The Influence of Schools on Adolescent Behavior and Risk-Taking
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Introduction
(A) *Overview and Theoretical Perspectives in Brief*

This paper draws upon developmental-contextual (e.g., Bronfenbrenner, 1979; Bronfenbrenner & Morris, 1998) and systems theory (Magnusson & Stattin, 1998; Sameroff, 1995) approaches to the developmental and prevention sciences. Central assumptions of these approaches are that (1) development is a function of dynamic and reciprocal transactions between individuals and the unique contexts in which they live, and (2) individuals and contexts represent coherent systems comprising a number of important and interrelated elements. As ecological models have been increasingly applied to development in educational contexts, the culture and climate of school and classroom settings as unique systems comprising characteristics of teachers, administrators and school staff, students, and the dynamic relationships between them, has become both a focus of intense study and a target of intervention and prevention efforts, many of which focus directly on both risk-taking behavior as well as universal social and emotional skills and processes (Jones, Brown & Aber, 2008; LaRusso, Brown, Jones & Aber, 2009). Recently, there is an emerging theory of social settings (or setting-level theory; e.g., Shinn & Yoshikawa, 2008; Tseng & Seidman, 2007) that is directed toward defining the key aspects and processes of these contexts that drive developmental outcomes. Setting-level theory as applied to schools and school micro-contexts focuses largely on social processes (e.g., interactions between individuals), resources (e.g., financial and material resources), and physical arrangements.

Developmental-contextual, systems, and settings models view development as taking place in a nested and interactive set of contexts ranging from the most immediate micro-contexts to the more distal meso- and exo-contexts. Within each context, individual experience and behavior is dynamically mediated by numerous proximal processes. In the micro-context (e.g., family, peer system, classroom, school), among the most salient proximal processes are important relationships (e.g., Pianta, 1999). For example, youth experience school contexts primarily through relationships with teachers and peers. Together adolescents, their peers, and teachers contribute to a dynamic and enduring set of interactions that is characterized by regular and consistent patterns. Thus, the theoretical models guiding the structure and organization of this paper posit that individual development is precipitated by experiences in multiple contexts that are dynamic, nested, and transactional in nature. Focusing on schools in particular is warranted for two primary reasons: (1) adolescents spend most of their waking time outside the home in their schools (and neighborhoods), in some cases perhaps making family environments less salient in terms of certain risk taking behaviors; and (2) most youth are exposed to these environments, suggesting that these environments could play a substantial role in determining population-level distributions of risk-taking behavior. Altogether, from the perspective favored in this paper, the question about the influence of schools in adolescents' risk taking behavior becomes one that favor not the main and monotonic effects of school on development, but one that focuses on the particular interactions between individual, social and cultural factors as they naturally occur in different settings within the schools.

(B) *Schools as Entities and Identifying Salient School-Level Phenomena and Processes*

Building out of this theoretical framework and in consideration of the body of literature that informs this paper, for our purposes we consider the school as a primary context for development

(one that is distinct from neighborhoods, for example; see Arum, 2000; Kirk, 2006; 2009), that (1) has socio-demographic structural characteristics (e.g., school disadvantage, per pupil expenditure, school poverty, school/classroom size), and (2) comprises a number of essential micro-contexts or micro-systems (classrooms, lunch rooms, outside space, hallways) which, in turn, carry certain characteristics (e.g., socio-demographic and behavioral composition, norms for behavior and discipline, perceptions of safety, and violence). In our view, these structural and micro-context features of schools carry their influence to child and youth outcomes (i.e., "risk-taking behavior") through a set of schooling processes (Bidwell & Kasarda, 1980[1]) that are embodied in (1) key relationships (between teachers and students and among peers), (2) student perceptions of connectedness or bonding to school, and (3) student and teacher perceptions of school climate. Interestingly, these schooling processes bear a great deal of similarity to the key features of social capital (e.g., norms, social networks, and relationships between adults and children) that have been identified in the sociological literature as important linking mechanisms between families and youth educational outcomes (e.g., Coleman, 1987) and between neighborhoods and youth social and problem behavior outcomes (e.g., Sampson, 2001).   A key feature of this conceptualization is that it incorporates both direct effects of structural elements and features of micro-systems, as well as their interactive influence on schooling processes, such as the quality of relationships and perceptions of climate, which, in turn, are tied most proximally to youth outcomes. Despite rich theoretical guidelines, there is relatively little empirical work that has incorporated more than one or two of these elements, focusing on both structural and process features and their links to youth outcomes.

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[1] Bidwell & Kasarda (1980) describe "schooling" as the process whereby instruction occurs. They provide a useful organizing perspective that can be applied to risk-taking and other developmental outcomes as well: "A theory of schooling must include a conceptualization of its social organizational components. A theory of school effects must show how the organizational form of schools affects schooling" (page 401).

In reviewing the literature and assessing the influence of schools on adolescent behavior and risk-taking we focused our search in the areas presented above: (1) socio-demographic structural characteristics, (2) micro-contexts or micro-systems (classrooms, lunch rooms, outside space, hallways), and (3) schooling processes that are embodied in (a) key relationships, (b) connectedness or bonding to school, and (c) school climate. In the following pages we begin by briefly defining and characterizing adolescent behavior and risk-taking. Part II of the paper provides a summary of the relevant literature in the areas highlight here, noting effect sizes and considering key factors such as differential findings by developmental stage (early vs. later adolescence or middle vs. high school effects) and by location (urban, suburban, or rural schools) when possible. This review is followed by Part III in which we review intervention and prevention efforts focusing on the degree to which change in contextual factors in schools result in changes in risk behaviors. We conclude the paper with a brief summary along with recommendations for research and intervention/prevention.

Before proceeding, a comment about the emphasis and key outcomes of focus in this review is necessary. Not surprisingly, the majority of research focusing on school effects on children and youth focuses on learning and achievement (e.g., Coleman 1987; Hedges, Laine & Greenwald, 1994). Although early reports suggested that schools had no impact on educational outcomes beyond that of families (e.g., Coleman, et al., 1966), newer research began to show clear school effects on achievement and a broad array of social behaviors (e.g., Rutter, 1983). Consistent with the presentation below, the balance of early research summarized nicely in Rutter (1983) clearly emphasizes the relative importance of "the ethos of the school as a whole" (page 25) over the relative influence of individual structural features (e.g., resources and physical plant, school size, etc.) for youth outcomes in both the academic and social outcome domains. Based on his

review, Rutter (1983) argues that it is the "overall functioning of the school as a social organization [that] affects pupil attendance, behavior, and attitudes toward the educational process as a whole" (page 25). In our view, the functioning of the school as a social organization is represented primarily in the relationships youth have in school (with teachers and peers, but also among teachers and school staff although not a focus of this paper) in key social contexts (in classrooms and other micro-settings). Thus, it may not be surprising that per-pupil expenditure or overall school size bear little direct weight on adolescent outcomes, but to the degree that they influence the quality of relationships in settings in the school for example, they likely play an important indirect role. In consequence, in the presentation below we have emphasized the schooling process constructs which we see as most proximal to youth outcomes. Finally, we have worked to maintain a relatively narrow focus directly on the four risk-taking behaviors (see below) identified as particularly salient for youth developmental outcomes. However, because there is relatively little systematic research focusing on the primary school characteristics we have identified, in some cases we expand to other outcome domains, largely major correlates of the risk-taking behaviors.

 (C) Defining Adolescent Behavior and Risk-Taking in Schools.

On average, rates of risk behaviors increase during the early adolescent years (Cote, Tremblay, Nagin, Zoccolillo, & Vitaro, 2002; Tolan, & Gorman-Smith, 2002). Underlying this average increase in risk behaviors is great variability in individual patterns of change in developmental processes and in both adaptive and maladaptive behaviors (Rudolph, Kurlakowsky, & Conley, 2001; Seidman & French, 2004). Risk behaviors in adolescence can reflect transitory, exploratory activities and choices that do not lead to negative outcomes. Such risk behaviors have even been understood as supporting the developmental competencies of adolescence (Jessor, 1992; Lightfoot, 1997). However, many adolescent risk behaviors are highly problematic and linked to current and future

negative social and health consequences, including developmental pathways toward

psychopathology (McGue, & Iacono, 2005). Although risk behavior involves individual choice, risks

are increasingly understood not only by researchers but also by adolescents themselves to happen

in the context of their significant social relationships and social contexts (Lightfoot, 1997; Selman, &

Adalbjanardottir, 2000; Way, 1998).

Adolescent behavior and risk-taking is defined for the purposes of this paper in four primary

areas: sexual risk behavior, substance use, illegal behavior (e.g., aggression and delinquency), and

dangerous driving. According to recent meta-analytic evidence compiled the National Academy of

Sciences (NAS, 2009) mental, emotional and behavioral problems have a prevalence of 17% in

youth up to 25 years of age. Disruptive behavior, characterized according to DSM-IV criteria, occurs

at a rate of 6.1% and substance use at 10.3%. Alcohol use among youth has a prevalence of 4.3%,

while conduct disorders is reported at 3.5%. These disorders interfere with daily functioning both

in and out of school (e.g., Adelman & Taylor, 1998; Roeser, Eccles, & Strobel, 1998). Indeed,

approximately 7.2 million adolescents in America terminate their education prematurely due to the

early-onset of psychiatric disorders (Kessler, Foster, Saunders, & Stang, 1995). Such risk-taking

behaviors have clear impact beyond educational attainment and the onset of psychiatric disorder.

For example, in a report from a prior workshop in the Science of Adolescence series, Blum

(2008/2009) reported that vehicular injuries, homicide, and suicide accounted for nearly 75% of the

mortality rate for adolescents between ages 10 and 18 years.

To what degree do adolescent risk behaviors occur *in schools*? According to *Indicators of

School Crime and Safety: 2008* (Dinkes, Kemp, Baum & Snyder, 2009) in 2007, 8% of students in

grades 9 to 12, nationally, reported being threatened or injured with a weapon on school property

in the previous 12 months, and 22% reported that illegal drugs were made available, offered, sold

or given to them on school property. Additionally, in 2006, 34 of the thefts per 1,000 students

occurred on school property, compared to the 25 per 1,000 that occurred outside of school. Finally,

in 2007 32% of students ages 12 to 18 reported having been bullied at school during the year, 45%

reported having consumed at least one drink of alcohol anywhere, while 4% of them reported

having consumed at least on drink on school property. Similarly, 22% of students grade 9 to 12 in

2007 reported using marijuana anywhere during the past 30 days, while 4% reported having used it

on school property during that period. Within schools, research has identified specific times and

spaces where school violence is more likely to occur. The period before and just after school or

during transitions between classes, where large groups of students tend to concentrate without

adult supervision, are more prone to violent events. Between schools, it is reported that violence

events are more likely to occur in places that are large, overcrowded and poorly organized

(Gershoff & Aber, 2006).

School Effects on Adolescent Behavior and Risk-Taking

We begin this section with a couple of basic observations about school effects. Empirically,

the very idea of school effects is predicated on the notion that there is sufficient variation between

schools, beyond that which exists between individuals within schools, in the outcomes of interest to

expect school-level characteristics to make a difference. However, there isn't a great deal of

evidence on this front, and what there is seems vary according to the outcome of focus and the

discipline of the authors (e.g., LaRusso et al., 2009; Rutter, 1983). A second closely related point is

whether or not the research takes a methodological approach that sufficiently enables the authors

to examine the degree to which any observed school effects exist beyond the effects of

characteristics of individuals in the schools (perhaps in this way accounting for family factors), *and*

beyond the effect of outside forces such as home and/or school neighborhoods (Sellstron &

Bremberg, 2006). For example, Teitler & Weiss (2000) report that when estimated jointly using

cross-classified models, schools account for a significant amount of variation in sexual behavior over and above home census tracts (.376 versus .109). In contrast, Garner & Raudenbush (1991; and Raudenbush, 1993) find the opposite for educational outcomes. Even though in our assessment of the literature very few studies approach this level of methodological focus and sensitivity, particularly in the risk-taking outcomes of interest here, the following sections will try to some evidence to illuminate this debate.

(A) *Socio-demographic Structural Characteristics*

School Disadvantage. School-level disadvantage can be conceptualized as having both contextual and compositional features. From a contextual standpoint, a prominent feature of school disadvantage is per-pupil expenditure. While there is little work that directly addresses links between factors as per-pupil expenditure (PPE) and adolescent risk-taking, there has been a great deal of work directed to the impact of PPE and other school-level resources (e.g., teacher education and experience, and teacher/student ratios) on student learning and achievement, with somewhat equivocal results (e.g., Hedges, Lain & Greenwald, 1994; Hanushek, 1989). Using sophisticated meta-analytic techniques applied to a set of prior studies, Hedges et al., conclude "substantially positive effects for global resource inputs [per pupil expenditure] and for teacher experience. The effects of certain resource inputs (teacher salary, administrative inputs, and facilities) are typically positive, but not always. The typical effects of class size (expressed either as pupil/teacher ratio or teacher/pupil ratio) are decidedly mixed" (page 11). The authors go on to suggest that "that resources matter, but allocation of resources to a specific area (such as reducing class size or improving facilities) may not be helpful in all situations" (page 11). From our perspective, these results suggest that the analysis of school expenditure and it's impact of youth academic and social development should be carried out while accounting not only for the variation between schools but

also for particular structural and relational features within schools that could modify the allocation

of these resources and the potential impact they could have (i.e. tracking systems, afterschool

programs, special education classes).

Pupil Expenditure: The 2009 Condition of Education reports that expenditures per student in

2005-06 were highest in high-poverty districts ($10,458) and in low-poverty districts ($10,447) and

were lowest in middle-poverty districts ($8,630) (Planty et al., 2009). Furthermore, among high-

poverty districts, current expenditures per student were highest in districts located in cities

($11,135), followed by districts located in suburbs ($10,986), rural areas ($9,008), and towns

($8,473) (Planty et al., 2009). While it may appear that PPEs are relatively equal in high versus low

poverty contexts, their relative value per student likely varies. Indeed a 2002 GAO report suggests

that when per-pupil expenditures are adjusted to account for the extra resources students facing

poverty, disabilities, and limited English proficiency might need (all characteristics that are more

likely to occur in inner city schools than in suburban or rural schools), "inner city schools almost

always spent less per pupil than suburban schools" (GAO, 2002, page 8). Moreover, while there is

little research that indicates that such factors as per pupil expenditure have substantial direct

effects on adolescent risk taking behaviors, it is likely that school resource factors co-occur with

other characteristics that do. For example, the 2002 GAO (2002) report indicates that the inner city

schools in their study, "generally had higher percentages of first-year teachers, higher enrollments,

fewer library and computer resources, and less in-school parental involvement" (page 3). This

pattern of findings is confirmed in other work (e.g., Ingersoll, 1999; Mayer, Mullins & Moore, 2000).

Higher enrollments and higher ratios of students to teachers are features of schools likely to result

in a larger number of unsupervised spaces (Flaherty, 2001), and larger concentrations of students in

those spaces, both factors linked to increased violence and victimization (e.g., Flannery, 1997). As

the results of Planty et al. (2009) suggest, these differences in PPEs should be considered at the light of other economical and social risk factors that students from different socio-economical backgrounds are likely to experience in contexts other than the schools (i.e. family and neighborhoods).

School Poverty: From the perspective of composition, a frequent marker of disadvantage is school poverty, or the percentage of students who receive a free or reduced price lunch at school (a variable often deployed at the individual level as a proxy for family poverty). Rusk (2006) employs a simple set of correlational analyses using school records from 14 sites to make a straightforward point that is confirmed by a large body of research (e.g., Battistich, et al., 1995; Lara-Cinisomo et al., 2004): that the percentage of socio-economically disadvantaged students in a school shows a substantial negative relationship to achievement. Research also suggests that it isn't only individual socio-economic status (SES) that makes a difference, but also the saturation of low SES students in a school, or the socio-economic composition of the school that is important (Rumberger & Palardy, 2005). For example, Wirt et al. (2003) indicate that among students who were not personally eligible for the school lunch program, students in schools with more than 50 percent of their students eligible for the program had a lower achievement than those in schools with 25% or fewer eligible. As with per-pupil expenditures, school poverty co-occurs with other factors that are likely to influence adolescent risk-taking. For example, in high poverty, urban schools there are higher rates of student absenteeism, less qualified teachers, fewer classroom resources, and fewer students are likely to report a positive attitude toward schooling (Gottfredson, 2001; Herrenkohl et al., 2001; Wirt et al., 2003). Anderman (2002) finds similar patterns distinguishing urban from suburban schools in perceptions of school belonging, with students in urban schools reporting lower levels of belonging.

There is some work linking school poverty using multi-level models to delinquency and related adolescent outcomes. For example, Felson, Liska, South & McNulty (1994) reported that 11 percent of the variation in delinquency occurred between schools, and that school SES showed an independent effect on delinquency. West (2009) reports that attending high-poverty middle and high schools had a strong independent effect on odds of arrest, controlling for family and peer influences. Wilcox & Clayton (2001) find that between school variation in weapon carrying is explained in part by school-level SES after accounting for important individual-level factors.

School and Classroom Size. On balance, research exploring the characteristics of schools and their influence on the students who attend them, suggest that school size influences student achievement and the degree to which students from different socio-economic backgrounds benefit from instruction. Some research suggests that small schools may better serve disadvantaged students, increasing their absolute achievement levels (Bickel, Howley, Williams, & Glascock, 2001; Friedkin & Necochea, 1988; Howley, Strange, & Bickel, 2000) and reducing achievement gaps between advantaged and disadvantaged students (McMillen, 2004). Lee (2000) suggests that for academic outcomes, the ideal size for a high school is between 600 to 900 students. This range, according to Lee (2000), allows schools to function as a community, one that is large enough to offer a credible curriculum, but small enough to allow members to know each other well. Research has linked large school size to poor behavior (e.g., Haller, 1992) and to negative perceptions of school climate and sense of community (Bryk, Lee & Holland, 1993; Flaherty, 2001; Pittman & Haughwout, 1987). Large schools also challenge the capacity of administrators to monitor disruptive student behavior (Flaherty, 2001). As with per pupil expenditure, it is inappropriate to expect school size to impact adolescent outcomes directly. Rather, school size is likely to influence student outcomes indirectly, through its relationships with other school factors such as school

11

social organization and student monitoring (Lee, 2004), as well as through the influence that school disadvantage, pupil expenditure and school poverty exert on classroom and school organization and size (sections above). The 2003 Condition of Education (Wirt et al., 2003) reports a positive relationship between school size and the percentage of teachers who reported that "apathy, tardiness, absenteeism, dropping out, and drug use are "serious" problems among students in their school" (page 60).

The 2009 Condition of Education reports that student/teacher ratios for all regular public secondary schools increased between 1990-1996 (from 17 to 18) and then declined to 17 in 2004 (Planty et al., 2009). In addition, student/teacher ratio was positively associated with enrollment in every year from 1990 through 2004, meaning that schools of larger overall size typically enrolled larger numbers of students per teacher than those of smaller size (Planty et al., 2009). It is important to note that student/teacher ratio is not an adequate representation of classroom size as it is calculated by dividing the total number of full-time equivalent teachers (including classroom teachers, art, music, physical education, and teacher who do not teach regular classes every day) into the total student enrollment.

School Factors and Exposure to Risk: With regard to broad school factors linked to adolescent risk-taking behaviors there are a few studies that employ multilevel designs to describe specific school effects. For example, George & Thomas (2002) examine individual and school-level predictors of victimization for 8th and 10th grade students using the National Educational Longitudinal Study of 1988. Findings indicate significant school effects on victimization for 8th graders but not 10th graders. For 8th graders, large schools (n>1200 students) show higher rates of victimization than small or medium schools, rural and urban schools have higher rates of victimization, and public schools show higher rates than private or Catholic schools. In both grades,

victimization was linked to misbehavior and substance use. These studies suggest school effects on

salient adolescent outcomes, but clearly there are too few to date (and none that are

experimental), to derive broad generalizations. However, what is clear from the previous review, at

least at the theoretical level, is that multiple features of schools socio-demographic and structural

characteristics are likely to interact to each other to particularly shape the micro-context of schools.

Such balance of risk and protective factors in the school micro-system, in turn are likely to exert an

important effect on adolescent risk taking behavior.

(B) *School Micro-contexts or Micro-systems*

Schools are systems made up of individuals (e.g., students, teachers, parents, aids, and

administrators) with their own characteristics and skills who both influence and are influenced by

the complex set of micro-contexts that exist within schools, each with its own individuals, social

norms, and supports. Understanding differences across school micro-contexts is especially critical

in middle and high school when students experience different settings typically every 50 minutes. In

addition, the transition from elementary to middle school is often characterized by an increase in

tracking or ability grouping which may determine assignment to micro-contexts within schools and

can affect the quality or climate of those settings (Ireson & Hallam, 2005; Hallinan, 1994). For

example, students in high ability classrooms perceive more respect for their points of view and

greater support from their teachers, while students in lower tracks tend to be viewed more

negatively and to have more negative relationships with teachers and peers (Ireson & Hallam, 2005;

Oakes, 1985). Compositional features of tracks can also vary across schools depending on school

policies, such as restrictions on sizes/capacities of tracks or requirements for racial heterogeneity

within tracks (Hallinan, 1994) and the same school composition (e.g., race/ethnicity, socioeconomic

status). Tracking practices translate into important differences among individual classrooms/micro-

contexts related to quantity and quality of instruction and to social psychological processes, both of which have implications for risk-taking behaviors and outcomes (Hallinan, 1994)

We begin our discussion of school micro-contexts with research about school spaces and their influence on risk-taking and related behaviors, focusing primarily on students' feelings of safety, aggression, and victimization. As noted above, studies have found that bullying and violence occur most frequently in the playground, lunchroom, and hallways; micro-contexts that tend to be more crowded and less supervised, and this appears to be particularly true in middle schools. For example, Astor & Meyer (2001) describe "undefined" or "unclaimed" spaces within the schools where students are more likely to be victims of aggression. Their data indicate that students in elementary, middle and high school regarded spaces such as hallways, bathrooms, playgrounds, parking lots, stairwells and cafeterias as unsafe environments in their schools. Students typically described such spaces as unsafe due to low or poor supervision from teachers and other adults.

From the perspective of teachers, Behre et al. (2001) indicate that middle school teachers are more likely than elementary school teachers to identify specific "unclaimed" spaces within the schools where they will not intervene in conflicts between their students. In addition, they find that middle school teachers are less likely to identify events of school aggression happening outside their classrooms, and to suggest that the location of a conflict influences teacher's attributions of responsibility about who should intervene. This work is consistent with Newman's (1995) who suggests that most of the crime in housing projects occurs in semipublic and unclaimed spaces that were perceived by community members as anyone's responsibility to monitor. Finally, because of the physical links that some schools share with their surrounding neighborhoods it is possible that adolescents will be exposed to risk factors in the physical spaces surrounding their schools (e.g.,

when the school yard is a shared space with a public housing development), that are perceived as unclaimed by both the school staff and the community members around the school.

In thinking about schools as a set of interrelated, yet distinct, micro-contexts, we turn to the question of what drives the relative influence of different micro-contexts on outcomes of adolescent risk taking behavior. Said another way, what characteristics or processes are likely to account for what LaRusso et al. (2009) describe as greater within-school compared to between school variation in climate. We address several related processes including (1) the distinct composition of individuals in different school settings, (2) norms for behavior and discipline, and (3) violence and safety.

Composition. Our description of compositional effects comes from a range of literatures and is designed to make an argument rather than to present a systematic body of research. This is largely because there isn't a great deal of research that considers compositional effects in school micro-contexts and their influence on adolescent risk-taking beyond the peer literature presented below.   Consistent with the school poverty research above, compositional effects at the school level are concerned with the degree to which individual characteristics aggregated to the school level exert an influence beyond the individual characteristics themselves (e.g., Harker & Tymms, 2004). Two additional examples of research in this vein are worth noting. Anderson (2002) explores the degree to which adolescents are at higher risk of delinquent behavior if they both live in a single-parent family and attend a school with a high proportion of adolescents who live with only one parent. They find a significant effect of school level single parenthood (i.e., the saturation of youth in the setting who have single parents) beyond individual effects, particularly for person offenses. Of significance, the authors report that "it matters how many single-parent families a student is exposed to, regardless of whether the student has one or two parents in the home"

(p.p585). Moreover, the authors find what they describe as a buffering effect of being in a school

context saturated by intact families (Anderson, 2002). Similarly, Felson et al. (1994) find a school-

level effect of "culture of violence" over and above an individual level measure of "subculture of

violence" on delinquency (among boys). The authors interpret this effect as suggesting that "in

some schools an aggressive response to a provocation is likely to meet with more peer approval

than in other schools" (Felson, et al., page 168). What is troubling about much of this research,

particularly from the perspective of setting-level theory, is that the vast majority relies on

measurement strategies that reflect basic aggregates of individual level phenomena, rather than on

independently measured characteristics of the setting itself (Shinn, 1990).

From this same perspective, focusing on micro-contexts within schools, the question

becomes whether or not aggregated features of classrooms (or other settings) exert an influence on

outcomes over and above individual features. There is growing attention to the impact of

classroom composition or peer effects on elementary school aged children's social-emotional and

academic adjustment. For example, Neidell & Waldfogel (2008) find the saturation of children in

Kindergarten classes with preschool experience positively influences individual children's reading

and math achievement through 3rd grade. Importantly, these authors also find that classroom-level

peer externalizing behaviors negatively influences individual children's achievement. This is

consistent with earlier work indicating the powerful role of classroom levels of aggressive behavior

in exacerbating or mitigating individual trajectories toward aggression (e.g., Kellam, Ling, Merisca,

Brown, & Ialongo, 1998). The mechanisms underlying such effects are less clear, however there is

some work suggesting that the composition of the classroom (e.g., the saturation or fraction of

children with normative beliefs supporting aggression and prosocial behavior, or with behavioral or

academic challenges) generates a set of norms and attitudes about behavior and achievement

(Henry, 2008; Henry, Cartland, Ruchross, & Monahan, 2004; , Henry, Guerra, Huesman, Tolan, VanAcker, & Eron, 2000) that are linked to children's developmental outcomes. If school-based interventions result in shifts in individual student's risk-taking and behavior, they, by extension, also shift the behavioral composition of classrooms and other settings in schools, suggesting an additional important mechanism through which interventions may have their impact on distal outcomes (see Part IV below). Importantly, however is also the degree in which interventions and evaluations are aware of these distal effects in their theories of change and introduce the adequate measures to account for this potential interference between units (Rosenbaun, 2007) or the social diffusion effect that peers could have individual and structural effects of an intervention.

From this perspective, a logical, and in our opinion, central next question is the degree to which compositional features of micro-contexts interact significantly with school characteristics to influence adolescent risk-taking, and how these interactive effects are buffered or bolstered by peer relations and other structural features of the school. To our knowledge, there is no research that takes this sophisticated approach.

Norms for Behavior and Discipline. As noted above, one particular feature of the micro-settings in schools that might explain variation between contexts within schools and outcomes are the descriptive and prescriptive norms that are held in particular contexts. Henry (2008), applying concepts of Social Identity Theory (Tajfel, 1978: Tajfel & Turner, 1979), suggests that classroom settings in particular play a role in establishing prescriptive rules. According to Henry (2008) because norms are dynamic by nature, students and/or adults in settings participate in their definition and enforcement by providing feedback on whether certain typical behaviors (descriptive norms) align with the goals and standards of a particular setting (prescriptive norms). Consistent with the concept of self-serving bias (Harrison & Shaffer, 1994), adolescents tend to overestimate

the degree to which their own groups endorse norms for risky behavior. As such, the role of teachers and other adults in the setting is especially salient in providing feedback that signals adolescents when the norms of their own groups diverge from the prescriptive norms of their environments. Given the evidence provided above about perceptions of safety and experiences of victimization in "unclaimed" spaces, building the capacity of schools to provide autonomy-supporting supervision (i.e., collaborating with youth to generate norms for unclaimed spaces and assisting them in maintaining them) represents a promising area for intervention.

Violence and Safety: Consistent with the work presented above it is reasonable to expect that different configurations of spaces, norms and patterns of interaction among individuals will lead to different levels of exposure to violence within school settings. Although there is a great deal of literature indicating that exposure to school and neighborhood violence is related to negative mental health outcomes (Hart & Marmostein, 2009; Burke, O'Campo, Salmon & Walker, 2009; Berton & Stabb, 1996; Farrington, 1993) such as aggression, anxiety, depression, PTST symptoms, and general trauma (Singer, Anglin, Song & Lunghofer, 1995), there is also reason to expect that these effects could be mediated by particular social relationships, norms and physical features of school micro-contexts. School bullying and victimization, as a particular expression of violence and aggression, has been explored according to their differential impact across micro-contexts in schools. Episodes of bullying characterized by the intention to harm others that are repeated over time, an asymmetry of power between victim and perpetrator, and, according to Salmivalli, Lagerspetz, Björkqvist, Österman & Kauklainen (1996), the active and passive participation of several others beyond victim and perpetrator (i.e., as observers, assistants, reinforcers and defenders), is perhaps one of the social processes within a classroom where an interaction between personal process, social, and micro-ecological roles are more salient. For example, research has

shown that bullying and victimization are most likely to occur in certain school settings, such as the

playground and the lunchroom (Craig & Pepler, 1997; Craig, Pepler & Atlas, 2000; Olweus, 1993),

and that peer relationships play an important role in the degree in which third parties reinforce and

get involve into new episodes of bullying and aggression, either as victims or perpetrators (Salmivali

et at, 1996; Espeglade, Green Jr & Wasserman, 2007).

Furthermore, particular features of these spaces, such as the structure of the activities, and

monitoring and school staff collaboration in the enforcement of rules has been linked to the roles,

attitudes and behaviors that students assume towards episodes of school bullying and victimization

(Left, Power, Costigan & Manz, 2003). More recently with the emergence of new technologies,

bullying, harassment and victimization have transcended the physical boundaries of the schools and

its particular spaces to enter the on-line and electronic communications of adolescents (Raskaukas

& Stoltz, 2007). Their results indicate that 48% of their participants had been victimized by

electronic means and 21% admitted to committing electronic bullying at some point during the

academic year. Either as a particular feature of school micro-contexts where the events are more

likely to occur, or as a general feature of the school climate that dampens perceptions of safety in

school, bullying has been related to poor outcomes for those who bully (Nansel, Overpeck, Pilla,

Ruan, Simons-Morton, & Scheidt, 2001) as well as for those who are victims of bullying (Espelage,

Green & Wasserman, 2007).

(C) *Schooling Processes*

As described above, in our view, the structural and micro-context features of schools carry

their influence to outcomes through a set of schooling processes, or mechanisms, that are

embodied in (1) key relationships (between teachers and students and among peers), (2) student

perceptions of connectedness or bonding to school, and (3) student and teacher perceptions of school climate.

1. Key Relationships (among peers, and with teachers)

Gershoff & Aber (2006) argue that a primary element of schools as communities are the relationships that students establish with their teachers and peers, a view supported by Wentzel (2009) who shows that peers and teachers socialize academic competence by communicating goals and expectations about performance, and by providing help, assistance, emotional support, and security. Vitaro, Boivin & Bukowsky (2009) suggest that peers and adults in school settings influence the psychosocial development of children and adolescents by providing a model of embeddedness (Moody & White, 2003) in a social network that is mediated by individual characteristics of group members, and their support or rejection of particular behaviors. Current research indicates that embeddedness, or the structural cohesion of the relationships established among peers in school settings, could serve as a risk factor for adolescent behavior to the extent that peers in micro-contexts socialize deviant behavior (Cairns, Leung, Buchanan, & Cairns, 1995; Dishion & Piehler, 2009), or as a source of protection, supporting adolescents' prosocial behavior (Wentzel, Barry, and Caldwell, 2004).

Relationships Among Peers. Current research on peer relationships and social networks within schools is perhaps one of the areas that best illustrate our argument regarding interactive effects among individual, social and structural features of the school ecology and the development of adolescents' risk taking behavior. While, it is now widely recognized that as early as 3 or 4 years old peer relationships become an important developmental context (Ellis, Rogoff, & Cromer, 1981), not until fairly recently, however, have the methodological tools been available that enable researchers to examine the time variant influence of peers and patterns of affiliation and

interaction across contexts during adolescence and into adulthood, in order to explore the effect of peer interaction on risky and prosocial behavior and development. Consistent with the increasing research attention that peer groups and social networks have drawn during the last decade, there is now wide variability in the definitions and methodological tools employed to examine the influence of peers on adolescent development (Hanish & Rodkin, 2007).

Whether groups are defined by similarities in the social status of their members (socio-metric categories, see Bukowski, Motzoi & Meyer, 2009), by common reputation among peers (social crowds, see Brown & Dietz, 2009), or by patterns of differentiated social ties of friendship or interaction (see Kindermann & Gest, 2009), the social networks in which young people participate have been linked to risk-taking outcomes such as early adolescent substance use, increases in problem or aggressive behavior, peer rejection (Dishon & Piehler, 2009, Light & Dishion, 2007), bullying and social exclusion (Espeglade, Green & Wasserman, 2007), loneliness and depressed feelings, and the acquisition, maintenance and escalation of externalizing behavior problems (Vitaro, Bovin & Bukowsky, 2009). Similarly, but to a lesser degree, peer networks have also been linked by some research to the development of prosocial behavior (Wentzel, Barry, and Caldwell, 2004).

However, as Vitaro et al. (2009) recognize, the effect of peer groups on adolescent behavior is not only mediated by relationships within groups or networks, but also by individual characteristics of group members. These important interactive effects should be considered in a broader social context in which structural characteristics (i.e., the presence or absence of a supervisory adult) are considered to also have a role in the promotion or inhibition of particular behavioral responses (Brown & Dietz, 2009).

Regarding the influence of adolescent peer groups on antisocial and externalizing behavior, Dishion and colleagues (Dishon & Piehler, 2009; Dishion, Nelson & Yasui, 2005; Dishion, Nelson, Winter & Bullock, 2004) have introduced the concepts of deviance training and peer contagion to represent the reciprocal process whereby friends, peers, and siblings reinforce deviant actions. As characterized by Patterson, Dishon & Yoeger (2000) the level of deviance in peer groups at 4th grade, the rate of reinforcement the group provides to new forms of risky and anti-social behavior, and the amount of unsupervised time available, serve as mechanisms supporting the growth of new antisocial behaviors during adolescence. Furthermore, Light and Dishion (2007) suggest that socially rejected youth (adolescents who are rejected because of their antisocial behavior and who are at higher risk of developing internalizing symptoms of depression, see Pelkonen, Marttunen, & Aro, (2003)) are more likely to form social groups together, in turn creating a social context that reinforces and promotes higher levels of aggressive behavior in their members.

Results supporting the dynamics of antisocial and delinquent behavior, both as a cause and a consequence of deviant patterns of affiliation, are further supported by iatrogenic effects of school interventions and policies that aggregate high risk youth into groups or tracks that become an opportunity for deviance training (Dishion & Piehler, 2009). These iatrogenic effects of well intended and designed interventions and policies have been identified for delinquent behavior (Dishion, McCord, & Poulin, 1999) and unsafe sexual practices (Moberg & Piper, 1998).

Although these findings underscore the potential powerful influence of peer groups on risky behavior and externalizing problems, some recent, albeit more scarce evidence highlights the contribution of peers' prosocial behavior to adolescents' normative and prosocial development. For example, Wentzel, Barry, and Caldwell (2004) document that reciprocated friendships between adolescents were associated with changes in individuals' prosocial behavior by influencing their

22

goals and motivations to behave prosocially. Other work indicates that links between peers' and adolescents' prosocial behavior is moderated by the quality and stability of the relationship and the frequency of the interaction (Barry & Wentzel, 2006).

As this body of research suggests, the effects of close peer relationships and group membership can have both positive and negative consequences for adolescent outcomes. However, the direction and magnitude of this effect is not only influenced by the simple presence of relational ties between adolescents, but also by interactions between characteristics of adolescents in social groups (Eisenberg, Vaughan & Hofer, 2009), the degree to which the groups and networks define and support implicit or explicit norms of behavior (Pickett & Brewer, 2005), and the social and relational structures that schools, teachers, parents and other adults provide for students to affiliate (Bierman & Powers, 2009).

Student–Teacher Relationships: According to Pianta & Allen (2008) the quality of student-teacher relationships reflects the capacity of schools to support the development of high risk youth by providing a developmentally meaningful experience. In particular, the authors suggest that a supportive relationship with a teacher is a key feature that influences academic success for students, as well as the social connection of students with the setting itself. The role of the teacher in (1) the student's development of a sense of control and autonomy over their learning and social experiences, (2) the construction of a supportive and close relationship with their students, and (3) the relevance or connection between the classroom topics and discussion with the students' real life, are posited as a central relational mechanisms supporting adolescents' positive development in school settings.   Similarly, Dishion, Dodge, and Lansford (2006) and Vitaro et al. (2009) highlight the role that adult supervision and close student-teacher relationships have in optimizing the influence of peers on adolescent development.

The power of the quality of student-teacher relationships is underscored by Hamre & Pianta (2001) who show that the type of relationship established by students and teachers in kindergarten predicted academic and behavioral outcomes up to eighth grade; an effect particularly strong for students who displayed higher levels of relational negativity with their kindergarten teacher. This work is consistent with that of Roeser, Marachi & Gelbach (2002) who show that teachers' professional identities are related to the institutional features of their schools and to their students' motivational profiles and academic outcomes. Roeser et al. (2002) present evidence that teachers' pedagogical approaches, their efficacy beliefs about their profession, and their perceived roles in students' development co-vary with level of instruction, the goal structure of the entire school, the subject matter that the teacher specializes in, and the characteristics of their students. These authors suggest, for example, that when teachers perceive differential treatment by school leaders and a sense of competitiveness among colleagues, they are also more likely to endorse classroom practices that highlight competition and ability differences among students. Similarly, when teachers perceive support for innovation and experimentation from their school and peers, they are more likely to translate these characteristics to their relationship with students and to a sense of efficacy in supporting the academic and social emotional development of students.

These results support a model that stresses the way in which teachers' professional identities are influenced by the social and organizational features of their work environments, and in turn influence the nature and quality of their relationships with their students; ultimately modifying the effects of student – teacher relationships on adolescent's academic and behavioral outcomes. Similarly, Gehlbach & Brinkworth (2008) consider the role of teachers in schools from a social cognition perspective, exploring the motivations, tools and cognitive heuristics that influence their relationships with students. They suggest that three fundamental goals guide social

interactions between students and teachers: (1) accurately understanding the self and the other, (2) enhancing one's sense of self, and (3) achieving efficiency in social cognitive interactions. The experience of conflict in these goals, between students and teachers, could lead both to maintain negative images about each other and their intentions. According to Gehlbach & Brinkworth (2008), within the school and classroom context these social cognitive errors have the potential to lead well intended teachers (and students) to stereotype, generalize and misattribute other's intentions and actions as hostile (Crick & Dodge, 1994) increasing the distance between social actors and reducing the possibility of creating caring and positive relationships in the classroom.

Finally, larger contextual features of schools and the local context influence the availability and quality of teachers, teacher rates of turnover (Ingersoll, 1999; Mayer, et al., 2000), teacher's expectations and their instructional practices, and these effects translate into the ways in which classroom norms are constructed and enforced, teacher's experiences of stress and strain, their quality of relationships with students (Yoon, 2002), and ultimately adolescent's development and behavior.

2. Connectedness or Bonding to School

A sense of belonging and connectedness is related to positive academic, psychological, and behavioral outcomes during adolescence. Although the concept of belongingness has been variously defined (from feelings and motivation, to connectedness to others), research suggests those students who identify themselves with their schools and develop a perception of school belongingness, exhibit higher academic achievement and commitment to their schooling experience (Finn, 1999), report having more friends that support their goal (Newman, Lohman, Newman, Myers, & Smith, 2000), and show improvements in their social skills, motivation and achievement (Battistich, Solomon, Watson & Schaps, 1997).

Anderman (2002) explored school level variation in belongingness and its effects on adolescent development using data from the National Longitudinal Study of Adolescent Health (Add Health). He reports lower levels of aggregate belongingness in urban over suburban schools and in schools that employ busing practices. Furthermore, school aggregated belongingness was linked to social rejection and school problems beyond individual perceptions of belonging. Interestingly, his results do not show a relationship between school size and sense of belongingness, possibly due to the interaction between school size and the tendency of students in large schools to develop small peer groups that buffer the effects of large educational settings on their connectedness with others in social relationships.

Within schools, Moody & White (2003), also using data from Add Health, identify that embeddedness within socially cohesive groups mediates perceptions of school attachment, building patterns of affiliation for adolescents that maintain a social structure of solidarity. Their findings take into account average school levels of attachment, differences in adolescent centrality within groups, the number of friends adolescents have, the interactions between the number of friends the closeness of friends, and the number of friends connected through a large interactional group (i.e., the classroom). These results, consistent with Anderman (2000), highlight the essential mediational role of social groups within schools on perceptions and outcomes. High levels of cohesion and solidarity to peers, and the sense of belongingness to the community of the school, have been linked to adolescent optimism and increased levels of GPA, and negatively to indices of depression, social rejection and school problems (Anderman, 2002).

Although limited in scope to date, research on school connectedness and social cohesion in general support their role as protective factors for adolescent development (Moody & White, 2003). Identifying and describing particular features of cohesion and embeddedness among

adolescents' social groups should lead to an analysis not only of the social ties among youth, but of the manner in which information about risk-taking flows through cohesive social groups, of the configuration of large communities of social actors related to the school (students, teachers, parents), of the localization of power within groups, and their relationship to both risk and positive behavior.

3. School Climate.

Research on school climate typically focuses on the influence of the broader relational atmosphere (including perceptions of connectedness and safety, attitudes, values and beliefs toward school and schooling) and has been generally defined as student and teachers perceptions and feelings regarding their school social environment (LaRusso, Romer & Selman, 2008; Welsh, 2000; Power, Higgins & Kohlberg, 1989; Maddox & Prinz, 2003). School climate is not just a broad, general perception, but also reflects the interaction between these factors and the compositional and contextual features of particular micro-contexts within schools. As such, we would expect these perceptions and observations of climate to vary not only across individuals and time, but also micro-contexts within schools. There is some research emerging that indicates this is the case (LaRusso, et al., 2009). However, most studies of school climate fail to assess the climate of specific school micro-contexts, and the majority of them rely on aggregated measures of students' (Welsh, 2000) and teachers' (Brand, Felner, Seitsinger, Burns & Bolton, 2008) perceptions rather than on an independent assessments of climate (Pianta, La Paro, & Hamre, 2005, 2008).

From a developmental perspective, middle school climate and changes in climate across the elementary to middle school transition may be particularly important for adolescent risk-taking. Early adolescence is a time when students are beginning to think more abstractly, to consider multiple social perspectives, and to question authority and social norms, particularly in their efforts

to become more autonomous and make their own decisions (Seidman, Aber & French, 2004; Selman, 1980). Middle schools would ideally provide a supportive context for young adolescents' growing capacities to engage in healthy relationships and effectively manage interpersonal problems that arise in schools, including, ostracism, teasing, gossip, and social conflicts (Nakula & Tosalis, 2006). However, researchers have identified interpersonal, structural, and organizational aspects of school environments that change from elementary to middle school, many of which result in a developmental mismatch with the needs of early adolescents (Roeser, & Eccles, 1998; Roeser, Eccles & Sameroff, 2000). These changes include fewer opportunities for proactive participation in classroom and school level social decision-making and choice; for working in small academic groups (to utilize their interest in using cooperative and collaborative skills for learning); and for engagement in positive, close relationships with teachers (Roeser, & Eccles, 1998; Roeser, Eccles & Sameroff, 2000). Although social conflicts naturally arise in the process of decision-making and working with others in school, the opportunity to build conflict resolution skills in a supportive classroom and school context may be compromised by the traditional structure and organization of middle and high schools (Roeser, Eccles & Sameroff, 2000, Shultz, Barr & Selman, 2001; Tollefson, Barr & Strom, 2004).

Variation in school climate within schools could be accounted for by the particular relationships that adolescents establish with their peers and their teachers. For example, LaRusso, Romer & Selman (2008) show that adolescents who identify higher teacher support and regard for student perspectives are more likely to see their schools as having respectful climates and healthy norms of drug use. These perceptions are associated with lower levels of personal drug use, higher self-reported social belonging, and fewer symptoms of depression.

While the research identified above underscores the importance of the climate of schools and school micro-contexts, it is clear from our exploration of the literature that monotonic definitions and operationalizations of school climate most often fail to incorporate the interactive nature of social relationships, perceptions and feelings among students and teachers across varying school settings.   Perhaps one exception is the work of Brand et al. (2008) on the development and validation of the "Inventory for School Climate-Teacher" (ISC-T), a parallel version of the Inventory for School Climate-Student (ICS-S; Brand et al. 2003). Based on confirmatory factor analyses, Brand et al. (2008) propose six underlying dimensions that characterize teacher's experience of the school climate.   Among these dimensions are (1) respect and sensitivity to peers and culture, (2) disruptiveness, (3) positive student-teacher relationships, (4) achievement orientation, (5) support for diversity; and (6) safety. Results from this validation study suggest that the ICS-T has a high degree of convergent validity with the student's version, while simultaneously is divergent from the latter in the extent that the shared variance explained by the two instruments ranges from 10 to 42%. In addition, substantive findings with the instrument suggest that better behavioral adjustment, self-esteem, and lower levels of substance abuse were found in schools where teachers reported more positive peer relationships, and lower levels of classroom disruption and safety problems. These results are consistent with those reported by Reis, Trockel & Mulhall (2007) where the inclusion of students in policy and rules processes, cultural sensitivity education, and teaching styles that emphasizes understanding over memorization were significant predictors of reductions in aggression at the school level, when controlling for individual demographic variables.

A final example of resent research showing promising results on the evaluation of the multiple interactions that define school and classroom climate comes from the work of Pianta, La Paro, & Hamre, (2005, 2008) and the development of the CLASS. According to Pianta, La Paro, &

Hamre, (2005, 2008) the CLASS is an observational tool based on developmental theory and

research that suggest that it is through the quality of the interactions among students and teachers

that occur on a daily basis (Pianta, 1999) that students have the opportunity to experience positive

connections to their peers and teachers, and that such interactions are one of the primary

mechanisms promoting positive student development and learning (Cameron, Connor, & Morrison,

2005; Emmer & Stough, 2001; Greenberg, Domitrovich, & Bumbarger, 2001; Hamre & Pianta, 2001;

Morrison & Connor, 2002; Rutter & Maughan, 2002).

Schools and Other Ecologies

Distinguishing Schools and Neighborhoods. Recent research addressing school effects on

non-educational outcomes is frequently conceptualized and conducted focusing on the

independent and joint effects of schools and neighborhoods (e.g., Arum, 2000; Kirk, 2009). While

often correlated with residential neighborhood, a youth's school may (or may not) be nested in the

neighborhood where they live (e.g., Bryk & Schneider, 2002). For example, Welsh et al. (1999)

differentiate the effects of both the schools' neighborhood ("local" neighborhood) and the

students' home neighborhood ("imported" neighborhood). Because local and imported

neighborhoods do not always coincide, the authors were able to examine whether neighborhood

characteristics have effects that transcend school walls (i.e., overriding the effect of the school

itself, as well as the characteristics of its students). Their results suggest that individual-level factors

were the strongest predictors of school disorder and student misconduct. Of note, neither local nor

imported measures of neighborhood crime were associated with these outcomes. The only

neighborhood measure that retained significance in their fully specified model was neighborhood

poverty (for both local and imported neighborhoods).

On the other hand, Leventhal & Brooks-Gunn (2000) suggest that among older children and adolescents, schools are an institutional resource through which the influence of neighborhoods are exerted. These authors suggest that neighborhood resources may contribute to developmental outcomes by shaping characteristics of school environments, such as quality, climate and socio-demographic characteristics that, in turn, have an impact on youth outcomes. In this way, schools imitate the normative environment of the neighborhood in which they are located (for example, dangerous neighborhoods make dangerous schools more likely; Sheley, McGee & Write, 1992).

Some evidence appears to support this conclusion. For example, Ludwig & Ladd (1997) using data from the Moving to Opportunity demonstration study, suggest that children and youth who moved from public housing to neighborhoods with fewer poor residents were more likely to attend schools with higher pass rates on achievement tests that did their peers who remained in public housing in high poverty neighborhoods. Differences in the school environment and the passing rates of these new schools were attributable largely to the presence of more resources and more advantaged student populations. Similarly, Teitler & Weiss (1996) report that schools norms and attitudes towards sexual initiation and parenting mediate the relationship between neighborhood attributes (median income, poverty, female family-hardship, and teen fertility rate) and differences in adolescent sexual activity. In a study of 5th and 6th graders, Ennett, et al., (1997) find that school characteristics such as the availability and acceptance of substances, school attachment and safety, partially mediate the association between neighborhood characteristics (reported neighborhood attachment and safety; census measures of population mobility and density) and school rates of lifetime alcohol and cigarette use.

Intervention/Prevention

Schools remain one of the most salient environments for prevention and intervention, mostly because: (1) schools are well-defined social institutions with natural boundaries that provide students with access to a range of potentially healthy and supportive relationships (Gershoff & Aber, 2006; Roeser, Eccles, & Sameroff, (2000), (2) schools have more formal opportunities, through mental health screening, health services, and educational mandates to monitor youth behavior and intervene with those at-risk (Roeser, Eccles, & Sameroff, 2000), and (3) schools are staffed with professionals and paraprofessionals paid to help students to develop as healthy individuals. There are now a growing number of school-based interventions and treatments designed to address youth behavioral and mental health outcomes. We should note, however, little to none of this research attempts to account for the ways in which school characteristics modify the effects of intervention on outcomes, and only recently has research begun to account for the inclusion of codependence, interdependence (Marsden, 2009; Cook & Kenny, 2005; Marsden & Friedkin, 1993), and interference between particular attributes of the units of intervention (Rosenbaum, 2009). Most frequently, meta-analyses and evaluations focus on certain features of the interventions and document how they differentially impact the development of the students and other changes in the school environment. This section will start by documenting some of the independent effects that interventions focused on individual, structural, and policy factors have on adolescents' risk taking behavior, and will then illustrate with a couple recent examples some of the nuances research will have to address to improve our understanding of the impact of schools and schooling on adolescent behavior.

In general terms recent meta-analyses have documented small but positive net effects of school based interventions on the prevention of problem and risky behaviors. For example, Wilson, Gottfredson & Nakaka (2001) report effect sizes ranging between 0.16 and 0.17 for a wide array of

interventions on dropout, attendance, and problem behaviors, and of 0.04 and 0.05 for delinquency and alcohol use. Similarly, Wilson, Lipsey & Derzon (2003) report an effect size of 0.31 for randomized experiments and of 0.16 for non-randomized school-based designs to prevent aggressive behavior among youth. More recently Wilson & Lipsey (2007) update their 2003 results to include 77 new studies and report similar effects for universal and selective school based programs on aggressive and disruptive behavior among youth. In contrast, Park-Higgerson, Perumean-Chaney, Bartulucci, Grimley & Singh (2008) analyzed the results of 26 randomized control trials of school based interventions, concluding that overall the intervention groups did not have significant effects in reducing aggression and violence compared to the control groups. Aside from these net effects, these studies also attempt to identify particular features of the programs that are associated with larger effects sizes. In the following pages we attempt to organize these results according to their focus on (1) school climate and individual social-emotional development, and (2) school safety and structural interventions, and them move on to highlight the role of policy interventions and recent methodological advances in the analysis of multi-level, cross context and cross system interventions.

School Climate, whole school & individually focused "SEL" interventions

Gottfredson (1997) recognize that although most school-based prevention programs contain a mix of different types of activities from an environmental and individual approach, an important group of them focuses on changing the behaviors, knowledge, skills, attitudes or beliefs of the student body. Durlak, Weissberg, Dymnicki, Taylor & Schellinger (in press), suggest that as extensive developmental research indicates, school based-efforts to promote students' social and emotional learning (SEL) represent a promising and effective way to promote positive development due to the association of these skills with greater well-being and better school performance. In fact,

49% of the 145 interventions analyzed by Wilson, Gottfredson & Najaka (2001) use individual

strategies to instruct students and increase their awareness, modify their behavior and thinking

strategies, modify their peer relations, or provide recreational, enrichment and leisure activities as

alternatives to risky behavior. Effect sizes for some of these intervention features suggest that, in

particular, those interventions that include the use of cognitive-behavioral or behavioral

modification are the most effective in reducing dropout rates and problem behavior ($\bar{d}$ = 0.37 and

0.32 respectively), when compared to other individually focused interventions such as counseling,

mentoring, and recreational activities. Similarly, Wilson, Lipsey & Derzon (2003) and Wilson &

Lipsey (2007) report that the most effective interventions strategies for the prevention of

aggressive behavior are behavioral, counseling, and academic programs ($\bar{d}$ = 0.27 and 0.33

respectively), and those that are delivered to all the students in a classroom or are targeted to

selected/indicated children ($\bar{d}$ = 0.21 and 0.29 respectively).

Finally, recent results from an extensive meta-analysis of 213 studies implementing

universal interventions to foster social-emotional development among youth (Durlak et al, in press)

suggest a positive effect of these programs on the development of social and emotional skills ($\bar{d}$ =

0.57), attitudes ($\bar{d}$ = 0.23), positive social behaviors ($\bar{d}$ = 0.24), and academic performance ($\bar{d}$ =

0.27).

Structural and environmental interventions

A second category of school-based interventions to prevent adolescents' risk behavior focus

their attention on altering the school or classroom environment as a whole as a mechanism for the

social regulation of individual behaviors and the reconfiguration of social structures and

institutions. According to Gottfredson (1997) these strategies include the modification of the

decision-making processes or authority structures at the school, redefining norms for behavior

through the use of school-wide or classroom rules, changing instructional methods to increase

student's academic performance and their bonding to the school, and reorganizing classes or

grades to enhance, prevent or modify relational structures. Results from Wilson, Gottfredson &

Najaka (2001) suggest modest effect sizes on outcomes such as delinquency (from .02 to .39),

alcohol and drug use (from .10 to .40), dropout rates (from .07 to .20) and general behavioral

problems (from .04 to .15) of these environmental-focused interventions. Additionally, some

individual evaluations have suggested the success of some of these interventions in modifying the

social structure of the school and the behavior of the students. For example, interventions that

stress the role that the entire community of the school plays on the definition and enforcement of

behavioral rules not only function as a mechanism to make the norms more visible (Olweus, 1993,

1991) but also influence the degree to which the school is valued as an institution by its members,

and the development of a shared sense of responsibility that would lead students to value their

social relationships and to even make personal sacrifices to pursue the well-being of their

community. Accordingly to Olweus, (1991) classroom and school norms regarding aggressive

behaviors not only highlight the possibility that such behavior could occur, but also provide key

opportunities for participants to engage in forgiveness, negotiation and reconciliation. Other

examples of these environmentally focused interventions are the Good Behavior Game (Embry,

2002; Henry, 2008, Kellam, Brown, Poduska, Ialongo, Wang, Toyinbo, Petras, Ford, Windham &

Wilcox, 2008), and systems of positive behavioral interventions and supports (PIBS, Bradshaw, Koth,

Bevans, Ialongo & Leaf, 2008) where peers and teachers effectively have discouraged negative

behaviors and reinforced positive interactions though the reference to clear and concise norms.

Policy interventions

Multiple interactions suggested by ecological models and system-level theories becomes most evident in the intersection between intervention and child development science and policy. However, as Steinberg (2009) suggests, developmental science is only one of many factors that influence the policy outcomes, and frequently is consulted after the policy proposal is made rather than before. Similarly Aber, Jones & Raver (2007) have shown that operating definitions and constraints imposed by public policy often influence the development of science in a direction that limits the inclusion of multiple conceptualizations, at both proximal and contextual levels, and within and across time, as in the case of the definition of poverty and social depravation in the U.S. In contrast, the multiple and sophisticated ways in which researchers are now defining poverty, and its relations with child and adolescent development, is one of many factors, along with ideological debate, fiscal realities, and public and policymaker perceptions of need that has the potential to modify and redefine policy decisions and interventions. The intersections between policy, developmental science, intervention, and evaluation have the power to help us better identify what works, for whom, and under what conditions (Aber, Raver & Jones, 2008).

Multi-level, cross context and cross systems interventions

Even though at the analytic and theoretical level it is possible to identify particular features of interventions that specifically target the social structure of the school or classroom, or the individual development of students, in reality several current school-based interventions include in their theories of change a set of direct and indirect steps directed to effect both environments and individuals. This multi-component feature is recognized by Durlak, Weissberg, Dymnicki, Taylor & Schellinger (in press) who included in their analysis of the effect of social-emotional learning interventions a comparison between the effect of single component (i.e., interventions that take place only in the classroom) and multi-component (i.e., interventions both at the individual and

classroom level, or at the classroom and the entire school) programs. However, their results do not support the idea that multi-component interventions produce larger effects on adolescent risk-taking outcomes. These null or small effects, from our perspective, could be partially explained by methodological issues that prevent meta-analytic techniques from effectively comparing the effects of a single and multi components on individual developmental outcomes. Further research is needed to elucidate the combined effect of multiple components, implemented across multiple settings within and between schools.

Additionally, it is important to mention that even though current meta-analytical evidence does to not support fully the effects of multi-dimensional interventions, resent individual evaluations have reported important interactions between particular features of these interventions and certain adolescents' risk profiles. One such an example is the work of the Multisite Violence Prevention Project (MVPP, 2009) where the importance of selective family-focused interventions with aggressive but highly influential peers within the school ecology (MVPP, 2009) is empirically supported within the context of a larger intervention that is carried out in four different sites over the course of two waves of data collection. Similarly, Jacard, Blaton & Dodge (2005) highlight the role of peers on adolescents' risky behavior, suggesting that peer effects are most likely to manifest when the two individuals in the relationship share similar behavioral histories and when the parental bonds for the individuals in the relationship are not well adjusted. These effects are shown for sexual behavior and binge drinking, and although not strong, they do provide empirical evidence of the influence of peers on risky behavior. Additionally, the results of the MVPP (2009) suggest that a selective intervention with highly influential individuals within the school environment could affect the overall aggression among other students in their grades, even in a higher degree than a universal intervention targeting the entire class. Although, neither the

results of Jacard et al (2005) nor those presented by the MVPP (2009) suggest that the effects are driven by the combination of multiple levels of intervention, they do provide a clear example of how many particular environmental features of schools interact with individual risk factors on the production of behavioral outcomes.

These studies, along with the work of Brown, Jones, LaRusso & Aber (in press) provide an illustration of the theoretical argument advanced in this paper: The adequate explanation of school effects on the development of adolescents' risk taking behavior is only possible once a set of theoretical and methodological steps are taken to ensure that both between and within school variation, and the interactive effects of individual, social and structural factors are effectively incorporated. As has been shown in several sections of this paper, different levels of the school ecology and features of interventions are likely to interact with each other, to simultaneously co-vary, and to influence the impact school based interventions. We believe that current methodological and theoretical formulations that apply settings-level theory to the study of schools and adolescents are a promising area of research and intervention that can build from the strong empirical foundations that exist in the current body of literature.

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