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A school connectedness scale for use with adolescents[1]

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Evaluators are frequently asked to assess the effectiveness of school programs implemented to improve academic achievement. School connectedness has been shown to be directly related to academic achievement (McNeely, Nonnemaker, & Blum, 2002) and is therefore of interest to evaluators. The construct of school connectedness has been shown to consist of 3 elements: connectedness to adults in schools, connectedness to peers, and connectedness to the school (Karcher & Lee, 2002). This paper reports the psychometric properties and factor analyses findings from a School Connectedness Scale (SCS) given to adolescents in 2 very different high schools in the Northeast, one a large urban school and one a medium-sized suburban school. The results indicate that the SCS is highly reliable with a stable factor structure across diverse populations. The broad applications of use for the instrument are discussed.

Keywords: school connectedness; adolescents; school program evaluation

Introduction

The evaluation of school programs requires evaluators to assess factors that affect school learning (Wang, Haertel, & Walberg, 1993) and social-behavioral outcomes. School connectedness occurs when students feel part of their school and an attachment to the adults and students therein. It has been viewed as a protective factor that is correlated with important school outcomes (McNeely, Nonnemaker, & Blum, 2002). Thus, educational reform initiatives have listed school connectedness as an important goal (Catalano, Oesterle, Fleming, & Hawkins, 2004). Karcher and Lee (2002) theorized that school connectedness is composed of belongingness or social support, relatedness or specific relational support, and active involvement and value of social support received by the student.

When students do not experience feelings of connectedness to school, they are more likely to engage in substance use, violent behavior, and early sexual activity (McNeely et al., 2002; Resnick, Harris, & Blum, 1993). They are also at increased risk for serious internalizing behaviors such as disordered eating and attempted suicide (Resnick et al., 1993) and are considerably more likely to drop out of school (Osterman, 2000). In contrast, students who report higher feelings of school connectedness also report higher academic achievement, academic

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engagement, peer acceptance, and emotional well-being (Anderman, 2002; Osterman, 2000).

Research interest in the topic of school connectedness has increased with awareness of findings such as these; unfortunately, the construct of and terminology for studying school connectedness remain unclear. Osterman (2000) and O'Farrell (2004) each conducted reviews of the school connectedness literature and found numerous synonyms for the basic concept of school connectedness, including bonding, acceptance, belongingness, relatedness, membership, community, and attachment. To further complicate matters, many of these terms have significantly different definitions, or focus on very different aspects while still relating to the same core construct of school connectedness (O'Farrell, 2004). However, a very general description of school connectedness may be considered to be the extent to which students experience feelings of caring at school and feel like they are part of their school (Osterman, 2000).

Karcher and Lee (2002) conducted a review of the literature on connectedness in general and theorized that the large, somewhat amorphous construct generally called connectedness is actually composed of three distinct levels or subconstructs: belongingness, an individual's perception of the amount of social support he or she receives in general; relatedness, an individual's perception of the amount of social support he or she receives in specific relationships; and connectedness, the individual's active involvement with and value of his or her general and specific sources of social support. Karcher and Lee also developed a measure of general connectedness for adolescents (Hemingway Measure of Adolescent Connectedness; HMAC), which includes several distinct subscales representing the different sources of social support including School, Teachers, and Peers (which is composed of items regarding classmate relationships and is a separate subscale from Friends). These three relationships or sources of connectedness are considered to be most important in the study of school connectedness (Osterman, 2000). However, the HMAC items were developed to reflect only the third subconstruct of connectedness, which Karcher and Lee viewed as a single factor, and so the hypothesized factors of connectedness have not yet been empirically substantiated.

Several years earlier, Goodenow (1993) developed and established the initial reliability and validity of an 18-item measure of school connectedness, the Psychological Sense of School Membership scale (PSSM). Hagborg (1994) conducted a factor analysis of the PSSM, developed as a unitary measure, and discovered three underlying constructs, with 11 of the 18 items loading onto a single factor. This supports the idea that there are multiple distinct constructs within the larger construct of school connectedness: However, the PSSM was designed to measure only the larger construct, thus further exploration of the subconstructs is necessary.

Loukas, Suzuki, and Horton (2006) used path analysis to show that connectedness to school mediated effects of school climate. Their focus was primarily on how this relationship might mediate later emotional problems with a focus on depression. Although they found that connectedness did not appear to mediate the effects of school climate on later depression, they did find that connectedness did mediate effects of school climate in the areas of perceived friction, cohesion, and overall satisfaction with classes for middle school students. They relied on 5 to 27 questions from several previously used inventories (My Class Inventory, Fraser & Fisher, 1982; Strength and Difficulties Questionnaire, Goodman, Metzler,

& Bailey, 1998; Children's Depressive Inventory, Kovacs, 1992; National Study of Adolescent Health, Resnick et al., 1997) to examine each of these areas.

Shochet, Dadds, Ham, and Montague (2006) also examined the relationship between school connectedness and mental health symptoms. Unlike Loukas et al. (2006), they found a strong predictive relationship between weak school connectedness and mental health symptoms 1 year later in 12- to 14-year-old students in the areas of depression, anxiety, and general functioning. However, mental health symptoms were not predictive of school connectedness.

This paper presents a new, more sensitive instrument for measuring school connectedness, the School Connectedness Scale (SCS). One reason for developing this measure was to test the hypothesis that the three subconstructs, or levels of connectedness, proposed by Karcher and Lee (2002) would emerge as an underlying factor structure in the larger construct of school connectedness. For the purposes of this study, the hypothesized types of school connectedness are called general support, specific support, and engagement and correspond to the definitions of belongingness, relatedness, and connectedness proposed by Karcher and Lee. To ensure that the developing instrument draws evenly from the major sources of connectedness, all three of the connectedness relationships identified by Karcher and Lee and by Osterman (2000) (teacher, peers, and school) were used to create items.

The new instrument proposed in this study is designed to reflect not only the three distinct hypothesized elements of school connectedness, but also the three major relationships used to study school connectedness. General descriptions of each of these levels and relationships can be found in Table 1. While general and specific support are primarily tied to school social relationships, engagement was conceived

Table 1. Descriptions of levels and sources of connectedness.

Level/Source	Description
	Levels of Connectedness
General Support (Belongingness)	Perceived support in general from other students, school adults, and the overall concepts of school and education; includes the student's sense of membership and acceptance in the student body as a whole.
Specific Support (Relatedness)	Perceived support from specific sources such as the student's teachers, school friends, classmates, classes, or membership at the student's current school; the student's actions are not presumed to be deliberate and support is acknowledged but not actively sought out.
Engagement (Connectedness)	Demonstrating effort in and enjoyment of schoolwork and school activities or demonstrating active involvement in and valuing of school adult or peer relationships; student explicitly values specific relationships or activities and deliberately seeks out support.
	Sources of Connectedness
School	The student's connection to the aspects of school that are unrelated to social relationships, including classes, activities, the importance of education, and sense of school spirit
Teachers/Adults	The student's relationships with teachers and other school adults such as coaches, counselors, or principals
Peers	The student's relationships with the other students at his/her school, including but not limited to classmates and school friends

as a mix of features addressing the interplay of school work and activities as they relate to general and specific social support at school (Karcher & Lee, 2002; Osterman, 2000). Assuming a multidimensional theory of school connectedness, Parker, Lee, and Lohmeier (2008) constructed the SCS, conceptualized as a 3x3 matrix crossing three relationships (school, adults, and peers) and three levels of connectedness (general support or ''belongingness'', specific support or ''relatedness'', and engagement or ''connectedness''). The school connectedness literature has shown that what students think, their values (Marks, 2000), and what they do, their behaviors (Klem & Connell, 2004), are both important factors in the development of school connectedness. As a result, we created three items each reflecting values and behavior for each cell of the matrix. A matrix of sample questions for each cell is presented in Table 2. Given the comprehensiveness of the SCS, it can be used by researchers, evaluators, and school personnel to examine a more accurate and comprehensive picture of students' connectedness to their schools and the people within those schools.

The SCS (Parker et al., 2008) was first used with junior high students attending after school programs. The initial study with the SCS established the construct validity of the SCS. However, generalizations about the use of the instrument based on that study were somewhat limited given the small sample of junior high students from one Midwestern school district. Thus in the present study, the SCS was presented to high schools in two very different Northeastern school districts.

Table 2. Sample questions from the School Connectedness Scale.

	General Support (Belongingness)	Specific Support (Relatedness)	Engagement (Connectedness)
School			
Behaviors	People I care about tell me that school is important.	I am very involved in activities at my school, like clubs or teams.	I encourage others to get involved in school activities.
Values	I think the things I learn at school are useless.	I feel like this school is the right place for me.	I feel stupid cheering for my school.
Adults			
Behaviors	Adults at my school are friendly to students.	My teachers give me extra help when I need it.	I often talk with an adult at my school about things that are important.
Values	Teachers at my school care about their students.	My teachers care about me.	I think my teachers are stupid.
Peers			
Behaviors	Students at my school help each other.	I can always find a friend to sit with at lunch.	I help my friends at school with their problems.
Values	I feel like I fit in with the other students at my school.	I would feel comfortable asking most of my classmates for help with a problem.	I like spending time with my classmates.

Although junior high and high school students are generally considered to be at different developmental periods, this instrument was expected to be applicable for both populations because feelings of connectedness, belongingness, relatedness, and engagement are not unique to students at one developmental level, but are feelings common to all students. The language used in the instrument is appropriate for adolescents from Grades 6 through 12; it scores at the fourth grade level on the Flesch-Kincaid Grade calculator, with a readability score of 78 (indicating high readability). This study was conducted to better understand the underlying factor structure of school connectedness and establish the psychometric properties of the SCS across diverse adolescent populations.

Method

Participants

Two hundred and sixty 9th through 12th-grade students from a Northeastern suburban high school completed the SCS in their English classes. Six hundred and sixty-nine 9th through 12th graders from a large urban high school completed the SCS during class time. Both samples completed the survey at the end of the spring semester. Approximately 50% of the respondents were female. The distributions of students in terms of grade and class levels (remedial, standard, and advanced) were representative of schools.

The urban high school students came from six high schools with a total enrollment of 3,391 students. The suburban school students attend a high school originally designed as an ''open classroom'' building. One of the goals for buildings designed in that manner was to make students feel more connected to each other. The suburban high school is the only high school in the town with a total of 1,940 students. Table 3 presents the distribution of students by race. Table 4 presents the percentage of students in each of some commonly considered at-risk for dropping out populations.

Table 3. Distribution of students by race.

	Suburban School	Urban School
Asian	2.7%	2.7%
Black	2.2%	2.8%
Hispanic	23.3%	89.1%
White	70%	5.4%

Table 4. Percentage of students in high risk categories.

	Suburban School	Urban School
Low Income	33.5%	76.8%
First Language Not English	17.9%	88.0%
English Language Learners/LEP	1.8%	17.8%
Special Education	9.3%	19.1%

Instrument

The 54-item SCS originally described by Parker et al. (2008) was conceptualized as a 3x3 matrix crossing three relationships (school, adults, and peers) and three levels of connectedness (general support or "belongingness", specific support or "relatedness", and engagement or "connectedness"). Each cell includes 3 items that ask about observable behavior ("My teachers give me extra help if I need it") and 3 items that ask about feelings or values ("I think school is important"). One third of the items are negatively worded to prevent response bias ("I fight with my classmates"). All items are on a 5-point scale, from 1 (*Not at all true*) to 5 (*Completely true*). Table 2 presents a matrix of a sample of questions included in the SCS. Initial items were reviewed by colleagues for readability and content validity. The initial SCS reported in 2008 yielded a four-factor solution based on data from 182 Midwestern suburban after-school program junior high students. In the 2008 study, each student was given an 18-item subset of the items. Cronbach's alpha for the SCS items was .798, $n = 182$, indicating acceptable reliability. The dimensionality of the SCS items was analyzed using principal axis factor analysis with a Varimax rotation. The rotated solution yielded four factors: School and adult connectedness, Negative connectedness, Peer involvement, and Peer relationships. The 18 items showed a strong positive correlation with the Communities That Care (Hawkins & Catalano, 1992) school connectedness subscale, $r = .595$, $n = 201$. Given these initial promising results with the limited sample and subset of the full SCS, the present study was conducted in order to better evaluate the psychometric properties of all SCS items with different populations.

Results

Cronbach's alpha indicated high reliability for the SCS for both the suburban ($\alpha = .93$) and the urban ($\alpha = .81$) schools. When the data from the two schools were combined, $\alpha = .78$, which is still an acceptable reliability score for a survey given to two very different populations. The overall mean scores for the SCS are statistically different with the suburban students indicating slightly higher levels of overall connectedness (Suburban $M = 2.955$, $SE = .017$; Urban $M = 2.891$, $SE = .015$; $t(922) = 2.395$, $p < .05$).

The initial exploratory factor analysis for both data sets combined used principal axis factoring with a varimax rotation. Initial convergence occurred with 13 factors with Eigenvalues >1, accounting for a total of 56.39% of the variability. However, the rotated factor matrix indicates that many of the 13 factors are not strong. The scree plot shown in Figure 1 indicates a few elbows before the 13th factor. Given the elbow after Factor 7, an analysis was run forcing 7 factors. This resulted in 7 relatively strong factors, with few cross-loaded items, no factors with less than three items, and all factors with all items' loadings $>.30$ (recommendations by Costello & Osborne, 2005). These 7 factors account for 44.13% of the variance. This principal axis factoring with a varimax rotation analysis yielded the following factors (with variance accounted for by that factor in parentheses):

(1) Negative connectedness (18.38%);
(2) Connection with adults in school (7.71%);
(3) Peer connections at school (5.41%);

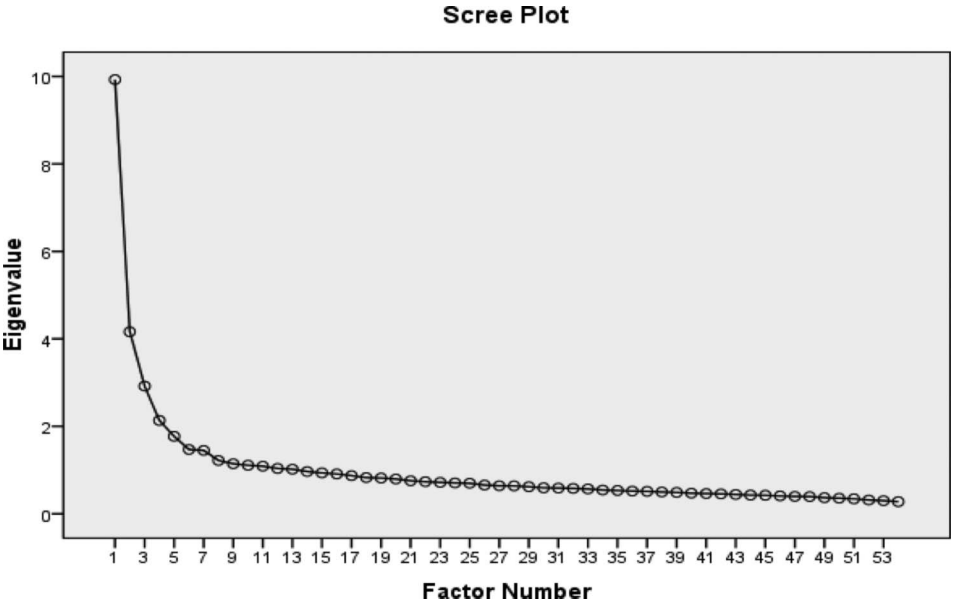

Figure 1. Scree plot for initial factor analyses with data from both schools.

(4) School involvement (3.95%);
(5) Emotional connections (3.28%);
(6) Value school (2.72%);
(7) Comfort in this school (2.68%).

Only one item (I always try to do my best at school) did not load on any of the 7 factors. The scree plot also indicated elbows following the 4th and 5th factors. The results of factor analyses forcing 4 or 5 factors are essentially the same. There is no clear 5th factor. These forced factor solutions for the data do not improve the explanation of variance compared to the 7-factor solution for this sample. The 4-factor solution is much messier than the 7-factor solution, such that the items do not so clearly fit into the resulting factors. Nonetheless, the 4-factor solution yields the following factors: Negative connection; Peer relationships; School is a caring, safe place; and Care about others' opinions. Thus, the rotated 7-factor matrix solution yields the strongest factors for the scale. The 7 factors with the items loadings are presented in Table 5. In addition to the item that did not load on any factors, two other items were omitted because of weak loading and a weak fit with the factor to which they most strongly loaded.

Despite the slight difference in overall SCS mean scores between the schools, factor analyses indicate that for both schools, essentially the same first seven factors appear, although in a slightly different order as in the overall factor analysis. If conducted separately, factor analyses indicate that the first three factors are essentially the same for both groups. These include the first three overall factors: Negative connectedness, Connection with adults in school, and Peer connections at school. These three factors contributed to 35% of the variance for the suburban school and 31% of the variance for the urban school.

Table 5. Rotated factor loading matrix for the SCS.

	Factor[a,b]						
	1	2	3	4	5	6	7
I wish my teachers would leave me alone.	.578						
Teachers at my school are unfair to students.	.550						
I think my teachers are stupid.	.540						
I argue a lot with my teachers.	.503					–.396	
I think the things I learn at school are useless.	.494						
I wish my classmates would leave me alone.	.480		–.334				
People I care about say bad things about my school.	.460						
I usually feel bored in class.	.449						
Adults at my school care more about punishing students than helping them.	.438	–.351					
I only go to school because I have to.	.437						
I often daydream or goof off in class.	.435						
I think my classmates are stupid.	.432						
My teachers only notice me when I do something wrong.	.429						
I would rather go to a different school.	.395						–.343
I feel stupid cheering for my school.	.370						
Students at my school bully each other.	.365						
Sometimes I skip class.	.351					–.325	
Teachers at my school care about their students.		.696					
Adults at my school are interested in how students are doing.		.684					
My teachers care about me.		.592					
Adults at my school ask students how they are doing.		.567					
My teachers give me extra help when I need it.		.567					
Adults at my school are friendly to students.		.565					
I like to make my teachers happy.		.411			.315		
When I have a problem, there is at least one adult at school I can trust.		.320					
I feel like I fit in with the other students at my school.			.645				
I think my classmates like me.			.623				
I feel comfortable around the other students at my school.			.602				
I usually get along with the other students at my school.			.564				
I like spending time with my classmates.			.530				
I can always find a friend to sit with at lunch.			.524				
My classmates ignore me.	.371		–.452				
I feel lonely at school.	.314		–.443				
I would feel comfortable asking most of my classmates for help with a problem.			.392				
I am very involved in activities in my				.713			

(*continued*)

Table 5. (*Continued*).

	Factor[a,b]						
	1	2	3	4	5	6	7
school, like clubs or teams.							
I encourage other students to get involved in school activities.				.638			
I do things to support my school.				.610			
I like going to school events, like sports events and dances.			.342	.388			
When I have a problem, I ask my friends at school for help.					.592		
I talk to my friends at school about how I am feeling.					.555		
I try to make my teachers happy.		.327			.408		
I help my friends at school with their problems.					.375		
I care what my classmates think of me.					.342		
I fight with my classmates.	.399					–.475	
I talk back to my teachers.	.437					–.466	
I think school is important.						.412	
I care about my teachers' opinion of me.					.320	.337	
I always try to do my best at school.							
I feel like this school is the right place for me.			.306				.546
I think my school is a safe place to be.							.444
I would feel upset if someone said bad things about my school.							.353

Note: Factor 1 – Negative connectedness; Factor 2 – Connection with adults in school ; Factor 3 – Peer connections at school; Factor 4 – School involvement; Factor 5 – Emotional connections; Factor 6 – Value school; Factor 7 – Comfort in this school.

[a]Extraction Method: Principal Axis Factoring.

[b]Rotation Method: Varimax with Kaiser Normalization. (Rotation converged in 12 iterations.)

In addition, a multivariate analysis of variance was conducted on the data with gender, grade, and level (there are three class levels for all grades) as independent variables and the seven factors as dependent variables. This analysis indicates few significant differences between gender, grade, and levels for each factor. A significant difference found was between genders for Factor 5, Feelings about having friends in school ($F(1, 153) = 18.48$, $p < .001$), with girls reporting higher positive feelings about having friends in school. A significant difference between class levels was also found for Factor 7, Involvement in school activities, $F(2, 153) = 2.62$, $p < .05$.

Conclusions

Improving school connectedness is clearly an important goal for many schools as they plan for school reform or important school improvement initiatives. The available instruments for measuring school connectedness have not comprehensively measured the phenomenon. Therefore, educational evaluators have not had current or psychometrically sound instruments to measure school connectedness. Educational evaluators, researchers, and practitioners can benefit from an easy-to-use and

highly reliable instrument. The SCS, developed as a multidimensional measure of school connectedness, holds promise as a powerful evaluation tool. Given its ease of use with students, as well as its high reliability and validity and clear factor structure, it is worthy of use with adolescents from various socioeconomic, racial, and geographic backgrounds. Additionally, the factor structure of the SCS allows educators or evaluators interested in only one factor measured by the instrument, such as Connections to Adults in School, to examine that area specifically.

Future research on the topic of school connectedness may include other measures of dimensions included in the instrument to further validate the SCS. For example, classroom observations and teacher reports may well yield additional information regarding aspects of connectedness like engagement behaviors. These measures are often logistically difficult to obtain. Thus, a study in which classroom observations, teacher reports, and SCS measures are all collected and compared may allow us to further validate the SCS as one simple measure of connectedness. Assuming this triangulation would produce consistent connectedness data, it may then further justify the use of the SCS without the other potentially redundant and more difficult to obtain measures.

Note

1. Portions of this paper were presented at the 2010 annual meeting of the American Evaluation Association in San Antonio, TX.

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