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SOCIAL ENVIRONMENTAL RISK AND PROTECTION: A TYPOLOGY WITH IMPLICATIONS FOR PRACTICE IN ELEMENTARY SCHOOLS

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Abstract

Social environmental assessments can play a critical role in prevention planning in schools. The purpose of this study was to describe the importance of conducting social environmental assessments, demonstrate that complex social environmental data can be simplified into a useful and valid typology, and illustrate how the typology can guide prevention planning in schools. Data collected from 532 3rd through 5th graders using the Elementary School Success Profile were analyzed in the study. A latent profile analysis based on eight child-report social environmental dimensions identified five patterns of social environmental risk and protection. The classes were labeled High Protection, Moderate Protection, Moderate Protection/Peer Risk, Little Protection/ Family Risk, and No Protection//School Risk. Class membership was significantly associated with measures of well-being, social behavior and academic performance. The article illustrates how the typology can be used to guide decisions about who to target in school-based preventions, which features of the social environment to target, and how much change to seek. Information is provided about online resources for selecting prevention strategies once these decisions are made.

Keywords

Assessment; Elementary school; Risk and protection; Prevention; Typology

Assessment serves multiple purposes in school-based prevention efforts with children. Assessment data may provide a description of problems, understanding of the factors contributing to problems, guidance in the choice of appropriate prevention strategies, and/or data for evaluating change (Corcoran & Fischer, 2000; Holmbeck, Greenley, & Franks,

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2004; Merrell, 2003; Richman, Bowen, & Woolley, 2004). Of these purposes, guidance in the choice of prevention strategies may currently be given the least attention by assessment developers. At the same time many practitioners have a high need for such guidance.

The most commonly used assessments in schools collect data that describe in detail the nature, frequency, and duration of problems in academic performance and social behavior at the individual or school level (N. K. Bowen, 2006). Such problem-oriented assessments do little to promote understanding of why behavior and performance problems exist and, therefore, provide little guidance in prevention planning. At the same time, an extensive body of theoretical and empirical work on child development suggests that the academic performance and socio-emotional functioning of a child at any given time can be explained by characteristics of the individual, past and current characteristics of the environment, and ongoing transactions between the individual and the environment (e..g, Bronfenbrenner, 1992; Fraser, Kirby, & Smokowski, 2004; Rutter, 2001; Sroufe, 1997). Assessing aspects of the social environment experienced by the child, therefore, may provide understanding of the causes of problems and guidance in prevention planning (N. K. Bowen, 2006; Richman, Bowen, & Woolley, 2004; Silverman & Saavedra, 2004).

A potential drawback of assessing multiple aspects of the social environment is the complexity of the assessment results. The translation of multi-faceted results into appropriate prevention strategies for individuals or groups may not always be straightforward. If social environmental assessments are to make a valuable contribution to school-based practice, strategies for summarizing and applying their results to prevention planning are needed. One strategy is to identify common patterns, or profiles, of social environmental experiences.

One aim of the current study was to simplify complex social environmental assessment data by identifying common profiles of risk and protection. Social environmental assessment data from 532 elementary school children were submitted to a latent profile analysis (LPA) in order to identify groups of students with unique profiles of risk and protection. The typology was validated through an examination of whether students with different profiles of risk and protection performed differently on a variety of outcomes.

The second aim of the study was to illustrate how a typology of social environmental risk and protection can help school-based practitioners answer the following four key questions of prevention planning: (a) Who should be targeted? (b) Which social environmental factors should be targeted? (c) How much change should be sought? and (d) Which prevention strategies should be implemented?

In summary, this article asserts the importance of assessing the social environments of elementary school children in order to plan effective and appropriate prevention efforts. A typology of social environmental risk and protection is used to illustrate how complex data on the social environment can help school-based practitioners answer four key prevention planning questions. In addition, the Elementary School Success Profile (ESSP, N. K. Bowen, 2006; N. K. Bowen, Bowen, & Woolley, 2004) is presented as an assessment tool that provides school-based practitioners with social environmental data to guide prevention planning with their own students.

Risk and Protection

An extensive body of literature on risk, protection, and resilience supports the use of these concepts for understanding child developmental outcomes at any point in time and over time. The rich child development literature on risk and protection offers increasingly complex theory and empirical data on the nature of transactional and multi-level

developmental processes (Rutter, 2001; Vance, 2001). The literature, for example, is beginning to identify how influences at multiple levels of the individual organism and the physical and social environments—e.g., genetics, neuropsychology, and social influences--interact with each other over time to yield outcomes (Pennington, 2002; Vance, 2001). While a review of this body of literature is beyond the scope of this paper, some key concepts are useful as a foundation for the current study. For an overview of risk and resilience and its application to social work practice, see Fraser (2004).

Risk and protective factors contribute both directly to developmental outcomes and indirectly to later outcomes through intermediate outcomes (Fraser et al., 2004). Risk factors are generally defined as individual traits, experiences, or environmental factors that increase the probability of a negative outcome. Two opposing conceptualizations of protection have been posited in the literature. The earliest definition suggested that protective factors were influences that reduced or buffered the negative impact of risk factors. Protection from this perspective was relevant *only in the context of risk* (Garmezy, 1985; Rutter, 2001; Werner & Smith, 1992). The concept of resilience is based on this type of protective factor. Resilience is successful adaptation in spite of risk exposure, due to the mitigating or buffering effects of individual, familial, or environmental protective factors (Garmezy, 1985; Werner & Smith, 1992). More recently, a different concept of protection, labeled “promotive factor,” has been advanced to capture the notion that some influences promote positive outcomes regardless of risk exposure (Sameroff, 2000).

The two views of protection have corresponding notions of how risk and protection are measured. From the resilience perspective, in which protection is meaningful only in the context of risk, protective factors are always distinct from risk phenomena and are measured separately. In contrast, from the promotive factor perspective, contrasting levels of the same factor measured with the same variable can serve either a risk or protective function (Sameroff, 2000). For example, low teacher support may be a risk factor that increases the probability of poor academic performance among a group of students, while high teacher support (measured with the same variable) increases the probability of successful academic performance. Considerable empirical evidence suggests that both views are valid and that protection operates in multiple ways (e.g., Dekovic, 1999; Jessor, Van Den Bos, Vanderryn, Costa, & Turbin, 1995; Pollard, Hawkins, & Arthur, 1999). Social work practice is likely to benefit from understanding the broadest array of factors that have been empirically linked to positive outcomes, not just those meeting the more stringent statistical requirements of the original definition of protection.

As reviewed by Fraser et al. (2004), the risk and protection literature consistently demonstrates that risk factors cluster together and that the accumulation of risk factors is especially detrimental to children’s outcomes (Rutter, 2001; Sameroff, 1985). These findings suggest that the number of risk factor matters more than the nature of the specific risks encountered. Similar clustering occurs with protective factors (Fraser et al.), and although there is less research on this phenomenon, cumulative protection is also associated with positive outcomes (e.g., Bowen & Flora, 2002; Jessor, et al., 1995). The clustering of risk or protection may be due at times to causal relationships among observed risk or protective factors, such that having one factor increases the chances of developing another, or to the presence of common developmental antecedents to the cluster of observed factors (Fraser et al.). For example, the clustering of protective factors may occur either because protection in one area leverages protection in others (e.g., when strong family support translates into efforts to connect children to protective influences in other areas), or due to common sources of protection in multiple areas (e.g., family income translates into neighborhood safety, access to a school with supportive teachers, and family relationships that are not strained by economic stressors).

Although the current study draws on the immense theoretical and empirical foundation of risk and protection, it focuses specifically on contextual risk and protection—influences in the neighborhood, school, peer, and family environments of children—and one point in time. We examine the social environment of a sample of elementary school children, present a typology of risk and protection, and demonstrate how social environmental assessment data can be used to guide prevention decisions. Risk and protection in each area examined were defined as opposing poles of the same measure. For example, a low score on a measure called Neighbors Who Care was considered a potential risk factor, while a high score on the same measure was considered protective.

Methods

Sample

The analyzed sample of 532 cases was drawn from a dataset (N=558) in which two samples were combined: a representative community sample of 497 3rd through 5th graders in seven elementary schools, and a sample of 61 students from a predominantly African American, low income inner city elementary school. Data for the samples were collected in the spring and fall of 2004, respectively. For the first sample, a random sample of 770 3rd through 5th grade students attending one community's seven elementary schools was drawn by personnel in the school district's administrative offices. Hispanic/Latino children were over-sampled to ensure adequate representation. Parents of the 770 students received consent packets explaining the study. The 497 children whose parents provided consent to participate represented 64.5% of the targeted random sample and 24.4% of the community's 3rd through 5th grade population. The obtained sample was representative of the community's public school population in the targeted age range on gender, race/ethnicity, grade level, free or reduced lunch program participation, and special programs participation. The inner city sample was obtained in order to increase the generalizability of findings to the school populations most often targeted in prevention efforts. Parent consent was sought from all parents of 3rd through 5th graders at the school. The obtained sample represented 47% of the 118 third through fifth graders at the school.

Cases were excluded from the analyses if they had missing values on one or more of the social environmental composites used in the typology analysis. The 26 excluded cases did not differ from the analyzed cases in terms of race/ethnicity, grade level, or on seven of the eight composites. However, excluded sample members were more likely to be male (chi square=4.02, df=1, $p \leq .05$) and had a lower mean on the Neighbors Who Care composite ($t=2.28$, $p \leq .05$).

Measures

Overview of the Elementary School Success Profile—All data analyzed for the current study were obtained with the ESSP (N. K. Bowen, 2006;N. K. Bowen, Bowen, & Woolley, 2004). The ESSP is a 3-part assessment tool designed to help school-based practitioners identify social environmental influences that promote or impede school success among 3rd through 5th graders. Data are collected with separate questionnaires for children, parent/guardians, and teachers on 17 dimensions of the social environment, four dimensions of physical health and well-being, three dimensions of home and school social behavior, and four dimensions of school performance. The combination of multiple sources of data is a major strength of the ESSP (Silverman & Saavedra, 2004).

The ESSP has undergone a rigorous development process, including extensive testing with children to ensure their ability to understand and respond validly to child-report items, and multiple pilot tests in schools (N. K. Bowen, 2006;N. K. Bowen et al., 2004;N. K. Bowen &

Powers, 2005; Woolley, Bowen, & Bowen, 2004). A detailed report on the reliability and validity of the child component of the ESSP is available elsewhere (N. K. Bowen, 2006). The ESSP was developed in response to requests from school-based practitioners using the School Success Profile (SSP, G. L. Bowen, Richman, & Bowen, 2002;G. L. Bowen, Rose, & Bowen, 2005) who asked for a version of the SSP for younger children. The SSP is a well-validated, self-report instrument that asks adolescents about their social environments, their physical and psychological well-being, and their school performance (G. L. Bowen, et al., 2005). Information about the subset of ESSP measures used in the current study is provided below.

Social Environmental Measures Used in Latent Profile Analysis—The analysis to identify patterns of social environmental risk and protection was based on a subset of items on the child-report component of the ESSP. Eight composites from four domains (neighborhood, school, peer system, and family) were used in the LPA. Questions had 3- or 4-point ordinal response options, such as “never,” “sometimes,” “often,” and “always.” Composite scores were created from sets of related questions (scales) and scored so that values ranged from 0 to 1 and represented the proportion of maximum (best) score possible on each scale. Based on clinical judgment and prior analyses of bivariate relationships between social environmental scores and outcome variables, the following interpretation guidelines are provided to users of the ESSP: Scores above .80 are considered to be in the protective range. Scores between .60 and .80 indicate areas of potential concern, and scores below .60 indicate risk. These cutoffs were used to guide the interpretation of classes below. Characteristics of the social environmental measures are presented in Table 1.

Measures used to Validate the Typology of Risk and Protection—After identifying the number and nature of the patterns of risk and protection (classes) found in the LPA, additional analyses were conducted to determine if children in different classes performed differently in terms of eight outcome variables. Four child-report, one parent-report, and three teacher-report composite measures from the ESSP were used as dependent variables in these tests of the validity of the typology. The child-report composites were based on items with 3- and 4-point ordinal frequency response options. The parent- and teacher report behavior composites were based on items with a 6-point ordinal frequency response set, ranging from “never” to “always.” The academic performance composite was based on standardized scores from two teacher-report ordinal items assessing recent grades in math and reading, and two items assessing whether the child was below grade level, on grade level or above grade level in the two subjects. The outcome measures are described briefly in Table 1.

Statistical Analyses

This study utilized latent profile analysis with MPlus 3.11 (Muthén & Muthén, 2004) to identify patterns of social environmental risk and protection experienced by students. LPA is person-centered approach which groups individuals into classes in order to explain observed relationships among a set of variables (Muthén & Muthén, 2000; O’Connor & Colder, 2005). Theoretically, class membership is viewed as an unobservable characteristic of individuals that “causes” their observed scores on variables used in the analysis (Iqbal et al., 2005; Muthén & Muthén, 2000). In other words, being part of a particular class helps explain why an individual student answers a set of assessment questions a certain way. Individuals in a class are assumed to be similar in terms of the scores they get on the assessment but different from individuals in other classes (Muthén & Muthén). The objective of LPA is to find the smallest number of classes (or groupings of similar students) that can explain the associations among a set of observed variables (Muthén & Muthén).

A number of strategies for assessing model fit and selecting a solution are discussed in the literature. According to Nylund, Asparouhov, and Muthén (2006), however, there is no consensus on the best criteria for identifying the number of classes that exist. Among the most common statistical criteria are the Log Likelihood statistic, the Bayesian Information Criterion (BIC), average posterior probabilities, and the number or percentage of sample members in the smallest classes of a solution. Models with higher log likelihood values and lower BIC values are considered better. Good classification quality is indicated by high average latent class probabilities (Muthén & Muthén). Average latent class probabilities indicate how accurately each individual can be assigned to a class given the model.

Muthén & Muthén (2000) have cautioned against using solutions in which any class had fewer than 50 individuals. However, others have used lower cut points to accommodate classes containing high risk sample members (Oxford et al., 2005). Interpretability, theoretical validity, and utility of the classes for practice are also critical criteria (Muthén & Muthén). Some researchers choose interpretability over statistical criteria as the reason for selecting their final models (Muthén & Muthén; O'Connor & Colder, 2005; Oxford et al., 2005).

In the current study, solutions with different numbers of classes were tested sequentially, starting with the 1-class solution. The BIC was used as a guide, average class probabilities of .90 or higher were sought, and class sizes of no less than 5% of sample (n=26) were sought. In addition, theoretical interpretability, construct validity (degree to which classes were differentially associated with outcomes), and practice utility were emphasized. The validity of the final solution was tested with Oneway ANOVA's in SPSS 14.0 (SPSS, 2005). In this analysis, group means on eight outcome variables were compared for children in the different classes identified with the LPA. Because of variation in group sizes and variances of means of the classifying variables, the Tamhame method of post hoc comparisons was used.

Results

Analyzed Sample Characteristics

Gender, race/ethnicity, age, and free/reduced lunch participation data were available for between 503 and 507 of the 532 analyzed cases. About half of the sample was female (50.9%, n=258). About 40% (43.3%, n=218) were European-American, 37.0% (n=186) were African-American, 15.7% were Latino/Hispanic (n=79), and 4.0% were students with Asian, Native American, or multi-racial backgrounds (n=20). The mean age was 9.8 years, and close to half of the sample (46.0%, n=232) qualified for free or reduced price school lunches.

LPA Analysis

A 5-class solution emerged as the best model, based on a combination of the criteria. The BIC and log-likelihood values improved from the 5- to 6-class solution, and the log likelihood also improved between the 6- and 7-class solutions. In the 6-class solution, however, one class became smaller than 5% of sample. In addition, the average latent class probability scores of the 5-class solution were better than the 6-class solution, with only one value slightly below the .90 cutoff as compared to three values below the cutoff in the 6-class solution. Table 2 presents model comparison statistics, and Figure 1 illustrates the mean score profiles of the five classes on the social environmental dimensions.

As shown in Figure 1, members of the High Protection class (48.7%, n=259) had higher scores than the other groups, with all but one score over .90 and the remaining score just under this value. The majority of scores for the Moderate Protection class (31.1 %, n=166),

in contrast, were below .90, but still in the protective range (over .80). The average score of this class on one dimension, School is a Fun Place to Learn, was in the middle of the cautionary range (.70); none were in the risk range. Each of three remaining classes experienced risk in one or two areas, combined with moderate, little, or no protection in other areas. The Moderate Protection/Peer Risk class (6.8%, n=36) had mean scores near or above the protective level of 0.80 on all dimensions except for Accepted by Peers and Friends Have Good Behavior, which had scores in the risk range. The majority of scores for the Little Protection/Family Risk class (7.6%, n=40) were in the cautionary range, and there was an especially low score on the Family Who Care dimension (0.59). Two scores related to peers were at or above the protective cutoff of .80, (School is a Fun Place to be With Peers, Friends Have Good Behavior), suggesting some protection. Finally, the No Protection/School Risk class (5.8%, n=31) had a majority of scores in the cautionary range, no means in the protective range, and two school dimension scores in the risk range.

Validation of the Five-Class Typology

The validity of the 5-class typology was tested by comparing class means on eight child-, parent-, and teacher-report ESSP outcome variables. From past research on cumulative risk and protection, we expected to find that children in the classes with the most risk would evidence the lowest scores on outcomes, and children in classes with the most protection would evidence the highest scores. Results are presented in Table 3 below.

The most consistent validity finding was that membership in the High Protection class was associated with statistically significantly higher means than two, three, or four of the other classes on every outcome (as shown by the letters in parentheses in Table 3). Children who perceived high protective levels of all of the social environmental influences examined were experiencing the best physical and psychological well-being, and demonstrating the best social and academic behaviors. The Moderate Protection class tended to have outcome means that were statistically significantly lower than the means of the High Protection class, but also higher than the means of one or more groups that faced risk. The classes that experienced one or more risk factors (Moderate Protection/Peer Risk, Little Protection/ Family Risk; No Protection/School Risk) had consistently lower means than the High Protection group, and means that were also usually significantly lower than the means of the Moderate Protection group. The Moderate Protection/Peer Risk group had a higher mean than the other two risk groups on two of the eight outcomes examined—Positive Feelings about Self, and Knows Where to Get Support—but did not differ from the two other risk groups on other outcomes. The two risk groups with little or no protection did not differ significantly from each other on any of the outcome variables.

Discussion

Using latent profile analysis and data from 532 3rd through 5th graders, this study identified a typology of social environmental risk and protection. The identified classes were labeled: High Protection, Moderate Protection, Moderate Protection/Peer Risk, Little Protection/ Family Risk, and No Protection/School Risk. Substantive interpretability and validity were major factors in selecting a 5-class solution. The findings suggest the value and validity of using social environmental assessments in schools to understand and address factors associated with students socio-emotional and academic functioning.

The identification of a High Protection group allows us to refine the clinical definition of protection that has been used with the ESSP. Previously, clinicians have been instructed that ESSP dimensions with scores above .80 represent areas of protection for children. The cutoff of .80 was validated by the finding of superior performance of the Moderate Protection group relative to the three groups experiencing risk, but the even better

performance of the group with scores over .90 indicates that higher levels of protection in all areas yield the most desirable outcomes among elementary school children.

The High Protection, Moderate Protection, and No Protection/School Risk classes were consistent with cumulative models of risk and protection. Cumulative models suggest that risk and protective factors tend to cluster together. In each of these classes there was consistency across social environmental domains in the levels of risk or protection experienced. It is not possible to determine from our cross-sectional data whether there were causal relationships among the risk and protective factors experienced in the different social environmental areas, or whether other unmeasured factors explained the tendency to experience similar levels of risk and protection across domains.

Cumulative models of risk and protection also assert that the number of risk or protective factors matters more than the specific nature of the factors in the prediction of outcomes (Rutter, 2001; Sameroff, 1985). The High Protection, Moderate Protection, and No Protection/School Risk classes had statistically different scores from each other on the majority of the outcomes examined. The scores were ranked in the expected order—the group with the highest number of protective factors and no risk factors (High Protection) had the highest scores, the group with the next highest number of protective factors and no risk factors (Moderate Protection) had the next highest scores, and the group with no protective factors and two risk factors (No Protection/School Risk) had the lowest scores.

The two classes in which experiences of risk and protection differed substantially across domains of the social environment represent discontinuity models of risk and protection. The Moderate Protection/Peer Risk and Little Protection/Family Risk classes demonstrate that risk can occur in the context of multidimensional protection, or in the context of mediocre support in other areas. These classes may represent temporary or transitional stages in longitudinal processes leading to either an accumulation of risk or protection. Sudden changes in family structure or economic status, for example, may change a child's family experience from protective to difficult while protective influences continue to operate in other domains. A change of neighborhood or school may place a child in the midst of a new negative peer group. Alternatively, the two classes may reflect common and stable discontinuities of experiences in child development. For example, enduring individual traits, such as an attention deficit and/or hyperactivity, might negatively influence a child's peer system, irrespective of other protective influences. The cross-sectional nature of the data do not permit adequate exploration of the nature, stability or possible causes of the discontinuities observed in these two classes.

The typology of risk and protection obtained in this study can be used to inform prevention planning in conjunction with the clinical judgment of practitioners and consideration of available time, personnel, and financial resources. Lessons from the typology for decision making around the four prevention planning questions are discussed below.

Who Should be Targeted?

A common public health model defines three levels of preventive intervention and indicates who is appropriately targeted with each level. As conceived by Gordon (1983), universal, selected, and indicated preventions apply only to "persons who are not, at the time, suffering from any discomfort or disability due to the disease or condition being prevented" (p. 108). The "disease" to be prevented in school practice might be dropping out of school or academic failure.

Universal prevention efforts are "desirable for everybody" (Gordon, 1983, p. 108), but they are especially designed to prevent the development of risk and to maintain protection.

Universal prevention would theoretically be most appropriate for sample members who are not exposed to social environmental risk factors and are therefore not candidates for selective or indicated interventions. In the new typology, the High Protection and Moderate Protection classes fit this criterion. About 80% of the sample was represented by these two classes, which is consistent with expectations about the percentage of populations appropriately served with universal prevention efforts (Stollar, Poth, & Cohen, 2006).

Together, the three classes experiencing risk comprised about 20% of the sample, somewhat more than the 10% to 15% expected in the three-level model of prevention (Stollar et al., 2006). These students are appropriately targeted with selective or indicated strategies. Students in the risk classes were similar on the majority of the outcomes examined, however, those in the Moderate Protection/Peer Risk group fared significantly better in two outcome areas. It is not clear if this advantage was due to peer risk being less harmful than school or family risk, or due to the benefits of protection in multiple other areas. Because the results about potential differences in risk groups are not definitive, no conclusion should be made about targeting children with one type of risk over another or for targeting students with risk in the absence or presence of protection in other areas. Further study of these classes is warranted.

Ideally, schools would implement prevention efforts at all of Gordon's (1983) levels of prevention. Even the High Protection class has unfavorable scores on two of the outcome composites (teacher-report social skills and learning behavior), for example, suggesting room for improvement even among members of this class. In addition, protection must be sustained over time in order for favorable outcomes to be sustained. In reality, however, many schools have limited resources for multi-level prevention efforts. The validation analyses indicate that students demonstrating social environmental risk factors are appropriately prioritized by clinicians hoping to maximize their impact with limited resources. Practitioners might have difficulty justifying the targeting of Moderate Protection students, who had superior performance relative to students in the risk classes, even though they performed significantly worse than High Protection students on most outcomes.

Which Social Environmental Factors Should be Targeted?

After identifying students in need of prevention efforts, practitioners must determine which environmental factors to target. The typology and outcome analysis provide justification for targeting all social environment areas with less than strong protection (scores of .90 on the ESSP measures). Students with scores close to or above .90 demonstrated superior performance on the eight outcomes. The typology and outcome analysis suggest that the second most desirable strategy would be to target all factors with scores below an assessment's pre-defined protection level (.80 on the ESSP). This approach is justified by the superior outcome performance of the Moderate Protection class compared to the risk classes. In the context of limited resources for prevention, however, it may be best to focus efforts on a combination of the social environmental dimensions with the lowest scores. The poorer outcomes evidenced among the classes experiencing risk indicate that efforts to prevent school failure are most urgently needed in those areas.

Children with profiles consistent with the Moderate Protection/Peer Risk class are likely to benefit most from strategies that target peer rejection and antisocial behavior at the group level. Family relationships are a prevention priority for the Little Protection/Family Risk group, but other supports across the neighborhood, school, and peer dimensions should also be developed. The No Protection/School Risk group similarly would benefit from prevention efforts simultaneously targeting all dimensions, but school risk factors might appropriately be prioritized in the context of resource constraints.

How Much Change Should be Sought?

The outcome validation of the 5-class solution provides guidance in decisions about how much change should be sought in social environmental scores. School resources and stakeholder goals will also play a role in decisions. Based on the outcome validation analysis alone, it is clear that scores above .90 on social environmental dimensions are the most desirable, with scores above .80 being the next best choice. For children with multiple dimension scores in the risk range (i.e., below .60), it may be necessary to set intermediate change goals that move the child toward the strongest levels of protection in feasible increments. For those with cautionary scores in one or two areas, the study's findings suggest that change goals should focus on moving into the protection range (.80 or higher), and then the high protection range (.90 or higher).

Which Prevention Strategies Should be Implemented?

After practitioners have identified the students and social environmental factors in need of prevention efforts, and have set change goals, relevant and feasible interventions must be identified and implemented. Using prevention strategies to improve malleable aspects of the social environment is expected to lead to improvement in the distal problems of interest (G. L. Bowen et al., 2002; Powers, Bowen, & Rose, 2005), such as unsatisfactory individual or aggregate academic performance or social behavior.

Selecting appropriate prevention strategies involves reviewing existing strategies to find those that are delivered at the desired level of prevention, that target identified social environment needs (Powers et al., 2005), and that are feasible given available resources. In spite of certain limitations, online databases increasingly offer an inexpensive and efficient way for practitioners to review available prevention strategies. Authoritative online sources of information on effective programs include: The Blueprints for Violence Prevention Website (http://www.colorado.edu/cspv/blueprints/), the OJJDP Model Programs Guide (http://www.dsgonline.com/mpg2.5//search.htm), the Promising Program Network (http://www.promisingpractices.net/), and the SAMHSA Model Programs website (http://modelprograms.samhsa.gov/template_cf.cfm?page=model_list). While there is overlap of the programs presented at each website, each site has its own navigational logic (e.g., searching by risk factors), and unique program rating criteria and program information.

The newly developed ESSP online best practices database (www.schoolsuccessonline.com) also helps practitioners find prevention strategies. The ESSP database and a corresponding SSP database with best practices for middle and high school students are accessible to all practitioners, not just ESSP and SSP users. Information on evidence-based programs (rigorously tested programs), promising practices (strategies that have preliminary support), and resources (online and print sources of prevention information) is available and searchable by dimensions of the social environment. Based on the combination of social environmental needs of a particular group of children, practitioners may identify one program that targets multiple factors of concern, or multiple programs and practices that together address all areas of concern. A summary of resource requirements is provided for each program and practice, so school staff can quickly assess the feasibility of their potential prevention choices. Because it may be difficult for school practitioners using social environmental assessment data to distinguish between "at-risk" and "high risk" students, and because many available prevention strategies do not clearly fall into either the selective or indicated categories, prevention strategies in the database are classified as universal, selected/indicated, or both.

Limitations—The study had a number of limitations. First, the data were cross-sectional, so no causal inferences can be made about the relationships between classes and outcomes.

Second, the internal consistency reliabilities of two of the social environmental scales were slightly below the minimal desirable level, which increases the error in the study's results. Third, cases excluded from the analysis differed from the included cases on two characteristics, which may reduce the generalizability of the findings. Fourth, although the study's use of child self-report data on the social environment is unique, self-report data represent perceptions of the environment, not objective measures of the environment. A strength of the study was the use of multiple sources of outcome data for the validation analyses. It should be noted, however, that more significant relationships between class membership and outcome variables were found for the child-report outcomes, which could partly reflect the common data source. Finally, aspects of the mixture modeling method used in the study are still being developed and disputed. The class solution chosen did not meet every one of the most common criteria, however, it was strong in terms of interpretability, empirical validation, and implications for practice.

Future Research Needs—Due to space limitations, two important aspects of the current analyses could not be elaborated. First, the role of protection in the choice of prevention efforts should be examined more closely. Prevention strategies rely on resources that include family, community, school adults, and, at times, peers. Evidence of these sources of support in profiles should be used to guide intervention selections in addition to risk status (Powers et al., 2005). Second, the pattern of relationships between classes and specific outcomes merits further exploration and could provide a number of practice insights, as illustrated in a previous study using SSP data (Powers et al.). The typology should be replicated with data from other populations and from other assessment tools. In addition, longitudinal analyses should be conducted to determine the stability of the typology over time, and for children of different ages.

Despite its limitations, this study suggests that social environmental assessment data on large numbers of children can be simplified into useful typologies of risk and protection. Common patterns of risk and protection can be identified and used to inform decision making about prevention efforts in schools. Attempting to develop prevention programs for elementary school children in the absence of social environmental assessment data is unlikely to result in the selection of the most appropriate or effective prevention strategies. The ESSP represents a useful social environmental tool for practitioners who want to identify and address patterns of need among their students.

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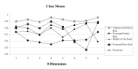

Figure 1.
Class Means on 8 Social Environmental Classification Variables
Dimension Labels
1: Neighbors Who Care, 2: Teacher Who Cares, 3: School is Fun Place to Learn, 4: School is Fun Place to be with Peers, 5: Friends Who Care, 6: Accepted by Peers, 7: Friends Have Good Behavior, 8: Family Who Care

Table 1

Descriptions, Means, and Internal Consistency Reliabilities of ESSP Measures in Study

	Description	M (SD)	Reliability (Alpha)
Child-Report Social Environmental Measures used in Typology Analysis			
Neighbor-hood	*Neighbors Who Care*: Five items about whether adult neighbors are nice, attentive, and available to child	0.85 (0.14)	0.66*
School	*Teachers Who Care*: Six items about whether the teacher listens to, helps, praises, and cares about child	0.85 (0.13)	0.76
	Fun Place to Learn: Four items about whether the child looks forward to school and learning at school	0.79 (0.17)	0.81
	Fun Place to be with Other Children: Three items about whether the child has friends at school	0.88 (0.14)	0.67*
Friends	*Friends Who Care*: Four items about whether the child has friends who listen to, help, and have fun with the child	0.84 (0.17)	0.77
	Accepted by Other Children: Seven reverse coded items about whether the child gets picked on, teased, and excluded	0.84 (0.16)	0.85
	Friends Have Good Behavior: Five items about whether the child's friends fight, hit, lie, or hurt others' feelings	0.85 (0.17)	0.88
Family	*Family Who Care*: Eight items about whether family members listen to and are supportive to the child, and have fun together	0.89 (0.13)	0.87
Measures Used to Validation the Typology			
Child-Report			
	Good Physical Health: Eight items about the frequency of health complaints, such as headaches, stomachaches, or hearing problems	0.88 (0.09)	0.75
	Positive Feelings about Self: Seven items about how often the child feels good at different types of activities, such as sports, art, music, and being a friend	0.86 (0.13)	0.74
	Good Adjustment: Four items about internalizing disorders, such as feeling alone or worrying that bad things will happen	.79 (0.16)	0.74
	Knows Where to Get Support: Seven items about the availability of different types of support, such as someone who listens or provides help	.82 (0.15)	0.82
Parent-Report			
	Child's Social Skills: Eleven items about the child's social skills, such as regulating emotions, understanding others' feelings, and following rules	.74 (0.13)	0.86
Teacher-Report			
	Child's Social Skills: Eleven items about the child's social skills, such as regulating emotions, understanding others' feelings, and following rules	.76 (0.17)	0.95
	Learning Behavior: Twelve items about the child's classroom learning behavior, such as paying attention and completing tasks	.72 (0.18)	0.97
	Academic performance: Four items about grades and grade level performance in math and reading	.01 (0.04)	0.88

*These scales have been revised to improve their psychometric properties.

Table 2

Class Solutions Comparison Table

Class Solution	BIC	Log likelihood	Lowest Class Proportion	Lowest Average Latent Class Probability
One	−3875.76	1988.09	1.00	1.00
Two	−4632.66	2394.79	0.22	0.95
Three	−4782.08	2497.74	0.11	0.88
Four	−4853.17	2561.53	0.07	0.85
Five (final)	**−4987.67**	**2657.03**	**0.06**	**0.86**
Six	−5039.80	2711.34	0.03	0.86
Seven	−5036.40	2737.88	0.01	0.86

Table 3

Substantive Validation of the Five-Class Solution: Means on Outcome Variables and Significant Classes Differences

	Physical Health (CR)[^] *M (group differences)*	**Positive Feelings About Self (CR)** *M (group differences)*	**Good Adjustment (CR)** *M (group differences)*	**Knows Support (CR)** *M (group differences)*	**Social Skills (PR)**[^] *M (group differences)*	**Social Skills (TR)**[^] *M (group differences)*	**Learner Behavior (TR)** *M (group differences)*	**Academic Performance**[+] **(TR)** *M (group differences)*
(a) High Protection	.91 (b,c,d,e)	.91 (b,d,e)	.86 (b,c,d,e)	.90 (b,d,e)	.77 (c,d,e)	.80 (b,c,d,e)	.77 (b,c,d,e)	.53 (c,e)
(b) Moderate Protection	.88 (a,c,d,e)	.82 (a,d)	.77 (a,c,d,e)	.78 (b,c,d,e)	.74 (−)	.74 (a,c)	.71 (a,c,e)	.30 (c,e)
(c) Moderate Protection/Peer Risk	.78 (a,b)	.88 (d,e)	.64 (a,b)	.87 (b,d,e)	.69 (a)	.64 (a,b)	.62 (a,b)	−2.56 (a,b)
(d) Little Protection/Family Risk	.82 (a,b)	.73 (a,b,c)	.64 (a,b)	.64 (a,b,c)	.69 (a)	.71 (a)	.67 (a)	−.53 (−)
(e) No Protection/School Risk	.78 (a,b)	.73 (a,c)	.65 (a,b)	.58 (a,b,c)	.68 (a)	.70 (a)	.59 (a,b)	−2.37 (a,b)
Omnibus F test statistics	$F(4,530) = 34.97^{***}$	$F(4,531) = 44.45^{***}$	$F(4,531) = 43.89^{***}$	$F(4,531) = 101.24^{***}$	$F(4,503) = 8.20^{***}$	$F(4,509) = 12.29^{***}$	$F(4,508) = 13.83^{***}$	$F(4,506) = 10.46^{***}$

[^] CR, PR, and TR = child report, parent report, and teacher report respectively

*** $p < .001$

[+] This composite is standardized and has a mean of 0; scores should not be compared with the other outcome means