Student Weapon Possession and the “Fear and Victimization Hypothesis”: Unraveling the Temporal Order

Pamela Wilcox, David C. May & Staci D. Roberts

Published online: 18 Feb 2007.

To cite this article: Pamela Wilcox, David C. May & Staci D. Roberts (2006): Student Weapon Possession and the “Fear and Victimization Hypothesis”: Unraveling the Temporal Order, Justice Quarterly, 23:4, 502-529

To link to this article: http://dx.doi.org/10.1080/07418820600985362
Student Weapon Possession and the “Fear and Victimization Hypothesis”: Unraveling the Temporal Order

Pamela Wilcox, David C. May and Staci D. Roberts

Using longitudinal data from nearly 4,000 students across 113 public schools in Kentucky, we attempt to unravel the direction of the relationships between student weapon carrying and various objective and subjective school-crime experiences, including victimization, perceived risk of school victimization, and fear of school victimization. Overall, we found little support for the idea that fear and victimization increase weapon carrying, controlling for other theoretically important predictors, including delinquent offending. While 7th-grade victimization was modestly associated with increased non-gun weapon carrying in 8th grade, high perceptions of individual victimization risk in 7th grade decreased both subsequent gun and non-gun weapon carrying. Fear of criminal victimization in 7th grade did not predict either type of subsequent (8th-grade) weapon carrying. Though fear, risk, and victimization were inconsistent predictors of gun and non-gun weapon carrying, we found strong and consistent support for the effects of weapon carrying on subsequent fear, risk, victimization, and offending. However, contrary to the implications of fear and victimization hypotheses, both gun carrying and non-gun weapon carrying in the 8th grade increased fear of school crime, perceived risk, and actual victimization in the 9th grade. Implications of these findings for the applicability of a “weapons” or “triggering” effect are discussed.

Pamela Wilcox is Associate Professor of Criminal Justice at University of Cincinnati. She received her PhD in Sociology at Duke University in 1994. Her research publications focus on the application of a general criminal opportunity perspective to understanding offending, victimization, fear, and precautionary behavior in community and school contexts. David C. May is an Associate Professor and Kentucky Center for School Safety Research Fellow in the Department of Correctional and Juvenile Justice Services at Eastern Kentucky University. He received his PhD in Sociology with emphasis in Criminology from Mississippi State University in 1997. He has published numerous articles in the areas of perceptions of the severity of correctional punishments and adolescent fear of crime and weapon possession and two books examining the antecedents of gun ownership and possession among male delinquents. Staci D. Roberts is finishing her PhD in Sociology at the University of Kentucky in 2006. She has co-authored several articles in the area of fear of crime in the school context. Her other research focuses on fear of crime and protective behavior among sexual assault victims. Correspondence to: Pamela Wilcox, Division of Criminal Justice, University of Cincinnati, 600 Dyer Hall, PO Box 210389 Cincinnati, OH 45221-0389, USA. E-mail: wilcox@uc.edu
Keywords weapon possession; "fear and victimization hypothesis"; school violence

Introduction

Weapon-related violence in schools is relatively rare compared to non-weapon "everyday school violence" (e.g., Bastian & Taylor, 1991; DeVoe et al., 2002; Elliott, Hamburg, & Williams, 1998; Garofalo, Siegel, & Laub, 1987; Gottfredson, 2001; Gottfredson & Gottfredson, 1985; Toby, 1994). Nonetheless, the potential harm posed by student armament is very real, as weapons, especially firearms, have the potential to escalate violent interactions at school into more serious, potentially lethal conflicts (e.g., Blumstein, 1995; Cook & Laub, 1998). While very serious and/or lethal incidents are thankfully uncommon, they are nonetheless a concern to students, teachers, school administrators, and parents in the post-Columbine era (e.g., Sprague, Smith & Stieber, 2002; Vettenburg, 2002). Hence, research addressing the etiology of school-based weapon carrying has increased substantially in recent years, as scholars seek to better inform policy related to this aspect of school safety.

One idea that has emerged from some etiological research is that student weapon carrying is positively related to feelings of being vulnerable to school crime (e.g., see May, 2001, for recent review). This idea is consistent with the "fear and victimization hypothesis" and "collective security hypothesis" emerging from the literature on adult weapon carrying (e.g., DeFronzo, 1979; Hill, Howell, & Driver, 1985; McDowall, 1995; McDowall & Loftin, 1983; Smith & Uchida, 1988; Young, 1985; Young, McDowall, & Loftin, 1987). These hypotheses view firearm procurement "as a situational reaction to the threat—actual, perceived, or emotional—posed by crime" at either individual or aggregate levels (Cao, Cullen, & Link, 1997, p. 631). Cao et al. (1997) and others (e.g., Wright, Rossi & Daly, 1983) have noted, however, inconsistent evidence regarding such effects on adult gun carrying. Regarding adolescent in-school weapon carrying, studies examining such effects have also revealed inconsistent findings (e.g., compare Kingery, Pruitt, & Heuberger 1996; Simon, Crosby, & Dahlberg, 1999; Wilcox & Clayton, 2001; Bailey, Flewelling, & Rosenbaum, 1997; DuRant, Kahn, Beckford, & Woods, 1997; May, 2001; Simon, Dent, & Sussman, 1997; Wilcox Rountree, 2000). Part of this imprecise understanding of the linkage between objective school-crime experiences (actual victimization) or subjective school-crime experiences (cognitive perception of risk of criminal victimization or emotional fear of crime) and weapon carrying among students may be due to an over-reliance on cross-sectional data. Scholars who claim that risk perceptions, fear of school crime, and actual school victimization affect student weapon carrying (i.e., protective weapon carrying) are often hampered by a potential confounding of the temporal order of the variables in question, with the possibility existing that weapon carrying affects school-crime risk perception, fear of school crime, and school victimization rather than the former being
predicted by the latter (see May, 2001, for example). Unfortunately, with cross-
sectional data, disentanglement of causal ordering is difficult to address fully.
Furthermore, the relationship between school-crime experiences and student
weapon carrying is also clouded by a paucity of research distinguishing between
gun and non-gun weaponry. Little empirical evidence exists for understanding
how gun carrying among students differs from non-gun weapon carrying etiologi-
cally and whether there are different effects of gun carrying versus non-gun
weapon carrying on subsequent experiences with school crime (see May, 2001,
for an exception).

Using longitudinal data from nearly 4,000 students across 113 public schools
in Kentucky, we attempt to assess the causal direction of the links between
subjective and objective experiences with school crime and student weapon
carrying. Through structural equation modeling techniques, we examine
whether student fear of school victimization, cognitive risk perception, and
actual victimization are linked to in-school weapon carrying in subsequent
years, and whether, in turn, weapon carrying affects later levels of fear, risk
perception, and victimization. We then address whether these causes and
effects are similar or different depending upon whether guns or non-gun weap-
ons are being considered.

Theoretical Background

Research on school-based weapon possession has focused upon several sets of
individual-level predictors: sociodemographic characteristics, deviant lifestyle,
peer influence, social attachment, and objective and subjective experiences
with crime at school (including school-based victimization, cognitive
perceptions of victimization risk, and emotionally based fear of school crime).
Regarding, first, sociodemographic correlates, previous research typically
reveals that males are more likely to carry weapons to school than are female
students (e.g., Bailey et al., 1997; DuRant et al. 1997; Kann et al. 1995; Kingery
et al., 1996; Martin, Sadowski, Cotten, & McCarrher, 1996; Sheley & Brewer,
1995; Sickmund, Snyder, & Poe-Yamagata, 1997; Simon et al., 1997; Wilcox &
Clayton, 2001), with some evidence suggesting that this effect may be particu-
larly pronounced in more rural settings (Wilcox Rountree, 2000).1 The impact of
race on student weapon carrying is less clear. Some researchers have found that
Whites are less likely to carry weapons than are minority students (Kann et al.,
1995; Kingery et al., 1996; Wilcox & Clayton, 2001; see also Sickmund et al.,
1997, for a review), while others find that race/ethnicity has no effect on
weapon carrying in student samples, particularly after other factors are
controlled (Bailey et al., 1997; DuRant et al., 1997; Sheley & Wright, 1995).

---

1. Simon et al. (1999) found that males were more likely to carry weapons in general (at school or
away from school). But, among those who carried weapons, females were actually more likely to
carry them to school specifically (as opposed to carrying them outside of the school context).
Extant research also suggests that the relationship between age and weapon carrying among school-aged children is curvilinear, peaking in grades 9 and 10 and then declining in grades 11 and 12 (Sickmund et al., 1997; Wilcox & Clayton, 2001).\(^2\) However, it should be noted that the effect of age on gun carrying specifically has been shown to be positive, not curvilinear (e.g., see Lizotte, Howard, Krohn & Thornberry; 1997). Considering SES, there is limited evidence that poverty is a relatively weak, yet statistically significant, predictor of carrying weapons to school (Martin et al., 1996). Parental education—another indicator of SES—has been shown to be negatively related to in-school weapon carrying (Simon et al., 1999; Wilcox & Clayton, 2001).

Previous research also demonstrates that adolescents with a deviant lifestyle are more likely to own weapons and/or arm themselves, both at school and away from school (Callahan & Rivara, 1992; DuRant, Getts, Candenhead, & Woods, 1995; Lizotte et al., 1994; Sheley & Wright, 1995; Webster, Gainer, & Champion, 1993). For instance, carrying a weapon to school is often positively related to indicators of criminal or “problem” behaviors, including gang membership, history of arrest, drinking, use of drugs, and fighting (see, e.g., Bailey et al., 1997; DuRant et al., 1997; Kingery et al., 1996; May, 2001; Simon et al., 1999; Wilcox & Clayton, 2001; Wilcox Rountree, 2000).

Peer and family weapon-related socialization have also been linked to adolescent weapon carrying in previous studies. For instance, peer influences (e.g., perceptions of weapon-carrying peers) have been shown to positively affect general weapon-carrying among school-aged youths (Bjerregaard & Lizotte, 1995; Lizotte et al., 1994; Sheley & Wright, 1995) and in-school carrying specifically (Bailey et al., 1997; Martin et al., 1996; Simon et al., 1997; Wilcox & Clayton, 2001; Wilcox Rountree, 2000). Previous research also indicates that perceptions of parental weapon ownership and use are positively associated with adolescent weapon ownership (Bjerregaard & Lizotte, 1995; Lizotte et al., 1994) and in-school carrying practices (Wilcox and Clayton, 2001).

Another individual-level factor associated with in-school weapon carrying is level of social attachment, or ties to conventional social institutions such as school and family. DuRant et al.’s (1997) findings, for instance, showed that poor academic performance was positively associated with the likelihood of carrying a weapon to school. Similarly, May (1999) and Wilcox and Clayton (2001) revealed a negative relationship between school attachment and in-school weapon carrying, though there is limited evidence that such a relationship may not be generalizable to particularly rural locations (Wilcox Rountree, 2000). Bailey et al.’s (1997) study showed that attachment to parents was also negatively related to in-school weapon carrying.

---

2. The effect of age on weapon carrying may be contextual, depending upon the age/grade structure of the school (e.g., whether the school houses 7-12 graders, 9-12 graders, or 10-12 graders).
Central to the focus of this study is previous work suggestive of "defensive weapon carrying." While adult defensive gun carrying/use has been the subject of much research and policy debate (e.g., Cook, 1991; Cook & Ludwig, 1998; Cook, Ludwig, & Hemenway, 1997; Kellermann et al., 1993; Kleck, 1988, 1997; Kleck & DeLone, 1993; Kleck & Gertz, 1995; McDowall & Wiersema, 1994), defensive weapon carrying among adolescents in the school context has received much less attention. Still, because students often express being fearful at school or avoiding school due to fear and/or feelings of risk (Bastian & Taylor, 1991; Lawrence, 1998; Martin et al., 1996; Pearson & Toby, 1991), it has been speculated that fear/protection may precipitate defensive student weapon carrying. In fact, Simon et al.'s (1997) study indicated that student survey respondents perceived protection to be the leading reason for others’ in-school weapon carrying. As alluded to earlier, contradictory empirical evidence exists regarding the relationship between school-crime experiences and one’s own carrying, however. We discuss the mixed evidence surrounding in-school weapon carrying below.

Some studies have found support for the link between fear and student carrying. For instance, Kingery et al.'s (1996) study of 8th and 10th grade students in rural Texas showed that, among the 85 students who reported having carried a gun to school within 12 months of the survey, 48 percent stated that the reason was concern for safety. Kingery et al. (1996) also found that students who had been previously victimized at school were more likely to go to school armed, and this result received support from both Simon et al.’s (1999) study of over 10,000 students across the nation participating in the Youth Risk Behavior Survey and Wilcox and Clayton’s (2001) study of over 6,000 six to 12 graders in Louisville, Kentucky. However, contradictory evidence exists regarding both the effects of fear and previous victimization, as several other studies have revealed weak and/or non-significant effects (Bailey et al., 1997; DuRant et al., 1997; May, 2001; Simon et al., 1997; Wilcox Rountree, 2000).

Perhaps one reason for the ambiguity surrounding the relationship between in-school weapon carrying and school-crime experiences (including victimization, risk perception, and fear of school crime) in the extant literature is inconsistency in the extent to which alternative hypotheses (e.g., criminal lifestyle) are controlled and the relative inattention to the possible bi-directionality of the relationship. A “fear and victimization hypothesis” would suggest a temporal order where prior victimization, perceptions of likely victimization, and fear of victimization precede the weapon carrying (e.g., see Cao et al., 1997; Hill et al., 1985; Wright et al., 1983). The idea is that the student carries defensively in response to victim, risk, and fear experiences, controlling for other theoretically important factors, including criminal offending/lifestyle. As indicated by the studies reviewed above, the limited extant literature on in-school carrying presumes this causal direction.
Carrying for defensive purposes, however, implies the belief that such action will affect subsequent victimization experiences, indicating a presumed feedback loop: victimization, perceived risk, and/or fear promote defensive carrying that, in turn, reduces future victimization, perceived risk, and/or fear. This feedback loop is largely ignored in research on the fear and victimization hypothesis, meaning that model estimates of the effects of fear and victimization on weapon carrying could be inaccurate.

Further clouding the meaningfulness of extant research is the idea that there are, in fact, competing theoretical perspectives that speak to how this feedback loop actually works. For instance, defensive weapon carrying presumably provides guardianship and thus, from an opportunity-theory standpoint (e.g., Cohen & Felson, 1979; Cohen, Kluegel, & Land, 1981), should reduce the opportunity for successful subsequent victimization (Kleck, 1988; Kleck & Gertz, 1995). Research with both incarcerated adults (Wright & Rossi, 1986) and juveniles (May & Jarjoura, 2006) suggests that gun criminals often arm themselves to increase the likelihood of a successful outcome in the event they face an armed victim. Similarly, individual weapon carrying can also provide a deterrent value if potential offenders know/suspect that individual to be armed (Lott & Mustard, 1997). From a deterrence perspective (e.g., Gibbs, 1975), the costs of offending against an armed target are enhanced in terms of both certainty and severity of punishment. From this perspective, then, it is possible that those who carry weapons defensively reduce their own victimization risk.

Nevertheless, defensive weapon carrying does not necessarily translate into defensive weapon use. As such, deterrent and/or opportunity-related benefits to weapon carrying may be negligible if those who carry are unable to use their weapons (e.g., Cook, 1991; McDowall, Lizotte, & Wiersema, 1991). Further, a contrasting perspective suggests that weapon carrying might incite violence among those who become aware (e.g., a potential victim) of its presence. This perspective—known as the “weapons effect” or “triggering effect” (Berkowitz & LePage, 1967)—implies that weapon carrying would lead to an increased risk of subsequent victimization. Similarly, the weapon carrier might be more likely to engage in violence as an offender when carrying.

Indeed, the empirical evidence regarding the guardianship/deterrent versus triggering effects of weapon carrying among adults is mixed. While evidence does exist suggesting that armed resistance can prevent completion of attempted victimizations (e.g., Kleck & McElrath, 1991; Kleck & Sayles, 1990; Lizotte, 1986) or reduce injury in cases of attack (Kleck & McElrath, 1991), other evidence suggests that forceful defensive resistance can enhance attack and injury (e.g., Cook, 1986). In addition, there is evidence that general weapon ownership/carrying (above and beyond instance of armed resistance) might actually increase the likelihood of future victimization (Kellermann et al., 1993; Wilcox, 2002), and recent analyses by Wells and Horney (2002, p.283) showed that “... compared with situations in which the respondent did not possess any weapon, both gun possession and other weapon possession increase the chances that the possessor will attack [another] ...” (see also Kleck & Hogan,
Thus, evidence exists to suggest that weapon carrying can serve to both diminish and enhance the likelihood of subsequent violence (either as an offender or as a victim).

In summary, while prior experience with crime is thought to precipitate weapon carrying, and most previous work on the linkage assumes this temporal ordering (see, May, 2001, for example), it is clear from the literature on adult samples that weapon carrying can, in turn, influence experiences with crime in potentially different ways. Tests of the fear and victimization hypothesis regarding weapon carrying should therefore estimate possible bi-directionality of effects in order to avoid model misspecification. Further, examining this potential bi-directionality with attention to possible differences depending upon weaponry is also essential, as tests of the effects of gun versus non-gun weaponry on violent offending among adult samples have revealed some interesting comparisons. For instance, Wells and Horney (2002) showed that non-gun weapon carrying actually had stronger positive effects on likelihood of violent offending than did gun carrying, and gun carrying lowered the chances of an injurious attack, while non-gun weapon carrying increased these chances. Kleck and his colleagues have found that defensive gun use among victims lowers the likelihood of injury in comparison to other forms of armed resistance (e.g., Kleck & DeLone, 1993; Kleck & Sayles, 1990). Other studies have indicated that defensive weapon use increases likelihood of attack similarly for guns, knives, and other weapons (e.g., Cook, 1986). This body of findings in the literature on defensive carrying among adults, while somewhat contradictory, suggests that examining distinctions in weaponry in studies of antecedents and effects of weapon carrying among student populations is essential in order to avoid possible misspecification due to potentially unique effects across type of weapon.

We are unaware of any study to date that has addressed, simultaneously: (1) the applicability of the "fear and victimization hypothesis" to subsequent gun and other-weapon carrying among students in a school context, controlling for delinquent lifestyle and other theoretically relevant variables; and (2) the presence of a feedback loop among these school students, testing alternative hypotheses related to a deterrence/guardianship effect of gun and other-weapon carrying versus a weapons/triggering effect of gun and other-weapon carrying on subsequent levels of school-based fear, risk perception, victimization, and offending.

The Present Study

We extend the previous work examining the etiology of carrying weapons to school by testing the fear and victimization hypothesis within a model allowing for possible reciprocal effects between gun and other-weapon carrying and school-based

3. Kleck and Hogan (1999, p. 288) note, in reference to their weak yet significant positive association between gun ownership and homicide offending, "The failure to control confounding factors that are known to positively affect both violent behavior and gun acquisition, however, is probably at least partly responsible for the positive guns-homicide association."
experiences with crime. More specifically, we use longitudinal data and structural equation modeling in order to assess (1) the extent to which fear, perceived risk, and victimization drive subsequent gun versus other-weapon carrying, controlling for other individual risk factors and (2) evidence regarding a feedback loop where gun and other-weapon carrying, in turn, either reduce subsequent fear, risk, and victimization experiences (consistent with opportunity and/or deterrence theory predictions) or, alternatively, increase subsequent fear, risk, victimization, and/or offending (consistent with a triggering effect). A conceptual model depicting the hypotheses tested regarding these concepts is provided in Figure 1.

Data

The data used in this study were collected as part of the Rural Substance Abuse and Violence Project (RSVP), a longitudinal study designed to examine individual and contextual factors that affect substance use, victimization, and offending among middle and high school students in the state of Kentucky (NIDA Grant DA-11317). Data were first collected in the spring of 2001 when participating students were in the seventh grade. The same students were again surveyed in spring 2002 as eighth graders, spring 2003 as ninth graders, and spring 2004 as tenth graders. For the purposes of this analysis, we focus on the first three waves of data, collected 2001-2003, while subjects transitioned from seventh grade to ninth grade.4

Figure 1  Possible relationships between school-crime experiences and weapon/gun carrying.

4. Waves 1-3 were utilized because we felt three successive waves of data were most theoretically appropriate. Since Wave 4 was in the process of being collected when this paper was begun, Waves 1-3 were our only option. While we have no reason to suspect that findings would be different if Waves 2-4 were examined as opposed to Waves 1-3, future validation work will examine the extent to which the findings emerging here are “wave-specific.”
Students were selected using a multi-stage sampling procedure in which 30 of Kentucky’s 120 counties were chosen from population-based strata. Within the 30 counties selected, all 74 public schools containing seventh graders were contacted, and 65 agreed to participate. The targeted sample was the entire population of 9,488 seventh graders that were then attending the original 65 participating middle schools. Prior to data collection, active parental consent was obtained for 43 percent of the targeted sample, leaving 4,102 scheduled participants. Of those participants, we received completed surveys from 3,692 students in wave 1 (hereafter referred to as W1), 3,638 students in wave 2 (W2), and 3,050 students in wave 3 (W3). Over the course of the 3 years of data collection, these students moved from the original 65 participating middle schools into 48 new schools within participating counties. For most students in the sample, this time series involves a move from middle school to high school between grades 8 and 9.

The response rate of 43 percent was obtained after a 2-month follow-up procedure in which parents were mailed one reminder post-card 2-3 weeks after the initial mailing, a new cover letter and response form after 4-5 weeks, and a final cover letter and response form after 8 weeks. Our response rate is consistent with other studies of students using active as opposed to passive parental consent. For example, research suggests that studies utilizing active parental consent reveal consent rates ranging from 35 to 60 percent (Ellickson & Hawes, 1989; Esbensen et al., 1996). Studies using active parental consent procedures with low response rates have been shown to produce downwardly biased prevalence estimates of risky behaviors such as those under study here (White, Hill, & Effendi, 2004, but also see Eaton, Lowry, Brener, Grunbaum, & Kann, 2004), but it should be noted that the purpose of our study is not to obtain population prevalence estimates. Rather, our aim is to address relationships among variables, with a high degree of internal validity preferred over a high degree of generalizability. Our survey responses obtained over three waves of data provide the potential for high internal validity, and thus we view our study as a...
strong basis for positing and testing a causal model that can then be later replicated on sub-populations and different samples in order to assess external validity and generalizability.

Measures of Variables

In testing the reciprocal effects between school-crime experiences and carrying a weapon to school, we created two different measures of weapon carrying utilizing responses from W2 survey items. First, gun carrying was measured as an ordinal variable indicating how often respondents had taken a gun to school during that school year. Responses ranged from 1 = "never" to 5 = "daily or almost daily." Second, non-gun weapon carrying was measured as the average response to similar survey items asking respondents how often they had, during the current school year, (1) taken an explosive to school and (2) taken another weapon to school (other than a gun or explosive). In estimating the effects of fear-and-victimization variables on W2 gun and non-gun weapon carrying, we control for W1 gun/weapon carrying using measures identical to those just described, except that we draw upon data from the first survey wave. Descriptive statistics for these and all other study variables are shown in Table 1. As the results presented in Table 1 suggest, both gun and non-gun weapon carrying are rare, with a mean score of 1.04 for gun carrying in W1 and W2, and mean scores of 1.08 and 1.10 for W1 and W2 other weapon carrying, respectively.8 Though the mean levels of carrying were nearly identical across years, the correlation between W1 and W2 gun carrying is only .14, and the correlation between W1 and W2 non-gun weapon carrying is .28 (see Appendix A). Hence, there is individual-level change in gun- and weapon-carrying across the first two waves of data, and controlling for W1 gun or non-gun weapon carrying should not absorb all variation.9 Though the failure of most previous studies to disentangle gun carrying from more general weapon carrying is generally perceived as a limitation (e.g., Kingery et al., 1996; May, 2001; Wells & Horney, 2002), the bivariate correlation between the two measures in our data is .74 in W1 and .76 in W2, suggesting that the two behaviors are quite strongly related.

8. These average scores correspond with the following frequencies (among the 3,968 total respondents for which we have at least one wave of data): Wave 1 gun carrying = 57; Wave 2 gun carrying = 63; Wave 1 non-gun weapon carrying = 295; Wave 2 non-gun weapon carrying = 344.
9. Despite the relatively low correlation between W1 and W2 gun/weapon carrying, we were concerned that controlling for W1 carrying might absorb all variation in W2 carrying. Therefore, we ran models with and without controls for W1 carrying. All results remain the same for the gun-carrying model with or without W1 carrying controlled. For the other-weapon carrying model, all results regarding our key variables (e.g., fear and victimization variables) were consistent regardless of whether W1 other-weapon carrying was controlled. However, two key differences emerged regarding control variables in the other-weapons model. In a model without W1 other-weapon carrying controlled, peer weapon carrying’s positive effect and school attachment’ negative effect on W2 other-weapon carrying became statistically significant. In addition, the effect of race was tempered, with the p value increasing from .03 to .07 in the non-gun weapon carrying models.
While the validity of self-reported weapon carrying in the context of a non-anonymous survey might be questioned, many precautions were taken to decrease perceived coerciveness and increase data validity. Foremost, trained survey administrators (including project faculty, staff, and graduate-student research assistants) were used for survey administration as opposed to relying upon school staff. At each administration, the study was carefully explained, as were the measures taken by project staff to reduce breach of confidentiality and ease student concerns about revealing illegal behavior (e.g., use of ID codes, Certificate of Confidentiality, etc.). After all surveys were collected, they were scanned for extreme and/or inconsistent response patterns. Few problems were detected in this scanning procedure (i.e., about 10 cases in any one wave), but if found, such cases were removed and counted as “missing.” While we have no absolute guarantees that the self-report data for weapon carrying or any self-reported delinquency is completely valid, there is literature to suggest that the methods we employed should increase the likelihood of obtaining valid data (e.g., Cross & Newman-Gonchar, 2004; Furlong, Sharkey, Bates & Smith, 2004).

### Table 1: Descriptive statistics for all study variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Metric</th>
<th>M</th>
<th>SD</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wave 1 variables (W1)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fear of Crime</td>
<td>1 = never ... 5 = always</td>
<td>1.77</td>
<td>.82</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Risk Perception</td>
<td>1 = very low ... 5 = very high</td>
<td>1.77</td>
<td>.80</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Victimization</td>
<td>0 = no victimization ... 20 = 20 or more</td>
<td>4.20</td>
<td>5.50</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>Gender</td>
<td>1 = female; 0 = male</td>
<td>.52</td>
<td>.50</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Race</td>
<td>1 = White; 0 = non-White</td>
<td>.89</td>
<td>.31</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Parental Education</td>
<td>1 = grade school or less; 7 = graduate of</td>
<td>4.25</td>
<td>1.60</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>School Attachment</td>
<td>1 = strongly disagree ... 4 = strongly agree</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delinquent Offending</td>
<td>1 = never ... 5 = daily</td>
<td>1.16</td>
<td>.40</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Parent Gun Ownership</td>
<td>1 = yes; 0 = no</td>
<td>.48</td>
<td>.38</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Self Gun Ownership</td>
<td>1 = yes; 0 = no</td>
<td>.23</td>
<td>.33</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Peer Weapon Carrying</td>
<td>1 = yes; 0 = no</td>
<td>.16</td>
<td>.37</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>In-School Gun Carrying</td>
<td>1 = never ... 5 = daily</td>
<td>1.04</td>
<td>.33</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>In-School Non-Gun Weapon</td>
<td>1 = never ... 5 = daily</td>
<td>1.08</td>
<td>.39</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Weapon Carrying</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Wave 2 variables (W2)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gun Carrying</td>
<td>1 = never ... 5 = daily</td>
<td>1.04</td>
<td>.36</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Non-Gun Weapon Carrying</td>
<td>1 = never ... 5 = daily</td>
<td>1.10</td>
<td>.45</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td><strong>Wave 3 variables (W3)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fear of Crime</td>
<td>1 = never ... 5 = always</td>
<td>1.69</td>
<td>.71</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Risk Perception</td>
<td>1 = very low ... 5 = very high</td>
<td>1.77</td>
<td>.73</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Victimization</td>
<td>0 = no victimization ... 20 = 20 or more</td>
<td>3.00</td>
<td>4.75</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>Delinquent Offending</td>
<td>1 = never ... 5 = daily</td>
<td>1.19</td>
<td>.40</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>
In addition, though obtaining population estimates is not the focus of our study, the past-year prevalence of gun carrying in our study is nonetheless consistent with 12-month handgun-to-school prevalence rates reported by other self-report instruments, including the Colorado Youth Survey (1.3 percent) and the Safe Schools/Healthy Students Survey (3.2 percent). Further, when “suspect” respondents (extreme and inconsistent respondents) are removed from analysis within these two comparison data sources, gun-carrying prevalence rates drop to .2 percent and .1 percent, respectively (Cross & Newman-Gonchar, 2004). Regarding weapon carrying more generally, once extreme and inconsistent responders are removed from the Youth Risk Behavior Surveillance Survey (YRBS), the prevalence rate for weapon carrying (1.08 percent) mirrors that found in our study (e.g., see Furlong et al. 2004). These comparisons suggest that students in our study did not appear unusually fearful of reporting illegal behavior.

Crime experiences as exogenous: Fear and victimization? In our model (see Figure 1), the key W1 variables conceptualized to be exogenous to W2 weapon/gun carrying include fear of school crime, perceived risk of school victimization, and school-crime victimization. To measure fear of crime, respondents indicated how often they were worried/afraid (1 = never, 5 = always) they would be (1) physically attacked, (2) forced to give up money or property, (3) have money or property stolen when they were not around, (4) have a gun pulled on them, and (5) have a weapon pulled on them. Responses to these items ($\alpha = .80$) were averaged for each respondent, with the mean W1 scale value being 1.77 (between never worried/afraid to not very often worried/afraid).

For measuring risk perception, respondents indicated the chance (1 = very low, 5 = very high) they would (while at school): (1) be physically attacked, (2) be forced to give up money or property, (3) have money or property stolen when they were not around, (4) have a gun pulled on them, and (5) have a weapon pulled on them. Responses to these five items ($\alpha = .82$) were averaged for each respondent, with the mean W1 scale value being 1.77 (between “very low” and “low” risk).

To measure crime victimization, respondents indicated how many times (0 = 0, 1 = 1 ... 10 = 10+) in the current school year on school grounds or during school-related activities they had (1) been physically attacked, (2) forced to give up money or property, (3) had money or property stolen when they were not around, (4) had a gun pulled on them, and (5) had a weapon pulled on them. Responses from these five items ($\alpha = .74$) were summed to create a continuous victimization scale that ranged from 0–50 victimizations. This scale was then recoded to range from 0 = 0 victimizations to 20 = 20 or more victimizations. The average number of victimizations reported in W1 is 4.20.

10. Only 7 percent of the sample reported that they had been victimized 20 or more times. As a result, we truncated the responses. Respondents reporting more than 20 victimizations were recoded to 20.
While W1 measures of fear- and victimization-related experiences are the key exogenous factors in our model, we also include, as exogenous control variables, student socio-demographic characteristics. Gender (0 = male, 1 = female) and race (0 = non-White, 1 = White) are both measured dichotomously.\textsuperscript{11} To measure student socioeconomic status (SES), a scale ($\alpha = .75$) was created using parental education. Responses indicating the highest level of education achieved by the student’s mother and father (1 = completed grade school or less, 7 = graduate or professional school) were averaged.\textsuperscript{12}

In addition to gender, race, and SES, several other individual-level variables are included as exogenous to weapon/gun carrying in W2 in order to control for other individual-level characteristics that are known risk factors for weapon carrying, including school attachment, delinquent offending, family gun ownership, respondent gun ownership, and peer weapon carrying. In order to measure W1 school attachment, we used survey items that indicated how strongly respondents agreed/disagreed (1 = "strongly disagree," 4 = "strongly agree") with the following statements about their school: (1) “I care a lot about what my teachers think of me,” (2) "Most of my teachers are not interested in anything I say or do,” (3) “Getting an education is important to me,” (4) “I would quit school now if I could,” (5) “Most of my classes are a waste of time,” and (6) "I look forward to coming to school most mornings."\textsuperscript{13} By averaging these items for each respondent, a scale ($\alpha = .70$) was created to indicate each respondent’s overall level of school attachment.

In testing the fear and victimization hypothesis (the effect of fear and victimization variables on subsequent gun/weapon carrying), we also control for delinquent offending. W1 delinquent offending is measured by averaging students responses to 19 items ($\alpha = .92$) asking them how often (1 = never… . 5 = daily), in the present school year, they had engaged in various delinquent activities.\textsuperscript{14}

\textsuperscript{11} Race was not originally measured dichotomously. Respondents were able to choose from several categories, including African American, Asian American, Hispanic American, Native American, White, White and Black, and Other. Less than 11 percent of the sample identified other than White, and race was therefore recoded into a dummy variable.
\textsuperscript{12} While household income is typically used to measure socioeconomic status, it is often the case that middle and high school kids do not know their family’s income. As such, we elected to measure family SES with parents’ education.
\textsuperscript{13} Items 4 and 5 were reverse-coded so that values for all items ranged from low attachment to high attachment.
\textsuperscript{14} Delinquent activities included drinking alcohol, getting drunk, smoking marijuana, using inhalants, using cocaine, using speed, using crystal meth, selling marijuana or other drugs, forcing someone at school to give up money or property, forcing someone not at school to give up money or property, stealing (without force) someone’s money or property at school, stealing (without force) someone’s money or property not at school, physically attacking someone at school, physically attacking someone not at school, using a gun during a fight, using another weapon during a fight, getting arrested, driving after drinking, and vandalizing property. We felt that the inclusion of the youth’s involvement in delinquent activities in waves 1 and 3 controlled for a "lifestyle" effect that suggests that weapon carrying is one of a host of delinquent activities in which criminogenic youths are involved. Its control thus strengthens the test of the fear and loathing hypothesis.
Weapon socialization/exposure at W1 is measured by two variables using responses to several questions about gun ownership. First, respondents indicated (0 = no, 1 = yes) if their parents own a BB gun, a handgun, and a rifle or shotgun. Responses to these three items were averaged to create a *family gun ownership* scale ($\alpha = .66$). Second, respondent’s indicated (1 = yes, 0 = no) if they personally own a BB gun, handgun, and rifle or shotgun. These three items were averaged to create a *self gun ownership* scale ($\alpha = .72$). To control for peer weapon carrying, respondents indicated how many of their closest friends had (1) taken a gun to school, (2) taken an explosive to school, and (3) taken a weapon to school (other than a gun or explosive). A dummy variable was created based upon these three items (0 = no friends have taken a gun/weapon/explosive to school, 1 = friends have taken a gun/weapon/explosive to school).\(^{15}\)

**Crime experiences as endogenous: Opportunity/deterrence or triggering effects?** The model presented in Figure 1 depicts our use of W3 fear, risk, victimization, and offending as fully endogenous variables suggesting that, though fear and victimization factors may precipitate gun/weapon carrying, they, along with offending, may also be affected by gun/weapon carrying. In order to examine this feedback loop, we include measures of fear of crime, risk perception, victimization, and offending from W3 data in order to discern opportunity/deterrence versus triggering effects. These W3 endogenous variables were created in the same manner as the W1 variables, when they were treated as fully exogenous characteristics (see above). As the descriptive statistics in Table 1 indicate, victimization declined between W1 (7th grade) and W3 (9th grade), while fear of crime, risk perception, and offending were relatively steady across the study period. In estimating the effects of W2 weapon possession on W3 fear, risk perception, victimization, and offending, we control for (1) W1 fear, risk, victimization, and delinquent offending, respectively, (2) sociodemographic characteristics (gender, race, parental education—see above measurement descriptions), and (3) other theoretically important risk factors, including school attachment, weapon socialization (including self gun ownership and parent gun ownership), peer weapon carrying, and W1 gun/weapon carrying.

**Missing Data**

With the exception of the parental education measure and the peer weapon-carrying measure, the variables used herein contain less than 5 percent of missing data.

\(^{15}\) The choice to dichotomize was driven by a coding issue affecting wave-one survey data. During the first wave, respondents were asked to provide the number of friends who had carried a gun/weapon in an open-ended fashion (provide the number on the blank provided). Rather than providing numbers of friends, a substantial number of respondents simply put a check mark on the blank line. Hence, in order to retain the cases that provided checkmarks instead of actual numbers, we had to dichotomize into 1 = any friends and 0 = no friends.
cases. Fifteen percent of cases were missing on parental education, and 19 percent of cases were missing data on peer weapon carrying. There were also limitations with measuring peer weapon carrying associated with the open-ended nature of the question in Wave 1. Blank responses could indicate both “missing” and “zero friends.” We chose the more conservative approach, treating blanks as missing cases rather than zero values, thus resulting in the higher amount of missing data on that measure. Despite significant missing data on only two variables, listwise deletion of cases with missing data on any variable in any of the three waves of data resulted in loss of approximately half the sample (N = 1,876).

In the analysis presented herein, therefore, missing data are handled through full-information maximum likelihood estimation employed by AMOS by which available data are used to calculate missing values, allowing the researcher to perform model estimation on an entire sample (for which there exist at least some data). Thus, the models presented below are based upon N = 3,968. While such full-information maximum-likelihood estimation procedures are not as ideal as having complete data on all subjects for all three years, they are typically preferable to losing large numbers of cases to listwise or pairwise deletion (see, e.g., Mayer, 2004). Nonetheless, following Mayer and Leone (1999), we conduct cross-validation analyses on a “pure” (no imputation) subsample obtained after listwise deletion of missing cases (available from the authors upon request). Findings across both analyses were substantively similar, except in the few instances noted below, lending credence to the models reported herein.

Analysis Plan

As reviewed above, our primary concern in this study is the following theoretical path: fear/risk/victimization in 7th grade leads to weapon possession in 8th grade that, in turn, leads to fear/risk/victimization/offending in 9th grade, while controlling for gender, race, socioeconomic status, theoretical predictors of weapon carrying, and school crime/safety perceptions. As such, we use structural equation modeling (SEM) to estimate the models predicting 8th grade weapon possession and 9th grade fear, risk perception, and victimization. SEM is

16. The full information maximum likelihood (FIML) estimation method used by AMOS to handle missing data uses all possible data points in a dataset to generate values for the data that are missing (as opposed to using only the few more plausible values in multiple imputation). FIML assumes that the missing data are missing at random (MAR). While it is possible that data-especially those related to weapon carrying—are not missing at random, we have several reasons to feel general confidence in the MAR assumption. First, as alluded to and reviewed in the text, our data yielded prevalence rates for gun/weapon carrying that were similar to other published studies. Second, we had small amounts of missing data on almost all the variables in any given wave (with the exception of SES and peer weapon carrying). Third, as reported throughout the paper, there were few substantive differences between the findings generated with the models that included no missing data and the FIML-based models under study here (with the effects for race being an important exception). In the models under study here, both the gun carrying and non-gun weapon carrying models converged in 10 iterations.
a comprehensive statistical strategy that extends regression, econometrics, and factor analytic procedures (Bollen, 1989). Although SEM does not "discover causal relations" (Bollen, 1989), the path model presentation of SEM allows the causal hypotheses to be stated clearly and effectively.

There are several advantages of SEM that make it the most adequate statistical technique for use in this study. SEM is more realistic in its allowance for measurement error in observed variables and also allows for the examination of indirect effects that operate through at least one intervening variable included in the model (Bollen, 1989). By requiring the pattern of relationships between variables to be specified beforehand, SEM takes a confirmatory rather than an exploratory approach to the data analysis (Byrne, 1994). The primary reason SEM was chosen as the statistical technique to be used in this study concerns the temporal order of the relationships tested in our models. The purpose of this paper is to determine the longitudinal effect of fear, risk perception, and victimization experiences on weapon possession and, in turn, the effect of weapon possession on subsequent fear, risk perception, and victimization experiences. As such, we felt that SEM not only gave us the added benefit of clarity when testing the model but also allowed us to specify the hypothesized reciprocal relationships and test these effects simultaneously within a linear model, allowing for more measurement precision than other more commonly used statistical techniques (e.g., multivariate linear regression).

It should be noted that SEM utilizing data from complex sample designs presents unique problems for AMOS in that standard errors can be underestimated if within-school errors are non-independent. Given our sampling design—with individual students nested non-randomly within schools—it is likely that our SEM models will suffer from such under-estimation, with inaccurate significance inferences possible. However, Mayer (2004, p. 141) suggests that $z$-scores greater than 5 essentially render such design concerns moot. Therefore, throughout discussion of our findings, we will highlight the extent to which key findings meet this "$z$-score > 5" criterion, with implications for inference clearly stated.17

Results

As the models discussed in this study contain a large number of fully exogenous independent variables and five endogenous dependent variables, we present the results in tabular form rather than the traditional causal model with the

17. It should be noted that we also estimated all models in M-plus, which better handles complex sampling designs through adjustment of standard errors. All findings regarding the key hypotheses tested here were consistent across models estimated in AMOS and those estimated in M-Plus. There were several minor differences in levels of significance among control variables in several of the models, and quite substantively different findings for the effects of race. We, therefore, feel confident in the robustness of the effects between fear and victimization variables and gun/weapon carrying. In contrast, we are hesitant to draw conclusions regarding the effects of race on gun/weapon carrying and fear and victimization variables.
regression coefficients on the paths between the variables under study. The results from the model presenting fear-and-victimization antecedents and effects of W2 firearm possession are presented first (Table 2), followed by presentation of the identical model, except with non-firearm weapon carrying as the intervening variable (Table 3). For each model, we first discuss the association between the W1 (7th grade) fully exogenous variables and the W2 (8th grade) weapon intervening variable. We then discuss the effects on the W3 (9th grade) fully endogenous variables.

Gun Carrying

The results presented in Table 2 provide little support for the fear-and-victimization hypothesis regarding the relationship between subjective and objective school-based crime victimization experiences in 7th grade and in-school firearm possession in 8th grade. The results reveal that the path leading from 7th grade school fear to 8th grade gun possession ($\beta = .014$) was nonsignificant, thus contradicting the "fear and victimization" hypothesis presented earlier. Similarly, contrary to predictions of the fear-and-victimization hypothesis, individual risk perception in 7th grade was negatively related to frequency of firearm carrying in the 8th grade ($\beta = -.064$). Finally, 7th grade victimization had a non-significant effect on 8th grade gun carrying ($\beta = .033$). In terms of control variables, only the effects of previous (7th grade) gun-carrying met the "coeff./S.E. > 5" rule; the level of carrying in the 7th grade was positively related to the level of gun-carrying in 8th grade.

The next four sections of Table 2 highlight the associations between firearm possession in 8th grade and fear, perceived risk, victimization, and offending in 9th grade. Overall, little evidence is provided in support of the idea that carrying weapons to school "works" to lower risk, fear, and victimization. Instead, the "triggering hypothesis" or "weapons effect" is supported. Frequency of carrying firearms to school in 8th grade was significantly positively related to fear in 9th grade ($\beta = .103$), risk perception in 9th grade ($\beta = .119$), victimization in 9th grade ($\beta = .103$), and offending in 9th grade ($\beta = .055$), though the z-score associated with the effect on offending is under 5.0. Thus, the use of

18. Though our endogenous variables consist of ordinal measures and/or ratio scales created from averaging ordinal measures, we assume they approximate ratio measures fairly well and thus feel reasonably comfortable with linear model assumptions made by SEM in AMOS. There is some skewness associated with the gun/weapon carrying measures, though the distribution is not entirely dichotomous. In addition, SEM does not handle dichotomous endogenous variables without violation of model assumptions, so collapsing response categories for those variables was viewed unfavorably. Additionally, we tested a number of models in an attempt to increase the goodness of fit of the models utilized in this study. The final models (for both gun carrying and non-gun weapon carrying) had the following paths estimated in addition to those presented in Tables 2 and 3: (a) all fully exogenous variables were estimated to be correlated with one another, and (2) error terms from all W3 endogenous variables were estimated to be correlated with one another. For brevity purposes, we do not present all the correlations included in our estimation. These are available from the authors upon request.
Table 2  Predictors of school-based gun carrying, fear, risk perception, and victimization and offending

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Wave 1 variables (W1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fear of Crime</td>
<td>.01</td>
<td>.01</td>
<td>.01</td>
<td>.12**</td>
<td>.02</td>
<td>.14</td>
<td>.05*</td>
<td>.02</td>
<td>.06</td>
<td>.20</td>
<td>.14</td>
<td>.03</td>
<td>-.02</td>
<td>.01</td>
<td>-.03</td>
</tr>
<tr>
<td>Risk Perception</td>
<td>-.03*</td>
<td>.01</td>
<td>-.06</td>
<td>.14**</td>
<td>.02</td>
<td>.16</td>
<td>.17**</td>
<td>.03</td>
<td>.18</td>
<td>.11</td>
<td>.15</td>
<td>.02</td>
<td>-.02</td>
<td>.01</td>
<td>-.03</td>
</tr>
<tr>
<td>Victimization</td>
<td>.00</td>
<td>.00</td>
<td>.03</td>
<td>.01*</td>
<td>.00</td>
<td>.11</td>
<td>.02**</td>
<td>.00</td>
<td>.13</td>
<td>.30**</td>
<td>.02</td>
<td>.34</td>
<td>.01*</td>
<td>.00</td>
<td>.09</td>
</tr>
<tr>
<td>Gender (female)</td>
<td>-.01</td>
<td>.02</td>
<td>-.01</td>
<td>.03</td>
<td>.03</td>
<td>.02</td>
<td>.06</td>
<td>.03</td>
<td>.04</td>
<td>-.77*</td>
<td>.20</td>
<td>-.08</td>
<td>-.01</td>
<td>.02</td>
<td>-.01</td>
</tr>
<tr>
<td>Race (White)</td>
<td>-.06*</td>
<td>.02</td>
<td>-.05</td>
<td>.03</td>
<td>.04</td>
<td>.02</td>
<td>.08*</td>
<td>.04</td>
<td>.04</td>
<td>-.36</td>
<td>.26</td>
<td>-.20</td>
<td>-.06*</td>
<td>.02</td>
<td>-.05</td>
</tr>
<tr>
<td>Parental Education</td>
<td>-.00</td>
<td>.00</td>
<td>-.01</td>
<td>-.01</td>
<td>.01</td>
<td>-.01</td>
<td>-.01</td>
<td>.01</td>
<td>-.03</td>
<td>-.08</td>
<td>.06</td>
<td>-.03</td>
<td>-.01</td>
<td>.01</td>
<td>-.02</td>
</tr>
<tr>
<td>School Attachment</td>
<td>-.02</td>
<td>.01</td>
<td>-.03</td>
<td>-.04</td>
<td>.02</td>
<td>-.03</td>
<td>-.04</td>
<td>.02</td>
<td>-.03</td>
<td>-.38*</td>
<td>.16</td>
<td>-.05</td>
<td>-.10*</td>
<td>.01</td>
<td>-.14</td>
</tr>
<tr>
<td>Delinquent Offending</td>
<td>.04</td>
<td>.02</td>
<td>-.04</td>
<td>-.11*</td>
<td>.05</td>
<td>-.06</td>
<td>.03</td>
<td>.05</td>
<td>.02</td>
<td>.79*</td>
<td>.31</td>
<td>.07</td>
<td>.34**</td>
<td>.03</td>
<td>.34</td>
</tr>
<tr>
<td>Parent Gun Ownership</td>
<td>-.01</td>
<td>.02</td>
<td>-.01</td>
<td>.01</td>
<td>.04</td>
<td>0</td>
<td>.06</td>
<td>.04</td>
<td>.03</td>
<td>-.33</td>
<td>.25</td>
<td>-.03</td>
<td>.00</td>
<td>.02</td>
<td>.00</td>
</tr>
<tr>
<td>Self Gun Ownership</td>
<td>.07*</td>
<td>.03</td>
<td>.07</td>
<td>-.06</td>
<td>.05</td>
<td>-.03</td>
<td>-.03</td>
<td>.06</td>
<td>-.01</td>
<td>.42</td>
<td>.34</td>
<td>.03</td>
<td>.07*</td>
<td>.03</td>
<td>.06</td>
</tr>
<tr>
<td>Peer Weapon Carrying</td>
<td>.01</td>
<td>.02</td>
<td>.01</td>
<td>-.05</td>
<td>.04</td>
<td>-.02</td>
<td>-.03</td>
<td>.04</td>
<td>-.01</td>
<td>-.23</td>
<td>.26</td>
<td>-.02</td>
<td>.04</td>
<td>.02</td>
<td>.04</td>
</tr>
<tr>
<td>In-School Gun Carrying</td>
<td>.15**</td>
<td>.03</td>
<td>.15</td>
<td>.08</td>
<td>.05</td>
<td>.04</td>
<td>-.08</td>
<td>.05</td>
<td>-.04</td>
<td>-.26</td>
<td>.33</td>
<td>-.02</td>
<td>-.23**</td>
<td>.03</td>
<td>-.19</td>
</tr>
<tr>
<td>Wave 2 variables (W2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In-School Gun Carrying</td>
<td></td>
<td></td>
<td></td>
<td>.20**</td>
<td>.04</td>
<td>.10</td>
<td>.24**</td>
<td>.03</td>
<td>.12</td>
<td>1.38**</td>
<td>.23</td>
<td>.10</td>
<td>.06*</td>
<td>.02</td>
<td>.06</td>
</tr>
<tr>
<td>Model chi-square / df</td>
<td>4.79 / 4 (p = .31)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NFI</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CFI</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RMSEA</td>
<td>.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < .05; **estimate/SE > 5.0; N = 3,968.
longitudinal data in this model directly contradicts the argument made by many using cross-sectional data (see May, 2001, for example) that youths who are fearful are more likely to carry guns to school (or do so more often). Instead, such findings suggest that fear, risk, victimization, and offending at school are effects of gun possession at school, not antecedents.

An important side note in our examination of the guardianship/deterrent versus triggering effects of weapon carrying on subsequent fear, risk, victimization, and fear is that 8th grade and 7th grade gun carrying had very different effects. In the estimation of fear, risk, and victimization, it was 8th grade gun carrying that had significant positive effects, while the effects of 7th grade carrying were non-significant. However, in estimating 9th grade offending, our model presented in Table 2 reveals that 8th grade gun carrying increased next-year offending, but 7th grade gun carrying actually decreased 9th grade offending. Findings such as these—in combination with the unexpectedly low correlation between 7th and 8th grade gun carrying—suggest that there may be important qualitative differences between in-school carrying among 7th graders versus 8th graders, perhaps related to developmental changes. While exploring such differences is beyond the scope of this study, the differences in effects revealed here are noteworthy.

In addition to the strong effects of 8th grade gun carrying, prior levels (i.e., 7th grade levels) of fear, risk perception, victimization, and offending also had strong positive effects on 9th grade fear, risk, victimization, and offending, respectively. Few control variables were significant across the models, especially when using the "z-score > 5" criterion. In sum, then, the results presented in Table 2 in many ways contradict the “fear-and-victimization hypothesis,” suggested by May (2001) for instance, as applicable in school contexts. Fear of school victimization, perceptions of individual risk, and school victimization did not increase subsequent firearm carrying among students. In contrast, firearm carrying in the 8th grade appears to increase subsequent fear of school victimization, risk perception, victimization, and offending. Additionally, these relationships hold true even after controlling for previous levels of fear, risk, victimization, and offending as well as other important control variables. These effects were revealed in a model that demonstrated strong goodness of fit. The non-significant chi-square ($p = .31$) indicates that the model is appropriate, and the other model-fit statistics presented in Table 2 (e.g., NFI, CFI, RMSEA) suggest a very “good-fitting” model (Byrne, 1994; Mayer, 2004).

Non-Gun Weapon Carrying

In an attempt to determine if the relationship between weapon possession and fear of school victimization, perceived risk of school victimization, and actual school victimization differed by the type of weapon, we estimated a second series of models substituting 8th grade possession of a non-gun weapon for 8th grade firearm possession. These results are presented in Table 3. As suggested
Table 3 Predictors of school-based weapon (non-gun) carrying, fear, risk perception, victimization, and offending

<table>
<thead>
<tr>
<th>Variables</th>
<th>W2 weapon</th>
<th>W3 fear</th>
<th>W3 risk</th>
<th>W3 victim</th>
<th>W3 offend</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unstand. coeff.</td>
<td>SE</td>
<td>β</td>
<td>Unstand. coeff.</td>
<td>SE</td>
</tr>
<tr>
<td>Wave 1 variables (W1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fear of Crime</td>
<td>-.01</td>
<td>.01</td>
<td>-.01</td>
<td>.12**</td>
<td>.02</td>
</tr>
<tr>
<td>Risk Perception</td>
<td>-.03*</td>
<td>.01</td>
<td>-.05</td>
<td>.14**</td>
<td>.02</td>
</tr>
<tr>
<td>Victimization</td>
<td>.01*</td>
<td>.00</td>
<td>.06</td>
<td>.01*</td>
<td>.00</td>
</tr>
<tr>
<td>Gender (female)</td>
<td>.00</td>
<td>.02</td>
<td>.00</td>
<td>.04</td>
<td>.03</td>
</tr>
<tr>
<td>Race (White)</td>
<td>-.05*</td>
<td>.02</td>
<td>-.04</td>
<td>.03</td>
<td>.04</td>
</tr>
<tr>
<td>Parental Education</td>
<td>-.01</td>
<td>.01</td>
<td>-.02</td>
<td>-.00</td>
<td>.01</td>
</tr>
<tr>
<td>School Attachment</td>
<td>-.04*</td>
<td>.01</td>
<td>-.05</td>
<td>-.03</td>
<td>.02</td>
</tr>
<tr>
<td>Delinquent Offending</td>
<td>-.04</td>
<td>.03</td>
<td>-.04</td>
<td>-.05</td>
<td>.05</td>
</tr>
<tr>
<td>Parent Gun Ownership</td>
<td>-.02</td>
<td>.02</td>
<td>-.02</td>
<td>.01</td>
<td>.04</td>
</tr>
<tr>
<td>Self Gun Ownership</td>
<td>.20**</td>
<td>.03</td>
<td>.15</td>
<td>-.07</td>
<td>.05</td>
</tr>
<tr>
<td>Peer Weapon Carrying</td>
<td>.03</td>
<td>.02</td>
<td>.02</td>
<td>-.05</td>
<td>.04</td>
</tr>
<tr>
<td>In-School Gun Carrying</td>
<td>.33**</td>
<td>.03</td>
<td>.29</td>
<td>-.01</td>
<td>.05</td>
</tr>
<tr>
<td>Wave 2 variables (W2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In-School Gun Carrying</td>
<td>.13*</td>
<td>.03</td>
<td>.08</td>
<td>.21**</td>
<td>.03</td>
</tr>
<tr>
<td>Model chi-square / df</td>
<td>4.13 / 4 (p = .389)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NFI</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CFI</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RMSEA</td>
<td>.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < .05; **estimate/SE > 5.0; N = 3,968.
by the strong bivariate correlation between gun and non-gun carrying, findings in Table 3 are very similar to those presented in Table 2.

The results of the first equation presented in Table 3 suggest that the focus on weapons other than firearms (referred to as weapons below) in 8th grade has little impact on the relationships between the 7th grade variables and 8th grade weapon possession. One possible exception is that the path leading from 7th grade school victimization experience to 8th grade weapon possession ($\beta = .058$) was positively related to W2 weapon carrying—in the direction predicted by the fear-and-victimization hypothesis. It should be noted, however, that while this effect was significant at $p < .05$, its z-score did not exceed 5.0. Other findings from Table 3 contradict the fear and victimization hypothesis. For instance, as in the gun-carrying equation (Table 2), 7th grade fear of crime has a null effect on 8th grade other-weapon carrying. Also similar to the gun-carrying model, perception of individual risk in 7th grade is negatively related to weapon carrying in 8th grade ($\beta = -.051$). Many of the control variables behave similarly in the other-weapon carrying equation as in the gun-carrying equation. Previous in-school weapon carrying was positively related to 8th grade in-school weapon carrying, having the largest effect in the model ($\beta = .287$). Likewise, owning a gun was positively related to 8th grade weapon carrying ($\beta = .150$).

The equations that use 8th grade other-weapon carrying to predict 9th grade fear, risk, and victimization are very similar to those models presented for firearm carrying in Table 2. For example, weapon carrying in 8th grade: (a) substantially enhances fear at school in 9th grade; (b) significantly increases individual school-based risk perception in 9th grade; (c) significantly increases school victimization in 9th grade; and (d) significantly increases offending in the 9th grade. These effects—counter to the implications of a fear-and-victimization hypothesis and more consistent instead with a "triggering/weapons effect"—were present when controlling for prior levels of fear/risk/victimization/offending, sociodemographic differences, school attachment, gun ownership (by respondent and respondent’s parents), peer weapon carrying, and wave 1 school weapon carrying. In addition, similar to the models with gun carrying, the models shown in Table 3 suggest that previous levels of fear, risk, victimization, and offending are important predictors of 9th grade levels of fear, risk, victimization, and offending, respectively. Again, few other control variables were significant, especially when the "coeff./S.E. > 5" rule is employed. As was the case with the findings from Table 2, the model fit for the equations presented in Table 3 is very good according to all of the diagnostics.

19. The negative effect of risk perception disappears in both the gun and other-weapon models when estimated using a "pure" sub-sample with listwise deletion of cases with any missing data.
20. While the effect of race had a p-value < .05, its z-score does not exceed 5.0 (the rule we use due to complex sampling designs). In addition, the effect of race on both gun and other-weapon carrying is non-significant in models using a sub-sample of cases obtained after listwise deletion. In models estimated with M-plus, the effect of race is actually in the opposite direction. As stated previously, we therefore are hesitant to make strong conclusions regarding the role of race in the feedback models estimated here.
Discussion and Conclusions

The overall purpose of this paper was to better assess the causal order involved in the relationships between school crime experiences and school weapon carrying. The fear-and-victimization hypothesis suggests that students carry weapons to school in response to antecedent emotional fear of school crime, cognitive school crime risk perception, or actual victimization experiences at school. The implication of the hypothesis is that such defensive weapon carrying would then lower subsequent levels of fear, risk and victimization, with support from this feedback loop offered by deterrence and criminal opportunity theories.

The results presented herein provide minimal support for this theoretical model, regardless of whether one is assessing firearm carrying or other weapon carrying. Previous victimization enhanced subsequent non-gun weapon carrying, as suggested by the fear-and-victimization hypothesis, but this effect was modest (not meeting the z-score > 5 criterion), and it was not apparent when firearms specifically were considered. Fear of personal victimization was unrelated to both gun and non-gun weapon carrying. Further, individual risk perception also had relatively weak effects on gun/weapon carrying (significant at \( p < .05 \), but not meeting the z-score > 5 criterion), and effects were in the opposite direction to what the fear and victimization hypothesis predicts. In light of such findings, it is important to note that the rhetoric that kids who carry weapons to school are doing so out of fear for their personal safety at school appears largely inaccurate according to our data. The strongest predictors in our models of gun/weapon carrying were previous carrying and gun ownership. As such, mere access to weapons, and thus the opportunity to carry, is important to address if in-school weapon carrying is going to be curbed.

In addition to suggesting minimal support for the fear-and-victimization hypothesis as an explanation for student weapon carrying, our findings revealed that weapon carrying tended to enhance rather than reduce subsequent fear, risk perception, and victimization. Thus, again, the assumption behind “defensive carrying” was not supported. Carrying did not appear to “work” as it theoretically should from a fear-and-victimization hypothetical standpoint. Our findings offer further evidence (see also Kellermann et al., 1996; Kleck & Hogan, 1999; Wells & Horney, 2002; Wilcox, 2002) that weapon carrying may have “triggering-” or “weapons effects.” Additional support for this hypothesis was provided in that 8th grade weapon carrying also served to increase 9th grade delinquent offending. Notably, the positive effects for 8th grade weapon carrying (gun and non-gun) on victimization, risk perception, fear of crime, and delinquent offending were all very strong, with z-scores exceeding 5.0 in nearly every case. As such, we feel confident that the significance of these effects is not a function of underestimated standard errors. Further, our findings regarding the fear-and-victimization hypothesis and our strong support of a “weapons” or “triggering” effect were consistent across a variety of models, including those not controlling for wave 1 weapon carrying and those based on a reduced sample created through listwise deletion of cases with missing data.
Such results suggest that weapon carrying may allow or even embolden youths to become involved in risk-generating situations and actual crime and victimization experiences that they would not have beforehand. In short, weapon carrying may be related to enhanced criminal opportunity as opposed to reduced opportunity, or deterrence, as is commonly assumed. To the extent that school-based weapon carrying is not defensive carrying at all, but more “opportunistic,” precipitated by having easy access to guns for carrying, then individual weapon carrying will not likely deter victimization or reduce feelings of vulnerability. Instead, an opportunity to carry may then breed further opportunity (or enhance already existing opportunity) for involvement in a “criminal lifestyle,” associated not only with increased offending but also with increased likelihood of victimization and enhanced cognitive and emotional perceptions of risk/fear (see also Schrek, Miller, & Gibson, 2003).

We recognize that our findings are limited by a single-state sample that excludes a substantial number of eligible participants due to non-consent. Further, as is the case in any school-based delinquency-related study, there is concern that those who do not give consent or who cannot be surveyed are systematically different from those from whom data are obtained. While the proportions of our respondents reporting gun and other-weapon carrying are similar to those reported from other samples, it is possible that our sample is biased with respect to key variables such as weapon carrying, delinquency, and victimization. In short, the focus on students in one state and considerable non-response are important limitations of our study that necessarily qualify our results. Again, however, we view our analysis as a meaningful step in continued refinement of our understanding of student weapon carrying given the strong internal validity of our study.

Our longitudinal data, while not necessarily generalizable, allowed for a more precise test of the causal assumptions of one popular model of student weapon carrying. For the most part, our findings contradict this previous model, highlighting the possible model misspecification that accompanies analyses using cross-sectional data. We encourage future tests of fear-and-victimization effects to incorporate feedback loops into the models in order to assess more accurately whether fear, risk perception, and criminal victimization increase weapon carrying and/or whether, as we show here, weapon carrying increases fear, risk, victimization, and offending. We have provided a study of this issue strong on internal validity but weak on external validity and generalizability. Future work should clearly be directed at assessing the external validity and generalizability of the findings provided.

Acknowledgments

This research was sponsored, in part, by grants (DA-05312 and DA-11317, Richard R. Clayton, PI) from the National Institute on Drug Abuse. The authors would like to thank Richard R. Clayton, Graham C. Ousey, Kimberly Reeder,
Shayne Jones, Michelle Campbell Augustine, and Jon Paul Bryan, for their contributions to the Rural Substance Abuse and Violence Project, which provides the data analyzed here.

References


### Appendix A. Intercorrelations Among Study Variables

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>.71*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>.49*</td>
<td>.51*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>-.02</td>
<td>-.01</td>
<td>-.19*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>.02</td>
<td>.01</td>
<td>-.02</td>
<td>.02</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>-.05*</td>
<td>-.03</td>
<td>-.04*</td>
<td>-.015</td>
<td>.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>-.16</td>
<td>-.20*</td>
<td>-.27*</td>
<td>-.23*</td>
<td>.04*</td>
<td>.08*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>.25*</td>
<td>.30*</td>
<td>.37*</td>
<td>-.15*</td>
<td>-.03</td>
<td>-.08*</td>
<td>-.35*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>.05*</td>
<td>.06*</td>
<td>.09*</td>
<td>-.10*</td>
<td>.16*</td>
<td>-.10*</td>
<td>-.06*</td>
<td>.13*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>.09</td>
<td>.12*</td>
<td>.23*</td>
<td>-.52*</td>
<td>.09*</td>
<td>-.10*</td>
<td>-.26*</td>
<td>.28*</td>
<td>.46*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>.12*</td>
<td>.19*</td>
<td>.22*</td>
<td>-.15*</td>
<td>-.01</td>
<td>-.08*</td>
<td>-.20*</td>
<td>.33*</td>
<td>.12*</td>
<td>.24*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>.17*</td>
<td>.17*</td>
<td>.18*</td>
<td>-.09*</td>
<td>.02</td>
<td>-.00</td>
<td>-.16*</td>
<td>.66*</td>
<td>.06*</td>
<td>.14*</td>
<td>.17*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>.21*</td>
<td>.22*</td>
<td>.27*</td>
<td>-.16*</td>
<td>.01</td>
<td>-.03</td>
<td>-.24*</td>
<td>.71*</td>
<td>.09*</td>
<td>.24*</td>
<td>.33*</td>
<td>.74*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>.02</td>
<td>.01</td>
<td>.07*</td>
<td>-.07*</td>
<td>-.05*</td>
<td>-.03</td>
<td>-.08*</td>
<td>.15*</td>
<td>.03</td>
<td>.10*</td>
<td>.07*</td>
<td>.14*</td>
<td>.14*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>.05*</td>
<td>.05*</td>
<td>.13*</td>
<td>-.14*</td>
<td>-.03</td>
<td>-.05*</td>
<td>-.15*</td>
<td>.22*</td>
<td>.07*</td>
<td>.21*</td>
<td>.15*</td>
<td>.14*</td>
<td>.28*</td>
<td>.76*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>.28*</td>
<td>.29*</td>
<td>.27*</td>
<td>.02</td>
<td>.01</td>
<td>-.03</td>
<td>-.08*</td>
<td>.09*</td>
<td>.01</td>
<td>.00</td>
<td>.03</td>
<td>.07*</td>
<td>.07*</td>
<td>.11*</td>
<td>.09*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>.24*</td>
<td>.28*</td>
<td>.24*</td>
<td>.02</td>
<td>.03</td>
<td>-.05*</td>
<td>-.10*</td>
<td>.12*</td>
<td>.05*</td>
<td>.04*</td>
<td>.05*</td>
<td>.06*</td>
<td>.12*</td>
<td>.14*</td>
<td>.67*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>.23*</td>
<td>.23*</td>
<td>.40*</td>
<td>-.17*</td>
<td>-.04*</td>
<td>-.05*</td>
<td>-.19*</td>
<td>.22*</td>
<td>.03</td>
<td>.16*</td>
<td>.11*</td>
<td>.11*</td>
<td>.15*</td>
<td>.15*</td>
<td>.18*</td>
<td>.51*</td>
<td>.49*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>.07*</td>
<td>.09*</td>
<td>.19*</td>
<td>-.12*</td>
<td>-.06*</td>
<td>-.06*</td>
<td>-.25*</td>
<td>.29*</td>
<td>.06*</td>
<td>.16*</td>
<td>.16*</td>
<td>.09*</td>
<td>.16*</td>
<td>.10*</td>
<td>.19*</td>
<td>.26*</td>
<td>.27*</td>
<td>.39*</td>
<td></td>
</tr>
</tbody>
</table>

*a1 = fear of crime (Y1); 2 = risk perception (Y1); 3 = victimization (Y1); 4 = gender; 5 = race; 6 = parental education; 7 = school attachment; 8 = delinquent offending (Y1); 9 = parent gun ownership (Y1); 10 = self gun ownership (Y1); 11 = peer weapon carrying (Y1); 12 = in-school gun carrying (Y1); 13 = in-school non-gun weapon carrying (Y1); 14 = in-school gun carrying (Y2); 15 = in-school non-gun weapon carrying (Y2); 16 = fear of crime (Y3); 17 = risk perception (Y3); 18 = victimization (Y3); 19 = delinquent offending (Y3).  
*p < .05.