Educ Psychol Rev
DOI 10.1007/s10648-015-9319-1

REVIEW ARTICLE

School Climate: a Review of the Construct, Measurement, and Impact on Student Outcomes

Ming-Te Wang[1] · **Jessica L. Degol**[1,2]

Abstract The construct of school climate has received attention as a way to enhance student achievement and reduce problem behaviors. The purpose of this article is to evaluate the existing literature on school climate and to bring to light the strengths, weakness, and gaps in the ways researchers have approached the construct. The central information in this article is organized into five sections. In the first, we describe the theoretical frameworks to support the multidimensionality of school climate and how school climate impacts student outcomes. In the second, we provide a breakdown of the four domains that make up school climate, including academic, community, safety, and institutional environment. In the third, we examine research on the outcomes of school climate. In the fourth, we outline the measurement and analytic methods of the construct of school climate. Finally, we summarize the strengths and limitations of the current work on school climate and make suggestions for future research directions.

Keywords School climate · School environment · Measurement · Behavioral development · Socioemotional development · Academic performance

School climate has been recognized as an opportunity to enhance student achievement and reduce problem behaviors and dropout rates. Climate shapes the quality of the interactions of all students, teachers, parents, and school personnel, and reflects the norms, values, and goals that represent the broader educational and social missions of the school (National School Climate Council 2007). School climate represents virtually every aspect of the school experience, including the quality of teaching and learning, school community relationships, school organization, and the institutional and structural features of the school environment. Thus, school is more than an academic learning context; it is also a place where children learn how to

✉ Ming-Te Wang
MTWANG@pitt.edu

Jessica L. Degol
jld91@pitt.edu

[1] University of Pittsburgh, 230 South Bouquet Street, Pittsburgh, PA 15260, USA

[2] Pennsylvania State University-Altoona, Altoona, PA, USA

Published online: 23 June 2015

form positive social relationships, gain independence, and develop emotionally, behaviorally, and cognitively (Cohen et al. 2009a; Wilson 2004). The value and insight that the study of school climate can bring to the education system is clear (Thapa et al. 2013). However, to better understand the processes through which school climate promotes positive student development, a systematic review of how researchers are defining, measuring, and studying the construct is needed.

This article aims to evaluate the existing literature on school climate, highlighting the strengths, weakness, and gaps in previous approaches to the research. Our goal is not to review these articles in detail, but rather to suggest how insights gained from them can contribute to our understanding of what school climate is and how it can be further advanced through research. The article is organized into five sections. In the first, we describe the theoretical frameworks that have been used to justify the selection of school climate indicators and the processes through which school climate impacts student outcomes. In the second, we provide a breakdown of the four domains that make up school climate. In the third, we examine research on the outcomes of school climate. In the fourth, we outline the measurement and analytic methods of the construct of school climate. Finally, we summarize and highlight the strengths and limitations of the current work on school climate and make suggestions for future research directions.

Defining School Climate

The importance of school climate was first recognized over 100 years ago when Arthur Perry, a New York City school principal, published *Management of a City School* (1908). In his book, Perry acknowledged the need to provide students with a quality learning environment and encouraged fellow administrators to make it the "duty of the school to provide something more than mere 'housing'" (Perry 1908, p. 303). Yet school climate did not enter the realm of empirical research until the early 1960s when Halpin and Croft (1963) developed the Organizational Climate Descriptive Questionnaire and began systematically studying the effects of school organizational climate on student learning and development. Over the last several decades, researchers and educators have come to realize that the initial conceptualization of school climate was overly simplistic, and now recognize it as a multidimensional construct.

To this day, there is a lack of consensus on the actual definition and parameters within which to measure school climate, resulting in the term *school climate*, often being used to encompass many different aspects of the school environment (Cohen et al. 2009b; Johnson and Stevens 2006; Zullig et al. 2010; Thapa et al. 2013). As there is no universal definition of school climate, researchers practice a great deal of discretion in how they characterize and describe school climate. Some choose to adopt a more concrete and fitted definition, while others choose a more abstract and theoretical one. For example, many researchers conceptualize school climate as the shared beliefs, values, and attitudes that shape interactions between students and adults and set the parameters of acceptable behavior and norms for the school (Brookover et al. 1978; Emmons et al. 1996; Esposito 1999; Kuperminc et al. 1997). Freiberg and Stein (1999) used a more abstract definition when they defined school climate as "the heart and soul of the school. It is about that essence of a school that leads a child, a teacher, and an administrator to love the school and to look forward to being there each school day" (Freiberg and Stein 1999, p.11). However broad or narrow

the definition, the parameters of school climate must be solidified to better understand the effectiveness of school climate features on student development.

The multidimensionality of school climate is represented in the research literature, which defines school climate in four ways: academic, community, safety, and institutional environment (see Fig. 1). These four broad categorizations provide one of the most comprehensive conceptualizations of the quality of the school climate. *Academic* climate focuses on the overall quality of the academic atmosphere, including curricula, instruction, teacher training, and professional development. *Community* stresses the quality of interpersonal relationships within the school. *Safety* represents the degree of physical and emotional security provided by the school, as well as the presence of effective, consistent, and fair disciplinary practices. Finally, *institutional environment* reflects the organizational or structural features of the school environment. Collectively, these four dimensions encompass just about every feature of the school environment that impacts student cognitive, behavioral, and psychological development.

School climate is malleable and can serve as a target for intervention. A crucial goal for effective school reform is to identify features of the school environment that can be altered to improve student outcomes. Currently, many school reform initiatives explicitly or implicitly focus on improving academic and social climate as a prelude to enhancing student academic and psychological wellbeing (Borman et al. 2003; Durlak et al. 2011). For example, the Comer School Development Program, which improves the social climate of the school by building more cooperative relationships among teachers, parents, and administrators, exemplifies this approach. The program has resulted in more positive student perceptions of the academic climate and shown gains in math and reading scores (Cook et al. 2000).

Characterizing school climate as multidimensional and malleable improves our understanding of the complexity of student experiences in school, and informs the design of targeted and nuanced interventions. More precise interventions can pinpoint features of climate that have the most robust connection to student outcomes, establish how altering features of the climate may enhance others, and identify for which subgroups of students interventions are most effective. In order to achieve this, we need a better understanding of the theoretical justification for the selection of specific school climate indicators and their impact on student outcomes.

Theoretical Framework for Studying School Climate and Its Relation to Student Outcomes

In this section, we include six theories and discuss theoretical support for the inclusion of multiple domains and dimensions of school climate. We conclude by summarizing the similarities and differences between these theories, particularly focusing on the dimensions of school climate and the student outcomes most relevant to each, as well as the developmental period during which they have the most prominence.

Bio-Ecological Theory

Bronfenbrenner's (1979) bio-ecological framework posits that human development takes place progressively through more complex reciprocal interactions between an active, bio-psychological human organism and the persons in its immediate environment. Proximal

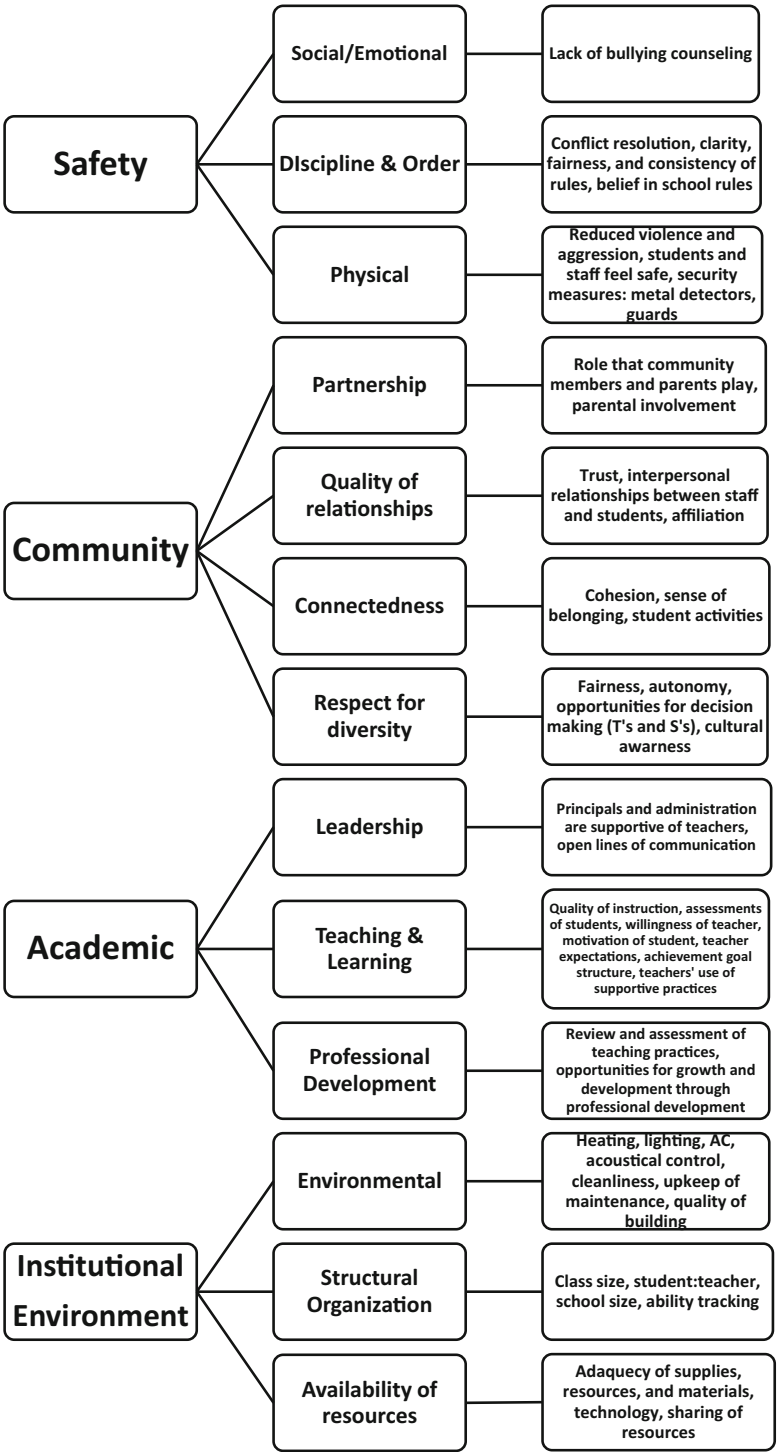

Fig. 1 The conceptualization and categorization of school climate

processes are the interactions between the individual and the many bio-ecological systems in which they are rooted (Bronfenbrenner 1979). One of the defining characteristics of school climate research is the way individual behaviors are shaped by the school environment, and the very foundation of bio-ecological theory is the multidimensional nature of the environmental contexts in which each child is embedded (Koth et al. 2008; Kuperminc et al. 1997; Wang 2009). Shifting from the distal layers of the school context to the more proximal processes, bio-ecological theory asserts that everything from the conditions and structure of the outside building, to the disciplinary and curriculum practices of the school, to the interpersonal relationships between students and teachers will influence student development (Way et al. 2007). For these reasons, bio-ecological theory is one of the theoretical pillars of school climate research. Its emphasis on multicontextualism, proximal processes, and growth over time aligns with the notion that multiple domains and features of the school environment can interact to impact student development across different age periods.

Risk and Resilience Perspective

The risk and resilience model focuses on delineating protective factors in a child's environment that foster adaptive adjustment and minimize negative outcomes in the presence of risk (Rutter 2006; Zimmerman and Arunkumar 1994). School is one of the most salient developmental contexts to consider risk and protective factors (Chang and Le 2010; Hawkins and Catalano 1990; Juvonen et al. 2006). Risk refers to any influence that increases a child's probability of a negative outcome, such as growing up in poverty or experiencing discrimination. Resilience can be thought of as the accumulation of developmental assets (e.g., positive relationships with teachers, academically challenging instruction) upon which children can draw to buffer the negative effects of adversity in their lives (Brooks 2006; Fraser et al. 1999). Given the way that risk and protective factors interact and operate within various ecological settings, positive student development varies according to the unique combination of a student's personal attributes and their school environment (Bowen et al. 2008; Hopson and Lee 2011). Similar to bio-ecological theory, the risk and resilience model is non-specific to any particular dimension of school climate or developmental period.

Attachment Theory

Attachment theory constitutes the psychological connectedness one person has to another, specifically between infant and mother (Ainsworth 1989; Bowlby 1969). When provided with consistent emotional support and a safe environment, children are able to become more self-reliant and feel more comfortable taking risks and exploring the world (Pianta and Hamre 2009). While the first 18 months of life are often the major focus of attachment theory (Ainsworth 1989), attachment bonds are present in relationships across the lifespan (Hughes and Akin-Little 2007). However, given attachment theory's emphasis on early patterns of attachment predicting later development, the theory may have greater relevance during the early years of schooling. One of the first opportunities to form attachments outside the family unit is during the transition to school, when children can bond with peers and teachers (Birch and Ladd 1997; Hamre and Pianta 2001). Early relationships with peers and teachers pave the way for later academic and behavioral performance. Because attachment theory focuses on the importance of building strong social bonds, it is most applicable to the community domain of school climate, emphasizing how the quality and frequency of relationships within the school influence child development.

Social Control Theory

According to social control theorists, delinquency results from weakened social and cultural constraints. Individuals are prevented from engaging in delinquent acts by four social bonds: attachment, commitment, involvement, and belief (Agnew 1993; Hirschi 1969). *Attachment* refers to the respect and connection an individual has toward significant people in his or her life. Those with high attachment are less likely to engage in delinquent behavior to avoid disappointing those they care about. *Commitment* refers to an individual's current or future investment in expected activities. Individuals who have an investment in these expected activities face a significant emotional loss if they engage in delinquent activities. *Involvement* refers to the amount of time spent doing various activities which means less time available for delinquent acts. Finally, *belief* refers to how committed an individual is to the moral value system of their society. Those who believe in the rules of their society will be less likely to break them (Agnew 1993; Hirschi 1969; Stewart 2003). As applied to school climate research, social control theory emphasizes the importance of quality academic climates to inspire greater commitment and involvement in educational activities. It also focuses on the quality of the safety and community domains to strengthen students' attachment to the school and belief in the school's moral code. Thus, a strong bond with the school community encourages conformity to conventional norms and decreases the likelihood of deviant behavior.

Social Cognitive Theory

Social cognitive theory illuminates the generative process of meaning and behavior in relation to person and environment (Bandura 1986). Social cognitive theory defines motivation as a goal-directed behavior that is dependent upon context and plays an essential role in behavior (Bandura 1997; Pintrich and Schunk 2002). Specifically, environmental factors influence how people think of themselves and their environments and, in this case, how students view themselves as active learners within the classroom. For this theoretical orientation, school climate impacts student development through the quality of interactions in the academic, community, and safety domains, by instilling high academic expectations, facilitating supportive teacher-student relationships, and maintaining an environment where students feel emotionally safe and secure in taking academic risks. Social cognitive theory is also frequently applied to school climate research when examining the achievement goal structure (Meece et al. 2006; Urdan and Schoenfelder 2006). Goal structure is a prime example of how schools can model and instill motivational beliefs in their students, thereby influencing their academic achievement.

Stage-Environment Fit Theory

Stage-environment fit theory suggests that human behavior, emotions, and cognitions are affected by characteristics of individuals and their environments (Eccles and Midgley 1989; Eccles et al. 1996). The fit between students' psychological needs and their school environment influences their motivation for academic success (Eccles et al. 1993; Roeser and Eccles 1996). Stage-environment fit theory, as a guiding framework for school climate research, is applicable to any feature of the school climate and is most relevant during major school transitions. The transition from elementary school to middle school, for example, is one that

students often struggle with. Research suggests that middle school environments are not congruent with adolescents' increased needs for autonomy, competence, and relatedness (Chung et al. 1998; Eccles et al. 1996; Loukas and Murphy 2007; Osterman 2000). This may contribute to a decline in positive achievement behaviors and motivation. Stage-environment fit theory, therefore, provides a theoretical foundation of how school climate, particularly during school transitions, may or may not support the psychological needs of adolescents, thereby influencing a variety of student outcomes.

Summary

While all six developmental theories stress the importance of developing strong social bonds between teachers and students, they each offer a unique perspective on which features of school climate, and which developmental periods, are most crucial for intervention. Attachment theory, for example, focuses specifically on interpersonal relationship quality as the main determinant of student development and is most relevant during the early years of schooling when nascent relationship patterns are forming. Social control and social cognitive theories emphasize relationship quality as well, but also include safety and academic indicators as important features of school climate. Social control and social cognitive theories are also more pertinent in adolescence than in early childhood. Delinquent behaviors and metacognitive strategies, outcomes of importance for both of these frameworks, not only tend to increase in adolescence but also become more susceptible to peer influences as children age. Bio-ecological, risk and resilience, and stage-environment fit theories are broader, which allow researchers to factor in multiple dimensions of school climate as important predictors of student outcomes. These frameworks are also not specific to any particular developmental period, with the exception of stage-environment fit, which is often used to explain difficulties that arise when students transition from elementary school to the more rigid structures of secondary schools. Selection of a theory to justify the focus of the school climate research, therefore, depends upon the particular research questions of interest, the environmental contexts assessed, the outcomes of interest, and the sample under consideration.

Domains and Dimensions of School Climate

Building upon the six theoretical frameworks, this review focuses primarily on literature related to the four domains and 13 dimensions of school climate: (a) academic (i.e., teaching and learning, leadership, professional development); (b) community (i.e., quality of relationships, connectedness, respect for diversity, partnerships); (c) safety (i.e., social and emotional safety, physical safety, discipline and order); and (d) institutional environment (i.e., environmental adequacy, structural organization, availability of resources). After extensively reviewing the literature, the domains, dimensions, and indicators of school climate were first identified through discussion and consensus among the research team. Initially, 50 of the most recent and highly cited school climate articles were selected to serve as guidelines for classification. Three coders read these articles and created a comprehensive list of indicators pertaining to school climate. The three coders achieved high inter-rater reliability in coding (i.e., $k>0.90$). The original coders then categorized indicators into different dimensions and domains; disagreement over the categorization of certain indicators was resolved by either

discussion or, if no consensus could be reached, indicators were discarded. The remaining indicators were categorized by two new coders. If these raters agreed, no further revision was necessary. If they disagreed, the process was repeated until all indicators were consistently coded as reflecting the four domains and 13 dimensions.

Experts were brought in to ensure the domains and dimensions corresponded to the current construct of school climate. Scholars familiar with school climate reviewed the dimensions and domains on their clarity and construct validity, and identified any important underrepresented or absent areas (McKenzie et al. 1999). We then conducted a comprehensive search for empirical, theoretical, and review papers using several databases, including ERIC, PsycINFO, Academic Search Premier, PsycARTICLES, PsycBOOKS, and Google Scholar. This search was conducted for (a) school climate in general, (b) each of the four domains of school climate listed above, and (c) other related fields of school climate. To verify inclusion of all relevant literature, a follow-up search was run to locate studies published by leading scholars in the field of school climate. Articles that were both qualitative and quantitative in nature and utilized descriptive, correlational, and experimental research methods were included. We finalized a list of approximately 327 references relevant for this review. Of these references, approximately 91 % are empirical studies and 9 % are conceptual or theoretical review papers.

Multidimensionality of School Climate

In the following section, we present the four domains of school climate reflected in the 327 reviewed literature sources, namely, academic, community, safety, and institutional environment. We then describe how the four domains are defined, vary, and overlap.

Academic Climate

The academic domain of school climate, referring to the ways in which learning and teaching are promoted in the school, is perhaps one of the most prominent and significant domains of school climate (Thapa et al. 2013). Academic climate is usually defined using three dimensions: leadership, teaching and learning, and professional development.

Leadership refers to the role that principals and other administrators play in shaping and executing the school's vision through communication and guidance (Leithwood and Riehl 2003). Effective leaders articulate the school's vision to students and staff, inspire everyone to strive toward common goals, show respect for all members of their staff, and express concern about individual feelings and needs. They also make every effort to strengthen the school morale and encourage collaboration and participation from school staff (Grayson and Alvarez 2008; Leithwood and Jantzi 1999; Leithwood and Riehl 2003). The best school leaders also find ways to facilitate open lines of communication between teachers, administrators, and students (Kelley et al. 2005; Waters et al. 2004).

Teaching and learning embodies one of the most salient facets of school climate research. The various methods and instructional practices that teachers employ in their classrooms can strongly impact students' learning experiences (Stefanou et al. 2004). These methods and practices are typically organized as supportive instruction, curriculum, teacher

expectations, and student evaluation. Instructional practices that promote student academic motivation are challenging, hands-on activities that have meaningful real-world applications (Marks 2000; Newmann and Wehlage 1993). Furthermore, effective instructional practices should be modified and tailored to the unique needs and skill sets of individual students and also be aligned with curriculum goals and state standards. The learning process is also influenced by teacher beliefs, expectations, and goal structure (Deemer 2004). Teachers demonstrate their expectations through the academic challenges they present, their endorsement of high academic rigor and performance, and their emphasis on student improvement and progress (Hoy et al. 2006; Roeser et al. 1996). The type of evaluation and feedback provided to students also matters. Using formative assessments, teachers are able to provide constructive feedback to students and can use the opportunity to improve their instructional strategies (Boston 2002).

Professional development refers to the opportunities and programs provided to teachers and staff to cultivate and improve their teaching strategies and curriculum design. High-quality professional development is characterized by several key features. First, the goals of professional development programs should be aligned with the goals of the school as well as state and district standards, so that instructional and evaluative expectations are clear. Second, professional development should focus on core content and model teaching strategies to improve delivery of instructional practices. Lastly, professional development allows for collaboration among teachers, as well as continuous feedback through formative teacher evaluation (Archibald et al. 2011).

Community

Community refers to the quality of interactions between and among members of the school (Battistich et al. 1995; Gottfredson 2001; Gottfredson and Gottfredson 2002; Solomon et al. 2000; Way and Robinson 2003). The community domain of school climate is defined as having four dimensions: quality of interpersonal relationships, connectedness, respect for diversity, and community partnerships.

Q*uality of interpersonal relationships* refers to the consistency, frequency, and nature of the relationships that take place within the school: student-teacher relationships, relationships among students, and relationships among staff members (Barth 2006; Crosnoe et al. 2003; Hopson and Lee 2011). Positive interpersonal relationships are characterized by mutual feelings of support, trust, respect, and caring (Birch and Ladd 1997; Pianta 1999; Wang et al. 2012). Relations among teachers and administrators are important as well. The extent to which teachers and staff effectively communicate, collaborate, and support each other is important for establishing positive interactions and interpersonal relationships.

Connectedness is the psychological state of attachment that students experience when they feel a sense of acceptance, inclusion, and belonging in school. School connectedness takes many forms, such as students' collective views of school attachment and bonding, which reflect the school's ability to cultivate a sense of identification and affiliation among its students and teachers (Brookmeyer et al. 2006; Freeman et al. 2009; MacNeil et al. 2009; Wilson 2004). Connected students consider themselves to be integral members of the school community (McNeely et al. 2002; Osterman 2000; Whitlock 2006).

Respect for diversity refers to the presence of cultural awareness, appreciation, and respect for all (Chang and Le 2010; Esposito 1999; Juvonen et al. 2006). A school that exemplifies respect for diversity holds all members, regardless of ethnicity, gender, sexual orientation, or religious affiliation, to the same standards and principles (Mattison and Aber 2007). Additionally, teachers who cultivate culturally sensitive classrooms are those who encourage student interests and autonomy, provide students opportunities for decision-making, and show appreciation for student opinions (Weinstein et al. 2003).

C*ommunity partnership* refers to the role that parents and other community members play in the school setting. A strong community partnership is usually characterized by parental involvement in school, communicating with teachers and other personnel, and attending events like parent-teacher conferences or school performances (Hill and Taylor 2004). A strong school-community partnership is inviting to parents and community members and promotes the development of mentoring programs, business partnerships, and safety patrols that can have a positive effect on student achievement and behavior (Epstein et al. 1997; Sheldon and Epstein 2002a, b, 2005).

Safety

School safety refers to the physical and emotional security provided by a school and formed by its members, along with the degree of order and discipline present (Devine and Cohen 2007; Morrison et al. 1994; Wilson 2004). The safety domain of school climate is most commonly defined in three dimensions: physical safety, emotional safety, and order and discipline.

The *physical safety* of a school refers to the degree to which violence, aggression, and victimization are present and what measures are taken to ensure the safety of its members (Booren et al. 2011; Gottfredson et al. 2005; Osher et al. 2010). Strategies to eliminate physical violence (e.g., fighting, theft, assault) include implementation of positive behavioral supports and active classroom management techniques, use of security guards, and effective disciplinary practices (Frey et al. 2009; Mehta et al. 2013a; Osher et al. 2010).

Emotional safety is described as the presence of caring and supportive staff, availability of counseling services for students struggling with depression or other mood disorders, and an absence of verbal bullying or harassment (Kuperminc et al. 1997, 2001; Swearer et al. 2010). Members of an emotionally safe environment are able to interact and communicate efficiently with a wide range of people. They can express their feelings and share their opinions without fear of antagonization. In addition, school-based mental health services cultivate a school climate characterized by greater psychological health by reducing a range of behavioral and emotional problems throughout the student population (Bruns et al. 2004; Rones and Hoagwood 2000).

Order and discipline refers to the degree to which students subscribe to school rules, the consistency and fairness of discipline practices, and the manner in which acts of incivility or disorder are handled. Gottfredson and colleagues (2005) characterized disorderly schools as having a high incidence of delinquent acts committed by students against their peers and teachers. The degree to which students believe in school rules and whether they feel these rules are implemented fairly and consistently indicate the degree of order and discipline present (Rutter et al. 1997; Sugai et al. 1998; Stewart 2003; Way 2011; Welsh 2000). Active classroom management also uses proactive and systematic means to deal

with student behaviors, rather than using punitive measures such as suspension and expulsion (Fenning and Rose 2007; Skiba et al. 2002).

Institutional Environment

The tangible, sensory quality of an environment plays a great part in shaping the experiences people have in that environment. The institutional environment component of school climate refers to the adequacy of the school setting, the maintenance and infrastructure of the building, and the accessibility and allocation of educational resources.

Environmental adequacy indicates the physical characteristics of the facility, such as temperature, lighting, sound, and maintenance. An optimal learning environment requires appropriate heating and air conditioning, ample forms of lighting, necessary acoustical control, and upkeep of maintenance (Buckley et al. 2004; Freiberg 1998; Uline and Tschannen-Moran 2008). The quality of physical features affects teaching effectiveness and instructional practices (Dawson and Parker 1998), which in turn affect student achievement.

Structural organization refers to the skeletal or architectural framework of the institution in which people carry out their work (Leithwood and Riehl 2003). Characteristics of the structural organization that have been linked to perceptions of school climate include school size (Bowen et al. 2000; Leithwood and Jantzi 2009), class size (Finn et al. 1999), the presence of ability tracking (Lee and Smith 1997; Mulkey et al. 2005; Oakes 2008), school start and end times (Baker et al. 2001; Eccles and Roeser 2011), and student mobility (Griffith 2000).

Availability of resources indicates the accessibility teachers and students have to the technology, tools, and resources that augment instruction (Oakes and Saunders 2002). Although the core of instruction comes from the interaction between teachers and students, that interaction is frequently facilitated by the equipment, materials, and supplies of teaching (Johnson 1990). Resource inadequacy is often a reflection of impoverished communities that are less likely to have materials than more affluent schools. Resource sharing and allocation are also important. When schools restructure classrooms and programs to increase availability and access to resources, students experience more positive academic outcomes, especially among high poverty schools where materials may be limited (Miles and Darling-Hammond 1998).

Summary

School climate is a complex and multifaceted construct that has been measured and studied extensively as a catalyst for school improvement. The conceptualization of school climate as a multidimensional construct has several strengths and limitations. First, scholars agree that school climate is multidimensional, but there is little clarity or agreement regarding the number of domains that characterize climate and the boundaries that separate these domains. Current definitions of school climate incorporate a wide range of constructs that shape student learning and behavior. This inclusiveness comes at a price. Many of these constructs overlap or are duplicated across studies. For example, some studies examine the contributions of school

belongingness and school climate separately, viewing them as distinctly divergent constructs of the school environment, while other researchers incorporate belongingness into climate. This overlap adds confusion to literature attempting to summarize the robustness of school climate as a predictor of student functioning. In addition, various dimensions or indicators of school climate are marked by duplication of concepts and lack of differentiation in definitions. For example, discipline and order are often labeled as part of the academic domain or as part of the safety domain, but no distinction is made between discipline and order aimed merely at facilitating classroom management and student learning, and discipline and order aimed at promoting physical and emotional safety at large. Finally, many conceptualizations of school climate research include only one or two of the four domains. While it is understandable that such a broad construct would have multiple operational definitions, perhaps the most disconcerting problem is the lack of theoretical or empirical justification for the inclusion or exclusion of selected dimensions.

School Climate and Student Outcomes

Children's experiences within the school environment have long been considered crucial to their academic and psychosocial development. The following sections will explore how each dimension of school climate relates to three types of student outcomes: academic, behavioral, and psychological. While the outcomes explored within each of these domains are not intended to be all-inclusive, they represent important aspects of developmental functioning.

Academic Outcomes

Academic outcomes have long been examined as a consequence of variation in school climate. The main academic outcome that will be discussed within this review is academic achievement.

Academic Climate The quality of an academic environment as an important predictor of student achievement has been extensively documented in samples of elementary, middle, and high school students (Lee and Smith 1999; McEvoy and Welker 2000). Higher achieving schools tend to emphasize the importance of commitment to high academic standards and are characterized by effective leadership from teachers and principals that believe in their ability to improve student outcomes. Illustrative of this are schools with greater academic pressure—ones that maintain higher standards and encourage students to do their best—that have been shown to experience greater growth in student math and science achievement (Hoy et al. 2006; Ma and Wilkins 2002). Schools that maintain high academic standards and expectations are also characterized by lower student disengagement (Pellerin 2005). Likewise, students in elementary schools where teachers set high but attainable goals, believe in students' abilities, and are committed to students' academic success, have higher standardized test scores (Goddard et al. 2000). Teacher perceptions of efficacy and effective principal leadership have also been consistently linked to standardized test scores, GPA, and grades for student populations spanning from kindergarten through twelfth grade (Lee and Shute 2010).

Studies also show that a school's achievement goal structure may influence student achievement directly and indirectly through student motivational beliefs. For example, student perceptions of school mastery goal structure have been linked to greater academic achievement

through positive academic self-concept (Roeser et al. 1996; Wang and Eccles 2013). In this sense, a school's ability to challenge students to measure their successes based on individual improvement rather than performance standards will most likely produce students with greater intrinsic interest in learning and greater academic achievement (Haynes et al. 1997). Collectively, high academic rigor, organized classroom instruction, effective leadership, and teachers who believe in themselves and promote mastery learning goals, produce an academic climate conducive to learning and high student performance.

Community Schools characterized by high-quality interpersonal relationships, communication, cohesiveness, and belongingness between students and teachers are better able to support student psychological needs and promote optimal development in academic domains. Unsurprisingly, secondary schools with higher quality community climate (assessed as collective focus on goals, communication, cohesiveness, morale, adaptation to stress, and effective problem-solving) have higher percentages of academically successful students compared to schools with lower quality community climate (Macneil et al. 2009). Positive teacher-student relationships are also linked to higher standardized test scores (Esposito 1999; Hoy and Hannum 1997), GPA (Wang and Holcombe 2010) and students' motivation to learn (Patrick et al. 2007; Ryan and Patrick 2001), while less teacher respect for students and less student belongingness are associated (retrospectively) with school dropout (Worrell and Hale 2001). The benefits of community school climate features extend beyond the parameters of the school environment itself. Strong parent-community-school partnerships, for example, are essential for promoting positive student achievement, although some evidence suggests that associations are stronger for elementary school children than for middle school children (Hill 2009; Sheldon 2003; Sheldon and Epstein 2005). Finally, student perceptions of cultural awareness, diversity, and racial equality also affect student achievement. A large sample of high school students indicates that those who perceive greater racial fairness and experience less racial discrimination have higher GPAs (Mattison and Aber 2007; Wang and Huguley 2012).

Safety A review of literature on school climate stressed the importance of student safety within the educational environment (McEvoy and Welker 2000). However, results are inconclusive with regard to the associations between safety characteristics and student academic achievement. Ma and Wilkins' (2002) work provides evidence that the disciplinary climate, measured as the prevalence of serious behavioral problems within each school, does not predict individual standardized test scores after controlling for a number of academic and community climate factors (e.g., academic pressure, teacher commitment) and institutional structural characteristics (e.g., size, SES, location). Another study has found that school discipline and order are not related to academic success and have the weakest relation to students' stress coping compared to all other school climate variables (Ruus et al. 2007). Contrarily, another study's results reveal that higher quality security factors are associated with greater math achievement in first grade, but are not predictive of achievement in second grade (Esposito 1999).

Institutional Environment Institutional features of the school environment (otherwise known as structural features), such as size, type (private or public), location (urban, suburban, or rural), and racial and SES composition, have been attributed with creating an educational atmosphere that promotes or undermines the development of student engagement and learning. Empirical research, however, has been inconsistent in its conclusions (Finn and Voelkl 1993;

Stewart 2007, 2008; Weiss et al. 2010). For example, in a review of research on how school size influences achievement, Cotton (1996) found that some studies demonstrated no difference between small and large schools while others favored small schools over large ones. In a more recent study, school type (private vs. public) and school size explained very little variance in math test scores among elementary and middle school students (Lubienski et al. 2008). Overall, it appears that demographics, academic climate variables, and community climate variables may explain more variance in student achievement than institutional variables (Lubienski et al. 2008).

Other studies have examined how the composition of student ability and SES in schools may impact student achievement. Findings for the composition of poverty or SES at the school level have been rather consistent, with research generally indicating that students who attend schools with lower proportions of low SES children demonstrate not only higher levels of achievement but also greater growth in achievement over time (Aikens and Barbarin 2008; Fantuzzo et al. 2014; Kieffer 2012; Perry 2012). Research on ability tracking, on the other hand, has been mixed, with some researchers finding that ability tracking is detrimental to low-ability students, particularly in the early years of schooling (e.g., Hanushek and Wößmann 2006), has no discernible effects on low ability students (e.g., Betts and Shkolnik 2000), or is beneficial for low achieving students (e.g., Figlio and Page 2002). The relative difficulties in identifying what exactly constitutes "ability tracking" and how parents may select schools based on whether they separate students based on ability may contribute to the complexities of studying ability tracking (Figlio and Page 2002).

Additionally, a number of studies have examined how differences in resource allocation across schools, often conceptualized as teacher education and experience, class size, teacher-student ratio, facilities, classroom materials, and financial expenditures, are associated with student achievement. The notion that pouring more money and resources into schools will enhance student academic performance has been widely debated by economists with differing conclusions. Other studies, relying on meta-analytic techniques, have found consistent, small to moderately positive effect sizes relating school resources to student achievement (Greenwald et al. 1996; Hedges et al. 1994). Regardless, Hanushek (1997) concluded that resources are not unimportant, but rather that school districts need to learn how to use these resources more effectively to facilitate greater learning, thereby determining that economic policies for school expenditures are more complicated than simply increasing the flow of money. Other research has also confirmed that school resources matter, but that translating resources to higher student academic performance is dependent on how schools and teachers are able to use those resources to improve more proximal features in the classroom, such as instructional quality (Archibald 2006; Cohen et al. 2003).

It is noteworthy that research seems to suggest that structural characteristics in and of themselves may not directly alter student achievement, but may in fact alter classroom processes, which in turn impact achievement. Smaller school sizes, for example, may increase student engagement indirectly by facilitating a greater sense of school community and more positive interactions between students and teachers (Crosnoe et al. 2004; Finn and Voelkl 1993; Lee and Burkam 2003; Weiss et al. 2010). Benner and her colleagues (Benner et al. 2008) found that school structural characteristics (e.g., school diversity, SES, achievement, and size) predicted academic engagement through school processes, such as perceptions of the academic climate. In addition, although relatively understudied, substandard structural features of school buildings, including building age, heating, air conditioning, crowding, and infestation have been demonstrated to influence student performance and school attendance by

impacting the quality of the learning environment (Berner 1993; Durán-Narucki 2008; Earthman 2002; Simons et al. 2010). These findings support that the structural features of the school may impact student achievement by shaping the more immediate or proximal processes that characterize students' daily experiences.

Summary School climate has been extensively examined in relation to academic outcomes. The most consistent findings demonstrate the importance of academic and community dimensions in promoting academic achievement. Schools that set high academic standards, stress commitment to students, exhibit effective leadership, and emphasize mastery goal orientations have students that demonstrate higher academic achievement. Likewise, community features such as warm teacher-student relationships, frequent communication between parents and schools, and appreciation for diversity cultivate an academic environment that is conducive to learning and promotes optimal achievement and motivation among students. Institutional and safety factors, on the other hand, seem to be less consistently associated with academic outcomes, with effects often disappearing when other school climate factors are controlled for. Greater appreciation for how different dimensions of school climate interact to promote academic outcomes may shed more light on the role that institutional and safety factors play in shaping student achievement.

Behavioral Outcomes

School climate has also been extensively researched as a determinant of student behaviors within the school, including behavioral problems such as bullying, delinquency, and aggression, and health problems such as substance abuse and psychosomatic symptoms.

Academic Climate Higher quality academic environments have been posited as important channels for directing antisocial students' focus and energy toward social skill building and academic achievement and away from deviant behaviors (McEvoy and Welker 2000). Schools with greater student perceptions of academic pressure, in conjunction with social support, have been associated with reduced suspension rates (Gregory et al. 2011). Studies examining school climate factors and student aggression have also found that student perceptions of school-level instructional practices that emphasized student understanding over ability were associated with less youth aggression (Reis et al. 2007) and less disruptive behavior (Kaplan et al. 2002; Wang 2009). Likewise, schools in which teachers provided feedback on homework, assisted students in achieving their academic goals, and encouraged student commitment to academic success, experienced lower youth- and teacher-reported behavioral problems (Kasen et al. 1998; Wang and Dishion 2012). These studies lend support for the conclusion that a high-quality academic environment not only promotes academic outcomes but also reduces behavioral problems within the classroom.

The relationship between academic climate and substance abuse is more complex. While one study found that students who reported receiving a good education were less likely to report abusing alcohol, marijuana, and cigarettes (Mayberry et al. 2009), another study found that schools with a strong academic focus and adaptation to individual needs of students did not predict less violence or substance abuse (Weishew and Peng 1993). These inconsistent findings could be attributed to substance abuse occurring outside of the parameters of the

school, while behavioral problems are almost exclusively measured as behaviors within the classroom.

Community There has been a great deal of support for the connection between the quality of interpersonal relationships within the school environment and experiences of bullying, aggression, and delinquency. Student perceptions of higher school cohesion and connectedness are associated with less serious risk of bullying victimization (Zaykowski and Gunter 2012) and less violent behavior (Brookmeyer et al. 2006). In addition, school connectedness has been found to buffer the negative effects of poor school attitudes and discipline practices on student aggression (Brookmeyer et al. 2006; Wilson 2004) and to mediate the association between student perceptions of three indicators of school climate (student cohesion, student friction, and class satisfaction) and youth conduct problems (Loukas et al. 2006). Likewise, students are more willing to intervene or report a peer's risky activities when they perceive that the school environment has a strong sense of solidarity and belonging (Syvertsen et al. 2009). These studies indicate the complex relationship between school belongingness and behavioral outcomes by demonstrating direct and interactive developmental pathways.

Individuals' relationships within the school are also highly relevant to community climate features that shape the incidence of disruptive problem behaviors (Reinke and Herman 2002). Positive relationships among teachers, students, and administrators are consistently associated with decreased behavioral problems for adolescents (Eliot et al. 2010; Fletcher et al. 2008; LaRusso et al. 2008; Wang et al. 2010; Way et al. 2007). Similarly, higher quality relationships with peers have been associated with reduced aggression, victimization, and behavioral problems (Elsaesser et al. 2013; Meyer-Adams and Conner 2008). Students attending schools in which their peers are kind, helpful, accepting, and enjoy spending time together experienced more positive adjustment to school. This positive adjustment, likewise, predicted greater health and fewer psychosomatic symptoms (Ravens-Sieberer et al. 2009). Naturally, these studies suggest that students are more likely to respect and conform to the classroom rules when teachers, students, and administrators value and support one another and have warm and caring relationships.

Safety The general safety of the school environment is an important determinant of student experiences with aggression and bullying. These measures of school safety, examined in connection with behavioral adjustment, are often conceptualized as student perceptions of safety, teacher effectiveness to handle disciplinary infractions and bullying behaviors, and school attitudes toward bullying and violent behavior. Students who perceived greater issues of school safety were more likely to engage in relational aggression and to be victimized (Elsaesser et al. 2013), while students attending schools with greater consistency in discipline and social support experienced less bullying, victimization, and school referrals (Gottfredson et al. 2005; Shirley and Cornell 2012). In the same vein, when staff and students perceived bullies as generally disliked among the school population, they tended to report greater feelings of safety, belonging, and fewer incidents of bullying (Goldstein et al. 2008). Similar findings on youth and teacher reports of discipline and bullying norms were detected (Gregory et al. 2010; Waasdorp et al. 2011), lending support for the importance of norms and attitudes regarding acceptable levels of aggression within the school. In line with research on perceived school norms of aggression, students who perceived their school climate as characterized by more peaceful, less aggressive resolutions to peer conflict also engaged in less risky behaviors (LaRusso and Selman 2011). These findings indicate that norms and values shared by the

school may shape student attitudes and beliefs regarding acceptable versus unacceptable behaviors in school. Teacher attitudes may be shaped by these norms as well, impacting their efficacy at preventing behavioral incidents and the importance they ascribe to promoting a bully-free zone.

Institutional Environment Studies examining the potential impact of school institutional features on behavioral adjustment have predominantly focused on the extent to which structural features affect bullying behaviors. For example, a large-scale study of public elementary and middle school students found that student-teacher ratios, poverty concentration, suspension rates, student mobility, and school location predicted bullying attitudes and experiences (Bradshaw et al. 2009). Another study indicated that structural variables (e.g., poverty, racial composition, size, and urbanicity) accounted for a large proportion of the variance in teacher and student victimization, after controlling for psychosocial and safety climate and discipline management (Gottfredson et al. 2005). Further analyses supported a mediated pathway between these structural variables, and delinquency and victimization, via psychosocial climate and discipline management (Benner et al. 2008). Institutional variables, therefore, seem to indirectly influence opportunities for bullying behaviors to occur on the school grounds, by shaping how effectively the school environment is organized, monitored, and supervised.

Summary The accumulated research supports the importance of school climate in reducing problem behaviors among students. Most of this research has focused on community and safety features. High-quality learning environments and institutional features have also been linked to behavioral problems, but these associations may be more interactive or indirect. More research, therefore, is needed to determine how the quality of the academic and institutional climate relates to student behavior, particularly in conjunction with community and safety features.

Psychological and Social Outcomes

The final subset of student outcomes examined in this review will focus on how school climate is related to psychological and socio-emotional functioning, including positive adjustment (e.g., high self-esteem, adaptive coping strategies, and high life satisfaction), and psychopathology, such as depression and anxiety.

Academic Climate There has been limited work on how academic climate promotes psychological well-being. One study relying upon a multidimensional perspective of school climate found that four dimensions (academic support, student-teacher relationships, school connectedness, and order and discipline), each contributed unique variance in school satisfaction, with academic support the strongest predictor (Zullig et al. 2011). Similarly, there has been little work linking academic climate to psychopathology, although recent studies provide encouraging findings for the importance of academic climate in reducing psychological distress. For example, one study found that schools with a stronger focus on academic learning and student autonomy predicted decreased symptoms for specific clusters of personality disorders (Kasen et al. 2009). School endorsement of a mastery goal structure was found to be related to lower levels of depression and behavioral deviancy, while school endorsement of

a performance goal structure was associated with higher levels of both outcomes (Wang 2009). This study also identifies social competence as a mediator between adolescents' perceptions of academic climate and their psychological adjustment.

Community The importance of community factors in promoting positive psychosocial adjustment is well-established. Specifically, community features that emphasize school belonging, respect for student opinions, and supportive relationships are key determinants of psychological functioning. For example, in a large cross-national sample of Western nations, adolescents in schools characterized by poorer social climate (e.g., students did not feel that they belonged in the school) reported worse emotional health compared to adolescents in schools characterized by higher quality social climate (Freeman et al. 2009). Likewise, a greater sense of school solidarity and belonging mediated the association between a school's democratic environment (e.g., allowing students the opportunity to exchange ideas, teachers maintaining mutual respect in the classroom), and social trust among students (Flanagan and Stout 2010). Furthermore, positive interpersonal relationships have been consistently linked to more positive adjustment and less prevalence of psychopathology (Loukas and Robinson 2004; Reddy et al. 2003; Way et al. 2007; Way and Robinson 2003). Indeed, more positive interpersonal relationships both between students and between students and teachers, as well as greater parental involvement in school, have been associated with higher life satisfaction (Suldo et al. 2013), better coping strategies, and optimistic attitudes toward school (Ruus et al. 2007). These findings, in conjunction with previous research on community features and student outcomes, demonstrate that the quality of interpersonal relationships within the school is one of the most robust predictors of psychological adjustment.

Safety There is some empirical support for the importance of school safety in promoting emotional well-being. A recent meta-analysis of social and emotional learning interventions aimed at improving school safety and reducing problem behaviors, found enhancements in social and emotional skills, attitudes toward self and school, and positive social behaviors (Durlak et al. 2011). Decreases in conduct problems and emotional distress were also detected when compared to controls, lending support for the importance of improved school safety in promoting psychological adjustment. In the same vein, student perceptions of the fairness of classroom rules, discipline, and general school safety are negatively associated with psychological distress, including loneliness, anxiety, and depression (Graham et al. 2006; Ozer and Weinstein 2004). In addition, schools with less homophobic teasing, and more positive feelings and attitudes about school, have buffered the association between sexual minority status and depression (Birkett et al. 2009; Espelage et al. 2008). High amounts of school conflict, disorder, and friction among students, on the other hand, have been linked to greater student and teacher reports of behavioral problems and depression (Kasen et al. 1990; Loukas and Murphy 2007).

Institutional Environment In our review of literature on school climate and psychological or social outcomes, we did not come across any studies that connected institutional characteristics with psychosocial functioning. It seems that researchers are predominantly concerned with the effects of structural characteristics on measures of learning, given that these characteristics, such as teacher qualifications, class sizes, facility maintenance, and financial expenditures are closely tied to state-mandated educational policies and budgeting.

Summary There has been uneven research to demonstrate the importance of school climate on psychological and social aspects of student functioning. The bulk of empirical support comes from community and safety dimensions, in which school belonging, interpersonal relationships, and safety prove key determinants to emotional well-being. These findings are straightforward; measures taken to enhance school safety and improve interpersonal relationships should better meet fundamental needs of safety, autonomy, and belongingness, which facilitate healthy psychological functioning. Much less is known, however, about the impact of academic climate on emotional well-being, and even far less is known about the impact of institutional features. We need more studies to determine the unique contribution of each dimension, as well as the interplay between dimensions on psychological outcomes.

Research Methodology in the Study of School Climate

School climate is a broad, overarching construct consisting of multiple dimensions and is, as a result, measured in multiple ways. In the following sections, we describe how school climate has been measured in past research, and summarize the advantages and potential measurement and analytic issues associated with each method. Among 297 empirical studies we reviewed, most studies were descriptive or correlational while a small portion was experimental or quasi-experimental. Approximately 48 % of studies used a correlational design to relate school climate to other variables. For studies that used an experimental (5 %) or quasi-experimental design (4 %), school climate was often an evaluation of an intervention's impact. About 15 % of studies focused solely on validating and developing measures of school climate (Bear et al. 2011; Brand et al. 2003). Approximately 28 % of studies used qualitative research methods to study school climate.

Measurement and Analytic Methods

Surveys Collecting survey data is the most common method used to measure school climates. Approximately 92 % of empirical studies assess school climate through self-report surveys. The surveys ask participants to reflect on their school experiences by selecting a value on Likert-type scales or by selecting yes or no responses. School climate surveys are advantageous as they cover a wide range of climate dimensions, from the quality of relationships to available resources (Bandyopadhyay et al. 2009; Uline and Tschannen-Moran 2008). In addition, surveys are relatively cheap and easy to administer, allowing researchers to collect information from large numbers of participants in multiple areas to assess variations in climate across schools. Academic, safety, and community domains of school climate are measured most often in survey studies, although the labels and definitions of those school climate dimensions vary among studies (Brand et al. 2003).

Interviews and Focus Groups Conducting interviews or focus groups to assess school climate is relatively uncommon in the literature. Approximately 8 % of empirical studies use interview or focus group data (Bryant et al. 2013; Gittelsohn et al. 2003; Griffith 1999; McGuire et al. 2010). Interviews or focus groups are advantageous in that they give insight into participants' perceptions of school climate and the factors they perceive as contributing to school climate. Unlike survey data, which provides a gross estimation of the degree of

agreement or disagreement to item questions and overlooks the *why* and *how* of participants' responses, interviews allow researchers to delve deeper into participants' ideas and perceptions of school climate through the use of more interpretive methods. Compared to surveys, interview protocols have more freedom to discuss participants' beliefs about what influences the development of school climate, as well as participants' views about how school climate can be improved. Moreover, interviews can capture the nuances of school climate that are neither definitively positive nor negative, a process that can be overlooked through survey analysis. Pairing survey data with interviews can be extremely effective in attaining a more complete picture of school climate. Interviews can be used as an exploratory tool to analyze participants' views of school climate for survey development. Surveys can then be administered on a larger scale to test theoretical frameworks. However, analyzing interviews is a time-intensive process. Sample sizes are generally smaller for interview methods than survey methods, and therefore, interviews may be limited in their generalizability and applicability in large-scale school reform. The scope of school climate discussed through interviews also tends to be smaller than the range captured in surveys.

Observational Ratings or Reports Observer reports allow an outside or inside observer to assess and compare school climate across schools. We only found a handful of studies that rely on school-level observational assessments to measure school structural safety and organization. For example, Tanner (2000) visited elementary schools to rate school design patterns, ranging from outside spaces to the condition of the bathrooms. In general, observational reports seem to work best with the physical or tangible aspects of the school, such as school resources, organizational structure, or maintenance (Fisk 2000; Rashid and Zimring 2008). In addition, observers may see patterns within schools that contribute to school climate which may go unnoticed by teachers and staff. For example, an observer may note that high incidence of bullying is mainly due to large amounts of unsupervised time between classes or large numbers of unsupervised locations in the school. Without knowledge of these preventable circumstances in school organization, survey ratings may overlook or undererestimate the effects of institutional and safety domains on bullying behaviors. This scenario provides an example of how observations may provide supplemental benefits to self-reports from students, teachers, and administrators, who are directly involved in school processes, and therefore, may overlook larger patterns that contribute to the quality of the climate.

Observational methods also have limitations. The MET (Measures of Effective Teaching) study, for example, is a large collaborative national research project in which students across several school districts were randomly assigned to classrooms to determine which indicators of teacher effectiveness (past gains on state achievement tests, student surveys, and observational reports) best predicted student achievement. The study found that a combination of past gains on state achievement tests, student surveys, and observational reports were better predictors of student achievement than any single indicator, but predictability was lower when students' perceptions of the classroom were weighted lower than observational reports. In addition, there may be other observer report biases. The MET study found that observers rarely gave scores in the very high or very low range, with most of the scores hovering around the middle. Such reduced variability in ratings can lead to statistical analysis issues, such as reduction of power to detect significant differences between teachers, and misinterpreting small statistically significant effects as meaningful or practically significant. Reliability of observations also depends on the number of observations conducted, the length of these observations, and the number of observers. Having more than three or four raters increases the reliability of observational ratings, but unfortunately,

multiple raters are often impractical due to the greater costs of keeping multiple raters on staff and the increased time it takes to train them effectively (Cantrell and Kane 2013). Observer training is crucial to obtaining inter-rater reliability, which must be repeatedly checked to verify if alterations in protocol are necessary or if retraining should be done.

Use of Different Reporters

Approximately 50 % of research focuses mainly on student perspectives of school climate, particularly students from middle school and high school (Gregory et al. 2012; LaRusso et al. 2008; Loukas and Murphy 2007; McCoy et al. 2013; Way et al. 2007). About 23 % of studies have surveyed teachers or school adults to gather information that may not be apparent to students, like principal leadership, teacher job satisfaction, or teacher efficacy (Deemer 2004; Johnson et al. 2007; Raudenbush et al. 1991). In elementary schools, teachers typically report on school climate (Bodovski et al. 2013; Bruns et al. 2004; Goddard et al. 2000; Johnson and Stevens 2006; Mehta et al. 2013b; Waasdorp et al. 2012). Due to age and reliability issues, very few studies include self-reports from elementary school students (Bear et al. 2011; Griffith 1999).

We only found a small number of empirical studies (17 %) that combined multiple perspectives (e.g., students, teachers, and parents) to measure school climate (Brand et al. 2005; Booren et al. 2011; Snyder et al. 2012). Goldkind and Farmer (2013) consider parents an important factor in school climate, yet parents' perspectives are rarely combined with students' or teachers' perspectives. By using teacher, student, and parent perspectives in measuring school climate, Snyder et al. (2012) showed that an intervention focusing on social-emotional and character development yielded more improvement on multiple levels than a control program.

School processes are relational and dynamic, and they involve ongoing interaction and communication between students, teachers, school staff, and parents. Collecting information from multiple groups provides unique and various perspectives on school climate. Using multi-informants to study different aspects of school climate will help researchers examine to what extent different groups' perceptions of school climate converge or diverge. Unfortunately, surveying or interviewing multiple groups can become expensive. Furthermore, if the perspectives of two or more groups diverge, the question arises of which view is more reliable, since different reporters represent different levels of influence. Teacher reports often provide insights into the socialization context in which the student is developing. In contrast, student reports often represent personal views of the socialization context. Thus, there is a controversy in educational psychology regarding whose reports or perceptions are most appropriate for studying the association between school experiences and human development (Cooper and Good 1983; Wang and Eccles 2014). In actuality, these two reports represent different but equally valid aspects of experience. Multiple perspectives may be useful to triangulate data; however, differing perspectives offer interesting points of divergence that can be further explored.

Issue of Clustering Nature of Survey Data

The nature of quantifying school climate creates a complex structure of student and teacher data nested within larger school units. Since students within a school share many of the same

school features (e.g., size, safety and disciplinary procedures), neglecting this shared variance can violate the assumption of data independence across subjects (Bryk and Raudenbush 1992; Marsh et al. 2012). This problem is pronounced when unequal numbers of students are sampled from each school; larger schools will be over-weighted and overrepresented in the findings. Thus, researchers suggest that multilevel modeling is the preferred method over ordinary least-square (OLS) methods for school climate research (Bryk and Raudenbush 1992). Unfortunately, many studies of school climate have failed to account for the nested nature of the data by relying solely upon individual reports of climate to predict individual outcomes. Subsequently, many studies have focused on creating aggregates of school climate (averaging individual reports of climate for each school) and using these aggregates in a multiple regression analysis to predict individual outcomes or aggregated outcomes within schools. Using individual level reports to predict individual outcomes is erroneous due to the violation of the assumption of data independence. Similarly, using school level reports to predict individual level outcomes does not allow for heterogeneity within schools or for the fact that individual perceptions and aggregated composites of school climate may differentially predict individual outcomes. School climate may be different for each participant in the school based on personal characteristics, individual interactions, and perceptions of the organization. Therefore, depending on the research questions of interest, it might be inappropriate to aggregate student perceptions to construct an average school climate score for assessing school effects.

Issue of Shared Method Variance

Shared method variance is a concerning issue for much of the school climate research, particularly in regard to the research on student behavioral and psychosocial outcomes. The majority of the school climate studies reviewed relied upon student perceptions of school climate to predict student reports of behaviors and psychological well-being. The use of only one source to provide information on both the independent and dependent variables may bias analyses toward detection of significant findings. However, there is an upside to using student perceptions of school climate to link to student outcomes. If student perceptions of climate are more closely linked to psychological functioning and behavior than other source ratings of school climate (e.g., observer, teacher, administrator), then student perceptions are important considerations for school climate reform. If student perceptions are tightly linked to outcomes, then climate reform will only truly be effective if student perceptions of the environment are altered as well. However, greater validation for these associations can be derived from having additional source reporters of climate, particularly for outcomes that can only be assessed by students themselves (e.g., depression) and having multiple source informants for outcomes when possible (e.g., school records for referrals, teacher ratings of behavior problems).

Issue of Causal Inference

The large volume of research that relies on correlational designs poses potential issues in establishing cause and effect relationships between school climate and student outcomes. While true experimental research using random assignment of students to schools is virtually impossible to achieve, there are methods through which causal inference can be strengthened

in correlational research. For example, using longitudinal data, implementing autoregressive or cross-lagged designs, controlling for confounding variables, and replicating research findings across various samples and settings can strengthen the inference that enhancing school climate can lead to improvements in student behavior (Marley and Levin 2011; Martin 2011). These strategies do not prove that a cause and effect relationship exists between school climate and student outcomes, but their adoption can strengthen the assumption that changes in climate *may* lead to changes in student outcomes, informing quasi-experimental studies that can better test for causal inference. Researchers need to adopt more rigorous research models and analytic techniques within the constraints of their chosen design (correlational or quasi-experimental) and exercise appropriate caution in how they present and interpret their findings.

Issue of Time in the Measurement of School Climate

School processes are dynamic and change continually. A smattering of studies have found that school climate perceptions decline during middle and high school (Way et al. 2007; Wang and Dishion 2011). These studies suggest that school climate perceptions can evolve, and therefore, measuring school climate at one point in time may not be sufficient to explain patterns of student academic and developmental outcomes. However, most studies rely primarily on cross-sectional data and rarely address the developmental complexity of impermanent perceptions of school climate (Wang et al. 2010). Indeed, only 30 % of studies examine aspects of school climate at two or more time points. Moreover, extant research typically treats students' perceptions of school climate as static, baseline predictors of student outcome variables rather than as dynamic processes that change over time (Way et al. 2007).

Shifts in any dimension of school climate, such as teacher support or peer support, are likely to have implications for student adjustment. Examining school climate longitudinally elucidates how school climate affects student outcomes over the course of schooling, and how school climate changes as a result of new program or system implementation. Planned and unexpected events and interruptions occur on a regular basis. It is, therefore, unlikely that school climate perceptions will remain stable after a single measurement. Thus, longitudinal studies are needed to conceptualize school climate as a dynamic rather than a static construct.

Summary

Studies rely heavily on survey data for assessing school climate. While quantitative methods are useful in collecting information from a large sample, qualitative methods can reveal more in-depth information, including the processes, influences, and nuances of school climate. School climate consists of the collective perspective of all individuals related to the school, but studies often present school climate based exclusively on the perspectives of students. In addition, although school climate is a dynamic construct, relatively few studies examine school climate at multiple time points across school years. Finally, despite researchers endeavoring to validate and create reliable school climate measures, very few existing school climate survey measures include strong psychometric properties (Zullig et al. 2010). A recent review of school climate measures by the American Institutes for Research (AIR) (Clifford et al. 2012) found only 13 publicly accessible school climate surveys with solid reliability and validity. The extent of psychometric support for most school climate measures is limited; a

problematic finding considering school climate is often measured as an indicator of "school health" that supports student learning and development.

Future Research Directions

Although extensive research has been conducted on school climate in the past several decades, there are still a number of issues that need greater attention. In the following section, we highlight areas in need of further elaboration and clarification.

School Climate as a Multidimensional Construct

Although studies appear to support the multidimensional conceptualization of school climate and its differential impact on student outcomes, there are numerous limitations and areas of further inquiry to consider. First, many studies focus only on one or two domains (or few dimensions under each domain) of school climate in their research, making it difficult to determine which domains, dimensions, or combinations of dimensions have the most influence on different types of student outcomes. Should we view domains of school climate as developmental, such that positive features in one domain set the stage for positive features in another? Should they be viewed as reciprocal, focusing on a continuous feedback loop among all domains of school climate? Are the domains interactive, such that one buffers the negative effects of another? Given the multifaceted nature of school climate, researchers need to clearly articulate their selected definitions and operationalizations of school climate used in their studies (including the specific domain, dimension, and indicator) and how their conceptualization of climate aligns with or builds upon existing theory. Failure to account for how interwoven and complex these processes are in the design, measurement, and analysis of school climate research not only oversimplifies these relations but also precludes the literature from further refinement.

Furthermore, most studies to date have relied upon variable-centered approaches instead of person-centered approaches to study school climate. Variable-centered approaches assume that the effect of a variable is consistent or universal across all populations (Bergman and Andersson 2010). For example, using a variable-centered approach to regress achievement onto academic climate would assume that the link between academic climate and student achievement is the same across all populations and situations. A person-centered approach, on the other hand, assumes that relations among variables differ across subpopulations (Bergman 2001). Therefore, the effect of school climate depends upon characteristics of the student and the surrounding environment. Given the lack of person-centered approaches in school climate research, the examination of heterogeneity and varying configurations among domains of school climate has been vastly overlooked. One solution to this problem could be to incorporate clustering techniques that identify subgroups of students who perceive varying combinations of dimensions of school climate (e.g., high academic and low community, high community and low academic), and then examine how these groups differ across various student outcomes. Such approaches take into consideration the interplay between domains of climate and how they jointly factor into student

functioning. Although variable-centered approaches still have their merit in scientific research, person-centered approaches may be more informative in designing targeted interventions for different groups of students.

Clarification of Definitions and Measures

The multidimensional measurement and characterization of school climate must be strengthened. This is readily apparent when reviewing how climate is actually measured throughout the literature. One important issue is the common practice of using a single scale, or the combined averages from different scales, to measure school climate. Relying solely upon one scale to capture school climate in general, or a single domain of climate, limits responses to the constraints of the scale, which often contains only a few items and overlooks other relevant features of school climate. Dependence on combined averages to measure school climate also presents a challenge to understanding how the breakdown of individual features of climate uniquely contribute, interact, or combine to influence student outcomes. Often, scant justification is provided to support the methods used to create school climate composites, and how selections of these measurement methods are preferable to other conceptualizations and measurements. A second caveat is that greater appreciation should be given to the wording of items used to measure climate. Aggregating items that are worded to reflect individual perceptions of the school as a whole (e.g., "I feel that I fit in at this school") versus aggregating items that are worded to reflect how the student body perceives the school as a whole (e.g., "Students feel that they fit in at this school") lead to differential points of reference, which can ultimately lead to differential findings. Another rarely addressed topic is that of individual reference; to wit, students' ratings of school climate may widely vary from student to student. Are students relying upon their classmates, peer groups, or closest friends as their frame of reference? Do these frames of reference remain consistent across multiple waves of data collection? Given that individual student perceptions of climate are expected to vary, it is worth exploring how individuals may differentially rate student body perceptions and experiences based upon the characteristics of their peer group affiliations.

Temporal Issues

A number of temporal issues warrant further attention. The most pressing of which concerns researchers' limited understanding of how school climate shapes student outcomes over time. For instance, school climate has been examined across the elementary, middle, and high school years, but studies of outcomes have not been spread equally over the three age periods. Most research is concentrated within the secondary school years, covering a number of student outcomes including achievement, problem behaviors, and mental health. Limited existing research on the elementary school has focused largely on achievement, behavioral problems, and social skills, while much less work has centered on psychological and emotional adjustment. Furthermore, most elementary school studies largely examine classroom climate in relation to outcomes, possibly due to the fact that younger children spend most of their time in one classroom with one teacher. Younger children may also be less reliable reporters of their perceptions of school climate. This leads to the question of whether classroom climate is actually a better predictor of developmental outcomes for younger children, while school

climate may be a better predictor of developmental outcomes for older children, who change classes and teachers throughout the day. However, it is still worth investigating how school and classroom climate may differentially impact the development of young children across a wide range of outcomes.

Another limitation to this work is the lack of research examining the development of multiple domains of long-term changes in school climate. The majority of studies are cross-sectional, and even when longitudinal data is available on student outcomes, school climate is almost exclusively assessed at a single time point. Therefore, we are uncertain if different domains or dimensions of school climate change and evolve over time. Additionally, among the limited longitudinal studies on school climate, few follow children across important developmental stages such as school transitions. Therefore, it is difficult to determine which domains or dimensions of school climate may be more salient to specific student outcomes at certain ages. For example, as nonparent relationships become more prevalent during the adolescent years, these relationships, such as student-teacher and peer relationships, may be more strongly linked to achievement and well-being for adolescents than for elementary school children. More extensive longitudinal research is needed to capture how school climate changes over time, how this change relates to student functioning, and how certain aspects of climate may have increased salience during specific stages of development.

Time can also introduce a number of confounding complexities in understanding how deliberate alterations of school climate can impact student outcomes (Selig et al. 2013). For example, as each school year has a definitive beginning, middle, and end with predictable patterns throughout the year, the impact of an intervention on student outcomes may vary based on when the intervention was administered and when the student outcomes were assessed. Students may receive the most benefit from an intervention implemented at the beginning of the year rather than at the end of the year, due to differences in the length of exposure over time to the intervention, and subsequently to differences in the length of time allotted to track changes in targeted student behaviors. An additional, though not final, consideration of how time can impact intervention findings is the question of whether climate can be reliably measured in the same fashion over time. For example, is a measure of autonomy supportive practices in an elementary school identical to a measure of autonomy supportive practices in secondary school? Can they be compared? The complex and multi-faceted role that time plays in school climate research is an important consideration for researchers when designing studies and interpreting findings.

Intervention Studies

Although the majority of work on school climate has been correlational, a number of researchers have developed interventions aimed at improving school atmosphere. Many of these programs target the social and emotional learning environments (Durlak et al. 2011), such as the Fast Track PATHS program, while others, including Direct Instruction, the Comer School Development Program, and Success for All, demonstrate significant improvements in academic outcomes by improving the academic and community climates (Borman et al. 2003). While much of this intervention work has shed light on the capability for reforms in school climate to produce meaningful change in student outcomes, there are still lingering questions: How does changing one feature of school climate potentially affect other features or domains? How do these features interact to shape development? How long do the effects of an

intervention last? In addition to individual change (student), how does school intervention target and achieve setting-level change (whole school)? We may become more adept at answering these questions as researchers continue to explore the validity of interventions.

Interactions of School Climate with Other Developmental Contexts

Another aspect of school climate research that has gone largely unexamined is the relative interplay between school climate and other developmental contexts such as the family, neighborhood, and community (Ainsworth 2002). Most studies on school climate focus completely on the impact of the school context on student outcomes, but neglect to factor the influence of these additional developmental contexts on student development. Research in risk and resilience has demonstrated that accumulation of protective factors or developmental assets increases the chances of optimal development in the face of risk or adversity. This research champions the ability of these factors to buffer the negative effects of risk and produce positive outcomes. Additionally, bio-ecological theory emphasizes the importance of positive supports across multiple environmental domains, given the emphasis on the interplay of human development with multiple embedded contexts. In other words, school climate factors do not exist in isolation from other environmental contexts (e.g., family, neighborhood), and should therefore be examined in relation to them. An area of interest for researchers with a bio-ecological perspective may be whether or not a good school buffers the detrimental effects of a neglectful or uninvolved parent or a high crime and poverty-stricken neighborhood. Are family or home environment more relevant and salient in the early years, while school environment becomes increasingly important as children age? The power of schools to positively impact development in the face of pronounced adversity can provide a greater incentive for policymakers to invest in reforming low performing schools, particularly since low performing schools are often comprised of students whose families face great economic hardships.

Use of Multi-Informant and Multi-Method to Assess School Climate

The increased use of multi-informant (e.g., teacher, student) and multi-method (e.g., surveys, observations) strategies to assess climate is important to the advancement of school climate research. There is an ongoing debate regarding the most relevant methods for measuring climate. Each method has its benefits and weaknesses. For instance, student perceptions are often considered better at capturing students' individual experiences and the psychological processes operating within the school environment (Kasen et al. 2009; Wang 2009), while observer reports are thought to be more objective and less biased by mood or prior experiences (Brophy and Good 1986; Pianta and Hamre 2009). However, recent work details that the use of multiple informants and multiple methods provides more accurate and reliable assessments of school climate, than relying upon one source alone (Cantrell and Kane 2013). For example, different sources (e.g., students, teachers, observers) occupy different niches within the school organization, and therefore, offer unique and only partially overlapping viewpoints of the atmosphere of the school. Employing multiple informants and methods to examine school climate can boost the explanatory power of school climate, while also providing information on which sources and methods are more strongly correlated with specific student outcomes. Although logistical and resource constraints do not always allow researchers to assess school

climate using multiple respondents with multiple methods, they should be aware of the implications of the choice of respondents and methods in the results of the analysis.

In addition to survey and observation methods, network data, which so far has been primarily used in teacher network analysis, can bring a new perspective to school climate research. Network theory emphasizes the relationships or ties between individuals in a network. These ties can represent spatial location, membership to a group, a shared attribute, interactions, or flow of resources (Borgatti and Ofem 2010). While network analysis has been particularly critical in understanding teacher networks (Coburn et al. 2010; Atteberry and Bryk 2010) or administrator-teacher networks (Penuel et al. 2006) that shape academic and instructional climate, it also has the potential to be useful when assessing social processes within school, such as teacher community or student peer networks (Gest and Rodkin 2011). Network analysis is unique, as it uses surveys as a main medium to collect data, which is then entered into network analysis software to investigate the structure, density, and other properties of a network. The properties of a network can be used in interpretive or quantitative analysis to determine whether certain network structures are associated with or can predict individual-level or school-level outcomes. Thus, network data and analysis is advantageous, especially for studies relating to organizational climate, as it retains the individual as the unit of analysis while simultaneously generating second-level or school-level data.

Beyond Student Outcomes

There is a need for more research on the impact of school climate on teacher and administrator outcomes. All of the research presented has focused on the associations between school climate and students' academic, behavioral, and psychological adjustment. However, teachers, principals, and administrators are shaped by the school climate as well, and their patterns of behavior, coping abilities, and emotional well-being may add unique contributions to student outcomes above and beyond those of school climate features. To understand the impact of school climate on student outcomes, we must examine the complex bidirectional interrelations between climate and the interactions between individuals within that climate.

School Climate Measured as Individual Level or School (Setting) Level

Although researchers agree that a multilevel modeling approach is appropriate for handling the nested nature of school climate data, some researchers find that standard multilevel modeling techniques are not sufficient to capture the variance in student outcomes (Marsh et al. 2009, 2012; Muthen 1994). These researchers advocate for the use of doubly latent models, which combine confirmatory factor analysis, structural equation modeling, and multilevel modeling to reflect a more accurate measure of school features. Arguing that the standard use of a single scale to represent an aspect of climate does not adequately control for measurement error, they emphasize the need for building models with latent constructs that represent climate at both the individual and setting levels. Latent constructs are unobserved (unmeasured) constructs that comprise multiple observed (measured) indicators of climate, and are responsible for the covariance among these indicators. Similar to confirmatory factor analysis, these several measured indicators of climate load onto an overall climate factor (the latent factor) that reduces measurement error at different levels and strengthens the validity of the research

findings. Although Marsh and colleagues (2012) focused their doubly latent model on classroom climate, their techniques can be readily applied to school climate research as well. Greater attention should be paid to how data on climate is collected, worded, and analyzed to justify a greater push for the use of multilevel modeling procedures and doubly latent models.

Conclusion

School climate research has permeated literature in education and psychology and offered a number of insights into the capacity of schools to shape student learning, decrease delinquent behaviors, and improve psychological well-being. There are several characteristics that can be gleaned from an extensive review of the literature. First, school climate is multidimensional. The inclusion of multiple domains enriches the characterization of school climate research and increases the likelihood of creating meaningful change through school reform initiatives that focus on multiple pathways to student success. Second, school climate could be a potentially promising target for intervention. A growing number of empirical research on school-wide interventions provides support that altering social processes of school climate across multiple domains will produce better outcomes for students. Third, school climate is predictive of student academic, behavioral, and psychological outcomes. Extensive empirical research has demonstrated a link between positive features of school climate and optimal student outcomes across academic, behavioral, and psychosocial domains. Fourth, school climate is inclusive; each domain of school climate combines constructs that are usually studied separately. School climate research, therefore, unites divergent disciplines throughout the educational and psychological literature by including both structural and process factors that are known to shape the overall climate and impact the well-being of all persons within the school. Although not necessarily an exhaustive list, these four principles represent the key points that demarcate a collective review of school climate research, which has demonstrated great potential from an applied and policy-relevant perspective as a target and catalyst for successful program implementation.

Although school climate research has progressed over the years, it is not lacking in complexities, limitations, and need for advancement. There is no universally accepted definition for climate nor is there consensus on the specific domains, features, or indicators that comprise it. We know little about how school climate changes over time, how domains or features interact to shape student outcomes, and how different source reporters may differentially impact outcomes of interest. However, some prominent findings have surfaced; we know that it is a malleable, multidimensional conceptualization that can shape student outcomes. All of these factors stress the important role that school climate plays in intervention work. Its ability to bring about meaningful change in student well-being demonstrates the importance of school climate as a target and catalyst for reform efforts. Given the number of institutions that are failing to provide students with the educational tools and skills that are necessary to succeed in life, greater attention must be given to improving our nation's schools. Although the effects of adverse conditions in one's home life or neighborhood may not be fully ameliorated, schools should be able to buffer these effects by providing students with a safe and healthy place to learn, socialize, discover, and explore. A high-quality school that meets the psychological, physical, and cognitive needs of its students is a school that will produce better educated citizens to take on the problems of tomorrow.

References

Agnew, R. (1993). Why do they do it? An examination of the intervening mechanisms between "social control" variables and delinquency. *Journal of Research in Crime and Delinquency, 30*, 245–266.

Aikens, N. L., & Barbarin, O. (2008). Socioeconomic differences in reading trajectories: the contribution of family, neighborhood, and school contexts. *Journal of Educational Psychology, 100*, 235–251.

Ainsworth, M. S. (1989). Attachments beyond infancy. *American Psychologist, 44*, 709–716.

Ainsworth, J. W. (2002). Why does it take a village? The mediation of neighborhood effects on educational achievement. *Social Forces, 81*, 117–152.

Archibald, S. (2006). Narrowing in on educational resources that do affect student achievement. *Peabody Journal of Education, 81*, 23–42.

Archibald, S., Coggshall, J. G., Croft, A., & Goe, L. (2011). High-quality professional development for all teachers: effectively allocating resources. *Research & Policy Brief. National Comprehensive Center for Teacher Quality.*

Atteberry, A., & Bryk, A. S. (2010). Centrality, connection, and commitment: the role of social networks in school-based literacy. In A. J. Daly (Ed.), *Social network theory and educational change* (pp. 51–76). Cambridge: Harvard Education Press.

Baker, J. A., Derrer, R. D., Davis, S. M., Dinklage-Travis, H. E., Linder, D. S., & Nicholson, M. D. (2001). The flip side of the coin: understanding the school's contribution to dropout and completion. *School Psychology Quarterly, 16*, 406–426.

Bandura, A. (1986). *Social foundations of thought and action: a social cognitive theory.* Englewood Cliffs: Prentice-Hall, Inc.

Bandura, A. (1997). *Self-efficacy: the exercise of control*. New York: W. H. Freeman and Co.

Bandyopadhyay, S., Cornell, D. G., & Konold, T. R. (2009). Validity of three school climate scales to assess bullying, aggressive attitudes, and help seeking. *School Psychology Review, 38*, 338–355.

Barth, R. S. (2006). Improving relationships within the schoolhouse. *Educational Leadership*, *63*, 8–13. Retrieved from http://www.ascd.org/publications/educational-leadership.aspx

Battistich, V., Solomon, D., Kim, D. I., Watson, M., & Schaps, E. (1995). Schools as communities, poverty levels of student populations, and students' attitudes, motives, and performance: a multilevel analysis. *American Educational Research Journal, 32*, 627–658.

Bear, G. G., Gaskins, C., Blank, J., & Chen, F. F. (2011). Delaware school climate survey-student: its factor structure, concurrent validity, and reliability. *Journal of School Psychology, 49*, 157–174.

Benner, A. D., Graham, S., & Mistry, R. S. (2008). Discerning direct and mediated effects of ecological structures and processes on adolescents' educational outcomes. *Developmental Psychology, 44*, 840–854.

Bergman, L. R. (2001). A person approach in research on adolescence: Some methodological challenges. *Journal of Adolescent Research, 16*, 28–53.

Bergman, L. R., & Andersson, H. (2010). The person and the variable in developmental psychology. *Journal of Psychology, 218*, 155–165.

Berner, M. M. (1993). Building conditions, parental involvement, and student achievement in the District of Columbia public school system. *Urban Education, 28*, 6–29.

Betts, J. R., & Shkolnik, J. L. (2000). The effects of ability grouping on student achievement and resource allocation in secondary schools. *Economics of Education Review, 19*, 1–15.

Birch, S. H., & Ladd, G. W. (1997). The teacher-child relationship and children's early school adjustment. *Journal of school psychology, 35*, 61–79.

Birkett, M., Espelage, D. L., & Koenig, B. (2009). LGB and questioning students in schools: the moderating effects of homophobic bullying and school climate on negative outcomes. *Journal of Youth and Adolescence, 38*, 989–1000.

Bodovski, K., Nahum-Shani, I., & Walsh, R. (2013). School climate and students' early mathematics learning: another search for contextual effects. *American Journal of Education, 119*, 209–234.

Booren, L. M., Handy, D. J., & Power, T. G. (2011). Examining perceptions of school safety strategies, school climate, and violence. *Youth Violence and Juvenile Justice, 9*, 171–187.

Borgatti, S. P., & Ofem, B. (2010). Overview: social network theory and analysis. In A. J. Daly (Ed.), *The ties of change: social network theory and application in education* (pp. 17–30). Cambridge: Harvard Press.

Borman, G. D., Hewes, G. M., Overman, L. T., & Brown, S. (2003). Comprehensive school reform and achievement: a meta-analysis. *Review of Educational Research, 73*, 125–230.

Boston, C. (2002). The concept of formative assessment. *Practical Assessment, Research & Evaluation, 8*.

Bowen, G. L., Bowen, N. K., & Richman, J. M. (2000). School size and middle school students' perceptions of the school environment. *Children & Schools, 22*, 69–82.

Bowen, G. L., Rose, R. A., Powers, J. D., & Glennie, E. J. (2008). The joint effects of neighborhoods, schools, peers, and families on changes in the school success of middle school students. *Family Relations, 57*, 504–516.

Bowlby, J. (1969). *Attachment and loss: volume 1: attachment. The International Psycho-Analytical Library, 79: 1–401*. London: The Hogarth Press and the Institute of Psycho-Analysis.

Bradshaw, C. P., Sawyer, A. L., & O'Brennan, L. M. (2009). A social disorganization perspective on bullying-related attitudes and behaviors: the influence of school context. *American Journal of Community Psychology, 43*, 204–220.

Brand, S., Felner, R., Shim, M., Seitsinger, A., & Dumas, T. (2003). Middle school improvement and reform: development and validation of a school-level assessment of climate, cultural pluralism, and school safety. *Journal of Educational Psychology, 95*, 570–588.

Brand, S., Felner, R. D., Seitsinger, A., Burns, A., & Bolton, N. (2005). A large scale study of the assessment of the social environment of middle and secondary schools: the validity and utility of teachers' ratings of school climate, cultural pluralism, and safety problems for understanding school effects and school improvement. *Journal of School Psychology, 46*, 507–535.

Bronfenbrenner, U., & Bronfenbrenner, U. (1979). *The ecology of human development: experiments by nature and design*. Boston: Harvard University Press.

Brookmeyer, K. A., Fanti, K. A., & Henrich, C. C. (2006). Schools, parents, and youth violence: a multilevel, ecological analysis. *Journal of Clinical Child and Adolescent Psychology, 35*, 504–514.

Brookover, W. B., Schweitzer, J. H., Schneider, J. M., Beady, C. H., Flood, P. K., & Wisenbaker, J. M. (1978). Elementary school social climate and school achievement. *American Educational Research Journal, 15*, 301–318.

Brooks, J. E. (2006). Strengthening resilience in children and youths: maximizing opportunities through the schools. *Children & Schools, 28*, 69–76.

Brophy, J., & Good, T. (1986). Teacher behavior and student achievement. In M. Wittrock (Ed.), *Third handbook of research on teaching* (pp. 328–375). New York: Macmillan.

Bruns, E. J., Walrath, C., Glass-Siegel, M., & Weist, M. D. (2004). School-based mental health services in Baltimore: association with school climate and special education referrals. *Behavior Modification, 28*, 491–512.

Bryant, V. C., Shdaimah, C., Sander, R. L., & Cornelius, L. J. (2013). School as haven: transforming school environments into welcoming learning communities. *Children and Youth Services Review, 35*, 848–855.

Bryk, A., & Raudenbush, S. W. (1992). *Hierarchical linear models for social and behavioral research: applications and data analysis methods*. Newbury Park: Sage.

Buckley, J., Schneider, M., & Shang, Y. (2004). The effects of school facility quality on teacher retention in urban school districts. *Washington, DC: National Clearinghouse for Educational Facilities, 24*, 2005–2132.

Cantrell, S., & Kane, T. J. (2013). Ensuring fair and reliable measures of effective teaching: culminating findings from the MET project's three-year study. *Policy and Practice Brief.*

Chang, J., & Le, T. N. (2010). Multiculturalism as a dimension of school climate: the impact on the academic achievement of Asian American and Hispanic youth. *Cultural Diversity and Ethnic Minority Psychology, 16*, 485.

Chung, H., Elias, M., & Schneider, K. (1998). Patterns of individual adjustment changes during middle school transition. *Journal of School Psychology, 36*, 83–101.

Clifford, M., Menon, R., Gangi, T., Condon, C., & Hornung, K. (2012). *Measuring school climate for gauging principal performance: a review of the validity and reliability of publicly accessible measures*. Washington, DC: American Institutes for Research.

Coburn, C. E., Choi L., Mata W.S. (2010). "I Would Go to Her Because Her Mind Is Math: Network Formation in the Context of Mathematics Reform."(pp. 33–50) in *Social network theory and educational change*, edited by Alan J. Daly. Cambridge, MA: Harvard Education Press.

Cohen, D. K., Raudenbush, S. W., & Ball, D. L. (2003). Resources, instruction, and research. *Educational Evaluation and Policy Analysis, 25*, 119–142.

Cohen, J., McCabe, L., Michelli, N. M., & Pickeral, T. (2009a). School climate: research, policy, practice, and teacher education. *The Teachers College Record, 111*, 180–213.

Cohen, J., Pickeral, T., & McCloskey, M. (2009b). Assessing school climate. *Education Digest: Essential Readings Condensed for Quick Review, 74*, 45–48.

Cook, T. D., Murphy, R. F., & Hunt, H. D. (2000). Comer's school development program in Chicago: a theory-based evaluation. *American Educational Research Journal, 37*, 535–597.

Cooper, H. M., & Good, T. L. (1983). Teacher and student perceptions of interactions frequencies. In H. M. Cooper & T. L. Good (Eds.), *Pygmalion grows up: Studies in the expectation communication process* (pp. 47–55). New York, NY: Longman.

Cotton, K. (1996). *Affective and social benefits of small-scale schooling. ERIC Digest ED401088*. Charleston: ERIC Clearinghouse on Rural Education and Small Schools.

Crosnoe, R., Cavanagh, S., & Elder, G. H., Jr. (2003). Adolescent friendships as academic resources: the intersection of friendship, race, and school disadvantage. *Sociological Perspectives, 46*, 331–352.

Crosnoe, R., Johnson, M. K., & Elder, G. H., Jr. (2004). School size and the interpersonal side of education: an examination of race/ethnicity and organizational context. *Social Science Quarterly, 85*, 1259–1274.

Dawson, C., & Parker, J. R. (1998). *A descriptive analysis of the perspective of Neville High School teachers regarding the school renovation*. New Orleans: paper presented at the Mid-South Educational Research Association.

Deemer, S. (2004). Classroom goal orientation in high school classrooms: revealing links between teacher beliefs and classroom environments. *Educational Research, 46*, 73–90.

Devine, J. F., & Cohen, J. (2007). *Making your school safe: strategies to protect children and promote learning*. Columbia University, NY: Teachers College Press.

Durán-Narucki, V. (2008). School building condition, school attendance, and academic achievement in New York City public schools: a mediation model. *Journal of Environmental Psychology, 28*, 278–286.

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child Development, 82*, 405–432.

Earthman, G. I. (2002). School facility conditions and student academic achievement. *U.C. Los Angeles: UCLA's Institute for Democracy, Education, and Access.*

Eccles, J. S., & Midgley, C. (1989). Stage/environment fit: developmentally appropriate classrooms for early adolescents, Ames, R., Ames, C. (Eds.), *Research on motivation in education*, Vol. 3 (pp. 139–181). New York: Academic Press.

Eccles, J. S., & Roeser, R. W. (2011). Schools as developmental contexts during adolescence. *Journal of Research on Adolescence, 21*, 225–241.

Eccles, J. S., Midgley, C., Wigfield, A., Buchanan, C. M., Reuman, D., Flanagan, C., & Mac Iver, D. (1993). Development during adolescence: the impact of stage environment fit on young adolescents' experiences in schools and in families. *American Psychologist, 48*, 90–101.

Eccles, J. S., Lord, S. E., & Roeser, R. W. (1996). Round holes, square pegs, rocky roads, and sore feet: the impact of stage-environment fit on young adolescents' experiences in schools. In D. Cicchetti & S. Toth (Eds.), *Adolescence: opportunities and challenges* (pp. 47–92). Rochester: University of Rochester Press.

Eliot, M., Cornell, D., Gregory, A., & Fan, X. (2010). Supportive school climate and student willingness to seek help for bullying and threats of violence. *Journal of School Psychology, 48*, 533–553.

Elsaesser, C., Gorman-Smith, D., & Henry, D. (2013). The role of the school environment in relational aggression and victimization. *Journal of Youth and Adolescence, 42*, 235–249.

Emmons, Comer, & Haynes. (1996). Translating theory into practice: Comer's theory of school reform. In J. P. Comer, N. M. Haynes, E. Joyner, & M. Ben-Avie (Eds.), *Rallying the whole village* (pp. 27–41). New York: Teachers College Press.

Epstein, J. L., Sanders, M. G., Sheldon, S., Simon, B. S., & Salinas, K. C. (1997). *School, family, and community partnerships: your handbook for action*. Thousand Oaks: Corwin Press.

Espelage, D. L., Aragon, S. R., & Birkett, M. (2008). Homophobic teasing, psychological outcomes, and sexual orientation among high school students: What influence do parents and schools have? *School Psychology Review, 37*, 202–216.

Esposito, C. (1999). Learning in urban blight: school climate and its effect on the school performance of urban, minority, low-income children. *School Psychology Review, 28*, 365–377.

Fantuzzo, J. W., LeBoeuf, W. A., & Rouse, H. L. (2014). An investigation of the relations between school concentrations of student risk factors and student educational well-being. *Educational Researcher, 43*, 25–36.

Fenning, P., & Rose, J. (2007). Overrepresentation of African American students in exclusionary discipline: the role of policy. *Urban Education, 42*, 536–559.

Figlio, D. N., & Page, M. E. (2002). School choice and the distributional effects of ability tracking: does separation increase inequality? *Journal of Urban Economics, 51*, 497–514.

Finn, J. D., & Voelkl, K. E. (1993). School characteristics related to student engagement. *Journal of Negro Education, 62*, 249–268.

Finn, J. D., Achilles, C. M., & Finn, J. D. (1999). Tennessee's class size study: findings, implications, misconceptions. *Educational Evaluation and Policy Analysis, 21*, 97–109.

Fisk, W. J. (2000). Health and productivity gains from better indoor environments and their relationship with building energy efficiency. *Annual Review of Energy and the Environment, 25*, 537–566.

Flanagan, C. A., & Stout, M. (2010). Developmental patterns of social trust between early and late adolescence: Age and school climate effects. *Journal of Research on Adolescence, 20*, 748–773.

Fletcher, A., Bonell, C., & Hargreaves, J. (2008). School effects on young people's drug use: a systematic review of intervention and observational studies. *Journal of Adolescent Health, 42*, 209–220.

Fraser, M. W., Galinsky, M. J., & Richman, J. M. (1999). Risk, protection, and resilience: toward a conceptual framework for social work practice. *Social Work Research, 23*, 131–143.

Freeman, J. G., Samdal, O., Klinger, D. A., Dur, W., Griebler, R., Currie, D., & Rasmussen, M. (2009). The relationship of schools to emotional health and bullying. *International Journal of Public Health, 54*, 251–259.

Freiberg, H. J. (1998). Measuring school climate: Let me count the ways. *Educational Leadership, 56*, 22–26.

Freiberg, H. J., & Stein, T. A. (1999). Measuring, improving and sustaining healthy learning environments. In H. J. Freiberg (Ed.), *School climate: Measuring, improving and sustaining healthy learning environments* (pp. 11–29). Philadelphia, PA: Falmer Press.

Frey, A., Ruchkin, V., Martin, A., & Schwab-Stone, M. (2009). Adolescents in transition: school and family characteristics in the development of violent behaviors entering high school. *Child Psychiatry and Human Development, 40*, 1–13.

Gest, S. D., & Rodkin, P. C. (2011). Teaching practices and elementary classroom peer ecologies. *Journal of Applied Developmental Psychology, 32*, 288–296.

Gittelsohn, J., Merkle, S., Story, M., Stone, E. J., Steckler, A., Noel, J., & Ethelbah, B. (2003). School climate and implementation of the pathways study. *Preventive Medicine, 37*, S97–S106.

Goddard, R. D., Sweetland, S. R., & Hoy, W. K. (2000). Academic emphasis of urban elementary schools and student achievement in reading and mathematics: a multilevel analysis. *Educational Administration Quarterly, 36*, 683–702.

Goldkind, L., & Farmer, G. (2013). The enduring influence of school size and school climate on parents' engagement in the school community. *School Community Journal, 23*, 223–244.

Goldstein, S. E., Young, A., & Boyd, C. (2008). Relational aggression at school: associations with school safety and social climate. *Journal of Youth and Adolescence, 37*, 641–654.

Gottfredson, D. (2001). *Delinquency and schools*. New York: Cambridge University Press.

Gottfredson, D., & Gottfredson, G. (2002). Quality of school-based prevention programs: results from a national survey. *Journal of Research in Crime and Delinquency, 39*, 3–35.

Gottfredson, G. D., Gottfredson, D. C., Payne, A. A., & Gottfredson, N. C. (2005). School climate predictors of school disorder: results from a national study of delinquency prevention in schools. *Journal of Research in Crime and Delinquency, 42*, 412–444.

Graham, S., Bellmore, A. D., & Mize, J. (2006). Peer victimization, aggression, and their co-occurrence in middle school: pathways to adjustment problems. *Journal of Abnormal Child Psychology, 34*, 349–364.

Grayson, J. L., & Alvarez, H. K. (2008). School climate factors relating to teacher burnout: a mediator model. *Teaching and Teacher Education, 24*, 1349–1363.

Greenwald, R., Hedges, L. V., & Laine, R. D. (1996). The effect of school resources on student achievement. *Review of Educational Research, 66*, 361–396.

Gregory, A., Cornell, D., Fan, X., Sheras, P., Shih, T. H., & Huang, F. (2010). Authoritative school discipline: high school practices associated with lower bullying and victimization. *Journal of Educational Psychology, 102*, 483–496.

Gregory, A., Cornell, D., & Fan, X. (2011). The relationship of school structure and support to suspension rates for Black and White high school students. *American Educational Research Journal, 48*, 904–934.

Gregory, A., Cornell, D., & Fan, X. (2012). Teacher safety and authoritative school climate in high schools. *American Journal of Education, 118*, 401–425.

Griffith, J. (1999). School climate as "social order" and "social action": a multi-level analysis of public elementary school student perceptions. *Social Psychology of Education, 2*, 339–369.

Griffith, J. (2000). School climate as group evaluation and group consensus: student and parent perceptions of the elementary school environment. *The Elementary School Journal, 101*, 35–61.

Halpin, A. W., & Croft, D. B. (1963). *The organizational climate of schools*. University of Chicago: Midwest Administration Center.

Hamre, B. K., & Pianta, R. C. (2001). Early teacher–child relationships and the trajectory of children's school outcomes through eighth grade. *Child Development, 72*, 625–638.

Hanushek, E. A. (1997). Assessing the effects of school resources on student performance: an update. *Educational Evaluation and Policy Analysis, 19*, 141–164.

Hanushek, E. A., & Wößmann, L. (2006). Does educational tracking affect performance and inequality? Differences-in-differences evidence across countries. *The Economic Journal, 116*, C63–C76.

Hawkins, J. D., & Catalano, R. F. (1990). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: implications for substance abuse prevention. Unpublished manuscript, University of Washington, Social Development Research Group, Seattle.

Haynes, N. M., Emmons, C., & Ben-Avie, M. (1997). School climate as a factor in student adjustment and achievement. *Journal of Educational and Psychological Consultation, 8*, 321–329.

Hedges, L. V., Laine, R. D., & Greenwald, R. (1994). Does money matter? A meta-analysis of studies of the effects of differential school inputs on student outcomes. *Educational Researcher, 23*, 5–14.

Hill, N. E. (2009). Culturally-based worldviews, family processes, and family-school interaction. In S. Christenson & A. Reschly (Eds.), *The handbook on school-family partnerships for promoting student competence* (pp. 101–127). New York: Routledge/Taylor Francis.

Hill, N. E., & Taylor, L. C. (2004). Parental school involvement and children's academic achievement: pragmatics and issues. *Current Directions in Psychological Science, 13*, 161–164.

Hirschi. (1969). *Causes of delinquency*. Berkeley: University of California Press.

Hopson, L. M., & Lee, E. (2011). Mitigating the effect of family poverty on academic and behavioral outcomes: the role of school climate in middle and high school. *Children and Youth Services Review, 33*, 2221–2229.

Hoy, W. K., & Hannum, J. W. (1997). Middle school climate: an empirical assessment of organizational health and student achievement. *Educational Administration Quarterly, 33*, 290–311.

Hoy, W. K., Tarter, C. J., & Hoy, A. W. (2006). Academic optimism of schools: a force for student achievement. *American Educational Research Journal, 43*, 425–446.

Hughes, T. L., & Akin-Little, A. (2007). Attachment theory: implications for practice in schools. *Journal of Early Childhood and Infant Psychology, 3*, 1–5.

Johnson, S. M. (1990). *Teachers at work: achieving success in our schools*. Scranton: Harper Collins Publishers.

Johnson, B., & Stevens, J. J. (2006). Student achievement and elementary teachers' perceptions of school climate. *Learning Environments Research, 9*, 111–122.

Johnson, B., Stevens, J. J., & Zvoch, K. (2007). Teachers' perceptions of school climate: a validity study of scores from the revised school level environment questionnaire. *Educational and Psychological Measurement, 67*, 833–844.

Juvonen, J., Nishina, A., & Graham, S. (2006). Ethnic diversity and perceptions of safety in urban middle schools. *Psychological Science, 17*, 393–400.

Kaplan, A., Gheen, M., & Midgley, C. (2002). Classroom goal structure and student disruptive behaviour. *British Journal of Educational Psychology, 72*, 191–211.

Kasen, S., Johnson, J., & Cohen, P. (1990). The impact of school emotional climate on student psychopathology. *Journal of Abnormal Child Psychology, 18*, 165–177.

Kasen, S., Cohen, P., & Brook, J. S. (1998). Adolescent school experiences and dropout, adolescent pregnancy, and young adult deviant behavior. *Journal of Adolescent Research, 13*, 49–72.

Kasen, S., Cohen, P., Chen, H., Johnson, J. G., & Crawford, T. N. (2009). School climate and continuity of adolescent personality disorder symptoms. *The Journal of Child Psychology and Psychiatry, 50*, 1504–1512.

Kelley, R. C., Thornton, B., & Daugherty, R. (2005). Relationships between measures of leadership and school climate. *Education, 126*, 17–25.

Kieffer, M. J. (2012). Before and after third grade: longitudinal evidence for the shifting role of socioeconomic status in reading growth. *Reading and Writing, 25*, 1725–1746.

Koth, C. W., Bradshaw, C. P., & Leaf, P. J. (2008). A multilevel study of predictors of student perceptions of school climate: the effect of classroom-level factors. *Journal of Educational Psychology, 100*, 96–104.

Kuperminc, G. P., Leadbeater, B. J., Emmons, C., & Blatt, S. J. (1997). Perceived school climate and difficulties in the social adjustment of middle school students. *Applied Developmental Science, 1*, 76–88.

Kuperminc, G. P., Leadbeater, B. J., & Blatt, S. J. (2001). School social climate and individual differences in vulnerability to psychopathology among middle school students. *Journal of School Psychology, 39*, 141–159.

LaRusso, M., & Selman, R. (2011). Early adolescent health risk behaviors, conflict resolution strategies, and school climate. *Journal of Applied Developmental Psychology, 32*, 354–362.

LaRusso, M. D., Romer, D., & Selman, R. L. (2008). Teachers as builders of respectful school climates: implications for adolescent drug use norms and depressive symptoms in high school. *Journal of Youth and Adolescence, 37*, 386–398.

Lee, V. E., & Burkam, D. T. (2003). Dropping out of high school: the role of school organization and structure. *American Educational Research Journal, 40*, 353–393.

Lee, J., & Shute, V. J. (2010). Personal and social-contextual factors in K–12 academic performance: an integrative perspective on student learning. *Educational Psychologist, 45*, 185–202.

Lee, V. E., & Smith, J. B. (1997). High school size: which works best and for whom? *Educational Evaluation and Policy Analysis, 19*, 205–227.

Lee, V. E., & Smith, J. B. (1999). Social support and achievement for young adolescents in Chicago: the role of school academic press. *American Educational Research Journal, 36*, 907–945.

Leithwood, K., & Jantzi, D. (1999). The relative effects of principal and teachers sources of leadership on student engagement with school. *Educational Administration Quarterly, 35*, 679–706.

Leithwood, K., & Jantzi, D. (2009). A review of empirical evidence about school size effects: a policy perspective. *Review of Educational Research, 79*, 464–490.

Leithwood, K. A., & Riehl, C. (2003). *What we know about successful school leadership*. Philadelphia: Laboratory for Student Success, Temple University.

Loukas, A., & Murphy, J. L. (2007). Middle school student perceptions of school climate: examining protective functions on subsequent adjustment problems. *Journal of School Psychology, 45*, 293–309.

Loukas, A., & Robinson, S. (2004). Examining the moderating role of perceived school climate in early adolescent adjustment. *Journal of Research on Adolescence, 14*, 209–233.

Loukas, A., Suzuki, R., & Horton, K. D. (2006). Examining school connectedness as a mediator of school climate effects. *Journal of Research on Adolescence, 16*, 491–502.

Lubienski, S. T., Lubienski, C., & Crane, C. C. (2008). Achievement differences and school type : the role of school climate, teacher certification, and instruction. *American Journal of Education, 115*, 97–138.

Ma, X., & Wilkins, J. L. (2002). The development of science achievement in middle and high school: individual differences and school effects. *Evaluation Review, 26*, 395–417.

MacNeil, A. J., Prater, D. L., & Busch, S. (2009). The effects of school culture and climate on student achievement. *International Journal of Leadership in Education, 12*, 73–84.

Marks, H. M. (2000). Student engagement in instructional activity: patterns in the elementary, middle, and high school years. *American Educational Research Journal, 37*, 153–184.

Marley, S. C., & Levin, J. R. (2011). When are prescriptive statements in educational research justified? *Educational Psychology Review, 23*, 197–206.

Marsh, H. W., Lüdtke, O., Robitzsch, A., Trautwein, U., Asparouhov, T., Muthén, B., & Nagengast, B. (2009). Doubly-latent models of school contextual effects: integrating multilevel and structural equation approaches to control measurement and sampling error. *Multivariate Behavioral Research, 44*, 764–802.

Marsh, H. W., Lüdtke, O., Nagengast, B., Trautwein, U., Morin, A. J., Abduljabbar, A. S., & Köller, O. (2012). Classroom climate and contextual effects: conceptual and methodological issues in the evaluation of group-level effects. *Educational Psychologist, 47*, 106–124.

Martin, A. J. (2011). Prescriptive statements and educational practice: what can structural equation modeling (SEM) offer? *Educational Psychology Review, 23*, 235–244.

Mattison, E., & Aber, M. S. (2007). Closing the achievement gap: the association of racial climate with achievement and behavioral outcomes. *American Journal of Community Psychology, 40*, 1–12.

Mayberry, M. L., Espelage, D. L., & Koenig, B. (2009). Multilevel modeling of direct effects and interactions of peers, parents, school, and community influences on adolescent substance use. *Journal of Youth and Adolescence, 38*, 1038–1049.

McCoy, D. C., Roy, A. L., & Sirkman, G. M. (2013). Neighborhood crime and school climate as predictors of elementary school academic quality: a cross-lagged panel analysis. *American Journal of Community Psychology, 52*, 128–140.

McEvoy, A., & Welker, R. (2000). Antisocial behavior, academic failure, and school climate: a critical review. *Journal of Emotional and Behavioral Disorders, 8*, 130–140.

McGuire, J. K., Anderson, C. R., Toomey, R. B., & Russell, S. T. (2010). School climate for transgender youth: a mixed method investigation of student experiences and school responses. *Journal of Youth and Adolescence, 39*, 1175–1188.

McKenzie, J. F., Wood, M. L., Kotecki, J. E., Clark, J. K., & Brey, R. A. (1999). Establishing content validity: using qualitative and quantitative steps. *American Journal of Health Behavior, 23*, 311–318.

McNeely, C. A., Nonnemaker, J. M., & Blum, R. W. (2002). Promoting school connectedness: evidence from the National Longitudinal Study of Adolescent Health. *Journal of School Health, 72*, 138–146.

Meece, J. L., Anderman, E. M., & Anderman, L. H. (2006). Classroom goal structure, student motivation, and academic achievement. *Annual Review of Psychology, 57*, 487–503.

Mehta, S. B., Cornell, D., Fan, X., & Gregory, A. (2013a). Bullying climate and school engagement in ninth-grade students. *The Journal of School Health, 83*, 45–52.

Mehta, T. G., Atkins, M. S., & Frazier, S. L. (2013b). The organizational health of urban elementary schools: school health and teacher functioning. *School Mental Health, 5*, 144–154.

Meyer-Adams, N., & Conner, B. T. (2008). School violence: bullying behaviors and the psychosocial school environment in middle schools. *Children & Schools, 30*, 211–221.

Miles, K. H., & Darling-Hammond, L. (1998). Rethinking the allocation of teaching resources: some lessons from high-performing schools. *Educational Evaluation and Policy Analysis, 20*, 9–29.

Morrison, G. M., Furlong, M. J., & Morrison, R. L. (1994). School violence to school safety: reframing the issue for school psychologists. *School Psychology Review, 23*, 236–256.

Mulkey, L. M., Catsambis, S., Steelman, L. C., & Crain, R. L. (2005). The long-term effects of ability grouping in mathematics: a national investigation. *Social Psychology of Education, 8*, 137–177.

Muthen, B. O. (1994). Multilevel covariance structure analysis. *Sociological Methods and Research, 22*, 376–398.

National School Climate Council (2007). The school climate challenge: narrowing the gap between school climate research and school climate policy, practice guidelines and teacher education policy. http://www.ecs.org/school-climate.

Newmann, F. M., & Wehlage, G. G. (1993). Five standards of authentic instruction. *Educational Leadership, 50*, 8–12.

Oakes, J. (2008). Keeping track: structuring equality and inequality in an era of accountability. *The Teachers College Record, 110*, 700–712.

Oakes, J., & Saunders, M. (2002). *Access to textbooks, instructional materials, equipment, and technology: Inadequacy and inequality in California's public schools*. UC Los Angeles: UCLA's Institute for Democracy, Education, and Access.

Osher, D., Bear, G. G., Sprague, J. R., & Doyle, W. (2010). How can we improve school discipline? *Educational Researcher, 39*, 48–58.

Osterman, K. F. (2000). Students' need for belonging in the school community. *Review of Educational Research, 70*, 323–367.

Ozer, E. J., & Weinstein, R. S. (2004). Urban adolescents' exposure to community violence: the role of support, school safety, and social constraints in a school-based sample of boys and girls. *Journal of Clinical Child and Adolescent Psychology, 33*, 463–476.

Patrick, H., Ryan, A. M., & Kaplan, A. (2007). Early adolescents' perceptions of the classroom social environment, motivational beliefs, and engagement. *Journal of Educational Psychology, 99*, 83–98.

Pellerin, L. A. (2005). Student disengagement and the socialization styles of high schools. *Social Forces, 84*, 1161–1179.

Penuel, W. R., Frank, K. A., & Krause, A. (2006). The distribution of resources and expertise and the implementation of schoolwide reform initiatives. In S. A. Barab, K. E. Hay, & D. T. Hickey (Eds.), *Proceedings of the 7th International Conference of the Learning Sciences* (Vol. 1, pp. 522–528). Mahwah: Erlbaum.

Perry. (1908). *The management of a city school*. New York: The Macmillan Company.

Perry, L. B. (2012). Causes and effects of school socio-economic composition? A review of the literature. *Education and Society, 30*, 19–35.

Pianta, R. C. (1999). *Enhancing relationships between children and teachers*. Washington DC: American Psychological Association.

Pianta, R. C., & Hamre, B. K. (2009). Conceptualization, measurement, and improvement of classroom processes: standardized observation can leverage capacity. *Educational Researcher, 38*, 109–119.

Pintrich, P. R., & Schunk, D. H. (2002). *Motivation in education: theory, research, and applications* (2nd ed.). Englewood Cliffs: Prentice-Hall, Inc.

Rashid, M., & Zimring, C. (2008). A review of the empirical literature on the relationships between indoor environment and stress in health care and office settings: problems and prospects of sharing evidence. *Environment and Behavior, 40*, 151–190.

Raudenbush, S. W., Rowan, B., & Kang, S. J. (1991). A multilevel, multivariate model for studying school climate with estimation via the EM algorithm and application to U.S. high-school data. *Journal of Educational Statistics, 16*, 295–330.

Ravens-Sieberer, U., Freeman, J., Kokonyei, G., Thomas, C. A., & Erhart, M. (2009). School as a determinant for health outcomes—a structural equation model analysis. *Health Education, 109*, 342–356.

Reddy, R., Rhodes, J. E., & Mulhall, P. (2003). The influence of teacher support on student adjustment in the middle school years: a latent growth curve study. *Development and Psychopathology, 15*, 119–138.

Reinke, W. M., & Herman, K. C. (2002). Creating school environments that deter antisocial behaviors in youth. *Psychology in the Schools, 39*, 549–559.

Reis, J., Trockel, M., & Mulhall, P. (2007). Individual and school predictors of middle school aggression. *Youth & Society, 38*, 322–347.

Roeser, R. W., & Eccles, J. S. (1996). Adolescents' perceptions of middle school: relation to longitudinal changes in academic and psychological adjustment. *Journal of Research on Adolescence, 8*, 123–158.

Roeser, R. W., Midgley, C., & Urdan, T. C. (1996). Perceptions of the school psychological environment and early adolescents' psychological and behavioral functioning in school: the mediating role of goals and belonging. *Journal of Educational Psychology, 88*, 408–422.

Rones, M., & Hoagwood, K. (2000). School-based mental health services: a research review. *Clinical Child and Family Psychology Review, 3*, 223–241.

Rutter, M. (2006). Implications of resilience concepts for scientific understanding. *Annals of the New York Academy of Sciences, 1094*, 1–12.

Rutter, M., Dunn, J., Plomin, R., Simonoff, E., Pickles, A., Maughan, B., Ormel, J., & Meyer, J. (1997). Eaves integrating nature and nurture: implications of person-environment correlations and interactions for developmental psychopathology. *Development and Psychopathology, 9*, 335.

Ruus, V. R., Veisson, M., Leino, M., Ots, L., Pallas, L., Sarv, E. S., & Veisson, A. (2007). Students' well-being, coping, academic success, and school climate. *Social Behavior and Personality: An International Journal, 35*, 919–936.

Ryan, A. M., & Patrick, H. (2001). The classroom social environment and changes in adolescents' motivation and engagement during middle school. *American Educational Research Journal, 38*, 437–460.

Selig, J. P., Hoy, R., & Little, T. D. (2013). Temporal design in organizational research. In M. E. Hassett & E. Paavilainen-Mäntymäki (Eds.), *Handbook of longitudinal research methods in organization and business studies* (pp. 78–91). Northampton: Edward Elgar Publishing.

Sheldon, S. B. (2003). Linking school–family–community partnerships in urban elementary schools to student achievement on state tests. *The Urban Review, 35*, 149–165.

Sheldon, J. E., & Epstein, J. L. (2002a). Present and accounted for: improving student attendance through family and community involvement. *The John Hopkins University, The Journal of Educational Research, 1*, 308–318.

Sheldon, S. B., & Epstein, J. L. (2002b). Improving student behavior and school discipline with family and community involvement. *Education and Urban Society, 35*, 4–26.

Sheldon, S. B., & Epstein, J. L. (2005). Involvement counts: family and community partnerships and mathematics achievement. *The Journal of Educational Research, 98*, 196–207.

Shirley, E. L., & Cornell, D. G. (2012). The contribution of student perceptions of school climate to understanding the disproportionate punishment of African American students in a middle school. *School Psychology International, 33*, 115–134.

Simons, E., Hwang, S. A., Fitzgerald, E. F., Kielb, C., & Lin, S. (2010). The impact of school building conditions on student absenteeism in upstate New York. *American Journal of Public Health, 100*, 1679.

Skiba, R., Michael, S., Nardo, A., & Peterson, R. (2002). The color of discipline: sources of racial and gender disproportionality in school punishment. *The Urban Review, 34*, 317–342.

Snyder, F. J., Vuchinich, S., Acock, A., Washburn, I. J., & Flay, B. R. (2012). Improving elementary school quality through the use of a social-emotional and character development program: a matched-pair, cluster-randomized, controlled trial in Hawaii. *Journal of School Health, 82*, 11–20.

Solomon, D., Battistich, V., Watson, M., Schaps, E., & Lewis, C. (2000). A six-district study of educational change: direct and mediated effects of the child development project. *Social Psychology of Education, 4*, 3–51.

Stefanou, C. R., Perencevich, K. C., DiCintio, M., & Turner, J. C. (2004). Supporting autonomy in the classroom: ways teachers encourage student decision making and ownership. *Educational Psychologist, 39*, 97–110.

Stewart, E. A. (2003). School social bonds, school climate, and school misbehavior: a multilevel analysis. *Justice Quarterly, 20*, 575–604.

Stewart, E. B. (2007). School structural characteristics, student effort, peer associations, and parental involvement: the influence of school- and individual-level factors on academic achievement. *Education and Urban Society, 40*, 179–204.

Stewart, E. B. (2008). School structural characteristics, student effort, peer associations, and parental involvement the influence of school-and individual-level factors on academic achievement. *Education and Urban Society, 40*, 179–204.

Sugai, G., Lewis-Palmer, T., & Hagan, S. (1998). Using functional assessments to develop behavior support plans. *Preventing School Failure, 43*, 6–13.

Suldo, S. M., Thalji-Raitano, A., Hasemeyer, M., Gelley, C. D., & Hoy, B. (2013). Understanding middle school students' life satisfaction: does school climate matter? *Applied Research in Quality of Life, 8*, 169–182.

Swearer, S. M., Espelage, D. L., Vaillancourt, T., & Hymel, S. (2010). What can be done about school bullying? Linking research to educational practice. *Educational Researcher, 39*, 38–47.

Syvertsen, A. K., Flanagan, C. A., & Stout, M. D. (2009). Code of silence: students' perceptions of school climate and willingness to intervene in a peer's dangerous plan. *Journal of Educational Psychology, 101*, 219–232.

Tanner, C. K. (2000). The influence of school architecture on academic achievement. *Journal of Educational Administration, 38*, 309–330.

Thapa, A., Cohen, J., Guffey, S., & Higgins-D'Alessandro, A. (2013). A review of school climate research. *Review of Educational Research, 83*, 357–385.

Uline, C., & Tschannen-Moran, M. (2008). The walls speak: the interplay of quality facilities, school climate, and student achievement. *Journal of Educational Administration, 46*, 55–73.

Urdan, T., & Schoenfelder, E. (2006). Classroom effects on student motivation: goal structures, social relationships, and competence beliefs. *Journal of School Psychology, 44*, 331–349.

Waasdorp, T. E., Pas, E. T., O'Brennan, L. M., & Bradshaw, C. P. (2011). A multilevel perspective on the climate of bullying: discrepancies among students, school staff, and parents. *Journal of School Violence, 10*, 115–132.

Waasdorp, T. E., Bradshaw, C. P., & Leaf, P. J. (2012). The impact of schoolwide positive behavioral interventions and supports on bullying and peer rejection: A randomized controlled effectiveness trial. *Archives of Pediatrics & Adolescent Medicine, 166*, 149–156.

Wang, M. T. (2009). School climate support for behavioral and psychological adjustment: testing the mediating effect of social competence. *School Psychology Quarterly, 24*, 240–251.
Wang, M. T., & Dishion, T. J. (2011). The trajectories of adolescents' perceptions of school climate, deviant peer affiliation, and behavioral problems during the middle school years. *Journal of Research on Adolescence, 22*, 40–53.
Wang, M. T., & Dishion, T. J. (2012). The trajectories of adolescents' perceptions of school climate, deviant peer affiliation, and behavioral problems during the middle school years. *Journal of Research on Adolescence, 22*, 40–53.
Wang, M. T., & Eccles, J. S. (2013). School context, achievement motivation, and academic engagement: a longitudinal study of school engagement using a multidimensional perspective. *Learning and Instruction, 28*, 12–23.
Wang, M. T., & Eccles, J. S. (2014). Multilevel predictors of math classroom climate: a comparison study of student and teacher perceptions. *Journal of Research on Adolescence*.
Wang, M. T., & Holcombe, R. (2010). Adolescents' perceptions of school environment, engagement, and academic achievement in middle school. *American Educational Research Journal, 47*, 633–662.
Wang, M. T., & Huguley, J. P. (2012). Parental racial socialization as a moderator of the effects of racial discrimination on educational success among African American adolescents. *Child Development, 83*, 1716–1731.
Wang, M. T., Selman, R. L., Dishion, T. J., & Stormshak, E. A. (2010). A tobit regression analysis of the covariation between middle school students' perceived school climate and behavioral problems. *Journal of Research on Adolescence, 20*, 274–286.
Wang, M. T., Brinkworth, M. E., & Eccles, J. S. (2012). The moderation effect of teacher–student relationship on the association between adolescents' self–regulation ability, family conflict, and developmental problems. *Developmental Psychology, 49*, 690–705.
Waters, T., Marzano, R., & McNulty, B. (2004). Leadership that sparks learning. *Educational Leadership, 61*, 48–52.
Way, S. M. (2011). School discipline and disruptive classroom behavior: the moderating effects of student perceptions. *The Sociological Quarterly, 52*, 346–375.
Way, N., & Robinson, M. G. (2003). A longitudinal study of the effects of family, friends, and school experiences on the psychological adjustment of ethnic minority, low-SES adolescents. *Journal of Adolescent Research, 18*, 324–346.
Way, N., Reddy, R., & Rhodes, J. (2007). Students' perceptions of school climate during the middle school years: associations with trajectories of psychological and behavioral adjustment. *American Journal of Community Psychology, 40*, 194–213.
Weinstein, C. S., Curran, M., & Tomlinson-Clarke, S. (2003). Culturally responsive classroom management: awareness into action. *Theory Into Practice, 42*, 269–276.
Weishew, N. L., & Peng, S. S. (1993). Variables predicting students' problem behaviors. *The Journal of Educational Research, 87*, 5–17.
Weiss, C. C., Carolan, B. V., & Baker-Smith, E. C. (2010). Big school, small school: (re)testing assumptions about high school size, school engagement and mathematics achievement. *Journal of Youth and Adolescence, 39*, 163–176.
Welsh, W. (2000). The effects of school climate on school disorder. *Annals of the American Academy of Political and Social Science, 567*, 88–107.
Whitlock, J. L. (2006). Youth perceptions of life at school: contextual correlates of school connectedness in adolescence. *Applied Developmental Science, 10*, 13–29.
Wilson, D. (2004). The interface of school climate and school connectedness and relationships with aggression and victimization. *Journal of School Health, 74*, 293–299.
Worrell, F. C., & Hale, R. L. (2001). The relationship of hope in the future and perceived school climate to school completion. *School Psychology Quarterly, 16*, 370–388.
Zaykowski, H., & Gunter, W. (2012). Youth victimization: school climate or deviant lifestyles? *Journal of Interpersonal Violence, 27*, 431–452.
Zimmerman, M. A., & Arunkumar, R. (1994). Resiliency research: implications for schools and policy. *Social Policy Report, 8*, 1–18.
Zullig, K. J., Koopman, T. M., Patton, J. M., & Ubbes, V. A. (2010). School climate: Historical review, instrument development, and school assessment. *Journal of Psychoeducational Assessment, 28*, 139–152.
Zullig, K. J., Huebner, E. S., & Patton, J. M. (2011). Relationships among school climate domains and school satisfaction. *Psychology in the Schools, 48*, 133–145.