-1.86	2.71	0	1	0.17	0.08	-0.82	0.16
Friends Participate at School	896	1	4	2.91	0.97	-0.56	0.08	-0.64	0.16
Emotional Engagement Gr. 9	604	-3.46	2.18	0.06	0.99	-0.40	0.10	0.31	0.20
Behavioral Engagement Gr. 9	635	0	3	0.47	0.74	1.64	0.10	2.31	0.19
<i>Predictor Variables</i>									
School Enrollment	848	1	6	3.68	1.52	-0.25	0.08	-0.83	0.17
Student-Teacher Ratio	896	12	36	21.30	2.63	0.175	0.08	1.86	0.16
Student Body Academic Press	890	-2.61	2.05	0.02	0.98	-0.165	0.08	-0.26	0.16
Teachers Academic Press	890	-4.15	1.10	0.02	0.98	-1.48	0.08	1.68	0.16
Teachers Know Students	890	-1.56	1.56	-0.02	1	-0.11	0.08	-1.36	0.16

Table 3.2  
Frequencies for Student Sex

	<b>Frequency</b>	<b>Percent</b>	
Male	397	44	
Female	499	56	
<i>Valid N</i>	896		100
<i>Missing</i>	0		0

Table 3.3  
Frequencies for Student Race

	<b>Frequency</b>	<b>Percent</b>	
White	224	25	
Not White	626	69	
<i>Valid N</i>	850		94
<i>Missing</i>	46		5

Table 3.4  
Frequencies for Applying to a Non-Neighborhood School

	<b>Frequency</b>	<b>Percent</b>	
Did not apply	769	85.8	
Applied	127	14.2	
<i>Valid N</i>	896		100
<i>Missing</i>	0		0

Table 3.5  
Frequencies for Student Participation in a Small Learning Community

	<b>Frequency</b>	<b>Percent</b>	
Participated	984	18.2	
Did Not Participate	224	80.1	
<i>Valid N</i>	1208		98.4
<i>Missing</i>	20		1.6

Table 3.6  
Frequencies for Student Participation in a High Quality Small Learning Community

	<b>Frequency</b>	<b>Percent</b>	
No	432	48.2	
Yes	451	50.3	
<i>Valid N</i>	883		100
<i>Missing</i>	13		0

Table 3.7  
Frequencies for Student Participation in a Low Quality Small Learning Community

	<b>Frequency</b>	<b>Percent</b>
No	648	72.3
Yes	223	24.9
<i>Valid N</i>	871	97.2
<i>Missing</i>	25	2.8

### *Bivariate Analyses*

The basic relationships between student outcomes and the predictors of interest (i.e., structure and climate variables) were assessed with a set of preliminary analyses. Bivariate analyses were completed to assess whether each of the predictor variables is significantly related to either emotional or behavioral engagement in school; significant bivariate relationships justify including each of the predictor variables in the predictive models. These relationships are described in this section.

#### *School enrollment.*

The degree to which students report that they enjoy school is negatively correlated with school enrollment ( $r = -.08, p \leq .05$ ), supporting the previous research findings that increased school size is related to lower student engagement. Though the strength of the correlation is low, it is significant. There is no significant correlation between school enrollment and the number of extracurricular activities/sports in which students participate (see Table 3.8).

#### *Participation in a small learning community.*

Participation in an SLC is not statistically related to either of the student engagement variables. Students who participated in an SLC reported a degree of liking school and participation in extracurricular activities/sports that are not significantly

Table 3.8  
Correlations Between the Structure of Small Scale Schooling and Student Engagement

	EmoEngage	BehEngage	GrEnroll	STRatio
EmoEngage		861	828	876
BehEngage	0.131 *		833	881
GrEnroll	-0.084 *	-0.014		848
STRatio	-0.096 *	-0.001	0.424 **	

*Note.* The lower half of the table represents Pearson's correlations between variables; the upper half gives the number of cases included in each individual analysis.

\*  $p < .05$ .

different from those reported by students who did not participated in an SLC (see Table 3.9).

Table 3.9

T-tests for Student Engagement by Participation in a Small Learning Community

	Students Not Participating in an SLC M (SD)	Students Participating in an SLC M (SD)	t	df
EmoEngage	0.018 (1.051)	0.035 (0.963)	-0.212	861
BehEngage	0.725 (0.914)	0.760 (0.930)	-0.458	866

\*  $p < .05$ .

#### *Student-teacher ratio.*

Student teacher ratio correlated significantly with how much students report liking school ( $r = -0.096$ ,  $p < .05$ ), but not with the number of extracurricular activities/sports in which students participate. The more students per teacher, the less students reported liking school; although the strength of the association is weak, the significance does support previous research into the effects of overcrowded classrooms (see Table 3.8).

*Academic press from the student body.*

There is a moderate, positive correlation between academic press from the student body and emotional engagement in school, with  $r = 0.287$ ,  $p < .01$  – the greater the academic press from the student body, the more students reported liking school. There was no significant correlation between academic press from the student body and behavioral engagement (see Table 3.10).

Table 3.10

Correlations Between the Climate of Small Scale Schooling and Student Engagement

	EmoEngage	BehEngage	SBAcPress	TAcPress	Personal
EmoEngage		861	870	870	870
BehEngage	0.131 *		875	875	875
SBAcPress	0.287 *	-0.019		890	890
TAcPress	0.191 *	0.067 *	-0.002		890
Personal	0.180 *	0.087 *	0.017	-0.069 *	

*Note.* The lower half of the table represents Pearson's correlations between variables; the upper half gives the number of cases included in each individual analysis.

\*  $p < .05$ .

*Academic press from teachers.*

Academic press from teachers is significantly related to both measures of student engagement. There is a modest, positive correlation between academic press from teachers and emotional engagement in school, with  $r = 0.191$ ,  $p < .01$ , suggesting that the greater the academic expectations of teachers, the more students report liking school. There is also a slight, positive correlation with behavioral engagement in school, with  $r = 0.067$ ,  $p < .05$ ; though slight, this significant association does suggest that the greater the

academic press from teachers, the greater the participation from students in extracurricular activities/sports (see Table 3.10).

*Personalization of teacher-student relationships.*

The proportion of teachers who know students' names is also significantly related to both measures of student engagement. The modest, positive correlation between the personalization of teacher-student relationships and emotional engagement in school ( $r = 0.180, p < .01$ ) suggests that as these relationships are more personalized, students like school more. Though the correlation between personalized teacher-student relationships and behavioral engagement is not as strong, it is significant ( $r = .087, p < .01$ ), suggesting that as these relationships are more personalized, students participate more (see Table 3.10).

*Predictive Analysis*

A number of methodological innovations have arisen over the past academic generation to deal with data that are nested. Situations where some units of interest for an analysis are naturally grouped within other units of interest occur frequently – and these units that are grouped into larger units cannot be considered wholly independent of each other. For example, siblings exist within families and are thus individuals who share highly similar upbringings. In this study, students are grouped within schools – and attributes of both will be included within analyses.

As such, the data were examined to determine whether there was enough variance that could be explained between schools to warrant use of multi-level modeling (MLM) techniques. More traditional modeling techniques only involve a single level of variables – in the real world many phenomena take place across units. For example, traditional

multiple regressions involving student- and school-level data would either disaggregate school-level information down to the student level to examine differences in individual outcomes or aggregate student-level information to describe schools. This treatment means that students sharing the same educational context are not treated as having coefficients that are correlated with each others' when they likely do. MLM allows researchers to avoid the misestimation of individual error terms due to aggregation or disaggregation bias and to allow regression coefficients to vary across contexts (Duncan, Jones, & Moon, 1998; Lee, 2000). This can be particularly important in school-effects research when trying to assess the differences in outcomes of individuals educated in different school contexts (Lee, 2000; Raudenbush & Bryk, 1986).

The intra-class correlation, which estimates the amount of variance between the higher level unit of analysis (in this case, schools), was not high enough to warrant use of the more complex modeling of MLM techniques. When 25% or more of the variance can be attributed to the higher level units, MLM is the most appropriate analytical technique for multivariate modeling (Guo, 2005; Heinrich & Lynn, 2001); when only a small amount of the variance (less than ten percent) can be attributed to differences between the higher level units, simpler modeling can be used for parsimonious models without jeopardizing the integrity of the findings.

The data for this study were analyzed to determine the intraclass correlation, which – in this case – gives the amount of variance between schools over the total amount of variance. Neither students' emotional engagement nor students' behavioral engagement varies enough between schools to require a multi-level model that takes this variation into consideration.

Therefore, this study uses ordinary least squares regression to model the relationships between each of the two dimensions of student engagement and a number of characteristics of schooling – namely, the structure and climate of school size.

*Models.*

Five sets of models will be built for each outcome variable, entering blocks of variables in order to apportion out the variance accounted for by each block (see Appendix E for a visual display of model-building):

- *Control models* that account for the variation of each measure of engagement that is explained by students' ascriptive characteristics and certain school characteristics, parent influence, peer group influence, and students' levels of engagement upon entering ninth grade,
- *Size models* that account for the variation explained by each of the educational scale measures (school enrollment size, student participation in a SLC, and student-teacher ratio) after controlling for students' ascriptive characteristics, parent influence, peer group influence, and select school characteristics.
- *Climate models* that account for the variation explained by each aspect of school climate being considered in this study (academic press from the student body, from teachers, and personalization of teacher-student relationships) after controlling for students' ascriptive characteristics, parent influence, peer group influence, and select school characteristics,
- *Mediator models* that account for any variation that can be accounted for by educational scale variables after controlling not only for the variables in the full control model, but also for school climate measures, and

- *SLC Quality models* that explore the ways that the quality of SLCs relative to other SLCs within the host school interact with the relationships between educational scale and student engagement.

Control models.

An ecological understanding of youth development contends that students are influenced by multiple contexts, including their family lives and peer groups, which interact with their individual characteristics. In order to isolate the effects of school context variables, the analyses in this study control for characteristics of multiple contexts outside of the school. Control models will add blocks of control variables grouped by context (e.g., parent, peer group); these control models will then be used as the foundational blocks in subsequent sets of models.

Ecological studies of student dropout suggest that student engagement is influenced by the contexts of family and friends (Fredericks, Blumenfeld, & Paris, 2004; Finn, Pannoizzo, & Achilles, 2003; Furrer & Skinner, 2003). As such, this study includes control measures of parents' school-related satisfaction and parent-student relationship, as well as the school-related attitudes, norms, and behaviors in students' peer groups.

There are a few school characteristics that will be controlled for in these analyses. Student body demographics have been studied in relation to the effects of school size; Lee and Smith (1997) found that the effects of school size are greater in schools with a greater percentage of students from minority racial/ethnic background. This study will therefore also control for the percentage of each student body that is not self-identified as White.

There is also some debate over whether students self-select into school atmospheres that best fit the path they are already on – do students already concerned with academics and future educational plans for college choose to apply to high schools and SLCs with better academic reputations than those who are already disengaged from school? (See Ready & Lee, 2008, for a review of the school choice argument as it relates to the small schools movement). This is particularly relevant in cities like Philadelphia where students are guaranteed a spot in their neighborhood schools, but are also given the option of applying for a school outside their home neighborhood. To minimize the possibility that the effects demonstrated are due to student choice, rather than the effects of school structure and climate, all models will control for whether the student exercised school choice to attend the school.

#### Size models.

The second set of models will address the first research question by examining the relationships between student engagement and various dimensions of educational scale, specifically school enrollment size, participation in a SLC, and student-teacher ratio. These models will also form the first half of the basis for deciding which mediation models will be built in the fourth set of analyses: only those relationships between educational scale and student engagement that are significant need to be examined to see if this significance disappears when school climate is considered.

The examination of educational scale will involve three levels of modeling:

a) models that assess the individual contribution of each indicator of educational scale in explaining the variation of the outcomes, after accounting for any influence of control variables

b) models that assess the entire amount of variance explained by all three indicators of educational scale together, after accounting for any influence of control variables, and

c) models that assess whether SLC participation mediates or moderates the relationship between school enrollment size and student engagement

Climate models.

The third set of models will form the second half of the basis for deciding which relationships between educational scale and student engagement need to be assessed for mediation by school climate. If a measure of educational scale significantly predicts a measure of student engagement *and* a measure of school climate also significantly predicts that measure, then a mediation model will be built to examine whether this measure of school climate explains away the significance of the relationship between the measure of educational scale and the measure of student engagement. If the relationship between educational scale and the measure of student engagement is no longer significant after consideration of the measure of school climate, that aspect of school climate will be known to mediate the relationship; if the relationship remains significant, we fail to show mediation.

Mediator models.

The fourth set of models will address the second research question by examining the possible influence of the school climate on the relationships between educational scale and student engagement. Two sets of mediation models will be assessed:

a) models that assess whether each educational scale variable remains significant predictors of student engagement after accounting for individual measures of school climate (as well as all other controls), and

b) models that assess whether the proportion of variance explained by the set of educational scale variables remains a significant contribution to models of student engagement after accounting for the cumulative effect of both academic press and teacher-student relationships (as well as all other controls).

SLC quality models.

A fifth set of models will examine whether the quality of a student's SLC (relative to the other SLCs in the host school) is related to students' emotional and behavioral engagement and, if so, the degree to which school climate mediates these effects.

#### *Interpretation Criteria*

##### *Significance threshold.*

A p-value of .05 will be used as the criteria for determining significance in all statistics yielding p-values.

##### *Explanatory power.*

In ordinary least squares regression,  $R^2$  increases with each additional variable entered into the model; this makes direct comparisons of models with different numbers of variables difficult to interpret. Instead of direct comparisons of the actual  $R^2$ , a series of F-tests of the residual sum of squares for each model being compared will be performed. This F-statistic will be used to determine whether the variances explained by the two models being compared are significantly different from each other. In other words, if adding a new block of variables explains an additional, significant portion of the

variance (as compared to the amount explained by the previous model), this new block of variables can be said to explain a significant amount of variance in student engagement *after controlling for the other sets of variables*. This analytical technique allows for theoretically-important sets of variables to be singled out as accounting for significant relationships with student engagement.

### Delimitations and Limitations

As with any empirical study, the analyses presented here in exploration of the effects of educational scale and their interactions with academic climate are limited in scope. The choices made during the design process to define the scope and the means of the analyses create one set of delimitations and the nature of the data, analytic tools, and other methodologies entail another set of limitations. The following sections will describe the restrictions involved in the interpretation of findings due to both delimitations and limitations, the rationale behind certain decisions that affect these restrictions, and the consequences for interpreting the findings presented.

#### *Delimitations*

Designing an empirical study involves making choices: what questions will be investigated? Which data will be examined? How will they be analyzed? Each decision contributes to an analytical plan that enables the research questions to be addressed; delimiting the study enables conclusions to be drawn. It also creates boundaries around what can be reasonably inferred from findings. This section will outline these boundaries, paying particular attention to justifying each major delimiting decision.

*Small scale schooling reform policies.*

This study makes no pretense of attempting to speak to all of the complicated issues involved in small scale schooling reforms – many of which (from the politics around the decision to embrace the reform to the implementation process itself) presumably have wide-ranging impacts on the questions under study. The current study has the very particular focus of illustrating whether small scale schooling itself is related to student engagement or whether the effects of these reforms are due to aspects of school climate that are often presumed to follow from decreasing the scale of schooling experiences.

Many factors may be related, on some level, to the effects of small scale school reforms. Some have to do with the populations these small scale schools best serve (e.g., the range of effects across various groups of students; the interaction between school choice and small scale schooling reforms); others are related to how well the reforms are implemented (e.g., buy-in and support from various actors in the reform, the model of small scale schooling chosen and the fidelity of implementation, funding saturation and stability for each of the components of changing policies and practices). No matter the mechanism, school reforms are complex social machines and no one study can adequately focus on all facets at once.

Some of the existing research on small scale schooling has begun to address the ways in which many of these issues affect students' experiences. The analyses included in this study add to this literature by attending to one area of small scale schooling that is both important and under-addressed in the current research: the extent to which the effects of small scale schooling are dependent not on schooling structure, but on

academic climate. Issues of implementation, reform politics, teacher perceptions, curriculum or other reforms undertaken in tandem with small scale schooling are all left to other studies to address in connection with the findings of this and other research projects.

*A quantitative approach.*

Many of the reform issues mentioned above would be better suited for qualitative study: How are small scale reforms best implemented and what approaches can effectively conquer common barriers to successful reform? Under what circumstances have school districts, from top-level officials and administrators to on-the-ground personnel, embraced the radical changes involved in breaking large comprehensive schools into small learning communities? How do classroom teachers navigate the mandate for more personal relationships with students? In fact, a number of qualitative case studies have provided evidence for the existence of relationships between student engagement and the aspects of educational experiences under examination in this study – namely, small school structures (e.g., Fine, 2000), academic press (e.g., Conchas & Clark, 2000; Antrop-Gonzalez & De Jesus, 2006), and personalized teacher-student relationships (e.g., McPartland et al., 1998; Antrop-Gonzalez, 2006).

However, even comparative case studies of multiple schools fall short of establishing wide-ranging patterns of relationships, which is the ultimate goal of this study. The decision to use a quantitative approach was made in order to take advantage of two particular benefits of statistical analysis: 1) the ability to determine the likelihood of a particular relationship occurring due to chance or to selective criteria, and 2) the ability to ascertain the comparative extent of interactions between patterns. The first

advantage eliminates the possibility of finding relationships that exist due to sampling bias. Case studies are severely limited in the generalizability of their findings and the qualitative studies to date on small scale schooling reforms have largely focused on “model” schools and best practices; this runs the risk of finding relationships that only exist under the best of circumstances, which can be particularly difficult for disadvantaged urban schools (those most likely to attempt small scale schooling reforms) to replicate. The second advantage allows for the effects related to school structures and school climates to be directly compared in ways that are difficult to establish using the small sample sizes of comparative qualitative approaches.

That being said, these quantitative analyses cannot address the why’s behind the existence of the particular patterns demonstrated, nor can they speak to the ways in which the educational structures and climate scrutinized actually *become* student experiences. They are designed to uncover patterns of relationships, but not to explain how those relationships have come to exist.

*Outcomes of interest.*

This study focuses directly on student outcomes – teacher experiences (e.g., teacher engagement in implementation, teacher retention), parent experiences (e.g., satisfaction with their students, participation in school activities), and community experiences (e.g., involvement in reform efforts, role in addressing students’ educational needs) are all potentially important in driving small scale schooling success; however, modeling these educational phenomena falls outside the scope of this particular set of analyses.

There are a wide range of student outcomes that have been linked to small scale schooling structures, academic press, and personalized teacher-student relationships in previous research. For practical reasons this study focuses solely on student engagement – the effects of these educational experiences on other outcomes, such as academic achievement, student persistence to degree, and post-high school aspirations and experiences are beyond the scope of this particular set of analyses. The decision to focus on this particular student outcome was based on the pivotal role that being engaged in one’s own schooling has been shown to play in a number of other student outcomes – including those named above (see Croninger & Lee, 2001; Klem & Connell, 2004); the expectation is that any relationships with student engagement may be indicative of other important student outcome effects related to small scale schooling. However, regardless of the findings presented here, these are areas of expansion for this set of analyses that should be taken up by research conducted at a later date.

*Measuring student engagement.*

Theoretical rationale guided the decision to focus on engagement in school as the student outcome of interest in these analyses; the treatment of engagement as a multidimensional construct was based on previous empirical work (Fredericks et al., 2004). Decisions were then made as to how emotional and behavioral engagement in school would be operationalized. Modeling how much students report liking school and the number of extracurricular activities/sport in which students participate offer key understandings of how connected students are to their own educations – and the structural and climatic factors that play into these aspects of student engagement. Additional measures of students’ emotional and behavioral engagement in school could be the focus

of further examination. Students' positive self-identities related to schooling, educational aspirations, and satisfaction with schooling are all possible measures of emotional engagement in school that could be examined in future studies; additional measures of behavioral engagement might include persistence to degree/dropping out of school, skipping school (particularly for particular reasons, excluding decisions to take care of family, deal with medical crises, etc.), and student scholastic effort (such as doing homework consistently, studying hard for tests, etc.).

*Measuring the climate of educational scale.*

Although academic press and the personalization of teacher-student relationships are the qualities of school climate most often associated with small scale schooling in the literature, there are other aspects of school climate that might be of interest in future research. For one, the relationships between students, not just between teachers and students, is likely important in the relationships between the scale of educational experiences and student outcomes; unfortunately, data to operationalize these relationships were not available in the PELS dataset. The school climate around bullying and school safety may be another major factor in the conversation of impersonal comprehensive schools into more personalized and welcoming environments. Given the complex influence of school safety policies on practice (see Irby, 2009), this issue deserves its own empirical treatment and is thus left to future study.

*Exploring SLCs as a tracking mechanism.*

A decision was made early on in this study to focus primarily on the mediation of structural effects by climate effects, rather than on the degree to which the SLCs in the district under examination function as a tracking mechanism. Although the study

includes some preliminary analysis of the effects of SLC quality on student engagement – and the degree to which these effects can be attributed to academic press and personalization of teacher-student relationships – these side-analyses are folded into the examination of school climate as it relates to student outcomes. This is the first step in building a foundational knowledge of the importance of school climate when considering, implementing, and examining the effects of small scale schooling reforms. The possibility that the school-within-a-school model of small school reform replicates existing structures of inequality when the climate of both these smaller units and the host school are not adequately considered is a much broader topic that must be examined in future analyses.

*Single district case study.*

There are both advantages and disadvantages to deciding to use a district-wide dataset in place of the nationally-representative datasets most often used in quantitative studies of small scale schooling. The most immediate advantage to using the PELS dataset is the fact that it includes data about SWSs not found in any nationally-representative datasets. One of the reasons cited for the lack of quantitative studies of the broad patterns associated with SWSs is the lack of quantitative data about them (Ready, Lee, & Welner, 2004). Another major reason for delimiting analyses to schools within a single district is that doing so eliminates the need to statistically control for the widely-varying district-level politics involved in small scale schooling reforms. The downside to these two winning advantages is that the findings cannot be generalized across all high schools in the United States. Rather, the results of these analyses must be considered as

one additional piece of evidence in understanding the mechanisms and effects that can be reasonably expected of small scale schooling reforms.

*Establishing mediation through regression analysis.*

There are multiple statistical means that could be used to examine the relationships between small scale schooling structures, school climate, and student engagement. This study uses multiple regression. Comparing blocks of variables entered into ordinary least squares regression models is a simpler process of demonstrating relationships that have yet to be established by the empirical literature than other possible techniques; and statistical protocol always stipulates a progressive approach from simple to more complex approaches. Given that the data do not meet threshold requirements for a multi-level modeling approach, OLS regression was judged to be the appropriate technique for the current study. Path analysis might expand upon these results in future analyses, given findings of mediation. Additional research into the cumulative effects of participating in particular small scale schooling structures, their associated school climates, and other predictive experiences using time series analysis might also be appropriate if the findings suggest significant mediation effects.

*Limitations*

In addition to the delimitations imposed through the design process, there are also certain limitations to the current study over which the author had little or no control. These by-products of the data, analytical means, and context available are described in this section.

*Measuring student engagement.*

Unfortunately, the data used in these analyses did not support a full examination of student engagement, as it is conceptualized – there were insufficient variables for operationalizing cognitive engagement in a valid, reliable manner. While there may be a modest degree of overlap between emotional, behavioral, and cognitive engagement in school, the results of modeling the former two do not necessarily predict the results of modeling the latter. Future study using different datasets might explore the cognitive dimension of student engagement in ways not possible in this study.

*Measuring the structure of educational scale.*

As is often the case, class size data was unavailable for these analyses; in its place, student-teacher ratios were used to approximate the number of students per academic classroom. As Mitchell and Mitchell (2003) have pointed out, however, this rough approximation is less than ideal – the common means for calculating teacher-student ratio does not limit the “teacher” portion to classroom instructors, but includes most (if not all) adults in the building. This artificially deflates the proportion of students to teachers since staff such as guidance counselors and paraprofessionals who do not actually affect classroom sizes are counted. Had classroom sizes been available, they would have been used in this study; as it is, the relationships between student-teacher ratios and outcomes can act only as rough estimates of class size effects.

*Generalizability across levels of analysis.*

The nature of the PELS dataset ensured adequate sample sizes within each of the feeder patterns from middle to high school in Philadelphia for analyses of the transition to high school; however, the number of students within each high school is not adequate to

aggregate student-level variables to school-level indicators. While this is less than ideal, it is not unusual for analyses of educational systems to include fewer level-1 cases (students) within level-2 groups (schools) than would be ideal.

Using data from a single school district, however, means that the results of these analyses cannot be generalized across other small scale schooling reforms. Rather, the findings presented in this study should be used as a springboard for further, more nuanced study of other school districts and national data; the findings can also be used in arguments to justify the collection of district- and nationally-representative data concerning the issues at hand to enable future analyses of a more generalizable nature.

## CHAPTER 4

### FINDINGS

The analyses in this study are designed to untangle several aspects of the relationships between student engagement and the structure and climate of schooling. Are the structures of small scale schooling in Philadelphia related to students' emotional and behavioral engagement in school? Or is it really the school climate of small scale schooling – academic press or the personalization of teacher-student relationships – that really contributes to student engagement?

Overall, results of regression models suggest that the scale of schooling is related to student engagement – but often only when school climate is ignored; small scale schooling without academic press and personalized relationships between teachers and students mostly do not matter. This chapter presents the results of analyses designed to answer these questions in three main sections: a general summary of the overall patterns of findings, a section describing the modeling of emotional engagement in school, and a section describing the modeling of behavioral engagement in school. Within each of the final two sections, the effects of control variables are described, followed by subsections for each of the analytic steps involved in addressing the research questions. The effects of the structures of small scale schooling, the climate of small scale schooling, and the mediation of structure by climate are all described in turn.

#### Overall Patterns of Findings

This section will summarize the overall patterns of relationships found in the analyses. Because there are a large number of steps involved in establishing which relationships can be examined for mediation and which factors might reasonably be

considered mediators, this section provides an overview of the results that form the basis of these decisions. All of the technical and statistical information will be presented in the following two sections on emotional engagement findings and behavioral engagement findings, in turn.

Not all of the structures of school scale examined in this study were significantly related to emotional and behavioral engagement (see Table 4.1). Enrollment, on its own, was not significantly related to either emotional or behavioral engagement. However, after controlling for students' participation in a small learning community within their school – effectively separating out the overall school size effect from the small learning community effect – enrollment became a significant predictor of emotional engagement, though it was still not related to behavioral engagement. This suggests that students who are in small learning communities are not significantly affected by the overall size of the host school, though those who do not participate in small learning communities are. Participation in a small learning community was significantly related to both emotional and behavioral engagement. Student-teacher ratio was significantly related to emotional engagement, though not to behavioral engagement.

Table 4.1

Patterns of Relationships Between Structures of School Scale and Student Engagement

	Emotional Engagement	Behavioral Engagement
Enrollment	NO	NO
Enrollment <i>after controlling for SLC Participation</i>	YES	NO
Participation in an SLC	YES	YES
Student-Teacher Ratio	YES	NO

This first step establishes which relationships in the dataset under analysis may be examined for mediation by climate: the relationships between emotional engagement and enrollment (after controlling for small learning community participation), emotional engagement and participation in a small learning community, and emotional engagement and student-teacher ratio may all be examined, as well as the relationship between behavioral engagement and participation in a small learning community.

Measures of the climate often associate with small school scale – academic press and personalization of teacher-student relationships – were almost always significantly related to student engagement (see Table 4.2). Academic press on its own was a significant predictor of both emotional and behavioral engagement; personalization of teacher-student relationships on its own was a significant predictor of emotional engagement, but not behavioral engagement. Together, the two were significantly related to both emotional and behavioral engagement.

Table 4.2

Patterns of Relationships Between the Climate of School Scale and Student Engagement

	Emotional Engagement	Behavioral Engagement
Academic Press	YES	YES
Personalization of Teacher-Student Relationships	YES	NO
Cumulative School Climate	YES	YES

This means that cumulatively, the two dimensions of school climate may be considered possible mediators of the significant relationships found between some structures of school and student engagement. These school climate measures together do not explain away the relationships between emotional engagement and enrollment (after

controlling for SLC participation), nor do they explain away the relationships between emotional engagement and participation in a small learning community; however, they do fully mediate the relationship between emotional engagement and student-teacher ratio. The relationship between behavioral engagement and participation in a small learning community is not fully mediated by school climate (see Tables 4.3 and 4.4).

Table 4.3

Patterns of Mediation of Structure and Emotional Engagement by Climate

	Emotional Engagement & Enrollment	Emotional Engagement & Participation in a Small Learning Community	Emotional Engagement & Student-Teacher Ratio
Academic Press	YES	NO	NO
Personalization of Teacher-Student Relationships	NO	YES	NO
Cumulative School Climate	NO	NO	YES

Table 4.4

Patterns of Mediation of Structure and Behavioral Engagement by Climate

	Behavioral Engagement & Participation in a Small Learning Community
Academic Press	NO
Personalization of Teacher-Student Relationships	(no relationship to mediate)
Cumulative School Climate	NO

Deeper investigation into the way small learning communities relate to student engagement in this study reveal some interesting patterns of relationships. Participation

in a relatively high quality small learning community – one participants rank as the best in the host school along at least one of three dimensions – is significantly related to both emotional and behavioral engagement; however, participation in a relatively low quality small learning community is not related to either dimension of student engagement (see Table 4.5).

Table 4.5

Patterns of Relationships Between Small Learning Community Quality and Student Engagement

	Emotional Engagement	Behavioral Engagement
Participation in a High Quality Small Learning Community	YES	YES
Participation in a Low Quality Small Learning Community	NO	NO

School climate does not fully explain away either of the relationships between participating in a relatively high quality small learning community and either emotional or behavioral engagement (see Tables 4.6 and 4.7). This suggests that there is something happening with students participating in high quality small learning communities that is not happening for those who either do not participate in a small learning community or participate in one of relatively low quality. The statistical evidence for these patterns of relationships is presented separately for emotional engagement and for behavioral engagement in the following two sections.

#### Emotional Engagement

The first outcome considered is students' emotional engagement in school. This section will establish the baseline influences of student background characteristics,

Table 4.6

Patterns of Mediation of Small Learning Community Quality and Emotional Engagement by Climate

	Emotional Engagement & Participation in a Low Quality Small Learning Community	Emotional Engagement & Participation in a High Quality Small Learning Community
Academic Press	(no relationship to mediate)	NO
Personalization of Teacher- Student Relationships	(no relationship to mediate)	NO
Cumulative School Climate	(no relationship to mediate)	NO

Table 4.7

Patterns of Mediation of Small Learning Community Quality and Behavioral Engagement by Climate

	Behavioral Engagement & Participation in a Low Quality Small Learning Community	Behavioral Engagement & Participation in a High Quality Small Learning Community
Academic Press	(no relationship to mediate)	YES
Personalization of Teacher- Student Relationships	(no relationship to mediate)	NO
Cumulative School Climate	(no relationship to mediate)	NO

school characteristics, parents, peers, and previous engagement, followed by an examination of the relationships between emotional engagement and both the structure and climate of size, in turn. The possible mediation of structural effects by climate effects is then described. Finally, the relationship between SLC quality and emotional engagement is explored.

### *Relationships Between Control Variables and Emotional Engagement*

Separate models were run to examine the effects of control variables on emotional engagement.

#### *Student background and school characteristics.*

Student background characteristics, student body racial composition, and students' decisions to apply for a high school outside their neighborhood school were each initially examined as separate blocks of control variables. Because none of these blocks explained a significant portion of the variance in emotional engagement, there was no explanatory advantage to keeping them separate and they were condensed into a single model for subsequent analyses.

After condensing the three blocks into one, the first control model still did not account for a significant amount of the variance in students' liking of school, with  $F(5,722) = 0.412$ , ns, and only 0.3% of the variance in students' enjoyment of school explained (see Table 4.8).

#### *Parent influence.*

As depicted in Table 4.1, when parent influence is added as a second block in the second control model, the model explains a significant amount of variance, with  $F(1,721) = 4.209$ ,  $p < .001$ , and 3.4% of the variance explained. The additional 3.1% of variance explained by parent influence is significant, with a change in  $F = 23.133$ ,  $< .001$ .

The standardized factor score for parent influence is a significant predictor of student enjoyment of school, with  $\beta = 0.179$ ,  $p < .001$ .

Table 4.8

## Relationship Between School Enrollment and Students' Emotional Engagement in School

	<b>Model 1: Student- School</b>	<b>Model 2: Parent Influence</b>	<b>Model 3: Peer Influence</b>	<b>Model 4: 9th Gr Engaged</b>	<b>Model 5: Structure</b>
(Constant)	0.020	0.088	-0.123	-0.139	0.004
Female	-0.041	-0.071	-0.091 *	-0.072 *	-0.072 *
Racial Minority	0.020	0.021	0.025	0.038	0.041
Parent's Education	-0.021	-0.032	-0.041	-0.049	-0.047
% Not White at School	0.010	0.006	0.003	0.016	0.008
Applied to Other School	-0.015	-0.013	-0.002	-0.003	0.000
Parent Influence		0.179 ***	0.178 ***	0.140 ***	0.138 ***
School Important to Friends			0.083 *	0.055	0.056
Friends Discuss School			0.281 ***	0.219 ***	0.216 ***
Friends Participate at School			0.086 *	0.064	0.065
Emotional Engagement Gr. 9				0.306 ***	0.304 ***
Enrollment at School					-0.050
R <sup>2</sup>	0.003	0.034	0.141	0.227	0.229
F	0.412	4.209 ***	13.126 ***	21.035 ***	19.360 ***
df	5,722	1,721	3,718	1,717	1,716
R <sup>2</sup> -change	0.003	0.031	0.107	0.086	0.002
F-change	0.412	23.133 ***	29.947 ***	79.324 ***	2.246

\* p < .05. \*\* p < .01. \*\*\* p < .001.

*Peer influence.*

Three peer influence variables – peer valuing of school, peer discussion of school, and peer participation in extracurricular activities/sports – were added in a third block in the third control model. A significant total of 14.1% of the variance in student participation is explained by this control model, with  $F(3,718) = 13.126, p < .001$  (see Table 4.8). Adding peer influence accounts for an additional 10.7% of the variance, which is significant with a change in  $F = 29.947, p < .001$ . Student sex becomes a significant predictor in this third control model with  $\beta = -0.091, p < .05$ ; males report liking school slightly more than females. Parent influence remains a significant predictor of emotional engagement with  $\beta = 0.178, p < .001$ . All three peer influence variables are significant predictors of how much students enjoy school after accounting for student background characteristics, school characteristics, and parent influence. Peer valuing of school has a  $\beta = 0.083, p < .05$ ; peer discussion of school has a  $\beta = 0.281, p < .001$ ; and peer participation in extracurricular activities/sports has a  $\beta = 0.086, p < .05$ .

*Previous level of engagement.*

Students' emotional engagement upon entering the ninth grade was entered as an additional block in the fourth control model. The model accounts for 22.7% of the variance in student enjoyment of school, which is significant with  $F(1,717) = 21.035, p < .001$  (see Table 4.8). Students' previous level of emotional engagement explains a significant portion of the variance itself, accounting for 8.6% of the variance in students' tenth grade level of emotional engagement. This explanatory power is significant with a change in  $F = 79.324, p < .001$ .

While student sex and parent influence remain significant predictors of students' enjoyment of school (with  $\beta = -0.072, p < .05$ , and  $\beta = 0.140, p < .001$ , respectively), there are some changes in the relationships between peer influence and emotional engagement when

previous level of emotional engagement is considered. Peer discussion of school remains significant, with  $\beta = 0.219$ ,  $p < .001$ ; however neither peer valuing of school nor peer participation in extracurricular activities/sports – both significant in the previous control model – are significant in the presence of previous levels of emotional engagement (see Table 4.8).

Emotional engagement is a significant predictor of students' enjoyment of school, with  $\beta = 0.306$ ,  $p < .001$ .

#### *Relationships Between the Structure of Size and Emotional Engagement*

After controlling for student background characteristics, student body racial composition, student choice, parental influence and peer influence, the influence of each structural aspect of size on emotional engagement was modeled.

##### *School enrollment.*

Enrollment size alone is not significantly related to how much students enjoy school after controlling for student background characteristics, school characteristics, parent influence, peer influence, and previous level of emotional engagement. Enrollment size does not explain a significant portion of the variance in emotional engagement, with a change in  $F = 2.246$ , ns, and  $\beta = -0.050$ , ns (see Table 4.8).

However, the basic intent behind breaking large high schools into small learning communities is to reap the benefits of small schools without having to create actual separate small schools. Presumably, if the reform is successfully implemented, the size of the school hosting the small learning community will not matter nearly as much – the small learning community becomes the more influential context than school enrollment size.

Enrollment size is significantly related to how much students like school when SLC participation is held constant. After controlling for student background characteristics, school

characteristics, parent influence, peer influence, and level of emotional engagement at the beginning of ninth grade, SLC participation accounts for an additional slight, but significant, 0.4% of the variance in emotional engagement in school, with a change in  $F = 3.887$ ,  $p < .05$  (see Table 4.9). Adding enrollment size in the next block also explains an additional slight, but significant, 0.5% of the variance, with a change in  $F = 4.252$ ,  $p < .05$ .

As shown on Table 4.9 enrollment size is negatively related to students' emotional engagement in school after controlling for SLC participation: as enrollment size increases, student liking of school decreases, with  $\beta = -0.071$ ,  $p < .05$ . Recall the lack of relationship between enrollment size and emotional engagement when SLC participation is not considered; combined with this mediation effect, these results suggest that enrollment size matters only for students not enrolled in an SLC. The effect sizes of SLC participation and enrollment size are nearly the same strength and in opposite directions (see Table 4.9); for students enrolled in an SLC (coded as "1"), these effects cancel themselves out, for all intents and purposes, leaving no net effect on emotional engagement. However, for students *not* enrolled in an SLC (coded as "0"), the larger the school enrollment size, the less emotionally engaged the student.

*SLC participation.*

Participating in an SLC is also a significant predictor of how much students enjoy school after controlling for student background characteristics, school characteristics, parent influence, peer influence, and previous level of emotional engagement. SLC participation accounts for a small, yet significant, 0.3% of the variance in student enjoyment of school, with a change in  $F = 3.919$ ,  $p < .05$  (see Table 4.10). Students who participate in an SLC like school significantly more than those who do not, with  $\beta = 0.067$ ,  $p < .05$ .

Table 4.9

Relationship Between School Enrollment and Students' Emotional Participation After Controlling for Small Learning Community Participation

	<b>Model 4: Controls</b>	<b>Model 5: SLC Mediation</b>	<b>Model 6: School Size</b>
(Constant)	-0.139	-0.221	-0.040
Female	-0.072 *	-0.072 *	-0.073 *
Racial Minority	0.038	0.040	0.045
Parent's Education	-0.049	-0.043	-0.040
% Not White at School	0.016	0.004	-0.011
Applied to Other School	-0.003	-0.002	0.002
Parent Influence	0.140 ***	0.143 ***	0.141 ***
School Important to Friends	0.055	0.057	0.058
Friends Discuss School	0.219 ***	0.220 ***	0.216 ***
Friends Participate at School	0.064	0.060	0.060
Emotional Engagement Gr. 9	0.306 ***	0.316 ***	0.315 ***
SLC Participation		0.067 *	0.085 *
Enrollment at School			-0.071 *
R <sup>2</sup>	0.227	0.231	0.236
F	21.035 ***	19.553 ***	18.359 ***
df	1,717	1,716	1,715
R <sup>2</sup> -change	0.086	0.004	0.005
F-change	79.324 ***	3.887 *	4.252 *

\* p < .05. \*\* p < .01. \*\*\* p < .001.

Table 4.10

## Relationship Between Participation in a Small Learning Community and Students' Emotional Engagement in School

	<b>Model 4: Controls</b>	<b>Model 5: Structure</b>
(Constant)	-0.139	-0.221
Female	-0.072 *	-0.072 *
Racial Minority	0.038	0.040
Parent's Education	-0.049	-0.043
% Not White at School	0.016	0.004
Applied to Other School	-0.003	-0.002
Parent Influence	0.140 ***	0.143 ***
School Important to Friends	0.055	0.057
Friends Discuss School	0.219 ***	0.220 ***
Friends Participate at School	0.064	0.060
Emotional Engagement Gr. 9	0.306 ***	0.316 ***
SLC Participation		0.067 *
R <sup>2</sup>	0.227	0.231
F	21.035 ***	19.717 ***
df	1,717	1,722
R <sup>2</sup> -change	0.086	0.004
F-change	79.324 ***	3.919 *

\* p < .05. \*\* p < .01. \*\*\* p < .001.

### *Student-teacher ratio.*

Lastly, student-teacher ratio was found to be significantly related to how much students like school. After controlling for student background characteristics, school characteristics, parent influence, peer influence, and level of emotional engagement at the beginning of ninth grade, student-teacher ratio accounts for an additional 0.7% of the variance in emotional engagement (see Table 4.11). Though slight, the change in  $F = 6.949$  is significant at  $p < .01$ . Student-teacher ratio is a significant predictor of how much students like school, with  $\beta = -0.088$  – as the number of students per teacher increases, the degree to which students liking school decreases.

### *Relationships Between the Climate of Size and Emotional Engagement*

Before examining whether certain aspects of school climate often associated with small scale schooling mediate these structural size effects, relationships between school climate and emotional engagement must first be established. Only those aspects of school climate that are significantly related to emotional engagement can possibly act as mediators of structural size effects.

### *Academic press.*

Academic press is significantly related to how much students like school. After controls, academic press accounts for an additional 4.4% of the variance in student liking of school, with change in  $F = 21.917$ ,  $p < .001$  (see Table 4.12). The model explains 27.1% of the variance, which is a significant amount with  $F(2,271) = 22.351$ ,  $p < .001$ .

Both measures of academic press – from the student body and from teachers – are significant predictors of how much students like school. The greater the academic press from the student body, the more students report liking school, with  $\beta = 0.200$ ,  $p < .001$ .

Table 4.11

Relationship Between Student-Teacher Ratio and Students' Emotional Engagement in School

	<b>Model 4: Controls</b>	<b>Model 5: Structure</b>
(Constant)	-0.139	0.551
Female	-0.072 *	-0.071 *
Racial Minority	0.038	0.046
Parent's Education	-0.049	-0.034
% Not White at School	0.016	0.021
Applied to Other School	-0.003	0.000
Parent Influence	0.140 ***	0.143 ***
School Important to Friends	0.055	0.063
Friends Discuss School	0.219 ***	0.221 ***
Friends Participate at School	0.064	0.059
Emotional Engagement Gr. 9	0.306 ***	0.303 ***
Student-Teacher Ratio		-0.088 **
R <sup>2</sup>	0.227	0.234
F	21.035 ***	20.073 ***
df	1,717	1,722
R <sup>2</sup> -change	0.086	0.007
F-change	79.324 ***	6.949 **

\* p &lt; .05. \*\* p &lt; .01. \*\*\* p &lt; .001.

Table 4.12

Relationship Between Academic Press and Students' Emotional Engagement in School

	<b>Model 4: Controls</b>	<b>Model 5: Climate</b>
(Constant)	-0.139	-0.207
Female	-0.072 *	-0.074 *
Racial Minority	0.038	0.041
Parent's Education	-0.049	-0.033
% Not White at School	0.016	0.035
Applied to Other School	-0.003	0.000
Parent Influence	0.140 ***	0.110 **
School Important to Friends	0.055	-0.017
Friends Discuss School	0.219 ***	0.174 ***
Friends Participate at School	0.064	0.051
Emotional Engagement Gr. 9	0.306 ***	0.264 ***
Student Body Academic Press		0.200 ***
Teachers Academic Press		0.131 ***
R <sup>2</sup>	0.227	0.271
F	21.035 ***	22.351 ***
df	1,723	2,721
R <sup>2</sup> -change	0.086	0.044
F-change	79.324 ***	21.917 ***

\* p &lt; .05. \*\* p &lt; .01. \*\*\* p &lt; .001.

Academic press from teachers also has a positive relationship with how much students like school,  $\beta = 0.131$ ,  $p < .001$ .

Academic press is therefore a possible mediator of the relationships between educational scale and emotional student engagement in school. This possibility will be examined in a later section on the mediation of structural effects by climate effects.

*Personalization of teacher-student relationships.*

The proportion of teachers who would know a student's name is significantly related to how much students like school. After accounting for all controls, the personalization of teacher-student relationships accounts for an additional 1.3% of the variance in student liking of school, with a change in  $F = 12.036$ ,  $p < .01$  (see Table 4.13). The model accounts for 24% of the variance, which is significant with  $F(1,722) = 20.671$ ,  $p < .001$ .

The proportion of teachers who would know a student's name has a significant, positive relationship with students' emotional engagement in school – as the student is better known by teachers, students enjoy school more, with  $\beta = 0.115$ ,  $p < .01$ .

Personalization of teacher-student relationships is therefore a possible mediator of the relationships between educational scale and students' emotional engagement in school. This possibility will also be explored in a later section examining the mediation of structural effects by climate effects.

*Full school climate.*

Together, academic press and personalization of teacher-student relationships have a greater cumulative relationship with student emotional engagement in school,

Table 4.13

Relationship Between the Personalization of Teacher-Student Relationships and Students' Emotional Engagement in School

	<b>Model 4: Controls</b>	<b>Model 5: Climate</b>
(Constant)	-0.139	-0.085
Female	-0.072 *	-0.074 *
Racial Minority	0.038	0.035
Parent's Education	-0.049	-0.037
% Not White at School	0.016	0.004
Applied to Other School	-0.003	0.000
Parent Influence	0.140 ***	0.137 ***
School Important to Friends	0.055	0.057
Friends Discuss School	0.219 ***	0.211 ***
Friends Participate at School	0.064	0.057
Emotional Engagement Gr. 9	0.306 ***	0.298 ***
Teachers Know Students		0.115 **
R <sup>2</sup>	0.227	0.240
F	21.035 ***	20.671 ***
df	1,723	1,722
R <sup>2</sup> -change	0.086	0.013
F-change	79.324 ***	12.036 **

\* p < .05. \*\* p < .01. \*\*\* p < .001.

together explaining 5.9% of the variance in how much students like school – a significant portion (change in  $F = 19.971$ ,  $p < .001$ ) of the 28.6% explained by the model [ $F(3,720) = 22.209$ ,  $p < .001$ ; see Table 4.14]. In this case, all three measures of school climate are significant predictors of student engagement.

*Mediation of Structural Effects by Climate Effects*

Given the findings that some aspects of school climate related to the small scale schooling argument are positively related to students' emotional engagement, as are some of the structural aspects of school size, there are three sets of mediation models to be examined for emotional engagement:

- (1) Whether any of the measures of school climate, separate or together, mediate the relationships between enrollment size (after accounting for SLC participation) and emotional engagement,
- (2) Whether any of the measures of school climate, separate or together, mediate the relationships between SLC participation and emotional engagement, and
- (3) Whether any of the measures of school climate, separate or together, mediate the relationships between student-teacher ratio and emotional engagement.

If a structural aspect of school size no longer explains a significant portion of the variance in emotional engagement *after controlling for the effects of school climate*, then the relationship between that structures of size and emotional engagement can be said to be fully mediated by school climate.

Table 4.14

Relationship Between School Climate and Students' Emotional Engagement in School

	<b>Model 4: Controls</b>	<b>Model 5: Climate</b>
(Constant)	-0.139	-0.150
Female	-0.072 *	-0.077 *
Racial Minority	0.038	0.037
Parent's Education	-0.049	-0.020
% Not White at School	0.016	0.022
Applied to Other School	-0.003	0.002
Parent Influence	0.140 ***	0.106 **
School Important to Friends	0.055	-0.017
Friends Discuss School	0.219 ***	0.165 ***
Friends Participate at School	0.064	0.043
Emotional Engagement Gr. 9	0.306 ***	0.254 ***
SBAcPress		0.207 ***
TAcPress		0.133 ***
TKnowS		0.126 ***
R <sup>2</sup>	0.227	0.286
F	21.035 ***	22.209 ***
df	1,723	3,720
R <sup>2</sup> -change	0.086	0.059
F-change	79.324 ***	19.971 ***

\* p &lt; .05. \*\* p &lt; .01. \*\*\* p &lt; .001.

*Mediation of the relationship between school enrollment (after controlling for SLC participation) and emotional engagement.*

Academic press mediates the relationship that exists between school enrollment and emotional engagement when SLC participation is held constant. While enrollment size is a significant predictor of students' liking of school after controlling for SLC participation (see Table 4.9), it ceases to be a significant predictor above and beyond the effects of academic press. After adding measures of academic press to the full control model and then adding participation in an SLC, school enrollment does not explain any additional portion of the variance in emotional engagement (change in  $F = 2.509$ , ns; see Table 4.15). This suggests that academic press fully mediates the effects of school enrollment. In other words, the *size* of a school does not matter – it only looks like it does when we confound school *size* with the *academic climates* of some small schools. According to these analyses, having a small enrollment does not have any advantage after controlling for the academic press of a school.

Enrollment size also ceases to explain a significant portion of the variance in emotional engagement (while controlling for SLC participation) when personalization of teacher-student relationships is considered as a mediator, with a change in  $F = 2.802$ , ns (see Table 4.16). Together, academic press and the personalization of teacher-student relationships fully mediate the significance of the relationship between school enrollment and students' liking of school after controlling for SLC participation – this structural aspect of school size no longer explains a significant portion of the variance in emotional engagement after controlling for school climate. Without considering school climate,

Table 4.15

Mediation of the Relationship Between School Enrollment and Students' Emotional Engagement (After Controlling for Small Learning Community Participation) by Academic Press

	<b>Model 4: Controls</b>	<b>Model 5: Academic Press</b>	<b>Model 6: SLC Mediator</b>	<b>Model 7: School Enrollment</b>
(Constant)	-0.139	-0.207	-0.302	-0.165
Female	-0.072 *	-0.074 *	-0.074 *	-0.074 *
Racial Minority	0.038	0.041	0.042	0.046
Parent's Education	-0.049	-0.033	-0.027	-0.024
% Not White at School	0.016	0.035	0.020	0.008
Applied to Other School	-0.003	0.000	0.000	0.002
Parent Influence	0.140 ***	0.110 **	0.114 **	0.113 **
School Important to Friends	0.055	-0.017	-0.017	-0.014
Friends Discuss School	0.219 ***	0.174 ***	0.174 ***	0.172 ***
Friends Participate at School	0.064	0.051	0.046	0.047
Emotional Engagement Gr. 9	0.306 ***	0.264 ***	0.274 ***	0.274 ***
Student Body Academic Press		0.200 ***	0.207 ***	0.204 ***
Teachers Academic Press		0.131 ***	0.128 ***	0.124 ***
SLC Participation			0.078 *	0.091 **
School Enrollment				-0.053
R <sup>2</sup>	0.227	0.271	0.277	0.279
F	21.035 ***	22.165 ***	21.005 ***	19.725 ***
df	1,717	2,715	1,714	1,713
R <sup>2</sup> -change	0.086	0.044	0.006	0.003
F-change	79.324 ***	21.735 ***	5.436 *	2.509

\* p < .05. \*\* p < .01. \*\*\* p < .001.

Table 4.16

Mediation of the Relationship Between School Enrollment and Students' Emotional Engagement (After Controlling for Small Learning Community Participation) by the Personalization of Teacher-Student Relationships

	<b>Model 4: Controls</b>	<b>Model 5: Personal</b>	<b>Model 6: SLC Mediator</b>	<b>Model 7: School Enrollment</b>
(Constant)	-0.139	-0.085	-0.165	-0.022
Female	-0.072 *	-0.074 *	-0.075 *	-0.075 *
Racial Minority	0.038	0.035	0.036	0.040
Parent's Education	-0.049	-0.037	-0.033	-0.031
% Not White at School	0.016	0.004	-0.008	-0.019
Applied to Other School	-0.003	0.000	0.000	0.003
Parent Influence	0.140 ***	0.137 ***	0.140 ***	0.139 ***
School Important to Friends	0.055	0.057	0.058	0.059
Friends Discuss School	0.219 ***	0.211 ***	0.212 ***	0.210 ***
Friends Participate at School	0.064	0.057	0.053	0.053
Emotional Engagement Gr. 9	0.306 ***	0.298 ***	0.308 ***	0.308 ***
Teachers Know Students		0.115 **	0.114 **	0.107 **
SLC Participation			0.065	0.080 *
School Enrollment				-0.058
R <sup>2</sup>	0.227	0.228	0.231	0.233
F	21.035 ***	20.499 ***	19.168 ***	17.954 ***
df	1,717	1,716	1,715	1,714
R <sup>2</sup> -change	0.086	0.013	0.004	0.003
F-change	79.324 ***	11.936 **	3.681	2.802

\* p < .05. \*\* p < .01. \*\*\* p < .001.

enrollment size is a significant predictor of emotional engagement after controlling for participation in an SLC (see Table 4.9); however, after first considering school climate, this relationship loses its significance ( $\beta = -0.038$ , ns, and a change in  $F = 1.267$ , ns; see Table 4.17).

*Mediation of the relationship between SLC participation and emotional engagement.*

Academic press does not fully mediate the relationship between participating in an SLC and how much students like school. Participation in an SLC remains a significant predictor of student liking of school after controlling for academic press, explaining an additional 0.6% of the variance with a change in  $F = 5.482$ ,  $p < .05$  (see Table 4.18). The full model explains 27.7% of the variance in student liking for school [ $F(1,720) = 21.182$ ,  $p < .001$ ].

As academic press from the student body increases, so does student liking of school ( $\beta = 0.207$ ,  $p < .001$ ; see Table 4.11); increases in academic press from teachers also correlates with increased student liking of school ( $\beta = 0.131$ ,  $p < .001$ ). After accounting for these relationships, participating in an SLC also correlates with greater student enjoyment of school ( $\beta = 0.078$ ,  $p < .05$ ). This means that the relationship between SLC participation and how much students enjoy school cannot be fully explained away by increased academic press in SLCs.

However, personalization of teacher-student relationships *does* appear to fully mediate the relationship between SLC participation and how much students like school. After accounting for all control variables and for the proportion of teachers who would know a student's name, participation in an SLC is no longer significantly related to how much

Table 4.17

Mediation of the Relationship Between School Enrollment and Students' Emotional Engagement  
(After Controlling for Small Learning Community Participation) by School Climate

	<b>Model 4: All Controls</b>	<b>Model 5: Climate</b>	<b>Model 6: SLC Mediator</b>	<b>Model 7: Structure</b>
(Constant)	-0.139	-0.150	-0.242	-0.147
Female	-0.072 *	-0.077 *	-0.077 *	-0.077 *
Racial Minority	0.038	0.037	0.038	0.041
Parent's Education	-0.049	-0.020	-0.014	-0.013
% Not White at School	0.016	0.022	0.008	0.000
Applied to Other School	-0.003	0.002	0.002	0.004
Parent Influence	0.140 ***	0.106 **	0.110 **	0.110 **
School Important to Friends	0.055	-0.017	-0.017	-0.015
Friends Discuss School	0.219 ***	0.165 ***	0.165 ***	0.164 ***
Friends Participate at School	0.064	0.043	0.039	0.039
Emotional Engagement Gr. 9	0.306 ***	0.254 ***	0.264 ***	0.265 ***
Student Body Academic Press		0.207 ***	0.214 ***	0.211 ***
Teachers Academic Press		0.133 ***	0.130 ***	0.127 ***
Teachers Know Students		0.126 ***	0.125 ***	0.120 ***
SLC Participation			0.076 *	0.086 *
School Enrollment				-0.038
R <sup>2</sup>	0.227	0.286	0.291	0.293
F	21.035 ***	22.024 ***	20.948 ***	19.643 ***
df	1,717	3,714	1,713	1,712
R <sup>2</sup> -change	0.086	0.059	0.005	0.001
F-change	79.324 ***	19.805 ***	5.252 *	1.267

\* p < .05. \*\* p < .01. \*\*\* p < .001.

Table 4.18

Mediation of Small Learning Community Effects on Students' Emotional Engagement in School by Academic Press

	<b>Model 4: Controls</b>	<b>Model 5: Academic Press</b>	<b>Model 6: Mediation (SLC)</b>
(Constant)	-0.139	-0.207	-0.302
Female	-0.072 *	-0.074 *	-0.074 *
Racial Minority	0.038	0.041	0.042
Parent's Education	-0.049	-0.033	-0.027
% Not White at School	0.016	0.035	0.020
Applied to Other School	-0.003	0.000	0.000
Parent Influence	0.140 ***	0.110 **	0.114 **
School Important to Friends	0.055	-0.017	-0.017
Friends Discuss School	0.219 ***	0.174 ***	0.174 ***
Friends Participate at School	0.064	0.051	0.046
Emotional Engagement Gr. 9	0.306 ***	0.264 ***	0.274 ***
Student Body Academic Press		0.200 ***	0.207 ***
Teachers Academic Press		0.131 ***	0.128 ***
SLC Participation			0.078 *
R <sup>2</sup>	0.227	0.271	0.277
F	21.035 ***	22.351 ***	21.182 ***
df	1,723	2,721	1,720
R <sup>2</sup> -change	0.086	0.044	0.006
F-change	79.324 ***	21.917 ***	5.482 *

\* p < .05. \*\* p < .01. \*\*\* p < .001.

students like school. The full model accounts for 24.3% of the variance [ $F(1,721) = 19.329, p < .001$ ], but SLC participation alone only accounts for 0.4% of the variance, with a change in  $F = 3.712, ns$  (see Table 4.19). Participating in an SLC is no longer a significant predictor of emotional engagement ( $\beta = 0.065, ns$ ).

The mediation of the relationship between SLC participation and emotional engagement is not strong enough for the mediation to remain when all three measures of school climate are considered together. The full school climate model accounts for 28.6% of the variance in student liking of school [ $F(3,720) = 22.209, p < .001$ ; see Table 4.20]; the addition of SLC participation contributes an additional 0.5% of explained variance – a slight, but significant amount, with a change in  $F = 5.296, p < .05$ .

Increased academic press – from both the student body and from teachers – and increased personalization in teacher-student relationships are all related to increased emotional engagement in school ( $\beta = 0.214, p < .001$ ;  $\beta = 0.130, p < .001$ ; and  $\beta = 0.125, p < .001$ , respectively). However, participation in an SLC remains significant even after controlling for the school climate, with students in SLCs reporting significantly greater emotional engagement ( $\beta = 0.076$ ).

*Mediation of the relationship between student-teacher ratio and emotional engagement.*

Academic press does not mediate the relationship between student-teacher ratio and how much students like school. As illustrated in Table 4.19 adding the two measures of academic press to the full control model explains 27.1% of the variance in student liking of school [ $F(2,721) = 22.351, p < .001$ ; see Table 4.21]; adding student-teacher

Table 4.19

Mediation of Small Learning Community Effects on Students' Emotional Engagement in School by the Personalization of Teacher-Student Relationships

	<b>Model 4: Controls</b>	<b>Model 5: Personal</b>	<b>Model 6: Mediation (SLC)</b>
(Constant)	-0.139	-0.085	-0.165
Female	-0.072 *	-0.074 *	-0.075 *
Racial Minority	0.038	0.035	0.036
Parent's Education	-0.049	-0.037	-0.033
% Not White at School	0.016	0.004	-0.008
Applied to Other School	-0.003	0.000	0.000
Parent Influence	0.140 ***	0.137 ***	0.140 ***
School Important to Friends	0.055	0.057	0.058
Friends Discuss School	0.219 ***	0.211 ***	0.212 ***
Friends Participate at School	0.064	0.057	0.053
Emotional Engagement Gr. 9	0.306 ***	0.298 ***	0.308 ***
Teachers Know Students		0.115 **	0.114 **
SLC Participation			0.065
R <sup>2</sup>	0.227	0.240	0.243
F	21.035 ***	20.671 ***	19.329 ***
df	1,723	1,722	1,721
R <sup>2</sup> -change	0.086	0.013	0.004
F-change	79.324 ***	12.036 **	3.712

\* p < .05. \*\* p < .01. \*\*\* p < .001.

Table 4.20

Mediation of Small Learning Community Effects on Students' Emotional Engagement in School by School Climate

	<b>Model 4: Controls</b>	<b>Model 5: School Climate</b>	<b>Model 6: Mediation (SLC)</b>
(Constant)	-0.139	-0.150	-0.242
Female	-0.072 *	-0.077 *	-0.077 *
Racial Minority	0.038	0.037	0.038
Parent's Education	-0.049	-0.020	-0.014
% Not White at School	0.016	0.022	0.008
Applied to Other School	-0.003	0.002	0.002
Parent Influence	0.140 ***	0.106 **	0.110 **
School Important to Friends	0.055	-0.017	-0.017
Friends Discuss School	0.219 ***	0.165 ***	0.165 ***
Friends Participate at School	0.064	0.043	0.039
Emotional Engagement Gr. 9	0.306 ***	0.254 ***	0.264 ***
Student Body Academic Press		0.207 ***	0.214 ***
Teachers Academic Press		0.133 ***	0.130 ***
Teachers Know Students		0.126 ***	0.125 ***
SLC Participation			0.076 *
R <sup>2</sup>	0.227	0.286	0.291
F	21.035 ***	22.209 ***	21.124 ***
df	1,723	3,720	1,719
R <sup>2</sup> -change	0.086	0.059	0.005
F-change	79.324 ***	19.971 ***	5.296 *

\* p < .05. \*\* p < .01. \*\*\* p < .001.

Table 4.21

Mediation of Student-Teacher Ratio Effects on Students' Emotional Engagement in School by Academic Press

	<b>Model 4: Controls</b>	<b>Model 5: Academic Press</b>	<b>Model 6: Mediation (STRatio)</b>
(Constant)	-0.139	-0.207	0.380
Female	-0.072 *	-0.074 *	-0.073 *
Racial Minority	0.038	0.041	0.047
Parent's Education	-0.049	-0.033	-0.021
% Not White at School	0.016	0.035	0.038
Applied to Other School	-0.003	0.000	0.001
Parent Influence	0.140 ***	0.110 **	0.113 **
School Important to Friends	0.055	-0.017	-0.009
Friends Discuss School	0.219 ***	0.174 ***	0.177 ***
Friends Participate at School	0.064	0.051	0.048
Emotional Engagement Gr. 9	0.306 ***	0.264 ***	0.261 ***
Student Body Academic Press		0.200 ***	0.195 ***
Teachers Academic Press		0.131 ***	0.130 ***
Student-Teacher Ratio			-0.075 *
R <sup>2</sup>	0.227	0.271	0.276
F	21.035 ***	22.351 ***	21.160 ***
df	1,723	2,721	1,720
R <sup>2</sup> -change	0.086	0.044	0.005
F-change	79.324 ***	21.917 ***	5.277 *

\* p < .05. \*\* p < .01. \*\*\* p < .001.

ratio to this model accounts for an additional 0.5% of the variance, which is slight but significant, with a change in  $F = 5.277$ ,  $p < .05$ .

As student-teacher ratio increases, student emotional engagement in school decreases ( $\beta = -0.075$ ,  $p < .05$ ), regardless of the academic press from the student body or from teachers (both of which exhibit significant, positive relationships with emotional engagement).

Personalization of teacher-student relationships also does not mediate the relationship between student-teacher ratio and how much students like school. The model that includes the proportion of teachers who would know a student's name on top of all control variables accounts for 24% of the variance in students emotional engagement (see Table 4.22); adding student-teacher ratio contributes a significant, additional 0.5% of explained variance, with a change in  $F = 4.958$ ,  $p < .05$ . Although slight, the relationship between student-teacher ratio and emotional engagement in school is not fully explained away by the personalization of teacher-student relationships.

The strength of the relationship is similar to that after accounting for academic press. As student-teacher ratio increases, student emotional engagement in school decreases, with  $\beta = -0.074$ ,  $p < .05$ .

However, the relationship between student-teacher ratio and how much students like school does appear to be mediated by *the combination* of academic press and personalization of teacher-student relationships when considered together. All three measures of school climate are significant predictors of students emotional engagement in school when added together to the full control model, all together explaining 28.6% of the variance in student liking of school [ $F(3,720) = 22.209$ ,  $p < .001$ ; see Table 4.23]. As

Table 4.22

Mediation of Student-Teacher Ratio Effects on Students' Emotional Engagement in School by the Personalization of Teacher-Student Relationships

	<b>Model 4: Controls</b>	<b>Model 5: Personal</b>	<b>Model 6: Mediation (STRatio)</b>
(Constant)	-0.139	-0.085	0.494
Female	-0.072 *	-0.074 *	-0.074 *
Racial Minority	0.038	0.035	0.041
Parent's Education	-0.049	-0.037	-0.026
% Not White at School	0.016	0.004	0.009
Applied to Other School	-0.003	0.000	0.001
Parent Influence	0.140 ***	0.137 ***	0.140 ***
School Important to Friends	0.055	0.057	0.063
Friends Discuss School	0.219 ***	0.211 ***	0.213 ***
Friends Participate at School	0.064	0.057	0.054
Emotional Engagement Gr. 9	0.306 ***	0.298 ***	0.296 ***
Teachers Knows Students		0.115 **	0.106 **
Student-Teacher Ratio			-0.074 *
R <sup>2</sup>	0.227	0.240	0.245
F	21.035 ***	20.671 ***	19.465 ***
df	1,723	1,722	1,721
R <sup>2</sup> -change	0.086	0.013	0.005
F-change	79.324 ***	12.036 **	4.958 *

\* p < .05. \*\* p < .01. \*\*\* p < .001.

Table 4.23

Mediation of Student-Teacher Ratio Effects on Students' Emotional Engagement in School by School Climate

	<b>Model 4: Controls</b>	<b>Model 5: Climate</b>	<b>Model 6: Mediation (STRatio)</b>
(Constant)	-0.139	-0.150	0.312
Female	-0.072 *	-0.077 *	-0.076 *
Racial Minority	0.038	0.037	0.042
Parent's Education	-0.049	-0.020	-0.012
% Not White at School	0.016	0.022	0.025
Applied to Other School	-0.003	0.002	0.003
Parent Influence	0.140 ***	0.106 **	0.109 **
School Important to Friends	0.055	-0.017	-0.011
Friends Discuss School	0.219 ***	0.165 ***	0.167 ***
Friends Participate at School	0.064	0.043	0.041
Emotional Engagement Gr. 9	0.306 ***	0.254 ***	0.253 ***
Student Body Academic Press		0.207 ***	0.203 ***
Teachers Academic Press		0.133 ***	0.132 ***
Teachers Know Students		0.126 ***	0.118 ***
Student-Teacher Ratio			-0.059
R <sup>2</sup>	0.227	0.286	0.289
F	21.035 ***	22.209 ***	20.925 ***
df	1,723	3,720	1,719
R <sup>2</sup> -change	0.086	0.059	0.003
F-change	79.324 ***	19.971 ***	3.307

\* p < .05. \*\* p < .01. \*\*\* p < .001.

academic press from the student body, academic press from teachers, and the proportion of teachers who would know a student's name increase, so too does the degree to which students like school.

Student-teacher ratio only adds an additional 0.3% of explained variance – an insignificant amount, with a change in  $F = 3.307$ , ns. Student-teacher ratio is no longer a significant predictor of how much students like school ( $\beta = -0.059$ , ns) after first considering the relationship of school climate measures and emotional engagement.

#### *Relationship Between the Quality of Small Learning Community and Emotional Engagement*

In exploring the relationships between SLCs and their climates, the issue of SLC quality has been well-noted as a major factor. Much of the data on SLCs has come in the form of qualitative descriptions of particular case studies, which have tended to focus on exceptional schools and models. However, many ethnographers who have studied the implementation of SLCs have found evidence of uneven implementation and, in some cases, explicit tracking of students along ability levels across various SLCs within a host school.

For these reasons, the analyses in this study include a subset of models designed to explore the effects of SLC quality on student engagement and the extent to which these effects can be attributed to the academic press and/or personalization of teacher-student relationships within the host school. Students who indicated that they were enrolled in an SLC were asked to rate that SLC along three dimensions of quality, as compared to the other SLCs within their host school: quality of teachers, quality of materials (e.g., books, lab equipment), and quality of space.

There is no relationship between participating in an SLC with less than the best materials, teachers, and space and how much students like school. The full control model for student liking

of school accounts for 22.7% of the variance in how much students like school [ $F(1,556) = 13.806, p < .001$ ; see Table 4.24]; adding a dummy variable for participation in a lower quality SLC adds only 0.3% of explained variance, which is insignificant with a change in  $F = 1.863, ns$ . Participating in a lower quality SLC is not a significant predictor of how much students like school ( $\beta = -0.053$ ).

However, participation in a high quality SLC *is* significantly related to how much students like school. High quality SLC participation accounts for a significant 0.9% addition to the explained variance, with a change in  $F = 6.322, p < .05$  (see Table 4.25). The full model, including all control variables and high quality SLC participation, accounts for a total of 23.6% of the variance in how much students like school [ $F(1,556) = 14.287, p < .001$ ]. Students who participate in high quality SLCs report liking school significantly more than those who do not ( $\beta = 0.096, p < .05$ ).

Furthermore, participating in a high quality SLC remains a significant predictor of students' emotional engagement in school even after school climate is taken into consideration. While both measures of academic press are significant predictors of students' liking of school (see Table 4.26), adding the dummy variable for participation in a relatively high quality SLC to the model in the next block is also a significant predictor of emotional engagement, with  $\beta = 0.086, p < .01$ . This model explains an additional 0.7% of the variance, which – though slight – is significant, with a change in  $F(1,720) = 7.054, p < .01$ .

Participation in a relatively high quality SLC also remains a significant predictor of emotional engagement after controlling for the personalization of teacher-student relationships, with  $\beta = 0.096, p < .01$  (see Table 4.27). After controlling for the effect of personalized relationships, participation in a high quality SLC accounts for an additional 0.9% of the variance

Table 4.24

Relationship Between Participating in a Low Quality Small Learning Community and Students' Emotional Engagement in School

	<b>Model 4: Controls</b>	<b>Model 5: SLC Quality</b>		
(Constant)	-0.131	-0.118		
Female	-0.072	-0.072		
Racial Minority	0.038	0.039		
Parent's Education	-0.049	-0.050		
% Not White at School	0.016	0.019		
Applied to Other School	-0.002	0.001		
Applied to Other SLC	-0.013	-0.004		
Parent Influence	0.139	***	0.135	***
School Important to Friends	0.054		0.051	
Friends Discuss School	0.218	***	0.219	***
Friends Participate at School	0.064		0.064	
Emotional Engagement Gr. 9	0.306	***	0.299	***
Enrolled in Low Quality SLC			-0.053	
R <sup>2</sup>	0.227		0.230	
F	14.869	***	13.806	***
df	1,557		1,556	
R <sup>2</sup> -change	0.085		0.003	
F-change	61.573	***	1.863	

\* p < .05. \*\* p < .01. \*\*\* p < .001.

Table 4.25

Relationship Between Participating in a High Quality Small Learning Community and Students' Emotional Engagement in School

	<b>Model 4: Controls</b>	<b>Model 5: SLC Quality</b>		
(Constant)	-0.131	-0.192		
Female	-0.072	-0.073		
Racial Minority	0.038	0.042		
Parent's Education	-0.049	-0.045		
% Not White at School	0.016	0.006		
Applied to Other School	-0.002	0.003		
Applied to Other SLC	-0.013	0.003		
Parent Influence	0.139	***	0.140	***
School Important to Friends	0.054		0.052	
Friends Discuss School	0.218	***	0.219	***
Friends Participate at School	0.064		0.059	
Emotional Engagement Gr. 9	0.306	***	0.305	***
Enrolled in High Quality SLC			0.096	*
R <sup>2</sup>	0.227		0.236	
F	14.869	***	14.287	***
df	1,557		1,556	
R <sup>2</sup> -change	0.085		0.009	
F-change	61.573	***	6.322	*

\* p < .05. \*\* p < .01. \*\*\* p < .001.

Table 4.26

Mediation of the Relationships between SLC Quality and Students' Emotional Engagement by Academic Press

	<b>Model 4: Controls</b>	<b>Model 5: Academic Press</b>	<b>Model 6: SLC Quality</b>
(Constant)	-0.139	-0.207	-0.250
Female	-0.072 *	-0.074 *	-0.074 *
Racial Minority	0.038	0.041	0.043
Parent's Education	-0.049	-0.033	-0.030
% Not White at School	0.016	0.035	0.025
Applied to Other School	-0.003	0.000	0.004
Parent Influence	0.140 ***	0.110 **	0.111 **
School Important to Friends	0.055	-0.017	-0.019
Friends Discuss School	0.219 ***	0.174 ***	0.174 ***
Friends Participate at School	0.064	0.051	0.048
Emotional Engagement Gr. 9	0.306 ***	0.264 ***	0.264 ***
Student Body Academic Press		0.200 ***	0.201 ***
Teachers Academic Press		0.131 ***	0.121 ***
Enrolled in High Quality SLC			0.086 **
R <sup>2</sup>	0.227	0.271	0.278
F	21.035 ***	22.351 ***	21.348 ***
df	1,723	2,721	1,720
R <sup>2</sup> -change	0.086	0.044	0.007
F-change	79.324 ***	21.917 ***	7.054 **

\* p < .05. \*\* p < .01. \*\*\* p < .001.

Table 4.27

Mediation of the Relationships between SLC Quality and Students' Emotional Engagement by Personalization of Teacher-Student Relationships

	<b>Model 4: Control</b>	<b>Model 5: Personal</b>	<b>Model 6: SLC Quality</b>
(Constant)	-0.139	-0.085	-0.136
Female	-0.072 *	-0.074 *	-0.076 *
Racial Minority	0.038	0.035	0.038
Parent's Education	-0.049	-0.037	-0.034
% Not White at School	0.016	0.004	-0.006
Applied to Other School	-0.003	0.000	0.005
Parent Influence	0.140 ***	0.137 ***	0.137 ***
School Important to Friends	0.055	0.057	0.053
Friends Discuss School	0.219 ***	0.211 ***	0.211 ***
Friends Participate at School	0.064	0.057	0.052
Emotional Engagement Gr. 9	0.306 ***	0.298 ***	0.297 ***
Teachers Know Students		0.115 **	0.116 ***
Enrolled in High Quality SLC			0.096 **
R <sup>2</sup>	0.227	0.240	0.248
F	21.035 ***	20.671 ***	19.863 ***
df	1,723	1,722	1,721
R <sup>2</sup> -change	0.086	0.013	0.009
F-change	79.324 ***	12.036 **	8.587 **

\* p < .05. \*\* p < .01. \*\*\* p < .001.

in emotional engagement, with a change in  $F(1,721) = 8.587, p < .01$ .

The predictive power of academic press and personalization of teacher-student relationships together does not explain away the effect of participation in a high quality SLC, either. After accounting for the effects of academic press and personalization of teacher-student relationships, participation in a high quality SLC explains an additional 0.7% of the variance in emotional engagement – a slight, though significant amount, with a change in  $F(1,719) = 7.295, p < .01$  (see Table 4.28). Participation in a high quality SLC remains a significant predictor of students' liking of school with  $\beta = 0.086, p < .01$ .

These results suggest that there is an additional benefit to participating in a high quality SLC above and beyond the positive effects of academic press and personalization of teacher-student relationships. (See Appendix F for a comparison of students participating in high quality, low quality, and no small learning community). The implications will be discussed in the section on future research in the final chapter.

#### *Summary of Emotional Engagement*

The results of mediation models of emotional engagement suggest that school climate matters at least as much, if not more, than the structure of schools – whether they are whole schools or schools-within-schools. However, there appears to be something about having fewer students per teacher, above and beyond the personalization of teacher-student relationships and academic press, that contributes to students' emotional engagement. The implications of these results will be discussed in the final chapter.

#### Behavioral Engagement

The second outcome considered is students' behavioral engagement in school. This section will follow the same structure as the first half of this chapter. First, the

Table 4.28

## Mediation of the Relationships between SLC Quality and Students' Emotional Engagement by School Climate

	<b>Model 4: Controls</b>	<b>Model 5: Climate</b>	<b>Model 6: SLC Quality</b>
(Constant)	-0.139	-0.150	-0.193
Female	-0.072 *	-0.077 *	-0.077 *
Racial Minority	0.038	0.037	0.039
Parent's Education	-0.049	-0.020	-0.017
% Not White at School	0.016	0.022	0.011
Applied to Other School	-0.003	0.002	0.006
Parent Influence	0.140 ***	0.106 **	0.107 **
School Important to Friends	0.055	-0.017	-0.019
Friends Discuss School	0.219 ***	0.165 ***	0.165 ***
Friends Participate at School	0.064	0.043	0.040
Emotional Engagement Gr. 9	0.306 ***	0.254 ***	0.254 ***
Student Body Academic Press		0.207 ***	0.208 ***
Teachers Academic Press		0.133 ***	0.122 ***
Teachers Know Students		0.126 ***	0.126 ***
Enrolled in High Quality SLC			0.086 **
R <sup>2</sup>	0.227	0.286	0.293
F	21.035 ***	22.209 ***	21.324 ***
df	1,723	3,720	1,719
R <sup>2</sup> -change	0.086	0.059	0.007
F-change	79.324 ***	19.971 ***	7.295 **

\* p < .05. \*\* p < .01. \*\*\* p < .001.

baseline influences of student background characteristics, school characteristics, parents, peers, and previous engagement will be established, with descriptions of control models. Next, an examination of the relationships between behavioral engagement and both the structure and climate of size will be described, in turn. The possible mediation of structural effects by climate effects is then described. Finally, the relationship between SLC quality and behavioral engagement is explored.

*Relationships Between Control Variables and Behavioral Engagement*

As with modeling emotional engagement, the first phase of analysis involved modeling the effects of the five sets of control variables on behavioral engagement.

*Student background characteristic and school characteristics.*

The three student ascriptive variables, student body racial composition, and student choice were parsed into models with three comparative blocks and, just as the modeling of emotional engagement, there was no explanatory advantage to the separation. Taken together, student sex, student race, student socioeconomic status, student body racial composition, and school choice accounts for 1.6% of the variance in student participation in extracurricular activities/sports (see Table 4.29). Although this is a relatively small amount of explanatory power, the contribution is statistically significant with  $F(5,765) = 2.541, p < .05$ .

Of the five variables included in this control model, the only significant predictor of this measure of behavioral engagement is parental education level (which acts as a proxy for socioeconomic status), with  $\beta = 0.100$  (see Table 4.29). Although statistically significant, the magnitude of this relationship is thus modest – all else held constant, the gap between students of parents with less than a high school degree and those of parents

Table 4.29

Relationship Between School Enrollment and Students' Behavioral Engagement in School

	<b>Model 1: Ascriptives &amp; School</b>	<b>Model 2: Parent Influence</b>	<b>Model 3: Peer Influence</b>	<b>Model 4: Previously Engaged</b>	<b>Model 5: Structure</b>
(Constant)	0.601 **	0.671 ***	0.065	-0.039	0.002
Female	0.050	0.015	0.031	0.023	0.023
Racial Minority	0.017	0.019	0.023	0.028	0.029
Parent's Education	0.100 **	0.087 *	0.086 *	0.067 *	0.067 *
% Not White at School	-0.039	-0.043	-0.041	-0.010	-0.012
Applied to Other School	-0.007	-0.005	0.000	-0.006	-0.005
Parent Influence		0.205 ***	0.188 ***	0.160 ***	0.159 ***
School Important to Friends			0.035	0.033	0.033
Friends Discuss School			0.136 ***	0.111 **	0.110 **
Friends Participate at School			0.219 ***	0.159 ***	0.159 ***
Emotional Engagement Gr. 9				0.338 ***	0.337 ***
School Enrollment					-0.016
R <sup>2</sup>	0.016	0.057	0.142	0.248	0.248
F	2.541 *	7.704 ***	13.959 ***	25.093 ***	22.810 ***
df	5,765	1,764	3,761	1,760	1,759
R <sup>2</sup> -change	0.016	0.041	0.085	0.107	0.000
F-change	2.541 *	32.988 ***	25.016 ***	107.683 ***	0.234

\* p &lt; .05. \*\* p &lt; .01. \*\*\* p &lt; .001.

with a graduate degree is not even equal to a difference of one additional extracurricular activity or sport.

*Parent influence.*

A second control model was run that included two blocks: one with student background characteristics and school characteristics and a second with the parent influence factor score. This second control model accounts for 5.7% of the variance in student participation in extracurricular activities/sports, which is significant with  $F(1,764) = 7.704$ ,  $p < .001$  (see Table 4.29). The change in variance explained when parent influence is added to the model (an additional 4.1%) is significant, with a change in  $F = 32.988$ ,  $p < .001$ .

Student socioeconomic status remains a significant, though slight, predictor of this measure of students' behavioral engagement, with  $\beta = 0.087$ ,  $p < .05$ . Parent influence is also a significant predictor with  $\beta = 0.205$ ,  $p < .001$ .

*Peer influence.*

A third control model included a block with three variables in addition to the student background characteristics/school characteristics block and the parent influence block: peer valuing of school, peer discussion of school, and peer participation in extracurricular activities/sports. This third control model accounts for 14.2% of the variance in students' participation in extracurricular activities/sports, a significant portion with  $F(3,761) = 13.959$ ,  $p < .001$  (see Table 4.29). Peer influence as a third block in the model alone accounts for an additional 8.5% of the variance, which is a significant change in  $F = 25.016$ ,  $p < .001$ .

Student socioeconomic status remains a significant, though slight, predictor of this measure of students' behavioral engagement, with  $\beta = 0.086$ ,  $p < .05$ , as does parent influence, with  $\beta = 0.188$ ,  $p < .001$ . Two of the three measures of peer influence are significant predictors:

peer discussion of school, with  $\beta = 0.136$ ,  $p < .001$ , and peer participation in extracurricular activities/sports, with  $\beta = 0.219$ ,  $p < .001$ .

*Previous level of engagement.*

A fourth control model added a fourth block with students' level of participation in extracurricular activities/sports upon entering high school, as shown in Table 4.29. This model accounts for 24.8% of the variance in students' participation in extracurricular activities/sports, with  $F(1,760) = 25.093$ ,  $p < .001$  (see Table 4.29). The additional 10.7% of the variance explained by students' previous level of engagement, significant with a change in  $F = 107.683$ ,  $p < .001$ , is the single largest contribution to the explanatory power of this model of students' participation in extracurricular activities/sports.

Student socioeconomic, parent influence, peer discussion of school, and peer participation all remain significant predictors of students' behavioral engagement. Previous behavioral engagement is a significant predictor with  $\beta = 0.338$ ,  $p < .001$ .

*Relationships Between the Structure of Size and Behavioral Engagement*

After assessing the influence of control variables and creating a full control model, each structure of size – school enrollment, participation in an SLC, and student-teacher ratio – was added to the model, in turn.

*School enrollment.*

After controlling for student background characteristics, school characteristics, parent influence, peer influence, and previous level of behavioral engagement, enrollment size is not significantly related to student participation in extracurricular activities/sports. Enrollment size does not explain a significant portion of the variance in behavioral engagement, with a change in  $F = 0.234$ , ns and  $\beta = -0.016$ , ns (see Table 4.29).

Controlling for participation in an SLC does not change the insignificance of the relationship between enrollment size and student participation in extracurricular activities/sports. Adding SLC participation to the full control model accounts for a slight, though significant, increase of 0.7% of the variance in student participation in extracurricular activities/sports, with a change in  $F = 6.772$ ,  $p < .01$  (see Table 4.30). SLC participation is a significant predictor of student participation in extracurricular activities/sports, with  $\beta = 0.084$ ,  $p < .01$ .

Adding enrollment size to this model does not account for any additional explanation of the variance in student participation. The change in  $F = 1.380$  and enrollment size is not a significant predictor of participation with  $\beta = -0.039$ .

*SLC participation.*

After controlling for student background characteristics, school characteristics, parent influence, peer influence, and previous level of behavioral engagement, participating in an SLC accounts for a significant portion of the variance in students' participation in extracurricular activities/sports. SLC participation accounts for 0.7% of the total variance – a small, but significant amount, with a change in  $F = 6.825$ ,  $p < .01$  (see Table 4.31). Students in SLCs participate in more extracurricular activities/sports than those who do not, with  $\beta = 0.084$ ,  $p < .01$ .

*Student-teacher ratio.*

Control variables account for 24.8% of the variance in student participation in extracurricular activities/sports; adding student-teacher ratio does not add any explanatory power to the model, with a change in  $F = 0.005$ , ns (see Table 4.32). Student-teacher ratio is not a significant predictor of student participation in extracurricular activities/sports, with  $\beta = -0.002$ , ns.

Table 4.30

Relationship Between School Enrollment and Students' Behavioral Engagement After Controlling for Small Learning Community Participation

	<b>Model 4: Controls</b>	<b>Model 5: SLC Mediator</b>	<b>Model 6: School Size</b>
(Constant)	-0.039	-0.133	-0.043
Female	0.023	0.022	0.022
Racial Minority	0.028	0.030	0.032
Parent's Education	0.067 *	0.073 *	0.075 *
% Not White at School	-0.010	-0.025	-0.035
Applied to Other School	-0.006	-0.005	-0.003
Parent Influence	0.160 ***	0.165 ***	0.164 ***
School Important to Friends	0.033	0.036	0.036
Friends Discuss School	0.111 **	0.114 **	0.122 **
Friends Participate at School	0.159 ***	0.154 ***	0.154 ***
Emotional Engagement Gr. 9	0.338 ***	0.343 ***	0.341 ***
SLC Participation		0.084 **	0.094 **
School Enrollment			-0.039
R <sup>2</sup>	0.248	0.255	0.256
F	25.093 ***	23.601 ***	21.760 ***
df	1,760	1,759	1,758
R <sup>2</sup> -change	0.107	0.007	0.001
F-change	107.683 ***	6.772 **	1.380

\* p < .05. \*\* p < .01. \*\*\* p < .001.

Table 4.31

Relationship Between Participation in a Small Learning Community and Students' Behavioral Engagement in School

	<b>Model 4: Controls</b>	<b>Model 5: Structure</b>
(Constant)	-0.039	-0.133
Female	0.023	0.022
Racial Minority	0.028	0.030
Parent's Education	0.067 *	0.073 *
% Not White at School	-0.010	-0.025
Applied to Other School	-0.006	-0.005
Parent Influence	0.160 ***	0.165 ***
School Important to Friends	0.033	0.036
Friends Discuss School	0.111 **	0.114 **
Friends Participate at School	0.159 ***	0.154 ***
Emotional Engagement Gr. 9	0.338 ***	0.343 ***
SLC Participation		0.084 **
R <sup>2</sup>	0.248	0.255
F	25.093 ***	23.787 ***
df	1,760	1,765
R <sup>2</sup> -change	0.107	0.007
F-change	107.683 ***	6.825 **

\* p < .05. \*\* p < .01. \*\*\* p < .001.

Table 4.32

Relationship Between Student-Teacher Ratio and Students' Behavioral Engagement in School

	<b>Model 4: Previously Engaged</b>	<b>Model 5: Scale of Schooling</b>
(Constant)	-0.039	-0.024
Female	0.023	0.023
Racial Minority	0.028	0.028
Parent's Education	0.067 *	0.067 *
% Not White at School	-0.010	-0.010
Applied to Other School	-0.006	-0.006
Parent Influence	0.160 ***	0.160 ***
School Important to Friends	0.033	0.033
Friends Discuss School	0.111 **	0.111 **
Friends Participate at School	0.159 ***	0.159 ***
Emotional Engagement Gr. 9	0.338 ***	0.338 ***
Student-Teacher Ratio		-0.002
R <sup>2</sup>	0.248	0.248
F	25.093 ***	22.962 ***
df	1,760	1,765
R <sup>2</sup> -change	0.107	0.000
F-change	107.683 ***	0.005

\* p &lt; .05. \*\* p &lt; .01. \*\*\* p &lt; .001.

### *Relationships Between the Climate of Size and Behavioral Engagement*

The aspects of climate under investigation can only moderate the relationship between participation in an SLC and behavioral engagement if there are significant relationships between school climate and behavioral engagement. This section describes models that add each aspect of climate as an additional block, both independently and together, to assess which (if any) are candidates for moderating the structural effect of SLC participation.

#### *Academic press.*

Academic press is significantly related to student participation in extracurricular activities/sports. After controlling for student background characteristics, school characteristics, parent influence, peer influence, and level of participation at the beginning of ninth grade, academic press accounts for an additional 0.6% of the variance in participation in extracurricular activities/sports, with a change in  $F = 3.187$ ,  $p < .05$  (see Table 4.33). The model explains 25.4% of the variance, which is a significant amount with  $F(2,764) = 21.727$ ,  $p < .001$ .

However, only academic press from the student body, not from teachers, is a significant predictor of student participation. The greater the academic press from the student body, the less a student participates in extracurricular activities/sports, with  $\beta = -0.080$ ,  $p < .05$ . Academic press from teachers is not a significant predictor of student participation, with  $\beta = 0.022$ , ns.

Academic press is therefore a possible mediator of the relationships between educational scale and behavioral engagement in school.

#### *Personalization of teacher-student relationships.*

The proportion of teachers who would know a student's name is not significantly related to student participation in extracurricular activities/sports. This variable does not add any

Table 4.33

Relationship Between Academic Press and Students' Behavioral Engagement in School

	<b>Model 4: Controls</b>	<b>Model 5: Academic Press</b>		
(Constant)	-0.039	-0.034		
Female	0.023	0.019		
Racial Minority	0.028	0.028		
Parent's Education	0.067 *	0.059		
% Not White at School	-0.010	-0.009		
Applied to Other School	-0.006	-0.002		
Parent Influence	0.160 ***	0.160 ***		
School Important to Friends	0.033	0.049		
Friends Discuss School	0.111 **	0.127 ***		
Friends Participate at School	0.159 ***	0.162 ***		
Emotional Engagement Gr. 9	0.338 ***	0.339 ***		
Student Body Academic Press		-0.080 *		
Teachers Academic Press		0.022		
R <sup>2</sup>	0.248	0.254		
F	25.093 ***	21.727 ***		
df	1,766	2,764		
R <sup>2</sup> -change	0.107	0.006		
F-change	107.683 ***	3.187 *		

\* p &lt; .05. \*\* p &lt; .01. \*\*\* p &lt; .001.

explanatory power to the full control model, with a change in  $F = 2.495$ , ns, and  $\beta = 0.051$ , ns (see Table 4.34).

Personalization of teacher-student relationships is therefore not a possible mediator of the relationships between educational scale and students' behavioral engagement in school.

*Full school climate.*

Together, academic press and personalization of teacher-student relationships account for a slight, though significant, amount of the variance in students' behavioral engagement in school. The model accounts for 25.7% of the variance, significant with  $F(3,763) = 20.259$ ,  $p < .001$  – which is 0.8% more than the full control model, with a significant change in  $F = 2.869$ ,  $p < .05$  (see Table 4.35). However, the only significant predictor is academic press from the student body, as discussed above.

*Mediation of Structural Effects by Climate Effects*

Results of size and climate models suggest one possible areas of mediation of relationships to behavioral engagement that will be examined in this study: whether academic press or full school climate mediate the significance of the relationship between school enrollment and behavioral engagement after controlling for SLC participation.

*Mediation of the relationship between SLC participation and behavioral engagement.*

Academic press does not mediate the relationship between participating in an SLC and behavioral engagement. Adding SLC participation as a sixth block to the full control model after controlling for academic press in the fifth model still explains a significant amount of the variance in student participation in extracurricular activities/sports, accounting for an additional 0.5% of the variance with a change in  $F = 5.582$ ,  $p < .05$  (see Table 4.36). Students who participate in an SLC participate in more extracurricular activities/sports ( $\beta = 0.076$ ,  $p < .05$ )

Table 4.34

Relationship Between the Personalization of Teacher-Student Relationships and Students' Behavioral Engagement in School

	<b>Model 4: Controls</b>	<b>Model 5: Personal</b>
(Constant)	-0.039	-0.017
Female	0.023	0.022
Racial Minority	0.028	0.027
Parent's Education	0.067 *	0.072 *
% Not White at School	-0.010	-0.015
Applied to Other School	-0.006	-0.004
Parent Influence	0.160 ***	0.159 ***
School Important to Friends	0.033	0.033
Friends Discuss School	0.111 **	0.107 **
Friends Participate at School	0.159 ***	0.156 ***
Emotional Engagement Gr. 9	0.338 ***	0.335 ***
Teachers Know Students		0.051
R <sup>2</sup>	0.248	0.251
F	25.093 ***	23.263 ***
df	1,766	1,765
R <sup>2</sup> -change	0.107	0.002
F-change	107.683 ***	2.495

\* p < .05. \*\* p < .01. \*\*\* p < .001.

Table 4.35

Relationship Between School Climate and Students' Behavioral Engagement in School

	<b>Model 4: Controls</b>		<b>Model 5: School Climate</b>	
(Constant)	-0.039		-0.014	
Female	0.023		0.018	
Racial Minority	0.028		0.026	
Parent's Education	0.067 *		0.064	
% Not White at School	-0.010		-0.014	
Applied to Other School	-0.006		-0.001	
Parent Influence	0.160 ***		0.159 ***	
School Important to Friends	0.033		0.049	
Friends Discuss School	0.111 **		0.123 ***	
Friends Participate at School	0.159 ***		0.160 ***	
Emotional Engagement Gr. 9	0.338 ***		0.335 ***	
Student Body Academic Press			-0.078 *	
Teachers Academic Press			0.022	
Teachers Know Students			0.048	
R <sup>2</sup>	0.248		0.257	
F	25.093 ***		20.259 ***	
df	1,766		3,763	
R <sup>2</sup> -change	0.107		0.008	
F-change	107.683 ***		2.869 *	

\* p &lt; .05. \*\* p &lt; .01. \*\*\* p &lt; .001.

Table 4.36

Mediation of Small Learning Community Effects on Students' Behavioral Engagement in School by Academic Press

	<b>Model 4: Controls</b>	<b>Model 5: Climate</b>	<b>Model 6: Mediation (SLC)</b>
(Constant)	-0.039	-0.014	-0.121
Female	0.023	0.018	0.018
Racial Minority	0.028	0.026	0.029
Parent's Education	0.067 *	0.064	0.066 *
% Not White at School	-0.010	-0.014	-0.023
Applied to Other School	-0.006	-0.001	-0.002
Parent Influence	0.160 ***	0.159 ***	0.165 ***
School Important to Friends	0.033	0.049	0.050
Friends Discuss School	0.111 **	0.123 ***	0.128 ***
Friends Participate at School	0.159 ***	0.160 ***	0.157 ***
Emotional Engagement Gr. 9	0.338 ***	0.335 ***	0.343 ***
Student Body Academic Press		-0.078 *	-0.072 *
Teachers Academic Press		0.022	0.020
SLC Participation			0.076 *
R <sup>2</sup>	0.248	0.254	0.260
F	25.093 ***	20.259 ***	20.606 ***
df	1,766	3,763	1,763
R <sup>2</sup> -change	0.107	0.008	0.005
F-change	107.683 ***	2.869 *	5.582 *

\* p < .05. \*\* p < .01. \*\*\* p < .001.

than those who do not.

*Relationship Between the Quality of Small Learning Community and Behavioral Engagement*

There is no relationship between participating in an SLC with less than the best materials, teachers, and space and student participation in extracurricular activities/sports. The full control model accounts for 24.9% of the variance in student participation in extracurricular activities/sports [ $F(1,592) = 17.798, p < .001$ ; see Table 4.37]; adding a dummy variable for participation in a lower quality SLC does not add any explained variance, with a change in  $F = 0.074, ns$ . Participating in a lower quality SLC is not a significant predictor of student participation in extracurricular activities/sports ( $\beta = -0.010$ ).

However, participation in an SLC with the best materials, best teachers, and best space in a school is significantly related to student participation in extracurricular activities/sports. High quality SLC participation accounts for a slight, though significant, 0.5% of the variance in student participation in extracurricular activities/sports (change in  $F = 4.276, p < .05$ ), above and beyond the 24.9% of variance explained by the full control model [ $F(1,592) = 17.798, p < .001$ ; see Table 4.38].

Students who participate in high quality SLCs participate in significantly more extracurricular activities/sports ( $\beta = 0.075, p < .05$ ).

Furthermore, the effects of participating in a high quality SLC remain significant even after accounting for the effects of school climate. Academic press from the student body is negatively associated with students' participation in extracurricular activities/sports (see Table 4.39); after accounting for this relationship, participating in a high quality SLC remains a significant predictor of behavioral engagement, with  $\beta = 0.073, p < .05$ . This model explains an

Table 4.37

Relationship Between Participating in a Low Quality Small Learning Community and Students' Behavioral Engagement in School

	<b>Model 4: Controls</b>	<b>Model 5: SLC Quality</b>		
(Constant)	-0.029	-0.027		
Female	0.023	0.023		
Racial Minority	0.027	0.028		
Parent's Education	0.066	0.066		
% Not White at School	-0.010	-0.010		
Applied to Other School	-0.004	-0.004		
Applied to Other SLC	-0.018	-0.016		
Parent Influence	0.159 ***	0.158 ***		
School Important to Friends	0.031	0.030		
Friends Discuss School	0.110 **	0.110 **		
Friends Participate at School	0.159 ***	0.159 ***		
Emotional Engagement Gr. 9	0.338 ***	0.339 ***		
Enrolled in Low Quality SLC		-0.010		
R <sup>2</sup>	0.249	0.249		
F	17.798 ***	16.296 ***		
df	1,592	1,591		
R <sup>2</sup> -change	0.107	0.000		
F-change	83.985 ***	0.074		

\* p < .05. \*\* p < .01. \*\*\* p < .001.

Table 4.38

Relationship Between Participating in a High Quality Small Learning Community and Students' Behavioral Engagement in School

	<b>Model 4: Controls</b>	<b>Model 5: SLC Quality</b>		
(Constant)	-0.029	-0.075		
Female	0.023	0.022		
Racial Minority	0.027	0.030		
Parent's Education	0.066	0.069		
% Not White at School	-0.010	-0.017		
Applied to Other School	-0.004	0.000		
Applied to Other SLC	-0.018	-0.005		
Parent Influence	0.159 ***	0.159 ***		
School Important to Friends	0.031	0.029		
Friends Discuss School	0.110 **	0.110 **		
Friends Participate at School	0.159 ***	0.155 ***		
Emotional Engagement Gr. 9	0.338 ***	0.343 ***		
Enrolled in High Quality SLC		0.075 *		
R <sup>2</sup>	0.249	0.254		
F	17.798 ***	16.762 ***		
df	1,592	1,591		
R <sup>2</sup> -change	0.107	0.005		
F-change	83.985 ***	4.276 *		

\* p < .05. \*\* p < .01. \*\*\* p < .001.

Table 4.39

Mediation of the Relationships Between Small Learning Community Quality and Students' Behavioral Engagement by Academic Press

	<b>Model 4: Controls</b>	<b>Model 5: Academic Press</b>	<b>Model 6: SLC Quality</b>
(Constant)	-0.039	-0.034	-0.069
Female	0.023	0.019	0.018
Racial Minority	0.028	0.028	0.030
Parent's Education	0.067 *	0.059	0.062
% Not White at School	-0.010	-0.009	-0.017
Applied to Other School	-0.006	-0.002	0.001
Parent Influence	0.160 ***	0.160 ***	0.161 ***
School Important to Friends	0.033	0.049	0.048
Friends Discuss School	0.111 **	0.127 ***	0.127 ***
Friends Participate at School	0.159 ***	0.162 ***	0.158 ***
Emotional Engagement Gr. 9	0.338 ***	0.339 ***	0.343 ***
Student Body Academic Press		-0.080 *	-0.079 *
Teachers Academic Press		0.022	0.013
Enrolled in High Quality SLC			0.073 *
R <sup>2</sup>	0.248	0.254	0.260
F	25.093 ***	21.727 ***	20.579 ***
df	1,766	2,764	1,763
R <sup>2</sup> -change	0.107	0.006	0.005
F-change	107.683 ***	3.187 *	5.327 *

\* p < .05. \*\* p < .01. \*\*\* p < .001.

additional 0.5% of the variance above and beyond the variance accounted for by academic press and other control variables, with a change in  $F(1,763) = 5.327, p < .05$ .

As personalization of teacher-student relationships is not a significant predictor of behavioral engagement, it was not examined as a possible mediator of the effects of participating in a high quality SLC on student participation in extracurricular activities/sports on its own.

However, the full mediation power of all three measures of climate – academic press from the student body, academic press from teachers, and personalization of teacher-student relationships – was examined. Even after the effects of school climate are taken into consideration, participation in a high quality SLC accounts for a significant portion of the variance, with a change in  $F(1,762) = 5.344, p < .05$  (see Table 4.40). Participation in a high quality SLC remains a significant predictor of behavioral engagement regardless of school climate ( $\beta = 0.073, p < .05$ ).

As with the pattern of results in modeling emotional engagement, these results suggest that there is a distinct advantage towards behavioral engagement for students who participate in high quality SLCs, above and beyond the effects of academic press and personalized relationships. See the section on future research in the final chapter of this study for a discussion of the implications of these results.

#### *Summary of Behavioral Engagement*

These results suggest that the structure of educational scale – enrollment size and participation in an SLC – matter for behavioral engagement in school only when we ignore the effects of school climate that are often assumed to come with these structures (namely, academic press and the personalization of teacher-student relationships). The

Table 4.40

Mediation of the Relationships Between Small Learning Community Quality and Students' Behavioral Engagement by School Climate

	<b>Model 4: Control Model</b>	<b>Model 5: School Climate</b>	<b>Model 6: SLC Quality</b>
(Constant)	-0.039	-0.014	-0.049
Female	0.023	0.018	0.018
Racial Minority	0.028	0.026	0.029
Parent's Education	0.067 *	0.064	0.067 *
% Not White at School Applied to Other School	-0.010	-0.014	-0.022
	-0.006	-0.001	0.002
Parent Influence	0.160 ***	0.159 ***	0.160 ***
School Important to Friends	0.033	0.049	0.048
Friends Discuss School	0.111 **	0.123 ***	0.123 ***
Friends Participate at School	0.159 ***	0.160 ***	0.156 ***
Emotional Engagement Gr. 9	0.338 ***	0.335 ***	0.340 ***
Student Body Academic Press		-0.078 *	-0.077 *
Teachers Academic Press		0.022	0.013
Teachers Know Students		0.048	0.048
Enrolled in High Quality SLC			0.073 *
R <sup>2</sup>	0.248	0.257	0.262
F	25.093 ***	20.259 ***	19.301 ***
df	1,766	3,763	1,762
R <sup>2</sup> -change	0.107	0.008	0.005
F-change	107.683 ***	2.869 *	5.344 *

\* p < .05. \*\* p < .01. \*\*\* p < .001.

implications of this pattern of findings will be discussed in the following chapter on implications.

### Summary of Findings

All three aspects of the structure of educational scale examined were significant predictors of how much students like school, after controlling for student background characteristics, school characteristics, parent influence, peer influence, and previous levels of engagement in school. Students in larger contexts – who attend schools with larger enrollment sizes, who do not participate in small learning communities within those schools, and who have more students per teacher – report liking school significantly less than those in smaller educational contexts.

Two dimensions of school climate that are often presumed to be important in small schooling reforms – academic press and the personalization of teacher-student relationships – were also examined and both were found to be significant predictors of students' emotional engagement in school after controlling for all background contexts. As expected, students who experience greater academic press from the student body and from teachers and those who report feeling known by more teachers also report liking school significantly more than those who feel lesser degrees of academic press and personalization of teacher-student relationships.

The primary analyses of this study examine the interactions between these two dimensions of small schooling reforms – is it really the structure of small scale schooling that matters or is it really the school climate that may or may not be fostered in these reforms that makes a difference in students' emotional engagement in school? The relationship between enrollment size and emotional engagement (which is significant

only after controlling for SLC participation) is fully mediated by academic press, as well as by the personalization of teacher-student relationships. While the relationship between SLC participation and emotional engagement is also fully mediated by the personalization of teacher-student relationships, academic press does not fully explain away the relationship. Neither academic press nor personalization of teacher-student relationships fully mediates the relationship between student-teacher ratio and emotional engagement in school. This pattern suggests that something about participating in an SLC and about having smaller class sizes other than academic press and personalization of teacher-student relationships is related to students' emotional engagement in school.

This study also considered the quality of SLCs as a possible predictor of students' liking of school. Students who participate in a high quality SLC report liking school significantly more than other students; however, there is no significant relationship between participating in a low quality SLC and emotional engagement. Furthermore, the explanatory power of participating in a high quality SLC remains significant even after considering the effects of academic press and the personalization of teacher-student relationships, suggesting that there is something else about high quality SLCs that is related to students' emotional engagement.

The overall picture of how small scale schooling reforms are related to behavioral engagement shows a much looser connection. SLC participation was the only structure of small scale schooling significant related to students' behavioral engagement – student in SLCs participated in significantly more extracurricular activities/sports than those not in SLCs. School enrollment size does not matter in these analyses, even after controlling for SLC participation, despite the findings of other researchers and the concern of

policymakers that small schools restrict opportunities for students to become involved in school activities. The number of students per teacher is also not related to students' behavioral engagement.

Academic press was the only aspect of school climate examined in this study to have any significant relationship to behavioral engagement. Students who reported a higher level of academic press – specifically, from the student body – participated in significantly fewer extracurricular activities/sports. Academic press from teachers and the personalization of teacher-student relationships have no bearing on the behavioral engagement of students in this sample.

However, academic press does not explain away the relationship between SLC participation and behavioral engagement in school. SLC participation remains a significant predictor of behavioral engagement even after controlling for the academic press reported by students; this suggests that there is something about participating in an SLC other than the academic press (and the personalization of teacher-student relationships, which exhibited no significant predictive power) that explains the relationship to behavioral engagement.

Analyses of SLC quality found a pattern for behavioral engagement similar to models of emotional engagement: participating in a high quality SLC is a significant predictor of higher behavioral engagement, though participating in a low quality SLC is not significantly related to participation in extracurricular activities/sports. Like models of emotional engagement, academic press does not fully mediate this relationship between participating in a high quality SLC and behavioral engagement. The implications for these relationships are discussed in the final chapter of this study.

## CHAPTER 5

### DISCUSSION

School reform models that rely on creating smaller schooling environments in the classroom, in small learning communities, and in whole schools continue to be popular – particularly in failing, underfunded urban school districts. While small classrooms and small schools are almost always labeled as research-based reform techniques, the current explanations for the mechanisms rely on a largely unexamined assumption, which this study addresses: is it the changes in school *structures* that are associated with increased student engagement in small scale schooling reforms – or changes in school *climate*? After highlighting the key findings of the study, this chapter will discuss the implications for reform policy and implementation, as well as the implications for future research.

#### Summary of Key Findings

The first research question asks, “*What is the relationship between the structural aspects of educational scale and student engagement?*” All three structural aspects of educational scale – school enrollment, participation in an SLC, and student-teacher ratio – appear to matter. Students in smaller whole schools (regardless of whether or not they are enrolled in SLCs), students enrolled in SLCs, and students in schools with fewer students per teacher all report liking school significantly more than those experiencing larger scaled schooling. Students enrolled in SLCs also participate in significantly more extracurricular activities/sports at school than those not enrolled in SLCs.

These findings support the previous literature that has found school enrollment to be related to students’ emotional engagement in school. A number of reviews of the empirical literature have concluded that smaller schools are unequivocally associated

with greater emotional engagement than larger schools (see Cotton, 1996; [others?]). Students educated in smaller schools have been shown to have better attitudes toward school (Fowler, 1995; Howley, 1994), more positive self-concepts as students (Stockard & Mayberry, 1992), and a greater sense of belonging at school (Fowler & Walberg, 1991; Gregory, 1992; Stockard & Mayberry, 1992).

The lack of meaningful relationship between school enrollment and participation in extracurricular activities/sports counters the argument that comprehensive high schools are needed in order to provide adequate opportunities for engaging in such activities. Previous studies have suggested that larger schools are able to provide more extracurricular opportunities due to their larger (and presumably more varied) student bodies. However, some studies of smaller schools have found that students in small schools participate in extracurricular activities at higher rates than those in larger schools (Cotton, 1996; Fowler, 1995; Stockard & Mayberry, 1992). These researchers have pointed out that small schools need a greater percentage of the student body to participate if sports teams, clubs, and other activities are going to be adequately “staffed” and able to remain functional. Thus, students are more likely to press fellow classmates into participating in order to sustain the desired extracurricular activities. Neither of these arguments – those in favor of large schools or those in favor of small schools – is supported by the results of this study. After controlling for various student background characteristics, including the degree to which students’ friends participate in extracurricular activities, school size is unrelated to students’ participation in extracurricular activities.

That students who participate in SLCs report being more emotionally and behaviorally engaged in school than those who do not contributes to a growing empirical discussion concerning the schools-within-a-school model of reform. Previous research on the SWS model of restructuring large, impersonal schools has relied almost exclusively on case studies of individual schools that have undergone restructuring. Many of these schools are hand-picked to illustrate particular successes – which hardly leads to a representative understanding of how the SWS model looks on the ground at an “average” school. The overarching pattern found in the School District of Philadelphia, however, supports many of the conclusions drawn from these smaller case studies.

Findings related to student-teacher ratios add new conclusions to the literature on class size. Despite being a rough measure of class size, smaller student-teacher ratios still predict greater student enjoyment of school in these analyses – an area of research that has mostly been unexamined in the existing literature. Explanations of why class size is related to academic achievement have focused mainly on differences in teaching styles, students social behaviors, and students learning behaviors (see Finn, Pannozzo, & Achilles, 2003, for a review of each area of research). The results of the analyses in this study suggest that there may be an affective dimension to explanations of why students in smaller classes tend to perform better in school.

The lack of meaningful relationship between the number of students per teacher and participation in extracurricular activities/sports is not particularly surprising – or at least does not contradict previous class size research. The behavioral engagement research concerned with class sizes has tended to focus on other indicators of student

engagement, such as student conduct (Finn et al., 1989; Johnston, 1990; Molnar, Smith, & Zahorik, 1999).

The second research questions digs more deeply into the degree to which these relationships are sufficient in explaining small scale schooling effects: “*Does the climate of the school influence these relationships between school structure and student engagement?*” The simple answer is yes, school climate does appear to influence at least some of the relationships between small school structures and student engagement.

Enrolling in a smaller school and having fewer students per teacher no longer matters when academic press and the personalization of teacher-student relationships are held constant – it does not appear to matter how small the school is or how small the classes are if students are not taught in schools with high academic expectations and supporting relationships with teachers. These results support the criticisms leveled at the Small Schools Movement by educational researchers such as Michelle Fine (2001) and Richard Elmore (1995)

However, the significant effects of participating in a small learning community are not fully mediated by school climate – for neither enjoyment of school nor for participation in extracurricular activities/sports. This suggests that there is something else about schools-within-schools accounting for their positive effects on student engagement. The relative ranking of an SLC within its host school is not only meaningfully related to both emotional and behavioral engagement in school – these effects do not lose their significance after controlling for academic press and the personalization of teacher-student relationships. The possibility that SWS create

hierarchically-organized tracks within a host school is one of the repercussions for restructuring discussed in detail in this chapter.

Given these conclusions, the analyses of this study suggest a number of implications for policymakers, practitioners, and researchers interested in issues of small scale schooling.

### Implications for Reform Policy and Implementation

There are various ways that school districts can embrace the Small Schools Movement, through increasing the number of classroom teachers and adult mentors available to students, building smaller school buildings and restructuring comprehensive high schools into smaller learning communities. There are even multiple models of restructuring available, with career academies, ethnocentric charters, and other organizational themes supported by various districts and proponents of small schools.

Several lessons can be gleaned from the analyses of this study that can and should be applied to the ways in which small scale schooling reforms are put into place. This study was deliberately designed to uncover possible mediators for successful small schools implementation, including the influence of school climate, the possible inequalities put into place by schools-within-schools, and the importance of taking a developmental approach to interventions.

#### *The Importance of Directly Addressing School Climate*

The findings of these analyses clearly demonstrate that small scale schooling reforms cannot afford to ignore school climate. Rather, direct attention must be paid to explicitly altering policies and practices related to aspects of the educational environment beyond altering scale. According to the findings of this study, simply restructuring

schools into smaller learning communities or smaller classes without really creating a small school atmosphere – large schools in small school drag, as Michelle Fine put it – may just be one more in a long list of reforms that do not work.

However that does not necessarily mean that restructuring comprehensive high schools into smaller-scaled learning environments should be abandoned. The overarching patterns of meaningful associations found in this study of students' experiences in the Philadelphia School District suggest that scale does not matter without academic press and personalized teacher-student relationships; ethnographic case studies have revealed several educational practices that can be instituted alongside restructuring to encourage a supportive school climate.

For example, Klein (2008) describes the process of learning new pedagogical tools, unlearning deeply-held assumptions about students and teaching, and relearning behaviors that engage students in learning. Her ethnography of the Big Picture Schools' way of restructuring schools focuses on how professional development that centers on these three steps can dramatically alter the way teachers construct the relationships critical to small school success. Patterson and colleagues (2008) describe the many strategies used by teachers and administrators in two schools undergoing a restructuring reform. At the center of these schools' reforms is a desire to democratize the schooling provided to the middle and high school students in attendance. The case study describes new pedagogies (such as action research projects and issues analysis) and interdisciplinary projects that bring teachers and students together in meaningful activities. The work of these and other ethnographers provide invaluable guidance on strategies that can be employed to make sure that restructuring large schools into small

learning communities involves authentically supportive changes to the way teachers, administrators, and students work together.

*The Importance of Monitoring Equality Across Schools-Within-Schools*

The subset of analyses in this study that examined the relationships between small learning community quality and student engagement suggest that the relative quality of a SWS – as compared to other SWSs within the same host school – matters. The mediation models reveal that the relative ranking of one’s SWS matters even when students in the lower-ranked SWSs report experiencing the same degree of academic press and the same quality of teacher-student relationships. This suggests that there is something other than these aspects of climate that accounts for the fact that students who attend a school’s most well-resourced SWSs – those with the best teachers, the best materials, and the best spaces – are more engaged in their schooling. While this particular issue for small scale schooling undoubtedly requires further empirical study, the findings of this study deserve careful consideration by policymakers and practitioners: districts and schools using the school-within-a-school model must be careful not to inadvertently create new structures for tracking students.

Many of the current SWS implementations described in the literature involve some form of explicit sorting of students into thematic SWSs. Rather than creating schools-within-a-school that are indistinguishable from each other – which can prompt problems for establishing new, semi-autonomous identities within the host school – many reformers suggest tying other desired reforms into the SWS design to create separate identities for each SWS. For example, career academies and similar SWS models are often described in the literature as making high school curricula more relevant to a

student's future success (Kemple & Scott-Clayton, 2004; Jordan et al., 2000) – which, in and of itself, is certainly a worthy pursuit.

However, schools with career academies often include one SWS that is “college prep” (sometimes called “Liberal Arts” or “Arts and Sciences”; see Shear et al., 2008 and Conchas & Clark, 2002 for examples). The decision to offer one SWS focused on advanced academic work for students preparing to go to four-year colleges structures the high school experiences into a de facto sorting house. Teachers who have skills and experience as instructors of college-preparatory classes, such as AP level courses, can become concentrated in these tracks, draining college mentors from other SWS. The courses offered and sometimes even required in a “Liberal Arts” SWS are those necessary for competitive college admissions. When career academies in the same school do not require the same courses, not only are students sent a message about what they are expected to do (and not be able to do) after high school, they are also constrained from having sufficient qualifications for acceptance to a four-year college.

Care should be taken within schools and within school districts to make sure that students receive equal opportunities to succeed – and that the support being given to students in different programs meets their needs, regardless of the program of study. If monitoring does not happen, the school cannot know whether it is doing more damage than intended to students who are not enrolled in the “best” SWSs within the host school.

#### *The Importance of a Developmental Approach to Interventions*

Including measures of student engagement upon entering high school as a control in these analyses allowed greater confidence in attributing effects to the appropriate aspects of the educational context: parents, friends, schooling – and the students

themselves. The results support previous educational research grounded in human development stage-environment fit theories that advocate for interventions in early years of students' development. Stage-environment fit theory (Eccles & Midgley, 1989; Eccles et al., 1993) suggests that negative behaviors in children and youth arise when their needs are not adequately met by the resources and opportunities afforded in their environments – including school. The theory includes an emphasis on early adolescence, when these changes often first appear for a large segment of youth, as well as the summative effect of lack of fit between youth and environment. It is perhaps no surprise then that students' engagement levels upon entering high school are by far the strongest predictors of tenth grade engagement.

However, none of this precludes high school reforms from mattering. Effect sizes of school factors may have been small in this study, but they were still significant in building a statistical understanding of how to predict which students are engaged and to what degree. Students experience a multitude of ecological contexts over the course of their development – home life, peer groups, personal history, and others; schools are only one of many influences. That each aspect of that schooling should have a relatively small individual effect on students should not be surprising.

In order to capitalize on this information, school reformers should think of the ways that the restructuring of comprehensive high schools can be built in to K-12 pipelines. What pieces of educational policy will be aimed at keeping students engaged in middle school – and through the transition to high school? How can the smaller scaled environments at the high school level be connected to students before they are even in attendance at those schools?

Some career academies and small schools of choice use recruitment exercises in which current students and staff make presentations to middle school students (see Boston Public School District, 2009). Perhaps these sort of activities could be expanded into fuller, more welcoming bridging exercises to engage incoming students and introduce them to the supportive atmospheres to be expected at the new small schools of their high school years. Building opportunities for eighth graders to become more deeply aware of their high school's academic expectations and personalized relationships may keep them from beginning to disengage before stepping in the door. Many urban districts experience a great degree of student disengagement in the form of dropping out altogether during the transition from middle school to high school (e.g., Boston, see Hamilton et al., 2006; Philadelphia, see Neild & Balfanz, 2006); perhaps showing students early on that high school does not have to be an anonymous, unsupportive place might stall that process, if not prevent it altogether.

Restructured high schools might also consider creating summer bridge programs, similar to college programs for students before entering freshman year. The idea is to give the students who are most vulnerable of becoming lost in the crowd once the school year begins a chance to become engaged in an even smaller and more supportive atmosphere before that can happen. Students have a chance to connect with new peer groups, bond with new teachers, and navigate the new expectations and routines of high school without the pressure of the official academic year.

Another outreach possibility would be to focus on involving the newly smaller scaled school in the community. Marketing the new ways of doing business might help parents, students, and other stakeholders have greater faith in their local high schools,

forestalling disengagement from schools as a relevant institution for personal growth. While most large school districts involved in small scale schooling reforms include this information on searchable school directories on their websites (e.g., Chicago Public Schools District's website) and offer various "High School Fairs" that invite community members to come and learn more about the schools, this requires a very active decision on the part of community members to get to know the reform schools. Schools might use a more aggressive outreach approach, such as the community outreach of the Boston Public School District's, which hosts events at various neighborhood locations to distribute information in addition to open houses at the schools themselves (Boston Public School District, 2009).

Of course, implementation of these and other pipeline strategies takes coordinated effort, funding beyond the mere "necessities," and a willingness to try something new long enough to be able to see results. But the relative size of the effects for students' level of engagement upon entering high school, combined with previous literature on student disengagement as they move through the system, suggests that such attention is necessary. Dedicating resources to a pipeline that not only narrows the gaps that students can fall through, but also actively and creatively works to build student engagement at critical junctions is imperative to reform success.

#### Implications for Future Research

In addition to the very real implications for the successful implementation of small scale schooling reforms, the findings of this study suggest a number of areas that would benefit from future empirical research.

### *Additional Student Outcomes and Aspects of School Climate*

The analyses included in this study are limited in scope to two measures of student engagement in school and two aspects of school climate. Replication of these analyses with other datasets would confirm the findings of this study; furthermore, the use of additional datasets would allow measures of student outcomes and school climate not available in PELS to expand upon these results.

Further examination of student engagement would help determine the bigger picture of how to keep students from disengaging from high school. This study uses one measure of behavioral engagement – participation in extracurricular activities/sports – but there are many others that may or may not have the same relationships with the structure and climate of size. Absences from school, cutting class, completing homework, and suspensions/expulsions, are all possible indicators of students' behavioral engagement in school that could be used in further analysis of the data at hand, as well as additional datasets. Additional indicators of students' emotional engagement could include school pride, self-identity as a “good” or “bad” student, and satisfaction with one's schooling.

Cognitive engagement was not modeled in this study due to the insufficient validity and reliability of the only composite measure available; however, other datasets that include measures of student effort could be used to examine whether school climate mediates the effects of small scale schooling. The mediation of small schooling effects on students' emotional and behavioral engagement by school climate in this study offers a compelling case for examining these relationships in future analyses.

Of course, there are also student outcomes beyond engagement in school that should also be examined in light of these reforms. Previous research has found a

significant association between small schools and student achievement, as well as between small class sizes and student achievement: are those relationships explained by school climate? Student persistence to a high school degree is also particularly important to examine, given the fact that high incidences of student drop-out is often one of the key failures that prompts school districts to restructure their schools. How is this outcome related to the structure and climate of small scale schooling? Analyses shouldn't stop at high school completion, though – students' post-high school aspirations, preparations, and behaviors are another set of student outcomes that should be examined in relation to small scale schooling.

In addition to expansion of the student outcomes examined, there are also additional aspects of school climate that should be investigated as possible mediators in small scale schooling reforms. Building upon the findings concerning academic press, course offerings in more advanced subjects, such as advanced placement courses and upper-level math and science classes, may be related to the relationships between small scale structures and various student outcomes. The relevance of coursework to students' futures is a common cornerstone of small scale schooling. Teacher pedagogies (e.g., lecturing, class discussion, small group work) may also factor into these relationships, particularly for small class sizes supposedly enable more personalized instruction.

The expansion of the analyses in this study to include additional student outcomes and measures of school climate will broaden our understanding of whether and when small scale schooling reforms can be effective in reversing comprehensive school failures.

*Schools-Within-Schools As Structures of Inequality*

A subset of the analyses in this study suggest that the schools-within-a-school model of restructuring can create structures that offer students varying qualities of education – and that this relative quality matters for student engagement. Educational researchers have brought up the possibility that cutting corners during implementation might very well lead to diminished returns (Raywid, 1996; Elmore, 1995). A number of studies have begun to question whether small schools, including schools-within-schools, really offer a more level playing field than large comprehensive high schools. Iatarola et al. (2008) examined differences across students attending small schools in New York City and those “left behind” in the City’s large comprehensive high schools. Their analyses found little segregation of students needing special attention, though small schools did offer greater resources to their students (having higher per-pupil expenditures and more teachers per student). Ready and Lee (2008) spent several years conducting an ethnographic study of the stratification amongst SWSs at five SWS high schools. Their analysis found that the SWS within these five host schools were highly stratified by student race/ethnicity, social class, and academic performance.

However, the data available to empirically examine this pattern of stratification has largely been in the form of ethnographic observations or comparative case studies within a single district, which cannot describe widespread patterns across various implementation models. The key issue at hand for designing such studies is the lack of quantitative data available on SWS participation and quality (see Lee, Ready, & Johnson, 2001). National datasets on secondary education collected by the National Center of Educational Statistics do not include sufficient information to examine issues of SWS

inequalities. That National Education Longitudinal Study of 1988, High School and Beyond, and the National Household Education Surveys do not include any indicator of schools-within-a-school, at either the student- or school-level.

The Education Longitudinal Study of 2002 did ask students about their high school track (general, college preparatory, or vocational) and their participation in special programs (such as career academies or the International Baccalaureate Program), but there is no indication of whether these constitute a school-within-a-school or general student body programs. The administrator at each school included in the sample was asked whether the school was a “public magnet school (e.g., whole school, magnet program, school within a school),” but this single indicator did not separate out schools-within-schools from whole schools participating in magnet programs school-wide.

The Schools and Staffing Survey or 2003-2004 does include an indicator of which schools organize students into small groups such as “houses” or “families” – however, this dataset does not include student-level data nor does it parse the data out by each school-within-a-school of the host school. At best, it can be used to describe differences between schools that host SWSs and those that do not. While this is certainly important information that should be used in further analyses, the data do not allow for any examination of within-school tracking by SWSs.

Studies of individual district’s implementations of SWSs tend to be tied to foundation reporting requirements. For example, the American Institutes for Research, SRI International, and Fouts and Associates have been examining the results of the small schools campaign funded by the Bill and Melinda Gates Foundation for years, resulting in well over 100 reports and updates. By tying evaluations of SWS effects to start-up

funding from foundations, school districts limit their ability to examine the long-term effects of restructuring into SWSs. Although the lessons learned from the more rigorous, comparative evaluations are certainly valuable, collecting student-level data as tied to their respective SWSs in routine school district records would allow the scope of these evaluations to expand across both time and perspectives. Access to this kind of data would allow for the replication of foundation-sponsored studies and might invite creative scientific advances from independent scholars.

Further investigation of the structures of inequality erected through restructuring comprehensive high schools into schools-within-schools is necessary, based on both the growing body of research in this area and the analyses of this study. Accomplishing this will require measures of student-level participation in these organizational structures, as well as greater descriptions of SWS characteristics, in both national datasets and local school district records. This will be a particularly important area of small scale schooling reforms to monitor as the model continues to be implemented in school districts already plagued by inequality.

#### *Relationships Between School Climate and School Culture in Small Scale Schooling Reforms*

One of the key limitations of this study is that it stops short before examining how the various school contexts included in analyses come to be. Analyzing school climate has the benefit of allowing widespread patterns across a large number of schools to come to light; however, analytical descriptions of these patterns do not include the school cultures – the shared values, norms, and routines – that bring about these contexts.

Future research into the possibilities afforded by small scale schooling (and the pitfalls to be avoided by these reforms) should build upon both the current examinations of widespread patterns and the deep ethnographic study of particular school cultures – not only to further understand of each, but to begin to build empirical bridges between the two. How do particular school cultures lead to school climates that are conducive to student engagement? What cultural values and practices must already be in place before the conversation from large, comprehensive high schools to schools-within-a-school in order to support positive reform changes? Are there cultural shifts that can occur in large scale schooling that mimic the results found in studies of small scale schooling? There is a wealth of knowledge to be gained about the importance of schooling scale and the ways in which it works that can only be accessed by examining school contexts in multi-method ways. This is an area of academic research that needs to be developed if we are to begin to make small scale schooling reforms more effective and efficient.

#### *The Role of School Choice in Small Scale Schooling Reforms*

Given the strong possibility that schools-within-schools can easily act as a mechanism of segregation and stratification, further investigation into the role school choice plays in small scale schooling reforms is warranted. The popularity of instituting both career-themed and liberal arts-themed schools-within-schools alongside each other when converting comprehensive high schools may very well re-create formal structures for reinforcing existing lines of inequalities across socioeconomic status. When students are given the option to choose their small learning community – either within a given school or even across districts – it can be easy to assume that students are sorting themselves in an appropriate manner: those who desire a future career in medicine

gravitate towards SLCs heavy on biology and chemistry; those who want school to be over quickly to start full-time work gravitate towards vocationally-themed SLCs.

As part of their ethnographic study of stratification by SWSs, Ready and Lee (2008) spoke at length with teachers about the sorting mechanisms involved in their schools and questioned students about their motivations for choosing particular SWSs. Both students and teachers saw the segregation of students into SWSs as the natural outcome of students' rational decision-making process – they chose the schooling environment that was the best fit for their motivations.

Clearly changing the stratification in such schools will depend greatly on changing the school culture from accepting any results of choice as appropriate to one where students and teachers really question the role of schooling in determining students' futures. Under what circumstances are students likely to exercise these stratifying choices? What is the influence of parents and peers on the self-selection into particular SLCs? What can teachers and administrators do to ensure equality in academic offerings across SWS – and how do policymakers and advocates for school choice and those who see the results of this choice as problematic come together to define structures that create the best chances for all students, regardless of students' backgrounds and motivations?

Determining the extent to which these cultures are malleable and the strategies for changing them will require further study, using both quantitative and qualitative methods. Examination of patterns across large samples of school contexts could reveal the manner and degree to which stratification across small schools appears to interact with school choice policies, parents and students decisions to go out of their way for small scale schooling, and teachers' attitudes about how school choice is reflected in their ability to

teach their students. Further qualitative investigation could build an empirically-backed understanding of why some small schools re-create structures of inequality while others create improved chances for those most in need; they could also aid in building a set of best practices for preventing stratification in districts with small schools of choice and for intervening once schools and districts find segregation across “chosen” learning communities.

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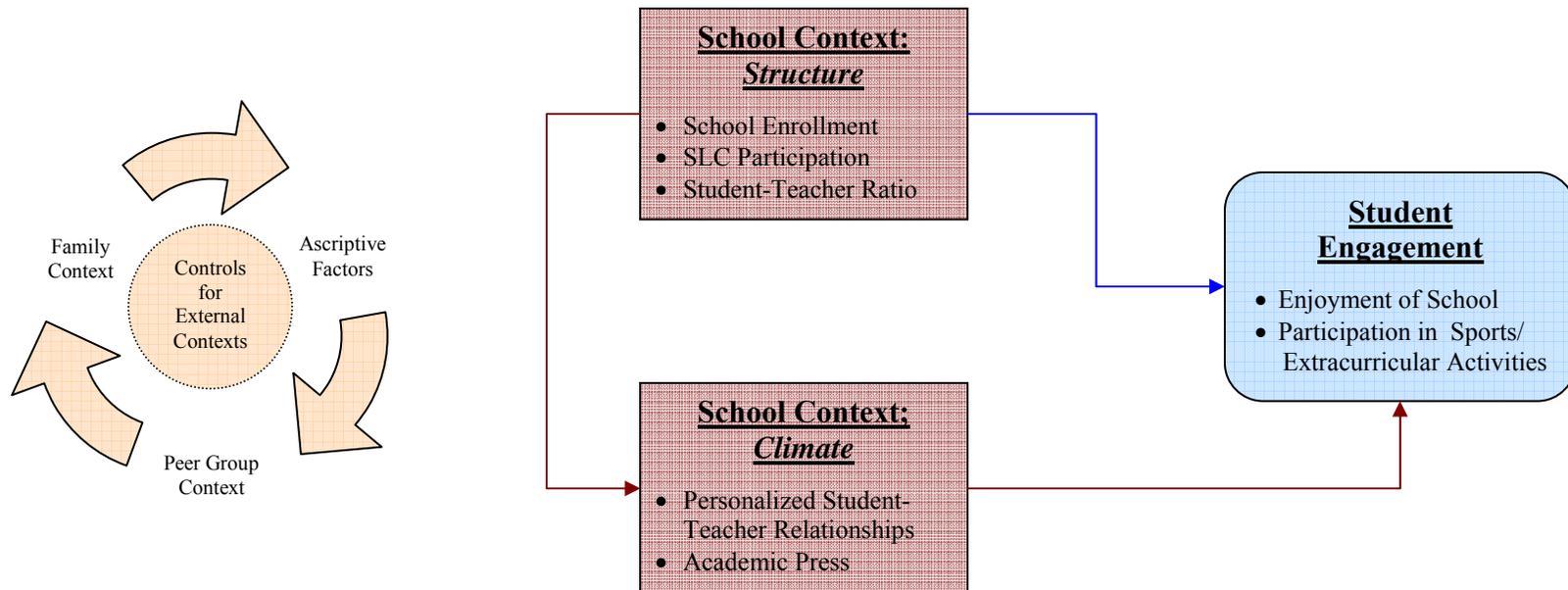
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## APPENDIX A

## CONCEPTUAL MAP OF

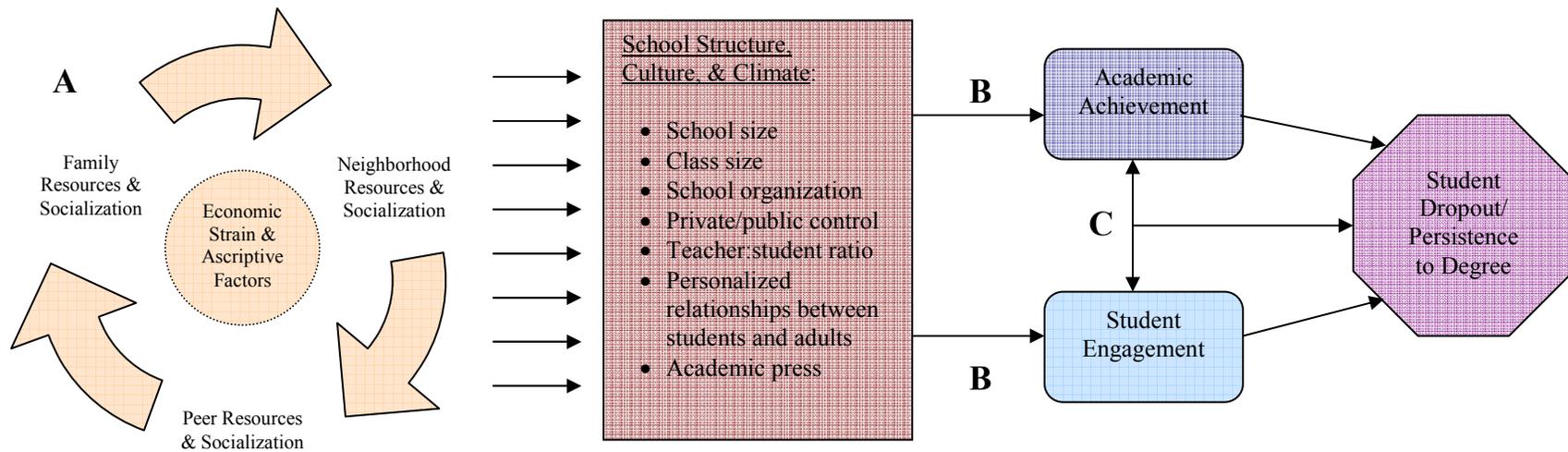
## SCHOOL STRUCTURE AND CLIMATE IN AN ECOLOGICAL UNDERSTANDING OF SCHOOL REFORM

**Research Questions:**

1. *What is the relationship between the structural aspects of school size and student engagement?*
2. *Does the climate of the school influence these relationships between school structure and student engagement?*

APPENDIX B  
 CONCEPTUAL MAP OF

THE MECHANISMS OF SCHOOL ENGAGEMENT AND THE POSITION OF SCHOOLS



**A** *Cognitive Evaluation Theory  
 & Social Control Models*

**B** *Participation-Identification Models*

**C** *Frustration-Self-Esteem Model*

APPENDIX C  
CONCEPTS, CONSTRUCTS, AND VARIABLES

<b>Concept</b>	<b>Construct</b>	<b>Variable</b>	<b>Variable Name</b>
Student Engagement	<i>Behavioral Dimension</i>	How often student is tardy/absent	[STardy]
	<i>Cognitive Dimension</i>	Student's expectations for graduating college	[SExpect]
	<i>Emotional Dimension</i>	Difference between desired and expected education	[SDissnance]
Ascriptive Factors	<i>Race/Ethnicity</i>	Student's Race/Ethnicity	[SRace]
	<i>Sex</i>	Student's Sex	[SSex]
Family Context	<i>Parent's Behavioral Influence</i>	Parent involvement at school	[PInvolved]
	<i>Parent's Cognitive Influence</i>	Parent's expectations for student graduating college	[PExpect]
	<i>Parent's Emotional Influence</i>	Parent's satisfaction with student's academics	[PSatisfied]
	<i>Parent-Student Relationship</i>	Frequency of parent-student discussion of school	[PSDiscuss]
	<i>School-related Cultural Capital</i>	Parent's highest level of education	[PEdLevel]
Peer Group Context	<i>Friends' Behavioral Engagement</i>	Frequency of academic discussions with friends	[FSDiscuss]
	<i>Friends' Cognitive Engagement</i>	Number of friends who think grades are important	[FGrades]
School Context	<i>Student Body Composition</i>	Percentage of the student body not White	[SchRace]
		School Enrollment	[SchEnroll]
	<i>Educational Scale</i>	Student participation in a small learning community	[SSLC]
		Student/Teacher Ratio	[STRatio]
		Teacher academic expectations of students	[TAcExpect]
	<i>Academic Press</i>	Students at school feel academics are important	[SBAcImp]
		Student was challenged in class	[SChallenged]
	<i>Personalized Relationships</i>	Number of teachers who know student's name	[SKnown]

APPENDIX D  
DATA DICTIONARY

**[STardy]**      **Behavioral Dimension of Student Engagement**  
 Dependent Variable, student-level  
 Data Source: PELS – Student Wave 4  
 Survey Questions: “During the past school year, what sports did you play?”  
 “Which [other extracurricular activities] were you involved in?”

**Original Values:** Multiresponse

Variable Construction: Values for the two survey questions were summed.

**[SEffort]**      **Cognitive Dimension of Student Engagement**  
 Dependent Variable, student-level  
 Data Source: PELS – Student Wave 4  
 Survey Question: “How often did you try as hard as you could in [NAME OF MATH CLASS]?”

---

**Original Values**

---

Almost Every Day	1
Sometimes	2
Rarely	3
Never	4
Don't Know	5
Refused to Answer	6

---

**Recoded Values**

---

Never	1
Rarely	2
Sometimes	3
Almost Every Day	4
Don't Know	88
Refused to Answer	99

---

Survey Question: “Do you strongly agree, agree, disagree, or strongly disagree that you worked hard to do your best in school this past year?”

<b>Original Values</b>	
Strongly Agree	1
Agree	2
Disagree	3
Strongly Disagree	4
Don't Know	5
Refused to Answer	6

<b>Recoded Values</b>	
Strongly Disagree	1
Disagree	2
Agree	3
Strongly Agree	4
Don't Know	88
Refused to Answer	99

Variable Construction: Factor scoring; see the Variable Section of Chapter 3.

**[SLikesSch] Emotional Dimension of Student Engagement**

Dependent Variable, student-level

Data Source: PELS – Student Wave 4

Survey Questions: “Do you strongly agree, agree, disagree, or strongly disagree that:

The topics you studied were usually interesting this past year?  
 You usually looked forward to school this past year?  
 You were happy to be at your school?”

<b>Original Value</b>	
Strongly Agree	1
Agree	2
Disagree	3
Strongly Disagree	4
Don't know	5
Refused to answer	6

<b>Recoded Value</b>	
Disagree/Strongly Disagree	1
Agree	2
Strongly Agree	3
Don't know	88
High school/GED or less	99

Variable Construction: Factor scoring; see the Variable Section of Chapter 3.

**[SRace]****Student's Race/Ethnicity**

Control Variable, student-level

Data Source: PELS – Student Wave 1

Survey Question: “Are you of Latino or Latino origin?”  
“And what are your main racial origins?”

<b>Original Values</b>	
White	1
Black	2
Asian	3
Latino	4
Other	14
Don't Know/Refused to Answer	15
<b>Recoded Values</b>	
White	0
Black, Asian, Latino, Other	1
Don't Know/Refused to Answer	99

Variable Construction: The two race/ethnicity survey questions were combined by PELS into a single variable, which was recoded into a dichotomous variable.

**[SSex]****Student's Sex**

Control Variable, student-level

Data Source: PELS – Student Wave 4

<b>Original Values</b>	
Male	1
Female	2
<b>Recoded Values</b>	
Male	0
Female	1

**[PInfluence] Parent Influence**

Control Variable, student-level

Data Source: PELS – Parent Wave 4

Survey Questions: “How satisfied are you with the grades that [TEEN] received during the last school year?” “And how satisfied are you with the amount of effort that [TEEN] put into (his/her) schoolwork?”

<b>Original Values</b>	
Very Satisfied	1
Somewhat Satisfied	2
Somewhat Disappointed	3
Very Disappointed	4
Don't Know	5
Refused to Answer	6

<b>Recoded Values</b>	
Very Disappointed	1
Somewhat Disappointed	2
Somewhat Satisfied	3
Very Satisfied	4
Don't Know	88
Refused to Answer	99

Survey Question: “Would you strongly agree, agree, disagree, or strongly disagree that [TEEN] does NOT like to tell you anything about school?”

<b>Original Values</b>	
Strongly Agree	1
Agree	2
Disagree	3
Strongly Disagree	4
Don't Know	5
Refused to Answer	6

<b>Recoded Values</b>	
Strongly Agree	1
Agree	2
Disagree	3
Strongly Disagree	4
Don't Know	88
Refused to Answer	99

Survey Question: “Would you strongly agree, agree, disagree, or strongly disagree that [TEEN] is willing to show you [his/her] homework?”

<b>Original Values</b>	
Strongly Agree	1
Agree	2
Disagree	3
Strongly Disagree	4
Don't Know	5
Refused to Answer	6

<b>Recoded Values</b>	
Strongly Disagree	1
Disagree	2
Agree	3
Strongly Agree	4
Don't Know	88
Refused to Answer	99

Variable Construction: Factor scoring; see the Variable Section of Chapter 3.

**[PEdLevel] Parent's Highest Level of Education**

Control Variable, student-level

Data Source: PELS – Parent Wave 4

Survey Question: “What is the highest level of education you have completed?”

<b>Original Value</b>	
8 <sup>th</sup> grade or less	1
9 <sup>th</sup> – 11 <sup>th</sup> grade	2
High school	3
GED	4
Technical school	5
Some college	6
2-year college	7
4-year college	8
Masters	9
Doctoral	10
Don't know	11
Refused to answer	12

<b>Recoded Value</b>	
High school/GED or less	1
Technical/Some college/2-year College	2
4-year College	3
Graduate school	4
Don't know	88
High school/GED or less	99

**[FSDiscuss] Friends' Behavioral Engagement**

Control Variable, student-level

Data Source: PELS – Student Wave 4

Survey Questions: “This past school year, how often did you talk with your friends from school about things you learned in school?”  
 “How often did you talk with your friends from school about your grades?”  
 “How often did you study with friends after school?”

<b>Original Values</b>	
Almost everyday	1
Once or twice a week	2
A few times a month	3
Less often	4
Don't Know	5
Refused to Answer	6

<b>Recoded Values</b>	
Less often	1
A few times a month	2
Once or twice a week	3
Almost everyday	4
Don't Know	88
Refused to Answer	99

Variable Construction: Factor scoring; see the Variable Section of Chapter 3.

**[FGGrades] Friends' Cognitive Engagement**

Control Variable, student-level

Data Source: PELS – Student Wave 4

Survey Questions: “How many of the people you hang out with at school think it's important to get good grades?”  
 “How many think it's important to finish high school?”

<b>Original Values</b>	
Most of them	1
Some of them	2
A Few of them	3
None of them	4
No friends at school	5
Don't Know	6

<b>Recoded Values</b>	
None of them	1
A Few of them	2
Some of them	3
Most of them	4
No friends at school	77
Don't Know	88

Variable Construction: Factor scoring; see the Variable Section of Chapter 3.

**[SchRace] Proportion of Student Body Not White**

Control Variable, student-level

Data Source: CCD

Survey Questions: "Total Students, All Grades"

"Total Students, All Grades, White, not Latino – male"

"Total Students, All Grades, White, not Latino – female"

"Total Students, All Grades, White, not Latino – unknown"

**Original Values:** continuous

Variable Construction: CCD creates a variable that sums the "Total Students, All Grades, White, not Latino" from all sex codes. This was subtracted from "Total Students, All Grades" and multiplied by 100 to get the "White, not Latino" proportion of the student body. The reverse proportion was used for this variable.

**[SchEnroll] School Enrollment**

Predictor Variable, school-level

Data Source: CCD

Survey Question: "Total Students, All Grades"

**Original Values:** Continuous

<b>Recoded Values</b>	
Fewer than 1000	1
1000-1499	2
1500-1999	3
2000-2499	4
2500-2999	5
3000 or more	6

Variable Construction: School enrollments were grouped into categories

with a unit gap of 500 students. This is to ensure meaningful differences between values along the variation of the data. The categories also displayed fairly equal distribution across schools.

[SSLC]

**Student Participation in a Small Learning Community**

Predictor Variable, school-level

Data Source: PELS – Student Wave 4

Survey Question: “Were you in a charter or small learning community at [SCHOOL]?”

<b>Original Values</b>	
Yes	1
No	2
Don’t Know	8
Refused to Answer	9
<b>Recoded Values</b>	
No	0
Yes	1
Don’t Know	88
Refused to Answer	99

[STRatio]

**Student/Teacher Ratio**

Predictor Variable, school-level

Data Source: CCD

Survey Question: “Classroom Teacher Count”  
“Total Students, All Grades”

**Original Values:** Continuous

<b>Recoded Values</b>	
Less than 18	1
18-19.9	2
20-21.9	3
22 or higher	4

Variable Construction: Student/Teacher ratios were grouped into categories with unit gaps of two students per teacher. The categories were designed to reflect the consensus in the literature that fewer than 18 students is ideal and the fact that most policies addressing student/teacher ratios or class size recommend 20-25 students per teacher or class; at the same time, the categories maintain a regular unit gap (two students) to preserve ease of

interpretation and to allow the variable to be treated as interval level in analyses.

**[TAcExpect] Teacher Academic Expectations of Students**

Predictor Variable, student-level

Data Source: PELS – Student Wave 4

Survey Question: “At [SCHOOL], was it very true, somewhat true, or not true that:

Most of the teachers expect you to do your best.

Most teachers don’t care if you don’t do your work.

Most teachers don’t really expect very good work.

Most teachers expect that most of their students will go to college.”

<b>Original Values</b>	
Very True	1
Somewhat True	2
Not True	3
Don’t Know	4
Refused to Answer	5
<b>Recoded Values</b>	
Not True	1
Somewhat True	2
Very True	3
Don’t Know	88
Refused to Answer	99

Variable Construction: Factor scoring; see the Variable Section of Chapter 3.

**[SBAcImpt] Students at School Feel Academics Are Important**

Predictor Variable, school-level

Data Source: PELS – Student Wave 4

Survey Question: “At [SCHOOL], is it very true, somewhat true, or not true that:

Students feel it is important to attend all their classes.

Students feel it is important to attend school every day.

Students feel it is important to pay attention in class.

Students feel it is important to do homework.

Students feel it is important to get good grades.”

<b>Original Values</b>	
Very True	1
Somewhat True	2
Not True	3
Don't Know	4
Refused to Answer	5

<b>Recoded Values</b>	
Not True	1
Somewhat True	2
Very True	3
Don't Know	88
Refused to Answer	99

Variable Construction: Factor scoring; see the Variable Section of Chapter 3.

**[SKnown] Proportion of Teachers Who Know Student's Name**

Predictor Variable, student-level

Data Source: PELS – Student Wave 4

Survey Question: “Think of all the teachers you saw in the halls on a typical school day last year. How many of them would know you by name?”

<b>Original Values</b>	
None of them	1
Some of them	2
Most of them	3
All of them	4
Don't Know	8
Refused to Answer	9

<b>Recoded Values</b>	
None of them	1
Some of them	2
Most of them	3
All of them	4
Don't Know	88
Refused to Answer	99

APPENDIX E  
PROGRESSION OF MODELS

<b>Control Model</b>	<b>Structure Model</b>	<b>Climate Model</b>	<b>Mediation Model</b>	<b>SLC Quality Model</b>
Control Variables	Control Variables	Control Variables	Control Variables	Control Variables
	Structure Variables	Climate Variables	Climate Variables	Climate Variables
			Structure Variables	SLC Participation (by Quality) Variables

## APPENDIX F

## COMPARISON OF STUDENTS ACROSS SLC PARTICIPATION AND RELATIVE QUALITY

<i>Control Variables</i>	<b>Not Participating in a Small Learning Community</b>				<b>Participating in a Low Quality Small Learning Community</b>				<b>Participating in a High Quality Small Learning Community</b>			
	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>SD</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>SD</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>SD</b>
Parents Education	1	4	1.91	1.07	1	4	1.52	0.72	1	4	1.76	0.82
% Not White at School	38.55%	99.74%	71.09%	17.54%	38.56%	99.74%	82.44%	23.07%	38.55%	99.74%	81.74%	24.08%
Parents Influence	-2.49	1.68	0.12	0.98	-2.71	1.75	-0.20	1.07	-2.77	1.56	0.05	1.06
School Important to Friends	-3.07	0.93	0.14	0.80	-4.49	1.01	-0.15	1.01	-4.76	0.98	0.21	0.89
Friends Discuss School	-1.78	2.71	0.11	0.89	-1.84	2.27	-0.12	1.03	-1.86	2.40	0.02	1.00
Friends Participate at School	1	4	2.87	0.95	1	4	2.81	0.96	1	4	3.07	1.00
Emotional Engagement Gr. 9	-2.49	2.18	0.32	1.02	-3.46	2.03	-0.09	0.96	-3.10	1.91	0.09	0.98
Behavioral Engagement Gr. 9	0	3	0.62	0.83	0	3	0.36	0.64	0	3	0.52	0.78
<i>Predictor Variables</i>												
School Enrollment	1	6	2.92	1.51	1	6	3.96	1.48	1	6	3.89	1.61
Student-Teacher Ratio	16.50	36.30	22.03	3.50	16.50	36.30	20.93	2.45	16.50	25.60	20.88	2.22
Student Body Academic Press	-2.47	1.70	0.23	0.92	-2.61	1.88	-0.10	0.94	-2.58	1.77	-0.05	1.06
Teachers Academic Press	-2.94	0.99	0.15	0.88	-4.04	1.10	-0.08	1.02	-3.70	1.10	0.21	0.88
Teachers Know Students	-1.50	1.42	-0.18	0.98	-1.50	1.41	-0.01	1.00	-1.52	1.47	0.04	0.97