School Crime Control and Prevention

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School violence, drug use, vandalism, gang activity, bullying, and theft are costly and interfere with academic achievement. Reducing crime rates has become an increasingly high priority for America's schools.

Middle and high schools aggregate youths who are in their peak crime years. Hence it is not surprising that crime rates in schools are high. Victimization rates are about the same in school as out, despite the fact that youths spend only about one fifth of their waking hours in school. And other things equal, youth violence rates tend to be higher when school is in session than not.

However, since 1993 schools have enjoyed a strong downward trend in crime of all types that mimics the downward trend in overall youth victimization. That coincidence reflects one of the important findings in the school crime literature – school crime is linked closely to community crime rates. The schools have benefited from the remarkable crime drop in America.

There has also been an important trend in the official response to school crime. The response has become increasingly formal over the last 20 years, with greater recourse to arrest and the juvenile courts rather than school-based discipline – a trend that has been dubbed the "criminalization" of student misbehavior (Hirschfield 2008). To some extent this trend has been furthered by federal law which has imposed zero-tolerance rules for some offenses, and has subsidized the hiring of uniformed officers to police the schools. The shift has been from administrative discretion to mandatory penalties, and from in-

school discipline to increasing use of suspension or arrest. At the same time, there has been a considerable investment in the use of surveillance cameras and metal detectors.

While the increasing formality in school response to crime has coincided with the declining crime rates, there is no clear indication of whether the new approach gets any of the credit. Indeed, the evaluation literature which we review here has very little to say about the likely effects of these changes. As so often happens, there appears to be a disconnect between policy and research.

In addition to reforms around security and discipline, a variety of other school reforms have had important effects on the quality of schooling and school life. Some are dictated by the recent push towards improved academic performance through school accountability. A question of considerable interest is whether reforms designed to improve academic performance are likely to increase or reduce crime rates in school. In our review, we find that for the most part the two goals of better academic performance and safer schools are compatible, as would be expected given that most delinquents have academic problems. One exception is the practice of retaining students who perform poorly on end of grade tests, a practice which has been broadly implemented as part of the effort to establish higher academic standards, but has the problematic effect of holding back and concentrating delinquency-prone youths. The goal of safer schools may also run afoul of the literal meaning of no child left behind. The growing use of suspension or expulsion may make schools safer, but at the cost of further limiting delinquents' chance to succeed in school. School officials face similar dilemmas in policies regarding truancy, dropout, and alternative schools.

There are alternatives to the get-tough approach with its reliance on deterrence and exclusion. We know that some schools do a much better job than others in controlling the behavior of their students. Characteristic of successful schools in this respect is that they are close knit communities where rules of acceptable behavior are clearly communicated and consistently (if not harshly) enforced. In addition to good management practices, there is much that can be done in the classroom that has demonstrated effectiveness in improving behavior. Admittedly, the challenge to establishing a well ordered community is much greater if a high proportion of the students are at risk.

For those like President Obama who want to identify what works and go with that, it is distressing that major reforms are adopted without evaluation. The get-tough exclusionary policies are the most glaring example. From a different part of the political spectrum is the high-profile push to break up large high schools into smaller ones, led by a billion-dollar commitment from the Gates Foundation. That effort was deemed a disappointment by the Foundation and discontinued in 2008, based on their evaluation of its effects on academic progress. Our own analysis suggests that while smaller schools may or may not be more conducive to academic achievement, they are not safer.

In this review, we focus on the characteristics of schools related to the problem behaviors of the current student population. That is, we consider those school characteristics that influence concurrent levels of crime, victimization, violence, and substance use both in and out of schools. Some of the mechanisms linking school characteristics with offending behavior (such as surveillance practices) can be expected to influence only crime that is perpetrated within the school, while others (such as

truancy prevention and use of disciplinary suspension) can be expected to influence the level of offending both in and out of school.

We begin with a review of the statistics on crime in school and youth crime more generally, documenting trends and patterns using a variety of data sources (which unfortunately tend to give different answers). Section II makes the case that crime in school is not simply the sum of criminal propensities of the enrolled students; that the organizational characteristics of the school have considerable influence. Sections III through V consider just what aspects of school organization or "climate" matter, including such factors as school size and composition of the student body (Section III), school discipline and delinquency prevention curricula (Section IV), and culture (Section V). Section VI discusses next steps in research and policy.

I. School Crime: Patterns and Trends

By rights, schools should be sanctuaries against criminal victimization, but the truth is otherwise. Youths are required by law to attend school until their late teens, but that requirement does not come with any assurance that they will be safe. In fact, students report similar victimization rates at school than away from school, despite the fact that they spend many fewer waking hours in school. The important exception is for the most serious violent crime, murder, where the relative risks are decidedly reversed; only about one percent of murders of school-aged youths occur on school grounds. But lesser crimes, the fights and strong arm robberies and larcenies, are common enough to have an important effect on the school experience for many students. Nor are schools a safe haven

against drug abuse – in 2007, 22 percent of high school students reported being offered an illegal drug on school grounds in the previous 12 months (CDCP 2008, Table 59).

Not just students, but also teachers are threatened by crime in schools. In 2003-4, 7 percent of teachers reported that they were threatened with injury in the previous year, and over 3 percent said they had been physically attacked. Surely the more crime-ridden schools have greater difficulty in recruiting and keeping qualified teachers. Crime prevention in schools also burdens school budgets. For example, 72 percent of high schools have security officers present (Guerino et al. 2006), 59 percent use drug-sniffing dogs for random drug checks (Jekielek et al. 2007), and 13 percent use metal detectors (Guerino et al. 2006). The corresponding percentages for middle schools are lower but not by much.

A threatening environment is not conducive to academic success. The federal law implementing No Child Left Behind (the national education-reform initiative) stipulates that school systems must have programs in place to reduce levels of violence. There does appear to be some progress on this score, although the problem remains: the NCVS School Crime Supplement data indicate that in 2005, approximately 6 percent of students ages 12–18 reported that they were afraid of attack or harm at school, compared with 12 percent in 1995.[1] The legislation authorizing No Child Left Behind (NCLB) has a specific provision that "persistently dangerous" schools be identified by the states and that students attending such schools be given the option of transferring to another school. The definition of "persistently dangerous" was left to each state, and only 46 schools out

[1] http://nces.ed.gov/programs/crimeindicators/crimeindicators2007/ind_17.asp, accessed 12/5/2008. In 2005, only 5 percent reported that they were afraid of being attacked away from school.

of the 94,000 in the United States were so identified in 2007 (Hernandez 2007). One problem is the tendency of school officials to underreport serious crimes to the police and to the public.

As it turns out, obtaining reliable information about crime in schools is a challenge for researchers as well as for state and federal officials. There are several sources of data in addition to the schools' own reports, but each source is error prone and there are some rather remarkable differences among them with respect to estimated crime rates and patterns. We begin with a brief summary of data sources and then summarize some of the statistical results and conundrums.

A. Data Sources

The primary source of crime data for many purposes is the FBI's Uniform Crime Reports, compiled from crimes known to the police and reported by police departments. The UCR's crime data do not provide information on the characteristics of victims and are of little help in estimating crime in schools. Some jurisdictions have begun reporting crimes in much more detail through the National Incident Based Reporting System (NIBRS): in this system police agencies submit a record of each known crime that includes the age, sex and race of the victim, the location of the crime, and the characteristics of the perpetrator (when known). These data can be used to provide detailed description of crimes involving school-aged youths, distinguishing, for example, between crimes on school grounds and elsewhere (Jacob and Lefgren 2003). There are two problems, however, with this source. First, participation rates are very low: only 20 percent of police agencies, representing 16 percent of the U.S. population, were

participating in NIBRS as of 2003.[2] And second, crimes committed on school property may be less likely to become known to the police than crimes occurring elsewhere.[3] As a result of the limitations of police data, school crime statistics are usually generated from school reports or surveys. In the School Survey on Crime and Safety, public school principals are asked to report to the U.S. Department of Education the number of violent incidents and thefts, and to indicate how many of these incidents were reported to the police. In addition there are several recurrent sample surveys: the National Crime Victimization Survey and the biannual School Crime Supplement to this Survey (sponsored by the National Center for Education Statistics, or NCES), and the Youth Risk Behavior Surveillance System (YRBSS), sponsored by the Centers for Disease Control and Prevention. The NCES compiles data from all these sources into a report called the *Indicators of School Crime and Safety*.[4] When the estimates from these alternative sources are compared there emerge some rather dramatic differences, leaving the investigator with the challenge of deciding where the truth lies.

B. Youthful victimization in school and out

Here we report crime victimization rates for school-aged youths, comparing, when possible, the rates at school and at other locations. We begin with murder, which is the

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[2] http://www.ojp.usdoj.gov/bjs/nibrsstatus.htm, accessed 11/19/2008.

[3] One analysis of NCVS data found that only 9% of violent crimes against teenagers occurring in school were reported to the police, compared to 37% occurring on the streets (Whitaker and Bastian 1991). But our analysis of the 2005 NCVS finds that the gap has narrowed or disappeared for violent crimes: 30% in school were reported to the police, versus 35% out of school. There remains a large difference in property crimes: the 2005 NCVS indicates that thefts outside of school are about twice as likely to be reported as those in school.

[4] http://nces.eaged.gov/programs/crimeindicators/crimeindicators2007/ind_06.asp, accessed 11/19/2008

only crime for which the statistics are reasonably accurate. Figure 1 depicts the trend in murders on school property for youths ages 5-18, compared with the overall murder count for that age group. There were about 30 school murders of youths each year from 1992-3 to 1998-9, a period notorious for the series of school rampage shootings that culminated with Columbine High School on April 20, 1999. During that event 12 students and a teacher were murdered, and 23 students injured, before the shooters committed suicide. In the year following Columbine the national in-school murder count dropped sharply and has remained relatively low since then. The murder rate for the same age group follows a similar pattern, though the decline began earlier and is less abrupt. The most important lesson from these data is that only about one in 100 murders of this age group occur in school. That was true during the peak years of the early 1990s, and also true a decade later. By this measure, then, school appears much safer than other locations for school-aged youths.

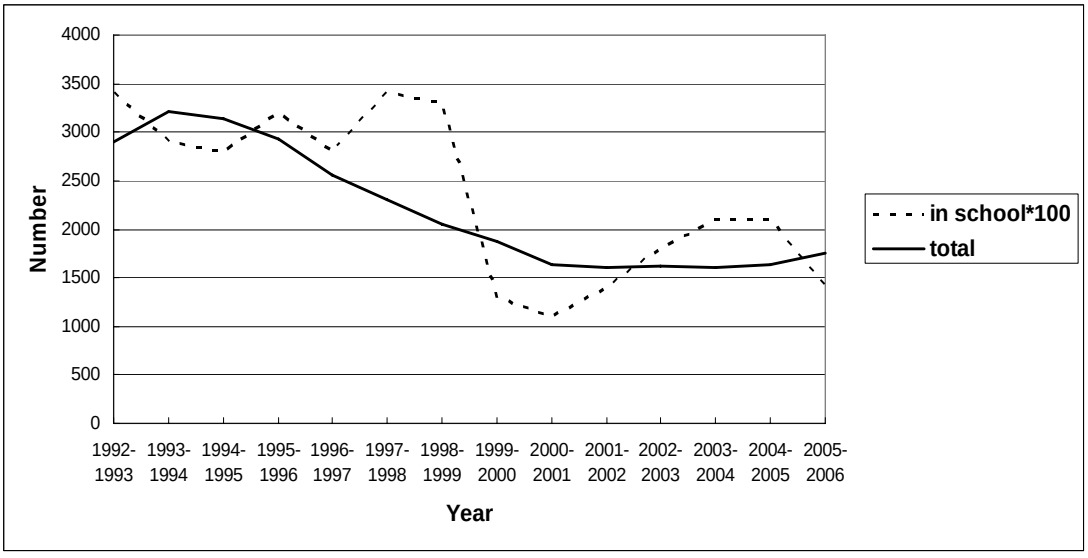


Figure 1. Number of homicides involving young victims, in school and out, 1992-3 to 2005-6

Note: "In school" includes on school property, on the way to or from regular sessions at school, and while attending or traveling to or from a school-sponsored event.

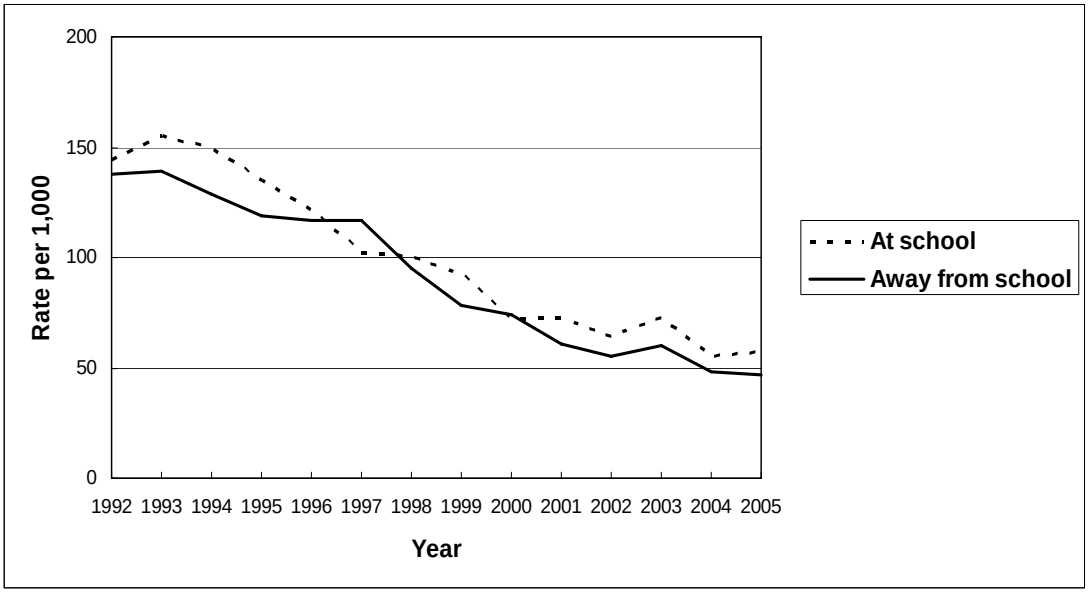
Source: data on number of homicides in school are from School-Associated Violent Deaths Surveillance Study (SAVD), tabulated in Indicators of School Crime and Safety (2007, p. 68); and data on number of homicides total are from National Center for Injury Prevention and Control, Web-based Injury Statistics Query and Reporting System Fatal (WISQARS™ Fatal), retrieved Nov 2008 from http://cdc.gov/ncipc/wisqars.

However, schools have a much larger share of the nonfatal crimes with school-aged victims. Figure 2 depicts the trend for victimization rates of youths aged 12-18, including both theft and violence.[5] The rates per 1,000 follow the trend for youth homicide (as well as the national trend for criminal victimization for all age groups) – a sustained and rather dramatic reduction, so that the 2005 figures are about one-third of the peak in 1993. For our immediate purpose here, the important thing to notice is that the victimization rate in school is about the same as out of school. That parity is the net result of theft, which has higher rates at school, and violence, which for most of the period has lower rates at school (although in-school and out-of-school rates of violence converged in 2004). Note that since youths spend over 80 percent of their waking hours during a calendar year out of school (Gottfredson 2001, p. 21), the parity in victimization rates implies that youths are far more likely to be victimized during an hour in school than an hour elsewhere.

For the serious violent crimes of rape, robbery, and aggravated assault, NCVS victimization rates are twice as high away from school as at school during recent years, as shown in Panel B. Since the corresponding ratio for murder is 100 to one, we conclude that serious violent crimes committed out of school are far more likely to become murders than is true for similar crimes in school.[6]

[5] Youths who have completed 12 years of school are excluded from this tabulation.
[6] Soulé, Gottfredson, and Bauer (2008) report that the crime that occurs in schools tends to be of a less serious nature than the crime that occurs outside of school.

Panel A



Panel B

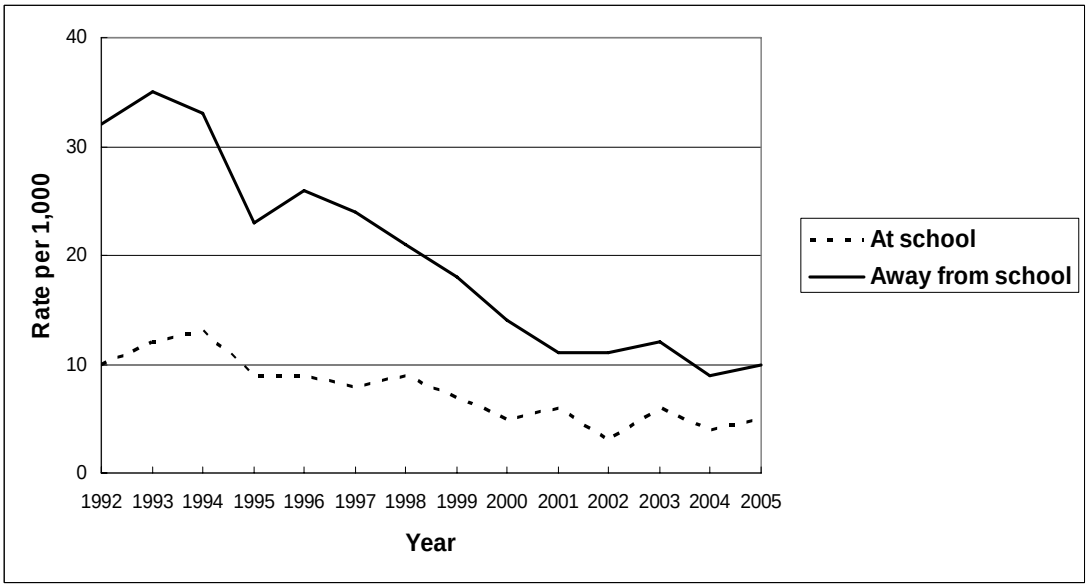


Figure 2. Panel A: Victimization rates at school and out for youths ages 12-18, 1992 - 2005: theft and violence. Panel B: Victimization rates at school and out for youths ages 12-18, 1992-2005, serious crimes of violence.

Note: Theft includes purse snatching, pick-pocketing, and all attempted and completed thefts except motor vehicle thefts. Theft does not include robbery in which threat or use of force is involved. Violence includes serious crimes of violence and simple assault. Serious crimes of violence include rape, sexual assault, robbery, and aggravated assault. "At school" includes inside the school building, on school property, or on the way to or from school.

Source: National Crime Victimization Survey (NCVS), tabulated in Indicators of School Crime and Safety (2007, p. 70)

Survey data on crime are notoriously unreliable. In particular, crime survey results are exquisitely sensitive to the details of how the data are collected. One survey that provides an alternative to NCVS for estimating victimization rates is the Youth Risk Behavior Surveillance System (YRBSS), sponsored by the CDC. This survey yields estimates of victimization rates for serious violent crime that are an order-of-magnitude higher than the NCVS rates. For example, in the 2005 YRBSS, 8 percent of students in grades 9-12 reported being threatened or injured with a weapon on school property during the previous 12 months. That compares with the serious-violence victimization rate at school for 15-18 year olds in the NCVS of 0.4 percent. Thus the YRBSS rate is 20 times as high, even though logic suggests that it should be *less,* given that the YRBSS refers to prevalence of victimization and the NCVS figure is overall incidence (so that multiple victimizations reported by the same respondent are included in computing the rate). Further, the NCVS category of "serious violence" encompasses more types of crime than the YRBSS category of "threatened or injured with a weapon."

What could account for this vast difference in results? First, the NCVS sample is interviewed every six months, and the previous interview serves as a bracket to help the respondent place events in time. Thus the NCVS sample members are asked to report on events that occurred since the previous interview. The YRBSS, on the other hand, is a one-shot survey with no natural bracket on the time interval; respondents are asked to report on the previous 12 months, which creates the likelihood that some will report on serious events that occurred outside the designated period (a phenomenon known as "telescoping"). A second important difference is that all YRBSS respondents are asked

the specific question about whether they were threatened or injured with a weapon on school property, whereas the only NCVS respondents who are asked about such an incident are those who first respond affirmatively to a more general screener question. Third, the NCVS questionnaire is administered to the respondent (in person or over the telephone) at home, whereas the YRBSS questionnaire is self-administered by the respondent while in school. These and other differences, none of which are relevant in a literal sense, appear to be hugely important to the respondents' answers in practice.[7]

Given the disparate results from surveys, it is of interest to consider administrative data. The School Survey on Crime and Safety gathers reports from public school principals about crimes occurring during school hours. For the 2005-6 school year, principals for middle and high schools reported a total of 928 thousand violent crimes and 206 thousand thefts (see Table 1). While these counts are not precisely comparable to the NCVS results for 12-18 year olds,[8] they should be close. In fact, the violence reports are half again as high in the SSCS as in the NCVS for 12-18 year olds, while the SSCS theft reports are much lower. It is not surprising that school officials do not know about many of the thefts that occur on school property, but the fact that they are aware of more violence than shows up in the NCVS defies ready explanation.

[7] Cook (1987) notes that the Safe Schools study estimated one million robberies in schools, compared with the estimate of 30,000 in the NCVS for the same period.
[8] Unlike the NCVS, the SSCS is limited to public schools. The NCVS age range of 12-18 is roughly but not exactly comparable to the SSCS category of "middle and high school."

Table 1
Comparison of SSCS and NCVS Crime Counts

	SSCS crime count: Public Middle and high schools 2005-6 school year	NCVS crime count in school Ages 12-18 2005
Violent crimes	928,000	628,000
Theft	206,000	868,000

Sources: http://nces.ed.gov/pubs2007/2007361.pdf; http://nces.ed.gov/programs/crimeindicators/crimeindicators2007/tables/table_02_1.asp?referrer=report

Thus the truth about crime in school – or even a rough approximation of the truth – is elusive. Our inclination is to believe that the SSCS reports provide a reliable lower bound for the "true" volume of crime, understating the true total to the extent that officials are never made aware of some crimes, and may generally be inclined to under report in order to make their schools look as safe as possible. If true, then the NCVS appears to provide a notable underestimate of the volume of violence in schools – but the difference is nothing like that suggested by the very high YRBSS results. We are inclined to believe that the NCVS data are superior to the YRBSS because the method of administration discourages exaggeration by respondents, and the bracketing provides some discipline on memory. We also note that the downward trend in NCVS rates (shown in Figure 2) reproduces well-documented trends during that period for the entire U.S. population, and hence is credible. The YRBSS victimization rates, on the other hand, exhibit no such trend during this period, showing if anything an upward tilt since 1993. For those reasons we report additional NCVS results in what follows, even though we are willing to believe that these are also far off the mark.

Table 2 summarizes demographic patterns in victimization rates at school for youths aged 12-18.[9] The rates shown here are averaged over the three most recent years of the School Supplement of the NCVS. Note that "theft" and "violence" sum to the total – "serious violence" is included in "violence."

Table 2
At-School Victimization Rates/1,000 for Youths Age 12-18

	Total	Theft	Violence	Serious violence
Male	73	41	32	7
Female	61	41	21	4
Ages 12-14	75	42	33	6
Ages 15-18	61	40	21	5
Urban	75	41	34	9
Suburban	67	43	24	5
Rural	58	37	22	2
White	72	45	27	4
Black	64	38	27	5
Hispanic	55	29	26	5
Other	53	33	20	2
Overall	67	41	27	6

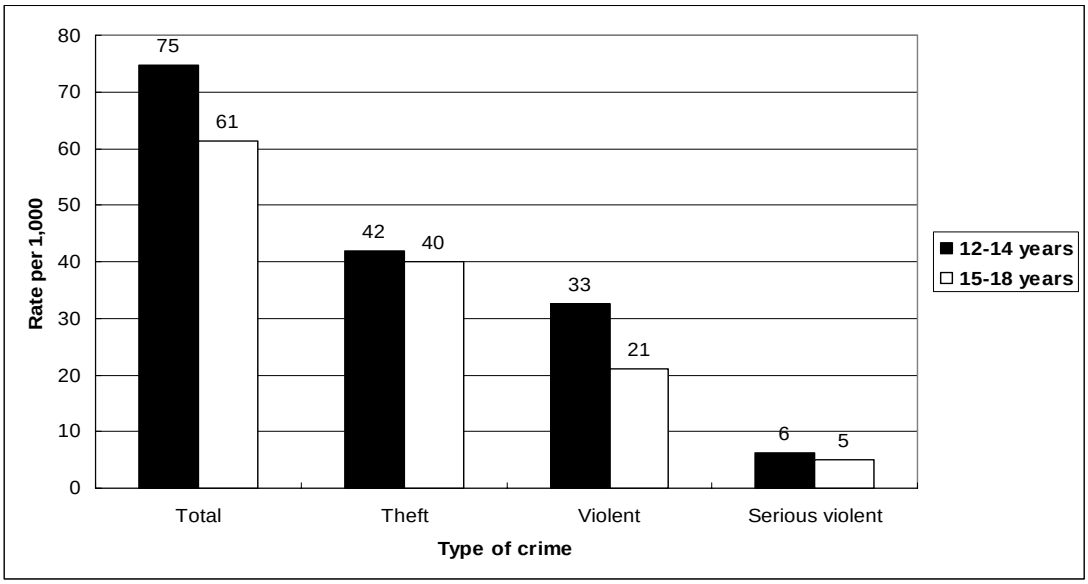
Source: NCVS results averaged for 2001, 2003, and 2005

Theft rates are remarkably uniform across all demographic categories, averaging 41/1,000. Violence rates are a bit lower overall and more textured, although the differences among groups are still not as large as one might expect. Males are half again as likely to be victims of violence as females, and youths 12-14 are half again as likely as older youths. Urban schools experience a higher per capita rate of violent incidents than suburban or rural schools. Most surprising is that whites, blacks, and Hispanics report virtually the same rates of violence and serious violence.

[9] It should be noted that these data exclude the responses of students who have already completed 12 years of schooling. They do not exclude school dropouts.

The same NCVS data provide estimates for victimization rates away from school. The patterns are not much different, with two exceptions. First, blacks report a higher rate of serious violent crimes (17/1,000) than whites and Hispanics (both at 10/1,000). Second, and perhaps most intriguing, is that the age pattern away from school is the reverse of the age pattern at school. The younger group, aged 12-14, has somewhat higher victimization rates at school than the older group, but the older group has much higher victimization rates than the younger group away from school. The results are depicted in Figure 3. The explanation may in part be due to the fact that the older group includes a number of school dropouts who, since they are not attending school are unlikely to be victimized on school property. Perhaps more important is that older youths have greater mobility and freedom outside of school, and thus more opportunity to get into trouble.

Panel A



Panel B

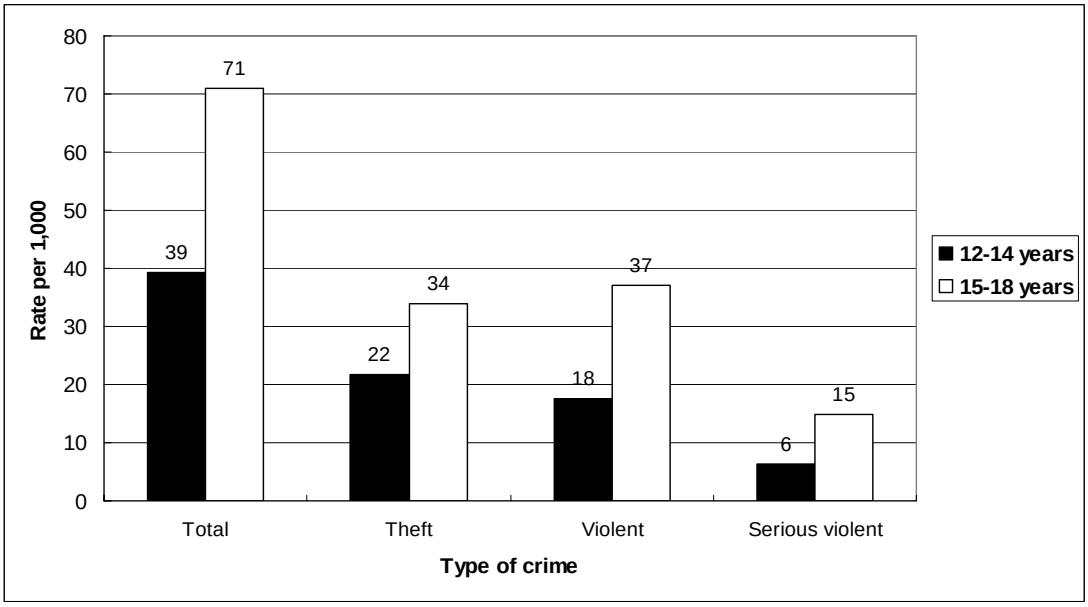


Figure 3. Panel A: Victimization rates at school for youths ages 12-14 and 15-18. Panel B: Victimization rates away from school for youths 12-14 and 15-18.

Note: Total crimes include theft and violent crimes. Theft includes purse snatching, pick-pocketing, and all attempted and completed thefts except motor vehicle thefts. Theft does not include robbery in which threat or use of force is involved. Violent crimes include serious violent crimes and simple assault. Serious violent crimes include rape, sexual assault, robbery, and aggravated assault. "At school" includes inside the school building, on school property, or on the way to or from school. NCVS results are averaged for 2001, 2003, and 2005.

Source: National Crime Victimization Survey (NCVS), tabulated in Indicators of School Crime and Safety (2003, pp. 55-66; 2005, pp. 72-73; 2007: pp. 70-71)

Finally, we note the high prevalence of bullying in school. While not necessarily a crime, bullying can greatly color the school experience for some children. The NCVS School Crime Supplement found that in 2005, 28 percent of youths ages 12-18 reported being bullied in school – of those, 79 percent said they were bullied inside school, 28 percent outside on school grounds, and 8 percent on the school bus.[10]

C. Teachers as crime victims

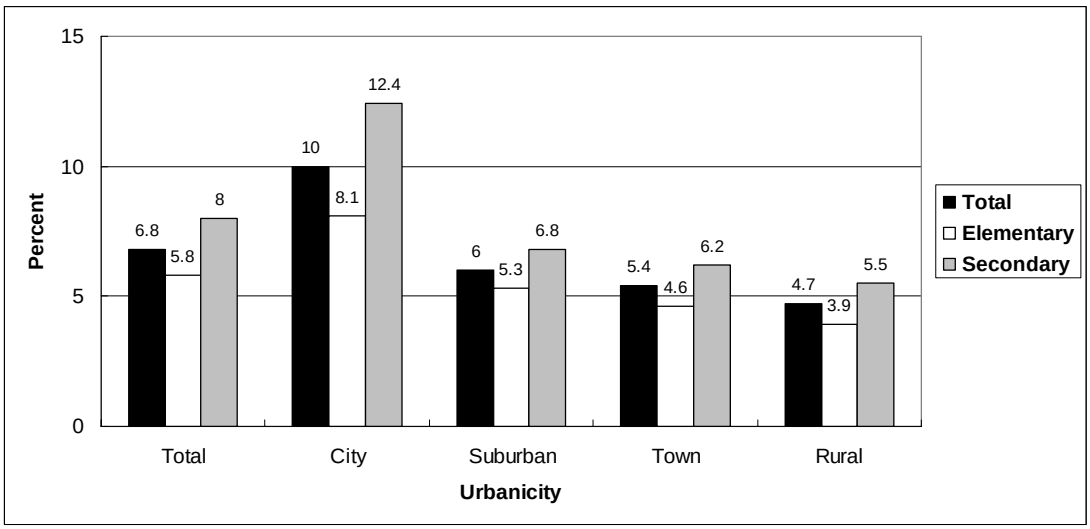
While crime in schools for the most part involves students as both perpetrators and victims, the teaching staff is not spared. The best source of information on teacher victimization rates is the recurrent School and Staffing Survey. This survey selects a stratified sample of schools and collects data from up to 20 teachers in each of the sample schools. Teachers are asked whether they had been threatened with injury or physically attacked by a student from their school in the previous 12 months. In 2003-4, an estimated 7 percent of teachers were threatened with injury, and 3 percent reported being physically attacked. These percentages are lower than in the previous wave (1999-2000) and substantially lower than in 1993-4: In that year, 12 percent of teachers were threatened, and 4 percent were attacked.[11]

The rates of teacher victimization differ somewhat along two dimensions that are reported in SASS: First, whether the school is in a city, suburb, town, or rural area, and second whether the school is elementary (through 6th grade) or secondary. Figure 4

[10] Indicators of School Crime and Safety, 2007, p. 95.
[11] Indicators of School Crime and Safety, 2007 (http://nces.ed.gov/programs/crimeindicators/crimeindicators2007/ind_05.asp, accessed 11/30, 2008).

depicts the results for threats and physical attacks. In both cases the city schools have the highest victimization rates. Interestingly, in every location the teachers are more likely to be threatened in secondary schools, but more likely to actually be attacked in elementary schools.

Panel A



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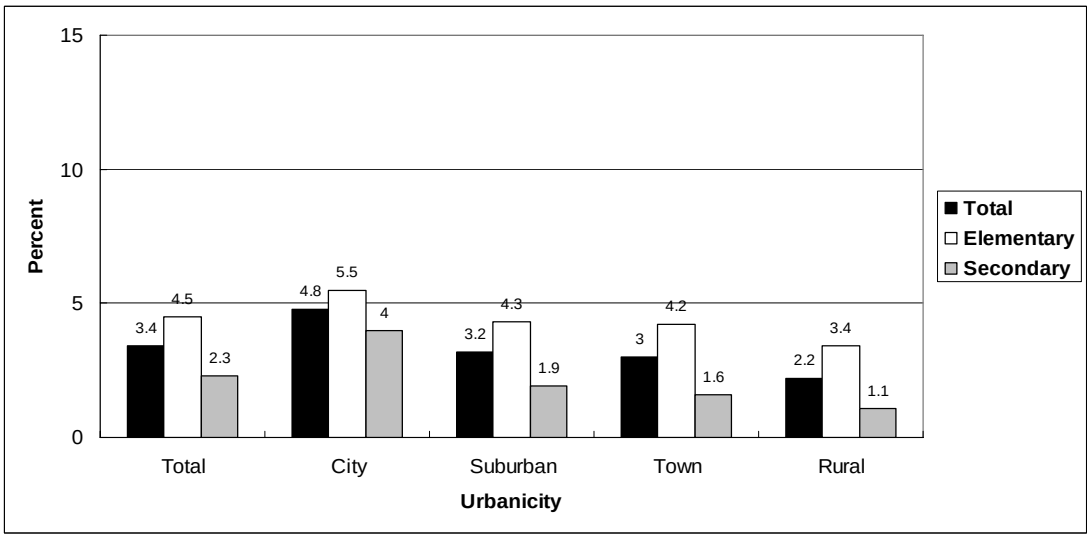


Figure 4. Panel A: Prevalence of injury threats to school teachers, 2003-4. Panel B: Prevalence of physical attacks on school teachers, 2003-4.

Source: Schools and Staffing Survey (SASS), tabulated in Indicators of School Crime and Safety (2007: pp. 77-78)

It is interesting to reflect on these results a bit. In what other professions that require a college degree are workers so likely to be threatened and physically attacked? After military officers and perhaps divorce lawyers, we suspect that teachers are among the most victimization-prone.

D. Differences among schools

Up until this point we have described crime patterns primarily with respect to the characteristics of the victims. From another perspective, school crime is a characteristic of the school, and there is strong evidence that school characteristics and policies influence crime victimization rates (Gottfredson and DiPietro 2009). While we postpone the discussion of the causal influence of school climate and other school features until subsequent sections, here we summarize several patterns.

The 2005-6 SSCS classifies schools by grade level, enrollment size, urbanicity, and percent minority enrollment. The rate of violent incidents reported by principals is much higher for middle schools than either elementary or high schools; somewhat higher for city schools than those in suburban or rural communities; and higher in predominantly minority schools than those with less than half minority. Notably, there is little relationship between the size of the school and the violence victimization rate. The results for theft tend to be less patterned, but recall that the theft statistics appear less reliable in this survey. Table 3 summarizes the results.

Table 3
Crime Rates by School Characteristic

	Violence rate/ 1,000 students	Theft rate/ 1,000 students
Level		
Primary	25.2	1.6
Middle	51.6	7.8
High school	25.7	8.7
Enrollment		
<300	34.5	4.3
300-499	34.0	3.3
500-999	30.9	4.5
1,000 or more	28.6	7.2
% minority enrollment		
<5%	26.9	4.8
5-20	22.9	5.2
20-50	28.4	5.5
50 or more	39.9	4.8

Source: Nolle, Guerino, and Dinkes (2007). *Crime, Violence, Discipline, and Safety in US Public Schools: Findings from the School Survey on Crime and Safety: 2005-6 (US Department of Education, NCES 2007-361), extracted from Table 1.*

To some extent these patterns are at odds with NCVS victimization patterns. In the administrative data in Table 3, violence is much more common than theft, while NCVS victimization rates are about equal. Further, it appears that the relatively high rate of violence in minority schools contradicts the NCVS finding that there is little difference in victimization rates by race. These differences could logically be due to the differences in coverage (since the SSCS includes all ages and NCVS only 12-18). More likely it reflects problems with under-reporting of violence in the NCVS that we encountered above.

The same source, SSCS, reports information on gang-related crime. In 2005-6, 11 percent of middle schools and 16 percent of high schools reported at least one crime that

was gang-related. Gang-related crimes were concentrated in large, urban, and predominantly minority schools (Nolle, Guerino, and Dinkes 2007, Table 4).[12]

E. Arrests and juvenile criminal careers

Our final perspective on crime in schools is in terms of arrests of school-aged youths. While school-aged youths are about equally likely to be victimized in school as out, they are much more likely to be arrested for offenses occurring outside of school. We draw that conclusion from the admittedly imperfect data provided by NIBRS – imperfect because, as mentioned above, only about one in five jurisdictions participate in this system, with no guarantees about just how representative participating police agencies are with respect to national arrest patterns. Still, we would be surprised if the NIBRS data are that far out of line with national patterns when it comes to the division of arrests between school and non-school.

What we see from Table 4 is that just 15 percent of all arrests of youths age 5-18 occur in conjunction with offenses committed in school. To some extent the arrest patterns follow the victimization patterns. For example, a much higher percentage of simple assault arrests (28%) occur in school as compared to aggravated assault arrests (12%) or murder arrests (0.9%). The percentages of arrests for larceny and robbery that occur in school are remarkably low given what we know about victimization patterns for this group.

[12] Some confirmation for these patterns comes from the NCVS School Supplement data. Students were asked about gangs in their schools. Affirmative responses were much more likely by black and Hispanic students, and by students in urban areas.

Table 4
Arrestees Aged 5-18 in NIBRS Jurisdictions, by Offense Type and Location: 2006

Offense Type	Total arrests	Percent in school
Murder	339	0.9
Forcible Rape	1282	3.6
Robbery	6331	4.4
Aggravated assault	13,242	12.1
Simple assault	58,778	27.8
Burglary	18,663	7.8
Larceny	74,1582	7.6
Motor vehicle theft	7,071	1.5
Arson	1,765	20.5
Vandalism	27,017	13.2
Drug/narcotic violations	55,418	17.9
Total**	264,058	14.9

Note: "In school" refers to the location of the offense that led to an arrest. "Total" includes some offenses that are not listed above.
Source: Original tabulations from data files. National Incident-Based Reporting System (NIBRS), 2006.

What accounts for the low percentage of arrests that occur in school, as compared with the percentage of victimizations that occur in school? We believe that may reflect the reality of juvenile crime careers – the bulk of crime committed by juveniles outside of school is committed against adults or commercial or residential targets. Thus it is plausible that there be a large difference between the distribution of locations of youth victimization and the location of delinquent acts. In school there is a close match between the ages of perpetrators and victims, but out of school that is not the case.

F. Concluding thoughts

There are a variety of sources of statistics on crime in schools, which unfortunately provide differing results on levels, patterns, and trends. Anyone wishing to make sense

of the available statistics should first become informed on the details of how the data are generated and consider the likely biases.

We believe that the homicide statistics are close to accurate, but that other police data on school crime are not to be trusted. For nonfatal crimes, we place some credence in the NCVS for students, and the SASS for teachers, both of which are recurrent surveys and implemented by the US Census Bureau. What one learns from these sources is that crime victimization in schools (for both students and teachers) followed the downward trend in national crime rates during the 1990s, and remains at a relatively low level since 2000. That there would be a common trend makes sense, and is one illustration of a more general result that crime in schools is closely linked to crime in the community.

Another credible result is that there is a great deal of crime in schools perpetrated by and against students, with victimization rates that are similar to rates experienced outside of school, despite the fact that students spend less than one-fifth of their waking hours in school. Fortunately, homicide is very rare in school (relatively and absolutely). In general a much higher percentage of minor assaults occur in schools than serious assaults. Teachers are somewhat less likely to be victims of threats and attacks by students, but teaching is without a doubt a risky profession. It is particularly frustrating that we lack good data on injuries to teachers resulting from physical attacks.

Despite the high rates of crime in school, school crime plays a relatively minor role in juvenile criminal careers. Eighty-five percent of juvenile arrests are for crimes committed away from school. When in school, delinquents primarily victimize their peers, but outside of school a large percentage of their victims are older and the crimes are more serious.

II. Schools' Potential to Influence Crime

Schools share the responsibility with families and communities for socializing youths to become law-abiding and productive citizens. For current students, schools have primary responsibility for providing a safe environment on school property, and a shared responsibility for limiting delinquent behavior elsewhere. Our focus in this review is on how schools can and do influence the behavior of students while they are enrolled. However, we begin with a brief account of the role of schools and schooling in influencing subsequent behavior.

A. Does schooling influence criminal careers?

It seems reasonable to expect that formal schooling would tend to provide licit skills and social capital that would compete effectively with the allure of criminal activity. Research on the relationship between school attainment and criminal careers is challenged by the difficulty in identifying the effect on crime of schooling per se, as distinguished from the underlying factors that influence both educational attainment and crime. This difficulty is evident in the mixed results from research on school drop out and crime. All studies find that drop-outs engage in more criminal behavior than do their peers who graduate from high school, but the conclusions differ depending on how the selection artifacts are handled. Some studies have concluded that, net of controls for factors that influence both educational attainment and crime such as school performance and socioeconomic status, dropping out of school is related to an increase in subsequent crime (Thornberry, Moore, and Christenson 1985), and that the number of offenses

committed per year is lowest when youths are enrolled in school as opposed to out of school (Farrington, Gallagher, Morley, St. Ledger, and West 1986). Other studies have concluded that graduation status is unrelated to subsequent crime when statistical controls are applied (Bachman et al. 1978; LeBlanc, Valliéres, and McDuff 1993; Sweeten, Bushway, and Paternoster 2009), or that problem behaviors such as substance use increase the likelihood of dropping out of school (Garnier, Stein, and Jacobs 1997; Mensch and Kandel 1988; but see Cook and Hutchinson 2007).[13] Another study (Jarjoura 1993) found that the relationship between dropout and later delinquent behavior is conditioned by the reason for dropping out.

One recent study used a quasi-experimental method to identify the influence of educational attainment on subsequent crime. Lochner and Moretti (2004) used changes in state compulsory education laws over time to provide an exogenous instrument influencing schooling decisions. They found that schooling significantly reduces the probability of incarceration, arrest, and crime. They note several mechanisms that may account for these findings: First, additional years of schooling might increase the opportunity cost of prison by providing more attractive licit employment opportunities. Additionally, the stigma of criminal conviction is likely to be higher for more highly educated individuals, and schooling may alter individual levels of risk aversion or "tastes for crime." It is also true that many school-based prevention programs seek to reduce participation in violence, substance use, and crime by increasing individuals' social bonding, social and cognitive skills related to future success, and social capital.

[13] Hjalmarsson (2009) investigates the reverse causal process. Her question is whether incarceration for delinquents reduces the chance that they will graduate from high school. She finds mixed results.

We conclude that compulsory education laws have a preventive effect on criminal activity. The effects on crime of other policies to extend school careers have not been tested adequately.

We now turn to our main focus, the effect of schools on the problem behaviors of the current student population. That is, we consider those school characteristics that influence concurrent levels of crime, victimization, violence, and substance use.

B. School Organization Matters

Contrary to the research demonstrating that staying in school for more years decreases *subsequent* crime, the data on how school attendance affects concurrent criminal activity is mixed. Two recent studies find that the causal effect of being in school differs by type of crime. Jacob and Lefgren (2003) exploit the quasi-experiment provided by teacher in-service days, finding that these days were associated with a 28% reduction in violent crimes known to the police, but a 14% increase in property crimes. Another analysis utilizing variation in attendance caused by teacher strikes finds similarly mixed results; teacher strikes in Washington State are associated with a 34% reduction in juvenile arrests for violence, and a 29% increase in arrests for property crimes (Luallen 2006). It is not clear from these studies whether overall property-crime rates increase when students are out of school – it is quite possible that property crime by students simply is relocated from school to the community, with the latter much more likely to become known to the police.

Regardless of the effect of school on juvenile crime commission, we know that youth victimization rates are higher in school than out is most likely due to increased exposure

to other deviant youths. Increase in delinquency perpetration is also likely to be encouraged during the school day by the presence of social norms that support (or at least appear to youth to support) delinquent behavior, and by peer reinforcement for the expression of deviant attitudes, beliefs, and behaviors. Dishion and Dodge (2006) discuss this "deviant peer contagion" process (which has mainly been of concern in the context of intervention programs that group high risk youth together for services) and how this process is facilitated by ecological factors such as the school and community contexts. They suggest, for example, that peer reinforcement of deviant behavior may be particularly potent in school contexts that fail to reinforce non-deviant behavior. An extensive body of "school effects" research has investigated what features of the school environment might be important for influencing students' deviant behavior.

Research on school organizations and crime in the U.S. was born out of the major shifts in public education of the 1960's that resulted from forced school desegregation and "white flight" from city schools. These events led to increasing concerns about the condition of schools and considerable media coverage emphasizing the general deterioration and safety problems in the inner city schools. The American Federation of Teachers was instrumental in raising public awareness related to teacher safety. In response to these pressures, the U.S. Congress held a series of hearings in 1975 and 1976 on the topic of school disorder. Subsequently, Congress mandated the National Institute of Education to conduct a study to learn more about school safety. This "Safe School Study," conducted in 1976 by Research Triangle Institute, became the first large-scale study of school climate and delinquency.

At approximately the same time, another early influential study was conducted by Michael Rutter and colleagues (1979) in which twelve city schools in Great Britain were compared. Rutter and Maughan (2002) describe their research team's early discovery of school effects on problem behavior as somewhat opportunistic. While studying reading difficulties and emotional/behavioral problems in communities, they noticed that the rates of problem behavior differed considerably from school to school. This observation coincided with those of several smaller scale studies conducted in the 1970's that demonstrated large variability in behavioral outcomes across schools.

Of course, school crime rates might differ not because schools influence these outcomes, but rather because the input characteristics of the students differ from school to school. Early work on school organization and problem behavior included only fairly crude controls for the characteristics of surrounding communities and student input. In the mid-1980's, Gottfredson and Gottfredson (1985) re-analyzed the Safe School Study data to provide a more precise estimate of the extent to which characteristics of schools influence the incidence of problem behaviors. They aggregated data from principal, teacher, and student surveys collected from 642 secondary schools to the school level to model the effects of school characteristics on school disorder, as measured by rates of victimization. They merged these reports of school disorder and school characteristics with census data pertaining to the school communities. The study found that input characteristics of the students and communities in which the schools were located accounted for 54% of the between-school variance in teacher victimization rates in junior high school and 43% reduction in senior high schools. However, controlling for these exogenous characteristics, characteristics of the schools (e.g., school and discipline

management practices and school culture and climate factors) accounted for an additional 12% (junior high) and 18% (senior high) of variance.

More recent studies of schools and problem behavior have replicated these findings. In another nationally representative sample of schools collected in the late 1990s, Gottfredson, Gottfredson, Payne, and Gottfredson (2005) again merged census characteristics describing the communities surrounding the schools onto school-level files containing reports from the principals, teachers, and students regarding their experiences with victimization and delinquency and the characterizations of their schools. As in earlier studies, school and community characteristics explained a considerable proportion of the between-school variability in problem behavior. (The list of community characteristics included racial composition of the schools, size of school, urban location, community poverty and disorganization, residential crowding, grade levels included in the school, and males as a percentage of the student body.[14]) But compared with the results of the earlier Safe School study data, this more recent research found that a lower percentage of variance in school disorder is accounted for by these exogenous characteristics: 12% for measures of student delinquency, 23% for student victimization, and 25% for teacher victimization. Similarly, the more recent study documented that a larger percentage of the variance in these outcomes is explained by school characteristics.

[14] Note that different studies have drawn different dividing lines between "community" and "school" characteristics. For example, Gottfredson and Gottfredson (1985) defined average demographic characteristics and grade level of the school's students as a community characteristic, but school size and staffing characteristics such as the racial composition of the school's teachers as school characteristics. Gottfredson, Gottfredson, Payne, and Gottfredson (2005) included teacher and student demographics as well as school size as "externally-determined" characteristics. In this chapter, we define "school climate" more broadly to include both demographic and ecological "inputs" that, although determined external to the school building, nevertheless may influence school crime. See below.

While the earlier study found characteristics of the schools accounted for an additional 12% (junior high) and 18% (senior high) of variance of teacher victimization rates, the more recent study found that 30% of the between-school variance in teacher victimization is accounted for by six different measures of school organization.

A recent study by Cullen, Jacob, and Levitt (2006) capitalized on a natural experiment in the Chicago Public Schools to demonstrate that schools matter for problem behavior outcomes. By analyzing data from Chicago's school choice program, they showed that ninth-graders who had won the lottery to attend a high-achieving high school reported arrests at a rate 60% lower than those who lost the lottery. This pattern of self-reports is corroborated by administrative data on incarceration rates for these students (p. 1223). Due to the chance allocation of school choice, these estimates of school effects on crime are not confounded with the characteristics of the students or of their community of residence. Thus there is something about schools themselves that is important for shaping the behavior of youths in the schools.

But what mechanisms link the school context to misbehavior? Criminological theory tells us that youths engage in proscribed behaviors when they believe that doing so will result in pleasure or profit and when they perceive opportunities to do so. They are especially likely to anticipate pleasure or profit if they have been reinforced in the past or seen others being reinforced for these behaviors. Fortunately, the application of controls reduces the likelihood that youths will act on their impulses. Some of these controls influence behavior by threatening undesirable consequences if caught. These include sanctions applied by parents, schools, and the police. But these sanctions tend to be less effective if the sanctioning process is not perceived as legitimate and fair. Some controls

are more implicit in the process of socialization. These "informal" controls bond youths to the social order through emotional attachments, investments in certain futures, and beliefs about what is right and wrong. They control behavior to the extent that youths believe that by engaging in proscribed behaviors they risk losing the respect of loved ones, gambling with a good future, or suffering a bad conscience. Finally, some youths hold their own behaviors in check through the application of self-control. This basic understanding of the mechanism underlying crime and other forms of misbehavior implies that schools can reduce these behaviors in the following ways:

- Reducing availability of opportunities to engage in problem behaviors
- Reducing positive reinforcement of problem behaviors
- Increasing formal controls (e.g., increasing the probability of formal sanction as a consequence for problem behavior as well as the perceived legitimacy of sanctioning process)
- Increasing informal controls (e.g., increasing emotional attachments, investments in goals inconsistent with engaging in crime, and beliefs about right and wrong behavior)
- Increasing self control

Of course, these mechanisms are influenced in large part by the community, the family, and individual predispositions. But several aspects of the way schools are organized and managed influence these crime-producing mechanisms. First, as will be developed in greater detail, school system decisions influence the demographic composition of schools

and the number and types of other students to whom a child is exposed. School or school-district decisions regarding how students are organized for instruction (e.g., academic or behavioral tracking, or departmentalization) further narrow the characteristics of other students to whom youths will be exposed. Importantly, these decisions determine the pool of youths from which highly influential peers will be selected as well as the dominant peer culture in the school. Second, curricular content and teaching methods determine student success in school and decisions to persist in school. Specialized curricula are often used to directly influence problem behaviors (e.g., social competency skills instruction, drug prevention curricula). Third, policies and procedures governing discipline management directly affect the extent to which formal sanctions are applied and the effectiveness of these sanctions. And fourth, the school social organization sets the stage for the application of social controls by influencing the nature of interactions among teachers and students and the school culture.

C. School Climate

The relevant aspects of the school environment are brought together under the umbrella term "school climate." The research literature relating characteristics of school climate to crime-related youth outcomes has grown at a rapid pace in the past ten years (see Figure 5).

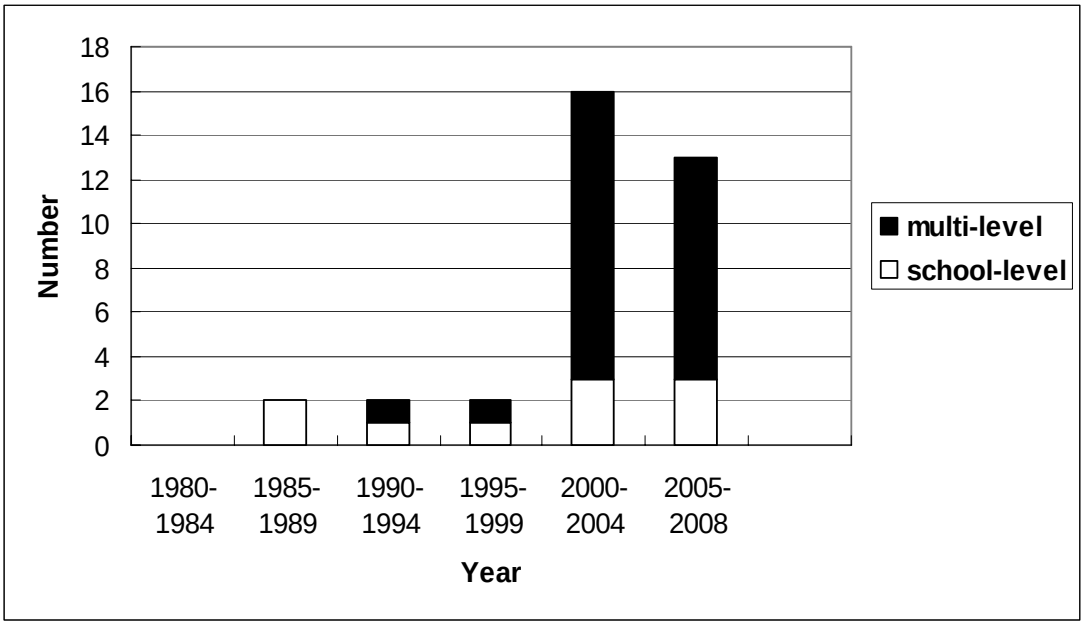


Figure 5. Number of school climate and problem behavior studies, 1980-2008.

The largest challenge to accumulating knowledge from this growing research base is that school climate is defined and measured very differently from study to study. School climate is rarely explicitly defined, but simply treated as a feature of the school environment that is larger than the individual student. While some studies measure school climate according to the average demographic characteristics of the students in the school, others measure it according to externally-determined characteristics of the school's organization such as size or student/teacher ratio. Still others use students' subjective assessments of their schools. It is necessary to organize these different conceptions of school climate before trying to summarize its influence on school crime. Although many organizing frameworks exist, we adopt one introduced by Tagiuri (1968) and utilized in an earlier review of school climate research (Anderson 1982).

Tagiuri's (1968) defined organizational climate as follows:

> "Organizational climate is a relatively enduring quality of the internal environment of an organization that (a) is experienced by its members, (b) influences their behavior, and (c) can be described in terms of the values of a particular set of characteristics (or attributes) of the organization" (p. 27).

His definition emphasizes the importance of the perceptions of members of the organization in defining the climate. Tagiuri (1968) distinguishes four important features of organizational environments: *Ecology* refers to physical and material features of the environment. In the school context, these are largely externally determined and they determine resources available and define patterns of interaction broadly speaking. They include school finances, physical features of building, school size and its derivative, and student/teacher ratio. *Milieu* characteristics are average input characteristics of people in the organization – the composition of the organization in terms of participating people and groups. The *social system* concerns patterned relationships of persons and groups in the organization, or the rules of operating and interacting in the organization. It is useful to divide the school social system into two major subcategories, *school organizational structure,* and *school administration/management:* The organizational structure refers to how the work in the organization is conducted. It includes the level of departmentalization and specialization, the curricular offerings and organization, and the way students are scheduled into classes and grouped for instruction, for example. School administration/management includes the methods used for discipline management, and for managing the organization more generally. Practices and procedures aimed at increasing goal clarity, effective communication and decision-making/problem solving,

and coordination of resources are included in this category. Finally, *culture* refers to the prevailing beliefs, values, norms, and attitudes of the people in the organization and pertains more to the quality of human relationships than to the formal social organization of the organization. Two important aspects of organization culture in the school context are the peer culture and the extent to which the organization is communally organized.

In order to summarize recent research on school climate and problem behavior, we conducted a search for such studies conducted since 1980. Specifically, we searched for empirical research categorized under the following key words: School climate, school culture, school environment, school organization, or school milieu *and* substance use, delinquency, crime, victimization, misbehavior, or problem behavior. We also searched for articles that had cited one of three earlier reviews of school climate research, and we included additional studies already known to us. We identified 72 studies for potential inclusion in our review of school climate factors associated with problem behaviors. About half (37) studies were eliminated in our first reading, mainly because they did not report on an empirical study. The remaining 35 studies were coded to capture aspects of their methodologies, the nature of the student outcomes and school variables examined, and the associations found. The measures of school climate were coded according to the elements of the Tagiuri's classification just described.

The studies are based on predominantly U.S. samples (86%), approximately half of the studies (57%) use nationally representative samples of schools, and approximately half (51%) include both middle and high schools. Some include only middle schools (34%) or only high schools (14%). The number of schools per study averages 339 (range: 11 through 2,270).

These studies are divided into two major classes according to their designs. School-level studies model only between-school variation relating school characteristics to school mean levels of student problem behaviors. Multi-level studies model individual-level student variability in problem behaviors from both individual-level predictors and school-level predictors. Note that intervention studies which report the results of experimental or quasi-experimental changes in some feature of school organization are treated in subsequent sections separately from the observational studies. The large number of studies of school-based interventions required that we conduct more focused literature searches only on specific types of interventions.

Although school-level studies are useful for identifying school-level associations, multi-level models allow for more precise decomposition of these aggregate correlations into a segment that is due to individual-level processes and another due to contextual effects. For example, we know that most problem behaviors are elevated for males relative to females. A school-level association between percentage students male and average delinquency level may reflect only this underlying individual-level correlation, but it might also reflect a contextual effect such that youths who attend schools with higher concentrations of males engage in more delinquency than they would if they attended a school with a lower concentration of males. In both types of studies, school characteristics are measured in a variety of ways, including the following: average student or teacher reports of their own characteristics and experiences (e.g., average teacher job satisfaction or youth reports of delinquent peers); average student or teacher reports of school characteristics (e.g., teacher reports of principal's administrative style or student reports of fairness of school rules); principal reports of school characteristics (e.g.,

presence of gangs in the school); school archival records (e.g., school size); and average census characteristics (e.g., poverty level in the area surrounding the school). Individual-level characteristics are almost always measured using youth self-reports.

In the following sections, we consider each major type of school climate characteristic included in Tagiuri's classification. *Ecology* and *Milieu* are considered in the next section (titled "inputs"). The remaining categories (*school system* and *culture*) are reviewed in Sections IV and V respectively. In each section, we first summarize evidence from the observational studies that relate aspects of school climate to measures of youth substance use, delinquency, victimization, and other problem behaviors such as misbehavior or classroom disorder. The details underlying these summaries are contained in the Appendix. Appendix Tables 1 and 7 provide overviews of the school-level and multi-level studies included in the summary. Appendix Tables 2 through 6 and 8 through 12 provide more detail showing the actual measures used as indicators of school climate and the nature of the associations observed. The results from observational studies are followed by discussions of intervention research that has attempted to alter each school characteristics of interest.

III. School Inputs

The four dimensions that constitute "school climate" include two that refer to what might be called the "inputs" in the process that produce school-related misbehavior. Those inputs include, first, the "ecology" of the school – physical features of the building, the ratio of students to adults in the school, and school size (size is of particular interest due to the widespread belief that smaller schools are better places to learn). Second is the

"milieu" of the school, meaning the characteristics of the students and adults who are present in the school on any given day.

A. *Ecology*.

Most studies listed in the Appendix Tables 2 and 8 include a measure of school size – number of students in the school, or in the grade. A few studies include measures of other aspects of ecology such as resources available for teaching (Gottfredson and Gottfredson 1985), per-pupil expenditure (Eitle and Eitle 2004), student-to-teacher ratio, or average class size. Only one study measured physical features of the environment (Kumar, O'Malley, and Johnston 2008). The reports of associations of problem behaviors with these aspects of school ecology other than school size are generally consistent with expectations, but the small number of studies reporting on such associations limits what can be learned from them. The discussion here will focus on school size, providing a summary of the literature and some new results.

School size is thought to have a major influence on the internal organization of schools and on subsequent student outcomes. Lee, Bryk, and Smith (1993) suggest that larger schools are likely to have increased capacity to tailor programs and services to meet the diverse needs of students in the school. The extreme example of low specialization is a one-room schoolhouse in which one teacher teaches all students all day. In small schools, the typical teacher teaches a smaller number of different students and gets to know these students well. Students in such schools may develop a greater sense of trust in the adults and be more likely to communicate potentially dangerous situations to them. Large schools are likely to be organized more bureaucratically and to involve more formalized

social interactions among members of the school population. As a result, communication may be less frequent or less direct, cohesiveness may be reduced, management functions (including the management of discipline) may become less nuanced, and individuals may share less of a common experience in the school. Alienation, isolation, and disengagement may result. All of these mechanisms are plausible but speculative.

As it turns out, school size has not received much focused attention in research on schools and crime. However, many studies have included a measure of school size as a control variable when focusing on the effects of other aspects of school climate. Appendix Table 2 summarizes the associations between measures of school size and problem behavior in school-level studies. The nine school-level studies are based on data from seven different data sources, although unambiguous associations with school size cannot be obtained from two of the data sources (used in three of the studies) because the school size measures were combined with other background measures. In two of the remaining studies (both using School Survey of Crime and Safety data), the dependent variable is the raw count of criminal incidents (rather than a rate per student) and therefore the association with school size is not very interesting. The remaining studies reach differing conclusions, depending among other things on the measure of problem behavior. Positive associations between school size and measures of minor misbehavior are reported for the High School and Beyond high school data and the National Education Longitudinal Study [NELS] eighth graders, but the association with more serious forms of misbehavior are not statistically significant. In another data source (Safe School Study), school size is not significantly related to student victimization but is positively related to teacher victimization. That study also shows that the effect of school size on

teacher victimization is mediated by aspects of the school social organization and culture to be discussed below. No significant relationship with school size is found in the remaining study of middle schools in Philadelphia.

The multi-level studies shown in Appendix Table 8 provide no support for the "smaller is better" viewpoint. We summarize fifteen different research reports based on nine different data sources. In these studies, which generally control for community characteristics as well as characteristics of the students who attend the school, only one data source (NELS tenth graders, as reported in Stewart 2003) produces a significant positive association between school size and a measure of problem behavior, and the measure of problem behavior used in this study is unusual because it contains mainly school responses to misbehavior (e.g., being suspended or put on probation) rather that actual youth behavior. Hoffmann and Dufur (2008) also report on the association of school size and a broader measure of problem behaviors including substance use, arrest, and running away using the NELS 10th grade sample and find no significant association. Reports from a sample of Israeli schools containing 7th and 11th grades document a positive association between average *class* size and student victimization, but no significant association with school size. One of the multi-level studies reports a significant negative association between school size and student victimization, but this sample is unusual in that it includes only rural schools located in New Brunswick, Canada whose average size was 39 and 53 students respectively for 6th and 8th grade. Most of the multi-level studies suggest that school size is not reliably related to student problem behavior once characteristics of the students who attend the schools are controlled.

However, these studies often report on the association between school size and problem behavior from models that may provide too conservative a test. The student characteristics that are controlled in the multi-level studies are often exactly those student characteristics that Lee, Bryk, and Smith (1993) hypothesized to be influenced by school size (e.g., school attachment, involvement, perceived positive social climate). Also, most of the associations with school size reported in the studies are from models that partial out influences not only of the communities in which the schools are located and the average demographic characteristics of the students attending the schools, but also of other school climate characteristics such as school culture and the administration/management of discipline, hypothesized to mediate the influence of school size on student outcomes. For example, Hoffmann and Dufur's (2008) study reports a negative association between school size and delinquency in the NELS data, but the equation also contains a measures of "school quality," a composite measure assessing youths perceptions of their school as fair and their teachers and fellow students as caring and trustworthy. Unfortunately, most of these reports do not report the association of school size with problem behavior in models that do not control for potential effects of school size.

New results. We analyzed data from the National Study of Delinquency Prevention in Schools (NSDPS) in an attempt to establish baseline descriptive results on how school size relates to school crime. The NSDPS (Gottfredson et al. 2000) provided national estimates of the amount of crime and violence occurring in and around schools in 1998. Reports by school principals (similar to those included in the School Survey on Crime and Safety discussed in section I) as well as student reports of crime victimization and

delinquent behavior were collected from probability samples of 1,287 (principal survey) and 847 (student survey) schools.

Principals were asked how many crimes of various types had been reported to law enforcement representatives during the 1997-98 school year. They were asked about crimes involving physical attack or fight with a weapon, robbery, physical attack or fight without a weapon, theft or larceny, and vandalism. Rates of each of these crimes (except vandalism) are positively related to school enrollment. However, as we noted in section I, school crime is highly related to school location (i.e., urbanicity) and school level. Because school size is also highly related to location and level, it is necessary to look at the association of crime rates and enrollment while controlling for these factors.

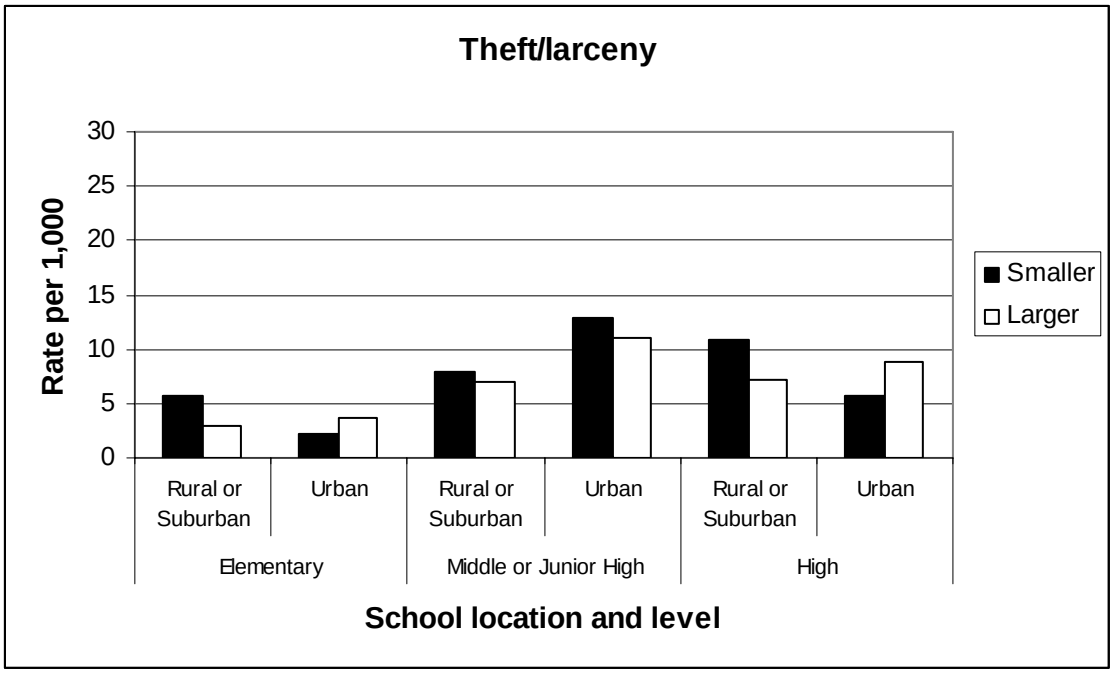
Figure 6 shows rates per 1,000 students for two common types of property and interpersonal crime – theft/larceny and physical attack or fight without a weapon[15] – reported to law enforcement agencies, according to school principals. The figures make clear that crime rates are not systematically related to school size within level and location. However, there is some suggestion that the association between size and principal reports of crime varies according to location: In suburban/rural locations, there is a tendency for smaller schools to report more crimes to the authorities. This is not the case in urban schools. .

The principal reports may reflect differences in reporting practices as well as differences in crime. That is, they may reflect a tendency among principals in larger schools to handle crimes in-house rather than reporting them to law enforcement. We explored this possibility using student reports from the same NSDPS schools. Students

[15] Results for the other crime reported by principals are similar to those presented.

were asked to report whether or not they had been victimized or had committed a variety of crimes in the past year. These reports were aggregated to the school level to show the percent of students in the school so involved. At the zero order, there is a tendency for students in larger schools to report *less* delinquency and victimization, but when level and location are controlled, most of these associations become non-significant. However, for theft victimization and going to school drunk or high, the association differs by location. A larger percentage of students in smaller schools (54.4%) than in larger schools (48.2%) in rural areas reported being a victim of minor theft. The percentages do not differ by school size in urban and suburban schools. Similarly, the association between school size and coming to school drunk or high is evident only in suburban schools, again with the smaller schools showing higher rates (17.6% vs. 10.7%).

We conclude that school size is not generally related to either principal reports of crime reported to law enforcement or to student reports of crime, and that whatever slight differences observed favor larger schools over smaller schools.



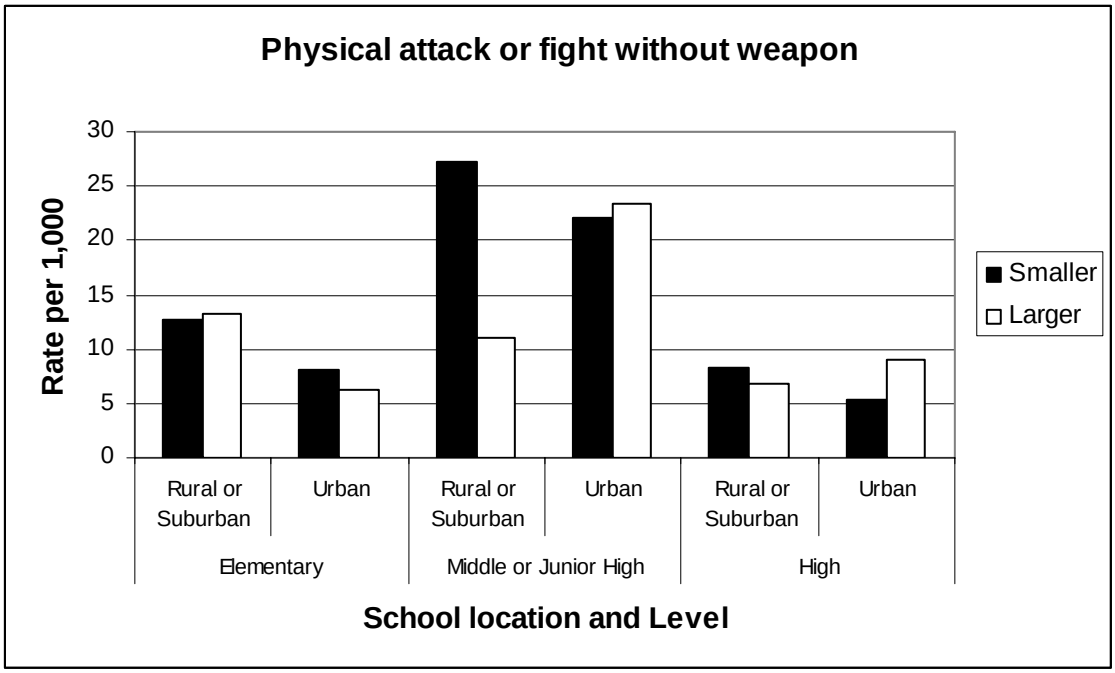


Figure 6. Principal reports of crimes reported to law enforcement agencies, by school enrollment, location, and level – rates per 1,000 students

Note: Size is split at the median total enrollment for each level: 476, 687, and 730 for elementary, middle, and high, respectively. Based on principal reports from non alternative, public schools (N=970) in NSDPS (Gottfredson et al. 2000).

It is likely that the ratio of adults to students rather than the actual number of students in the school is related to problem behavior. Five of the studies summarized in Appendix Tables 2 and 8 looked at the association of problem behavior to student-teacher ratio. Only one of the five studies reported a significant relationship, Gottfredson and DiPietro (2009), a multi-level study using the NSDPS data in which a positive association of student/teacher ratio was observed for a measure of personal but not property crime victimization. We believe that a more sensitive measure of adult presence would be the ratio of all adults (rather than just teachers) to students. Unfortunately, no studies have reported on this association. Still more troublesome is the dearth of studies on how school finances affect school crime rates. Whether a better financed school is a safer school is surely an interesting question for future research.

As far as we know, there are no intervention-based studies of how school size or resources affect school crime. Case studies of instances in which an established school is divided in smaller units are available, but they almost never assess effects on crime, and they do not provide a clean test of the effects of changing school size because other factors (such as the curriculum, aspects of the physical space, and school finances) are always altered simultaneously.

B. Milieu

As discussed in section I, rates of problem behavior differ with demographic characteristics, a fact that is reflected in school-level rates in the obvious way. Middle-schools have higher rates of delinquency than elementary or high schools (the partial exception is substance use, which increases through high school). Schools with 50% or

more minority enrollment experience higher rates of violence than majority white schools (see Table 3). Socioeconomic status of the student body is also associated with delinquency rates (Gottfredson and Gottfredson 2005; Brooks-Gunn et al. 1993; Bryant et al. 2003). Appendix Table 3 summarizes these associations from the school-level studies.

More interesting from a policy perspective is the extent to which the mix of students in the school or the classroom influences the likelihood that any given student will misbehave. The mechanisms of deviant peer influence are both direct and indirect. The direct effects may arise as a result of deviant peer influence: learning and imitation, social reinforcement for deviant acts, and the creation of opportunities for deviant activities (Dishion and Dodge 2006). All of these mechanisms are relevant for involvement with delinquency both in and out of school, including drugs and alcohol, and participation in gangs (Reid, Patterson, and Snyder 2002).[16] The indirect effects may come about as a result of the dilution of authority – a teacher who can manage one or two disruptive students may lose control of the classroom when there are more than two. The same phenomenon can occur at the school level, where a high "load" of troublesome students may swamp the mechanisms of control in the corridors, cafeteria, lavatories, and grounds.

Given the real possibility of peer influence (Carrell and Hoekstra 2008), the actual behavior of youths with a given propensity to deviant or criminal activity may well depend on who they encounter in their classes and in the other locations in the school. A variety of policies are relevant to influencing the mix of students. At the level of the

[16] The potential for deviant learning is illustrated by a study of Florida reformatories, which finds suggestive evidence that youths with similar criminal specialties learn from each other and are more likely to recidivate if exposed to a high concentration of similar youths (Bayer, Hjalmarsson, and Pozen 2009).

school district, the distribution of students among schools will be influenced by which grade spans are included in the middle schools, the extent to which low-performing students are held back, and whether school assignments are tied largely to place of residence or tailored to promote integration or parental choice. For a given pattern of assignments to schools, the number and characteristics of students who are actually in the building on a school day will depend on abstenteeism and use of out-of-school suspension. And for a given population of students who are actually attending the school on any given day, social influence will likely be mediated by policies that influence the extent to which deviant students are concentrated, such as in-school suspension or academic tracking.

Appendix Table 9 summarizes the results from eighteen multi-level studies based on fourteen datasets showing associations between the milieu of the school and measures of problem behavior, controlling for individual-level demographics as well as for related characteristics of the communities in which the student body is drawn. These studies are largely consistent in showing that the grade levels included in the school or average age of the students in the school, the percentage male students, the social class composition, and the racial and ethnic composition of the schools are related to measures of problem behavior. These associations sometimes do not reach statistical significance, but they are nearly always in the expected direction. Here we discuss several of the strongest studies relevant to evaluating the impact of policy choices concerning grade span, grade retention, truancy prevention, racial segregation, and use of alternative schools.

Grade span. One recent study demonstrates that the grade composition in a middle school influences the rates of misbehavior of the students. A generation ago most

elementary schools included sixth grade, but now most sixth graders attend middle school. Using a quasi-experimental approach, Cook, MacCoun, Muschkin, and Vigdor (2008) compare the school records of North Carolina students whose sixth grade was located in a middle school, with those whose sixth grade was in elementary school (the sample of sixth grades in middle school was trimmed to match the sixth grades in elementary school in several dimensions). While the two groups of students had similar infraction rates in fourth and fifth grades, those who moved to a middle school for sixth grade experienced a sharp increase in disciplinary infractions relative to those who stayed in elementary school. More interesting, perhaps, is that the elevated infraction rate persisted through ninth grade. A plausible interpretation of these findings is that sixth graders are at a highly impressionable age, and if placed with older adolescents tend to be heavily influenced by their inclination to break the rules (Jang 1999; Warr 1993). This example of negative peer influence is quite large and extends to all types of infractions, including violence and drug violations.

Retention policies. The age mix in a school is closely related to the grade span, but that is not the only determinant – the school district's retention policies also play a role. In response to high-stakes accountability programs (including No Child Left Behind) many school systems have ended social promotion for students who fail end-of-grade tests, thus increasing the number of old-for-grade students (Jimerson and Ferguson 2007). Entry-level at-risk students are often held back for a year before making the transition to second grade. The effect of retention on behavior of the retained students has been extensively studied. Most studies have focused on academic outcomes: meta-analyses of this literature conclude that the long-term effect on academic achievement is null or

negative, with a greatly elevated risk of dropping out (Jimerson et al. 2006). Hence, given the robust general finding that students with academic difficulties are more prone to anti-social behavior (Nagin et al. 2003), it is not surprising that grade retention appears to increase conduct problems (Jimerson 2001; Pagani et al. 2001; but see Gottfredson, Fink, and Graham 1994). One of the most sophisticated studies, using Richard Tremblay's longitudinal data on Montreal school children, found that the effect of grade retention on classroom physical aggression (as measured by teacher report) is conditioned by the developmental history of the child: those showing no aggression or chronic aggression levels were not affected, while those on a diminishing trajectory were bumped up to a higher level if retained (Nagin et al. 2003).

There has been less attention to the contextual effect of having old-for-grade students in the classroom and school. One exception is a recent study that uses a comprehensive data set of North Carolina students.[17] Muschkin, Glennie, and Beck (2008) conduct a cross-section analysis of infraction rates by seventh graders, finding that the prevalence and incidence of infractions increase with the prevalence of retained students (students who were retained at least once in the previous three years) and the prevalence of old-for-grade students who were not retained during that three-year period. These results hold after controlling for various characteristics of the student body and the schools, and the inclusion of district fixed effects. The authors also find evidence that susceptibility differs among types of students, in particular the old-for-grade seventh graders were themselves especially susceptible to the influence of the concentration of other old-for-

[17] A similar study that also found deleterious effects on behavior is Lavy, Paserman, and Schlosser (2008).

grade students in their school. Similar results were found when the outcome variable was the likelihood of being suspended.

Truancy prevention. The mix of students who are in the school building on any given day will be affected by absenteeism and tardiness. School attendance laws require that youths between specified ages (e.g., 7-16 in North Carolina, and 5-18 in New Mexico) attend school, with possible exceptions for home schooling. This is a legal obligation for which both the child and parents are liable. In many school districts, however, these laws are widely flouted. For example, the absentee rate in DC public high schools in the 2006-2007 school year averaged 17 percent.[18]

The rate of unexcused absence determines not only the number of students in the school building, but also the behavioral propensities of those students. Chronic truants are not a representative sample of the student body, but rather tend to come from dysfunctional families and be at risk for delinquency, violence, and substance abuse (McCluskey, Bynum, and Patchin 2004). It is also true that chronic truancy engenders academic problems and is associated with failure to graduate from high school and a variety of poor life outcomes, including involvement with serious crime. As a logical matter, then, programs that are effective in improving attendance rates may have several effects. First, if they get delinquent youths off the street and into school, the result may be reduced crime rates in the community. Indeed, communities concerned about the daytime crimes committed by truants have increasingly enlisted the police and the juvenile court to combat truancy (Bazemore, Stinchcomb, and Leip 2004). Second, effective truancy-prevention programs may come at the cost of higher crime rates within

[18] http://www.washingtontimes.com/news/2008/jan/24/dc-students-raise-truancy-rate/, accessed 1/25/2009.

the school. And third, if at-risk youths are persuaded to attend school more faithfully, the long-term result may be to improve their chances of graduation and subsequent success.

A number of school-based programs have been evaluated in part by their effect on school attendance. Some of these programs are reviewed in Sections IV and V. Several of these studies demonstrate that it is possible to increase school attendance among delinquency-prone youths, and that doing so also reduces delinquency (e.g., Tierney et al. 1995), school drop-out rates (Sinclair, Christenson, Evelo, and Hurley 1998), and subsequent crime rates (Bry 1982). Unfortunately, there are no studies, insofar as we know, that evaluate the effect of attendance-promoting programs on school crime rates or overall (community plus school) crime rates.

School desegregation. In compliance with the 1954 Supreme Court ruling *Brown v. Board of Education*, federal courts issued a series of desegregation orders to public school districts. These orders forced a considerable increase in the extent to which African American students attended school with whites during the 1960s and 1970s. A vast literature on the effects of school segregation and desegregation has focused on academic outcomes. The results of this research offer support to the conclusion that integrated schools promote black achievement and increase black high-school graduation rates, college attendance and graduation rates, and occupational success (LaFree and Arum 2006). A persuasive quasi-experimental study of the effect of desegregation plans found that they reduced black dropout rates by 2-3 percentage points, with no detectable effect on whites (Guryan 2004). The termination of many of these desegregation plans during the 1990s appears to have had similar effects in the other direction (Lutz 2005).

Given the tight link between academic success and school behavior, it is entirely plausible that the degree of segregation has a direct influence on delinquency in schools. But we are not aware of any direct evidence on the subject – segregation studies have not used school crime as an outcome variable. There have been two persuasive studies concerning the effects of segregation on crime outside of school. LaFree and Arum (2006) analyzed the incarceration rates for black males who moved to a different state following school. For any given destination state, they found that those who moved from a state with well integrated schools had a substantially lower incarceration rate than those who moved from a state where the schools were more segregated. A more recent study (Weiner, Lutz, and Ludwig 2008) utilizes a quasi-experimental approach in which the court desegregation orders serve as the experimental intervention: they report that these orders reduced black and white homicide victimization rates for 15-19 year olds. The authors explore several mechanisms that may account for this result, including both the direct effects of changing the mix of students in the schools, and indirect effects associated with police spending and relocation of some white students. In any event, since all but a handful of these homicides occurred outside of school (see Section I), we are still waiting for direct evidence on crime in schools.

Alternative schools. A recent survey found that 39% of public school districts administered at least one alternative school for students at risk of educational failure. As of October, 2000, 613,000 students were enrolled in these schools, 1.3% of nationwide total enrollment. Urban districts, large districts (those with 10,000 or more students), districts in the Southeast, districts with high minority student enrollments, and districts with high poverty concentrations were more likely than other districts to have alternative

schools and programs for at-risk students (Kleiner, Porch, and Farris 2002). Despite the widespread use of these schools as a means of removing antisocial and violent students from the regular classrooms, there have been no systematic studies of the effects on school crime rates. The effects on the behavior of youths who are given alternative-school placements have been studied, with mixed results. Indeed, there is unlikely to be any generic answer, since effects will depend on quality of the programming and on which students are selected (Gottfredson 2001). Best- practice judgments tend to rely on expert opinion rather than on evaluation studies with strong designs (Van Acker 2007).

Grouping within schools. Academic tracking is nearly universal in U.S. secondary education. The attraction of separating students into tracks that are more or less demanding academically is the belief that this is the best way to tailor coursework to the differing background, ability, and motivation of the students. Tracking tends to have the result of concentrating minorities and students from lower socioeconomic status households in certain classrooms. Given the strong association between academic success and delinquency involvement, it also has the effect of concentrating crime-prone students, setting the stage for negative peer influence (Reinke and Walker 2006).

As a device to improve academic progress, tracking has had more detractors than advocates among education specialists. The evidence base is thin: most notably, Mosteller, Light and Sachs (1996) identified only ten randomized experimental evaluations comparing the performance of students in tracked (homogeneous) and untracked (heterogeneous) classrooms – combining these studies, the best estimate was a zero difference in average academic performance. Still thinner is any evidence on how

tracking affects misbehavior.[19] Thus we conclude that the possibility of deviant peer influence due to tracking is plausible but unproven.

Concluding thoughts. School reform is typically shaped by theories of how to improve students' academic performance. But to the extent that school safety is an important goal, somewhat distinct from academic progress, the potential impacts on safety should be considered in any evaluation.

One of the most prominent reform efforts since 2001 has been the campaign funded largely by the Gates Foundation to create small high schools. While that effort was abandoned in 2008 as a result of disappointing results on academic progress, it would also be of interest to know the effect on school crime and juvenile delinquency. Given the fact, reported here, that small schools are not systematically safer than large schools (controlling for urbanicity and grade level), it appears doubtful that smaller is better in this domain.

There is very good reason to believe that the mix of students who are assembled in a school or any one classroom may influence the behavior of all. Two relevant mechanisms are deviant peer influence and "resource swamping," both implying that overall crime rates within school may increase in nonlinear fashion with the addition of deviant students to the mix (Cook and Ludwig 2006). This concern is relevant in evaluating policies regarding grade retention, truancy prevention, use of suspension and

[19] An early study by Wiatrowski et al. (1982) used a national longitudinal sample and found that change in delinquency involvement after tenth grade was not affected by track status in 11th grade, controlling for grades and such variables as school attachment and "college encouragement" (which may themselves be influenced by tracking). In this study delinquency is self-reported, and only slightly correlated with academic track in the cross section.

expulsion, use of alternative high schools, and even academic tracking. In each case, however, we found that relevant evaluations were lacking.

IV. School Social System

In this section, we discuss Tagiuri's (1968) social system dimensions. We remind the reader that our conception of the *social system* includes both *school organizational structure* (e.g., how the school is organized to conduct its work) and *school administration/management:* Not surprisingly, a sizeable research literature describes attempts to alter many aspects of the school social system. More than a dozen narrative reviews and meta-analyses of school-based interventions aimed at reducing conduct problems and delinquent behavior have been published in the last fifteen years (Catalano *et al*. 1998; Dryfoos 1990; Durlak 1995; Gottfredson 1997; Gottfredson 2001; Gottfredson, Wilson, and Najaka 2002; Hahn et al. 2007; Hawkins et al. 1998; Institute of Medicine 1994; Lipsey 1992; Lipsey and Wilson 1993; Samples and Aber 1998; Stage and Quiroz 1997; Tremblay and Craig 1995; Wilson, Gottfredson, and Najaka 2001; Wilson and Lipsey 2007). This growing research base has led to a rapid increase in utilization of research by government and professional organizations seeking to promote the use of "evidence-based" practices. In the past ten years, we have seen several large-scale efforts to publicize and disseminate effective prevention practices for use in schools. Early examples include the Centers for Disease Control and Prevention's *Sourcebook for Community Action* (Thornton et al. 2000), the U.S. Department of Education's Expert Panel on Safe, Disciplined, and Drug-Free Schools (http://www.ed.gov), the U S. Surgeon General's *Report on Youth Violence* (http://www.surgeongeneral.gov), and the

American Psychological Association's Commission on Violence and Youth (American Psychological Association 1993). These efforts to catalogue and disseminate research information have become increasingly rigorous over time.

Two contemporary efforts to disseminate information about effective school-based prevention practices are the University of Colorado Center for the Study and Prevention of Violence's "Blueprints for Violence Prevention" program (BVP; http://www.colorado.edu/cspv/blueprints) and the U.S. Department of Education's "What Woks Clearinghouse"(WWC; http://ies.ed.gov/ncee/wwc). Both of these efforts apply rigorous standards of evidence in identifying effective programs. BVP requires evidence of a deterrent effect on a measure of violence, delinquency, and/or drug use in a study using a strong research design (e.g., randomized controlled trial or strong quasi-experimental design), evidence that effects are sustained for at least a year after the intervention has ended, and multiple site replication. To date, eleven model programs have been identified. Several others have been designated as "promising" based on initial positive effects in a rigorous study, but whose effects must be replicated or shown to last beyond the project period before they can be identified as model programs.

WWC was established in 2002 by the Institute of Educational Sciences (IES) at the U.S. Department of Education. It is intended to provide an unbiased summary of scientific evidence about effective practices in education. Much broader in scope than BVP, it provides summaries of evidence in topics such as beginning reading, character education, dropout prevention, early childhood education, elementary school math, English language learners, and middle school math. Although WWC does not endorse specific programs as effective, it provides ratings for each reviewed program based on the

type of design used in the study, the quality of the data, and the adequacy of the study's statistical procedures. The criteria used are very similar to those used in the BVP effort. A "positive effect" WWC rating for an intervention means that two or more studies showed statistically significant positive effects on an outcome of interest, and that at least one of the studies used a randomized design. Such a rating also requires that no studies of the intervention showed statistically significant or substantively important negative effects. Most central to our chapter are the WWC reviews of character education and dropout prevention, although as we will see efforts aimed at improving academic performance may also reduce crime.

In this section, in addition to the observational studies summarized in Appendix Tables 4, 5, 10, and 11, we also rely on several existing reviews to summarize effective school-based crime prevention practices. A thorough review of the evaluation research on school-based prevention would be redundant with these other efforts. Instead, we rely primarily on earlier narrative and meta-analytic summaries of school-based prevention (Gottfredson 2001; Wilson, Gottfredson, and Najaka 2001; Gottfredson, Wilson, and Najaka 2002). These reviews are based on 178 studies located through a bibliographic search for studies meeting these criteria: Included studies (a) reported on an evaluation of a school-based intervention intended to reduce problem behaviors among children and youth, (b) used a comparison group against which to compare outcomes for treated youth, and (c) measured at least one of the following outcomes[20]: crime or delinquency; alcohol or other drug use; withdrawal from school (e.g., dropout, truancy); rebellious, antisocial, aggressive, or defiant behavior; suspension, or expulsion. As these reviews are

[20] See Gottfredson, Wilson, and Najaka (2002) for a more detailed account of outcomes included in the review.

somewhat dated, we rely also on two very recent reviews of school-based delinquency prevention efforts (Hahn et al. 2007, Wilson and Lipsey 2007). We briefly summarize the conclusions from these reviews about the effectiveness of different types of school-based interventions. Findings from these reviews are reported as standardized mean difference effects sizes (ESs), which are measures of the difference between program and comparison groups on an outcome relative to the standard deviation of the outcome measure.[21] We also provide a few examples of specific programs that have been demonstrated to be effective for reducing problem behaviors. We rely on the BVP and WWC efforts to identify particularly effective programs.

A. School Organizational Structure

Schools differ in the rules that govern the operations of the school and the way people interact to conduct the school's business. Much has been written in the educational literature about the importance of features of the school organizational structure for determining levels of student academic achievement. Lee, Bryk, and Smith (1993) summarize research relating the internal organization of schools to educational outcomes. Among these important organizational features are (a) the extent to which teachers act in the role of subject matter specialists versus having broader roles in socializing students, (b) the content of the curriculum (e.g., emphasizing college versus vocational preparation), (c) how students are "mapped into" the curriculum, and (d) how decisions

[21] To provide a benchmark against which to compare the ESs reported in this section, we note that the typical ES for delinquency prevention programs is small. Lipsey (1992) showed that the average ES across 397 delinquency treatment and prevention evaluations was 0.17.

are made about which teachers and students are assigned to curricular tracks and courses within those tracks.

Although the effects of variations of these school organizational features on crime have for the most part not been studied, it is tempting to conclude that attempts to improve academic performance, if successful, would also result in a reduction in crime because academic performance is highly correlated with youthful offending. Of course, much of the association between academic performance and crime is due to common causes including lower intelligence, attention problems (Maguin and Loeber 1996), and low self-control (Felson and Staff 2006), suggesting that school-based interventions that target these common causes early in the school career will both decrease crime and increase academic performance. Below we review evaluation research demonstrating the crime prevention potential of such interventions. Notwithstanding these common influences on both outcomes, other research suggests that interventions targeting school performance are also likely to reduce crime.

Najaka, Gottfredson, and Wilson (2001) provide evidence from experimental and quasi-experimental studies of school-based interventions that improving academic performance reduces problem behaviors. Using the meta-analytic data base described above, they regressed changes in problem behavior resulting from school-based interventions on changes in risk factors for problem behavior also resulting from the interventions. They found that increases in social bonds – attachment and commitment to school – resulting from the interventions were by far the largest correlates of reductions in problem behaviors. Increases in academic performance resulting from the interventions were also modestly related to changes in problem behaviors. Of course,

direct experimental evidence of the crime-rate effects of interventions aimed at improving academic performance would be more convincing. But the meta-analysis results suggest that interventions aimed at increasing academic performance do reduce crime, especially if these interventions are also successful in increasing attachment and commitment to school. Also, to the extent interventions aimed at improving academic success reduce subsequent school dropout, they can be expected to reduce later crime as well. The crime reduction potential of manipulating the aspects of school organization known to be related to academic performance should be more thoroughly studied. A good starting point would be studies of the organizational features identified by Lee, Bryk, and Smith (1993), including teacher roles, the academic content of the curriculum, and how students are assigned to curricular tracks and courses within those tracks.

Class size and schools-within-schools. That said, a small body of research does link certain aspects of the way schools are organized for instruction to crime. A handful of studies have examined the influence of the number of different students taught by the average teacher on problem behaviors. Gottfredson and Gottfredson (1985) in Appendix Table 4 show that the number of different students taught by the average teacher is positively related to teacher victimization rates in senior high schools, net of community factors and the demographic composition of the school. The zero-order correlation with student victimization is also statistically significant, but reduced to non-significance once control variables are added to the equation. Two multi-level studies of a more contemporary nationally representative sample of schools, the National Study of Delinquency Prevention in Schools, have also examined the influence of number of different students taught (Appendix Table 10). Payne (2008) finds no effect on student

reports of delinquent behavior in general, but Gottfredson and DiPietro (2009) find that in schools in which the typical teacher teaches more students, student reports of property victimization at school are elevated. O'Neill and McGloin (2007), analyzing a third nationally representative sample of schools from the School Survey on Crime and Safety, find that a related measure of school organizational structure, the number of classroom changes throughout the day, is related to higher levels of violent and property crime perpetration.

These findings dovetail with findings from educational research suggesting that school organizational features that promote more cohesive teacher-student relationships promote learning (Lee, Smerdon, Alfred-Liro, and Brown 2000). Schools in which the typical teacher interacts on a regular basis with fewer different students might facilitate more cohesive student-teacher relationships. Organizational arrangements that can be expected to reduce the number of different students taught include reducing class size and organizing instruction so that smaller groups of students remain together for an extended period during the school day and are taught by a small group of teachers. Some schools accomplish such reorganizations by breaking into smaller "schools-within-schools" (SWS), and others through creative use of block scheduling.

A recent review of research on class size (Finn, Pannozzo, and Achilles 2003) summarizes results from 19 studies, including five large-scale class-size reduction initiatives conducted in Indiana, Tennessee, North Carolina, Wisconsin, and California. The research clearly demonstrates positive effects of reduced classroom size in the early elementary grades on both academic achievement and negative or antisocial behaviors. Lasting effects on academic outcomes of having attended smaller classes were also

observed: Finn, Gerber, and Boyd-Zaharias (2005), reporting on long term-effects from the Tennessee class size experiment, found that high school graduation was more likely for students who had attended smaller classes for three or more years. Analyses of possible mechanisms linking class size to these outcomes conclude that the positive effects are at least in part due to teachers getting to know students better in smaller classes, which increases students' sense of belonging in the classroom. Also, teachers in smaller classes are better able to "nip discipline problems in the bud," therefore reducing time that must be spent on discipline management. Although not mentioned in the reviews, reducing discipline problems in the early grades is also likely to reduce subsequent problem behaviors by limiting student exposure to the modeling of misbehavior and its reinforcement.

Although these reports suggest that reducing class size is likely to reduce student misbehavior by increasing teachers' attention to students, increasing student engagement and sense of belonging in the school, and facilitating more effective management of classroom behavior, only one study that we know of relates class size to actual crime, most likely because most of the research on class size is conducted at the elementary school level. One of the studies summarized earlier (Khoury-Kassabri et al. 2004; 2005) demonstrated that in a sample of Israeli schools containing 7th and 11th grades, smaller class size was related to lower levels of student victimization. But others have speculated that the benefits of smaller classes that are evident in elementary schools may not be observed in middle and high schools because higher level schools tend to rotate students through different classes during the school day rather than keeping them with one teacher. Finn et al. (2003) suggest that the positive effect of reduced class size may be offset by a

simultaneous negative effect of changing classes. Future studies should attempt to isolate the effects of class size and class changing in the upper grades.

It may be possible, however, to achieve an increase in sense of community without altering class size directly. Nearly twenty years ago, two different studies reported on efforts to reorganize secondary schools to create small groups of students who stay together for an extended period during the school day and who are taught by a small group of teachers. Although neither of these studies meets contemporary standards for scientific rigor in establishing intervention effectiveness (Flay et al. 2005), both offer suggestive evidence of reductions in problem behaviors resulting from the reorganizations. Felner and Adan (1988) reported that students who had been assigned to a SWS program rather than to the typical ninth grade experience had higher grades, better attendance, and lower drop-out rates later in their high school years. Gottfredson (1990) reported that delinquency-prone students who were randomly assigned to a two-hour per day integrated curriculum in which students were team taught by a small number of teachers reported lower levels of delinquent behavior and drug use than their counterparts in the regular school setting. These experimental students also experienced higher academic achievement, persisted longer in school, and reported higher levels of attachment to school and lower levels of negative peer influence.

A more recent effort to study the effect of a similar intervention – "accelerated middle schools" (AMS) – on school drop-out is included in the WWC. AMSs are self-contained academic programs designed to help middle school students who are behind grade level catch up with their age peers before entering high school. The programs target students who have been retained in grade at least once and give them the opportunity to cover an

additional year of curriculum during their one to two years in the program. AMSs can be structured as separate schools or as schools within traditional middle schools. The SWS model is similar in many respects to the intervention reported by Gottfredson (1990). Dynarski, Gleason, Rangarajan, and Wood (1998) reported on three different implementations of AMSs, only one of which (the New Jersey experiment) used the SWS model. The New Jersey experiment, which met the WWC's high standards for evidence, used a randomized controlled research design and a sample of 620 6th and 7th graders. Treatment students were assigned to a special program serving about 50 students, taught by a team of four teachers who each covered one of four subjects: English, math, basic skills, and science/social studies. Sixth graders stayed in the program for two years, and seventh graders for one. All students were followed for three years to determine their dropout rates and highest grade completed. The study found that students who were assigned to the AMS program completed significantly more years of schooling (highest grade completed after two years was 7.8 vs. 7.5 for the treatment versus the control cases, with an effect size of 0.38). Dropout rates after two years were low for both groups and not significantly different. Although effects on crime were not reported, a smaller percentage of treatment than control subjects were sent to the office for doing something wrong (46% vs. 59%) and reported that they drank alcohol in the previous month (11% vs. 19%) during the school year of the three-year follow-up.

A much larger scale effort to mimic the small school environment is seen in the recent "schools within schools" (SWS) movement that is sweeping the nation. In light of evidence documenting greater achievement gains in smaller schools (e.g., Lee and Smith 1995), researchers and professional educator organizations such as the National

Association of Secondary School Principals began calling for smaller schools. Although the high cost of rebuilding schools precludes such a radical shift, many school districts caught on to the less costly alternative of dividing large high schools into several smaller "schools within schools" (SWS). The reform was expected to result in closer, more personalized relations among teachers and students, which was expected to increase student engagement in the learning process and improve their academic performance. Although our analysis (in Section III) found no consistent relationship between school size per se and crime rates, it is not unreasonable to expect that reorganizing large schools into smaller units could reduce crime if such reorganizations result in increased informal social control.

The SWS idea came into full swing in the last decade, with the U.S. Department of Education awarding $100 million through its Smaller Learning Communities Grants program, the Bill and Melinda Gates Foundation investing over a billion dollars in similar initiatives, and other charitable organizations following suit. Large urban centers including Philadelphia, Chicago, and Baltimore have systematically converted their large comprehensive high schools to smaller SWS's (Lee and Ready 2007) and, in some cases, have also opened new smaller schools.[22]

Lee and Ready (2007) summarize what was learned from evaluations of these major reform efforts. First, all of the studies found that social relations in the SWS schools were more positive than in the traditional comprehensive schools. However, findings

[22] Evaluations of these efforts to create new small schools fail to separate selection effects from outcomes of having attended these smaller schools. Most often, the criteria for entry into the smaller schools renders the remaining large schools grossly non-equivalent for evaluation purposes. For this reason, we limit our discussion to the efforts to create smaller schools within schools. The populations in these reorganized schools are more similar to the populations in the original large high schools.

were inconsistent across studies regarding effects on other outcomes such as attendance and academic achievement, and little can be said about the mechanisms underlying the changes that were observed. In many cases, the changes to the school organization were completely confounded with changes in the curriculum and other aspects of the schooling experience so that the effects of these multiple changes could not be disaggregated. Sadly, the studies produced no evidence whatsoever about the effects of the reforms on crime. The findings related to the more beneficial social relations in the SWSs are promising, but it is left to future research to determine how this major shift in school organization influences crime.[23] In the meantime, Bill and Melinda Gates have given up on this initiative.[24]

Prevention curricula. Another aspect of school organizational structure whose effects on crime have been studied is curricular content. While Lee, Bryk, and Smith (1993) focus primarily on the academic content of the curriculum, prevention researchers are more concerned with investigating attempts to incorporate content related to the prevention of problem behaviors into the school curriculum. Evaluations of these efforts have shown positive effects on crime and crime-related outcomes. Gottfredson, Wilson, and Najaka's (2002) review of studies of school-based prevention found that certain types

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[23] One recent study of "career academies," small learning communities within large high schools, demonstrated that among a highly motivated group of students who volunteered for the program, those who participated in the career academies were earning higher salaries eight years after their scheduled graduation than randomly assigned control cases (males only). No effects were found on graduation rates, criminal activity, or substance use, however. The absence of findings may be due to the highly selective study population. Graduation rates were very high and crime rates very low for both the treatment and control groups at follow-up (Kemple and Willner 2008). More research of this nature, using rigorous research designs with more at-risk populations, is needed.

[24] http://www.gatesfoundation.org/speeches-commentary/Pages/bill-gates-2008-education-forum-speech.aspx

of curricular change are effective for reducing problem behaviors. They reported average effect sizes ranging from 0.05 ($p<.05$) for alcohol and drug use to 0.30 ($p<.05$) for antisocial behavior and aggression due to instructional programs that teach self-control or social competency using cognitive-behavioral or behavioral instructional methods. This category of intervention seeks to develop students' skills in recognizing situations in which they are likely to get into trouble, controlling or managing their impulses, anticipating the consequences of their actions, perceiving accurately the feelings or intentions of others, or coping with peer influence that may lead to trouble. These interventions use instructional methods that explicitly teach principles for self-regulation and recognize antecedents of problem behavior. They provide cues to help young people remember and apply the principles, use modeling to demonstrate the principles and associated behavior, encourage goal setting, provide opportunities for rehearsal and practice of the behavior in social situations (role-playing), provide feedback on student performance, and promote self-monitoring and self-regulation.

A closely related type of school-based intervention that teaches similar cognitive content, often coupled with behavior change strategies (to be discussed in greater detail later) and most often targets higher risk youths rather than entire classrooms, also has positive effects on measures of anti-social behavior and aggression (average effect size = 0.34, $p<.05$). More recent reviews of school-based prevention curricula (Hahn et al. 2007; Wilson and Lipsey 2007) concur that this type of prevention curriculum is moderately effective for reducing a variety of forms of problem behavior. Also of interest is the conclusion from these reviews (Wilson and Lipsey 2007; Wilson, Gottfredson, and Najaka 2001) that school-based interventions targeting more at-risk

populations produced larger effect sizes on measures of delinquent, disruptive, and aggressive behaviors than those targeting the general population.

The reviews identify a large number of programs of the general type found to be effective. These effective programs are heterogeneous in terms of age group (ranging from pre-K through high school), duration, and targeting strategies. The most ambitious demonstration of the effectiveness of an intervention primarily targeting cognitive and social cognitive skill development to date is Fast Track (Conduct Problems Prevention Research Group 1999; 2002; 2007; 2009*a*; 2009*b*). The multi-component intervention, which began in grade one and continued for ten years, provided training for parents in family management practices; frequent home visits by program staff; social skills coaching for children delivered by program staff using a model that focused on social competency skill development as described earlier; and academic tutoring. The intervention also included a universal classroom instructional program (the PATHS curriculum: Greenberg and Kushé 1993; 1996; Greenberg, Kusché, Cook, and Quamma 1995) which reinforced social-competency skill development in students, and provided classroom management strategies for the teacher. Thus, the program provided both universal and selective programming, mostly focused on social cognitive skill development, to participating youths during elementary school. It is exactly the type of early intervention we suggested above that had the potential to both decrease crime and increase academic performance by addressing the common causes of both behaviors. Less intensive services were also provided in Fast Track during the middle and early high school years: Families were invited to participate in meetings addressing adolescent

development issues, and youths were invited to participate in "Youth Forums" addressing issues related to vocational preparation.

The evaluation of this intervention involved 891 subjects who were screened and found to be at-risk for conduct disorder while in kindergarten. These subjects have been followed for 12 years so far. Early reports from the project (Conduct Problems Prevention Research Group 1999; 2002) found positive effects on several of the intermediate behaviors targeted by the program (e.g., parent involvement in the child's education and child social-cognitive skills) and less aggressive behavior in the classroom. By the end of elementary school, the intervention children reported lower rates of antisocial behavior (Conduct Problems Prevention Research Group 2007). Effects of the intervention on problem behaviors during the middle school years seemed to fade, but began to re-emerge in high school. Interestingly, by the end of high school, the rates of diagnosed conduct disorder for the program children were half as high as those for the control group. But, when broken down by initial risk level, only those with the highest initial risk exhibited gains (Conduct Problems Prevention Research Group 2009*a*). Rates of court-recorded juvenile arrests[25] and onset of arrests were also significantly lower for the intervention than the control children at the end of 12th grade. For example, among intervention youth, the odds of being in a higher juvenile arrest activity group were only 71% of the odds for control youth, a finding that was not conditioned by initial risk level. Surprisingly (given these results), neither self-reports of a wide range of delinquent behaviors nor adult arrest rates from official sources differed significantly for the

[25] The measure of juvenile arrests was a severity weighted frequency of juvenile arrests. Each offense for each arrest was assigned a severity score ranging from 1 to 5. The severity levels of the most severe offense from each arrest were summed. This sum was then broken into four categories for analysis.

treatment and control groups (Conduct Problems Prevention Research Group 2009*b*). Fast Track appears effective for reducing crime, but the effects are evident only for the presumably more serious offenses that come to the attention of the police, and subsequent follow-ups will be required to establish lasting effects on adult crime rates.

The Fast Track intervention is considered a promising program on the BVP website, pending replication. The universal prevention curriculum component of Fast Track (PATHS), though, has been studied more extensively and is identified by BVP as one of its eleven model programs. The Fast Track research clearly demonstrates that an intensive, long-term effort that begins early and involves both the family and the school in teaching self control and social competency skills can reduce arrests of students. It also provides a solid example of the benefits of targeting higher-risk youths for intervention. But can shorter duration school-based programs also work? Both Hahn et al. (2007) and Wilson and Lipsey (2007), examining the effect of a wide assortment of school-based programs intended to reduce violence and aggressive behaviors, conclude that moderately large effect sizes are observed on aggressive and disruptive behavior for programs targeting all age groups (elementary, middle, and high). For example, Hahn et al. (2007) report a 29.2% reduction in violent behavior for programs targeting high school students, a 7.3% reduction for middle school students, and an 18.0% reduction for elementary school students. Further, both studies reported that the duration of the program does not influence the observed effect sizes. It is possible that a ten-year intervention beginning in elementary school will produce more durable effects in the long run, but programs of more limited duration delivered much later in the educational career also produce reductions in problem behavior.

Finally, we note that there may be unintended benefits of providing effective prevention services for high-risk youths. The Fast Track results as well as the research summaries clearly suggest that the strongest effects are observed for the highest risk youths receiving the services. While most studies have examined intervention effects only on the targeted group, a recent CDC-sponsored study measured effects of both universal and selective violence prevention programs on the general populations in the participating middle schools. In this study (The Multisite Violence Prevention Project, 2008; 2009), 37 schools were randomly assigned to receive (a) a universal prevention curriculum for all sixth grade students, (b) a selective family intervention for high risk sixth graders, (c) both the universal and the selective intervention, or (d) a no-intervention control condition. The study found negative effects of the universal intervention both at the immediate post-test and in growth parameters over the following two years. It found positive effects of the selective intervention that emerged only over time (that is, no immediate effects were observed on aggression measures). Interestingly, the effects of both the selective and universal interventions at the end of the intervention year differed according to pre-intervention risk status: Students at low initial risk *increased* in aggression relative to controls; while students at high initial risk *decreased* (The Multisite Violence Prevention Project, 2009). This pattern of findings not only supports the conclusion that targeting high risk youths for prevention programming is more beneficial than providing universal programming in the long run, but it also suggests that universal programming may actually *increase* aggression among the lower risk segment of the population. Even more interesting, the study found that the selective intervention produced significant long term reductions in aggression for the *entire* sixth

grade cohort. It is not clear how much of this overall effect is due to the specific effect of the program on the targeted high risk youths' aggression or to an ecological effect of these students on the larger group, but the results again remind us that it is important to examine effects of programming not only on the youths who receive it directly, but also on those who are in the part of the same social network as those who receive the intervention. Unexpected positive "spillover" effects as well as negative effects may be observed.

B. Administration/Management Structure

The second aspect of the school social system, administration/management structure has been studied extensively. Appendix Tables 5 and 11 summarize findings from four school-level and eight multi-level studies, representing ten different data sources. The results for discipline management[26] show remarkable consistency: When schools monitor students and control access to the campus, and when students perceive that school rules are fair and consistently enforced, schools experience lower levels of problem behavior. Inclusion of students in establishing school rules and policies for dealing with problem

[26] Although discipline management is by far the most studied aspect of school administration and management, Appendix Tables 5 and 11 also report findings related to broader aspects of school administration. These studies show that practices and procedures aimed at increasing goal clarity, effective communication, decision-making/problem solving, and coordination of resources have inconsistent effects on problem behaviors. Both Gottfredson and Gottfredson (1985) and Gottfredson et al. (2005) show that teacher reports of victimization are more highly related to these aspects of school management than are student reports of victimization, and Welsh (2000; 2001) reports that student victimization but not delinquency is related to student reports of the extent to which their schools take action to improve the school. Similarly, the studies show that involving students in the management of the school more broadly is not consistently related to the level of problem behavior experienced in the school.

behaviors has also been found to be related to lower levels of problem behavior, most likely because students are likely to internalize school rules if they have helped to shape them. On the other hand, severity of sanctions is not related to a reduction in problem behaviors. These findings conform to the main findings from deterrence research that the certainty of punishment has greater deterrent effect than the severity of punishment (Cook 1980; Nagin 1998).

Of course, there has been considerable policy attention to school disciplinary practices, especially in response to the spate of school shootings experienced in the 1980s and 1990s. Most schools employ security and surveillance strategies aimed at keeping intruders out and preventing weapons from coming into the schools. Common practices include controlled entry and identification systems, metal detectors, security personnel or volunteers who challenge intruders, or doors fitted with electromagnetic locks. The NSDPS described earlier showed that over half of schools in the United States employ one or more such procedure (G. Gottfredson and Gottfredson 2001). Unfortunately, our search for evidence on the effectiveness of these practices yielded only one outcome study of reasonable scientific rigor – a study of metal detectors in high-schools in New York City. Ginsberg and Loffredo (1993) compared the frequency of weapon carrying in schools with and without metal detectors and found that students in schools with metal detectors were half as likely to carry a weapon to school as students in schools without metal detectors.

Since the late 1990s, school resource officers (SROs) have been especially popular in secondary schools as a way to prevent violence, encouraged by federal subsidies. Kochel et al. (2004) reported that as of October, 2004, the US Department of Justice had invested

$746 million to place more than 6,500 SROs in schools and an additional $20 million to train them to implement community policing in schools. According to the School Crime Supplement to the NCVS described in section I, the percentage of students aged 12-18 who reported the presence of security guards and/or assigned police officers at their schools increased from 54% in 1999 to 68% in 2005. A recent New York Times article (January 4, 2009) reported that more than 17,000 police officers are now placed in the nation's schools. As with other security strategies, little high quality evaluation research has been conducted to assess SRO effectiveness, but it seems reasonable that the increased presence of SRO officers in schools at the very least increases the referral of problem behaviors to law enforcement agencies. Using SSOCS data for the 2003-4 school year, we find that schools in which the principal reports the presence of at least one SRO or other sworn law enforcement officer are much more likely to report criminal incidents to the police. Figure 7 shows that of the fourteen offenses reported in the survey, only referrals for the robbery with weapon are not related to the presence of an SRO or other law enforcement office (These crimes are rare and the rates of referral to the police are uniformly high). The presence of an officer in the school results in a doubling of the rate of referrals to law enforcement for the most common crime perpetrated by students in schools – simple assault without a weapon.

We do not know if the increase in referrals to law enforcement deters future crime. Regardless of the impact, the cost of adding SROs to schools is high, not only in personnel costs, but also in extra costs related to formal processing of misbehaviors that would otherwise be handled in the school. There are also civil liberties issues to be considered. As reported in the New York Times (January 4, 2009), an A.C.L.U inquiry

into school-based arrests in Hartford, Connecticut found that that they disproportionately affected minority youths. Clearly, research is needed to assess the effectiveness of popular but costly security and surveillance practices, especially in light of the high potential for net-widening and disproportionality in the consequences of their use.

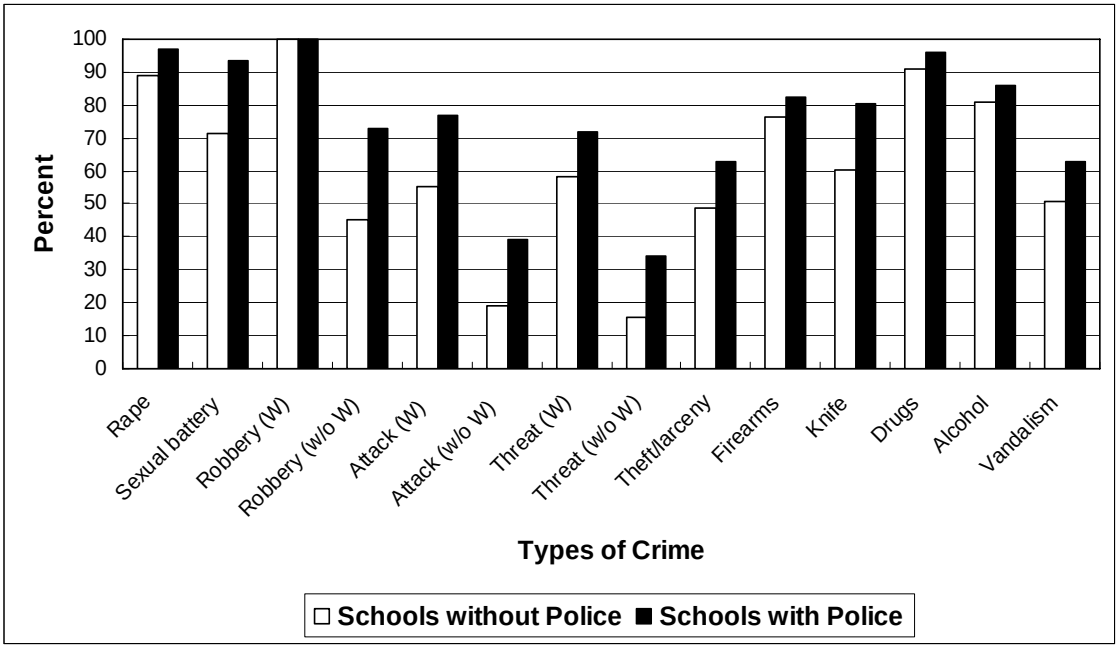

Figure 7. Crimes reported by police, by presence of police in schools
Source: School Survey on Crime and Safety (2003-2004), U.S. Department of Education

A closely related discipline strategy is the use of zero-tolerance policies in schools – another "tough on crime" practice engendered by the epidemic of youth violence in the late 1980s and the school rampage shootings of that decade and the next. Congress adopted the Gun-Free Schools Act in 1994, mandating that students be suspended for one year if they brought a gun to school. A large majority of school districts adopted zero tolerance policies for alcohol, tobacco, drugs, and violence (Simon 2006). The use of suspension, especially long-term suspension, is thought to have disproportionate impact

on minority and special education populations (McFadden and Marsh 1992; Gregory 1995), whose behavior places them more at risk for suspension. Civil liberties advocates have argued that zero tolerance policies rob youths of their right to a public education (Skiba 2000). As with the other security-related school polices, little high quality evidence is available to guide decisions about which discipline management policies produce the most desirable outcomes. The issue is complex, requiring consideration of the trade-offs between in-school versus out-of-school crime, the welfare of the youths who perpetrate the school-based offenses versus that of the other youths in the school, and long-term versus short term outcomes. Clearly, removing troublemakers from school helps to maintain an environment more suitable for learning for these remaining students. But what are the costs for the offenders and society? A recent econometric analysis of discipline data from middle schools in three North Carolina counties (Kinsler 2009) found that suspension reduces subsequent *in-school* problem behavior among the suspended youths without reducing subsequent academic performance among the suspended youths (possibly because suspended youths are already disengaged from the learning process). Further, Kinsler (2009) found that disruptive behavior reduces academic achievement for the general student population, suggesting that strict discipline policies that make liberal use of suspension for misbehavior are a rational course of action for school administration seeking to increase overall achievement.

Of course, this analysis is limited in scope and based on nonexperimental evidence. A more complete analysis of the effect of zero-tolerance policies on youth crime would consider the displacement of crime from school to the community as well as consequences for the suspended youths' long-term criminal and academic careers. As

youths lose more days of school to suspension, promotion to the next grade becomes less likely. And as youths fall farther behind grade, they become much less likely to graduate (Alexander, Entwisle, and Horsey 1997; Entwisle, Alexander, and Olson 1997; Jimerson et al. 2006; Lee and Burkam, 2003), and drop-out, as we have seen, is likely to increase subsequent crime. Clearly, although zero-tolerance policies benefit the classmates of troublesome youths, a rational discipline policy would also have to consider the broader consequences of such policies for the community.

More consistent with the research on effective crime deterrents are school discipline polices that emphasize the certainty of response to misbehavior over the severity of the response. Among the most effective school-based strategies for reducing youth violence, aggression, and problem behavior are behavioral interventions that target specific behaviors, systematically remove rewards for undesirable behavior, and apply contingent rewards for desired behavior or punishment for undesired behavior.[27] These interventions are often applied to the high-risk youths who are most at-risk for being suspended from school under zero-tolerance policies, and as such could be incorporated into school routines for discipline management. Gottfredson, Wilson, and Najaka's (2002) meta-analysis reported average effect size on measures of antisocial behavior and aggression of 0.34 ($p<.05$) across 12 studies of this type of behavioral intervention.

[27] These behavioral interventions are often extended to work on cognitive skills as well. These cognitive-behavioral interventions are often based on research indicating that aggressive or delinquent children and youths tend to be impulsive, tend not to make self-attributions for negative personal outcomes, tend to have hostile attributional bias in interpreting ambiguous social cues, fail to consider alternative solutions to problems, and lack effective communication skills (Dodge, Bates, and Pettit 1990).

Examples of particularly effective behavioral interventions currently in use in schools are the "Good Behavior Game" (GBG: Dolan et al. 1993; Kellam et al. 1994; 2008), "home-based reinforcement" (Schumaker, Hovell, and Sherman 1977), and the "Behavioral Monitoring and Reinforcement Program" (Bry 2003; Bry and George 1980). GBG is a classroom-based application of behavioral principles in which elementary school children are divided into small teams, and the teams are rewarded when the classroom behavior of the entire team meets or exceeds a pre-established standard. The GBG is played several times per week throughout the school year. The intervention was evaluated through a randomized trial involving 19 schools in Baltimore City, with post-tests conducted immediately following the intervention as well as six and fourteen years later. The results of this study indicate that participation in GBG is related to immediate reductions in aggressive behavior, rates of diagnosed antisocial personality disorder, and long term effects (fourteen years later) on drug and alcohol use and smoking. GBG is considered a promising program in the BVP classification.

Home-based reinforcement (HBR), applied to individual students displaying behavior problems, requires cooperation between teachers and parents in the management of the child's behavior. After agreeing upon specific child behaviors to be extinguished or encouraged and establishing a baseline for these behaviors, teachers systematically record data on the target behavior on a "daily report card" that goes home to the parents. The parents, who generally have access to a wider array of reinforcers and punishments than do the teachers, use the teacher's information to guide the application of rewards and punishments. As the desired behavior emerges, the frequency of reports home is reduced, and the schedule of contingencies is relaxed. In the earliest research on HBR, application

of this technique to junior high school students showed that school rule compliance, teacher satisfaction with the student, and academic performance improved as a result of participation in an HBR program (Schumaker, Hovell, and Sherman 1977). A recent review of 18 empirical studies of "school-home collaboration" interventions (Cox 2005) concluded that behavioral interventions using the daily report card strategy had the strongest effects on problem behavior. Lasting effects on crime are unknown.

The Behavioral Monitoring and Reinforcement Program (Bry and George 1979; 1980; Bry 1982), also a promising program on the BVP website pending replication, was among the first published studies demonstrating the effectiveness of a school-based behavioral intervention with high risk middle-school youths. Students were randomly assigned to the treatment and control conditions in this study. Tardiness, class preparedness, class performance, classroom behavior, school attendance, and disciplinary referrals were monitored weekly for two years. Students met with program staff weekly and earned points contingent on their own behavior which could be used for a class trip of the students choosing. Frequent parent notification was used. Experimental students had significantly better grades and attendance at the end of the program than did controls, but the positive effects did not appear until the students had been in the program for two years (Bry and George 1979; 1980). Bry (1982) reported that in the year after the intervention ended, experimental students displayed significantly fewer problem behaviors at school than did controls and in the 18 months following the intervention, experimental students reported significantly less substance abuse (ES = -.44) and criminal behavior (ES = -.30). Five years after the program ended, experimental youth were 66%

less likely to have a juvenile record than were controls (ES = -.50). The program has been updated and is currently in use in numerous school systems in the U.S. (Bry 2003).

These relatively simple and inexpensive behavioral interventions represent a potentially potent school-based prevention strategy that might be incorporated into routine school practice. The 1997 reauthorization of the Individuals with Disabilities Education Act (IDEA) (P.L. 105-17) required functional assessment and behavioral intervention procedures to be implemented in the disciplining of students with disabilities. The evidence-based programs described here would meet these federal requirements.

Behavioral principles have also been incorporated into school-wide discipline management systems. These systems are typically designed to clarify expectations for behavior. They establish school and classroom rules, communicate these rules as well as consequences for breaking them clearly to parents and students, establish systems for tracking both youth behavior and consequences applied by the schools, and monitor the consistency of the application of consequences for misbehavior. School-wide discipline management efforts, most often implemented by a school-based team of educators, are highly consistent with the research summarized earlier suggesting that students' perceptions of school rules as fair and consistently enforced is related to reductions in problem behavior. The meta-analysis described earlier (Gottfredson, Wilson, and Najaka 2002) also examined the effectiveness of this type of school-wide effort to improve discipline management and reported average effect size on measures of crime (0.27, $p<.05$) and alcohol and other drug use (0.24, $p<.05$). Among the studies included in the meta-analysis are two early studies of the effects of school-wide discipline management systems on problem behavior outcomes. Students in the intervention schools in the first

of these efforts (Project PATHE implemented in nine Charleston, South Carolina schools) reported less delinquent behavior and drug use and fewer punishments in school relative to the students in the comparison schools (Gottfredson 1986). A similar intervention was tested in a troubled Baltimore City junior high school, with a special emphasis on replacing the school's reliance on out-of-school suspension with a wider array of consequences for misbehavior. This intervention, which also added positive reinforcement for desired behavior to the mix of consequences routinely used, also showed positive effects on student delinquency and rebellious behavior (Gottfredson 1987). This early research, although based on relatively small numbers of schools and lacking randomization to condition, suggested that behavioral principles could be incorporated into "normal" school disciplinary practices, and that an emphasis on consistency of rule enforcement as opposed to severity of punishment provided an effective deterrent.

Contemporary approaches to discipline management incorporate behavioral principles into comprehensive systems that include school-wide discipline policies and practices as well as targeted behavioral interventions. One popular approach is "School-wide positive behavior support" (SWPBS), a "whole-school approach emphasizing effective systemic and individualized behavioral interventions for achieving social and learning outcomes while preventing problem behaviors" (Sugai and Horner 2008). This system, adopted by over 5,600 schools throughout the United States, uses a school-team approach to apply behavioral interventions at different levels of intensity for students at different levels of need. Universal interventions focus on clarity of school and classroom rules and consistency of enforcement, and on screening for more serious behavior disorders.

Group-based behavioral interventions are employed with the 5-10% of youths who do not respond to the universal interventions. In addition, intensive, individualized behavioral interventions are employed to manage the behavior of the small segment of the population that is especially at-risk. Unfortunately, the research on the effectiveness of SWPBS is not as sophisticated as it should be for such a widely-disseminated program. Although dozens of studies have demonstrated that problem behavior decreases after the intervention is put in place, only one (Sprague, Walker, Golly, White, Myers, and Shannon 2001) compared change in the intervention school(s) with the change that might be expected in the absence of an intervention. Even this study is not useful for isolating the effects of the behavior management strategies because it also included the introduction of a prevention curriculum along with the school-wide behavioral supports. Higher quality research is needed to assess the effects of this promising approach on crime both in and out of school.

Recent high profile efforts to manage student behavior in urban centers also reflect an emphasis on behavioral principles. Under the direction of Roland G. Fryer of the American Inequity Lab at Harvard University, students in fourteen Washington D.C. middle schools are being given the opportunity to earn up to $100 every two weeks contingent on their school attendance and behavior. The program, "Capital Gains," is described by Washington D.C.'s mayor as the kind of "outside the box" thinking required to turn a failing urban school district around (Washington Post, September 14, 2008). The program mimics Fryer's similar efforts currently being tested in the New York City and Chicago public schools. This type of intervention, focusing on reinforcing the positive, is similar to the effective Behavioral Monitoring and Reinforcement Program

(Bry and George 1979; 1980; Bry 1982) described above. It holds more promise for reducing crime in the long run than do zero tolerance and other policies and practices that exclude misbehaving youths from school.

C. Conclusion

We began this section by considering research on the efforts to change the way secondary students are organized for instruction. We noted that relatively little is known about the crime reduction potential of manipulating school organization, and we suggested that this is an area ripe for additional research. The little available research suggests, however, that it may be fruitful to reorganize schools by creating smaller groups of students who stay together for an extended period during the school day and who are taught by a small group of teachers. The research on these efforts suggests that such efforts might be effective for increasing youths' sense of connection, which serves to hold criminal behavior in check.

Much more is known about the effectiveness of prevention curricula for reducing problem behaviors. We summarized evidence showing that instructional programs that teach self-control or social competency using cognitive-behavioral or behavioral instructional methods are effective, and that the largest crime prevention potential results when youths who are at elevated risk for subsequent problem behavior are targeted for such school-based programs. We also summarized research suggesting that programs that are effective for reducing problem behavior among high-risk youths may have beneficial effects for the general population as well, and we suggested that more research is needed to document such unanticipated "spillover" effects.

This section also summarized research on school discipline management policies and practices and showed that they are important determinants of school crime. The studies reviewed consistently showed that in schools in which students report that the school rules are clearly stated, fair, and consistently enforced, and in schools in which students have participated in establishing mechanisms for reducing misbehavior, students are more less likely to engage in problem behaviors. We showed that evaluations of specific school-based programs that employ behavioral strategies to monitor and reinforce student behavior are effective both for controlling behavior in school and for reducing subsequent crime. Also, altering school-wide discipline management policies and practices to incorporate behavioral principles, clarify expectations for behavior, and consistently enforce rules reduces problem behavior. We discussed popular "get tough" approaches to school discipline, including zero tolerance policies and the use of law enforcement officers in schools. Although the effects of these polices on crime are not known, we argued that they might actually increase crime outside of school. There is a clear need for rigorous research on the effects of these policies.

V. School Culture

The final category of school climate to be considered is school culture – potentially the most potent aspect of school climate because it involves proximal interpersonal influences on student behavior. *School culture* refers to the quality of human relationships in the school and includes both peer culture and the extent to which the organization is communally organized. All of these dimensions influence youth crime and can be successfully manipulated to reduce it.

We rely in this section on the same resources we did in the previous section. We first summarize results from observational studies relating features of school culture to measures of problem behavior (results summarized in Appendix Tables 6 and 12). The same meta-analyses discussed in the previous section are used to identify effective categories of school-based prevention practice, and the WWC and BVP initiatives are referenced to identify particularly effective programs.

A. Behavioral Norms

Cultural norms, expectations, and beliefs influence all behaviors. Considerable research has focused, for example, on the notion that academic achievement is devalued in contemporary youth culture, especially among African American youths who associate academic achievement with an oppressive white culture (Fordham and Ogbu 1986). Although the best empirical evidence does not support the claim that a racialized "oppositional culture" is commonplace, it is plausible that peer pressure against being "nerdy" and working hard in school influences the academic achievement of youths in general (Cook and Ludwig 1997; Tyson, Darity, and Castellino 2005). Early research on characteristics of effective schools documented that schools have a distinctive "ethos" that influence students' academic as well as social behaviors (Rutter et al. 1979). Norms and expectations for behavior, both peers and adult, have been shown to be powerful determinants of behavior. Appendix Tables 6 and 12 summarize findings from studies that have related some aspect of school culture to student problem behaviors.

Culture is variously operationalized in these studies. Many studies use a measure of the average level of some form of misbehavior (e.g., truancy, bullying, or classroom

misconduct) among students in the school to measure norms for misbehavior. These studies most often control for individual-level measures of the same behavior to demonstrate that net of the individual's own level of misbehavior, school norms influence more serious forms of misbehavior such as substance use or delinquency. Another common method for assessing school culture is to ask students to report on the availability of illegal substances in the school or the extent to which other students in the school engage in problem behaviors. These approaches to measuring "culture" are suspect because they confound cultural values with other determinants of school-crime rates.

A purer operationalization of "culture" asks youths to report on their own beliefs about morality. An observed effect on problem behaviors of school average beliefs, net of individual-level beliefs, is taken as an indication of a school culture effect. Appendix Tables 6 and 12 show that most studies that have measured school culture using one of these methods have produced evidence in support of a school-culture effect on problem behavior.

Of course, the school "inputs" discussed in Section III are key determinants of the predominant cultural beliefs in the school. As we discussed, school desegregation and retention policies as well as the grade span of the school can influence school culture by altering the mix of students in the school. But several more programmatic attempts to alter school culture have also been studied. These programs have in common a focus on clarifying behavioral norms. That is, in contrast to the instructional programs described in the previous section that focus on teaching youths specific social competency skills, these normative change programs focus on clarifying expectations for behavior. Some

signal appropriate behavior through media campaigns or ceremonies, others involve youths in activities aimed at clarifying misperceptions about normative behavior, and still others increase exposure to pro-social models and messages.

Several studies of attempts to clarify norms for behavior have been reported. Gottfredson, Wilson, and Najaka (2002) summarized effects reported in 13 studies and concluded that such programs are effective for reducing crime, substance use, and anti-social behavior. Two of the better-known examples of programs in this category are the Bullying Prevention Program (Olweus, Limber, and Mihalic 1999), and the Safe Dates Program (Foshee et al. 1996; 1998). Olweus's program is designated as one of the eleven BVP model programs.

Olweus's anti-bullying program includes school-wide, classroom, and individual components. School-wide components include increased adult supervision at bullying "hot spots" and school-wide discussions of bullying. Classroom components focus on developing and enforcing rules against bullying. Individual counseling is also provided to children identified as bullies and victims. A large scale evaluation of this program in Norwegian schools demonstrated that it led to reductions in student bullying and victimization and decreases in the incidence of vandalism, fighting, and theft (Olweus et al. 1999). A very recent review of anti-bullying programs summarizing results from 59 studies conducted between 1983 and 2008 (Farrington and Ttofi 2009*)* confirmed that anti-bullying programs are effective for reducing bullying and student victimization, and that Olweus's program is particularly effective.

The Safe Dates Program targets norms for dating violence among adolescents. The school portion of the intervention includes a theater production performed by peers; a 10-

session curriculum addressing dating violence norms, gender stereotyping, and conflict management skills; and a poster contest. The community portion of the intervention includes services for adolescents experiencing abuse and training for community service providers. Foshee et al. (1998) found that intervention students reported less psychological abuse and violence against dating partners than did control students.

Based on these and other relatively rigorous evaluations, Gottfredson et al. (2002) concluded that interventions aimed at establishing norms or expectations for behavior can be effective in preventing substance use, delinquency, aggression, and other problem behaviors. It should be noted, however, that evaluations of these programs seldom provide clean tests of the proposition that culture matters, since the programs more often than not combine attempts to alter norms with other components aimed at increasing levels of supervision and enforcement (e.g., Olweus) or improving social competency skills (Foshee).

Another type of school-based program that fits into the more general class of programs aimed at changing perceived norms for behavior has recently been highlighted in the U.S. Department of Education's WWC. These "character education" programs are defined in the WWC as educational efforts to support the positive character development of children and adults, where "character" refers specifically to moral qualities such as respect, responsibility, trustworthiness, fairness, caring, and citizenship. Such initiatives were specifically encouraged and supported in the No Child Left Behind Act of 2001. In criminological language, character education programs seek to develop internal controls for behavior by clarifying beliefs about right and wrong behavior. Unfortunately, the majority of character education studies reviewed by the WWC were found to have

insufficient evidence to ascertain their effectiveness. We believe the evidence supporting character education programs does not warrant the level of attention these programs have been given of late. On the other hand, the evidence supporting the effectiveness of norm-clarification programs, whether or not it focuses on fostering moral development, is more persuasive.

We would be remiss if we failed to mention that sometimes school-based practices that seek to clarify norms for behavior backfire. One example is a peer counseling program that deliberately mixed delinquent and nondelinquent youths in counseling sessions in which youths were encouraged to share their problems. The intent was that the negative beliefs and attitudes voiced by the delinquent youths would be corrected through interaction with the non-delinquent youths. A randomized experiment testing this program as implemented in the Chicago Public Schools (G. Gottfredson 1987) reported predominantly harmful effects for high school students: high school treatment youths reported significantly *more* delinquent behavior than controls. A more recent large scale evaluation of the Reconnecting Youth program (Cho, Hallfors, and Sánchez 2005) also found negative effects for a group counseling program for at-risk high school students. This program sought to "re-connect" truant, underachieving high school students (and to reduce their deviance and substance use) by developing a positive peer group culture. Students were grouped together in classes of 10-12 students for a full semester during which a trained group leader (following a standardized curriculum) attempted to develop a climate conducive to building trust. The evaluation reported only negative effects six months following the end of the intervention. Treatment students showed greater

bonding to high-risk peers, lower bonding to school and conventional peers, lower GPA, and higher anger than control students at the 6-month follow-up.

B. Communal Social Organization

A second aspect of school culture that has been studied extensively pertains to the affective bonds between students and teachers and among adults in the school. The concept of "communal social organization" (CSO) was first introduced as part of the effective schools debate in the 1980's (e.g., Firestone and Rosenblum 1988; Purkey and Smith 1983) and studied by Bryk and colleagues (Bryk and Dirscoll 1988) mostly in the context of predictors of school achievement. Communally organized schools are schools in which "…members know, care about, and support one another, have common goals and sense of shared purpose, and…actively contribute and feel personally committed" (Solomon et al. 1997). This aspect of school culture is especially important for school crime research because we know that individual-level student affective bonds are an important predictor of delinquency (Hirschi 1969), and it seems reasonable to hypothesize that schools high on CSO would produce higher levels of student bonding to school.

Four studies have measured CSO and nine studies have related some measure of student affective bonds (at the school level) to problem behaviors. These studies, summarized in Appendix Tables 6 and 12, are compatible with the conclusion that average student attachment to school and CSO more generally do inhibit student problem behaviors. The most comprehensive test of this linkage was provided by Payne et al. (2003) using data from the National Study of Delinquency Prevention in Schools. This

study demonstrated that more communally organized schools experience less student delinquency and teacher victimization, and that the effect of communal school organization on student delinquency is mediated by average student bonding.

This survey research dovetails nicely with an ambitious ethnographic study of school violence conducted for the National Research Council. In 2003, the Committee to Study Youth Violence in Schools of the National Research Council published its report on the circumstances surrounding several incidents involving extreme lethal violence that had occurred in the nation's schools (National Research Council 2003). The report was based on detailed case studies of six schools and communities that had experienced school shootings resulting in death. Among the committee's several insights into the factors leading to the incidents is the following:

> "… the sense of community between youth and adults in these schools… was lacking. In the worst example, the school allowed a school newspaper to print an article that humiliated one of the students who became a shooter. The adults involved may have been too distant from the students to prevent some social processes leading to the potential for violence or resulting in an intolerable humiliation from some potentially vulnerable youth" (p. 256).

This observation is consistent with the research on more mundane forms of school violence just summarized. It suggests that strategies that increase social bonds between students and others in their schools will reduce misbehavior by increasing informal controls. Students who care what adults in the school think about them will be less likely to act in ways that jeopardize their positive regard. More concretely, students who have close ties to the adults in the school will be more likely to report on rumors of impending

attacks. But how can such bonds be built or maintained? Possibilities noted in previous sections of this chapter include organizing the school so that the typical teacher interacts with fewer students, reducing class size, and creating more "communal" social environments in which members are more tightly joined together by common goals and in which members are held in place by the support and positive regard of others in the organization.

In the previous section, we summarized evidence suggesting that reorganizing schools to create a smaller feel to the schooling experience is an effective strategy for increasing youths' sense of connection, and that enhanced connectedness should hold criminal behavior in check. A less drastic intervention with the same objectives is mentoring. Youth mentoring programs often target youths at risk of behavioral problems, assigning them to an adult mentor who spends time with the young person, provides support and guidance, and provides general guidance. Evaluations of such programs have been mixed, but often null or weak results can be attributed to implementation failure. As with any voluntary program, mentoring programs in practice are often not as intensive as intended (e.g., Karcher 2008). However, a recent meta-analysis of mentoring programs (Eby et al. 2007) demonstrated small but positive effects of mentoring programs on several behaviors of interest in this chapter: withdrawal behaviors (e.g., school drop-out, truancy – 18 studies), deviance (e.g., suspension from school, aggressive behavior, property crime – 15 studies), and substance use (7 studies). This review included a wide range of types of mentoring programs, but outcomes for youth mentoring programs were as strong on these outcomes as were the other types of mentoring programs (academic and workplace mentoring) included in the review.

One of the better-known models for adult mentoring, the Big Brothers-Big Sisters program (BBBS) is a community-based program identified by BVP as a model primarily on the basis of evidence from a large-scale randomized trial that found that mentored youths were 46% less likely than control youth to initiate drug use, 27% less likely to initiate alcohol use, and almost one-third less likely to hit someone during the study period (Tierney et al. 1995). Community-based mentoring involves meetings between the mentor and mentee at times and places selected by the pair. Many schools now provide "school based mentoring," (SBM) which involves meetings primarily in school during the school day. A recent evaluation of the BBBS SBM model, also involving random assignment of a large number of youths, shows that although it is not as effective as the community-based alternative, SBM does improve academic performance, reduce truancy, and reduce serious school infractions (Herrera, Grossman, Kauh, Feldman, McMaken, with Jucovy 2007) at least during the first year of mentoring. Consistent with results from smaller scale randomized trials of SBM showing positive effects on increasing connectedness to school (Karcher 2005) and perceived social support (Karcher 2008), Herrera et al. (2006) found that mentored youths reported more often than controls the presence of a non-parental adult in their life who provides social supports. At the end of the second year of the study during which minimal SBM was provided, the positive program effect on truancy was sustained but the other positive effects were not. Herrera et al. (2006) conclude that although the SBM model is promising, it needs to be strengthened to ensure longer and higher quality mentor/mentee matches than are typically found in schools.

A similar program is described in the WWC review of drop-out prevention research. The "Check & Connect" program involves monitoring of school performance, mentoring, and case management for at-risk high school students. Program staffers closely monitor student attendance, performance, and behavior in school. They also provide individualized attention to participating students, encouraging them to stay in school. One study – a randomized controlled trial that included 94 high school students from the Minneapolis public schools with learning, emotional, or behavioral disabilities – met the WWC standards for evidence (Sinclair, Christenson, Evelo, and Hurley 1998). That study reported that 9% of ninth grade students enrolled in Check & Connect compared with 30% of controls dropped out of school at the end of the first follow-up year. This intervention is interesting because it combines aspects of adult mentoring with aspects of behavior management described earlier as having crime prevention potential.

C. Summary.

In this section, we summarized findings from observational studies relating measures of school culture and student delinquency, victimization, substance use, and other forms of problem behavior. These studies suggest that perceptions of social norms for behavior are related as expected to problem behavior, net of individuals' personal beliefs. In schools in which the prevailing norm is to condone delinquent activities, students are more likely to do so regardless of their own personal dispositions to engage in these behaviors. But we showed that schools can intervene to change perceptions of norms and expectations for behavior and that doing so reduces delinquency, although attempts to do so sometimes backfire.

We also found evidence in observational studies that in schools in which students feel an emotional attachment to the adults in the school, their misbehavior is restrained. We referenced our earlier discussion of efforts to create smaller learning environments (SWS) aimed at increasing youths' sense of connection to the school, reminding the reader that such attempts to reorganize schools are promising to the extent they are successful at creating more communal social organizations. We reviewed research on school-based mentoring programs and showed that they also hold considerable promise for crime prevention. Although research documents positive effects of these programs on social relations outcomes, more work is needed to test the full potential of more potent models of school-based mentoring than have been tested to date.

VI. Where now for policy and research?

While only one percent of homicides of school-aged youths take place in schools, non-lethal victimization rates for theft and violence in school are as high as in all other locations combined. The concentration of crime in schools reflects the fact that schools, especially middle and high schools, concentrate youths near the peak of their delinquent careers. The regimentation of school life and extensive adult supervision are surely helpful in controlling behavior, but not sufficient to negate the basic fact of exposure. Other things equal, a school-aged youth is more likely to be mugged or beaten up on a day when school is in session than when it is not.

Still, there is good news of a sort. In 2005 school-crime-victimization rates were only about one-third what they were in the early 1990s. The school rampage shootings that culminated in the Columbine disaster in April 1999 are largely a thing of the past.

Students and teachers alike are far less likely to be victims of larceny, robbery, or assault while in school.

What can we learn from this remarkable crime drop? A possible explanation is in terms of the redirection of school discipline and crime-prevention policy that occurred during the 1990s and beyond. During that period schools have greatly expanded the use of school resource officers (police), adopted zero-tolerance policies that have increased suspensions and expulsions, referred more crimes to the juvenile justice system, and generally "criminalized" behavior that used to be dealt with internally and less formally. The problem with crediting this shift in policy, however, is that youth victimization rates were declining as fast or faster *outside* the schools as in. Occam's Razor would suggest that any explanation for the trend in school crime take note of the close link between school crime and community crime, and the fact that the crime drop in the community fully accounts for the crime drop in schools since 1993. In sum, and perhaps unsatisfactorily, the primary reason school crime rates have dropped is that community crime rates have dropped.

This conclusion does not imply that there is nothing that schools themselves can do to control the criminal activity by their students. Crime rates differ widely among schools, even those that are similar with respect to grade span, urbanicity, and demographic characteristics of the students. Experimental evidence suggests that the crime involvement of any given student at risk is influenced by the school that they attend. That fact motivates our scientific quest to find the school-level determinants of criminal activity by school-aged youths.

In sections III through V we summarized findings from 35 studies of school climate and crime conducted since 1980 and discussed numerous additional studies that reported on attempts to manipulate aspects of school climate. The review was organized around the four categories of school climate described by Tagiuri (1968). The school climate studies revealed sturdy associations between measures of school climate and measures of student delinquency, victimization, substance use, or other forms of problem behavior, summarized in Table 5.

A starting point in accounting for inter-school differences in crime is the criminal propensities of the students. Schools in which many of the students are active delinquents outside school start with a far greater challenge than those where the students are largely law abiding. The school crime rate of a high-crime-propensity student body may be greater than the sum of the parts, for two reasons. First, if the school lacks the adult resources to manage the "load" of misbehavior, then the school may become progressively more chaotic, spinning out of control. Further, delinquent and deviant youths may have negative influence on each other and other students as well, further amplifying the problem. In short, the crime rate in school is not just the sum of the parts, but does reflect the ecological effects of the mix of students in the building.

Schools and school districts have a good deal of control over the makeup of the student body. Schools can be based on neighborhood residential patterns or integrated across race and class. The grade span for elementary and middle schools can be adjusted. Truancy and dropout prevention programs can be pursued with more or less vigor, and troublesome students reassigned. Whether failing students are retained in grade or given a social promotion influences the extent of age homogeneity within classrooms. Students

who are enrolled in the school can be tracked on the basis of academic potential or mixed together. And so forth. This array of policy choices all have the potential to influence the "load" on teachers and other adults, and the opportunity for deviant peer influence. Some of these policies have been evaluated for these ecological effects, but the evidence base is quite thin.

Aspects of school culture have the most robust associations with problem behavior. In schools in which the prevailing norm is to engage in delinquent activities, students are more likely to do so regardless of their own personal dispositions to engage in these behaviors. We also found strong evidence that in schools in which students feel an emotional attachment to the adults in the school, their misbehavior is restrained. The challenge is to find interventions that are effective in changing school culture. We provided evidence to suggest that reorganizing secondary schools so that the typical teacher interacts with fewer students may help to create school environments that limit problem behaviors. We reviewed research on efforts to change the way secondary students are organized for instruction, creating smaller groups of students who stay together for an extended period during the school day and who are taught by a small group of teachers. The research on these efforts suggested that such reorganization efforts might be effective for increasing youths' sense of connection with school, which serves to hold criminal behavior in check. These interventions should be put to more rigorous test to document their effects of crime. Mentoring programs can also be expected to reduce crime by creating connections with adults, but more work is needed to test the full potential of more potent models of school-based mentoring than have been tested to date.

School discipline management policies and practices are important determinants of school crime. The studies we reviewed consistently showed that in schools in which students report that the school rules are clearly stated, fair, and consistently enforced, and in schools in which students have participated in establishing mechanisms for reducing misbehavior, students are less likely to engage in problem behaviors. Altering school discipline management to incorporate behavioral principles, clarify expectations for behavior, and consistently enforce rules reduces problem behavior. We discussed popular "get tough" approaches to school discipline, including zero tolerance policies and the use of law enforcement officers in schools. Although the effects of these policies on crime are not known, we argued that they might actually increase crime outside of school. There is a clear need for rigorous research on the effects of these policies.

Finally, we noted that evidence does not support the conclusion that smaller schools are more effective for limiting problem behaviors than larger schools, but it does suggest that conditions that make a school environment "feel" smaller and more communally organized are related to levels of problem behavior.

The findings from the review of existing research dovetail nicely with our earlier discussion of the mechanisms involved in the production of crime and the features of schools that might influence these mechanisms. We noted that decisions that influence the demographic composition of schools are important because they determine the prevailing cultural beliefs in the school as well as the pool of youths from whom friends can be selected. We noted that policies and procedures governing discipline management are important because they influence the extent to which formal sanctions are applied and the effectiveness of these sanctions. And we noted that the school social organization is

important because it influences the level of social control to which students in the school are exposed.

Recommendations. Given the limitations of the evidence base, we are more confident in making recommendations about research priorities than about effective policy. Indeed, this field is burdened by a lack of timely policy research, and a tendency to launch major initiatives without first (or ever!) doing a high-quality evaluation. Note in this regard the various "get tough" policies that have been encouraged by the federal government and adopted nationwide since the 1990s, or the School-Wide Positive Behavior Support package that has been adopted by 5,500 schools, or the nationwide shift beginning in the 1970s toward a middle school grade configuration that included sixth graders. On the other hand, a model approach is the series of experiments being conducted by Roland Fryer on providing cash incentives to students to come to class, do the school work, and stay out of trouble. Presumably the outcomes of these experiments will affect the decision to adopt.

The place to begin the research agenda is with a close look at the quality of the data in current use. Scholars, school officials, and policy advocates all make use of the various data sources on school crime – the crime-survey data from NCVS and from the CDC's YRBSS, the principals' reports to the US Department of Education, and the detailed data base on crimes known to the police (NIBRS). To an extent the resulting statistics on school crime can be compared across sources, and the results are rather distressing. We found order-of-magnitude differences in violent crime rates from NCVS and YRBSS, for example – even more important, perhaps, is that the NCVS reveals a dramatic reduction in crime rates since 1993, while the YRBSS does not show any trend during this time.

Despite these problems, it is too often true that users do not investigate the quality of the data or check one source against another. It would be a useful service to all users if there were a comprehensive investigation of the differences in crime rates and patterns across these data sets, together with an investigation of the sources of disagreement. One thing that is clear is that survey results with adolescent subjects are exquisitely sensitive to where and how the questions are administered.

We have several recommendations to guide evaluation research on interventions. The first recommendation is to actually do such research, as suggested above. Given the tens of millions that are being spent on school resource officers, it seems criminal that we do not have good evidence on the effects on how infractions are dealt with, whether crime is suppressed, and more generally whether there is a positive or negative effect on attitudes of students toward school.

Second, and relatedly, is that when evaluations are conducted of interventions intended to improve academic performance, that crime and other forms of misbehavior be included as outcome measures. We expect that most interventions that are successful in improving academic performance will have salutary effects on behavior, but that speculation needs to be documented and is not necessarily the case. Given the strong focus on pushing up academic standards, it is surely important to know what the tradeoffs may be.

Third, when misbehavior is included in the list of outcomes, the list of indicators should include those that capture the most serious forms of crime. In a review of 178 studies of school-based prevention, only 18 (10%) measured serious violent crime, and 39 (22%) measured serious property crime (Gottfredson, Wilson, and Najaka 2002).

The bulk of the studies measure effects on gateway substance use, rebelliousness, defiant behavior, and related measures, but do not include specific crimes or arrests.

Fourth, we note that most of the evaluations of policies that affect the mix of students – truancy and dropout prevention, alternative schools, tracking, grade retention of failing students, and so forth – only consider the effect on the students who are targeted, and fail to consider the ecological effects. The exceptions, reviewed in Sections III and IV, suggest that secondary effects on other students may be quite important, and should be included when it is possible to implement a comprehensive study.

Fifth, although the Gates Foundation has stopped promoting the idea of smaller high schools, it is still important to identify programs to create more cohesive, communal, personalized environments. From what we know already, the "schools within schools" approach appears promising. At the other end of the ideological and theoretical spectrum, but also interesting, is the idea of offering immediate tangible rewards for good behavior. Old experiments with token economies worked well, and the experiments with cash payments now underway in three cities should yield useful additional information. If either the communal approach or the individual incentive approach appears successful, the challenge will be to design cost-effective programs, the next desirable line of research.

Finally, there is a missing chapter from the literature on schools and crime, which should be filled in. The literature we have reviewed is concerned with the question of how school climate affects crime. The reverse question of how crime affects school climate is also important, but almost entirely neglected by social scientists. It is plausible that crime-ridden schools are going to have difficulty in recruiting the best teachers and administrators, and students from families that have choices will go elsewhere. Any

sense of community or legitimacy is going to be lost in a high-crime school where students are fearful of each other and see that the adults do not have adequate control. Documenting the strength and magnitude of such causal links are important in setting priorities for crime control and prevention in schools.

Table 5
School Climate and Problem Behaviors: Summary of Evidence

Tagiuri (1968) classification	Feature of School Environment	Evidence from Observational Studies
Ecology	School size	School size generally unrelated to levels of problem behavior (weak evidence)
Milieu	Demographic characteristics of students in the school	Demographic composition of the school matters for level of problem behavior, net of individual demographics. Important compositional characteristics include grade levels included in the school or average age of the students in the school, the percentage male students, and the social class composition of the school. (strong evidence)
Social System	Organizational structure:	
	Number of different students taught by teacher/number of classroom changes	Teaching more students and allowing more classroom changes promotes higher levels of problem behavior (moderate evidence)
	Administration/ Management:	
	Discipline management	Schools that establish and maintain rules, effectively communicate clear expectations for behavior, monitor student behavior, consistently enforce rules, experience lower levels of problem behaviors (strong evidence).
	Student involvement	Giving students a meaningful role in establishing mechanisms for reducing misbehavior reduces problem behaviors (moderate evidence)
	General school management	Effective management of the school reduces problem behaviors (moderate evidence)
Culture	School norms related to problem behaviors	The attitudes, beliefs, and behaviors of students in the school predict the level of problem behavior (strong evidence)
	Students affective bonds/ communal social organization (CSO)	Average student attachment to school and CSO more generally do inhibit student problem behaviors (strong evidence)

APPENDIX

Table 1
Studies of School Climate and Problem Behavior, 1980-2008: School-Level Studies

Citation	# School	Sample Characteristics	Time Point	Measures of Problem Behavior				Measures of School Climate				
				Substance Use	Crime/ Delinquency	Victimization	Other	Ecology	Milieu	Organizational Structure	Administration/ Management	Culture
Bryk & Driscoll (1988)	357	High School and Beyond: Nationally representative samples of high schools	1				x	x	x			x
Chen (2008)	712	School Survey on Crime and Safety: Nationally representative sample of secondary public schools	1		x			x	x		x	x
Eitle and Eitle (2004)[28]	740	Middle and high schools from 40 counties in Florida (after excluding 27 rural counties)	1	x				x	x			x
Gottfredson & Gottfredson (1985)	623	Safe School Study: Nationally representative sample of 7th-12th graders in public schools	1			X		x	x	x	x	x
Gottfredson et al. (2005)	254	National Study of Delinquency Prevention in Schools: Nationally representative sample of secondary schools	1		x	X		x	x		x	x
O'Neill & McGloin (2007)	2,270	School Survey on Crime and Safety: Nationally representative sample of public schools	1		x			x	x	x		
Payne,	254	National Study of Delinquency Prevention in	1		x	X		x	x			x

[28] This is actually a multi-level study of schools nested in counties. It is included with the school-level studies because it does not analyze student-level variability.

Citation	# School	Sample Characteristics	Time Point	Measures of Problem Behavior				Measures of School Climate				
				Substance Use	Crime/ Delinquency	Victimization	Other	Ecology	Milieu	Organizational Structure	Administration/ Management	Culture
Gottfredson, & Gottfredson (2003)		Schools: Nationally representative sample of secondary schools										
Roski et al. (1997)	30	Schools that reported significant substance use problem in northeastern Minnesota	1	x								x
Weishew & Peng (1993)	1,051	National Education Longitudinal Study: Nationally representative sample of 8th graders	1	x	x		x	x	x	x	x	x
Welsh, Strokes, & Greene (2000)	43	Convenient sample of middle school students in Philadelphia	1		x			x				x

Table 2
Studies of Problem Behavior and School Climate Dimension – Ecology, 1980-2008: School-Level studies

Citation	Indicator of School Ecology	Outcome[29]				Control Variables	School Climate Controlled	Comments
		Substance Use	Delinquency	Victimization	Other			
Bryk & Driscoll (1988)	School size				+*		Milieu	Other= classroom disorder
	School selectivity				-			
	Parental cooperation (a resource)				-*			
Chen (2008)	School size		+*			Community crime rate, school urbanicity	Milieu, Administration/management, Culture	
Eitle and Eitle (2004)	School organizational structure	+*				Index of dissimilarity, population density, household poverty rate, index crime rate	Milieu, Culture	School organizational structure= school size, class size, per-pupil expenditures
Gottfredson & Gottfredson (1985)[30]	Student-teacher ratio			0/0	-/0	Poverty and disorganization, affluence and education, affluent mobility, rural (vs. urban) location, distance from business district, population of area, community crime, desegregation	Milieu	Other= teacher victimization
	Teaching resources			-/-	-*/-*			Outcome= junior/senior high school
	Total enrollment			0/0	+*/+			

[29] When more than one measure of the school climate or outcome variable are included in the study, the largest association is recorded. When different measures of the same construct result in associations with differing signs, this is noted in the "comments" section.
+* = statistically significant effect in positive direction (that is, high value on school ecology characteristic is associated with more problem behavior).
+ = statistically non-significant effect in positive direction (that is, high value on school ecology characteristic is associated with more problem behavior).
0 = statistically non-significant effect whose direction is unknown.
- = statistically non-significant effect in negative direction (that is, high value on school ecology characteristic is associated with less problem behavior).
-* = statistically significant effect in negative direction (that is, high value on school ecology characteristic is associated with less problem behavior).
[30] This study reported correlations of hundreds of school characteristics with two different measures of school disorder. Only selected associations are summarized here.

Citation	Indicator of School Ecology	Outcome[29]				Control Variables	School Climate Controlled	Comments
		Substance Use	Delinquency	Victimization	Other			
Gottfredson et al. (2005)	School size and urbanicity		-*	-*	0	Concentrated poverty/African American, residential crowding	Milieu, Administration/management, Culture	Other= teacher victimization
O'Neill & McGloin (2007)	Total number of student		+*/+*			Crime level, school location	Milieu, Organizational structure	Outcome= property/violent crime
	Student/teacher ratio		+/+					
Payne, Gottfredson, & Gottfredson (2003)	School size and urbanicity		-*	-*	0	Concentrated poverty/African American, residential crowding	Milieu, Culture	Other= teacher victimization
Weishew & Peng (1993)	School enrollment	+	+		+*	Parental involvement, time spent alone, self-perception, achievement, educational expectation, participation, % disadvantaged, urbanicity	Milieu, Organizational structure, Administration/management, Culture	Other= misbehavior
	Student/teacher ratio	-	-		+			
Welsh, Strokes, & Greene (2000)	School size		-			Community poverty, community stability, community crime	Culture	

Table 3
Studies of Problem Behavior and School Climate Dimension – Milieu, 1980-2008: School-Level studies

Citation	Indicator of School Milieu	Outcome[31]				Control Variables	School Climate Controlled	Comments
		Substance Use	Delinquency	Victimization	Other			
Bryk & Driscoll (1988)	Average academic background				-*		Ecology	Other= classroom disorder
	School social class				-*			
	School minority concentration				+			
	School social class diversity				+			
	School ethnic diversity				+*			
Chen (2008)	School transience		+*			Community crime rate, school urbanicity	Ecology, Administration/management, Culture	School transience= number of students transferred
	Student SES		-					
Eitle and Eitle (2004)	% non-white	-*				Index of dissimilarity, population density, household poverty rate, index crime rate	Ecology, Culture	Teacher social milieu= % master's degree, average teaching experience
	Teacher social milieu	-*						
	High school (vs. junior school)	+*						

[31] When more than one measure of the school climate or outcome variable are included in the study, the largest association is recorded. When different measures of the same construct result in associations with differing signs, this is noted in the "comments" section.
+* = statistically significant effect in positive direction (that is, high value on school milieu characteristic is associated with more problem behavior).
+ = statistically non-significant effect in positive direction (that is, high value on school milieu characteristic is associated with more problem behavior).
0 = statistically non-significant effect whose direction is unknown.
- = statistically non-significant effect in negative direction (that is, high value on school milieu characteristic is associated with less problem behavior).
-* = statistically significant effect in negative direction (that is, high value on school milieu characteristic is associated with less problem behavior).

Citation	Indicator of School Milieu	Outcome[31]				Control Variables	School Climate Controlled	Comments
		Substance Use	Delinquency	Victimization	Other			
Gottfredson & Gottfredson (1985)[32]	% student female			0/-*	0/0	Poverty and disorganization, affluence and education, affluent mobility, rural (vs. urban) location, distance from business district, population of area, community crime, desegregation	Ecology	Other= teacher victimization Outcome = junior/senior high school
	mean grade level			0/-*	0/0			
	% teachers white			0/0	+/0			
Gottfredson et al. (2005)	% student male		+*	+*	0	Concentrated poverty/African American, residential crowding	Ecology, Administration/management, Culture	Other= teacher victimization
	Grade level		-*	-*	-*			
O'Neill & McGloin (2007)	% minority		+/+			Crime level, school location	Ecology, Organizational structure	Outcome= property/violent crime
	High (vs. middle) school		+*/-					
	% male		-/-*					
	% free lunch		+/+					
Payne, Gottfredson, & Gottfredson (2003)	% student male		+*	+*	0	Concentrated poverty/African American, residential crowding	Ecology, Culture	Other= teacher victimization
	Grade level		-*	-*	-*			
Weishew & Peng (1993)	% male	-	+		+	Parental involvement, time spent alone, self-perception, achievement, educational expectation, participation, % disadvantaged, urbanicity	Ecology, Organizational structure, Administration/management, Culture	Other= misbehavior
	Grade span	+*	-		+			
	Private (vs. public) school	-	+		-*			

[32] This study reported correlations of hundreds of school characteristics with two different measures of school disorder. Only selected associations are summarized here.

Table 4
Studies of Problem Behavior and School Climate Dimension – Organizational Structure, 1980-2008: School-Level studies

Citation	Indicator of School Organizational Structure	Outcome[33]				Control Variables	School Climate Controlled	Comments
		Substance Use	Delinquency	Victimization	Other			
Gottfredson & Gottfredson (1985)[34]	# different students taught			0/+	0/+*	Poverty and disorganization, affluence and education, affluent mobility, rural (vs. urban) location, distance from business district, population of area, community crime, desegregation	Ecology, Milieu, Administration/management, Culture	Other= teacher victimization Outcome= junior/senior high school
O'Neill & McGloin (2007)	Classroom change		+*/+*			Crime level, school location	Ecology, Milieu	Outcome= property/violent crime

[33] When more than one measure of the school climate or outcome variable are included in the study, the largest association is recorded. When different measures of the same construct result in associations with differing signs, this is noted in the "comments" section.
+* = statistically significant effect in positive direction (that is, high value on school organizational structure characteristic is associated with more problem behavior).
+ = statistically non-significant effect in positive direction (that is, high value on school organizational structure characteristic is associated with more problem behavior).
0 = statistically non-significant effect whose direction is unknown.
- = statistically non-significant effect in negative direction (that is, high value on school organizational structure characteristic is associated with less problem behavior).
-* = statistically significant effect in negative direction (that is, high value on school organizational structure characteristic is associated with less problem behavior).
[34] This study reported correlations of hundreds of school characteristics with two different measures of school disorder. Only selected associations are summarized here.

Table 5
Studies of Problem Behavior and School Climate Dimension – Administration/Management, 1980-2008: School-Level studies

Citation	Indicator of School Adminstration/Magagement	Outcome[35]				Control Variables	School Climate Controlled	Comments
		Substance Use	Delinquency	Victimization	Other			
Chen (2008)	Security measures		-			Community crime rate, school urbanicity	Ecology, Milieu, Culture	Security measures= controls to campus access, monitors student activities
	Serious penalties		+*					Serious penalties= use of punitive measures for disciplinary problems
Gottfredson &	Teacher-adm. cooperation			-/-	-/-*	Poverty and disorganization, affluence and education, affluent mobility, rural (vs. urban) location, distance from business district, population of area, community crime, desegregation	Ecology, Milieu, Organizational structure, Culture	Other= teacher victimization
Gottfredson (1985)[36]	Policy confusion			+*/0	+/0			Outcome= junior/senior high
	Ambiguous sanction			0/0	+*/+*			
	Firm and clear enforcement			0/0	-*/-			
	Fairness and clarity of rules			-*/-*	-/-			
	Student influence			0/-	+/0			
Gottfredson	Psycho-social climate		0	0	-*	Concentrated poverty/African American, residential crowding	Ecology, Milieu, Culture	Other= teacher victimization
et al. (2005)	Discipline management		-*	-*	0			Psycho-social climate= organizational focus, planning, administrative leadership

[35] When more than one measure of the school climate or outcome variable are included in the study, the largest association is recorded. When different measures of the same construct result in associations with differing signs, this is noted in the "comments" section.
+* = statistically significant effect in positive direction (that is, high value on school administration/management characteristic is associated with more problem behavior).
+ = statistically non-significant effect in positive direction (that is, high value on school administration/management characteristic is associated with more problem behavior).
0 = statistically non-significant effect whose direction is unknown.
- = statistically non-significant effect in negative direction (that is, high value on school administration/management characteristic is associated with less problem behavior).
-* = statistically significant effect in negative direction (that is, high value on school administration/management characteristic is associated with less problem behavior).
[36] This study reported correlations of hundreds of school characteristics with two different measures of school disorder. Only selected associations are summarized here.

Citation	Indicator of School Adminstration/Magagement	Outcome[35]				Control Variables	School Climate Controlled	Comments
		Substance Use	Delinquency	Victimization	Other			
Weishew & Peng (1993)	Fairness of discipline	-	-		-*	Parental involvement, time spent alone, self-perception, achievement, educational expectation, participation, % disadvantaged, urbanicity	Ecology, Milieu, Organizational structure, Culture	Other= misbehavior
	Disciplined student environment	-*	-		-			
	Flexibility of school environment	-*	-		-			

Table 6
Studies of Problem Behavior and School Climate Dimension – Culture, 1980-2008: School-Level studies

Citation	Indicator of School Culture	Outcome[37]				Control variables	School climate controlled	Comments
		Substance Use	Delinquency	Victimization	Other			
Bryk & Driscoll (1988)	Communal social organization				-*		Ecology, Milieu	Other= classroom disorder
Chen (2008)	School misbehavior		+*			Community crime rate, school urbanicity	Ecology, Milieu, Administration/management	School misbehavior= frequency of bullying and disorder in the classroom
Eitle and Eitle (2004)	School culture	+*				Index of dissimilarity, population density, household poverty rate, index crime rate	Ecology, Milieu	School culture= school absenteeism and drop out rate, % low school achievement
Gottfredson & Gottfredson (1985)[38]	Delinquent youth culture Belief in conventional rules			+/0 +/+	+/0 -/-*	Poverty and disorganization, affluence and education, affluent mobility, rural (vs. urban) location, distance from business district, population of area, community crime, desegregation	Ecology, Milieu, Organizational structure, Administration/management,	Other = teacher victimization Outcome= junior/senior high school
Gottfredson et al. (2005)	Psycho-social climate		0	0	-*	Concentrated poverty/African American, residential crowding	Ecology, Milieu, Administration/management,	Other= teacher victimization Psycho-social climate= teacher morale

[37] When more than one measure of the school climate or outcome variable are included in the study, the largest association is recorded. When different measures of the same construct result in associations with differing signs, this is noted in the "comments" section.
+* = statistically significant effect in positive direction (that is, high value on school culture characteristic is associated with more problem behavior).
+ = statistically non-significant effect in positive direction (that is, high value on school culture characteristic is associated with more problem behavior).
0 = statistically non-significant effect whose direction is unknown.
- = statistically non-significant effect in negative direction (that is, high value on school culture characteristic is associated with less problem behavior).
-* = statistically significant effect in negative direction (that is, high value on school culture characteristic is associated with less problem behavior).
[38] This study reported correlations of hundreds of school characteristics with two different measures of school disorder. Only selected associations are summarized here.

Citation	Indicator of School Culture	Outcome[37]				Control variables	School climate controlled	Comments
		Substance Use	Delinquency	Victimization	Other			
Payne, Gottfredson, & Gottfredson (2003)	Communal school organization		-*	0	-*	Concentrated poverty/African American, residential crowding	Ecology, Milieu,	Other= teacher victimization
	Student bonding		-*	-*	0			
Roski et al. (1997)	School norms	-*				Opportunities for alcohol and drug non-use, community population, community % white, community average family income, community annual average unemployment		Substance use is measured by four different levels of alcohol and marijuana use and only preponderant outcome is coded here School role model= prevalence/perceived non-use of tobacco and drug by peers and adults
	School role models	-*						
Weishew & Peng (1993)	School climate	-	-		-*	Parental involvement, time spent alone, self-perception, achievement, educational expectation, participation, % disadvantaged, urbanicity	Ecology, Milieu, Organizational structure, Administration/management,	Other= misbehavior School climate= composite of teacher-administrator relation, priority student place on learning, teacher morale, teachers' attitudes about students, teacher response to individual needs. "Substance abuse problem" was not entered for predicting "substance use"
	Student perception of school	+	-		-*			
	Student perception of teacher	-	+		+			
	Substance abuse problem	0	+*		+*			
Welsh, Strokes, & Greene (2000)	School stability		-*			Community poverty, community stability, community crime	Ecology	School stability= average student attendance and % student turnover

Table 7
Studies of School Climate and Problem Behavior, 1980-2008: Multi-Level Studies

Citation	# School/ Individuals	Sample Characteristics	Time Point	Measures of Problem Behavior				Measures of School Climate				
				Substance Use	Crime/ Delinquency	Victimization	Other	Ecology	Milieu	Organizational Structure	Administration/ Management	Culture
Birnbaum et al. (2003)	16/ 2941	Convenient sample of middle schools in Minneapolis, Minnesota	2 (6 months)				x		x			
Bisset, Markham, & Aveyard (2007)	166/ 257,801	7th, 9th, 11th graders from 15 west midlands district in UK	1	x								x
Boardman et al. (2008)	84/ 1,198	National Longitudinal Study of Adolescent Health: nationally representative sample of 7th to 12th graders	1	x					x		x	x
Felson et al. (1994)	87/ 2,213	Youth in Transition: Nationally representative sample of high school boys	2 (18 months)		x		x	x	x			x
Gottfredson & DiPietro (2009)	253/ 13,597	National Study of Delinquency Prevention in Schools: Nationally representative sample of secondary schools	1			x		x	x	x	x	x
Henry & Slater (2007)	32/ 4,216	Students in 16 communities across U.S. who participated in prevention trial	1	x				x	x			x
Hoffmann & Dufur (2008)	883/ 11,477 (NELS) 142/ 7,991 (Add Health)	NELS: Nationally representative sample of 10th graders Add Health: nationally representative sample of 9th to 12th graders	1				x	x	x			x
Hoffmann & Ireland (2004)	883/ 12,420	NELS: nationally representative sample of 10th and 12th graders	2 (2 years)		x							x
Johnson & Hoffmann (2000)	1,012/16,454 (8th graders) 1,397/ 13,840 (10th graders)	NELS: nationally representative sample of 8th and 10th graders	2 (2 years)	x				x	x			x
Khoury-Kassabri, Astor, & Benbenishty (2007)	162/ 10400	Nationally (Israel) representative sample of 7th to 11th graders	1		x			x	x			

Citation	# School/ Individuals	Sample Characteristics	Time Point	Measures of Problem Behavior				Measures of School Climate				
				Substance Use	Crime/ Delinquency	Victimization	Other	Ecology	Milieu	Organizational Structure	Administration/ Management	Culture
Khoury-Kassabri, Benbenishty, & Astor (2005)	162/ 10400	Nationally (Israel) representative sample of 7th to 11th graders	1			x		x	x		x	x
Khoury-Kassabri et al. (2004)	162/ 10400	Nationally (Israel) representative sample of 7th to 11th graders	1			x		x	x		x	x
Kumar et al. (2002)	150/16,051 (8th graders) 140/ 13,251 (10th graders) 142/ 8,797 (12th graders)	Monitoring the Future: nationally representative sample of 8th, 10th, and 12th graders	1	x				x	x			x
Kumar, O'Malley, & Johnston (2008)	244/27,462 (8th graders) 211/21,920 (10th graders) 200/21,510 (12th graders)	Monitoring the Future: nationally representative sample of 8th, 10th, and 12th graders	1	x				x	x			
Ma (2002)	148/ 6,883 (6th graders) 92/6,868 (8th graders)	New Brunswick School Climate Study: All 6th and 8th graders in Brunswick, Canada	1			x	x	x	x		x	x
Novak & Clayton (2001)	38/ 25,368	Annual cross-sectional survey of middle and high schools in Kentucky	1	x					x		x	
Payne (2008)	253/13,597	National Study of Delinquency Prevention in Schools: Nationally representative sample of secondary schools	1		x			x	x	x		x
Pokorny, Jason, & Schoeny (2004)	14/5399	Representative sample of 6th to 8th graders in northern and central Illinois	1	x					x			x
Reis, Trockel, & Mulhall (2007)	198/111,662	Statewide middle school students with diverse background in Illinois	1				x				x	x

Citation	# School/ Individuals	Sample Characteristics	Time Point	Measures of Problem Behavior				Measures of School Climate				
				Substance Use	Crime/ Delinquency	Victimization	Other	Ecology	Milieu	Organizational Structure	Administration/ Management	Culture
Stewart (2003)	528/10,578	NELS: nationally representative sample of 10th graders	1				x	x	x			x
Welsh (2000)	11/4,640	Middle schools in Philadelphia	1		x	x	x				x	x
Welsh (2001)	11/4,640	Middle schools in Philadelphia	1		x	x	x				x	x
Welsh (2003)	11/5,203	Middle schools in Philadelphia	1		x		x	x			x	x
Welsh, Greene, & Jenkins (1999)	11/7583	Middle schools in Philadelphia	1				x	x				x
Wilcox & Clayton (2001)	21/6,169	Kentucky Youth Survey: Census based survey of 6 to 12 graders in Kentucky	1		x				x			x

Table 8
Studies of Problem Behavior and School Climate Dimension – Ecology, 1980-2008: Multi-Level studies

Citation	Indicator of school Ecology	Outcome[39]				Control Variables[40]	School Climate Controlled	Comments
		Substance Use	Delinquency	Victimization	Other			
Felson et al. (1994)	School size		-		-	1. approval of aggression, academic values, SES, race, family stability, residential stability 2. urbanicity	Milieu, Culture	Other= violence, less serious delinquency
Gottfredson & DiPietro (2009)	Student enrollment Student/ teacher ratio			-/-* +*/+		1. gender, age, overage for grade, ethnic minority, bonding 2. community disadvantage, urbanicity	Milieu, Organizational Structure, Administration/Management	Outcome= personal/property victimization
Henry & Slater (2007)	Number of students in the grade	-				1. sex, age, race, school attachment	Milieu, Culture	
Hoffmann & Dufur (2008)	School size				-/+	1. family structure, parental attachment/ supervision/ involvement, academic values/ achievement, male, family SES, grade level, race/ ethnicity, family moves, student work hours, peer drop out 2. urbanicity	Milieu, Culture	Other= composite of drug and alcohol use, arrested, fighting, suspension from school, and running away from house Outcome= NELS/Add Health sample

[39] When more than one measure of the school climate or outcome variable are included in the study, the largest association is recorded. When different measures of the same construct result in associations with differing signs, this is noted in the "comments" section.
+* = statistically significant effect in positive direction (that is, high value on school ecology characteristic is associated with more problem behavior).
+ = statistically non-significant effect in positive direction (that is, high value on school ecology characteristic is associated with more problem behavior).
0 = statistically non-significant effect whose direction is unknown.
- = statistically non-significant effect in negative direction (that is, high value on school ecology characteristic is associated with less problem behavior).
-* = statistically significant effect in negative direction (that is, high value on school ecology characteristic is associated with less problem behavior).
[40] 1 = individual-level. 2 = school or community-level.

Citation	Indicator of school Ecology	Outcome[39]				Control Variables[40]	School Climate Controlled	Comments
		Substance Use	Delinquency	Victimization	Other			
Johnson & Hoffmann (2000)	School size	+/+				1. gender, race, college plans, works 10+ hours a week, GPA, self-esteem, school misconduct, positive school attitude, school dropout, negative peer association, two parents, parental support, parents education, family income 2. western region, urban place	Milieu, Culture	Outcome= 8th graders/10th graders
	Students per teacher	-/-						
Khoury-Kassabri, Astor, & Benbenishty (2007)	School size		-			1. gender, grade level, victimization, fear to attend school, perceived safety, teacher support, school policy, student participation	Milieu	
	Class size		-					
Khoury-Kassabri, Benbenishty, & Astor (2005)	School size			-		1. gender 2. % unemployment, % working part time job, % high income, % low income, % low education, % high education, house overcrowding	Milieu, Administration/management, Culture	For both studies, victimization is measured five different types (serious physical, threats, moderate physical, verbal-social, and property damage) and preponderant outcome is coded here
	Class size			+*				
Khoury-Kassabri et al. (2004)	School size			+		1. gender, grade, perceived school climate 2. % unemployment, overall crimes, low income, low education	Milieu, Administration/management, Culture	
	Class size			+*				
Kumar et al. (2002)	School size	-/-/+				1. number of parents, parental education, race, gender, student disapproval of substance use 2. urbanicity	Milieu, Culture	Substance use is measured three different types (cigarette, heavy drinking, marijuana) and preponderant outcome is coded here Outcome= 8th/10th/12th graders

Citation	Indicator of school Ecology	Outcome[39]				Control Variables[40]	School Climate Controlled	Comments
		Substance Use	Delinquency	Victimization	Other			
Kumar, O'Malley, & Johnston (2008)	Attractive physical environment Negative physical environment Number of unobserved areas School size	-/-*/-* 0 0/+*/+* 0				1. gender, race/ethnicity, parental education, number of parents, 2. neighborhood drug and alcohol problem, urbanicity	Milieu	Substance use is measured six different types of cigarette, alcohol, drug use. Only preponderant outcome is coded here Outcome= 8th/10th/12th graders
Ma (2002)	School size			0/-	-*/-	1. gender, SES, # parent, # sibling, academic/ affective/ physical condition 2. parental involvement	Milieu	Other= bullying Outcome= 6th graders/ 8th graders
Payne (2008)	Student enrollment		-			1. gender, age, race 2. urbanicity, poverty and disorganization,	Milieu, Organizational structure	
Stewart (2003)	School size				+*	1. school attachment/ commitment/ belief/ involvement, positive peers, parental school involvement, GPA, family structure, family income, gender, ethnicity 2. urbanicity	Milieu, Culture	Other= misbehavior
Welsh (2003)	School size		+		+	1. age, race, sex, school effort, school reward, positive peer associations, involvement, belief in rules	Administration/management, Culture	Other= misconduct
Welsh, Greene, & Jenkins (1999)	School enrollment				+	1. school effort, school reward, positive peer association, school involvement/ belief, age, race, sex 2. community poverty, community stability	Culture	Other= misconduct

Table 9
Studies of Problem Behavior and School Climate Dimension – Milieu, 1980-2008: Multi-Level studies

Citation	Indicator of School Milieu	Outcome[41]				Control Variables	School Climate Controlled	Comments
		Substance Use	Delinquency	Victimization	Other			
Birnbaum et al. (2003)	School Functioning Index				-*	1. sex, race, family structure, free lunch, past 30 day use of alcohol/marijuana/inhalants, age		Other= violent behavior School Functioning Index= average attendance, student mobility, % staffs less than 3 years, % staffs left midyear, % students passed basic standards reading test, % free lunch, % limited English proficiency
Boardman et al. (2008)	% non-Hispanic and white	-*				1. gender, age, race/ethnicity, friends/parents are smokers, % friends in common, sibling smoking status, genetic similarity, evidence of heritability 2. % college educated mothers	Administration/management, Culture	Substance use is measured by heritability of daily smoking

[41] When more than one measure of the school climate or outcome variable are included in the study, the largest association is recorded. When different measures of the same construct result in associations with differing signs, this is noted in the "comments" section.
+* = statistically significant effect in positive direction (that is, high value on school milieu characteristic is associated with more problem behavior).
+ = statistically non-significant effect in positive direction (that is, high value on school milieu characteristic is associated with more problem behavior).
0 = statistically non-significant effect whose direction is unknown.
- = statistically non-significant effect in negative direction (that is, high value on school milieu characteristic is associated with less problem behavior).
-* = statistically significant effect in negative direction (that is, high value on school milieu characteristic is associated with less problem behavior).

Citation	Indicator of School Milieu	Outcome[41]				Control Variables	School Climate Controlled	Comments
		Substance Use	Delinquency	Victimization	Other			
Felson et al. (1994)	% black		+		+*	1. approval of aggression, academic values, SES, race, family stability, residential stability 2. urbanicity	Ecology, Culture	Other= violence, less serious delinquency
	Family stability		-		-			
	Residential stability		+		+			
	SES		-		-*			
Gottfredson & DiPietro (2009)	% African American			0/0		1. gender, age, overage for grade, ethnic minority, bonding 2. community disadvantage, urbanicity	Ecology, Organizational Structure, Administration/Management	Outcome= personal/property victimization
	% Hispanic			0/+				
	% Asian			0/-*				
	Average age			-/-				
	% male			-/+				
Henry & Slater (2007)	% minority	-				1. sex, age, race, school attachment	Ecology, Culture	
	% free lunch	+						
	Average age	-						
Hoffmann & Dufur (2008)	% free lunch				-/0	1. family structure, parental attachment/ supervision/ involvement, academic values/ achievement, male, family SES, grade level, race/ ethnicity, family moves, student work hours, peer drop out 2. urbanicity	Ecology, Culture	Other= composite of drug and alcohol use, arrested, fighting, suspension from school, running away from house Outcome= NELS/Add Health sample
	% minority				-/+*			
	Private school				+/-			

Citation	Indicator of School Milieu	Outcome[41]				Control Variables	School Climate Controlled	Comments
		Substance Use	Delinquency	Victimization	Other			
Johnson & Hoffmann (2000)	Catholic school	+*/+				1. gender, race, college plans, works 10+ hours a week, GPA, self-esteem, school misconduct, positive school attitude, school dropout, negative peer association, two parents, parental support, parents education, family income 2. western region, urban place	Ecology, Culture	Outcome= 8th graders/10th graders
	% minority	+/+						
Khoury-Kassabri, Astor, & Benbenishty (2007)	Social Deprivation Index		+*			1. gender, grade level, victimization, fear to attend school, perceived safety, teacher support, school policy, student participation	Ecology	
	Arab (vs. Jewish) school		+*					
	High (vs. junior) school		+					
Khoury-Kassabri, Benbenishty, & Astor (2005)	Family poverty			+*		1. gender 2. % unemployment, % working part time job, % high income, % low income, % low education, % high education, house overcrowding	Ecology, Administration/management, Culture	For both studies, victimization is measured five different types (serious physical, threats, moderate physical, verbal-social, and property damage) and preponderant outcome is coded here
	Family low education			+				
	Large families			+*				
	Social Deprivation Index			+*				
	High (vs. junior) school			-*				
Khoury-Kassabri et al. (2004)	Family poverty			+*		1. gender, grade, perceived school climate 2. % unemployment, overall crimes, low income, low education	Ecology, Administration/management, Culture	
	Family low education			+*				
	Large families			+*				
	Social Deprivation Index			+*				
	% male			+*				

Citation	Indicator of School Milieu	Outcome[41]				Control Variables	School Climate Controlled	Comments
		Substance Use	Delinquency	Victimization	Other			
Kumar et al. (2002)	Number of parents	-/-/-				1. number of parents, parental education, race, gender, student disapproval of substance use 2. urbanicity	Ecology, Culture	Substance use is measured three different types (cigarette, heavy drinking, marijuana) and preponderant outcome is coded here Outcome= 8th/10th/12th graders
	Parental education	+/+/+						
	Private (vs. public) school	+*/+*/-						
Kumar, O'Malley, & Johnston (2008)	Number of parents	0				1. gender, race/ethnicity, parental education, number of parents, 2. neighborhood drug and alcohol problem, urbanicity	Ecology	Substance use is measured by six different types of cigarette, alcohol, drug use. Only preponderant outcome is coded here Outcome= 8th/10th/12th graders
	Parental education	0						
	School type (public vs. private)	0						
	% white, %black, %Hispanic	0						
Ma (2002)	School mean SES			-/+	+/+	1. gender, SES, # parent, # sibling, academic/ affective/ physical condition 2. parental involvement	Ecology	Other= bullying Outcome= 6th graders/ 8th graders
Novak & Clayton (2001)	School mean SES	+*				1. self-regulation, gender, age, race, SES	Administration/management	Substance use is measured by four different types of transitions between stages of smoking and only preponderant outcome is coded here
	Racial heterogeneity	-						
	High (vs. middle) school	+*						
Payne (2008)	% black (student)		-*			1. gender, age, race 2. urbanicity, poverty and disorganization,	Ecology, Organizational structure	
	% black (teacher)		0					
	% male		+					
	Grade level		+*					

Citation	Indicator of School Milieu	Outcome[41]				Control Variables	School Climate Controlled	Comments
		Substance Use	Delinquency	Victimization	Other			
Pokorny, Jason, & Schoeny (2004)	Mean age	0				1. grade, race, age, race, sex, parent education, attitude about tobacco possession law, prevalence of adult/peer tobacco users 2. mean attitudes toward tobacco possession law, % adult tobacco users	Culture	
	% white, black, and Latino	0						
	% male	0						
	Parent education	0						
Stewart (2003)	% non-white				+	1. school attachment/ commitment/ belief/ involvement, positive peers, parental school involvement, GPA, family structure, family income, gender, ethnicity 2. urbanicity	Ecology, Culture	Other= misbehavior
	% free lunch				+			
Wilcox & Clayton (2001)	% non-white		-			1. sex, age, race, SES, problem behavior, parental gun ownership/use, peer weapon carrying to school, family dysfunction, school attachment, religious ties, threatened at school, property stolen at school, afraid at school		
	% male		-					
	% free lunch		+					
	Middle(vs. high) school		-					

Table 10
Studies of Problem Behavior and School Climate Dimension – Organizational Structure, 1980-2008: Multi-Level studies

Citation	Indicator of School Organizational Structure	Outcome[42]				Control Variables	School Climate Controlled	Comments
		Substance Use	Delinquency	Victimization	Other			
Payne (2008)	# different student taught		-			1. gender, age, race 2. urbanicity, poverty and disorganization,	Ecology, Milieu	
Gottfredson & DiPietro (2009)	# different student taught			0/+*		1. gender, age, overage for grade, ethnic minority, bonding 2. community disadvantage, urbanicity	Ecology, Milieu, Administration/Management	Outcome= personal/property victimization

[42] When more than one measure of the school climate or outcome variable are included in the study, the largest association is recorded. When different measures of the same construct result in associations with differing signs, this is noted in the "comments" section.
+* = statistically significant effect in positive direction (that is, high value on school organizational structure characteristic is associated with more problem behavior).
+ = statistically non-significant effect in positive direction (that is, high value on school organizational structure characteristic is associated with more problem behavior).
0 = statistically non-significant effect whose direction is unknown.
- = statistically non-significant effect in negative direction (that is, high value on school organizational structure characteristic is associated with less problem behavior).
-* = statistically significant effect in negative direction (that is, high value on school organizational structure characteristic is associated with less problem behavior).

Table 11
Studies of Problem Behavior and School Climate Dimension – Administration/Management, 1980-2008: Multi-Level studies

Citation	Indicator of School Administration/Management	Outcome[43]				Control Variables	School Climate Controlled	Comments
		Substance Use	Delinquency	Victimization	Other			
Boardman et al. (2008)	School smoking policy	-				1. gender, age, race/ethnicity, friends/parents are smokers, % friends in common, sibling smoking status, genetic similarity, evidence of heritability 2. % college educated mothers	Milieu, Culture	School smoking policy= # disciplinary responses per smoking on school grounds Substance use is measured by heritability of daily smoking
Gottfredson & DiPietro (2009)	School discipline practices			-*/-		1. gender, age, overage for grade, ethnic minority, bonding 2. community disadvantage, urbanicity	Ecology, Milieu, Organizational Structure	Outcome= personal/property victimization

[43] When more than one measure of the school climate or outcome variable are included in the study, the largest association is recorded. When different measures of the same construct result in associations with differing signs, this is noted in the "comments" section.
+* = statistically significant effect in positive direction (that is, high value on school administration/management characteristic is associated with more problem behavior).
+ = statistically non-significant effect in positive direction (that is, high value on school administration/management characteristic is associated with more problem behavior).
0 = statistically non-significant effect whose direction is unknown.
- = statistically non-significant effect in negative direction (that is, high value on school administration/management characteristic is associated with less problem behavior).
-* = statistically significant effect in negative direction (that is, high value on school administration/management characteristic is associated with less problem behavior).

Citation	Indicator of School Administration/Management	Outcome[43]				Control Variables	School Climate Controlled	Comments
		Substance Use	Delinquency	Victimization	Other			
Khoury-Kassabri, Benbenishty, & Astor (2005)	School policy			-*		1. gender 2. % unemployment, % working part time job, % high income, % low income, % low education, % high education, house overcrowding	Ecology, Milieu, Culture	School policy= students' judgments concerning school policies or procedures to reduce violence Student participation= students' role in addressing school violence issues For both studies, victimization is measured five different types (serious physical, threats, moderate physical, verbal-social, and property damage) and preponderant outcome is coded here
	Student participation			-*				
Khoury-Kassabri et al. (2004)	School policy			-*		1. gender, grade, perceived school climate 2. % unemployment, overall crimes, low income, low education	Ecology, Milieu, Culture	
	Student participation			-*				
Ma (2002)	Discipline climate			-/-*	-/-*	1. gender, SES, # parent, # sibling, academic/ affective/ physical condition 2. parental involvement	Ecology, Milieu, Culture	Other= bullying Outcome= 6th graders/ 8th graders Discipline climate= the extent to which students internalize the rules, norms, and values of the school, and conforms to them

Citation	Indicator of School Administration/Management	Outcome[43]				Control Variables	School Climate Controlled	Comments
		Substance Use	Delinquency	Victimization	Other			
Novak & Clayton (2001)	Involvement	-*				1. self-regulation, gender, age, race, SES	Milieu	Substance use is measured by four different types of transitions between stages of smoking and only preponderant outcome is coded here Involvement= student involvement in school management Discipline= the degree to which discipline was present in the school
	Discipline	-*						
Reis, Trockel, & Mulhall (2007)	Clear and consistent discipline				0	1. teacher support, problem solving skills, problem coping strategy, friend support, family support, quality of school life, hassle at school, rejection from peers hassles, race, ethnicity, free lunch, male, grade, # parent, parent education, religious participation	Culture	Other= aggression
	Student inclusion in policy/rule process				-*			

Citation	Indicator of School Administration/Management	Outcome[43]				Control Variables	School Climate Controlled	Comments
		Substance Use	Delinquency	Victimization	Other			
Welsh (2000)	Planning and action		+	-*	-	1. age, race, sex, school involvement, positive peer association, belief in school rules, school effort, school rewards	Culture	Other= misconduct
	Fairness of rules		-*	-*	-*			Planning and action= the degree to which the school undertakes efforts to plan and implement school improvement
	Clarity of rules		-*	-*	+			
	Student influence		-*	+	+			Student influence= the degree to which students can influence sqchool practices
Welsh (2001)	Planning and action		+	-*	-	1. age, race, sex, school involvement, positive peer association, belief in school rules, school effort, school rewards 2. poverty rate	Culture	
	Fairness of rules		-*	-*	-*			
	Clarity of rules		-*	-*	+			
	Student influence		-*	+	+			
Welsh (2003)	Planning and action		+		+	1. age, race, sex, school effort, school reward, positive peer associations, involvement, belief in rules	Ecology, Culture	Other= misconduct
	Fairness of rules		-		-			
	Clarity of rules		+		-			
	Student influence		-		-			

Table 12
Studies of Problem Behavior and School Climate Dimension – Culture, 1980-2008: Multi-Level studies

Citation	Indicator of School Culture	Outcome[44]				Control Variables	School Climate Controlled	Comments
		Substance Use	Delinquency	Victimization	Other			
Bisset, Markham, & Aveyard (2007)	Value-added education	-*				1. gender, grade, ethnicity, housing tenure, free lunch, drinking with parents 2. neighborhood deprivation		Value-added education= school support/ control
Boardman et al. (2008)	Smoking norms Smoking prevalence	+* -				1. gender, age, race/ethnicity, friends/parents are smokers, % friends in common, sibling smoking status, genetic similarity, evidence of heritability 2. % college educated mothers	Milieu, Administration/management	Smoking norms= popular students are also smokers Substance use is measured by heritability of daily smoking
Felson et al. (1994)	Subculture of violence Academic values		+* +*		+* +*	1. approval of aggression, academic values, SES, race, family stability, residential stability 2. urbanicity	Ecology, Milieu	Other= violence, less serious delinquency
Gottfredson & DiPietro (2009)	Bonding			-*/+		1. gender, age, overage for grade, ethnic minority, bonding 2. community disadvantage, urbanicity	Ecology, Milieu, Organizational Structure, Administration/Management	Outcome= personal/property victimization

[44] When more than one measure of the school climate or outcome variable are included in the study, the largest association is recorded. When different measures of the same construct result in associations with differing signs, this is noted in the "comments" section.
+* = statistically significant effect in positive direction (that is, high value on school culture characteristic is associated with more problem behavior).
+ = statistically non-significant effect in positive direction (that is, high value on school culture characteristic is associated with more problem behavior).
0 = statistically non-significant effect whose direction is unknown.
- = statistically non-significant effect in negative direction (that is, high value on school culture characteristic is associated with less problem behavior).
-* = statistically significant effect in negative direction (that is, high value on school culture characteristic is associated with less problem behavior).

Citation	Indicator of School Culture	Outcome[44]				Control Variables	School Climate Controlled	Comments
		Substance Use	Delinquency	Victimization	Other			
Henry & Slater (2007)	School attachment	-*				1. sex, age, race, school attachment	Ecology, Milieu	
Hoffmann & Dufur (2008)	School quality Academic emphasis School safety				-*/-* +*/+ -/-*	1. family structure, parental attachment/ supervision/ involvement, academic values/ achievement, male, family SES, grade level, race/ ethnicity, family moves, student work hours, peer drop out 2. urbanicity	Ecology, Milieu	Other= composite of drug and alcohol use, arrested, fighting, suspension from school, running away from house Outcome= NELS/Add Health sample School quality= support from school administrators and faculty
Hoffmann & Ireland (2004)	School quality Aggregate delinquency School problem Delinquent values		-* + + +*			1. self-concept, stressful life events change score, strain, two bio-parents, race/ethnicity 2. rural/ suburban/ urban school		School quality= support from school administrators and faculty School problem= the extent to which school has problems with crime, violence, etc.
Johnson & Hoffmann (2000)	Competitive climate	+*/+*				1. gender, race, college plans, works 10+ hours a week, GPA, self-esteem, school misconduct, positive school attitude, school dropout, negative peer association, two parents, parental support, parents education, family income 2. western region, urban place	Ecology, Milieu	Outcome= 8th graders/10th graders

Citation	Indicator of School Culture	Outcome[44]				Control Variables	School Climate Controlled	Comments
		Substance Use	Delinquency	Victimization	Other			
Khoury-Kassabri, Benbenishty, & Astor (2005)	Teachers' support			-*		1. gender 2. % unemployment, % working part time job, % high income, % low income, % low education, % high education, house overcrowding	Ecology, Milieu, Administration/management	For both studies, victimization is measured five different types (serious physical, threats, moderate physical, verbal-social, and property damage) and preponderant outcome is coded here
Khoury-Kassabri et al. (2004)	Teachers' support			-*		1. gender, grade, perceived school climate 2. % unemployment, overall crimes, low income, low education	Ecology, Milieu, Administration/management	
Kumar et al. (2002)	Disapproval of substance use	-*/-*/-*				1. number of parents, parental education, race, gender, student disapproval of substance use 2. urbanicity	Ecology, Milieu	Substance use is measured three different types (cigarette, heavy drinking, marijuana) and preponderant outcome is coded here Outcome= 8th/10th/12th graders
Ma (2002)	Academic press			+/+	-/-*	1. gender, SES, # parent, # sibling, academic/ affective/ physical condition 2. parental involvement	Ecology, Milieu, Administration/management	Other= bullying Outcome= 6th grader/ 8th grader
Payne (2008)	Supportive/collaborative relation Common norms and goals		-* -*			1. gender, age, race 2. urbanicity, poverty and disorganization,	Ecology, Milieu, Organizational structure	

Citation	Indicator of School Culture	Outcome[44]				Control Variables	School Climate Controlled	Comments
		Substance Use	Delinquency	Victimization	Other			
Pokorny, Jason, & Schoeny (2004)	Perceived peer tobacco use	+				1. grade, race, age, race, sex, parent education, attitude about tobacco possession law, prevalence of adult/peer tobacco users 2. mean attitudes toward tobacco possession law, % adult tobacco users	Milieu	
Reis, Trockel, & Mulhall (2007)	Teacher support				0	1. teacher support, problem solving skills, problem coping strategy, friend support, family support, quality of school life, hassle at school, rejection from peers hassles, race, ethnicity, free lunch, male, grade, # parent, parent education, religious participation	Administration/management	Other= aggression
	Teacher recognition				0			
	Emphasis on understanding over memorization				-*			
Stewart (2003)	School social problem				+	1. school attachment/ commitment/ belief/ involvement, positive peers, parental school involvement, GPA, family structure, family income, gender, ethnicity 2. urbanicity	Ecology, Milieu	Other= misbehavior School social problem= the extent to which school is experiencing a range of behavioral problems among students
	School cohesion				-			
Welsh (2000)	Respect for students		-*	-*	-*	1. age, race, sex, school involvement, positive peer association, belief in school rules, school effort, school rewards	Administration/management	Other= misconduct
Welsh (2001)	Respect for students		-*	-*	-*	1. age, race, sex, school involvement, positive peer association, belief in school rules, school effort, school rewards 2. poverty rate	Administration/management	Other= misconduct

Citation	Indicator of School Culture	Outcome[44]				Control Variables	School Climate Controlled	Comments
		Substance Use	Delinquency	Victimization	Other			
Welsh (2003)	Respect for students		+		0	1. age, race, sex, school effort, school reward, positive peer associations, involvement, belief in rules	Ecology, Administration/management	Other= misconduct
Welsh, Greene, & Jenkins (1999)	School attachment				+	1. school effort, school reward, positive peer association, school involvement/ belief, age, race, sex 2. community poverty, community stability	Ecology	Other= misconduct
Wilcox & Clayton (2001)	School deficit School capital		- -			1. sex, age, race, SES, problem behavior, parental gun ownership/use, peer weapon carrying to school, family dysfunction, school attachment, religious ties, threatened at school, property stolen at school, afraid at school	Milieu	School deficit= % afraid at school, %property victims, % threatened, problem behavior, family disruption, gun ownership, parental gun ownership, peers carrying weapon School capital= school attachment, church attendance, religious commitment

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