Weapon Carrying in Israeli Schools: The Contribution of Individual and School Factors

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The present study employed an ecological perspective to examine the relative predictive power of individual and school contextual factors on weapon carrying at school. The study is based on a nationally representative sample of 10,400 students in Grades 7 through 11 in 162 schools across Israel. Hierarchical logistic modeling examined the relationships between students and school-level variables and carrying weapons to school (guns, knives, and other weapons). The authors found that school context is associated with weapon carrying and increases the likelihood of having students with weapons in the school. For instance, schools with a large proportion of students from low–socioeconomic status (SES) families showed higher levels of weapon carrying. Furthermore, individual factors, such as victimization and fear, are positively associated with weapon carrying in school. The discussion highlights the importance of improving school climate to deal more effectively with weapon carrying to school.

Keywords: *weapon carrying; victimization; school climate; community; culture*

The presence of weapons in school is considered one of the most dangerous aspects of school violence (Mercy & Rosenberg, 1998). Carrying weapons to school might cause death and physical injuries of students and school staff. In addition, victims and witnesses of weapon use in schools suffer psychological trauma, fear, and a strong sense of feeling unsafe in school. Carrying weapons on school grounds disrupts the learning environment because students cannot learn and teachers' ability to teach is jeopardized (Kingery, Coggeshall, & Alford, 1999; Mercy & Rosenberg, 1998). The prevalence of weapons in schools is not negligible. For example, according to the Youth Risk Behavior Surveillance (YRBS), 6.1% of U.S. high school students reported carrying weapons to school (Centers for Disease Control and Prevention [CDC], 2004). Furthermore, knowledge of weapons on school grounds affects a sizable number of students. A rumor about one handgun on school grounds can scare the entire student population on a campus.

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Given the serious consequences of having weapons on school grounds, it is surprising that the literature on weapons in schools is relatively small and theoretically undeveloped. More research and theory development could help deal with this frightening problem. One major area needing further development pertains to the factors that contribute to students' motivations or reasons for carrying weapons on school grounds. In this article, we examined what student and school characteristics are associated with reports on carrying different types of weapons to school.

Prior research has identified several factors contributing to reports on carrying weapons to school. These range from neighborhood and community factors, such as crime and poverty in the school's neighborhood or a transient nature of the community, to various characteristics of the students' families and aspects of the school's organization and climate. In addition, considerable efforts have been made to identify the relationships between carrying weapons to school and student attributes such as gender, age, and psychological characteristics (Benbenishty & Astor, 2005; Wilcox & Clayton, 2001).

However, all too often the studies that examined the issue of school violence have been piecemeal (Welsh, Greene, & Jenkins, 1999), examining only a limited number of variables in isolation from one another. Wilcox and Clayton (2001) further argued that previous studies focused on only one level of analysis. Thus, some studies explored which students carry more weapons to school, whereas other studies just focused on specific school characteristics that contribute to carrying weapons to schools. The current study aimed to examine simultaneously a wide range of factors associated with weapon carrying. We examined factors that are at the individual and the school level. This examination will help identify both students and schools that are at risk for weapon-associated victimization and suggest venues for assessment, policy making, and intervention development.

Wilcox and Clayton (2001) conducted one of the few studies that examined the relative influences of both individual and school factors on students' reports of carrying weapons to school. Based on a sample of more than 6,000 students from 21 schools in Louisville, Kentucky, they examined weapon carrying in general without distinguishing between different types of weapons. The results indicated that schools vary significantly in students' reports of weapon carrying, emphasizing that weapon carrying is not only an individual phenomenon but also that the school characteristics have a unique effect on it.

In this study, we expand the work of Wilcox and Clayton (2001) by

a. Addressing separately several types of weapons (e.g., gun, knife, and other weapon) to determine whether each type of weapon can be explained by a unique configuration of variables in the school's ecology. Most research in this area has not distinguished between different kinds of weapons (Astor, Benbenishty, Meyer, & Rosemond, 2004; Kingery, Pruitt, & Heuberger, 1996). For instance, the YRBS included only one item that asked, "During the past 30 days, on how many days did you carry weapons such as a gun, knife, or club on school property?" Although guns are highly lethal weapons, students are victimized by a number of other potentially lethal weapons such as bats/clubs, knives, rocks, box-cutters, and so forth (Corvo & Williams, 2000; Simon, Crosby, & Dahlberg, 1999; Stolzenberg & D'Alessio, 2002).
b. Using a large and nationally representative sample of schools and students. In the current study, we used a nationally representative sample of schools and students in Israel (162 schools and almost 10,400 students) to examine the relationships of students' self-reports on carrying weapons to school with student characteristics (i.e., gender, age, and victimization in school) and school-level attributes (i.e., sociodemographic characteristics of

students' families). Using a nationally representative sample is important because there is an extensive variation among schools within the same countries. In Israel, Benbenishty and Astor (2005) found that Arab students report more than Jewish students that they were involved with guns and knives. In the United States, reports on weapon carrying among non-Whites were almost 50% greater than among White students (Wilcox & Clayton, 2001).Therefore, the various groups within society and the variations among schools should be adequately represented.

Variables Associated With Weapons on School Ground

The review by Astor and his associates (2004) revealed that gun carrying to school has been associated with a wide range of factors that belong to several dimensions. Empirical evidence associates youth weapon carrying with delinquent behaviors, adverse impact of violent and poor communities, negative influences of families, and, more specifically, victimization and fear in school leading to possessing weapons for self-protection. In the following sections, we will focus our review on the variables included in our study that are associated with carrying weapons to school both at the individual and the school level.

Individual Factors

Gender. Male students more than female ones report carrying weapons to school. For instance, in a study conducted by DuRant, Krowchuk, Kreiter, Sinal, and Woods (1999), a higher percentage of adolescent boys (20.2%) reported having carried a knife or club to school than adolescent girls (7.7%; see also Kingery et al., 1999; Malecki & Demaray, 2003).

Age. There are inconsistent findings regarding age differences in students' reports of carrying weapons to school. Malecki and Demaray (2003) reported that older adolescents are more likely than early adolescents to carry weapons. In their study, they found that sixth-graders were less likely than seventh- and eighth-graders to carry weapons. In U.S. schools, the prevalence of having carried a weapon in the past month was higher among 11th-grade students as compared to 9th- and 10th-grade students (CDC, 2004). In contrast, DuRant et al. (1999) found no significant relationships between school grade level and carrying a gun to school. Therefore, in the current study, we explored the relationships between student's age (measured by grade level) and school level (junior high vs. high school) and student reports of carrying weapons to school.

Victimization, Fear of Violence, and Feeling Safe at School. Many studies found an association between students' reports of being bullied or victimized at school and carrying weapons (Kingery et al., 1999; Nasel, Overpeck, Haynie, Ruan, & Scheidt, 2003; Simon et al., 1999). Similarly, Paetsch and Bertrand (1999) reported that in their sample of Canadian youth, students who self-reported weapon possession were more likely to report higher levels of victimization, both at school and while not at school. Thus, of the students who reported having weapons at school, 49.0% reported a moderate to high level of victimization at school, 22.1% reported a low level, and only 15.7% reported no victimization at all. The levels of victimization among the students who did not report involvement with weapons were much lower (14.4%).

Benbenishty and Astor (2005; see also Astor, Benbenishty, Zeira, & Vinokur, 2002) suggested that even students who have not been personally victimized may feel that the school is unsafe and may fear to attend school because they observe violent behaviors carried out by other students. Such fear may also be associated with bringing weapons to school. A study by May (1999) assessed the impact of fear of crime and victimization on gun possession on school campuses. He found that there is a significant association between adolescents' fear of criminal victimization and their gun possession in school, even after controlling for other explanations. In addition, students who carried weapons to school perceived their neighborhoods to be more dangerous and had increased fear of criminal victimization.

Similarly, carrying weapons to school is correlated with students' reports of missing school because of fear. Simon and colleagues (1999) showed that among students who missed school because of fear, the probability of bringing weapons to school was 6 times higher than among those who did not report missing school because of fear. Interestingly, Wilcox and Clayton (2001) reported that despite strong relationships between weapon carrying on school grounds and previous victimization, little evidence was found for the predictive power of school-associated fear.

In the current study, we examined the relationships between each of these variables—personal victimization, missing school because of fear of violence and feeling safe at school, and students' reports on carrying weapons to school.

Student's Perception of School Climate. Many researchers emphasized the importance of developing a positive school climate to reduce school violence (e.g., Colven, Tobin, Beard, Hagan, & Sprague, 1998; Dwyer, Osher, & Hoffman, 2000; Fraser, 1996; Stephens, 1994). The present study focused on the student's subjective perception of three aspects of school climate: school policy against violence, teacher support of students, and student participation in decision making. Khoury-Kassabri, Benbenishty, Zeira, and Astor (2004) found that students have reported lower levels of victimization when they perceive that the school policy includes clear, consistent, and fair rules and that there are positive student-teacher relationships and high student participation in decision making.

Another aspect of school climate was studied by Malecki and Demaray (2003), who examined the relationship between carrying weapons and student perception of social support among 461 students from urban Illinois middle schools. They found that students who carry weapons to school perceived that they have lower levels of social support than students who did not carry weapons to school (see also Marsh & Cornell, 2001; McNeely, Nonnemaker, & Blum, 2002; Powell, 1997). Moreover, increasing students' sense of connectedness to school decreases risk behavior among students (McNeely et al., 2002). Based on this literature, we expected that students who perceive a positive school climate will report less carrying of weapons to school.

Context Factors

Ethnic/Cultural Context. Public schools in Israel are organized by the ethnic-cultural affiliation of the student's family, either Jewish or Arab, with Arab students almost never attending Jewish schools and vice versa. This ethnic affiliation shows relevance to issues of school violence. The Israeli National Study of School Violence (Benbenishty, Zeira, & Astor, 2000) revealed considerable differences in victimization

between Arab and Jewish students in several areas. For instance, although 6.0% of junior high students in Jewish schools reported that they did not attend school at least once in the past month because of fear of school violence, the rate among students in Arab schools was as high as 21.5%.

It should be noted that, in Israel, ethnic-cultural affiliation is highly associated with socioeconomic status (SES); every socioeconomic indicator shows that, as a group, the Arab population in Israel is more disadvantaged than the Jewish population (e.g., Hareven, 1998; Kop, 1999). This difference in the ethnic, cultural, and economic contexts of Arab and Jewish schools may impact carrying weapons to school (cf. Soriano, Soriano, & Jimenez, 1994). In the present study, we included both ethnic affiliation and socioeconomic indicators of the school neighborhood so that we could isolate the role of each of these factors.

Family Socioeconomic Status (*SES)*. There is evidence that the SES of students and their families predicts weapon carrying to school. For instance, in a study conducted by McNabb, Farley, Powell, Rolka, and Horan (1996), they found a relationship between carrying weapons to school and unemployment of a student's parent. Also, Kingery et al. (1999) indicated that one of the risk factors for carrying a weapon to school is not having disposable income. Furthermore, some studies have found that parental education was negatively correlated with school weapon carrying (Simon et al., 1999). In the current study, we examined the relationship between the SES of students' families and reports on carrying weapon to school.

School Context—School Size and Class Size. Several studies have examined the association between school size and class size and students' reports of school violence. The results were inconsistent. For instance, Hellman and Beaton (1986) reported that a high child-to-teacher ratio makes it practically impossible for teachers to monitor their students' behavior effectively, so discipline problems and crime increase. Khoury-Kassabri and her associates (2004) found that although class size was related positively to students' reports of victimization, there was no significant relationship between school size and victimization (see also Welsh et al., 1999). However, studies have not yet explored the contribution of school and class size to weapons in school. In the present study, we explored whether school and class sizes are associated with carrying weapons to school.

In summary, the aim of this study was to examine what factors are associated with bringing different types of weapons to school. The study uses a nationally representative sample of students and schools in Israel to examine individual characteristics and contextual variables that can explain why students bring various types of weapons to school.

METHOD

The data presented in this article were collected as part of a nationally representative school violence study carried out across Israel during the spring of 1999 (Benbenishty et al., 2000).[1] The study was supported by the Israeli Ministry of Education, carried out according to their ethical guidelines, and reviewed and supervised by a steering committee consisting of academicians, educators, and school psychologists and counselors. Students in Grades 4 through 11 filled out a structured questionnaire in their classrooms.

The questionnaire asked students about several types of peer victimization, sexual harassment, weapon carrying, and victimization by school staff (emotional, physical, and sexual). The current study focused on weapon carrying by students in junior high and high schools.

Sample

The overall sample was designed to represent all students in Grades 4 through 11 in the official public school system supervised by the Israeli Ministry of Education. Approximately 91% of the schools agreed to participate, and the response rate among the students approached 95%. The probability sampling method was a two-stage, nonproportional stratified cluster sample. The strata were Jewish/Arab, and primary/junior high/high school.

In the first stage, schools were selected randomly from the sampling frame according to their appropriate strata. In the second stage, one class within each of the chosen schools was selected randomly from each of the grade levels. Overall, the sampling procedure yielded responses from 15,916 students from 239 schools. Because the questionnaire to the elementary school students did not include questions on weapon carrying, this study focused on 10,444 students in Grades 7 through 11 attending 100 junior high and 62 high schools. The grade-level distribution was 22.3% of students in 7th grade, 22.9% in 8th grade, 21.5% in 9th grade, 17.4% in 10th grade, and 15.9% in 11th grade. The sample consisted of 110 Jewish schools and 52 Arab schools. The sample was weighted to represent the Israeli student body, with weights normalized so that significance tests could be used. All analyses were conducted with normalized weighted data.

Measures

Student reporting of carrying weapons to school was the dependent variable in this study. Students were asked to indicate whether they brought weapons to school during the previous month. If their answer was yes, they were asked to indicate whether it was a gun, a knife, or other weapon (club, rock, etc.). The scale was dichotomous: 1 = yes, 0 = no. Table 1 presents the descriptive statistics for all variables used in the current study.

The current study included two groups of independent variables: student characteristics (student-level variables) and contextual characteristics (school-level variables).

Student-Level Characteristics. Student-level characteristics used in the current study included gender, grade level, school climate, student victimization, fear of attending school because of violence, and safety. Gender was measured by a dichotomous variable (male = 1, female = 0). Grade level ranged from the 7th to 11th grades.

Climate. Information on student perception of school climate was obtained through the students' responses in the self-report questionnaire. Students were asked to rate their level of agreement with a series of statements describing school climate on a scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). Statements belonged to the following three dimensions: *school policy* (alpha = .85), which included 10 questions about students' opinions of school policies or procedures aimed at reducing violence (e.g., "When students break the rules with regard to violence, teachers and the principal handle it decisively but in a fair manner"); *teacher support* (alpha = .86), which

Table 1: Descriptive Statistics of the Dependent Variables and Student- and School-Level Characteristics

Variables	*M*	*SD*	Min.	Max.
Dependent variables				
Gun	0.04	0.19	0.00	1.00
Knife	0.07	0.25	0.00	1.00
Other weapons	0.05	0.22	0.00	1.00
Independent variables				
Individual-level characteristics				
Gender	0.50	0.50	0.00	1.00
Grade level	8.82	1.38	7.00	11.00
Teacher support	2.72	0.71	1.00	4.00
School policy	2.79	0.66	1.00	4.00
Student participation	2.63	0.67	1.00	4.00
Perceived safety	2.88	0.92	1.00	4.00
Fear to attend school	0.12	0.51	0.00	3.00
Victimization	0.41	0.39	0.00	2.00
School-level characteristics				
Ethnic/cultural affiliation	0.32	0.47	0.00	1.00
Social Deprivation Index	5.75	2.85	1.00	10.00
School level	0.38	0.49	0.00	1.00
School size	505.33	297.54	41.00	1638.00
Class size	28.23	6.21	9.29	39.70

NOTE: Gender takes values of 0 for females and 1 for males; ethnic affiliation takes values of 0 for Jewish and 1 for Arab; school level takes values of 0 for junior high and 1 for high schools.

included 6 questions about instructors' supportive relationships with students (e.g., "I have close and good relationships with my teachers"); and *students' participation* (alpha = .53), which included 4 questions on the respondent's feeling of whether students play an important and active role in addressing issues of school violence (e.g., "Students play an important role in dealing with school violence"). In this study, we used indices for each of the dimensions (computed as the mean of all items on the relevant dimension).

Victimization. Student reports of victimization were obtained from a self-report questionnaire adapted from the California School Climate Survey (Furlong et al., 2005; Rosenblatt & Furlong, 1997). It included 24 items on victimization by several types of violent acts (i.e., moderate and serious physical violence, verbal-social violence, threats, property damage, and overall victimization). Students could check off one of three categories to describe how many times they were victimized in the past month (*never*, *once or twice*, and *three or more times*). Based on a series of factor analysis presented elsewhere (Benbenishty & Astor, 2005), we created an overall index of victimization that was the mean of 12 victimization items representing moderate, severe, and social-verbal victimization.

Fear. Students were asked, "During the last four weeks, how many times did you not come to school because you were afraid that somebody will hurt you in school or on your way to school?" and the response scale ranged from 0 (*never*) to 3 (*more than twice*).

Safety. Students were asked to rate their level of agreement with the statement "I feel safe and protected in my school" on a scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*).

School climate characteristics and safety were reverse-recoded to make the reference group the one with the least amount of risk.

School-Level Variables

School level variables included students' families' SES and ethnic affiliation, school type, school size, and class size. Ethnic affiliation and school type were measured by a dichotomous variables (Arab = 1, Jewish = 0; junior high = 0, high = 1).

The school database in the Ministry of Education contained information on the families of all students in each school. To assess the SES of the students' families, this information was aggregated at the school level. This protected the privacy of the individual students. The initial set of family characteristics included the following four variables: low income, low education, large families, and Social Deprivation Index (for details, see Khoury-Kassabri et al., 2004). Factor analysis results indicated that they are heavily loaded on one factor. Therefore, in the current study, we used the Social Deprivation Index, which is a summary index computed by the Ministry of Education based mainly on students' families' income, education, and family size. It is presented as a percentile in the distribution of all schools in Israel. It should be noted that our measure of SES describes the level of deprivation (i.e., high figures mean low levels of SES). The same database was used to obtain school size and class size information. School size was measured as the number of students attending the school, and class size was computed as the number of students attending the school divided by the number of classes at the school.

Data Analysis

Each of the three types of weapons (gun, knife, and other weapon) was analyzed separately as a dichotomous variable—whether the student reported bringing this weapon to school in the past month. The main analytical tool was hierarchical logistic modeling, which provides a technique to analyze the unique effect of different analytic levels (e.g., individual and group level among nested data; Bryk & Raudenbush, 2002) using a binary outcome. In this study, students were nested within schools: A level-1 model represented the relationships between the student-level characteristics and the dependent variables, and the level-2 model captured the influence of school-level variables.

In our analyses, we first entered to the hierarchical logistic modeling equation student-level characteristics in a sequential manner. Our second step was to examine the contribution of school-level variables after controlling for student-level characteristics. Thus, although keeping student-level variables in the hierarchical logistic modeling equation, we added school-level factors to the equation in a sequential manner, following a hierarchy from the most general context in which schools are embedded (SES of students' families) to the context within the school (mean class size).

Except for gender and grade level, all independent variables were standardized to a mean of 0 and standard deviation of 1. Given the many tests we conducted and the relatively large sample, we were concerned with high levels of Type I errors and therefore used a conservative significance level of $p < .01$.

Table 2: Weapon-Related Behavior by Gender, Ethnic Group, and School Level (%)

		Ethnic Group				School Level			
		Jewish		Arab		Junior High		High School	
	Total	Male	Female	Male	Female	Male	Female	Male	Female
Gun	2.7	3.4	1.1	6.9	2.3	4.2	1.3	3.8	1.3
Knife	5.7	7.1	2.1	16.3	3.1	8.5	2.4	9.4	2.3
Other weapons	4.0	5.1	1.0	11.2	3.8	7.0	1.7	5.1	1.5

RESULTS

We first studied the frequency of reporting on bringing weapons to school. Table 2 shows that Israeli students reported bringing knives much more often than guns and other weapons. About 2.7% of students reported carrying a gun to school in the past month, 5.7% said they carried a knife, and 4.0% mentioned carrying other weapons to school. Male students reported 3 to 4 times more frequently on carrying weapons than did females in each of the groups examined. The largest differences existed between Arab males and females in their report on carrying knives to school (16.3% vs. 3.1%) and between Jewish males and females in their reports on carrying other weapons (5.1% vs. 1.0%). Arab males had the highest reports of carrying weapons to school. For instance, 16.3% of Arab males reported carrying knives to school compared with 7.1% of Jewish males. Finally, there were almost no differences between junior high and high school students in their reports on carrying weapons to school, taking into account gender differences.

In this study, we wanted to examine school-context variables that may be associated with weapon carrying. This question assumes a variance among schools that needs to be explained. A preliminary question then is whether weapon-related behaviors vary across schools. To address this question, we used a fully unconditional, two-level HLM. This analysis revealed that weapon carrying varies across schools—the variance component of level-2 units (schools) was significant. Variance components (Uoj) were as follows: gun carrying 0.79 (chi-square = 596.92, $p < .001$); knives 0.69 (chi-square = 684.86, $p < .001$), and other weapons 0.69 (chi-square = 697.58, $p < .001$).

Hence, variation in weapon carrying is a result of individual characteristics of the students as well as contextual variables of the schools.[2] We first examined what student-level characteristics were associated with weapon carrying.

Student-Level Factors

The results in Table 3 reveal that almost all student characteristics examined in this study were correlated with students' reports of carrying weapons to school.

Gender. Boys were more likely to carry weapons to school than girls. The odds of carrying a gun to school among boys were more than 3 times higher than for girls (3.17, $p < .001$), and the odds for carrying a knife were more than 4 times higher (4.56, $p < .001$).

Age. Table 3 shows that carrying a gun and a knife to school was not associated with age. However, the probability that a student would carry other weapons to school decreased with age.

Table 3: The Relationships Between Student Characteristics and Weapon Carrying

	Gun		Knife		Other Weapons	
Gender	OR	CI	OR	CI	OR	CI
Gender	3.17**	3.68-2.74	4.56**	5.30-1.16	3.81**	4.32-1.14
Grade level	1.48	1.92-1.74	1.01	2.61-1.06	0.84**	1.06-0.89
Victimization	3.35**	3.69-1.10	3.25**	3.49-1.07	3.05**	3.29-1.08
Fear to attend school	1.77**	1.84-1.04	1.56**	1.60-1.03	1.57**	1.63-1.04
Perceived safety	1.89**	2.04-1.08	1.73**	1.83-1.05	1.52**	1.59-1.05
Teacher support	1.27	1.42-1.16	1.22	1.34-1.13	1.24	1.36-1.14
School policy	1.45**	1.63-1.12	1.40**	1.54-1.10	1.41**	1.56-1.10
Student participation	1.07	1.89-1.20	1.21	1.32 -1.14	1.14	1.32-1.26

NOTE: Gender takes values of 0 for females and 1 for males. Few of the odds ratios (OR) fall in the confidence interval (CI) and are still reported as not significant because in the current study, we used a conservative significance level of $p < .01$.
*$p < .01$. **$p < .001$.

Victimization. Students who were victimized in school reported bringing weapons to school more than others did. As shown in Table 3, with each increment increase in students' reporting of victimization, the odds of carrying a gun to school increased 3.35 times ($p < .001$) and the odds of carrying a knife 3.25 times ($p < .001$).

Fear and Safety. Students who feel unsafe in their school reported more on carrying weapons to school (odds of 1.89, $p < .001$). Conversely, fear of attending school because of violence correlated positively with students' reports on bringing weapons to school. The largest effect of fear was on carrying a gun to school, with an odds ratio of 1.77 ($p < .001$).

School Climate. Students with a negative perception of their school policy were more likely to carry weapons to school, with odds ratios of 1.45 for a gun, 1.40 for a knife, and 1.41 for other weapons ($p < .001$). There were no significant relationships between teachers' support and student participation and students' reports on carrying weapons to school.

Interactions Between Gender and Other Student-Level Characteristics. We examined the interaction between gender and each of the student-level variables. The results showed that there were almost no significant interactions. The only significant interactions were between gender and fear with regard to carrying knives and other weapons to school. The findings indicated that the effects of avoiding school because of fear were much stronger for males than they were for females.

School-Level Characteristics

In our analysis of school-level effects, we examined the relationships between carrying weapons to school and school-level characteristics (level-2 variables). These level-2 variables were standardized to a mean of 0 and standard deviation of 1. Table 4 presents the results of these analyses separately for each weapon type.

Table 4: The Relationships Between School Characteristics and Weapon Carrying

	Gun		Knife		Other Weapons	
Fixed Effects	OR	CI	OR	CI	OR	CI
Family characteristics						
Social Deprivation Index	1.40**	1.54-1.28	1.34**	1.45-1.24	1.39**	1.50-1.28
Ethnic/cultural affiliation	2.61**	3.17-2.15	2.50**	2.94-2.13	3.29**	3.87-2.80
School organizational characteristics						
School level	1.12	1.39-0.90	1.38	1.65-1.16	1.21	1.56-0.94
School size	0.81	0.90-0.73	0.94	1.03-0.87	0.98	1.08-0.89
Class size	0.90	1.01-0.81	0.85	0.92-0.78	0.86	0.95-0.77
Random Effects	Variance Component	Chi-Square	Variance Component	Chi-Square	Variance Component	Chi-Square
Mean weapon carrying (Uoj)						
Social Deprivation Index	0.56	249.38**	0.40	179.69**	0.53	344.79**
Ethnic/cultural affiliation	0.43	190.05**	0.31	132.13	0.26	200.97**

NOTE: OR = odds ratio; CI = confidence interval. Predictors are centered around the grand mean. Ethnic affiliation takes values of 0 for Jewish and 1 for Arab; school level takes values of 0 for junior high and 1 for high schools.
*$p < .01$. **$p < .001$.

SES of Students' Families. We found significant positive relationships between the SES of students' families and reports on carrying weapons to school. Odds ratio for carrying a gun to school was 1.40, carrying knives 1.45, and carrying other weapons 1.39 (all ps $< .001$). Note that our measure of SES describes the level of deprivation (i.e., high figures mean low levels of SES). Thus, these results mean that the lower the SES of students' families, the more likely it is that they report carrying a weapon to school.

Jewish Versus Arab Schools. Table 4 shows that students in Arab schools reported carrying weapons to school more than those in Jewish schools. They reported more than twice as often of carrying gun (odds of 2.61, $p < .001$) and knives (2.50, $p < .001$) and more than 3 times as often of carrying other weapons to school (3.29, $p < .001$).

School Organizational Characteristics. Table 4 shows that there were no significant relationships between school organizational characteristics (school level, school size, and class size) and reports of carrying weapons to school.

Explained Variance Between Schools

We examined the contribution of the SES of students' families and ethnic affiliation to explain differences between schools in students' reports of carrying weapons to school. As shown in Table 4, the variance component decreased[3] after adding the SES of students' families by 29.46% in reports on gun currying, 40.09% for knives, and 23.22% for other weapons in comparison with the variance in the null model, as reported earlier. The unique contribution of ethnic affiliation to the explained variance

between schools after controlling for the SES of students' families was 15.75% for guns, 13.35% for knives, and 39.81% for other weapons.

DISCUSSION

The present study employed an ecological perspective that brings together the characteristics of the individual students and of the context in which their school is embedded. We wanted to examine the relative predictive power of these multilevel factors on weapon carrying to school. In contrast to many other studies, we examined this question separately for three types of weapons—guns, knives, and other weapons (i.e., clubs and rocks). We studied a large, representative sample of secondary schools in Israel and used hierarchical logistic modeling to identify the relative predictive role of variables at the student and the school level.

Risk and Protective Factors for Carrying Weapons to School

In our study, we simultaneously addressed contextual and individual factors and examined their relative power in prediction of carrying weapons to school. In general, we identified several risk and protective factors for carrying weapons to school.

Risk Factors for Carrying Weapons to School. We found that victimized students, male students, students who feel unsafe and fear attending school, Arab students, and students in low SES schools are at higher risk for carrying weapons to schools than others. These findings are in agreement with previous studies conducted in the United States (e.g., Kingery et al., 1999; May, 1999; Nasel et al., 2003; Simon et al., 1999).

Previous studies showed that weapon carrying is often related to criminal activity (Page & Hammermeister, 1997) and that offenders are more likely than nonoffenders to be victimized (Sampson & Lauritsen, 1994). Hence, it is not always clear what are the motivations that underlie carrying weapons on school ground—is it self-defense, preparation for revenge against perpetrators, or perhaps a reflection of nonnormative behavior of perpetrators of criminal activities? In the current study, we did not examine the relationships between being a perpetrator of violent behavior and carrying weapons to school. Hence, our findings call for further examination of the interplay between perpetration and victimization to better understand the motivations for weapons carrying.

We also examined the role of student gender and age on reports of carrying weapons to school. Although studies have shown that in recent years, there has been an increase in girls' involvement in delinquent behavior (Cottle, Lee, & Heilbrun, 2001), male adolescents still report significantly more weapon carrying to school than do females (see, e.g., DuRant et al., 1999; Kingery et al., 1999; Malecki & Demaray, 2003). The large gender effects found in the present study can be explained by the differences between boys and girls in their overall involvement in violence. Boys are more involved in violent behaviors, especially the more severe types (Khoury-Kassabri et al., 2004). Branscombe, Weir, and Crosby (1991) found that American men and women differ in their perceptions of weapon use. Although females think that guns motivate crime, males are more likely to believe that guns provide protection from crime.

SES of Students' Families. The findings supported the literature showing that school contextual characteristics are associated with weapons in school. For instance, we

found that schools with a large proportion of students from low-SES families show higher levels of weapons carrying (see also McNabb et al., 1996; and Kingery et al., 1999). These results strengthen previous findings reported by Khoury-Kassabri et al. (2004), in which they found that the SES of school neighborhood and students' families were associated with students' reports of severe physical victimization, whereas it has almost no contribution to moderate physical victimization. Youth living in disadvantaged neighborhoods and families with high levels of poverty, low education, and large families are in higher risk to be involved in more severe violence and carrying weapons to school. Welsh and associates (1999) claimed that students from low-SES families and communities pass through dangerous areas on their way to school and, as a result of their fear, they carry weapons to school. McNabb et al. (1996) argued that youth living in risky environments may not have the social support required to learn how to deal effectively with their difficulties, and they think carrying weapons may provide them with some protection.

Our comparison between Jewish and Arab schools revealed some surprising and interesting findings. Students in Arab schools were found to be at higher risk of carrying all kinds of weapons to school compared to Jewish students. Astor and colleagues (2004) associated more weapons in Arab schools with clan-related violent feuds, especially in the Bedouin and Druze population (who serve in the military and have access to guns). Another interpretation is that Arab children live in families with higher rates of unemployment, poverty, low education, and so forth (Hareven, 1998). Thus, the differences between Jewish and Arab students in carrying weapons to school might be a reflection of the many socioeconomic differences between Jewish and Arab children in Israel. Still, their interpretation does not explain our results because ethnic affiliation has a unique contribution to the explained variance between schools after controlling for the SES of students' families. Further examination is required to explain the differences between Jewish and Arab schools in students' reports of carrying weapon to schools.

With regard to this ethnic/cultural divide, Khoury-Kassabri, Benbenishty, & Astor (2005) found that there are differences between the models explaining victimization in Jewish and Arab schools. Thus, for instance, in Arab schools, SES had a significant contribution in explaining victimization, whereas it had no significant effects in Jewish schools. Some other aspects of the school organization, such as school climate and class size, remained important predictive variables for both groups. Future studies should examine whether the relative contributions of each of the nested ecological settings (e.g., student, school, family, and community) to levels of weapon carrying in school may be different for each ethnic group.

Several studies identify school size and class size as risk factors for violent behavior. However, no study has examined their effects on carrying weapons to school. In the current study, we found that school and class sizes were not associated with carrying weapons to school. It is interesting to note that although the findings on the relationships between school size and weapon carrying are similar to findings on other aspects of school violence (e.g., Khoury-Kassabri et al., 2004; Olweus, 1993; Welsh et al., 1999), the findings on the effects of class size are different from previous findings (e.g., Khoury-Kassabri et al., 2004). These results highlight the need to address the issue of carrying weapons to school as a specific and unique kind of behavioral problem that has some similarities to the other kinds of violent behavior but that also has its own specific attributes.

Protective Factor for Weapon Carrying. Previous studies that examined the contribution of school climate in understanding school violence found positive correlations

between developing positive school climate and school violence and victimization (Colven et al., 1998; Dwyer et al., 2000; Fraser, 1996; Khoury-Kassabri et al., 2004; Stephens, 1994). The present study showed that school policies that include clear, consistent, and fair rules predict lower levels of carrying weapons to school. These results are in agreement with those of Hawkins et al. (1992) that higher levels of bonding to family and school are associated with lower levels of drug use and delinquent activity.

In sum, we found that carrying weapons to school is predicted by several risk factors both at the student level and school contextual level. These results reflect and support the growing consensus that school violence should be treated as a multidetermined phenomenon that can be explained by many factors on multiple levels (Astor, Pitner, & Duncan, 1996; Catalano & Hawkins, 1996; Fraser, 1996; Goldstein, 1994; Hellman & Beaton, 1986; Welsh et al., 1999).

Distinguishing Between the Various Types of Weapons

A unique feature of the current study was that it sought to determine whether each type of weapon is associated with a different configuration of variables. Most previous studies either focused solely on carrying firearms to school or on weapons in general without distinguishing between different types of weapon (Kingery et al., 1996; Wilcox & Clayton, 2001). Our findings seem to support this distinction between the three types of weapons. Although in general the patterns of association were quite similar across the different types of weapons, the strengths of associations varied.

Implications for Practice

The results of the current study suggest that to reduce the presence of weapons in schools, there is a need for interventions that focus on identifying the social and school contexts in which weapon carrying is more prevalent. Interventions should be targeted toward students who were victimized and improvement of the overall school climate rather than emphasizing current "punishment" and "exclusion" measures, such as expulsion and suspension, alone.

More efforts should be directed toward protecting students in school and increasing their safety before we can expect students to refrain from bringing weapons to school. Furthermore, special attention should be given to male students who were victimized by others and who may believe that they need to protect themselves by carrying a weapon.

Our findings indicate that students who come from families and schools with fewer resources are more likely to carry weapons. These schools need greater allocations of resources to help them create a positive school climate and to forge partnerships between the various agents affecting students' lives—family, neighborhood, and school. Teachers and other staff members need training to help them acquire the knowledge and skills necessary to implement these changes.

The cross-sectional nature of our study does not permit causal inference. Still, it suggests that carrying weapons to school may be reduced if schools implement effective policies, including clear, consistent, and fair rules. Student participation in school activities and decision making, positive relationships between students and teachers, and teachers' support of students can all reduce students' feeling of alienation and increase their connection to the school, reducing the likelihood of violence (e.g., Hyman & Snook, 2000). Support for this approach has been obtained also by interventions that include the improvement of school climate as an important component of a "whole

school" approach (e.g., see Felner et al.'s 2001 evaluation of the School Transitional Environment Program in junior high and high schools). This program tries to influence students' developmental behavior through an ecological perspective of the educational setting. Felner and associates (2001) found that giving the student access to important information (i.e., school rules, expectations, and regulations) and increasing students' sense of accountability and belonging have positive effects on their social, emotional, behavioral, and substance-abuse experiences.

Limitations

The present study is the largest of its kind and addressed a number of issues not studied before. Nevertheless, its limitations should not be overlooked. In the current study, we reported on findings of a national survey on school violence in Israel. Because the sample was representative, the results of the current study can be generalized to the entire student population in Israel. However, it is important to examine to what extent the results of our study can be generalized to other contexts and cultures. The Health Behavior in School-Aged Children (HBSC) study that compared Israel with 34 European countries found some clear variations among countries as well as similarities. Benbenishty and Astor (2005) reported significant similarities in the structure of victimization in an Israeli sample and a sample from California. They, however, did not compare the characteristics of weapons in Israeli and U.S. schools. Hence, it is imperative to replicate this study in other cultures and countries and to identify levels of similarity in the area of weapons in schools. Such replications are necessary to know how similar or different that the situation in Israel is compared to other countries.

In the current study, the variables fear and safety were measured using only one question each. Therefore, they might be statistically unreliable. Future studies should improve the measurement of these variables by comprising them of several items related to feeling fearful of attending school because of violence and feeling safe in and protected in school.

The study used a cross-sectional design. Thus, our ability to derive causal inferences is limited. Future studies should employ longitudinal designs and collect information on both victimization and perpetration to help understand the causal relationships between the various risk and protective factors associated with weapons in school. For instance, a longitudinal study that follows children through childhood and adolescence may enable us to examine whether victimization leads to perpetration, which in turn leads to carrying a weapon to school. Or perhaps weapon carrying is associated with perpetration, which in turn leads to retaliation by others—hence, to victimization.

The current study highlights the importance of examining the multiple layers of social context to disentangle and better understand the effects of the school, community, culture, and SES. We hope that other studies from across the globe will explore these issues with similar samples and methods. This will greatly facilitate our understanding of the ways in which cultures, economics, and schools contribute to students' experiences with weapons at school.

Notes

1. Benbenishty, Zeria, and Astor (2000) conducted two studies in the same academic year; in the current study, we used the second wave of data, which was carried out in the middle of the Israeli school year.

2. In the present study, we focus on the main effects of the student- and school-level variables. Therefore, we do not estimate the interaction between student- and school-level variables.

3. Variance explained at the school level—variance between schools—was calculated using the formula: Tau00 (random regression) – Tau00 (fitted model) / Tau00 (random regression).

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