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### Validity of Three School Climate Scales to Assess Bullying, Aggressive Attitudes, and Help Seeking

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*Abstract.* The School Climate Bullying Survey (Cornell & Sheras, 2003) is a self-report survey used to measure attitudes and behaviors associated with school bullying. Two studies were conducted to examine the valid use of its three school climate scales: (a) Prevalence of Teasing and Bullying, (b) Aggressive Attitudes, and (c) Willingness to Seek Help. In Study 1, exploratory and confirmatory factor analyses were performed with a sample of 2,111 students from four middle schools and established reasonable fit for 20 items with their hypothesized scales. Multigroup confirmatory factor analyses revealed good overall model fit. In Study 2, regression analyses using school-level measures aggregated from 7,318 ninth-grade students attending 291 Virginia public high schools indicated that the three scales were related to meaningful criteria for school disorder.

Bullying prevention programs attempt to modify school climate by changing student attitudes that promote bullying and fostering behaviors that prevent it (Bonds & Stoker, 2000; Olweus & Limber, 2000). More specifically, these programs aim to reduce aggressive attitudes among students and encourage them to be more accepting of classmates from diverse backgrounds. Furthermore, they encourage students and teachers to recognize

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bullying as a serious problem and attempt to increase student willingness to seek help for victims. The School Climate Bullying Survey (SCBS) was developed to assess these important features of school climate with three scales: Prevalence of Teasing and Bullying, Aggressive Attitudes, and Willingness to Seek Help (Cornell & Sheras, 2003). The purpose of this study was to investigate the construct validity of these scales through exploratory and confirmatory factor analyses and to support their criterion-related validity through correlations with independently measured school characteristics.

School climate can be defined as the quality and frequency of interactions among adults and students (Emmons, 1993) and encompasses multiple aspects of the school's social environment, such as student perceptions of the fairness and strictness of school rules or qualities of student-teacher relations (Kuperminc, Leadbeater, Emmons, & Blatt, 1997). The quality of school climate has important implications for student adjustment and learning (Brand, Felner, Shim, Seitsinger, & Dumas, 2003). In a longitudinal study of 188 middle schools, Brand and colleagues (2003) found better socioemotional adjustment among students reporting a more positive school climate, as indicated by higher peer commitment to academic achievement and prosocial behavior, greater teacher support, greater safety, and higher levels of structure and clarity in rules.

School climate has particular relevance for the prevention of bullying and teasing. Victims of bullying struggle with student absenteeism, poor academic achievement, social isolation, and internalizing problems that persist into high school (Nansel et al., 2001; Rigby, 2003). Unnever and Cornell (2003) described a "culture of bullying" in middle schools where there is a widespread perception that bullying can take place without intervention or interruption. This type of school climate empowers bullies to act aggressively without fear of sanction, encourages passivity in bystanders (Unnever and Cornell, 2003), and creates an environment in which victims

of bullying see no reason to report their victimization or expect assistance (Olweus & Limber, 2000). From this perspective, a comprehensive approach to bullying prevention would entail both an assessment of the extent of bullying and associated school climate conditions, so that school psychologists and other staff members could identify aspects of the school environment in need of attention.

The Olweus Bully/Victim Questionnaire is the best-known measure of bullying and has 40 questions concerned primarily with the frequency and type of bullying that students have experienced and how they responded to it, but relatively few questions concerned with school climate (Solberg & Olweus, 2003). Bradshaw, Sawyer, and O'Brennan (2007) developed a bullying questionnaire based in part on the Olweus Bully/Victim Questionnaire, but also only asked a few questions related to school climate. Notably, these questions included asking about the prevalence of bullying, aggressive attitudes (e.g., whether bullies are popular or disliked at school and whether it is OK to hit someone who hits you first), and help seeking (e.g., whether the adults at school are doing enough to prevent bullying).

In contrast, there are measures of school climate that do not directly assess bullying. Most notably, the 50-item Inventory of School Climate—Student (Brand et al., 2003) assesses 10 dimensions of school climate, ranging from student perceptions of disciplinary harshness and student commitment to achievement to general reports of the extent of positive and negative peer interactions. Studies using the Inventory of School Climate have demonstrated the viability of using the reports of middle school students to measure school climate and document the correspondence between student and teacher perceptions (Brand, Felner, Seitsinger, Burns, & Bolton, 2008). However, it is often not practical to administer both a bullying questionnaire and a school climate survey in the limited time available during the school day. Moreover, it is desirable to measure aspects of school climate that are closely related to the goals of bullying prevention.

### **School Climate Bullying Survey**

The SCBS was designed to assess the nature and prevalence of bullying at school and to measure specific aspects of school climate that could guide bullying prevention efforts (Cornell & Sheras, 2003). The SCBS was not intended to provide a comprehensive assessment of school climate, but to offer a focused assessment of bullying. It represents a hybrid of a bullying questionnaire and a school climate survey with the virtues of brevity and narrow focus (see Method section for details).

The SCBS has been used in studies to evaluate the effect of bullying prevention programs (Brockenbrough, 2001) and to examine behavioral and attitudinal characteristics of students identified as bullies (Cornell, Sheras, & Cole 2006; Thunfors & Cornell, 2008). Several studies have demonstrated the correspondence between the section of the instrument that elicits self-reports of bullying (as victim or aggressor) and measures from other sources, including peer and teacher reports (Branson & Cornell, 2009; Cornell & Brockenbrough, 2004).

The present study is concerned solely with the three school climate scales that address the prevalence of bullying, the extent to which students hold aggressive attitudes central to the propagation of bullying, and the countervailing presence of help-seeking attitudes that are important to the prevention of bullying. Although the school climate scales investigated in this study have been used in previous studies, the items that make up these scales were theoretically, rather than empirically, derived. The current study is the first investigation of the validity of the internal structure of the three school climate scales and of the criterion-related validity of the scales across a large sample of schools.

### **Prevalence of Teasing and Bullying**

Bullying research suggests that bullying not only affects the bullied victims, but also damages an entire school's atmosphere by creating a climate of fear and intimidation (Olweus & Limber, 2000). In addition, teasing

and bullying have a detrimental effect on student learning and contribute to school refusal, truancy, and dropout (Forero, McLellan, Rissel, & Bauman, 1999). The Prevalence of Teasing and Bullying scale of the SCBS asks students whether bullying is a problem at their school and how much teasing occurs about clothing and physical appearance, sexual topics, and race.

### **Aggressive Attitudes**

Students who regard aggressive behavior as an acceptable, even socially desirable and effective way to deal with others, are more likely to bully others or encourage bullying by their peers (McConville & Cornell, 2003). Aggressive attitudes have been linked to disciplinary referrals (McConville & Cornell), engagement in high-risk behaviors such as weapon carrying, drug and alcohol use, gang involvement, physical violence, and low academic achievement (Brockenbrough et al., 2002). The Aggressive Attitudes scale of the SCBS is comprised of 7 items assessing aggressive attitudes toward bullying, such as whether some students deserve to be bullied or teased.

### **Willingness to Seek Help**

Bullying thrives in schools because teachers and school officials are often unaware that it is taking place and only learn about it when students report it (Bradshaw et al., 2007; Olweus & Limber, 2000; Unnever & Cornell, 2003). One of the goals of school-wide bullying prevention efforts is to increase student willingness to seek help when they directly experience or witness serious circumstances of bullying or threatening behavior. Research on severe acts of school violence has supported efforts to encourage student help seeking and reporting of threatening behavior and weapon carrying at school (Cornell & Williams, 2006). The Willingness to Seek Help scale of the SCBS was developed to measure student willingness to report and seek help for bullying and other dangerous behaviors. Williams and Cornell (2006) found that help seeking de-

clined from grades 6–8 and was lower among male than female students.

### **Influence of Gender and Race/Ethnicity on Bullying Behaviors**

One important indication of construct validity is whether the items on the school climate scales of the SCBS function equivalently across different populations. The limited research on student perceptions of school climate suggests that male students perceive the school environment less favorably than female students (Kuperminc et al., 1997). Koth, Bradshaw, and Leaf (2008) found that male students reported less order, discipline, and achievement motivation than female students and were more likely to display disruptive behavior at school. In addition, bullying research suggests that boys are more likely than girls to engage in bullying, with the possible exception of social bullying (Spriggs, Iannotti, Nansel, & Haynie, 2007).

Koth and colleagues (2008) also found that minority students perceived the school environment as less safe and reported lower levels of achievement motivation than did their Caucasian counterparts. In particular, female minority students may have less favorable perceptions than Caucasian females (Kuperminc et al., 1997). Research on ethnic differences in bullying is limited and less consistent (Nansel et al., 2001; Juvonen, Graham, & Schuster, 2003). In a national study of American 6th- to 10th-graders, Hispanic students were more likely to report both being bullied and bullying others than were African American students, but there were no significant differences between Caucasian and Hispanic or African American students (Nansel et al., 2001). Similarly, a study examining the effectiveness of the Olweus Bullying Prevention program found a lower prevalence of bullying victimization reported by African American adolescents than Caucasian and Hispanic adolescents (Spriggs, Iannotti, Nansel, & Haynie, 2007). In contrast, Juvonen and colleagues (2003) found that African American adolescents were more likely than their Hispanic peers to be bullies, victims of bullying,

and bully-victims in a Los Angeles middle school.

### **School Climate and School Disorder**

Schools with more positive school climates have lower levels of crime (Bryk & Driscoll, 1988), less fear among students (Lee & Croninger, 1996), and fewer behavioral problems (Kuperminc et al., 1997). For example, Bryk and Driscoll (1988) demonstrated that a sense of community in which caring adults interact regularly with students and share norms and expectations about their students is related to lower levels of problem behavior. Several studies identify the role of school climate in promoting or inhibiting bullying (Leff, Power, Costigan, & Manz, 2003; Nansel et al., 2001).

Gottfredson, Gottfredson, Payne, and Gottfredson (2005) defined school disorder as “acts of incivility either perpetrated by students while in school or experienced by students or teachers while at school” (p. 419). The present study hypothesized that schools with a more hostile peer climate that is characterized by bullying and teasing should have more disorder. Similarly, schools in which students maintain more aggressive attitudes should have more disorder. In contrast, schools with greater student willingness to seek help should have a more positive school climate with less disorder.

The number of student suspensions and expulsions from school is one of the most common indicators used to assess the level of school disorder in a school (Morrison, Redding, & Fisher, 2006). Suspensions and expulsions are an indication of serious discipline violations, and may include aggressive behavior, weapon carrying, drug possession, and other behavioral indications of school disorder (Virginia Department of Education, 2006). Other forms of school disorder may not rise to the level of suspensions and expulsions, but are still disruptive to the learning environment. For example, the prevalence of bullying and teasing at school can have a pervasive effect on the learning environment and can contribute to a number of school-related prob-

lems, including a dislike of school, truancy, and school dropout (Forero et al., 1999). In addition, research has shown that gangs and gang-related violence are a serious problem in many schools (Griffin & Meacham, 2002) and that gang-related problems are related to higher school crime and student dropout rates, as well as lower academic achievement (Regulus, 1994).

Two studies were conducted to examine the validity of the school climate portion of the SCBS and relations between school climate and external measures of school disorder. Study 1 employed factor analyses to investigate the construct validity of three school climate scales in a sample of 2,111 middle school students divided into two subsamples. The hypothesized factor structure was first investigated through exploratory factor analysis in one subsample, and cross-validated through confirmatory factor analysis in the second subsample. The resulting solution was examined for invariance across gender and race groups through methods of multigroup confirmatory factor analysis. In Study 2, the resulting school climate factors were measured with confirmatory factor analysis on a new sample of 7,318 ninth-grade students attending 291 high schools. Finally, regression analyses examining the relationship between school climate and school disorder were conducted using schools rather than students as the unit of analysis. In these analyses, student responses on the school climate scales were aggregated into school-level means, and these mean scores were regressed onto independent, school-level measures of school disorder.

### Study 1

#### Method

**Participants.** The SCBS was administered to 2,111 students in four public middle schools in a suburban/rural school district in central Virginia in the fall of 2006. The sample included 1,128 (53%) boys and 983 (47%) girls, including 691 (33%) sixth-graders, 720 (34%) seventh-graders, and 700 (33%) eighth-graders. There were 1,482 (70%) students who identified themselves as Caucasian, 237 (11%)

as African American, 92 (4%) as Hispanic, 148 (7%) as Asian, and 152 (7%) as Other. Participants ranged from 11 to 15 years of age with a mean age of 12 years.

**Procedure.** The SCBS was administered in schools employing the Olweus Bullying Prevention Program (Olweus & Limber, 2000). The Olweus Bullying Prevention Program is an internationally recognized program designed to reduce bullying through coordinated interventions at the school-wide, classroom, and individual level. Each school adopts school-wide rules against bullying and develops appropriate consequences for bullying behaviors. At the classroom level, teachers reinforce school-wide rules against bullying and employ regular classroom efforts to increase student knowledge and empathy regarding bullying. At the individual level, counselors work with students identified as victims or perpetrators of bullying. The SCBS was used to anonymously measure program effectiveness in these schools.

The SCBS was administered anonymously to all students in attendance on the day of the survey administration. A total of 2,111 students (83% of total enrolled) completed surveys on the survey administration days at the participating middle schools. All surveys were completed in classrooms under teacher supervision following a standard set of instructions. Because the survey was administered on an anonymous basis as part of the school's bullying prevention program, the schools did not obtain signed parental consent for the survey. Data were provided to the researchers in archival form.

**Measures.** The SCBS (Cornell & Sheras, 2003) is a 45-item self-report instrument used to examine the extent and nature of bullying problems in school. The definition of bullying used in the SCBS is derived from Olweus and Limber's work (2000), but was shortened and reworded for American students: "Bullying is defined as the use of one's strength or status to injure, threaten, or humiliate another person. Bullying can be physical, verbal, or social. It is *not* bullying when two

students of about the same strength argue or fight.”

The focus of the present study was on the 24-item school climate portion of the SCBS, including an 8-item Prevalence of Teasing and Bullying scale (later reduced to 4 items), a 7-item Aggressive Attitudes scale, and a 9-item Willingness to Seek Help scale (Table 1). These items all had Likert-type answer choices ranging from *strongly disagree* to *strongly agree*. Coefficient alpha was calculated for the Prevalence of Teasing and Bullying scale ( $\alpha = .61$  for 8 items;  $\alpha = .65$  after removing 4 items from this scale), Aggressive Attitudes scale ( $\alpha = .80$ ), and Willingness to Seek Help scale ( $\alpha = .80$ ).

The SCBS also asks participants to provide demographic information and includes questions about bullying that are not considered in this study. The survey asks students if they have been victims or perpetrators of physical, verbal, or social bullying, as well as who, if anyone, students have told that they were bullied in the past month (Cornell & Sheras, 2003). Students are also asked to identify where bullying takes place in their school. Finally, the survey includes a peer nomination section that allows students to write the names of any classmates who are victims of bullying.

**Data analyses.** Study 1 consisted of three phases of data analysis on the school climate portion of the SCBS. In the first phase, the underlying factor structure was examined using a split-half approach in which 2,111 children were assigned to two subsamples using Statistical Package for Social Sciences, Version 15.0. Exploratory factor analyses (EFA) were conducted with the first subsample ( $N = 1,055$ ) of children to explore the underlying factors among the SCBS school climate items and evaluate their alignment with theoretical postulates of school climate. EFA is a useful technique for uncovering the relationships among a set of variables with the goal to better understand the underlying structure of those variables in terms of their unifying themes (Thompson, 2004). Principal axis factor extraction was performed in which both orthogonal (varimax) and oblique (direct ob-

limin) rotations were considered. The resulting factor solutions were evaluated against the following criteria: (a) unrotated factors were required to satisfy Kaiser's (1958) criterion of eigenvalues  $>1.00$ ; (b) accepted configurations had to account for an appreciable percentage of total score variance; (c) solutions should meet Cattell's (1966) minimum scree requirement; (d) each rotated factor should include at least two appreciable factor loadings (i.e.,  $\geq .35$ ); (e) no items should load on more than one factor; (g) resultant dimensions should demonstrate good internal consistency; (h) the final solution should be compatible with theoretical postulates; and (i) the resultant factor solution should be consistent with parallel analysis (Horn, 1965), often cited as the most accurate method for determining the number of factors to retain (Ledesma & Valero-Mora, 2007).

In the second phase, the factor structure identified in the EFA was replicated in the second subsample ( $N = 1,056$ ) through confirmatory factor analysis (CFA). Compared to EFA, CFA more closely evaluates the patterns of zero and nonzero loadings suggested by the exploratory procedures; the discrepancy between the covariance matrix that is reproduced from the model and the original, unrestricted, covariance matrix can be taken as an indication of how well the hypothesized model explains relationships among the observed variables. Numerous measures for evaluating the overall fit of the models may be computed that have somewhat different theoretical frameworks and that address different components of fit (e.g., Browne & Cudeck 1993; Hu & Bentler, 1995). For this reason, it is generally recommended that multiple measures be considered to highlight different aspects of fit (Tanaka, 1993). Although we report chi square ( $\chi^2$ ) as a stand-alone measure of fit, it is important to note that this statistic is well known to reject good-fitting models that are estimated on large samples (Cheung & Rensvold, 2002; Hu & Bentler, 1995; Kaplan, 1990). We calculated the comparative fit index (CFI) and Steiger's root mean square error of approximation (RMSEA). The CFI gauges model fit by comparing the hypothesized model to a null

**Table 1**  
**Study 1 Factor Loadings for School Climate Items of the SCBS and VHSSS**

Factor Item	SCBS								VHSSS				
	EFA <sup>a</sup>				CFA				CFA				
	F1	F2	F3	F1	F2	F3	Sk	Kurt	F1	F2	F3	Sk	Kurt
<b>F1 (Willingness to Seek Help)</b>													
1. If I tell a teacher that someone is bullying me, the teacher will do something to help.	.63	.07	-.05	.70			-.71	-.26	.61			-.74	-.04
2. Students tell teachers when other students are being bullied.	.62	.13	.04	.54			.10	-.67	.50			.37	-.75
3. Teachers here make it clear to students that bullying is not tolerated.	.59	.01	.05	.53			-.76	-.48	.57			-.42	-.65
4. There are adults at this school I could turn to if I had a personal problem.	.55	-.09	-.07	.61			-.68	-.49	.54			-.69	-.49
5. If another student was bullying me, I would tell one of the teachers or staff at school.	.54	-.07	-.12	.60			-.25	-.95	.62			-.13	-.93
6. Students here try to stop bullying when they see it happening.	.53	.11	.07	.45			.29	-.61	.46			.26	-.98
7. The teachers at this school are genuinely concerned about me.	.45	-.02	-.00	.44			-.14	-.97	*			*	*
8. If another student talked about killing someone, I would tell one of the teachers or staff at school.	.43	-.19	-.20	.61			-1.18	.21	.60			-.98	-.12
9. If another student brought a gun to school, I would tell one of the teachers or staff at school.	.34	-.25	-.29	.56			-1.78	1.94	.58			1.44	.95
<b>F2 (Prevalence of Teasing and Bullying)</b>													
1. Bullying is a problem at this school.	.02	.68	.06	.54			-.04	-.78	.69			.12	-.56
2. Students here often get teased about their clothing or physical appearance.	.03	.61	-.04	.67			.22	-.91	.73			-.40	-.33
3. There is a lot of teasing about sexual topics at this school.	.20	.48	-.08	.58			-.68	-.44	.57			-.05	-.77

(Table 1 continues)

Table 1 Continued

Factor Item	SCBS							VHSS					
	EFA <sup>a</sup>			CFA				CFA					
	F1	F2	F3	F1	F2	F3	Sk	Kurt	F1	F2	F3	Sk	Kurt
4. Students here often get put down because of their race or ethnicity.	-.10	.37	-.19		.54		-.14	-1.06		.58		.34	-.58
F3 (Aggressive Attitudes)													
1. If someone threatens you, it is okay to hit that person.	-.01	.02	-.64			.69	-.81	-.22			*	*	*
2. It feels good when I hit someone.	.03	-.06	-.64			.68	-.25	-.95			.73	.61	-.27
3. Bullying is sometimes fun to do.	.06	.03	-.60			.62	-1.84	2.44			.62	.79	-.22
4. Sometimes you only have two choices—get punched or punch the other person first.	-.03	.16	-.57			.58	-.29	-1.06			.65	-.02	-1.2
5. Students who are bullied or teased mostly deserve it.	.06	-.01	-.57			.59	-1.06	.40			.55	1.18	1.19
6. If you fight a lot, everyone will look up to you.	-.01	.00	-.56			.58	-1.31	.76			.74	.89	.42
7. If you are afraid to fight, you won't have many friends.	-.01	.05	-.50			.56	-1.12	.35			.62	.78	.07
Oblimin Factor Correlation Matrix ( $\Delta = 0$ )													
F1		-.02	-.44		.09	.51							
F2			-.16			.49							
Eigenvalues	4.14	1.57	1.09										
Percentage of variance	20.7	7.9	5.4										
Cumulative percentage of variance	20.7	28.5	34.0										

Note. Sk = skewness; Kurt = kurtosis; SCBS = School Climate Bullying Survey; VHSS = Virginia High School Safety Survey; EFA = exploratory factor analysis; F1 = Factor 1; F2 = Factor 2; F3 = Factor 3.  
<sup>a</sup>Pattern matrix loadings.  
 \*item not included in the VHSS.

model that assumes there are no relations among observed variables (Kranzler & Keith, 1999). CFI values generally range between 0 and 1. Traditionally, values of .90 or greater have been taken as evidence of good-fitting models (Bentler & Bonnet, 1980). However, more recent research suggests that better fitting models produce values around .95 (Hu & Bentler, 1999). By contrast, smaller RMSEA values indicate better fit, with values of .05 or less generally reflective of a good model fit and values of .08 or less associated with reasonable model fit (Browne & Cudeck, 1993). At the same time, these rules of thumb are viewed by some as being overly restrictive in the sense that they tend to result in decisions that reject otherwise good-fitting models, particularly when models include item-level data (Marsh, Hau, & Wen, 2004). As a result, it is important to consider both measures of model fit as well as the reasonableness of other parameter estimates when gauging overall model quality. CFAs were conducted using the Analysis of Moment Structures program (AMOS; Arbuckle, 1999) with maximum likelihood estimation of covariance matrices.

Phase three involved evaluating whether the items located on the SCBS were functioning similarly for members of different gender and race groups. Multigroup confirmatory factor analysis (MGCFAs) was performed on the combined sample for this purpose. It is important to note that our primary interest in MGCFAs was to determine whether the same pattern of free and fixed loadings was reasonable for different groups (configural invariance), and whether the factor loadings linking the items to their respective factors were statistically indistinguishable across groups (i.e., partial metric invariance). Although it is also possible to test the invariance of parameters involving variances and covariances, these tests are viewed as overly restrictive (Keith et al., 1995). Moreover, there is often little to be gained from tests of these parameters as their values may fluctuate from group to group even when the factors are being similarly measured (MacCallum & Tucker, 1991). Differences between nested MGCFAs models were evaluated through changes in CFI estimates (i.e.,  $\Delta CFI$ )

as measured between constrained ( $CFI_C$ ) and unconstrained ( $CFI_{UC}$ ) models. Following Cheung and Rensvold (2002),  $\Delta CFI = CFI_C - CFI_{UC} \geq -0.01$ , were taken as evidence of a failure to reject the null hypothesis of invariance, meaning that metric invariance was obtained across groups.

## Results

Principal-axis factor extraction was performed on the 24 items located on the school climate portion of the SCBS. Results of parallel analysis (Horn, 1965) supported a three-factor solution; however, examination of the resulting structure matrix failed to reveal a clear pattern of simple structure across the three factors. As a result, both varimax (orthogonal) and oblimin (nonorthogonal) were examined. In both instances four items<sup>1</sup> (all on the Prevalence of Bullying and Teasing scale) failed to load as expected and were sequentially removed, leaving a pool of 20 items. Only these 20 items were used in subsequent analyses in Study 1. Upon reexamination, the resulting oblimin rotation revealed a clean pattern of item loading across the three factors. Pattern loadings across factors are provided in Table 1.

This final three-factor model, as suggested by Cattell's (1966) scree, satisfied Kaiser's (1958) eigenvalue criterion. The three factors were defined by 9 items (Willingness to Seek Help), 4 items (Prevalence of Teasing and Bullying), and 7 items (Aggressive Attitudes), respectively, and accounted for appreciable amounts of item variance. All items demonstrated sufficient loadings (i.e.,  $>.40$ ). No doublets (i.e., an item that loads on two factors) were observed. Moreover, these three factors closely aligned with previous theoretical postulates regarding school climate.

CFA was performed on the second half of the study sample ( $N = 1,056$ ) using AMOS, Version 7.0. The covariance between factors was estimated freely and each item was restricted to load only on its hypothesized factor. Not surprisingly,  $\chi^2$  was large and statistically significant,  $\chi^2(167) = 800.66, p < .001$ . Although the CFI of .87 was somewhat below

expectation, the RMSEA of .06 was indicative of reasonable model fit (Browne & Cudeck, 1993). Moreover, model parameter estimates were well within expectation, with moderate to large factor loadings. In the aggregate, overall model quality can be considered reasonable (Marsh et al., 2004).

MGCFA performed across gender groups failed to result in a statistically significant decline in fit between the general form model in which no across-group equality constraints were imposed,  $\chi^2(334) = 1550.22, p < .001$ , CFI = .864; and the fully constrained factor loading matrix between gender groups,  $\chi^2(351) = 1580.39, p < .001$ , CFI = .852):  $\Delta\text{CFI} = -.002 < -.01$ . These results indicated metric invariance. Similarly, MGCFA procedures were also used to assess the three-factor model across race groups. Here, the Caucasian group ( $n = 1,482$ ) was compared to a minority group comprised of students who identified themselves as African American, Hispanic, Asian, or Other ( $n = 629$ ). A comparison between the unconstrained model of race,  $\chi^2(334) = 1560.79, p < .001$ , CFI = .862; and the fully constrained factor loading matrix,  $\chi^2(351) = 1593.92, p < .001$ , CFI = .860, also supported metric invariance across groups:  $\Delta\text{CFI} = -.002 < -.01$ .

## Study 2

The focus of Study 2 was on the criterion-related validity of the identified SCBS factors. SCBS factor scores were obtained from an independent sample of  $n = 7,318$  ninth-grade students attending 291 high schools. Criterion-related validity of the SCBS factor scores was examined through their associations with independent aggregated measures of school disorder obtained from school records and teacher reports. Because school climate scales are intended to assess school-level characteristics, it is necessary to conduct a comparison among schools rather than students within the same school.

In Spring 2007, school climate surveys were completed by ninth-grade students from public high schools in the state of Virginia as a part of the Virginia High School Safety

Study (VHSSS) and Virginia's 2006–2007 school safety audit program (Cornell & Gregory, 2008). The authors of this survey omitted 2 of the 20 items that made up the three factors established in Study 1 (“The teachers at this school are genuinely concerned about me” and “If someone threatens you, it is okay to hit that person”). A CFA was conducted on the remaining 18 items in Study 2 to reconfirm the Study 1 factor structure in the Study 2 population. It was hypothesized that the three school climate scales would be correlated with external measures of problem behaviors at school, including student suspensions and expulsions, teacher perceptions of the prevalence of teasing and bullying among students, and teacher reports of gang violence. In addition, the three school climate scales were hypothesized to correspond with teacher perceptions of student willingness to seek help for bullying and threats of violence.

## Method

**Participants.** The school safety survey of the VHSSS was administered to 7,318 ninth-grade students in 291 Virginia public high schools in the spring of 2007. The high school participation rate for this study resulted in a sample that included 93% of the state's high schools (Cornell & Gregory, 2008). Ninth-grade students were selected for the VHSSS because of the high rate of discipline problems observed among ninth-graders and because the survey results were to be used to track progress of Virginia's ninth-grade cohort through high school. Of these students, 49% were girls and 51% were boys. The student sample self-reported as 63% Caucasian, 23% African American, 5% Latino/Hispanic, 3% Asian American, 1% American Indian, and 5% Other. Participants ranged from 13 to 17 years of age with a mean age of 14.8 years (2% were age 13, 87% were ages 14 or 15, 11% were age 16, and 2% were age 17). Students were not included in the study if they did not read English well enough to complete the survey, or had cognitive limitations (e.g., intellectual disabilities) or physical limitations

that prevented them from completing the survey.

**Procedure.** A sampling procedure was designed to obtain approximately 25 ninth-grade student participants and 10 teacher participants from each school (Cornell & Gregory, 2008). Principals at each school were provided with a set of random numbers (generated for the size of the student body) to identify students from their alphabetized rolls. Parents of selected students received a standard letter explaining that their child had been chosen to complete an anonymous survey as part of the state's school safety audit program and advising them to contact the school if they did not wish their child to participate. Approximately 1,983 (27%) students initially identified by the sampling procedure were unwilling or unable to participate in the study and were replaced with the next available or willing student on the roll. Of those who did not participate, 16% declined to participate, 6% had a parent who declined, 32% were absent because of illness, 5% were suspended from school, 7% moved or transferred, 3% faced a language barrier, and 30% had some other reason (i.e., severe disability, attending a field trip). More than 96% of the participating schools submitted 20–30 surveys with an average of 25.3 surveys per school. Students completed the survey online in classrooms under school staff supervision. A parallel procedure was followed for teachers, who also were identified by random number, contacted by letter, and invited to complete an anonymous online survey. Overall, each school submitted an average of 10 teacher surveys.

**Measures.** The student school safety survey of the VHSSS included all 4 of the items from the Prevalence of Teasing and Bullying Scale, 6 of the 7 items on the Aggressive Attitudes Scale, and 8 of the 9 items on the Willingness to Seek Help Scale. Coefficient alphas were recalculated at the school level for the Prevalence of Teasing and Bullying scale ( $\alpha = .78$ ), Aggressive Attitudes scale ( $\alpha = .88$ ), and Willingness to Seek Help scale ( $\alpha = .89$ ) and were found to be consistent with

those obtained in Study 1. In addition, the Willingness to Seek Help scale was correlated  $-.19$  with the Prevalence of Teasing and Bullying scale and  $-.50$  with the Aggressive Attitudes scale. The Aggressive Attitudes scale was correlated  $.24$  with the Prevalence of Teasing and Bullying scale.

The version of the school safety survey that was administered to ninth-grade teachers included measures of teacher perceptions of the prevalence of bullying and teasing among students and student willingness to seek help from adults at school for bullying-related problems. These scales were designed to correspond with the student scales, with similar content and wording to reflect the teacher's perspective. For example, the item on the student measure of Willingness to Seek Help, "If another student was bullying me, I would tell one of the teachers or staff at school," was comparable to the item on the teacher scale, "Students are encouraged to report bullying and aggression." Coefficient alphas at the school level were  $.82$  for the scale measuring teacher perceptions of student help-seeking behaviors and  $.87$  for the scale measuring teacher perceptions of the prevalence of teasing and bullying.

To measure the extent of gang violence in each school, teachers were asked "During the last six months, how often have gangs been involved in fights, attacks, or other violence at your school?" (Answer choices were *Never*, *Once or twice in the last six months*, *Once or twice a month*, *Once or twice a week*, and *Almost everyday*.) The average response across teachers in each school was used as an index of gang violence.

The total number of short-term suspensions and the total number of long-term suspensions that took place during the school year in each school were used as indicators of school disorder. These data were collected from the state's Discipline, Crime, and Violence database. Every school in Virginia is required by law to record incidents of crime and violence using a standard set of discipline categories and a Web-based reporting format (Virginia Department of Education, 2006). In Virginia, there are three categories of school

**Table 2**  
**Relations Between School Climate Factors and Measures of School Disorder**

Measure	Prevalence of Teasing and Bullying <i>r</i>	Aggressive Attitudes <i>r</i>	Willingness to Seek Help <i>r</i>	Multiple Regression	
				<i>R</i> <sup>2</sup>	<i>p</i>
Short-term suspensions	.25**	.35**	-.33**	.16	.000
Long-term suspensions/expulsions	.13	.18*	-.16*	.04	.064
Teacher reports of gang-related violence	.25**	.27**	-.33**	.15	.000
Teacher reports of bullying and teasing	.30*	.22**	-.23**	.12	.000
Teacher reports of help-seeking behaviors	-.26*	-.13*	.28**	.12	.000

*Note.* The *r* values indicate simple Pearson correlations. The *R*<sup>2</sup> values represent the total variance accounted for when all three school climate scales are entered simultaneously in a multiple regression analysis.

\**p* < .05.

\*\**p* < .01.

removal: (a) short-term suspension for one to 10 days, (b) long-term suspension for more than 10 and less than 365 days, and (c) expulsion for a minimum of 365 days (Virginia Department of Education). Because of their low frequency in most schools, long-term suspensions and expulsions at each school were summed and termed "long-term suspensions/expulsions." The correlation between short-term suspensions and long-term suspensions/expulsions was .13.

## Results

The three-factor structure established in Study 1 factor analyses was replicated in the Study 2 sample ( $n = 7,318$ ; Table 1). CFA was performed on the 18 items of the SCBS included in the VHSSS using AMOS, Version 7.0. The covariance between factors was estimated freely, and each item was constrained to load only on its hypothesized factor. Not surprisingly,  $\chi^2$  was large and statistically significant when estimated on this large sample,  $\chi^2(132) = 5386.9, p < .001$ . Although the CFI of .85 was somewhat below expectation, the RMSEA of .07 was indicative of reasonable model fit (Browne & Cudeck, 1993). Moreover, model parameter estimates were well within expectation, with moderate to large factor loadings. In the aggregate, overall

model quality can be considered reasonable (Marsh et al., 2004).

Regression analyses indicated a consistent pattern of correlations between the SCBS Prevalence of Teasing and Bullying, Aggressive Attitudes, and Willingness to Seek Help scales and the measures of school disorder. Multiple regression analyses of the three school climate scales with these external measures of school disorder are reported in Table 2. Cohen's (1988) criteria for evaluation of effect sizes in multiple regression analyses are as follows: 1.96%–12.9% variance = small; 13.0%–25.9% variance = medium; and  $\geq 26\%$  variance = large. When entered simultaneously, the three scales cumulatively accounted for a significant proportion of the variance in short-term suspensions (16%), but long-term suspensions/expulsions were not significant (4%;  $p = .06$ ). Together, the three school climate scales also accounted for significant proportions of the variance in teacher reports of gang violence (15%), bullying and teasing among students (12%), and student help-seeking behaviors (12%).

## Discussion

The present study investigated the validity of three scales from the SCBS developed to

assist schools in measuring aspects of school climate essential to bullying prevention. We considered both the internal structure of the three scales at the individual student level of analysis and the predictive associations between SCBS scale scores aggregated at the school level and independent, external criteria of school conditions. The theoretical perspective underlying this approach is that, in order to reduce bullying, schools must begin by ascertaining the extent to which bullying is a problem by measuring student perceptions of teasing and bullying behaviors. Next, schools need to address two aspects of school climate that are common impediments to bullying prevention efforts. First, interventions should be aimed at student attitudes that support and encourage bullying and peer aggression. Second, school staff must convince students that it is acceptable for them to seek help and that they will receive support when they do so.

In Study 1, EFA and CFA indicated a parsimonious three-factor structure for the three school climate scales of the SCBS that we conceptualized as the Prevalence of Teasing and Bullying, Aggressive Attitudes, and Willingness to Seek Help scales. Multigroup confirmatory factor analyses found evidence of full metric invariance across gender and race groups. As a whole, the three scales can be said to adequately assess school climate at the school level without appreciable bias associated with gender or race.

The measurement of school climate implies that there are identifiable qualities that characterize entire schools rather than students. Accordingly, the validation of a school climate measure should include analyses with schools as the unit of analysis. The use of a statewide sample of almost all ( $n = 291$ ) public high schools in Virginia helped to assure sufficient variation among schools to examine the criterion-related validity of the school climate scales.

In Study 2, the three-factor structure of the 18 items of the SCBS used in the VHSSS was reconfirmed in a sample of 7,318 ninth-grade students. The first of these factors, the Prevalence of Teasing and Bullying scale, was found to have predictive associations with four

out of five markers of school disorder. Schools characterized by students as having higher levels of teasing and bullying had higher levels of short-term suspensions, but not long-term suspensions/expulsions. In such schools, teachers reported a more hostile environment for students, characterized by teasing and bullying, as well as gang-related violence. Teachers also reported less propensity for students to seek help. Although correlations cannot establish a causal relationship or indicate the direction of causal effects, these findings are consistent with the view that in schools with more teasing and bullying, there will also be higher rates of students receiving disciplinary consequences for misbehavior and less willingness among those students to seek help from teachers. Teasing and bullying may be related to gang violence because gangs engage in coercive and threatening behavior that is essentially bullying.

A second important feature of school climate concerns peer group values related to antisocial and prosocial behavior (Brand et al., 2003). Aggressive individuals are more likely than their peers to maintain beliefs that aggression is a legitimate response that will lead to positive outcomes, such as increased self-esteem and social status (Guerra & Slaby, 1990). The Aggressive Attitudes scale used in this study attempts to measure the extent to which aggressive attitudes are shared by peers and can be used to characterize the school climate as a whole. In Study 2, higher scores on this scale were correlated with more short-term suspensions as well as long-term suspensions/expulsions. In addition, schools characterized by students with more aggressive attitudes were associated with more bullying and gang violence at school, and less student help-seeking behaviors as reported by teachers.

Finally, it is important to create a school climate in which students are willing to seek help for bullying-related problems as well as more serious threats of violence such as bringing a lethal weapon to school. Research has shown that access to guidance and support from teachers is linked to better academic, behavioral, and socioemotional adjustment (Brand et al., 2003). In Study 2, there was only

modest correspondence ( $r = .28$ ) between student and teacher perceptions of student willingness to seek help. Nevertheless, high scores on the student Willingness to Seek Help scale were associated with less school disorder. Schools with students who reported more willingness to seek help had fewer short-term suspensions and long-term suspensions/expulsions. In addition, high scores on the Willingness to Seek Help Scale were consistently correlated with teacher reports of less bullying and gang violence.

The two teacher scales for teasing and bullying and for student help seeking were designed to parallel the two student school climate scales. It should be noted that the teacher and student scales have similar item content, but we did not formally test them for parallel structure. Students and teachers showed modest correspondence at the school level, which is a typical finding in research comparing student and teacher perspectives at the individual level (Pittinsky & Carolan, 2008) and using school-level aggregated scores (Brand et al., 2008). Two aspects of the teacher perspective may have limited the correlations between students and teachers and could be considered in future study. First, some teachers might be biased toward more positive characterizations of their own willingness to help students. Second, research indicates that teachers tend to underestimate the prevalence of bullying (Bradshaw et al., 2007) and often fail to observe it taking place (Craig, Pepler, & Atlas, 2000).

The modest intercorrelations among the school climate scales suggest that the three school climate factors are conceptually distinct. The Prevalence of Bullying and Teasing scale measures student perceptions of the extent of teasing and bullying, but does not assess how these behaviors are regarded by students. In contrast, the Aggressive Attitudes scale does not ask about the extent of peer aggression at school, but whether the students view aggressive behavior in positive or negative terms. The Willingness to Seek Help scale was correlated negatively ( $-.19$ ) with the Prevalence of Teasing and Bullying scale and more substantially ( $-.50$ ) with the Aggressive

Attitudes scale. It seems reasonable to infer that schools where students feel comfortable seeking help and are confident that teachers will respond to their concerns will have lower levels of teasing and bullying and that students will be less likely to share positive attitudes about peer aggression. The relationships among these variables are quite possibly interactive, because one can plausibly envision causal effects in multiple directions.

When all three school climate scales are considered together, they account for a substantial percent of variance for four of the five indicators of school disorder. The three scales cumulatively accounted for approximately 16% of the variance in short-term suspensions and 15% of the variance in teacher reports of gang violence. In addition, the school climate scales accounted for 12% of the variance in teacher reports of bullying and teasing and 12% of the variance in teacher reports of help-seeking behaviors. These results support the criterion-related validity of the school climate scales and suggest that efforts to improve these aspects of the school could have an ameliorative effect on school disorder. Although the effect sizes were "small" to "medium" according to Cohen's criteria (1988), effects of this magnitude are not trivial or inconsequential. Interventions that target these aspects of school climate should be evaluated using an experimental design.

### Limitations and Directions for Further Study

There are a number of sample limitations to the present study. The four middle schools in Study 1 were limited to a suburban/rural region in Central Virginia and the 291 high schools were limited to the state of Virginia. Study 1 was limited to students attending grades 6–8, whereas Study 2 was limited to ninth-grade students. Of particular note, the measures of high school climate were based on the perceptions of ninth-graders, who may be less informed or have a more immature perspective than the older students in the school. It would be useful to extend the study to other age groups and to compare the per-

ceptions of younger and older students. It is conceivable that students in different grade levels have different experiences of the school climate, but we expected that ninth-graders would be most vulnerable to teasing and bullying because of their junior status in their schools.

All of the factor analyses in Study 1 and Study 2 were conducted on student-level data, whereas the regression analyses in Study 2 were calculated with data that aggregated student responses at the school level. It would be useful to conduct more extensive multilevel, multigroup confirmatory factor analyses to demonstrate that the measurement model for the three scales is invariant between student and school levels. In addition, it would be useful to test the parallel nature of the teacher and student versions of the school climate scales.

There are aspects of school climate not addressed in this study that have been linked to negative adolescent adjustment and could influence bullying prevention efforts, such as the quality of school structure and discipline (Brand et al., 2003; Cornell & Gregory, 2008). For example, Gottfredson and colleagues (2005) found that consistent enforcement of school rules is associated with less victimization. Future research efforts might investigate such additional school climate factors.

The findings in Study 2 demonstrate a correlational relationship between school climate and measures of school disorder, but they do not establish a causal relationship. Controlled studies using an experimental design are needed to demonstrate that improvements in school climate will have an ameliorative effect on school disorder. Research by Wilson, Lipsey, and Derzon (2003) indicates that a variety of school-based interventions, ranging from individual counseling to school-wide systems of positive behavior support, have been effective in preventing bullying and fighting. They conducted a meta-analysis of 221 studies of school-based interventions that confirmed that well-implemented programs can reduce aggressive and disruptive behavior. The mechanisms by which these interventions effect school-wide change have been largely

unexamined. The assessment of school climate may be one means by which these mechanisms might be identified.

### **Practical Implications and Conclusions**

There are a number of practical implications of this study for school psychologists. The SCBS is a relatively brief 45-item instrument that can be administered for a focused assessment of bullying, including examination of three important dimensions of school climate that could be key targets for intervention. The SCBS Prevalence of Bullying and Teasing scale includes items to assess teasing about clothing and physical appearance, teasing about sexual topics, and comments about race or ethnicity. In our experience, these are fertile topics for student discussion in small groups or classrooms.

The SCBS Aggressive Attitudes scale can be used to identify attitudes that promote or encourage bullying, such as the belief that bullying and fighting are appropriate or even socially desirable. Although most students do not endorse these attitudes, it can be helpful to present these results to groups of students so that the few students who do endorse them can realize that their views are inconsistent with the majority of their peers.

The SCBS Willingness to Seek Help scale is especially useful in addressing student reluctance to report or seek help for bullying and threats of violence. Studies of school shootings have stressed the importance of encouraging students to report threats of violence and to distinguish help seeking from snitching (Cornell & Williams, 2006). Teachers may find it useful to know how many of their students are willing to seek help when a student brings a gun to school or threatens to kill someone, and to lead discussions on this topic. In summary, the findings of this study support the conclusion that there are measurable features of the school climate that are associated with multiple markers of school disorder. School-wide assessment of these dimensions of school climate may be a useful guide to bullying prevention efforts.

## Footnotes

<sup>1</sup>The 4 items dropped from further analysis were the following: "New students are made to feel welcome here by other students"; "Students at this school accept me for who I am"; "I have some close friends whom I trust"; and "Students from different neighborhoods get along well together here." In retrospect, these items may have assessed feelings of acceptance and friendship at school that diverged from perceptions of how much bullying and teasing takes place.

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