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UNIVERSITY OF CALIFORNIA

Santa Barbara

Understanding School Discipline Climate: A Multilevel Latent Class Analysis Approach

A dissertation submitted in partial satisfaction of the

requirements for the degree Doctor of Philosophy

in Counseling, Clinical, and School Psychology

by

Ashley Morgan Mayworm

Committee in charge:

Professor Jill D. Sharkey, Co-Chair

Professor Michael J. Furlong, Co-Chair

Professor Karen Nylund-Gibson

Professor Matthew Quirk

September 2016

The dissertation of Ashley Morgan Mayworm is approved.

_____

Karen Nylund-Gibson

_____

Matthew Quirk

_____

Michael J. Furlong, Committee Co-Chair

_____

Jill D. Sharkey, Committee Co-Chair

June 2015

ACKNOWLEDGEMENTS

This dissertation would not be possible without the minds and hearts of many.

Sincerest thank you to…

My advisor, mentor, and committee co-chair, Jill Sharkey. I cannot express enough gratitude for you. Over the past six years you have been my teacher, research advisor, practicum supervisor, and role model. You have pushed me to do more than I thought possible, with a smile and sense of humor through it all. Thank you for teaching me the difference between "relationship" and "relation," and the words of yoda. I will carry your wisdom and grace with me as a model of what it truly means to be a mentor.

My committee members, Michael Furlong, Karen Nylund-Gibson, and Matthew Quirk. Thank you for the thoughtful discussions, critiques, edits, and feedback. Mike – thank you for pushing me to think in new ways and to never assume the status quo is correct. Karen – this would not have been possible without your incredible statistical mind, feedback, and guidance; thank you for the hours of help interpreting error messages and analyzing output. Matt – thank you for your thoughtful feedback and discussions; you forced me to answer tough, important questions. To each of you, thank you for believing in the importance of this research.

My parents, Greg and Suzan Mayworm. This dissertation is dedicated to you. Thank you, with all of my heart, for helping me to accomplish this work through your unwavering love and support. At a young age you showed me the importance of exploring, learning, and being curious about life. Because of you, I will always wonder and research.

My sister, Anna Mayworm. I feel so lucky that my childhood wishes for a little sister came true; you are my best friend and biggest cheerleader. Thank you for helping me to have some fun through it all.

My friends (you know who you are). Thank you for making my time in Santa Barbara some of the best of my life. You were my surrogate family. The hikes, glasses of wine, incredible chats, and dance parties will not be forgotten.

The students, teachers, principals, parents and community members whom I have had the privilege of working with and for through out graduate school. Thank you for allowing me to learn with and from you. This is for you.

VITA OF ASHLEY MORGAN MAYWORM
September 2016

EDUCATION

Bachelor of Arts in Psychology & Peace Studies, University of Notre Dame, May 2009
(Magna Cum Laude)

Master of Education in Counseling, Clinical and School Psychology, University of
California, Santa Barbara, June 2012

Doctor of Philosophy in Counseling, Clinical and School Psychology, University of
California, Santa Barbara, September 2016 (expected)

PROFESSIONAL EMPLOYMENT

University of California, Santa Barbara
2014- 2015   Project Director (funded GSR position)
             Evaluation of Lompoc CalGRIP to Reduce Gang Activity, California Board
             of Corrections and Rehabilitation, PI: Jill Sharkey, PhD

2014- 2015   Project Director (funded GSR position)
             Evaluation of Santa Barbara CalGRIP to Improve Juvenile Justice Outcomes for
             Youth on Probation**,** California Board of Corrections and Rehabilitation, PI: Jill
             Sharkey, PhD

2012- 2015   Graduate Student Researcher (funded GSR position)
             Reduction of Parolee Recidivism with Local Probation Practices, Santa Barbara
             County Probation Department**,** PIs: Jill Sharkey, PhD and Merith Cosden, PhD

2014   Teaching Assistant
             College Student Peer Helping and Leadership (CNCSP 115), Undergraduate
             Course: Summer Session, Counseling, Clinical, and School Psychology
             Program, UCSB

2013   Graduate Student Researcher (funded GSR position)
             UCSB Evaluation of Community-Based Individualized Programs, Bower
             Foundation, PI: Jill Sharkey, PhD

2012- 2013   Teaching Assistant
             School Psychology First Year Induction (CNCSP 274 A, B & C), Graduate
             Course: Fall, Winter & Spring Sessions, Counseling, Clinical, and School
             Psychology Program, UCSB

2011- 2012   Teaching Assistant

Advanced Research Methods in Psychology (PSY 120L), Undergraduate
Course: Fall & Winter Sessions, Psychological and Brain Sciences, UCSB

University of Notre Dame
2009- 2010   Program Assistant (full-time employment)
Longitudinal Study of Family Process, Emotional Security, and Child
Adjustment**,** National Institute of Mental Health & Northern Ireland Project**,**
National Institute of Child Health and Human Development
PI: E. Mark Cummings, PhD

PUBLICATIONS

Mayworm, A.M., & Sharkey, J.D. (2013). The gender-specific mental health outcomes of a community-based delinquency intervention. *Journal of Juvenile Justice*, *3*, 15-35.

Sharkey, J.D., Hunnicutt, K.L., Mayworm, A.M., Scheidel, K.C., & Calcagnotto, L. (2014). Effective yard supervision: From needs assessment to customized training. *Contemporary School Psychology, 18*(2), 103-116. doi:10.1007/s40688-014-0011-0

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AWARDS

Michael Goodman Memorial Research Award, CASP	2013
Chicano Studies Institute (CSI) Dissertation Research Grant, CSI, UCSB	2013- 2014
Donald Atkinson Diversity Enhancement Fellowship, UCSB	2013
Paul H. Henkin Memorial Scholarship, CASP	2012
Hosford Fellowship Research Award, Hosford Research Committee, UCSB	2012- 2013
Senior Recognition Award, Psychology Department, University of Notre Dame	2009
Undergraduate Research Opportunity Program, Learning Beyond the Classroom, & President's Circle Fund grants, University of Notre Dame	2008/2009

ABSTRACT

Understanding School Discipline Climate: A Multilevel Latent Class Analysis Approach

by

Ashley Morgan Mayworm

School discipline reform has gained considerable attention at the local, state and national levels in recent years, and in 2011 the U.S. Department of Education and Justice called for a focus on rigorous research that can guide school discipline policy decisions. School discipline climate, or the degree to which schools demonstrate student support and disciplinary structure, has been found to predict several outcomes associated with school discipline, including the racial suspension gap, student disengagement, and school safety. Based in authoritative parenting theory, researchers have theorized that entire schools can be characterized as having a school discipline climate typology, which reflect authoritative (high support, high structure), authoritarian (low support, high structure), permissive (high support, low structure), and uninvolved (low support, low structure) styles, and that these school discipline climate typologies are strongly related to the socialization of students to school norms and their success in school. In an effort to better understand this construct at the student and school-levels, the current study used multilevel latent class analysis (MLCA) to identify latent classes of student perceptions of school discipline climate, model school-level variation in these student experiences, and examine the relation between school discipline climate and important student and school demographic characteristics. Using a nationally

representative sample of approximately 12,610 students nested within 580 public high schools in the U.S. from the Educational Longitudinal Study of 2002, results show that student perceptions of school discipline climate fall into four classes: authoritative, permissive, authoritarian, and uninvolved, which are consistent with authoritative parenting theory and the school discipline climate literature. In addition, schools tend to have one school discipline climate type that is experienced by more students than the others (a predominant school discipline experience), although considerable variability in individual student experiences exists. Student gender, ethnicity/race, and SES all impact a student's likelihood of membership in these classes. Current findings address gaps in the previous literature on school discipline climate and have important implications for future research and school policy decisions.

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Introduction

School discipline reform has gained considerable attention at the local, state and national levels in recent years. In 2011, the Supportive School Discipline Initiative, a collaboration between the U.S. Department of Education and Justice, was initiated to support discipline practices that promote safe, effective learning environments (U.S. Department of Education and Justice, 2011); it stated that investing in research on school discipline practice is critical to guide further policy decisions. This focused attention on discipline policy change stems largely from research evidence that: (a) punitive and exclusionary forms of discipline are often ineffective and even harmful (APA Zero Tolerance Task Force, 2008), particularly for minority students (Gregory, Skiba, & Noguera, 2010); (b) zero-tolerance policies intended for very serious offenses have been increasingly used by schools for less serious misconduct like disruption and truancy; and (c) students who are minorities, males, and have disabilities are significantly more likely to be suspended or expelled and are disproportionately affected by the "school to prison pipeline" due to zero-tolerance policies (APA Zero Tolerance Task Force, 2008). Thus, it is critical that research leads to a better understanding of the discipline approaches that are most effective and least harmful for diverse students and schools.

Presumably, school administrators and teachers adopt discipline policies and practices they believe will result in less misbehavior, violence, disorder and, in turn, greater student engagement and achievement—the premise being that a safe and orderly school is needed for learning to take place (Cornell & Mayer, 2010). Despite these intentions, the discipline approaches used to achieve these aims may actually create greater disruption, lead to student disengagement, or exclude students from their education through the use of suspensions and

expulsions. In what has been termed the "school to prison pipeline," schools that rely on exclusionary discipline and the criminalization of misbehavior may be pushing students out of school and into the criminal justice system (Heitzeg, 2009). For youth who already have risk factors for school disengagement, these discipline approaches may be exacerbating negative trajectories (e.g., minority youth, males and those with disabilities; APA Zero Tolerance Task Force, 2008).

Alternatively, there is evidence to suggest that characteristics of the school have the potential to act as protective factors for youth, which can compensate for other types of student risk factors. School-level factors such as having supportive leadership, effective academic instruction, and dedicated and cooperative staff can minimize youth delinquency (Christle, Jolivette, & Nelson, 2005). Sharkey, You, and Schnoebelen (2008) found that even though youth with low levels of family assets (i.e., having a caring adult relationship at home) demonstrate less student engagement than students with higher levels of family assets, school assets (i.e., having a caring teacher or adult relationship at school) were related to greater engagement regardless of their level of self-reported family assets. Kilgore, Snyder, and Lentz (2000) found that the relation between parent practices (i.e., parental monitoring) and child conduct problems was mediated by whether or not the child attended a high-risk school. These findings suggest that particular characteristics of schools may buffer against risk factors in other areas of youths' lives.

One way of understanding how school factors impact student outcomes is through the concept of school climate, or "school community members' subjective experiences of the structural and contextual elements of a particular school" (O'Malley, Katz, Renshaw, & Furlong, 2012, p. 317). Rather than focusing on how a specific, observable, or explicit policy

or action impacts youth, school climate focuses on understanding one's perceptual experience of their school and its policies. Despite inconsistencies in how school climate is defined across studies, research on school climate has shown consistency in its association with student and school outcomes. For example, studies on positive school climate have found that it is predictive of student physical and mental health, engagement in school, experience of exclusionary discipline, and academic achievement (see review in Thapa et al., 2013). Similar results have been found across diverse groups in terms of student age, geographic location, culture, and language (Thapa et al., 2013). Findings such as these have helped bring national attention to the importance of positive school climates, with the U.S. Department of Education (2010) initiating the Safe and Supportive School grant program to promote the assessment of school climate and safety in several U.S. states.

Within the broader school climate literature, Gregory and Cornell (2009) have focused on the specific role of school disciplinary structure and student support in understanding school climate and student outcomes. Applying Baumrind's (1968) authoritative parenting theory to schools, researchers have argued and found support for the idea that the degree of structure/demandingness and support/warmth experienced by students within schools (i.e., school discipline climate: authoritative, authoritarian, permissive, and uninvolved) impacts their socialization to school norms and numerous outcomes (Konold, et al., 2014). These studies have found significant associations between school discipline climate styles and student victimization and bullying (Gerlinger & Wo, 2014; Gregory et al., 2010), teacher experiences of victimization (Gregory, Cornell, & Fan, 2012), the racial suspension gap (Gregory, Cornell, & Fan, 2011), academic achievement (Gregory & Weinstein, 2004; Marchant, Paulson, & Rothlisburg, 2001), and truancy and dropout

(Pellerin, 2005).

This previous work examining the association between school discipline climate and student and teacher outcomes is quite compelling. However, the way in which school discipline climate types should be defined and categorized warrants further study. Previous researchers have either examined how different dimensions of school climate (e.g., structure and support) individually impact student and teacher outcomes, or used a cut-point to place schools into groups or typologies (e.g., a school above the mean on structure and above the mean on support would be placed in the authoritative group). There are some limitations to this approach, however, including: (a) the arbitrary nature of the cut-point and (b) assumption that these four typologies exist, are the best way of describing the experience of support and disciplinary structure, and are relatively equal in size. Thus, research that aims to better understand the way students experience support and disciplinary structure at school is an important first step in understanding school discipline climate typologies and their possible implications for students and schools. Furthermore, because students' socialization within a school can be impacted by numerous individuals (e.g., different teachers, administrators), a set of mutually reinforcing norms, rules, values and policies across the school ecology are needed to create a cohesive school discipline climate (Gregory et al., 2010). An understanding of the degree to which a consistent experience of school discipline climate exists across students in schools is essential before adopting these theorized school-level typologies. The current study will address these gaps in the literature. Specifically, through the use of multilevel latent class analysis (MLCA), it will examine the nature of student experiences of their school discipline climates, how much consistency exists in student experiences within and across schools, and how student and school demographic factors

affect these experiences.

Literature Review

Parenting Styles and Authoritative Parenting Theory

The concept of school discipline climate is grounded in the parenting style literature and authoritative parenting theory. Therefore, it is critical to have a comprehensive understanding of the theory of authoritative parenting as conceptualized by Diana Baumrind (1966, 1968). Using observational techniques with parents of preschool children, Baumrind identified three types of parents whom differed in their combination of three dimensions of parenting behavior originally described by Schaefer (1959, 1965): acceptance versus rejection, firm behavioral control versus lax behavioral control, and psychological autonomy versus psychological control. These parenting types are: (a) permissive parents who demonstrate acceptance, lax behavioral control, and psychological autonomy; (b) authoritarian parents who exhibit rejection, firm behavioral control and psychological control; and (c) authoritative parents who show acceptance, firm behavioral control, and psychological autonomy. Later, a fourth parenting type called disengaged was identified which was characterized as demonstrating rejection and lax behavioral control (Baumrind, 1996, 2013). As Baumrind's research progressed and she began examining the parenting practices of mothers and fathers with older children and adolescents a few other types of parenting emerged, most notably the democratic (moderate level of demandingness and highly responsive) and directive (highly demanding and moderate level of responsivity) types (Baumrind, 1991a, 1991b).

In the years since Baumrind's parenting typologies were originally identified, the dimensions that make-up parenting style have been simplified, with a parent's degree of two dimensions of parenting (demandingness and responsiveness) being used to assign

typologies. Rather than support and demandingness being portrayed as opposite ends of the same continuum, they are two distinct, independent dimensions, which have their own respective continuums (Baumrind, 2013). Thus, a permissive parent is high in responsiveness but low in demandingness, an authoritarian parent is low in responsiveness and high in demandingness, an authoritative parent is high in both, and a disengaged or uninvolved parent is low in both. Figure 1 displays the continuum of demandingness and responsiveness that is often used to illustrate Baumrind's parenting typologies.
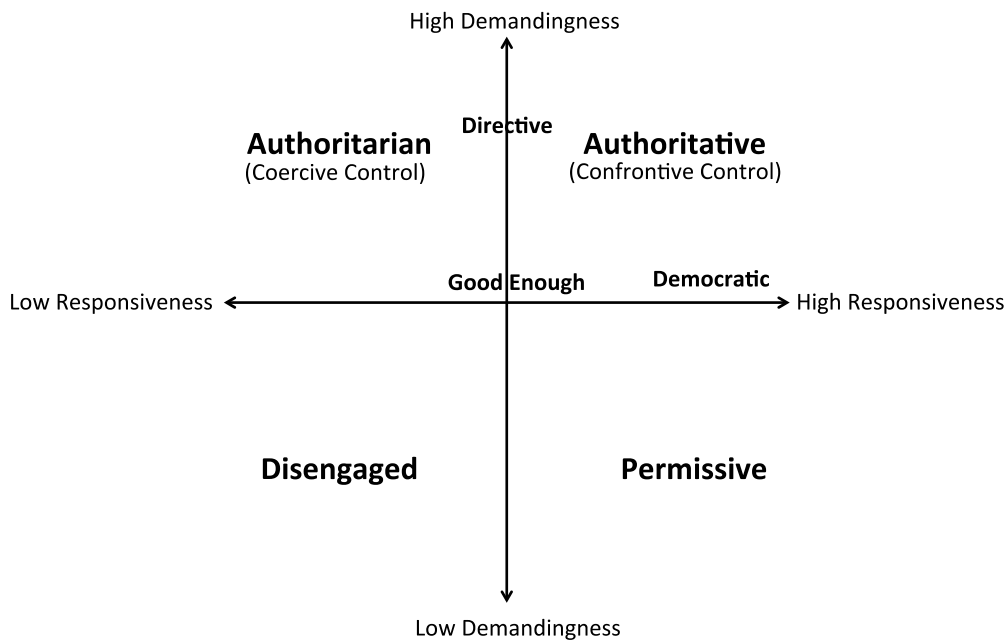
Figure 1. Baumrind's parenting typologies organized by responsiveness and demandingness dimensions.

However, Figure 1 is overly simplistic, as it portrays authoritarian and authoritative parents as being equal in terms of their demandingness. This is not accurate, as the nature of their demandingness is actually different (Criss & Larzelere, 2013). Baumrind (2013) explains that authoritative parents have high demandingness but utilize a confrontive form of control ("demanding, firm, and goal-directed"), whereas authoritarian parents use both

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confrontive and coercive control ("intrusive, manipulative, punitive, autonomy undermining, and restrictive"; Baumrind, 2013, p. 19). Thus, confrontive control is reasonable and the reason for its use can be articulated, justified, and negotiated, whereas coercive control cannot (Baumrind, 2013). This is a critical distinction between the nature of the demandingness factor for authoritative versus authoritarian approaches, as Baumrind (2013) argues that coercive control can lead to dispositional compliance and children who lack agency and self-determination, whereas confrontive control should not impact sense of self-determination and individuation in children. Research conducted by Baumrind, Larzelere, and Owens (2010) found that parental control that was confrontive (and not coercive) was predictive of child prosocial behavior, mental health, and self-assertiveness over time. It is important that the differences between these two types of control are distinguished, so that potentially important differential effects can be studied.

  Causal mechanisms. Baumrind's theory of parenting argues that an authoritative approach to parenting is ideal because of its impact on children's socialization. Socialization is defined as the process by which a child learns and acquires, through adult-initiated teaching and training, the values, culture, knowledge and other skills needed to appropriately function in one's own culture (Baumrind, 2013). The different ways in which parents attempt to socialize their children may result in different levels of acceptance and rejection of those efforts by their children. That is, some ways of socializing children are more effective than others. Baumrind (2013) explains that authoritarian approaches to parenting may cause nonreflective compliance or defiance in their children, as they rely on unquestioning compliance, which may inhibit their child's reflective thought processes and personal agency. Permissive parents may fail to socialize their children, as they may fear that placing

demands on their children will anger them or cause them to feel rejected. And for authoritative parents, the balance between providing reasons and incentives and helping their children to explain the reason for their own disobedience should support greater acceptance of the parent socialization process. This explanation of the causal mechanism between parenting style and child outcomes was further articulated by Darling and Steinberg (1993) who suggested that an authoritative style of parenting creates a positive emotional climate between parents and their children, which increases their openness to the socialization process.

Within Baumrind's theory of authoritative parenting, optimal child functioning is defined as having a balance of both communion and agency (Baumrind, 2013); children should develop the ability to be both cooperative and compliant (i.e., communion) and self-determined and able to dissent from others constructively (i.e., agency). Thus, the degree to which an individual has synthesized agency and communion is a reflection of their functioning. Baumrind (1996) describes the multidimensionality of this ideal outcome well when she writes, "Children are encouraged to respond habitually in prosocial ways *and* to reason autonomously about moral problems, *and* to respect adult authorities *and* learn how to think independently" (p. 405).

Child outcomes. A large body of research has been conducted to understand the association between different parenting styles and child outcomes for a diverse population of parents and their children. Overall, research suggests that children fare best when their parent(s) use an authoritative parenting style. These findings have been found across diverse samples, including diversity of race, ethnicity, social background, and parents' marital status, and in countries with diverse value systems, such as Argentina, Pakistan, China, and

Australia (Steinberg, 1990, in Baumrind, 2013). Specifically, the dimensions of authoritative parenting are associated with: greater life satisfaction in youth and less maladaptive behavior (Suldo & Huebner, 2004); greater child disclosure of information to parents (Darling, Cumsile, Caldwell, & Dowdy, 2006); less alcohol and drug use (Fletcher & Jeffries, 1999; Piko & Balázs, 2012; Stephenson, Quick, Atkinson, & Tschida, 2005); lower levels of tobacco use (Adamczyk-Robinette, Fletcher, & Wright, 2002); greater physical, psychological, and overall well-being (Slicker & Thornberry, 2002); less depression overtime (Liem, Cavell, & Lustig, 2010); fewer mood problems (Piko & Balázs, 2012); and academic achievement and engagement (e.g., Steinberg, Elmen, & Mounts, 1989; Steinberg, Lamborn, Dornbusch, & Darling, 1992; Strage & Brandt, 1999).

In contrast, overly harsh control (e.g., coercive control) and parenting, associated with the authoritarian approach, is related to increased rule breaking and deviant behavior (Kakihara, Tilton-Weaver, Kerr, & Stattin, 2010; Nix et al., 1999). In addition, punitive power assertive discipline, like that used within an authoritarian approach, has been associated with less prosocial behavior (Nix et al., 1999) and a number of negative mental health outcomes in adolescents (e.g., anxiety, depression, low self-esteem; Silk, Morris, Kanaya, & Steinberg, 2003) and younger children (e.g., internalizing and externalizing problems; Morris et al., 2002; Olsen et al., 2002). The perception youth have of their parents' use of control may be particularly important, as studies suggest that when adolescents interpret their parent's control as overly intrusive and negative they have a higher likelihood of experiencing depression and believing their parents do not think they are important (Kakihara et al., 2010). Furthermore, research has found that the effects of strict parental control on children are moderated by the meaning children attribute to it (Chao, 1994;

Gunnoe, Hetherington, & Reiss, 2006); therefore, it is possible that an authoritarian approach only inhibits optimal functioning when children interpret it negatively. If strict parental control is the norm within one's community or culture and/or viewed as being a reflection of love and concern, then it may be beneficial.

        Racial/ethnic differences. The applicability of these parenting styles and their impact on child outcomes for different racial/ethnic groups has been challenged. The original research conducted by Baumrind used a primarily middle to upper-class, White sample in Berkeley, California. Baumrind (2013) has cautioned that these parenting types may not exert the same effect or result in the same child outcomes in diverse populations. Indeed, results have been mixed. European American parents are more likely to use an authoritative style than African American, Hispanic, or Asian American parents (Park & Bauer, 2002). Several studies have found that in Asian and Asian American families, an authoritarian approach is associated with better academic outcomes (Blair & Qian, 1998; Leung, Lau, & Lam, 1998), although others have found that a more controlling, authoritarian style is associated with low self-esteem and negative attitudes about school for Asian American youth (Ang & Goh, 2006; Nguyen, 2008). Some have argued that for youth of color who live in dangerous neighborhoods an authoritarian approach may be protective (Baumrind, 2013). Conversely, researchers have found the authoritative approach to be associated with less affiliation with deviant peers and delinquent behavior (Simons, Simons, Burt, Brody, & Cutrona, 2005), higher self-esteem (Mandara & Murray, 2002), and higher educational aspirations (Gorman-Smith, Tolan, & Henry, 2000) for African American youth. Park and Bauer (2002) did not find a significant difference in the academic outcomes of Hispanic youth who had authoritative versus authoritarian parents after controlling for SES, whereas others have

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found authoritative parenting is related to better school achievement for this population (Steinberg et al., 1992). Nonetheless, Steinberg, Mounts, Lamborn, and Dornbusch (1991) found that almost regardless of ethnicity, socioeconomic status, or family structure, youth with parents who adopted an authoritative approach fared better in terms of their academic, social and behavioral outcomes than youth in non-authoritative households.

   Developmental considerations. The nature of the authoritative parenting style changes as children get older. Youth have different developmental needs in adolescence than they did in childhood, and as children get older they can take on more responsibility and think more independently. With these changes comes a need for parents to allow for more negotiation and give-and-take in setting rules and boundaries and resolving conflicts (Baumrind, 1991b). Henry and Hubbs-Tait (2013) state that psychological control (a characteristic of an authoritarian approach) may become increasingly detrimental to child development as children get older. If the adolescent need for autonomy and self-determination is met with psychological control and coercion, then the outcome for youth could be quite negative, including causing adolescents to lack communion (e.g., rebelling) and/or agency (e.g., anxiety, low self-esteem). Thus, the importance of an authoritative approach may be particularly critical when children are in middle and high school.

Teaching Styles and Authoritative Teaching

   Authoritative parenting theory has been applied to a number of other relationships outside of that of parents and children. For example, Fletcher, Darling, Steinberg, and Dornbusch (1995) conducted a study on parenting style and a number of child outcomes and found that it is not only the individual child's parents' style that impacts their outcomes, but also that of the parents in their social network. Analysis of adolescents' self-report measures

indicated that high levels of authoritativeness in the youths' social network was related to lower delinquency and substance use for boys and girls and more psychosocial competence and lower distress for girls, above and beyond the positive impact of parenting style at home. Findings such as these suggest that youth can be influenced and impacted by the authoritativeness, or lack thereof, of adults outside of their immediate family. One of the most prominent relationships discussed from this perspective is that of teachers and students.

Within the classroom context, teaching styles have been described similarly to the parenting literature, with a teacher's degree of demandingness and responsiveness with students characterizing their style of teaching (Ertesvag, 2011). Teacher demandingness, which has also been called structure (e.g., Gregory et al., 2010), control (e.g., Baker, Clark, Crowl & Carlson, 2008), regulation (e.g., Gregory & Weinstein, 2004), and high academic press (e.g., Gill, Ashton, & Algina, 2004), refers to a teacher's ability to demand appropriate behavior, hold high expectations, and monitor and enforce clear and consistent rules. Teacher responsiveness has also been called support (e.g., Gregory et al., 2010), warmth (e.g., Baker et al., 2008), connection (Gregory & Weinstein, 2004), and communal values (e.g., Gill et al., 2004), and describes the degree to which a teacher responds to the socio-emotional, cognitive, and physical needs of students with care and concern. Like in the parenting literature, the combination of these two dimensions is what determines whether a teacher's style is characterized as authoritarian, permissive, authoritative, or uninvolved/disengaged (Bear, 2008).

Bear (2008) provides a review of these styles of teaching and their practical application. To summarize, an authoritarian teaching style is high in demandingness and low in responsivity. This style of teaching places high demands on students, frequently uses

punishment, and may be perceived as overly harsh, unfair, and strict. In addition, there is a lack of care and support in response to student needs. Conversely, low levels of teacher demandingness and high levels of teacher responsivity characterize a permissive teaching style. Permissive teachers tend to be responsive to student needs, but fail to enforce rules and demand appropriate student behavior. Thus, the permissive teaching style can result in poorly managed classrooms in which students are not actively engaged in learning. In combination, the positive aspects of the authoritarian and permissive teaching styles, demandingness and responsivity, respectively, characterize the authoritative teaching style. Authoritative teachers build positive, supportive relationships with students but also hold high expectations for their students. The idea of teaching with both demandingness and responsiveness has been discussed outside of the authoritative teaching literature, with Vasquez (1988) and Kleinfeld (1975) arguing that the most effective teachers were "warm demanders" and Irvine (2002) using the term "compassionate disciplinarians." Lastly, the disengaged or indifferent teaching style is the opposite of an authoritative approach and is low on both dimensions; these teachers are uninvolved and neglectful.

Teaching styles and student outcomes. A large body of research has found associations between one of the dimensions of teaching style (i.e., support or structure) and student behavior, achievement, and positive development. A thorough review of this literature can be found in Dever and Karabenick (2011). Far fewer studies have examined the combined or interactive influence of the two dimensions of teaching styles. In one of the first key studies to apply the parenting typologies to teachers, Wentzel (2002) examined how teachers differ on dimensions of authoritative teaching (i.e., high expectations, rule setting, nurturance, fairness and modeling of motivation), as well as how those factors relate to

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student adjustment. Participants included approximately 450 sixth-grade students and 18 teachers from two middle schools. Results indicated that the strongest individual predictor of student grades, interest in schoolwork, goals, and prosocial behavior was teacher high expectations, whereas a lack of caring (i.e., negative feedback) was predictive of lower academic achievement; findings were similar across gender and race/ethnicity. Further support for an authoritative teaching style came from a study conducted by Walker (2008), which found that three teachers who fit the description of an authoritarian, permissive, and authoritative style had marked differences in student outcomes six months after the school year began. Specifically, at the end of the semester, students in the authoritarian classroom had greater self-handicapping, lower academic self-efficacy, and a defensive stance towards learning as compared to both the permissive and authoritative classrooms, whereas students in the permissive classroom made the lowest academic gains.

Dever and Karabenick (2011) conducted an important study that examined whether the authoritative teaching style is the best approach for students of various ethnicities. They were specifically interested in understanding how academic press and teacher caring for students was related to student interest and achievement in math, as well as how student ethnicity impacted that association. Several thousand middle and high school students from nearly 200 classrooms were included in the sample. They found that academic press was predictive of greater interest and achievement in math for all three ethnic groups (Vietnamese, Caucasian, and Hispanic) and that higher teacher caring was related to less achievement growth for all groups. Overall, the authoritarian approach seemed to be most effective in promoting interest and achievement for Vietnamese students. Whereas results for Hispanic and Caucasian students were inconclusive; there was a trend toward the

authoritative approach being most effective. Findings from this study suggest that the association between teaching style and student outcomes may differ for different groups of students and that the elements of academic press and caring may function differently in determining some student outcomes. Further research is needed to fully understand how these constructs function for diverse youth in the classroom environment.

School Climate & School Discipline Climate

Research studies on the authoritative, authoritarian, permissive, and uninvolved approaches to teaching have primarily focused on student and classroom-level effects. However, Gregory and Cornell (2009) argue that additional attention needs to be given to these constructs at the school level. That is, consideration must also be given to how schools create entire climates of structure and support and how those climates impact outcomes for schools and their students. A school-level understanding of these constructs is particularly critical in middle and high schools where students change classrooms and teachers every period and the impact of one teacher may not be as significant as the overall climate of the school on student outcomes.

School climate. The research on school-level authoritative discipline or school discipline climate fits within a broader research literature on school climate. School climate has been defined in numerous ways, but one definition cited frequently in the literature and recommended by the National School Climate Council (2007) is: "School climate is based on patterns of people's experiences of school life and reflects norms, goals, values, interpersonal relationships, teaching and learning practices, and organizational structures" (p. 4). Research on school climate is vast and a thorough review of outcomes associated with school climate can be found in Thapa et al. (2013). Overall, research provides compelling

evidence that when schools have positive school climates, students and staff benefit in numerous ways. For example, when students perceive their school climate positively, they are more likely to feel connected to school (Water, Cross, & Runions, 2009), demonstrate fewer antisocial and risk-taking behaviors (Resnick et al., 1997), and are more likely to do well academically (Haahr, Nielsen, Hansen, & Jakobsen, 2005). These benefits extend to staff, as well, with teacher perceptions of a positive school climate related to decreased burnout (Grayson & Alvarez, 2008), higher job satisfaction (Bevans, Bradshaw, Miech, & Leaf, 2007), and increased fidelity of implementation for interventions and curricula (Beets et al., 2008; Gregory, Henry & Schoeny, 2007). Furthermore, teachers in schools with positive climates are more likely to hold attitudes and beliefs that help in the successful implementation of school reform (Beets et al., 2008; Guo & Higgins-D'Alessandro, 2011, as cited in Thapa et al., 2013). Thus, efforts to change school practices and policies may do well to focus on aspects of school climate.

Researchers have only recently explicitly applied Baumrind's parenting typologies to schools as a whole, but for several decades related concepts have been examined within the broader school climate literature. A number of these studies have found a relation between the interplay of support and structure (or related constructs) and academic achievement and growth. For example, Shouse (1996) was one of the first researchers to address the issue of "tension" between two prevailing systems of thought about schooling: one focused on social cohesion and the other on academic mission. Using a large national dataset (i.e., NELS:88), Shouse found support for the existence of and effectiveness of schools with both communality and academic press. Both low and high-SES schools had better achievement in environments with high academic press and communality. However, there was an interesting

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interaction; for low-SES schools, academic press was more important than communality in predicting academic achievement, but for high-SES schools the opposite was true. Results suggest that schools with both high expectations for academic achievement and a sense of communality are ideal, but that schools with different sociodemographic characteristics may respond differently to the presence of only one of these factors. Lee, Smith and Croninger (1997) and Lee and Smith (1999) found similar results to Shouse. In their 1999 study, Lee and Smith estimated the effect of social support and academic press on academic achievement, as well as the effect of academic press on the association between social support and achievement. They found that, overall, student-reported social support in school has a weak, positive association with academic achievement, but that the effect of social support differs in schools with different amounts of academic press. Specifically, schools having only academic press or social support without the other did not lead to significant academic gains. Marchant et al. (2001) and Gregory and Weinstein (2004) also found support for the importance of schools providing both connection and regulation in promoting academic achievement. Studies such as these suggest that schools should communicate high achievement expectations to students, but in addition must provide the support necessary to meet those academic expectations.

School discipline climate. Several different terms have been used when describing the specific role of disciplinary structure and student support at the school level. Some have called this authoritative school climate (Gregory et al., 2012), authoritative discipline theory (Gregory & Cornell, 2009), school atmosphere (Marchant et al., 2001), authoritative socialization (Pellerin, 2005), and school discipline climate (Gregory et al., 2010). I will use the term school discipline climate throughout this dissertation for consistency. Regardless of

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the term used, the construct states that the school discipline climate is created by mutually reinforcing norms, rules, values and policies across the school ecology (Gregory et al., 2010). There are multiple influences on the socialization of students within one school, including teachers, administrators, and staff, and consistency in the way these individuals and groups interact with students creates a school-level discipline climate or style. Thus, the school discipline climate is the composition of the experience of disciplinary structure (i.e., firm, fair and consistent school rules) and student support (i.e., warm, responsive, and autonomy-supportive relationships) within a school. An authoritative school discipline style, therefore, integrates firm and consistent enforcement of rules with warmth and responsiveness to students' individual needs (Gregory et al., 2010).

In one of the first studies to explicitly apply Baumrind's parenting typologies to schools at the school-level, rather than teacher or classroom level, Pellerin (2005) examined whether it is appropriate to use the parenting typologies to classify schools into styles and if similar patterns in terms of students outcomes emerge; specifically, are the most disengaged students in indifferent schools and the most engaged students in authoritative schools? Data for the study came from the High School Effectiveness Study (HSES; an outgrowth of NELS:88) and included 164 public schools with 4,743 students. Using a mean-split method, schools were categorized into the authoritative, authoritarian, permissive, or uninvolved style based on aggregate scores on factors measuring responsiveness and demandingness. Pellerin found outcomes similar to that seen in the parenting literature: authoritative schools had the lowest disengagement and dropout, whereas uninvolved schools had the worst disengagement and authoritarian schools the worst dropout rates. Pellerin conjectured that students may not dropout in lax or uninvolved schools (permissive and indifferent) even if

they are disengaged, but that authoritarian schools may result in dropout because the strict, harsh nature of the school may push students away.

Within the broader school discipline policy literature, there is often debate regarding the best methods and approaches for making schools safe and reducing student misbehavior and experiences of victimization. Authoritative school discipline theory (Gregory & Cornell, 2009) argues that schools that demonstrate both high levels of disciplinary structure and student support will be the safest places for students, as students will be more likely to accept and be socialized to the school rules and values when they feel supported and understood. If school discipline climate typologies are predictive of important outcomes associated with school discipline (e.g., school and student safety, experience of suspension/expulsion), then there is further evidence of its validity and usefulness in addressing the pressing issue of school discipline policy reform, including the reduction of exclusionary discipline and elimination of the school-to-prison pipeline.

In terms of student and school safety, Gregory et al. (2010) tested their hypothesis that schools with an authoritative discipline climate would be safer (i.e., less bullying and victimization) than other schools, regardless of school racial/ethnic composition, school size, and percent of students eligible for free and reduced price meals (FRPM). Using a large, diverse sample of public high schools in the state of Virginia they found support for their hypothesis. After taking school demographic factors into account, structure and support explained an additional 45%-50% of the variance in student-reported bullying and victimization between schools; structure and support were significantly, inversely related to bullying and victimization. In addition, when the four classes of schools (authoritarian, permissive, authoritative, and uninvolved) were compared, uninvolved schools had

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significantly more bullying and victimization than authoritative schools. Gerlinger and Wo (2014) found that an authoritative school discipline approach is related to lower levels of all types of school bullying and victimization, whereas security measures (e.g., metal detectors, school cameras) have no discernable effect on physical and verbal bullying. The association between school discipline climate and victimization extends to teacher experiences of victimization, as well; Gregory et al. (2012) found that after controlling for school demographic variables, school structure and support explained 19% of the variance in teacher victimization.

Based on school discipline climate theory, schools with an authoritative school discipline climate should differ from other school types in their use of exclusionary and punitive discipline. Gregory et al. (2011) investigated whether or not the discipline climate of a school could predict suspension rates at the high school level, and specifically how school discipline style relates to the racial discipline gap between Black and White students. Participants included ninth-grade students from public high schools in the state of Virginia. Descriptively, they found that the suspension rates of Black students were more than double that of Whites. After controlling for school demographics, schools low in both support and structure/academic press had the highest rates of suspensions for both groups of students (Black $M = 28\%$; White $M = 13\%$) and the largest suspensions gaps between Black and White students. The uninvolved style schools had the highest rates of suspensions for both racial groups and the largest discipline gap as compared to the other three discipline styles, but authoritarian, authoritative, and permissive schools were not significantly different from each other. Overall, the researchers suggest that their findings support the authoritative

model, as the combination of lacking both structure and support was most related to suspensions and the racial suspension gap.

However, these previous studies have not found many significant differences in outcomes between schools that are permissive or authoritarian. Findings tend to show that authoritative schools are related to better outcomes as compared to uninvolved schools, but other school types are less consistently predictive of outcomes. This is important to note, as school discipline climate theory suggests that significant differences between authoritative and authoritarian, and possibly permissive schools, should also exist. It is possible that the way these typologies are being measured is hiding real differences that exist between these groups and/or that some of these typologies are not appropriate for describing student experiences of the school discipline climate at the school level, and thus found to be unrelated to hypothesized outcomes. Hence, despite the interesting and important findings that have been published to date on school discipline climate, there are still a number of critical questions that need to be resolved regarding the measurement and classification of school discipline climate types, which the current study will address.

Measurement of school discipline climate. Of the six primary studies that discuss the constructs of demandingness/disciplinary structure and support at the schoolwide level, four classified schools into specific typologies (Gregory et al., 2010, 2011, 2012; Pellerin, 2005), whereas the other two examined the constructs of disciplinary structure and support as individual, continuous variables without creating typologies (Gregory & Weinstein, 2004; Marchant et al., 2001). All four studies that created typologies of the different styles of school discipline climate used a mean- or median-split approach. That is, the mean or median score for each construct was used to split schools into high or low for demandingness and

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support, then schools were classified as authoritative (high-high), authoritarian (high-low), permissive (low-high), or disengaged/uninvolved (low-low). Although this method of creating groups has yielded school types that have differentially predicted some important related outcomes, suggesting its predictive validity, there are some drawbacks to this method.

First, the mean-split approach leads to arbitrary cut-offs. There may be no real difference between a person or school falling directly above the mean versus directly below the mean on a factor. In a study that used an LCA approach to classifying peer victimization types, Nylund, Bellmore, Nishina, and Graham (2007) explain that the use of standardized cutoffs is dependent upon the score variations of the sample; in one sample the mean could be high and in another sample the mean could be low and students with the same score in these different samples would be placed into different classification types. This same concern applies to school discipline climate typologies; the same school could be classified as authoritarian in one sample and authoritative in another. Nylund et al. noted that cutoffs based on sample-specific criteria may lead to classification errors that reduce the likelihood of finding meaningful differences between groups. Some parenting studies have attempted to address this concern by removing any participants who are within 1 standard deviation of the mean score (Steinberg et al., 1992), or a variation of this approach (e.g., Slicker, 1998), and only examine the more "extreme" cases. However, this solution reduces sample size and fails to understand outcomes associated with more "middle range" scores. Furthermore, the mean-split approach results in four classes that are relatively similar in size. This may be problematic, as there is not enough evidence to conclude that the four school types are equally prevalent.

Second, splitting schools into groups by creating high and low groups in terms of the demandingness construct is not entirely consistent with Baumrind's original parenting typology theory, which emphasized the critical importance of distinguishing between different types of demandingness. It is not just high versus low demandingness, but the type of demandingness (coercive and confrontive control) used, that is hypothesized to impact child outcomes. In order to extend Baumrind's typologies to the school level, it is necessary to capture this distinction in measurement and typology classification. An example item that may distinguish between these types of control is "rules are fair." Some studies have included this item in the demandingness construct and others in the responsiveness factor. A confirmatory factor analysis (CFA) conducted by Gregory et al. (2010) supported the inclusion of the items "school rules are fair" and "school rules are strictly enforced" into the same demandingness factor. However, if these items are included in the same factor, the difference between coercive and confrontive control may be lost. Pellerin (2005) included an item to measure the fairness of rules in the responsiveness factor rather than the demandingness factor from a theory driven perspective. Because of the nuances in Baumrind's theory regarding parenting typologies and its subsequent translation to the school context, a person-centered approach to typology classification that reveals naturally occurring patterns of responding is more appropriate.

Pellerin (2005) was able to explore some of the subtleties of school discipline climate classifications by comparing the descriptive statistics for the different underlying subscales that were used to create the demandingness and support factors. Her findings provide support for the application of Baumrind's parenting typologies to schools. For example, she found that authoritative and permissive schools were both high in perceptions of fairness of

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discipline, permissive schools were perceived as most lenient in demandingness, and authoritative schools were most demanding. Additionally, authoritarian schools had moderately high demands and indifferent schools moderately low demands, but both perceived discipline as unfair. Authoritarian schools were only most demanding in the strictness of punishment. Overall, Pellerin argues that these findings reflect the nuances of the parenting typologies in schools and support the use of the mean-split classification system she used in her study. These findings are promising, but more research is needed to confirm these results and further explore the most appropriate way of understanding how school discipline climate typologies are assigned. One way of addressing these measurement concerns is through the use of multilevel latent class analysis (MLCA).

Alternative Approach: Multilevel Latent Class Analysis

Latent class analysis (LCA) is an exploratory statistical method that uses observable indicators (continuous or categorical) to identify related subgroups of participants that are not directly observable within a population. These unobservable subgroups or subtypes are called latent classes (Vermunt & Magidson, 2004). For example, Nylund, Bellmore et al. (2007) used observable indictors of peer victimization (e.g., hit or pushed, spread rumors) to detect whether different types or patterns of victimization existed in the sample. Theoretically, in Nylund et al.'s study, latent classes of students could have differed in terms of having different dimensions (e.g., type of victimization: physically, verbally, or relationally victimized), different relative frequencies (e.g., low or high frequency of victimization across all types of victimization), or both. Through the use of LCA with categorical indicators, researchers can use statistical fit indices to determine the most appropriate number of classes, the probability of an individual within a particular class endorsing specific indicators (item

probability), and the percentage of the sample that belongs to each identified class (class probability). In addition, covariates at the individual level can be included in the model and distal outcomes can be predicted based on class membership.

LCA in social science research is becoming more commonly used due to its ability to more accurately group participants into categories than other approaches, such as using a cut-point or cluster analysis. One of the limitations of a traditional LCA approach is the assumption that observations are independent of one another. This is problematic when data are nested (for example, students nested within schools), as a failure to account for the non-independence of observations can cause inflated Type I error rates, biased standard errors, and cause inaccuracy in the estimation of parameters (Vermunt, 2003). A simulation study conducted by Kaplan and Keller (2011) found that when data are clustered and clustering is not accounted for in LCA, this leads to biased BIC and entropy estimates. Thus, a multilevel approach is necessary when analyzing nested data. Multilevel LCA (MLCA), developed by Vermunt (2003, 2008) and Asparouhov and Muthén (2008), addresses this problem of non-independence of observations and also allows researchers to address important research questions that are not answerable when using a traditional LCA approach (Henry & Muthén, 2011).

MLCA extends traditional LCA by allowing the individual-level latent classes to be modeled while accounting for clustering (non-independence of observations) and also allowing patterns of variation in individual-level class membership at the clustering level to be modeled. MLCA can be conducted using a parametric or nonparametric approach (Henry & Muthén, 2011). The parametric approach accounts for clustering and can improve model fit in nested data. In the nonparametric model an additional element is added on, in which the

random means of the latent classes at the individual level are allowed to vary (non-normal distribution) across the clusters, which allows for the modeling of latent classes at both Level 1 (e.g., individual level) and Level 2 (e.g., school level; Henry & Muthén, 2011). In the nonparametric approach, the Level 2 latent classes are essentially grouping schools based on the distribution patterns of the Level 1 class memberships of the students within their schools.

MLCA also allows for the inclusion of covariates at both the individual and clustering level. For example, important individual covariates that are believed to predict Level 1 class membership can be included, such as student gender or ethnicity, as well as clustering covariates believed to predict Level 2 class membership, such as school size or percentage of students receiving FRPM. The addition of the Level 2 covariates (e.g., school characteristics) is an advantage of the MLCA approach over individual-level LCA. Ultimately, an MLCA approach is beneficial when using nested data; it provides better measurement of Level 1 latent classes because it accounts for Level 1 and Level 2 influences and allows for better understanding of variation in student-level experiences across Level 2.

MLCA is a relatively new statistical technique and has only recently been applied to social science research. A literature search for all publications with the phrase "multilevel latent class*" OR "multi-level latent class*" OR "MLCA" OR "multilevel mixture model*" anywhere in the publication was run in PsycInfo and ERIC databases and returned only 18 relevant studies published in peer-reviewed journals, several of which were methodological papers (not applied research). The studies that have been conducted shed light on the very interesting and important research questions that can be answered by using this method, including exploration of how individual-level experiences are impacted by ecological context

(e.g., community, school, country); examination of both individual- and clustering-level covariates on class membership at both levels; and prediction of distal outcomes based on class membership at either the individual or clustering level. Henry and Muthén (2011) provide a comprehensive review of the MLCA approach.

Summary

In summary, the construct of school discipline climate is grounded in extensive research on parenting typologies and school climate. Research on parenting has supported the existence of four main parenting styles (authoritative, authoritarian, permissive, and uninvolved) that differ in regards to the parents' degree of demandingness and support in their interactions with their children; the authoritative parenting style is generally related to the best behavioral, psychological, and academic outcomes for students. The application of these parenting typologies to the teacher-student relationship is a more recent area of research. Nonetheless, studies on teaching styles also suggest that an authoritative teaching style is beneficial for most students. In an extension of this work, several researchers in the last decade (e.g., Gregory & Cornell, 2009; Pellerin, 2005) have applied the parenting typology construct to the school as a whole. That is, it has been theorized that entire schools can be characterized as having a particular discipline climate or typology that reflects authoritative, authoritarian, permissive, and uninvolved styles. Several researchers have found support for this theory, with some interesting student and teacher outcomes being found to relate to one or more of the school discipline climate types. Although these findings are important and interesting, further exploration of the nature of the school discipline construct is needed due to the limitations of the mean-split approach to classifying schools into discipline climate types used in previous studies. MLCA will allow for better

understanding of student experiences of school discipline climate, school-level variation in

these experiences, and the relation between school discipline climate and important student

and school demographic characteristics.

Current Study

The current study addresses several identified gaps in the research literature on school discipline climate. Specifically, this dissertation: (a) examines the nature of school discipline climate using MLCA and selects the most appropriate model for classifying students and schools, and (b) uses the selected latent class model to understand the association between class membership and important student and school covariates. The research questions, hypotheses, variables, and statistical methods used to answer the research questions for the current study are summarized in Table 1.

The first goal of this study is to examine the nature of the school discipline climate construct through the use of MLCA. Previous researchers have used a mean-split method to place schools into the four theorized typologies of school discipline climate, namely: authoritative, authoritarian, permissive, and uninvolved. However, it is still unclear if these four types of discipline climate are the best way of categorizing schools (Gregory et al., 2011). Rather than assuming that these four types of school discipline climate exist, the current study explores what underlying heterogeneity emerges in student responses to indicators measuring perceived teacher support, school rule fairness, and structure/demandingness of school rules. In addition, the variability in class membership for students within the same school is explored by modeling patterns of student class membership at the school level. This will allow for further exploration of the degree to which consistency in perceptions of school discipline climate exists within schools.

Research Question 1: What underlying latent classes of individual students' experiences of the school discipline climate exist?

First, a traditional LCA method will be used to understand individual student experiences of school discipline climate. This level of analysis will not take into account the clustering of students within schools nor will it provide insight into whether school discipline climate is consistently experienced by students within the same school. Instead, it will determine if there are latent classes of student perceptions of disciplinary structure and teacher support, the nature of these classes, and the percentage of students within the sample that fall into each class. It is possible that, in the school setting, disciplinary structure and support are related in different ways than in the parenting context. For example, perhaps students tend to experience their school's discipline climate as either both supportive and structured (authoritative) or neither supportive nor structured (uninvolved), and permissive and authoritative styles are not perceived. Additionally, it is possible that more than four typologies exist, such as Baumrind's democratic or directive parenting types (Baumrind, 2013). Distinctions such as these are important to explore so that a more nuanced understanding of this construct can emerge. Gregory et al. (2011) suggest that differentiation between more of the classes and outcomes may not have occurred in their study because of the limitations of a mean split approach to categorizing schools. In the current study, it is hypothesized that four meaningful latent classes will emerge at the individual level, which will reflect the authoritative, authoritarian, permissive and uninvolved styles of school discipline climate.

Research Question 2: How do latent classes based on individual students' *experiences change when accounting for student clustering within schools?*

Participants in the current study are a selected subset of students nested within schools, thus, it will be important to account for this through the use of a multilevel

approach. First, the parametric MLCA model will be fit, which will allow for the clustering of students within schools to be accounted for in the identification of latent classes. Results of this analysis will reveal what latent classes of student experiences of their school discipline climate exist after accounting for commonalities that may exist between students within the same school. It is hypothesized that after accounting for clustering, the same four latent classes (authoritative, authoritarian, permissive and uninvolved) will emerge and that this model will fit the data better than the individual-level LCA model.

Research Question 3: How are latent classes of student perceptions of school discipline climate distributed at the school level?

The school discipline climate literature is based on the premise that schools can create a consistent culture of school discipline climate that is reflected in some degree of consistency in the experiences of students within that school. However, it is also possible that the experience of the school discipline climate is very person-centered and differs for every student in a school. Gregory and Cornell (2009) explain that providing both structure and support is no easy task, especially at the schoolwide level. In particular, mixed messages can be given to students if different adults in the school have different approaches and different relationships with students. Ripski and Gregory (2009) further articulated this point when they argued that research on school climate is often overly simplistic in its assumption that all student perceptions about the climate within a school are in agreement. Thus, it is important to know if inconsistency exists in students' experiences of their school.

To explore these questions, nonparametric MLCA will be used. The nonparametric MLCA will allow the variability of student class membership (i.e., whether students perceive an authoritative, authoritarian, permissive, or uninvolved discipline climate) to be modeled at

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the school level. This modeling of school-level latent classes will provide information about the variability of student experiences of school discipline climate within schools. It will not provide definitive answers about the "true" existence of school discipline climate types, but will allow for greater understanding about the way individual students and schools vary in terms of this construct. For example, if one class of schools tends to have students who experience authoritative climates more than the other climate types, then there is more evidence that an authoritative school discipline climate exists. The same would be true for the other styles. It is also possible that two types of school-level latent classes will emerge, those with students who primarily experience the authoritative climate and another type in which students primarily experience the uninvolved type; the permissive and authoritarian style may be experienced less consistently within schools. None of this information will provide conclusive evidence on whether these school discipline climates truly exist, but they will provide much more information about the nature of these constructs than has been examined in previous research.

I hypothesize that if a four-class solution to the individual-level LCA that can be described as reflecting authoritative, authoritarian, permissive, and uninvolved discipline climates is supported, then the nonparametric LCA will support the existence of four school-level classes that reflect schools with primarily authoritative, authoritarian, permissive and uninvolved students; that is, more than 50% of the students within each school-level class are classified as falling into one of the class types. If true, this provides evidence that schools as a whole can be described as having a school discipline climate that is perceived by the majority of the students.

Research Question 4: How are important student- and school-level covariates

related to student class membership at Level 1 and school class membership at Level 2?

After gaining a better understanding of the nature of the construct of school discipline climate at both the student and school level, the model that makes the most empirical and theoretical sense will be selected and the relation between class membership and covariates will be examined. MLCA allows for the inclusion of both individual- and school-level covariates. Research and theory on school discipline climate, student misbehavior, and experiences of exclusionary school discipline points to several individual- and school-level variables that may impact student experiences of the school discipline climate. The current study will include these important variables in the model. Through the inclusion of these covariates it will be possible to understand how different student and school factors impact both student experiences of the school climate and school composition of student experiences. At the individual level, the following covariates will be included: student gender, student race/ethnicity, and student SES. At the school level, school size, school racial composition, and school poverty will be included. The rationale for the inclusion of these covariates is described below.

Student gender. There is reason to believe that a student's gender may be related to their experience and perception of the school discipline climate. Ripski and Gregory (2009) found that gender was significantly correlated with experiences of unfairness, hostility, and victimization in school; boys reported higher levels of all three constructs. Boys are significantly higher on reports of irresponsible behavior (Wentzel, 2002), are more likely to receive suspensions and expulsions (APA Zero Tolerance Task Force, 2008), and are less likely to seek help from teachers than girls (Eliot, Cornell, Gregory, & Fan, 2010). It is

hypothesized that boys will be less likely than girls to perceive their school discipline climate as authoritative.

Student race/ethnicity. There has been some criticism of the parenting typologies because of its potential limitations with diverse populations, including non-White children. Wong and Rowley (2001) suggest that school practices are not experienced the same for students of different ethnic groups. Studies have consistently found that minority students, particularly Black students, are suspended and expelled more than White students (APA Zero Tolerance Task Force, 2008). In terms of school discipline climate, Gregory et al. (2011) found that the racial discipline gap in suspension rates for White and Black students was significantly greater in schools with an indifferent/uninvolved school discipline climate as compared to authoritative schools. Furthermore, Ripski and Gregory (2009) found that non-White students rate their schools as more hostile than White students. Other studies measuring school discipline climate and related constructs have included students' race/ethnicity as an important covariate (e.g., Dever & Karabenick, 2011; Shouse, 1996). In the current study, it is hypothesized that non-White students will be less likely to perceive their school as authoritative than White students.

School racial composition. In a similar vein, at the school level the racial composition of schools has been related to discipline outcomes. Both White and Black students in schools with higher proportions of Black students are more likely to be suspended (Gregory et al., 2011). Welch and Payne (2010) found that, even after taking student poverty, neighborhood disadvantage, and student delinquency and drug use into account, schools with larger Black enrollment used harsher sanctions for misbehavior. It is hypothesized that, in the current study, the percentage of minority students within a school will have an impact on the

school discipline climate, such that schools with a higher percentage of minority students are more likely to be perceived as having an authoritarian or uninvolved approach.

Student SES. Student poverty and SES have also been found to relate to student experiences in school (e.g., Shouse, 1996). For example, low-income students rate their schools as more hostile (Ripski & Gregory, 2009), and are more likely to attend schools low in academic press (Lee & Smith, 1999). It will be important to understand how the experience of school discipline climate differs as a function of student SES. It is hypothesized that higher SES students will be more likely to perceive their school as authoritative than lower SES students.

School poverty. At the school level, the percentage of students within a school that are in poverty is also predictive of a number of different student outcomes (e.g., Pellerin, 2005) and has been included as a covariate in previous studies about school discipline climate (Gregory et al., 2010; 2011). Similar to findings regarding school racial composition, low SES schools are perceived as more hostile and have more victimization (Ripski & Gregory, 2009). Shouse (1996) found that academic press had a stronger impact on student achievement outcomes in low SES schools, whereas school communality actually had a slight negative effect on low SES schools. This study suggests that there is an important and interesting interaction between school SES and the impact of constructs related to school discipline climate, such as academic press and communality. It will, therefore, be included as a school-level covariate in the current study. It is hypothesized that schools with higher poverty will be less likely to be in the authoritative school discipline climate class.

School size. Of particular interest to understanding the school discipline climate construct is school size. The construct of school discipline climate is based in the assumption

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that schools create overarching climates of discipline that are experienced by the majority of students. However, it is probable that larger schools may have more difficulty creating this type of climate, as the size of the school may prohibit consistency across diverse and perhaps disconnected staff, teachers, and students (Shouse, 1996). Leithwood and Jantzi (2009) reviewed 57 articles on school size and found evidence that small schools have better student and school outcomes overall, including in terms of school climate and student behavior. Previous studies examining school discipline climate have included school size as an important covariate (Gregory et al., 2010; 2011; Pellerin, 2005). In the current study, it is hypothesized that smaller schools will be more likely to be perceived as authoritative than larger schools.

Table 1

Summary of Study Research Questions, Hypotheses, Variables, and Analysis Methods

Research Question	Hypothesis	DVs	IVs	Covariates	Analytic Method
Q1: What underlying latent classes of individual students' experiences of the school discipline climate exist?	Four meaningful latent classes will emerge at the individual level, which will reflect the authoritative, authoritarian, permissive and uninvolved styles of school discipline climate.	Within latent classes	Indicators of school discipline climate (STU BY): 1. Students get along well with teachers 2. Teachers are interested in students 3. Teachers praise effort 4. School rules are fair 5. Punishment same no matter who you are 6. Students know punishment for broken rules 7. School rules are strictly enforced	None	Traditional LCA at individual level
Q2: How do latent classes based on individual students' experiences change when accounting for student clustering within schools?	After accounting for clustering, the same four latent classes (authoritative, authoritarian, permissive and uninvolved) will emerge.	Within latent classes	7 indicators of school discipline climate	None	Parametric MLCA
Q3: How are latent classes of student perceptions of school discipline climate distributed at the school level?	If a 4-class solution to the LCA that can be described as authoritative, authoritarian, permissive, and uninvolved is supported, then the nonparametric LCA will support the	Within latent classes Between latent classes	7 indicators of school discipline climate	None	Non-Parametric MLCA

	existence of four school-level classes that reflect schools with primarily authoritative, authoritarian, permissive and uninvolved students.				
Q4: How are important student- and school-level covariates related to student class membership at Level 1 and school class membership at Level 2?	At the individual level, boys, non-White students, and low SES students will be less likely to perceive their school as authoritative than girls, White students, and higher SES students. At the school level, schools with a lower percentage of minority students, less poverty, and that are smaller in enrollment size will be more likely to be authoritative, than higher percentage minority, poorer, and larger schools.	Within latent classes Between latent classes	7 indicators of school discipline climate	STU BY: 1. Student gender 2. Student SES 3. Student race/ethnicity CCD: 1. School size 2. School poverty 3. School % minority	MLCA with covariates

Note. BY = Base year (2002) of study; STU = Student questionnaire; CCD = NCES Common Core of Data.

Method

Dataset Selection Criteria

The current study uses secondary data from the Educational Longitudinal Study of 2002 (ELS:2002). This dataset was selected because it met the following criteria: (a) includes a nationally representative sample of high school students, which is necessary to generalize results to the population of interest (U.S. public high school students) and examine the impact of diverse student and school characteristics on the constructs of interest; (b) includes variables that adequately measure the constructs of interest (teacher support and disciplinary structure) and covariates (student- and school-level demographics), and these variables are similar to those used in previous studies on the topic; and (c) includes a large enough sample size (at both the student and school level) to conduct an MLCA study with many parameters.

Participants

Participants include students in the ELS 2001-2002 sophomore cohort who were also attending a public high school in 2001-2002 (not a private or religious institution; useobservations = G10COHRT eq 1 and BYSCTRL eq 1). All sample sizes are rounded to the nearest ten in accordance with IES restricted-use data disclosure rules. This sample of participants includes 12,610 students nested within 580 public high schools. Approximately half of the participants are female ($n = 6,100$ and 50%) and half have a race/ethnicity of White, non-Hispanic ($n = 6,310$ and 50%). The schools attended by the students are located in suburban (50%), urban (30%), and rural areas (20%), with wide variation in school size, percentage of students receiving FRPL, and the percentage of ethnic/racial minority students enrolled. More detailed student and school demographic information is included in Table 2.

Table 2

Sample Demographics (Non-Weighted)

Student Variables ($N = 12,610$)	n	%	School Variables ($N = 580$)	n	%
Gender			School Urbanicity		
Male	5,990	50	Urban	160	30
Female	6,100	50	Suburban	290	50
Nonrespondent	520	< 10	Rural	130	20
Race/Ethnicity					
American Indian/Alaskan Native	120	< 10			
Asian/Hawaiian/Pacific Islander	1,290	10			
Black or African American	1,780	10			
Hispanic	1,890	20			
More than one race	580	< 10			
White, non-Hispanic	6,310	50			
Nonrespondent	650	< 10			

	Range	*M* (*SD*)		Range	*M* (*SD*)
Socioeconomic status ($N = 11,970$)	-2.11 to 1.98	-0.08 (0.71)	School Size ($N = 580$)	42 to 4,640	1,420 (850)
			% Minority ($N = 570$)	0 to 100	40 (30)
			% FRPL ($N = 520$)	0 to 100	20 (20)

Procedures

The ELS: 2002 is a national longitudinal study conducted by the National Center for Educational Statistics (NCES) and the U.S. Department of Education. It was designed to follow the trajectories of youth from tenth grade through young adulthood, as they transitioned into postsecondary education and the workforce. To accomplish this, a nationally representative sample of tenth graders was selected from the population using a two-part stratified sampling design. First, public, private and Catholic schools in the United States with tenth-grade students were selected. Of those schools that agreed to participate, a sample of approximately 26 tenth- grade students within each school was randomly selected from the sophomore enrollment roster, with slight oversampling of Asian and Hispanic students. Sixty-eight percent of eligible schools participated and 87% of eligible selected students completed the student survey in the base year. In the base year (2002), data were collected from the students; two of their teachers (math and English); their parent; and their school principal, librarian, and a facilities observer. Students completed a self-report questionnaire and academic achievement tests at school in a group administration format. Teachers and parents of the student were then contacted to complete surveys about the target student. The principal and librarian at each participating school completed surveys about the school and a researcher completed an observation checklist about the school facilities. Greater detail about the study design, sampling methods, and administration procedures is available in the ELS:2002 User Guide (U.S. Department of Education, 2004).

In the current study, selection bias in the sample will be addressed; sampling weights provided in the ELS:2002 dataset will be used to account for unequal selection probabilities at the student level (weight = BYSTUWT, universe flag = G10COHRT) and the clustering of

students within schools will be accounted for using the TWOLEVEL option in *Mplus*. I received permission to use the ELS:2002 restricted-use data from the Institute of Education Sciences (IES). In accordance with IES security requirements, all data were stored on a secured computer in a secured office. The IES has reviewed this manuscript for adherence with restricted-use data reporting requirements and approved it for dissemination. I received an exemption from the Institutional Review Board at the University of California, Santa Barbara before conducting the current study.

Measures

All items used in the present study are from the student self-report questionnaire or the school-level Common Core of Data (CCD) from the ELS:2002 study in its base year (2002). Table 3 provides a summary of all items in the current study.

Indicators of school discipline climate. Seven items measuring the construct of school discipline climate (three teacher support items and four school disciplinary structure items) were included as indicators in the LCAs; all selected items are similar to those used in previous studies on this topic. These seven items are from the base year student self-report questionnaire. For the three items measuring teacher support, students were asked, "How much do you agree or disagree with each of the following statements about your current school and teachers?": "Students get along well with teachers" (BYS20A), "Teachers are interested in students" (BYS20F), and "When I work hard on schoolwork, my teachers praise my effort" (BYS20G). Items measuring teacher responsiveness are similar to those used in other studies measuring this construct (e.g., Gregory & Weinstein, 2004; Pellerin, 2005). For the four items measuring aspects of school disciplinary structure, students were asked, "Thinking about your school over the last year, how much do you agree or disagree with the

following statements?": "The school rules are fair" (BYS21B), "The punishment for breaking school rules is the same no matter who you are" (BYS21C), "If a school rule is broken students know what kind of punishment will follow" (BYS21E), and "The school rules are strictly enforced" (BYS21D). Items measuring disciplinary structure and rule fairness are identical to those in the Experience of School Rules (NCES, 2005) scale that has been used in previous studies on school discipline climate (Gregory et al., 2010, 2011, 2012; Pellerin, 2005). Responses to all items are on a four-point Likert scale ranging from (1) *strongly agree* to (4) *strongly disagree*. All items were dichotomized (*agree and strongly agree* = 1 and *disagree and strongly disagree* = 0) to create categorical indicators for the LCAs.

Student covariates. The final LCA model includes student-level covariates hypothesized to impact student experiences of school discipline climate. These covariates are student gender, student race/ethnicity, and student SES. Gender is self-reported by students (BYSEX) and was dummy coded as 1 = *female* and 0 = *male*. Student race/ethnicity is also self-reported by the student (BYRACE_R). Race/ethnicity categories were collapsed so that there was a large enough sample in each group, thus five categories were created: White (non-Hispanic), Black or African American, Hispanic, Asian/Native Hawaiian/Pacific Islander, More than one race/American Indian/Alaska Native. Dummy coding was used, with White (non-Hispanic) serving as the reference class. The student SES composite (BYSES2) was used to measure student socioeconomic status. This variable was constructed based on an algorithm using father occupation, mother occupation, father highest level of education, mother highest level of education, and family income; it is a continuous variable ranging from +1.98 to -2.11, with higher values indicating higher SES (see the ELS:2002 User Guide for further details on variable construction; U.S. Department of Education, 2004).

School covariates. In addition, three school-level covariates were examined: school enrollment size, percentage of students receiving free and reduced price lunch (FRPL), and school racial composition. All three school-level covariates come from the CCC, which is collected annually by the NCES (U.S. Department of Education, 2004) and was included in the ELS:2002 restricted-use dataset. School enrollment size is defined as the total school population during the 2001-2002 school year (CP02STEN) and is a continuous variable ranging from 40 to 4,260 students in the current study sample. The school poverty covariate was measured by the percentage of students within the entire school receiving FRPL during the 2001-2002 school year (CP02FLUN); percentages are continuous and range from 0% to 100% in the current sample. The last school-level covariate included in the model is school racial composition, or the percentage of ethnic/racial minority students attending the school during the 2001-2002 school year (CP02PMIN). This variable is continuous and ranges from 0% to 100% in the current sample.

Table 3

List and Description of Variables Included in Current Study from the ELS:2002 Restricted-Use Dataset

	ELS Survey	ELS Variable Name	Variable Description	Response Options	Recoded for Current Study
Indicators of School Discipline Climate	STU BY	BYS20A	Students get along well with teachers	(1) Strongly agree (2) Agree (3) Disagree (4) Strongly disagree	Dichotomized: Agree/strongly agree = 1 Disagree/strongly disagree = 0
	STU BY	BYS20F	Teachers are interested in students	(1) Strongly agree (2) Agree (3) Disagree (4) Strongly disagree	Dichotomized: Agree/strongly agree = 1 Disagree/strongly disagree = 0
	STU BY	BYS20G	Teachers praise effort	(1) Strongly agree (2) Agree (3) Disagree (4) Strongly disagree	Dichotomized: Agree/strongly agree = 1 Disagree/strongly disagree = 0
	STU BY	BYS21B	School rules are fair	(1) Strongly agree (2) Agree (3) Disagree (4) Strongly disagree	Dichotomized: Agree/strongly agree = 1 Disagree/strongly disagree = 0
	STU BY	BYS21C	Punishment same no matter who you are	(1) Strongly agree (2) Agree (3) Disagree (4) Strongly disagree	Dichotomized: Agree/strongly agree = 1 Disagree/strongly disagree = 0
	STU BY	BYS21E	Students know punishment for broken rules	(1) Strongly agree (2) Agree (3) Disagree (4) Strongly disagree	Dichotomized: Agree/strongly agree = 1 Disagree/strongly disagree = 0
	STU BY	BYS21D	School rules are strictly enforced	(1) Strongly agree (2) Agree (3) Disagree (4) Strongly disagree	Dichotomized: Agree/strongly agree = 1 Disagree/strongly disagree = 0
Student-Level Covariates	STU BY	BYSEX	Student sex composite	(1) Male (2) Female	Dummy coded: 1 = Female, 0 = Male
	STU BY	BYRACE	Student race/ethnicity composite	(1) American Indian/Alaskan Native,	Dummy coded:

				non-Hispanic	Black:
				(2) Asian, Hawaii/Pacific Islander, non-Hispanic	White = 0 (reference class) Black or African American = 1
				(3) Black or African American, non-Hispanic	
				(4) Hispanic, no race specified	Asian: White = 0 Asian/Hawaii/PacIslander = 1
				(5) Hispanic, race specified	
				(6) Multiracial, non-Hispanic	Hispanic: White = 0
				(7) White, non-Hispanic	Hispanic = 1
					Other: White = 0 American Indian/Alaskan Native/Multiracial = 1
	STU BY	BYSES2	Socioeconomic status composite, v.2	Five equally weighted, standardized components: father's education, mother's education, family income, father's occupation, and mother's occupation (Range = -2.11 to 1.98)	Not recoded
School-Level Covariates	CCD	CP02STEN	Total school enrollment 2001/2002	Range = 40 to 4,640	Not recoded
	CCD	CP02FLUN	School percent receiving FRPL 2001/2002	Range = 0 to 100%	Not recoded
	CCD	CP02PMIN	School percent minority 2001/2002	Range = 0 to 100%	Not recoded

Note. BY = Base year (2002) of study; STU = Student questionnaire; CCD = NCES Common Core of Data.

Data Analysis Plan

When specifying MLCAs, researchers recommend using a model building process, in which a series of models are fit and careful analysis of model fit indices and theoretical meaningfulness are used to determine the most appropriate model to explain the data (Asparouhov and Muthén, 2008; Henry & Muthén, 2011). However, it is important to note that best practices in specifying MLCAs have not yet been fully developed (Nylund-Gibson et al., 2010). In the current study, a traditional Level 1 LCA with seven indicators (items measuring school discipline climate) will be run first (see Figure 2; Nylund-Gibson et al., 2010; Rindskopf, 2006). In the second and third steps, a parametric MLCA with and without a common factor on the Level 2 random means will be run (see Figure 3 and 4, respectively), followed by the nonparametric MLCA with random effects (see Figure 5; Nylund-Gibson et al., 2010). Once the best model is selected, Level 1 and Level 2 covariates will be added to the final model (Nylund-Gibson et al., 2010).

All models will be estimated using Mplus 7.0 (Muthén & Muthén, 1998-2012) statistical software. Full information maximum likelihood estimation with robust standard errors, which accounts for data missing at random (MAR), will be used; this estimation method has been found superior to other methods for dealing with missing data (e.g., listwise deletion, pairwise deletion; Enders & Bandalos, 2001). All mixture models run in Mplus use automated random start values, which helps ensure that the model parameter values reflect a global solution (as opposed to a local solution; Nylund-Gibson et al., 2010). Prior to running all LCA models, data screening will be conducted.

Traditional LCA. LCA is an exploratory analysis and uses an iterative process of examining possible classes; the one class solution is fit first, then the number of classes is

increased by one (i.e., two-class, three-class) until there is no further improvement in the model (Nylund, Asparouhov, & Muthén, 2007). To determine model fit, both fit statistics and conceptual knowledge should be used. First, it is important that the maximum log likelihood value is replicated (Asparouhov & Muthén, 2012); this indicates that the best solution is being selected across numerous starts and suggests stability in the solution. Nylund, Asparouhov et al. (2007) recommend that the following fit statistics be used to make model fit determinations: Bayesian Information Criterion (BIC; Schwartz, 1978), Adjusted BIC (ABIC; Sclove, 1987), Bootstrap Likelihood Ratio Test (BLRT; McLachlan & Peel, 2000), and Lo-Mendell-Rubin Likelihood Ratio Test (LMR-LRT; Lo, Mendell & Rubin, 2001). The BIC is one of the more commonly used and trusted measures of model fit; smaller BIC values (and ABIC values) indicate better fit (Nylund, Asparouhov et al., 2007). The BLRT and LMR-LRT are both likelihood ratio tests that compare neighboring models (2-class to 3-class, 3-class to 4-class, etc.). The BLRT is a very accurate indicator of the true number of classes in LCA and has been recommended over the LMR-LRT (Nylund, Asparouhov et al., 2007). However, the BLRT test cannot be calculated in Mplus when weights are used (as in the current study). The last significant LMR-LRT *p*-value is an indication of better model fit (when the *p*-value becomes nonsignificant, the preceding significant class model is chosen).

In addition to examining these fit statistics, two model parameters should be used to aid in the selection of the best model: the class-specific item probability (probability of an individual in that class endorsing the item) and the class probability parameter (relative size [percentage] of the population in each class; Hadzi-Pavlovic, 2009; Nylund, Asparouhov et al., 2007). All of these criteria, in addition to consideration of the theoretical support,

interpretability, and plausibility of each model, will be used to determine the correct number of Level 1 latent classes.
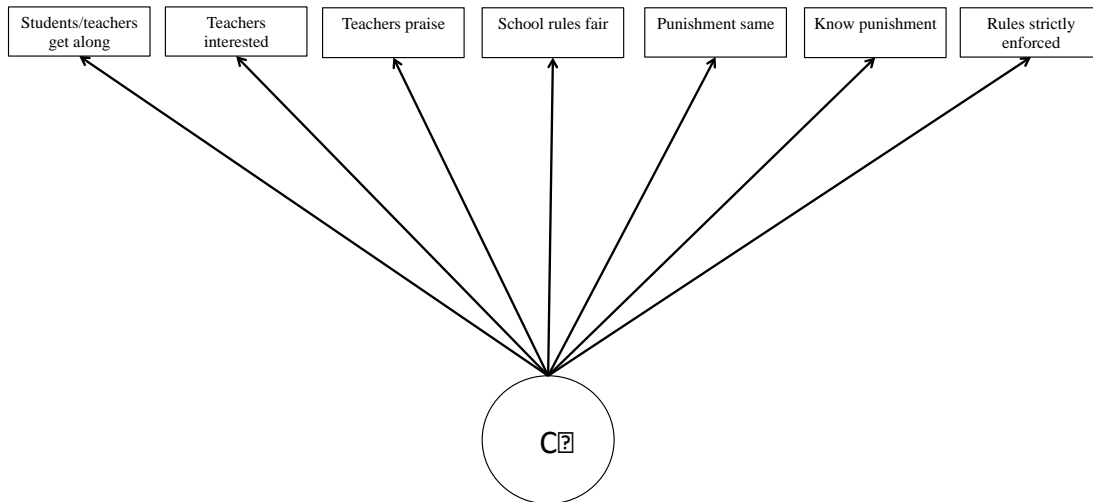

Figure 2. Traditional LCA with seven indicators of school discipline climate. C = the Level 1 latent classes.

Parametric and nonparametric MLCA. When conducting MLCA, Vermunt (2003) recommends that once a Level 1 LCA model is selected as the best fitting model, the number of classes in that model should be retained at Level 1 for all subsequent multilevel models run. Other studies using MLCA have retained the number of class selected at Level 1 as the primary model, but also continue to examine neighboring Level 1 latent class models (e.g., one class above and one class below the selected model) in these multilevel models (e.g., Henry & Muthén, 2010; Mutz & Daniel, 2011); this approach will be used in the current study. First, the parametric MLCA will be run, which will allow the probability of belonging to a certain Level 1 latent class to vary across Level 2 units (i.e., schools). A normal distribution of random means is assumed (Vermunt, 2008). Fit indices for the parametric MLCA will be compared to those of the traditional LCA model to determine if model fit

improved (Henry & Muthén, 2010). Specifically, each model will be evaluated based on: (a) BIC values (lower value indicates better fit, although Henry & Muthén [2010] caution that, "more research is needed to understand the performance of BIC in multilevel latent class models" [p. 9]); (b) magnitude of change in the log likelihood (smaller magnitude indicates that the addition of another class does not result in a significant improvement in fit; Nylund et al., 2010); and (c) interpretability and theoretical meaningfulness.

Next, the parametric model with a common factor at Level 2 will be run. Rather than allowing the random means and covariances to vary at Level 2 (as in the parametric model described previously), this model assumes high correlation among the random means and represents these random means with a single factor (Henry & Muthén, 2011). This approach is much less computationally heavy than the parametric model with random means and may be preferable if model fit remains strong (Asparouhov & Muthén, 2008; Henry & Muthén, 2011; Vermunt, 2003). The parametric model with a common factor will be compared to both the original Level 1 LCA and the parametric model with random means, based on the same criteria described in the previous step.

Lastly, the non-parametric MLCA will be run. For non-parametric models, a multinomial distribution rather than a normal distribution of random means is assumed; this allows for non-normality (Asparouhov & Muthén, 2008; Vermunt, 2008). In the non-parametric approach, schools with similar distributions of students in the Level 1 latent classes will be grouped together, creating Level 2 latent classes (Henry & Muthén, 2010). An iterative process of determining the most appropriate number of Level 2 latent classes, as done for the traditional LCA, will be used. Again, fit indices between the non-parametric

model and the previous parametric models (with and without a factor at Level 2) will be compared to determine which model best fits the data (Henry & Muthén, 2010).
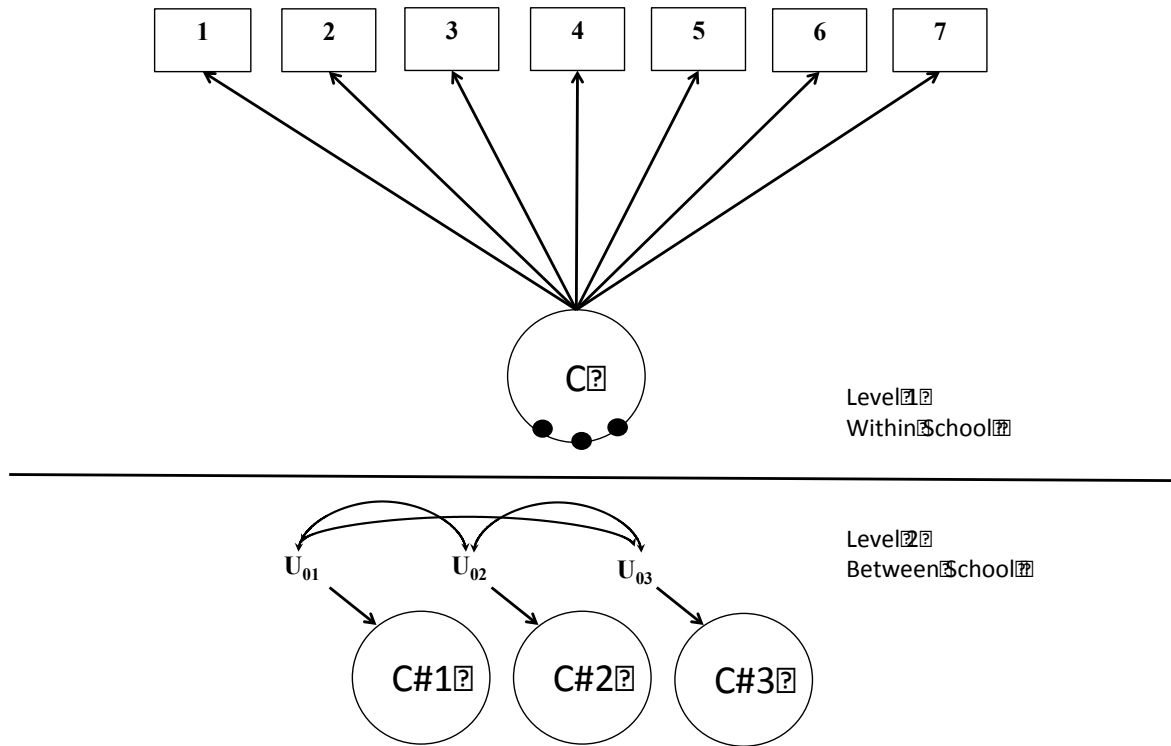

Figure 3. Hypothesized MLCA with four Level 1 latent classes- the parametric approach with random means. C = the Level 1 latent classes; single filled circles = random mean for within-school latent classes ($T-1$ random means, T = number of Level 1 latent classes); C#1 = random mean for the first latent classes. The T-1 random means are correlated with each other (Henry & Muthén, 2010).
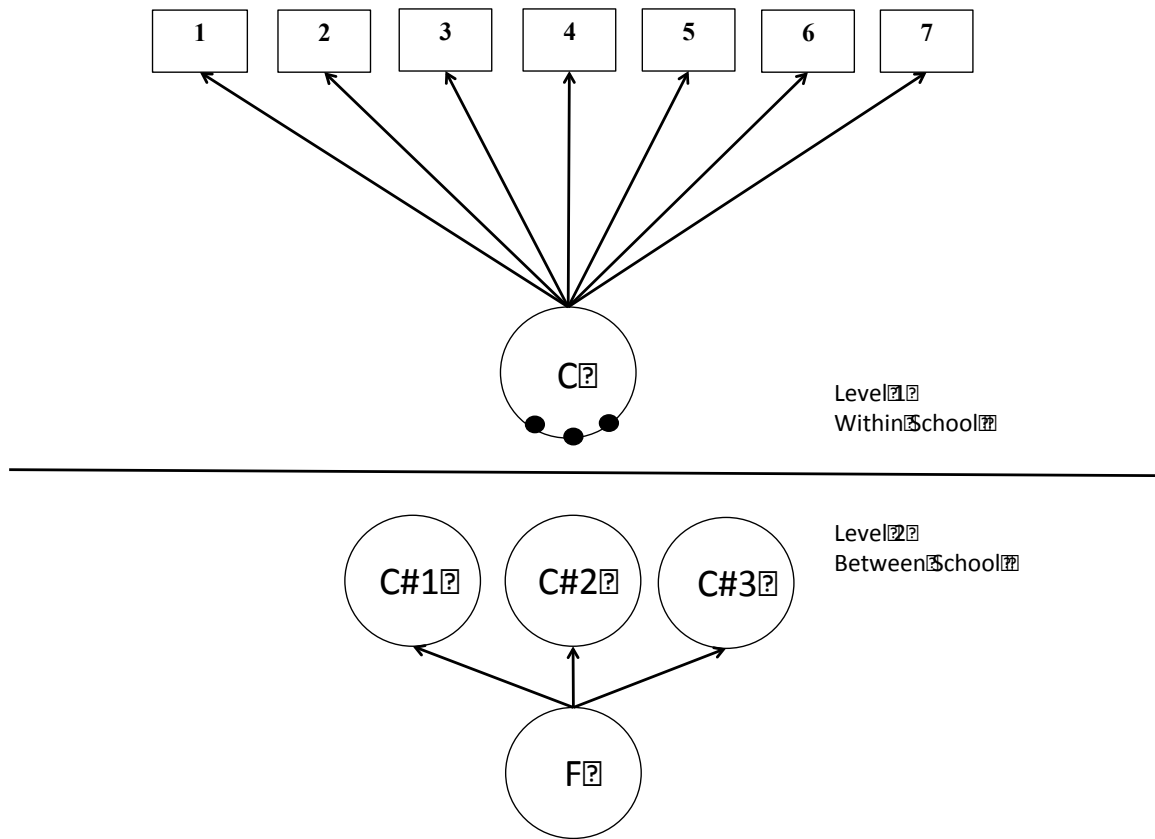
Figure 4. Hypothesized MLCA with four Level 1 latent classes- the parametric approach

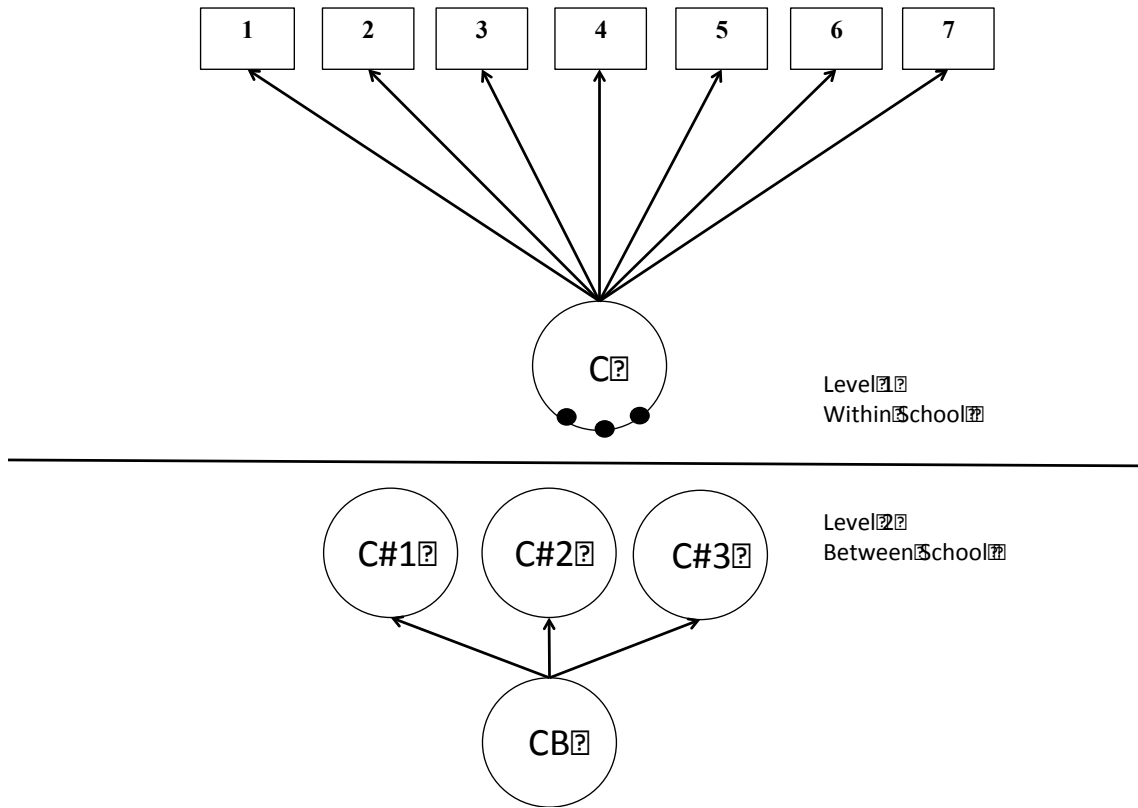with a factor on the Level 2 random means. F = factor on Level 2 random means.

Figure 5. Hypothesized MLCA with four Level 1 latent classes and Level 2 latent classes –

the nonparametric approach. CB = between school or Level 2 latent classes.

Addition of covariates. Once the series of models described above are run and the best fitting model is decided upon, Level 1 (i.e., student gender, race/ethnicity, and SES) and Level 2 (i.e., school size, percent FRPL, and percent minority) covariates will be added to the model. If the parametric MLCA model is chosen, Level 1 covariates will be allowed to predict Level 1 class membership and will be analyzed using multinomial logistic regression (Henry & Muthén, 2010). If the non-parametric MLCA model is chosen, in addition to Level 1 covariates predicting Level 1 class membership, the Level 2 covariates will also be allowed to predict the probability of a school's membership in the Level 2 latent classes using multinomial logistic regression (Henry & Muthén, 2010).

Results

Descriptive Statistics

Preliminary exploration of the seven items included in the LCA (when weighted: BYSTUWT) show that students were more likely to endorse (agree or strongly agree) than not endorse (disagree or strongly disagree) items. Table 4 shows the means and standard deviations for each binary item. Item 4 ("School rules are fair") had a more balanced distribution than the other items, with approximately 51% of students agreeing and 44% disagreeing with the statement. There were significant ($p < .001$), small magnitude (.08 - .34) bivariate correlations for all pairs of items (see Table 5). Skewness and kurtosis values for all items did not exceed critical limits (|2.0| for skewness and |7.0| for kurtosis; Chou & Bentler, 1995; Curran, West, & Finch, 1996), suggesting no major violations to normality (see Table 5).

Table 4

Mean and Standard Deviations for all School Discipline Climate Items (Binary, Weighted)

Item Number	ELS Variable Name	Item	*M*	*SD*
1	BYS20A	Students get along well with teachers	.73	.44
2	BYS20F	Teachers are interested in students	.73	.44
3	BYS20G	Teachers praise effort	.63	.48
4	BYS21B	School rules are fair	.54	.50
5	BYS21C	Punishment same no matter who you are	.62	.49
6	BYS21E	Students know punishment for broken rules	.69	.46
7	BYS21D	School rules are strictly enforced	.66	.47

Note. Means indicate the proportion of the sample endorsing (Agree or Strongly Agree) the items.

Table 5

Bivariate Pearson Correlations, Skewness and Kurtosis for all Items (Weighted)

Item	1	2	3	4	5	6	7
1	—						
2	.29	—					
3	.17	.34	—				
4	.25	.27	.21	—			
5	.14	.21	.20	.25	—		
6	.10	.15	.15	.16	.25	—	
7	.09	.13	.15	.08	.25	.24	—
Skewness	-1.04	-1.05	-0.55	-0.14	-0.49	-0.80	-0.68
Kurtosis	-0.91	-0.90	-1.70	-1.98	-1.76	-1.36	-1.54

Note. All correlations significant at $p < .001$.

Missing Data

As described in the data analysis plan, all analyses in the current study treated

missing data as MAR. Full information maximum likelihood estimation with robust standard

errors has been found superior to other methods for dealing with missing data (Enders &

Bandalos, 2001), but assumes that data are not missing systematically. There were

approximately 1,120 participants missing on all seven LCA indicators, reducing the sample

size to about 11,490 students in the traditional, parametric and non-parametric LCA models.

After inclusion of the covariates at Level 1 and 2, the sample size was reduced to 10,420

students. Although it is impossible to prove these data meet MAR standards, important

covariates that are likely related to the missingness of data (e.g., gender, race/ethnicity, SES)

were included and controlled for in the final model, resulting in greater confidence that the

MAR assumption has been met (Allison, 2009).

Model 1: Traditional LCA

First, a traditional LCA was run to establish the basic latent class structure. This analysis did not take into account the clustering of students within high schools. The 1-class model was run first, followed by models with progressively larger numbers of classes ($1 - 6$ classes). Table 6 summarizes the fit statistics for all six models. The maximum log likelihood was replicated for all models. Analysis of fit statistics suggested that the 3-, 4- or 5-class models fit the data best. Specifically, the BIC improved (declined) as the number of classes increased, reaching its lowest point at the 5-class solution (see Figure 6), then slightly increased in the 6-class solution. Whereas the 5-class solution had the lowest BIC, there was very little change in the BIC from the 4- to 5-class solutions, showing support for the 2-, 3-, or 4-class models. The ABIC showed the same pattern. The LMRT suggested the 4-class solution as the best model (last solution with a significant LMRT p-value). Additionally, entropy (which is not necessarily an indicator of model fit) was low for all models (.51 - .63). The further entropy is from 1.0, the less clearly it will be able to distinguish classes, which diminishes the use of class assignment in any future analyses (Finch & French, 2014).

Table 6

Fit Statistics for Each Level 1 LCA Model (Classes 1 – 6)

Classes	Log likelihood	BIC	ABIC	p-value of LMRT
1	-50303.34	100672.12	100649.88	-
2	-47454.66	95049.56	95001.89	< .001
3	-47051.26	94317.56	94244.47	< .001
4	-46912.24	94114.32	94015.80	< .001
5	-46839.54	94043.71	93919.77	0.416
6	-46804.51	94048.43	93899.07	0.156

Note. BIC = Bayesian Information Criterion; ABIC = Adjusted BIC; LMRT = Lo-Mendell-Rubin Adjusted Likelihood Ratio Test
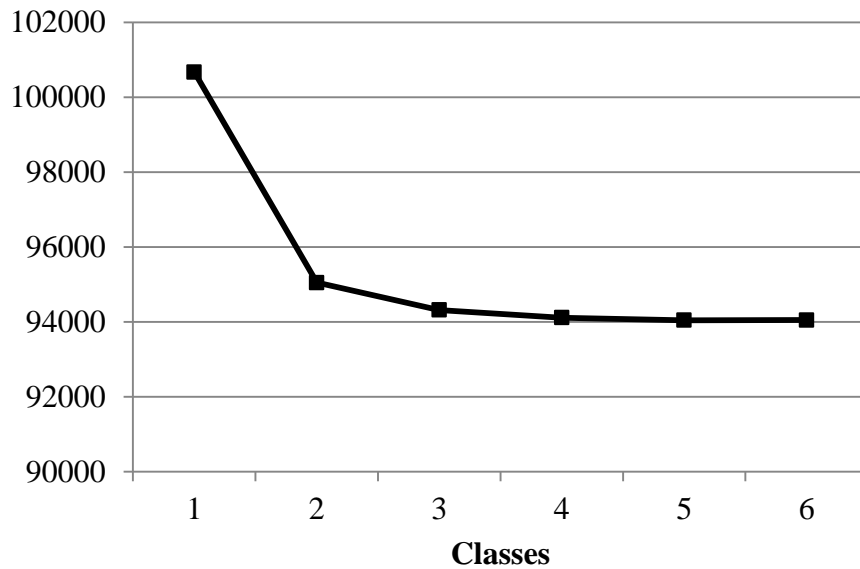
Figure 6. Bayesian Information Criteria for LCA classes 1-6.

In addition to examining fit statistics, item probability plots were visually analyzed for the 3-, 4- and 5-class models. The item probability plot shows the probability of a student selecting agree/strongly agree for each of the items (conditional by class). See Figure 7 for the item probability plot for the 4-class solution and Figure 8 for plots for the 3- and 5-class solutions.

The 4-class solution shows the greatest consistency with school discipline climate theory and previous research. Specifically, the largest class in the 4-class solution contains 34.2% of the sample and is titled the "High Support/High Disciplinary Structure: Authoritative" class. Students in this class have a high probability of endorsing all teacher supportiveness items, as well as all disciplinary structure items. The second largest class contains 27.4% of the sample and is titled the "High Support/Low-Moderate Disciplinary Structure: Permissive" class. Students in this class have a high probability (although lower

than the authoritative class) of endorsing teacher support items, moderate probability of endorsing rule fairness and moderate/low probability of endorsing disciplinary structure items. Next, the third largest class contains 23.0% of the sample and is titled the "Moderate Support/High Disciplinary Structure: Authoritarian" class. Students in this class have a moderate (40-60%) probability of endorsing the teacher support items, low/moderate probability of endorsing rule fairness, and high probability of endorsing disciplinary structure items (although the probability is lower than the authoritative class). Lastly, the smallest class is comprised of 15.4% of the sample and is called the "Low Support/Low Disciplinary Structure: Uninvolved" class. Students in this class have a low probability (less than or approximately equal to 40%) of endorsing all items.

Alternatively, the 3-class solution reveals a class high in teacher support, rule fairness, and disciplinary structure (41.7%); a class high in teacher support and moderate in disciplinary structure (26.3%); and a class low/moderate in both teacher support and disciplinary structure (32.1%). The 5-class solution has similar classes to those in the 4-class solution, but also adds a fifth class (8.8% of the sample) with moderate/high teacher support, high fairness of rules, and low strictness of rules. Thus, there appear to be two different types of "permissive" school discipline climate types in the 5-class model, one with high perception of rule fairness and the other with low perception of rule fairness. Neither the 3- nor 5-class solution is completely consistent with theory on school discipline climate types. Ultimately, fit statistics and analysis of probability plots, as well as consideration of the substantive meaning, interpretability, and parsimony of the models point to the 4-class model as the best solution.
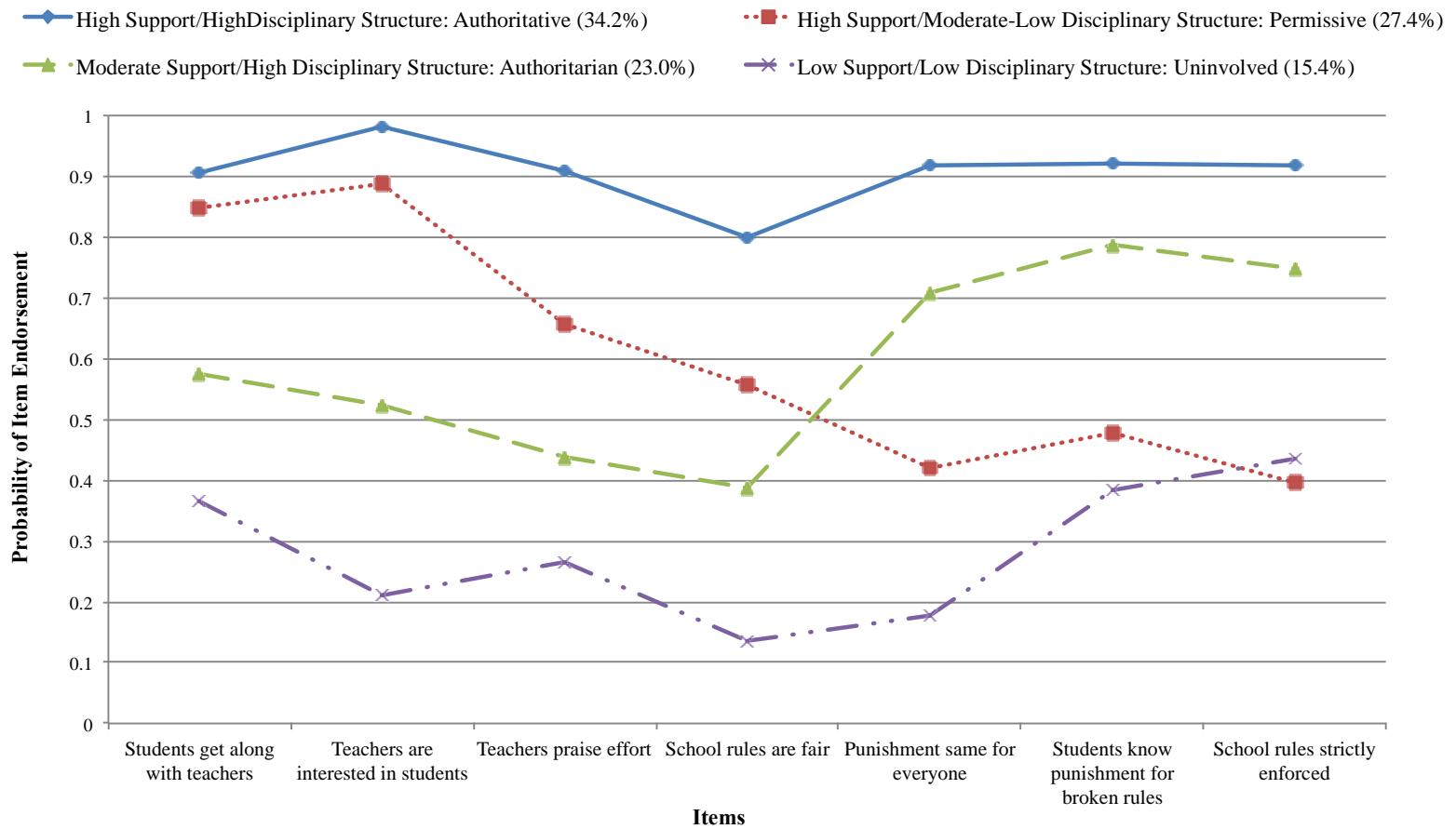
Figure 7. Item probability plot of school discipline climate for the 4-class Level 1 LCA.
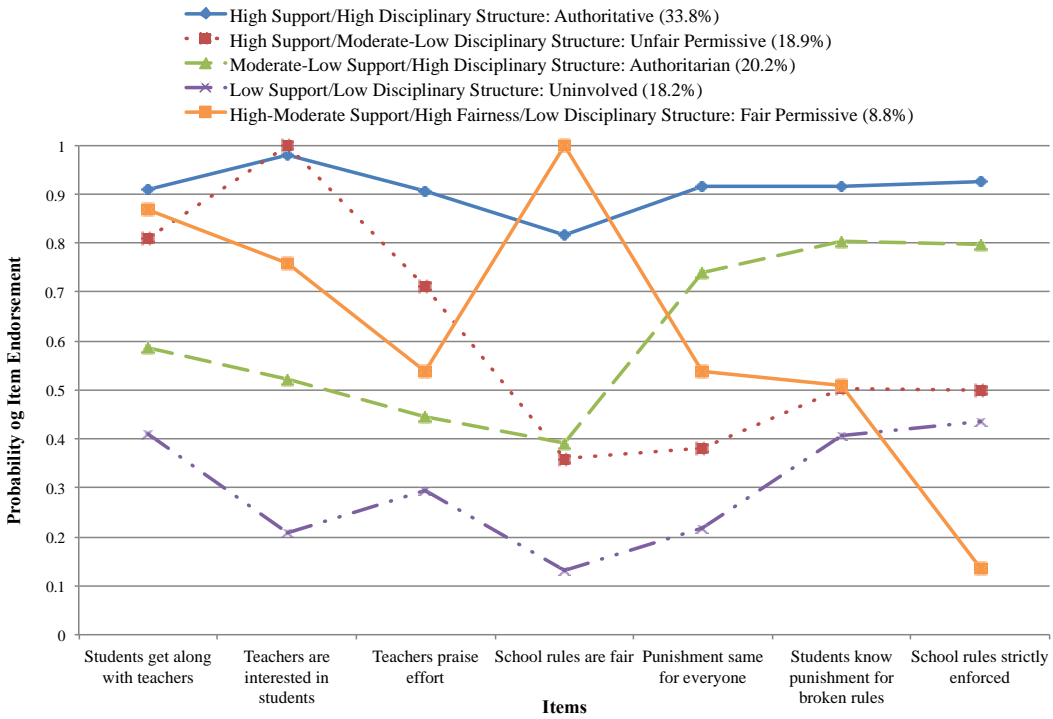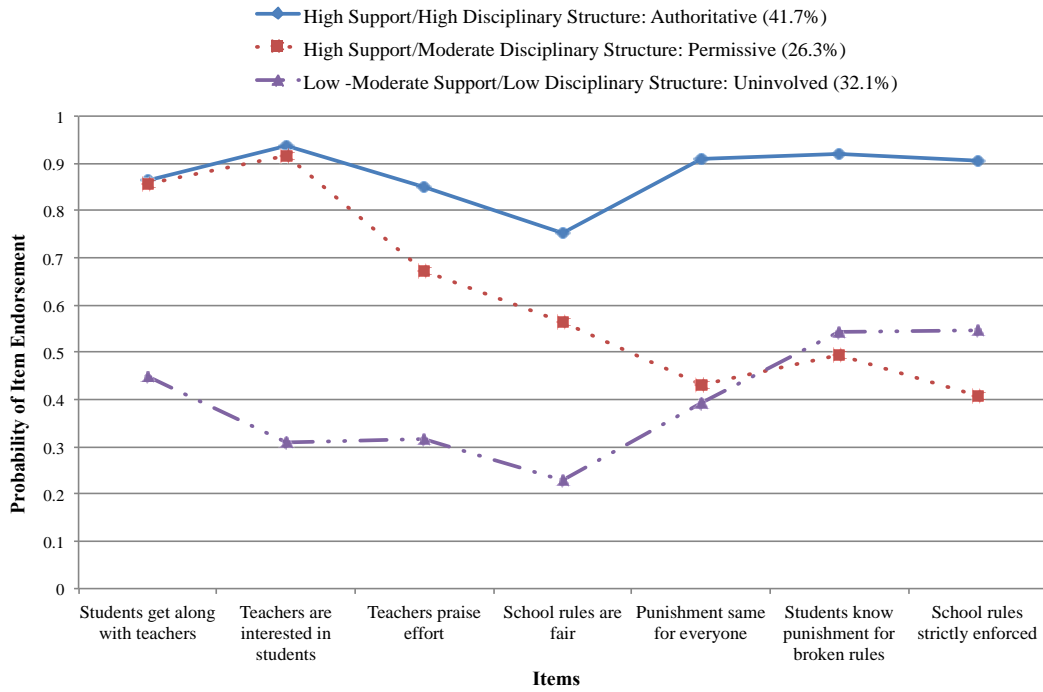
Figure 8. Item probability plots for the non-selected 3- and 5-class LCAs at Level 1.

Model 2 & 3: Parametric MLCA

Moving forward with the 4-class LCA solution at the individual level, a series of
MLCA models were run which took into account the clustering of students within schools. In
an effort to ensure the best fitting model was retained, both the neighboring 3- and 5-class
solutions were also modeled in the multilevel approaches.

First, the parametric MLCA with random means was run. Table 7, Model 2 shows the
fit statistics for this model. The 4-class model shows a decrease in the log likelihood and
BIC, as compared to the Level 1 model, although the magnitude of change is relatively small.
The entropy remained the same. Comparison of the 4-class model to the 3-class and 5-class
models further supported the 4-class parametric model (fit statistics were weaker for the 3-
class model and the 5-class model was unable to converge on a meaningful solution; a high-
powered computer with many processors was unable to finish running the model in Mplus
over the course of a week). Item probability plots showed that the classes in the 4-class
parametric model remained very similar to the original individual-level model in item
probability and size, suggesting stability in the classes.

Next, the parametric approach with a common factor on the Level 2 random means,
which requires less computation time, was run (see Table 7, Model 3 for fit statistics).
However, once a common factor was added, the 4-class model was unable to replicate the log
likelihood value, even after increasing the number of random starts to 2500. The BIC also
increased with the addition of a common factor. This suggests that when the random means
(at Level 2) were represented by one common factor, the model was unstable and did not
provide a better fit than the parametric model with random means. The 3- and 5-class

parametric models with a common factor did not provide compelling evidence of better model fit or substantive interpretation when compared with the other Model 3 solutions.

Model 4: Non-Parametric MLCA

Subsequently, the Non-Parametric MLCA was considered. A series of models were run that allowed for latent classes to be modeled at the school level (see Table 7, Model 4a, 4b, and 4c for the fit statistics). Models with two, three, and four classes at Level 2 were examined. The 4-class model with two latent classes at Level 2 (Table 7, Model 4a) failed to replicate the log likelihood and had a slightly higher BIC value than the parametric model. When a third class was added at Level 2 (Table 7, Model 4b), the log likelihood replicated and the BIC slightly decreased (although it remained higher than the BIC for the parametric model). A fourth class was also modeled at Level 2 (Table 7, Model 4c), but this model showed some instability; the log likelihood replicated, but when it was run a second time with double the number of random starts it failed to replicate. The 3-class and 5-class Level 1 models were also considered with two, three and four Level 2 latent classes, but did not suggest significantly better fit or substantive meaning than the 4-class Level 1 solutions. For the non-parametric solutions with three and four classes at Level 2, the item probability plots for the Level 1 classes were re-examined and showed no substantial change in class meaning or size after allowing for the modeling of Level 2 classes, suggesting stability of the four individual-level latent classes after accounting for clustering.

The non-parametric solution with three classes at Level 2 (Table 7, Model 4b and Figure 9) reveals three school-level classes that group schools based on the distribution of student perceptions of school discipline climate types (Level 1 classes). Approximately one-third of the schools were in each school-level class. The first class has the largest proportion

64

of students perceiving their school as authoritative (46%), with 24% in the permissive class, 19% in the authoritarian, and 11% in the uninvolved class. This class includes 34% of schools and is titled the "Mostly Authoritative Schools" class. The second class has the largest proportion of students perceiving their school as permissive (44%), with 25% in the authoritative class, 23% in the uninvolved class, and 8% in the authoritarian class. This class includes 31% of the schools and is titled the "Mostly Permissive Schools" class. The third class has the largest proportion of students perceiving their school as authoritarian (41%), with 25% in the uninvolved class, 17% in the permissive class, and 16% in the authoritative class. This class includes 35% of the schools and is titled the "Mostly Authoritarian Schools" class.
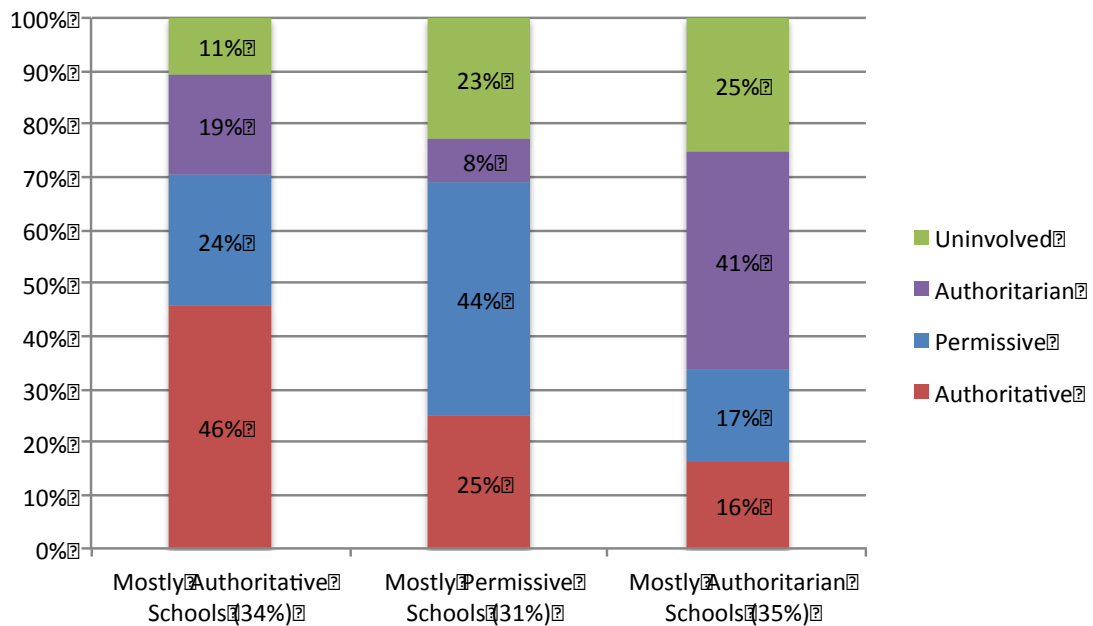

Figure 9. Non-parametric MLCA solution (Level 1 = 4 classes, Level 2 = 3 classes), Level 2 class sizes and distribution of students within each Level 2 class.

The non-parametric model with four classes at Level 1 and four classes at Level 2 was also considered (See Figure 10). In this model there are three Level 2 classes similar to those in the previous model (3 classes at Level 2), with the addition of a fourth class. The added fourth class has the highest proportion of students in the uninvolved class (44%), a large proportion of students in the authoritarian class (34%), and fewer in the authoritative (18%) and permissive (4%) classes. This fourth Level 2 class, titled "Mostly Uninvolved Schools," includes only 5.6% of the schools.
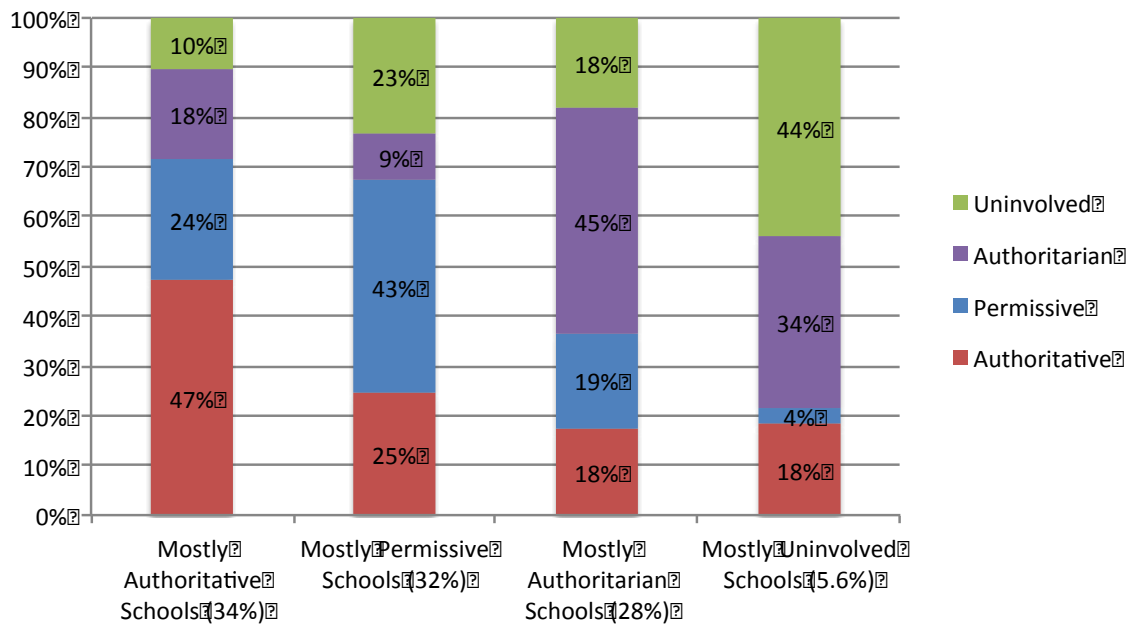

Figure 10. Non-parametric MLCA solution (Level 1 = 4 classes, Level 2 = 4 classes), Level 2 class sizes and distribution of students within each Level 2 class.

Model Selection

      Overall, the 3-class models at Level 1 have slightly higher BIC values than the 4-class models and provide a less substantively interesting and meaningful solution. The 5-class models consistently show a slightly lower BIC value than the 4-class models, but the classes are less consistent, changing significantly in substantive meaning after accounting for clustering. Additionally, across the 5-class models, the fifth class is relatively small (8-11% of the students). Thus, the 4-class Level 1 model was selected based on fit statistics and alignment and meaningfulness within the broader school discipline climate literature. The 4-class Level 1 model was retained in subsequent multi-level models. The BIC value was similar across multi-level approaches (parametric, parametric with common factor, and non-parametric), with the parametric model having the lowest BIC. However, the non-parametric model with three classes at Level 2 had a BIC value that was only slightly higher than the parametric model and provided interesting and meaningful classes at Level 2. For these reasons, the non-parametric approach with four classes at Level 1 and three classes at Level 2 was chosen as the final model (depicted in Figure 11).
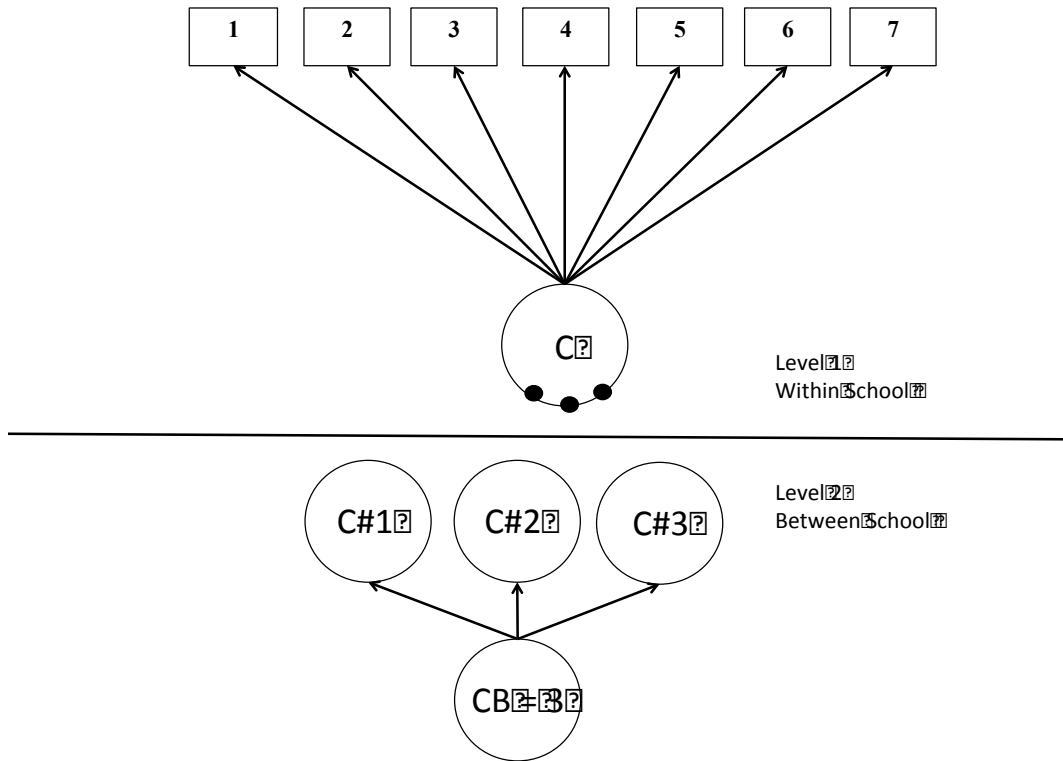
Figure 11. Final model: Non-parametric MLCA with four Level 1 latent classes and three

Level 2 latent classes.

Table 7

Fit Statistics for all Models

Model	Level 1 Classes					
	1 Class	2 Class	3 Class	4 Class	5 Class	6 Class
Model 1. Traditional LCA						
# of free parameters	7	15	23	31	39	47
Log likelihood	-50303.34	-47454.66	-47051.26	-46912.24	-46839.54	-46804.51
BIC	100672.12	95049.56	94317.56	94114.32	94043.71	94048.43
ABIC	100649.88	95001.89	94244.47	94015.80	93919.77	93899.07
p-value LMRT	-	< .001	< .001	< .001	0.42	0.16
Entropy	1.00	0.60	0.55	0.51	0.55	0.63
Model 2. Parametric, random means						
# of free parameters	-	-	26	37	45	-
Log Likelihood	-	-	-46994.38	-46791.60	*	-
BIC	-	-	94231.85	93929.12		-
Entropy	-	-	0.56	0.51		-
Model 3. Parametric, common factor						
# of free parameters	-	-	25	34	43	-
Log Likelihood	-	-	-47034.41	NR	-46739.67	-
BIC	-	-	94302.55	94032.09	93881.35	-
Entropy	-	-	0.54	0.51	0.53	-
Model 4a. Nonparametric, 2 classes at Level 2						
# of free parameters	-	-	26	35	44	-
Log Likelihood	-	-	-47041.53	NR	-46764.08	-

BIC	-	-	94326.14	94060.82	93939.52	-
Entropy	-	-	0.53	0.53	0.57	-
Model 4b. Nonparametric, 3 classes at Level 2						
# of free parameters	-	-	29	39	49	-
Log Likelihood	-	-	-47009.57	-46816.27	NR	-
BIC	-	-	94290.27	93997.16	93892.73	-
Entropy	-	-	0.53	0.53	0.57	-
Model 4c. Nonparametric, 4 classes at Level 2						
# of free parameters	-	-	32	43	54	-
Log Likelihood	-	-	*	-46801.97	-46685.53	-
BIC	-	-		94005.96	93875.93	-
Entropy	-	-		0.56	0.56	-

Note. * Indicates that the model did not converge on a meaningful solution; NR = Log likelihood value was not replicated.

Addition of Covariates

In the next step, the non-parametric MLCA with four classes at the student level and three classes at the school level was modeled with the addition of covariates at both the student and school levels. Student- and school-level covariates are included in the model at the same time; thus, the effect of each covariate represents its effect on class membership after controlling for the other variables in the model. When covariates are included, results of the original model (item probability and class sizes) can vary. In the current analysis, some change occurred in the model after the addition of covariates (i.e., class sizes became more evenly distributed across the four classes; two teacher support items increased in their probability of endorsement for the Authoritarian class), but changes do not greatly impact the meaning of the solution. Figure 12 shows the item probability plot for the student-level 4-class non-parametric solution after the inclusion of covariates.

Figure 12. Item probability plot for the final model with inclusion of covariates.

Student-level covariates. Using multinomial logistic regression, Level 1 latent class

membership was predicted based on important student-level demographics (gender,

race/ethnicity, and SES). All possible comparisons were made among the four classes

(authoritative, permissive, authoritarian, and uninvolved), for a total of six unique

comparisons for each covariate. The results of covariate analyses at Level 1, including the

logistic regression coefficient, odds ratio (OR), and *p*-value are presented in Table 8. Table 8

is somewhat complicated, so a brief explanation is provided. The reference classes, or latent

classes of comparison, are listed at the top of each of the columns, and the class that is being

compared to each reference class is listed in the rows on the left side of the table. As an

example, one would interpret the cells in the first column and seventh row as follows: female

students (the covariate) are slightly more likely (positive logit value) to be in the permissive

class than the authoritative class (the reference class), as compared with male students. This

effect is non-significant, however, with females being 1.05 times more likely (OR) to be in

the permissive class than authoritative class, as compared with male students. All possible

comparisons are shown; for example, the comparison between the permissive class versus

authoritative class (reference class) is also presented as the authoritative class versus

permissive class (reference class). The logit sign (- or +) will be in the opposite direction

when the reference class switches.

Gender. When examining the impact of gender on latent class membership, results

indicate that being female, as opposed to male, increased the odds of being in the Uninvolved

class rather than the Authoritative, Permissive or Authoritarian classes. Specifically, students

who are female are approximately 1.3 times more likely to be in Uninvolved class than the

Authoritative class (0.29, *p* < .01), 1.3 times more likely to be in the Uninvolved class than

the Permissive class (0.23, $p < .05$), and 1.5 times more likely to be in the Uninvolved class than the Authoritarian class (0.43, $p < .01$). There were no gender differences for any of the other latent class comparisons.

Race/ethnicity. To compare the likelihood of latent class membership based on race/ethnicity, student race/ethnicity was dummy coded so that each racial/ethnic minority group (Black, Hispanic, Asian, and Other) was compared to the majority racial/ethnic group (White). Results show that students who are Black are about 1.86 times more likely to be in the Authoritative class than the Permissive class, as compared to White students (0.62, $p < .05$). Black students are also more likely to be in the Authoritarian class than the Authoritative (OR = 4.95, 1.60, $p < 001$), Permissive (OR = 9.31, 2.23, $p < .001$) or Uninvolved classes (OR = 2.49, 0.91, $p < .01$), and are 1.99 times more likely to be in the Uninvolved class than the Authoritative class (0.68, $p < .01$). Hispanic/Latino students are more likely to be in the Authoritarian class than the Authoritative (OR = 1.74, 0.55, $p < .05$), Permissive (OR = 1.99, 0.87, $p < .01$), or Uninvolved (OR = 2.43, 0.89, $p < .001$) classes. Hispanic students did not differ significantly from White students in their likelihood of membership in any other classes. Asian students were approximately 2.77 times more likely to be in the Authoritarian class than the Uninvolved (1.02, $p < .01$), but did not differ significantly from White students in their likelihood of membership in any other latent classes. Lastly, students who are Multiracial or American Indian ("Other") are more likely to be in the Authoritarian class than the Authoritative (OR = 4.06, 1.40, $p < .001$), Permissive (OR = 2.90, 1.06, $p < .01$) or Uninvolved (OR = 2.21, 0.79, $p < .01$) classes. They are also approximately 1.84 times more likely to be in the Uninvolved class than the Authoritative class (0.61, $p < .01$).

SES. The SES covariate was included in the model as a continuous variable, with higher values reflecting higher SES. Results indicate that as student SES increases, students are more likely to be in the Authoritative class than the Authoritarian class. Students with higher SES are also more likely to be in the Permissive class than either the Authoritative (OR = 1.33, 0.29, *p* < .001), Authoritarian (OR = 1.92, 0.65, *p* < .001), or Uninvolved (OR = 1.47, 0.38, *p* < .001) classes. As SES increases, the likelihood of being in the Uninvolved class rather than the Authoritarian class also increases (OR = 1.30, 0.26, *p* < .05).

School-level covariates. Level 2 class membership was predicted based on school-level covariates using multinomial logistic regression. Specifically, school size, percent of students receiving FRPL, and school racial composition were also included in the model. However, when school size was included in the model, the model was unable to replicate the log likelihood value and suggested that the model was not identified. When school size was included as a covariate on its own (without any other covariates) it was non-significant, suggesting that it was not related to class membership at Level 2. Thus, the school size covariate was removed from the model and the entire model was re-run with all of the student-level covariates and the remaining school-level covariates (percent of students receiving FRPL and school racial composition). All possible Level 2 class comparisons (four comparisons) were made and results are presented in Table 9.

Percent receiving FRPL. Results of the analyses showed that after controlling for student-level covariates at Level 1 and racial composition at Level 2, the percent of students receiving FRPL did not predict Level 2 class membership. That is, schools did not differ in their likelihood of being in the Primarily Authoritative, Primarily Permissive or Primarily Authoritarian Schools classes based on their percentage of students in poverty.

Racial composition. Similar results were found for racial composition. After controlling for student-level covariates at Level 1 and the percentage of students receiving FRPL, the racial composition of schools (percentage of students that are ethnic/racial minorities) was not predictive of their school-level class membership.
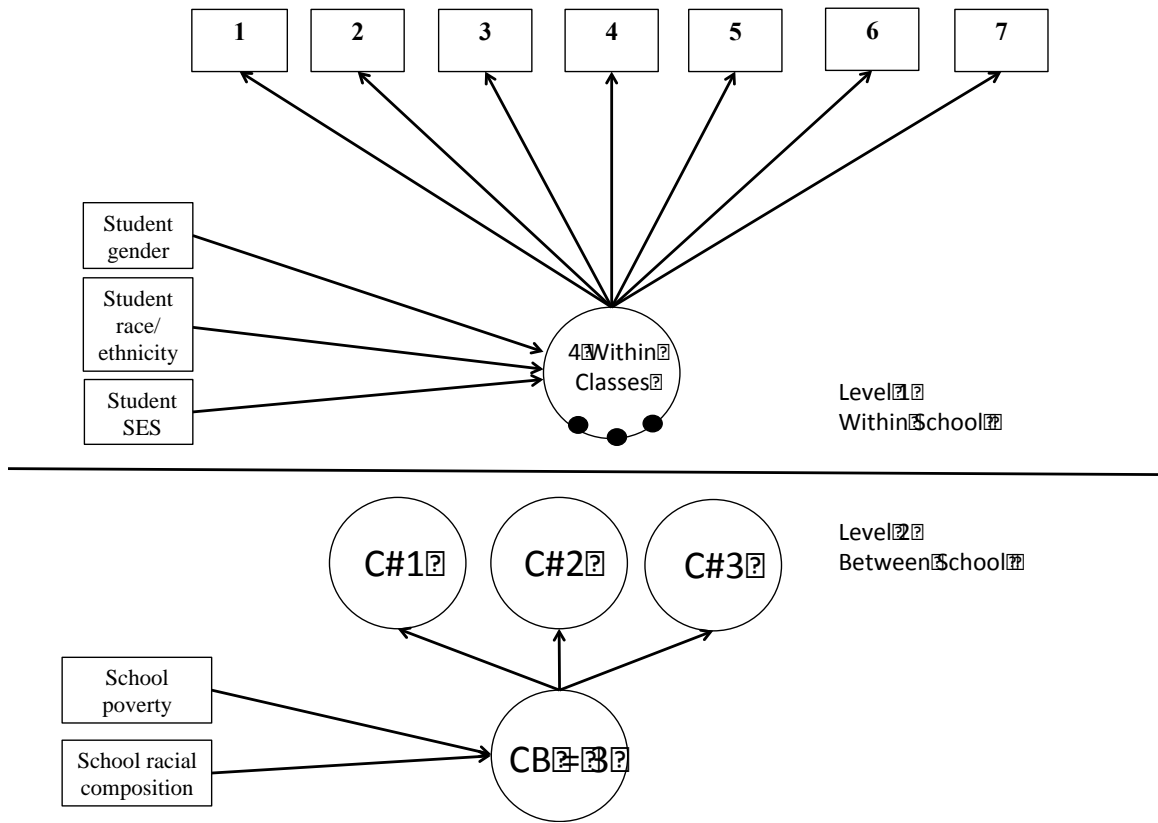

Figure 11. Addition of covariates to the final model.

Table 8

Final Nonparametric MLCA Model with Covariates (Level 1 Results)

| | | Reference Class | | | | | | | |
| | | Authoritative | | Permissive | | Authoritarian | | Uninvolved | |
	Effect	Logit	OR	Logit	OR	Logit	OR	Logit	OR
Authoritative	Female	-	-	-0.05	0.95	0.14	1.15	-0.29**	0.75
	Black/AA	-	-	0.62*	1.86	-1.60***	0.20	-0.68**	0.51
	Hispanic/Latino	-	-	0.31	1.37	-0.55*	0.57	0.33	1.40
	Asian/PI	-	-	0.12	1.13	-0.57	0.57	0.46	1.58
	Other	-	-	-0.35	0.71	-1.40***	0.25	-0.61**	0.55
	SES	-	-	-0.29***	0.75	0.36*	1.44	0.10	1.10
Permissive	Female	0.05	1.05	-	-	0.19	1.21	-0.23*	0.79
	Black/AA	-0.62*	0.54	-	-	-2.23***	0.11	-1.30***	0.27
	Hispanic/Latino	-0.31	0.73	-	-	-0.87**	0.42	0.02	1.02
	Asian/PI	-0.12	0.89	-	-	-0.69	0.50	0.34	1.40
	Other	0.35	1.41	-	-	-1.06**	0.35	-0.26	0.77
	SES	0.29***	1.33	-	-	0.65***	1.92	0.38***	1.47
Authoritarian	Female	-0.14	0.87	-0.19	0.83	-	-	-0.43**	0.65
	Black/AA	1.60***	4.95	2.23***	9.31	-	-	0.91**	2.49
	Hispanic/Latino	0.55*	1.74	0.87**	1.99	-	-	0.89***	2.43
	Asian/PI	0.57	1.76	0.69	2.40	-	-	1.02**	2.77
	Other	1.40***	4.06	1.06**	2.90	-	-	0.79**	2.21
	SES	-0.36*	0.70	-0.65***	0.52	-	-	-0.26*	0.77
Uninvolved	Female	0.29**	1.33	0.23*	1.27	0.43**	1.53	-	-
	Black/AA	0.68**	1.99	1.30***	3.69	-0.91**	0.40	-	-
	Hispanic/Latino	-0.33	0.72	-0.02	0.72	-0.89***	0.41	-	-
	Asian/PI	-0.46	0.64	-0.34	0.99	-1.02**	0.36	-	-

	0.61**	1.84	0.26	1.30	0.79**	0.45	-	-
Other	0.61**	1.84	0.26	1.30	0.79**	0.45	-	-
SES	-0.10	0.91	-0.38***	0.68	0.26*	1.30	-	-

Note. OR = Odds Ratio. AA = African American. PI = Pacific Islander. *p* < .05; **p* < .01; ***p < .001

Table 9

Final Nonparametric MLCA Model with Covariates (Level 2 Results)

		Reference Class			
		Mostly Permissive Schools		Mostly Authoritarian Schools	
	Effect	Logit	*p*-value	Logit	*p*-value
Mostly Authoritative	% FRPL	0.01	0.55	-0.01	0.41
	% Minority	<.01	0.90	-0.01	0.27
Mostly Permissive	% FRPL	-	-	-0.02	0.35
	% Minority	-	-	-0.02	0.58
Mostly Authoritarian	% FRPL	0.02	0.36	-	-
	% Minority	0.01	0.66	-	-

Discussion

The current study explored the construct of school discipline climate using MLCA. Specifically, with a nationally representative sample of tenth-grade public school students, I identified underlying latent classes of student perceptions of teacher support and school disciplinary structure, modeled patterns of student response types at the school level, and examined how important student and school demographic variables affect these experiences. Results suggest that student perceptions of school discipline climate fall into four classes: authoritative, permissive, authoritarian, and uninvolved, and that schools tend to have one school discipline climate type that is experienced by more students than the others (a predominant school discipline experience), although considerable variability in individual student experiences exists. Student gender, ethnicity/race, and SES all impact a student's likelihood of membership in these classes. Current findings address gaps in the previous literature on school discipline climate and have important implications for future research and school policy decisions.

Student-Level School Discipline Climate Typologies

To answer the first research question, student-level LCA was used to understand how students perceive teacher support of students and school disciplinary structure at their schools. This analysis identified underlying heterogeneity in item responses, allowing for the creation of school discipline climate typologies. Results were largely consistent with my original hypothesis, pointing to the existence of four latent classes similar to those discussed in the literature on parenting and school discipline climate: (1) an authoritative class (34% of sample) perceiving high teacher support, high rule fairness, and high school disciplinary structure; (2) a permissive class (27%) perceiving high teacher support and moderate-low

disciplinary structure; (3) an authoritarian class (23%) perceiving moderate-low teacher support and rule fairness and high school disciplinary structure; and (4) an uninvolved class (15%) perceiving low teacher support and low school disciplinary structure (percentages reflect individual-level LCA before accounting for clustering and covariates).

The student-level LCA results help provide further validity for the four theorized discipline climate types. Generally, results support previous research and theoretical arguments about the nature of the relation between teacher support and school disciplinary structure. Specifically, like Gregory and Cornell (2009) and Pellerin (2005) discuss, students do seem to experience teacher support and school disciplinary structure in typologies consistent with the authoritative, authoritarian, permissive, and uninvolved styles first discussed in Baumrind's (1968) work on parenting. That is, there are students who experience high levels of teacher support and disciplinary structure, there are those who do not experience either, and students who tend to experience one dimension but not (or less consistently) the other dimension. The current study was able to provide further evidence for the existence of these school discipline climate typologies, while addressing some of the disadvantages of the more commonly used mean or median-split classification system; most notably, avoiding the use of an arbitrary cut-point for classification (differences between someone one point above or below the mean may not be meaningful) and not relying on sample-dependent means that can potentially lead to classification errors (Nylund, Bellmore et al., 2007).

The use of LCA in the current study also allowed for better understanding of the nuances of these typologies. For example, item probability plots show that even though the authoritarian school discipline climate type is characterized as being strict and having high

disciplinary structure and lower levels of support, it is actually lower in perceived disciplinary structure and strictness than the authoritative class. This finding is consistent with previous work by Pellerin (2005), who found that even though both the authoritarian and authoritative groups were created because they were above the mean on her disciplinary structure variable, authoritative schools had a higher mean score for this construct than authoritarian schools. Although unlike the current study, Pellerin found that authoritarian schools had a higher mean score on the item "school rules are strict" than authoritative schools. Present findings suggest that the authoritative approach is not any less structured or demanding than the authoritarian approach, and in fact may be more so, but is also perceived as having fairer rules and being more supportive. This runs contrary to some arguments stating that care, fairness and support are in opposition to or incompatible with structure, demandingness, and high expectations (Nickerson & Martens, 2008). In fact, Gregory et al. (2010) found that disciplinary structure had a strong, positive correlation with support, suggesting that schools high in structure are also more likely to be high in support. Another study found that when teachers had clear and consistent rules, their students had more positive perceptions of them as teachers (Trickett & Moos, 1974). Thus, these constructs are not mutually exclusive, and discussions surrounding school discipline policy that focus on the dichotomy between "strict versus therapeutic" approaches may be inappropriate. Instead, efforts to understand how both disciplinary structure and supportiveness can be created consistently across a school climate are warranted.

Additionally, the current study revealed interesting differences in the probability of students endorsing the item "school rules are fair." As would be expected, the two classes that are lower in teacher support of students (uninvolved and authoritarian) had the lowest

probability of endorsing the "school rules are fair" item. However, it was unexpected to find that the permissive class was not much more likely to endorse rule fairness than the authoritarian class. The only class with a high likelihood of perceiving school rules as fair was the authoritative class. Findings suggest that students who experience their teachers as supportive may not necessarily experience school rules and fair, and that students who experience their school discipline as structured also may not experience rules as fair; neither the endorsement of teacher support nor school disciplinary structure is equivalent to feeling that rules are fair. This is important to note, as previous studies have included the item "school rules are fair" as a factor or composite with items measuring either teacher support or disciplinary structure (e.g., Gregory et al., 2010). The current study suggests that fairness seems to be its own, unique dimension of the school discipline climate construct, not to be subsumed under the teacher support or the school disciplinary structure constructs. Furthermore, the item "school rules are fair" may distinguish between coercive control (a tenet of an authoritarian approach) and confrontive control (a tenet of an authoritative approach; Baumrind, 2013). Although the current study did not include items that specifically measured student perceptions of coercive versus confrontive control, it is possible that school rules that are perceived as "fair" have other qualities consistent with a confrontive style (proportionate, purpose of rules is articulated; Baumrind, 2013). In the current study, we do see that the authoritative approach has the highest endorsement of rules being fair, and the authoritarian approach the second to lowest (uninvolved is lower). If this item had been included in a composite with other items about school discipline structure this distinction may have been lost. Taken together, findings suggest that understanding the fairness of school rules is important in distinguishing between school discipline climate types

and that researchers should use methodological approaches that allow for these distinctions, such as LCA.

Contrary to my hypothesis, it was interesting to find that the authoritarian class was only moderate in its endorsement of teacher support and the permissive class was moderate to moderately-low in its endorsement of disciplinary structure. I had expected to find more extreme differences between these classes on these indicators, with students in the authoritarian class very rarely endorsing teacher support and students in the permissive class very rarely endorsing disciplinary structure. Instead, results suggest that students in these classes are inconsistently experiencing these dimensions of the school discipline climate. Perhaps students in the permissive class find that teachers, staff, and context impact their experience of structure and those in the authoritarian class find that teachers, staff, and context impact their experience of support. It is plausible that students in the authoritative and uninvolved classes experience more consistency in teacher support and disciplinary structure throughout their school days and months, whereas students in the authoritarian and permissive classes experience that consistency in regards to one dimension but not the other. Additionally, these classes of school discipline climate may be more consistent with the democratic (moderate demandingness and high support) and directive (high demandingness and moderate support) parenting typologies that Baumrind found in her later work with adolescents and their parents (Baumrind, 1991a, 1991b). Because this is the first known study to use latent class analysis to explore school discipline climate, additional studies are needed to determine whether this pattern in responding is replicated and what its implications are for student and school outcomes.

Student Perceptions of School Discipline Climate at the School Level

To address my second and third research questions, parametric and non-parametric MLCAs were run to account for the clustering of students within schools. Results show little change in latent class size or substantive interpretation after accounting for clustering. Additionally, the multilevel models were generally better fitting than the individual-level model. Findings indicate that the school a student attends impacts that student's perception of school discipline climate and thus a multilevel analytical approach is necessary. The non-parametric approach also allowed for the modeling of patterns in the distribution of student perceptions of school discipline climate (Level 1 latent classes) within schools (Level 2 latent classes). In other words, schools were grouped based on their profiles of student perceptions of school discipline climate. Results support a 3-class solution at the school level: (a) a "mostly authoritative schools" class (34% of schools), with 46% of students in the authoritative class, 24% in the permissive, 19% in the authoritarian, and 11% in the uninvolved; (b) a "mostly permissive schools" class (31%), with 44% of students in the permissive class, 25% in the authoritative, 8% in the authoritarian, and 23% in the uninvolved; and (c) a "mostly authoritarian schools" class (35%), with 41% of students in the authoritarian class, 16% in the authoritative, 17% in the permissive, and 25% in the uninvolved.

Theory guiding school discipline climate is predicated on the idea that multiple people and factors within a school, including teachers, staff, and administrators, affect the socialization of students (Gregory et al., 2010). When a school has a predominant culture or climate, it indicates that these different socializing systems are mutually reinforcing one another to create a general perception of the discipline climate (Gregory et al., 2010). The current study expanded upon previous research on this topic by exploring the validity of this

concept. Whereas previous studies have categorized schools into typologies based on the aggregate of student (administrator, teacher, or a combination of these) perceptions within the school (e.g., Gregory et al., 2010; Gregory et al., 2011; Pellerin, 2005), the current study examined naturally occurring patterns in student experiences at the school level. Results suggest that, as hypothesized, schools tend to have a predominant school discipline climate typology that is experienced by students within their school (i.e., mostly authoritative, mostly authoritarian, mostly permissive). Thus, school discipline climate is not a completely individualized experience and school effects are impacting student perceptions. However, contrary to my hypothesis, these predominate climate types were not experienced by a majority (50% or more) of the students. Hence, schools tend to have one type of discipline climate that is more commonly experienced by students, but there still exists a great deal of individual-level variability in these perceptions within a school. These results held after controlling for student gender, race/ethnicity, and SES, and school racial composition and poverty. Results suggest that understanding school discipline climate perceptions at both the individual student and school levels is important. For example, perhaps individual student perceptions of the school discipline climate are more predictive of outcomes than school-level climate. Additionally, it is possible that students who do not experience their school climate similarly to a majority of their peers (the predominate school type) have different outcomes than those who do. These types of questions can be answered in future studies by using MLCA to model these classes and examine differences in outcomes at both levels.

Furthermore, contrary to my hypothesis, modeling results did not point to a 4-class school-level solution. Mostly authoritative, mostly authoritarian, and mostly permissive school-level classes emerged, but a mostly uninvolved class did not. This indicates that it is

rare for a large proportion of students within a school to perceive their school as low in both support and disciplinary structure. However, approximately one-quarter of students in any school do perceive their school as uninvolved at the individual level. Taken together, results suggest that although many students perceive their school as uninvolved, these students are dispersed among schools that have one of the other predominate discipline climate types. Schools characterized as mostly authoritarian have the highest proportion of students in the uninvolved school discipline climate class. In these mostly authoritarian schools, most students do not (or inconsistently) experience teacher support, with disciplinary structure experiences varying for different students. These findings have important implications, as most previous studies have found significant differences in outcomes between schools they have categorized as uninvolved and those they have categorized as authoritative (e.g., the racial suspension gap and student victimization; Gregory et al., 2011). These uninvolved schools may actually be quite rare; it is possible that the classification systems used in previous studies over-estimated the number of schools that are uninvolved and may be obscuring real differences between authoritarian, permissive, and authoritative schools. Future studies can address these hypotheses by using MLCA to examine the association between school-level classes and these outcomes, as well as compare these results to the results that would have been obtained if a mean-split classification approach were used.

Student and School Covariates

To answer my fourth and final research question, I examined the association between class membership at both the student and school level and important demographic variables. At the student level, I examined the impact of gender, race/ethnicity, and SES on latent class

membership at Level 1, and at the school-level school racial composition and school poverty were included as covariates.

In terms of gender, being male versus female only impacted one's likelihood of being in the uninvolved school discipline class. Female students were significantly more likely than males to be in the uninvolved class than the authoritative, authoritarian, or permissive classes. Because previous studies have looked at school discipline climate at the school level, the impact of gender on individual students' perceptions of the school discipline climate has not been previously examined. Nonetheless, findings are surprising considering related research that shows male students are more likely to report experiencing unfairness, hostility, and victimization at school (Ripski & Gregory, 2009) and experience exclusionary discipline (APA Zero Tolerance Task Force, 2008), and less likely to seek help from teachers (Eliot et al., 2010). Based on the relation between gender and these related outcomes, I hypothesized that males would report experiencing the authoritarian and uninvolved discipline climate types more frequently than female students. However, other studies have found that girls receive less support and attention from their teachers than boys (Sadker & Sadker, 1995), but are also more aware of teachers' interpersonal cues (DeBold, Brown, Wessen, & Brookins, 1999). It is possible that girls actually receive less support and structure than boys; girls are more likely to demonstrate internalizing problems and inhibitory control (Else-Quest, Hyde, Goldsmith, & VanHulle, 2006) and are less likely to engage in disruptive behavior (Skiba, Michael, Nardo & Peterson, 2002), because of this they may be less "visible" within the school and more likely to feel ignored or overlooked. Alternatively, because girls have been found to be more socially oriented (Nolen-Hoeksema & Girgus, 1994), they may actually need greater levels of support and structure in order to perceive these as sufficiently present.

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That is, girls and boys may receive the same levels of support and structure, but differ in their perception of the adequacy of these experiences. Because this is the first study to examine the impact of gender on perception of school discipline climate, further research is needed to empirically test these hypotheses.

Student race/ethnicity is also related to perception of the school discipline climate. After controlling for gender and SES, results show that, as compared to the majority White students, Black/African American students are less likely to be in the permissive class and more likely to be in the authoritarian and uninvolved classes. Notably, Black students are 9.3 times more likely to be in the authoritarian class than the permissive class. Similar findings exist for the other ethnic/racial minority groups: in comparison to White students, Hispanic and multiracial/American Indian ("Other") youth are more likely to be in the authoritarian class than any other class; multiracial/American Indian youth are more likely to be in the uninvolved class than the authoritative class; and Asian/Asian American youth are more likely to be in the authoritarian class than the uninvolved class. Thus, all groups of minority students are more likely to perceive their schools as authoritarian than are White students. As Wong and Rowley (2011) suggest, and consistent with my hypothesis, students from different racial/ethnic groups perceive school discipline climate differently. Specifically, there seems to be an association between racial minority status and perceptions of school as having low or inconsistent teacher supportiveness.

Previous studies on school discipline climate have not examined how different ethnic/minority groups experience their school discipline climate (Gregory et al., 2011), but current findings are consistent with a study that found non-White students rate their school climates as more hostile than White students (Ripski & Gregory, 2009). There are several

theories that may explain these racial/ethnic differences. First, the cultural mismatch

hypothesis (e.g., Irvine, 2002) states that within the U.S., schools and teachers (83.5% of

whom were White in 2007-2008; U.S. Department of Education, 2007-2008) often have

cultural values that clash with those of minority students. Ethnic minority students may find

it harder to feel supported by teachers because of differences in interactional and

communication styles, expectations, and values. Alternatively, explicit or implicit bias by

teachers or other school staff towards minority youth may also impact student perceptions of

the school discipline climate. Researchers have found that despite weak evidence of actual

differences in misbehavior between minority and non-minority students, minority youth are

more likely to be suspended or expelled, especially for more subjective offenses (APA Zero

Tolerance Task Force, 2008). Dee (2005) found that a mismatch in race/ethnicity between

student and teacher led to significant increases in the odds of the teacher perceiving the

student as disruptive and inattentive. Ferguson (2000) suggested that teachers often rely on

stereotypes (whether explicitly or implicitly) about minority youth, which impact their

interactions and expectations of these students, and may lead to student conflicts with

authority (Weinstein, Gregory, & Strambler, 2004), all of which can impact student

perceptions of both teacher support and school disciplinary structure. However, the current

study only examined differences in the likelihood of class membership based on

race/ethnicity, and current findings do not provide insight into whether or not students of

different races/ethnicities benefit differently from these approaches, or why these differences

exist. Perhaps an authoritarian approach is appropriate or helpful for some youth, but not for

others; for example, Dever & Karabenick (2011) found that the association between teaching

style (authoritative, authoritarian, permissive) and student achievement differed by student

ethnicity. Future research should examine how student race/ethnicity interacts with these school discipline climate classes and outcomes of interest.

The final student-level covariate, student SES, is also related to school discipline climate perceptions. Results show that as student SES increases the likelihood of being in the authoritative class rather than the authoritarian class increases, as does ones likelihood of being in the permissive class as opposed to any of the other classes. Higher SES is also related to being in the uninvolved rather than authoritarian class. Thus, youth of higher SES are more likely to be in the authoritative, permissive, or uninvolved class, and less likely to be in the authoritarian class, even after controlling for student race/ethnicity and gender. Students lower in SES are less likely to be in classes where teacher supportiveness is high, which is similar to findings in the previous section on ethnic/racial minority youth. Past studies have found that low-income youths are more likely to attend schools low in academic press (Lee & Smith, 1999) and to describe their schools as more hostile (Ripski & Gregory, 2009). Additionally, there is evidence that schools in low-SES communities, the types of schools that low-SES youth may be attending, have less qualified teachers (Ingersoll, 1999). It is possible that students from lower SES backgrounds have teachers who are less likely to be supportive (e.g., overburdened, poor working conditions; Pierce & Molloy, 1990), may feel a cultural mismatch with their teachers and school staff that leads to a sense of alienation and lack of connection at school (Irvine, 2002), or may be more likely to be academically disengaged or display problem behaviors (Blondal & Adalbjarnardottir, 2012), which may impact their perception of their teachers and school. Again, these hypotheses deserve further empirical investigation, as results of this study do not inform why youth from different

socioeconomic backgrounds perceive their school climates differently or if school discipline climate types impact them differently.

Surprisingly, and inconsistent with my hypothesis, none of the school-level covariates (school size, percentage of minority students, percentage of students eligible for FRPL) had an effect on school-level latent class membership. School size was not included as a covariate in the final model because the model had poor fit (was unidentified) when it was included; furthermore, analysis of its effect on class membership, without any other covariates included, revealed non-significant results. The two school-level covariates that were included in the final model, the percentage of minority students and the percent of students receiving FRPL, did not significantly predict school-level latent class membership. Because all covariates were included in the model simultaneously, it is possible that once the student-level factors (gender, race/ethnicity, SES) were controlled for at Level 1, any effects of covariates at the school level were "washed out." Nonetheless, these results are inconsistent with research showing that school-level demographic factors have significant effects on constructs related to school discipline climate (e.g., responses to misbehavior, school climate, perception of school hostility, experience of victimization; Leithwood & Jantzi, 2009; Ripski & Gregory, 2009; Welch & Payne, 2010). In an effort to understand if the current study findings are replicated in other samples, future research should continue to examine the unique impact of school demographic factors on student- and school-level perceptions of school discipline climate.

Limitations

The current study has several strengths, including its use of a large, nationally representative sample; inclusion of weights and multilevel modeling to address the study's

sampling design; and application of an advanced, exploratory method of analysis that enhances current understanding of the school discipline climate construct. Nonetheless, there are several important study limitations to discuss.

First, data for the current study are from a sample of students in the tenth grade in 2002, reflecting student attitudes and perceptions from approximately 13 years ago. Student experiences surrounding school discipline climate may have changed since data were collected. Nonetheless, the current findings build-upon, and generally corroborate, the work of Pellerin (2005), which used data from a national dataset from 1992-93. This points to some consistency in the school discipline climate construct across two decades. Additionally, this sample only includes students in tenth grade. It is possible that the school discipline climate experience of tenth graders is different than that of students in other grades. However, there is reason to believe tenth graders may be an ideal population of high school students to study, if only one grade is selected, as they are in the middle of their high school tenure and may be most representative of the overall high school experience. Future research should examine school discipline climate perceptions in different grades, and examine how these perceptions change as students progress through school.

Some of the more significant drawbacks of the current study are related to the limitations of using secondary data. Specifically, the ELS:2002 dataset did not have all of the indicators of school discipline climate that I would have liked to include in my models. Although the items used in the current study are very similar to those used in previous studies on the topic (e.g., Gregory et al., 2010; Pellerin, 2005), measurement of the construct of school discipline climate would have been more aligned with theory if it had included: (a) items examining the construct of autonomy-support, such as "When students are accused of

doing something wrong, they get a chance to explain it" from the Authoritative School Climate Survey (ASCS; Cornell, 2013); (b) an item that emphasized not just strictness, but overly strict environments, such as the item "the adults at this school are too strict" from the ASCS; and (c) items measuring support that are not focused solely on teacher supportiveness, but measure the supportiveness of all adults in the school, such as items in the ASCS that begin with "most teachers and other adults in this school…". Overall, items from the ASCS (which has demonstrated validity and reliability as a measure of school climate from the perspective of authoritative discipline theory; Konold, et al., 2014) may be more appropriate for future analyses. An additional limitation related to the measurement of the school discipline climate construct is the inclusion of only student self-report items. This could increase social desirability response bias and does not include the perspectives of multiple informants, such as teachers or administrators. However, the current study was focused on understanding student perceptions and their variability within schools; as Gregory et al. (2010) explain, efforts to create a particular school climate cannot be viewed as successful if the students do not perceive the climate as intended, thus student perceptions are critical in school climate research. Future research can build-upon the current study findings by using a multi-informant approach in which teacher, administrator, and student perceptions are modeled and compared. This will allow for better understanding of how perceptions of school discipline climate vary among key members of the school community and how that variation is related to important outcomes.

There are also several limitations related to the analytic approach used in the current study. Although MLCA has many benefits over less sophisticated analytical methods, the newness of the approach can also be limiting. For example, more research is needed on best

practices and procedures for selecting the best fitting models in MLCA. Currently, there are only two fit indices for multilevel models and limited knowledge regarding their performance in the multilevel context (Henry & Muthén, 2010). Additionally, because the MLCA approach is understudied, tools that are available in traditional LCA, such as the 3-step method (which allows for the prediction of covariates or distal outcomes without re-estimating the latent class model decided upon in the first step; Lanza, Tan, & Bray, 2013; Vermunt, 2010), are unavailable. In the current study, all models had low classification entropy, which prevented me from assigning students or schools to their most likely latent class and then predicting this class membership based on covariates and distal outcomes. Thus, low entropy and the lack of a 3-step method prevented me from including distal outcomes (e.g., experience of exclusionary discipline, school violence and safety) in the study, which could have provided further validity for the identified latent classes and answered additional interesting research questions. Lastly, as with all studies using latent class approaches, the selection of the best fitting model is based on fit statistics and substantive interpretation; this information is used to select the most appropriate model, but it is impossible to prove the solution is "correct."

Future Research

Results of the current study provide foundational support for the use of an MLCA approach to measuring school discipline climate. However, the current study did not examine the association between student- and school-level school discipline climate classes and student outcomes, so present findings cannot tell us which climate type is "best" or directly inform school policy decisions. Thus, future work should attempt to replicate findings in other samples and then, if possible, use latent classes at both the student and school levels to

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predict outcomes. Outcomes of particular interest include those that: (a) provide further validity for the latent classes (e.g., experience of exclusionary discipline, autonomy-support) and (b) test the relation between class membership and discipline-related outcomes (e.g., student behavior, involvement in the juvenile justice system). The interactions between these outcomes and different demographic factors (e.g., race/ethnicity, special education status) should also continue to be analyzed. Furthermore, it will be important for future studies to examine how these school-level constructs relate to student outcomes associated with Baumrind's parenting theories; for example, if students in authoritative schools demonstrate greater communality and agency, as the parenting literature suggests (Baumrind, 2013). If so, it will be important to test causal pathways between school discipline climate and these outcomes, including the potential mediating role of authoritative socialization (Baumrind, 2013).

Researchers currently have a limited understanding of the way specific policies and approaches to discipline impact the school discipline climate and if changes in specific, concrete practices can change a school's climate. By studying school discipline climate at the school level over time, it would be possible to examine how the implementation of a new discipline approach (e.g., Positive Behavioral Interventions and Supports [Bradshaw, Mitchell & Leaf, 2010], use of in- school suspensions) alters student perceptions of their school discipline climate. This is an important direction for future research, as it would expand understanding of the way school climate is related to specific, alterable practices, which can directly guide policy change.

Future research that examines how latent classes of school discipline climate are related to student outcomes, especially in regards to school engagement, prosocial behavior,

and involvement with the juvenile justice system, will help increase knowledge of "what works" in school discipline. This work will have implications for the types of school discipline climates that are advocated for, the development of training programs for teachers and administrators, and the implementation of discipline-related programs that align with school discipline climate theory and research. This work is particularly timely, as the U.S. Department of Education and Justice (2001) has called for an increase in rigorous research on school discipline that will guide reform efforts.

Implications for School Policy

This study focused on addressing limitations in the classification methods used in previous studies on school discipline climate and more comprehensively understanding student perceptions of support and structure at school. The current findings lay the groundwork for further research on school discipline climate using a latent variable approach. Results of the current study indicate that only one-quarter of tenth-grade students perceive their school as having supportive teachers, fair rules, and high disciplinary structure and that only about one-third of public schools have a school discipline climate that is predominately authoritative. Furthermore, students that are racial minorities and from lower SES backgrounds are more likely to perceive their school discipline climate as low in teacher supportiveness. These findings are worrisome in light of previous research that has found a correlation between authoritative school discipline climate and better student outcomes (e.g., less bullying and victimization [Gregory et al., 2010; 2012], greater engagement and less dropout [Pellerin, 2005], and a smaller racial discipline gap [Gregory et al., 2011]). These results highlight the large number of students that may be impacted by the lack of perceived

structure and support in their schools and should further propel rigorous research on the important topic of school discipline climate.

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