ARTICLE

Gun Threats Against and Self-defense Gun Use by California Adolescents

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Objective: To assess hostile gun use against and self-defense gun use by adolescents.

Design, Setting, and Participants: We use random-digit-dial telephone survey data collected from approximately 5800 California adolescents, aged 12 through 17 years, between November 1, 2000, and October 31, 2001.

Main Outcome Measures: The prevalence and correlates of reported hostile gun use against and self-defense gun use by adolescents, as well as qualitative information about these 2 types of gun uses. Correlates include age, sex, ethnicity, smoking, alcoholic binge drinking, threatening others, parents knowing their adolescent's whereabouts in the afternoon after school, attending school, area urbanization and poverty level, and living in a household with a gun.

Results: Approximately 4% of the adolescents reported ever having been threatened with a gun; only 0.3% reported using a gun in self-defense. Boys, smokers, adolescents who threatened others, and adolescents whose parents knew little about their whereabouts in the afternoon after school were more likely to report being threatened with a gun. Most episodes of self-defense gun use seem to be hostile interactions between adolescents with weapons.

Conclusions: Far more California adolescents are threatened with a gun than use a gun in self-defense. Self-defense gun use is rare; many of the reported self-defense gun uses seem to be armed confrontations.

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THE UNITED STATES HAS more guns, particularly handguns, per capita than other high-income countries, and generally higher rates of homicide for adults and children.[1-3] While reliable state data exist on total firearm deaths, including homicide, suicide, and unintentional injuries,[4] most states do not have good data on nonfatal woundings; national estimates are derived from a sample of hospitals.[5]

Shootings that result in injury or death are only a small percentage of interpersonal hostile events involving firearms. In some of these other events, guns may be instruments of aggression or intimidation; in others, guns may deter or thwart criminal assaults. Some national information about these noninjury events comes from the semiannual National Crime Victimization Survey and some information comes from nonfederal one-time surveys. The National Crime Victimization Survey obtains information on gun use only if the respondent first says she or he has been the victim of 1 of 6 serious criminal acts (ie, rapes and sexual assaults, assaults, robberies, thefts, household burglaries, and motor vehicle thefts). The National Crime Victimization Survey may miss many less serious or less clear-cut criminal gun uses.[6]

Most private studies of guns and adolescents obtain data from school surveys.[7-20] These studies generally focus on gun carrying and, occasionally, gun threats against the respondent; results consistently show that most adolescents who carry a gun claim to do so for protection or self-defense. We could not find any nonfederal adolescent survey that asked for descriptions of the gun threats or any that asked about self-defense gun use.

Data for the current study come from a random-digit-dial telephone survey of adolescents aged 12 through 17 years for the entire state of California, including those who may have dropped out of school. Our study provides new information about the firearm-related experiences of adolescents, specifically interpersonal threats and gun uses in self-defense, events that usually are not physically injurious.

METHODS

The California Health Interview Survey (CHIS) was the largest health survey of its kind in the nation. Data came from a random-digit-dial telephone survey of adults, adolescents, and children. Information for the present study was gathered as a supplement to the adolescent survey. The detailed method for the CHIS is available in a series of 5 reports.[21]

The CHIS sample came from the population of all households in California with a telephone number. The sample was classified into 41 strata: 33 constituted counties of more than 100 000 people; groupings of the remaining less populous counties constituted the other 8 strata. A sample from each stratum was selected using a computer-generated list of all (listed and unlisted) telephone numbers. In each household selected, 1 adult was randomly selected to be interviewed.

If an adolescent lived in the household, the adult (parent or guardian) was asked for verbal consent to allow the adolescent to be interviewed. Consent was then requested from the adolescent. If more than 1 adolescent resided in a household, one was selected at random. Among adults with an adolescent, 75% allowed the adolescent to be interviewed. Of those adolescents, 84% agreed to be interviewed, leading to a response rate of 63%. However, we have a dual layer of permission. First an adult needed to be reached; including those households that were called but no adult was reached (eg, no response or surveyors only reached an answering machine) as well as adults who were reached but refused to be interviewed, the adult response rate was 38%. Thus, the overall response rate for the adolescent part of the survey was 24% (38% × 63%). The CHIS collected data from more than 55 000 households; 5801 adolescents were interviewed between November 1, 2000, and October 31, 2001.

Interviews were conducted in English, Spanish, Mandarin, Cantonese, Vietnamese, Korean, and Cambodian (Mon-Khmer); the survey instrument was translated and back-translated to ensure comparability. About 9% of the adolescents were interviewed in a language other than English. Adolescents were asked a series of gun-related questions, including: "Has anyone ever brought out, shown, or used a gun against you in a threatening way?" and for those answering in the affirmative, "Please describe the most recent time." All adolescents were also asked, "Have you ever brought out, shown, or used a gun against another person in self defense?" with a follow-up "Please describe the most recent time." Of the 5801 adolescents who were surveyed, 10 did not answer the gun threat question and 9 did not respond to whether they had ever used a gun in self-defense.

After reading the responses, we created 12 mutually exclusive categories for the gun threats and 3 for the self-defense gun uses. Two graduate students at Harvard School of Public Health separately read and categorized the short responses to the open-ended questions and then met and reached agreement on a single classification for each. For the gun threats, the students also decided whether the perpetrator was an adolescent, an adult, or if it was unclear from the description.

We examined 11 potential correlates of gun threats and gun use in self-defense. Nine correlates came from the following responses of the adolescents: (1) having a gun in the home; (2) age (16-17, 14-15, or 12-13 years old); (3) sex (male/female); (4) race/ethnicity (white, Asian, black, or other); (5) being a cigarette smoker ("Have you ever smoked cigarettes regularly, ie, at least 1 cigarette every day for 30 days?"); (6) being a binge drinker of alcoholic beverages, being a drinker of alcoholic beverages but not a binge drinker, or not being a drinker of alcoholic beverages ("How many days in the past 30 days did you have 5 or more drinks in 1 day?" [One or more days constitutes binge drinking.] and "Have you ever had more than a few sips of any alcoholic beverage like wine, beer, mixed drinks, or [hard] liquor?"); (7) threatened or not ("In the past 12 months, how many times did you threaten to hurt someone or threaten to beat them up?"); (8) a lot of parental involvement vs little or nothing ("How much do your parents [or guardians] really know about where you are most afternoons [after school]?"); and (9) attending school or not.

In addition, 2 variables—urban or rural residence and annual income (>3 times the poverty index or not)—came from the adult questionnaire. These 11 correlates were selected for the final model before any findings were examined and were selected based on characteristics previously linked to offensive gun use against and defensive gun use by adults and to risky behavior by adolescents. The exact categories for age and for the extent to which parents knew the whereabouts of the adolescent in the afternoon after school were determined after preliminary analysis of the results.

For gun threats, since we had a sufficient number of incidents, we used bivariate χ^2 analyses and multivariate logistic regression analysis. The CHIS used a sophisticated weighted scheme to account for a wide variety of factors, described in detail elsewhere,[21] including multiple telephone lines (these households were more likely to be contacted), a listed address (these households were more likely to have received an advance letter), and oversampling of rural areas and of certain ethnic groups. Findings can be considered to be a reasonable approximation of the population of adolescents in California. The study received Human Subjects Approval from the Harvard School of Public Health institutional review board, Boston, Mass.

RESULTS

Respondents ranged from age 12 through 17 years, with an almost equal number in each age category. Forty-three percent were non-Hispanic whites, 39% were Hispanics, 8% were non-Hispanic Asians, 5% were non-Hispanic blacks, and 4% identified themselves as belonging to some other race/ethnicity; 98% were attending school. Twenty percent reported living in a home with a firearm (**Table 1**). Approximately 4% of these 5801 California adolescents reported a gun threat against them; by contrast only (0.3%) reported using a gun in self-defense (Table 1).

In bivariate analysis, older adolescents, boys, those who had ever smoked, recent binge drinkers, adolescents who had threatened others in the past year, those whose parents did not know a lot about their whereabouts in the afternoon after school, and poorer teenagers were more likely to report that they were ever threatened with a gun (**Table 2**). They were also more likely to have ever used a gun in self-defense. For example, while only 5% of the respondents reported having ever smoked cigarettes regularly, 31% of those threatened with guns, and 86% of self-defense gun users reported ever having smoked regularly (Table 1). While only 18% of the respondents reported binge drinking in the past year, 42% of those threatened with a gun and 71% of self-defense gun users reported binge drinking. While 19% of the respondents reported that their parents did not know a lot about where they were in the afternoon after school, the comparable figures for those had ever threatened someone with a gun and those who used a gun in self-defense were 38% and 73%, respectively (Table 1). In the multivariate analysis for being threat-

ened with a gun, older adolescents, being male (odds ratio, 2.1, 95% confidence interval, 1.3-3.4), smoking (odds ratio 6.2, 95% confidence interval, 3.9-9.9), and threatening others (odds ratio 2.5, 95% confidence interval, 1.5-4.0) remained statistically significant.

African Americans were more likely than other ethnic groups to be threatened with a gun (eg, 7.6% of non-Hispanic blacks report having been threatened with a gun vs 3.2% of whites). However, no African Americans reported using a gun in self-defense. Adolescents not attending school (only 2% of respondents) were more likely to be the victims of gun threats (although this was not significant in the multivariate analysis); none of these adolescents reported using a gun in self-defense.

The 12 categories of gun threats are listed in order of prevalence, except for the last 2: (1) argument, (2) no reason for attack by a stranger, (3) robbery, (4) fooling around, (5) gang, (6) drive-by shooting, (7) police, (8) dating, (9) family, (10) self-defense by gun user against respondent, (11) circumstances unclear, and (12) probably not an actual gun threat. Thirty-two events were categorized as arguments, 29 as no reason for the attack by a stranger, and 21 as robberies (**Table 3**). In only half of the cases was the description sufficiently detailed to allow a determination of the apparent age of the perpetrator; in 78% of these instances, the aggressor was an adolescent. Of the 15 self-defense gun uses, 10 were confrontations outside of the home, 3 involved potential intruders at home, and in 2 instances the circumstances were unclear.

Table 1. Weighted Distribution of Characteristics Among 5801 California Adolescents*

Respondent Characteristic	Entire Cohort	Cohort Who Have Ever Been Threatened With a Gun	Cohort Who Ever Used a Gun in Self-defense
Ever threatened with a firearm	3.9	100	52
Ever used a firearm in self-defense	0.3	5	100
Gun in the home	20	27	52
No gun in the home	78	72	48
Missing information	3	1	2
Age, y			
16-17	33	55	53
14-15	33	30	44
12-13	34	15	3
Sex			
Male	51	73	85
Female	49	27	15
Race/ethnicity			
Non-Hispanic white	43	35	57
Hispanic	39	45	30
Non-Hispanic black	5	10	0
Non-Hispanic Asian	8	2	0
Non-Hispanic other	4	7	13
History of smoking			
Smoke	5	31	86
Do not smoke	95	69	14
History of drinking alcoholic beverages			
Binge drink	18	42	71
Drink, do not binge drink	14	19	26
Do not drink	68	39	3
History of aggressive behavior			
Threatened others	19	49	95
Do not threaten others	81	49	5
Missing information	<1	2	
Parental knowledge of after-school activities			
Parents do not know whereabouts	19	38	73
Parents know whereabouts	81	62	27
History of school attendance			
Do not attend	2	5	0
Attend	98	95	100
Residence			
Urban	86	88	89
Rural	14	12	11
Annual household income			
<3 Times the poverty index	57	69	89
≥3 Times the poverty index	43	31	11

*Of the 5801 California adolescents interviewed, 200 reported ever having been threatened with a gun and 15 reported ever using a gun in self-defense. Data are given as percentages of the cohort who reported the characteristic noted in a given row (all are weighted results). Some categories, as presented, do not sum to exactly 100% due to rounding errors.

COMMENT

Our results focus on 2 aspects of victimization and firearms: whether the adolescent was ever threatened with a gun, and whether (supposedly in response to some threat) the adolescent ever used a gun for self-defense. Consistent with surveys of adults,[6,22-24] we find that far more California adolescents report having guns used against them than report using guns in self-defense.

The rate of gun threats reported by our sample of California adolescents between 2000 and 2001 is lower than those reported in studies from the early 1990s when rates of adolescent crime and violence were much higher. For example, in 1 national study, 11% of the elementary, middle, and senior high school students reported having been shot at by someone else in the past year[25]; in another study of 10 inner-city high schools in 4 states, 20% of the high school students reported being threatened with a gun and 12% reported being shot at in school or in transit to or from school in the last few years.[8,26] In a 1993 study of Jefferson parish (Louisanna), a wealthy predominantly white suburb of New Orleans, 23% of the high school students reported that they had been threatened with a gun in the past year.[10,12]

By contrast, a 1996 national survey of male 16- to 18-year-old high school students found that 8% reported firearm-related threats against them.[27] Compared with that 1996 survey, our population is aged 12 though 17 years, and half are female. When we look at adolescents aged 16 through 17 years, the rate of gun threats among our population increases to 7%; when we look only at males aged 16 through 17 years, the rate of gun threats increases to 10% (not shown).

Adolescents who are threatened with guns are often youth who engage in high-risk behaviors. For example, 1 study of 10 inner-city high schools found those threatened with a gun were more likely to use hard drugs, be drug dealers, carry a gun, and carry a gun in school.[8] Consistent with findings from inner cities, we find that across California as a whole, adolescents who report hav-

Table 2. Correlates of 200 Instances of Hostile Gun Use Against 5801 California Adolescents, 2000-2001

Respondent Characteristic	Percentage of Adolescents With a Given Characteristic Who Have Ever Been Threatened With a Gun	Adjusted Odds Ratio (95% Confidence Interval) for Ever Having Been Threatened With a Gun
Gun in the home	5.3	1.4 (0.8-2.3)
No gun in the home	3.6	(Reference)
Missing	2.1	0.8 (0.2-3.0)
Age, y		
16-17	6.6*	2.3 (1.2-4.6)†
14-15	3.4†	1.5 (0.7-3.2)
12-13	1.7	(Reference)
Sex		
Male	5.5*	2.1 (1.3-3.4)‡
Female	2.1	(Reference)
Race/ethnicity		
Non-Hispanic white	3.2	(Reference)
Hispanic	4.5	1.6 (1.0-2.7)§
Non-Hispanic black	7.6‡	2.6 (1.2-5.7)†
Non-Hispanic Asian	0.8†	0.4 (0.1-1.7)
Non-Hispanic other	6.5§	1.8 (0.7-4.7)
History of smoking		
Smoke	23.2*	6.2 (3.9-9.9)*
Do not smoke	2.8	(Reference)
History of drinking alcoholic beverages		
Binge drink	9.1*	1.2 (0.7-2.1)
Do not binge drink	5.1*	1.1 (0.6-1.9)
Do not drink	2.3	(Reference)
History of aggressive behavior		
Threatened others	10.1*	2.5 (1.5-4.0)*
Do not threaten others	2.4	(Reference)
Missing information	8.8	2.9 (0.8-10.6)
Parental knowledge of after-school activities		
Parents do not know whereabouts	7.7*	1.6 (1.0-2.5)§
Parents know whereabouts	2.9	
History of school attendance		
Do not attend	9.4†	1.3 (0.4-4.1)
Attend school	3.8	
Residence		
Urban	4.0	1.5 (0.9-2.6)
Rural	3.3	
Annual household income		
<3 Times the poverty index	4.7*	1.3 (0.8-2.3)
≥3 Times the poverty index	2.8	

*$P<.001$.
†$P<.05$.
‡$P<.01$.
§$P<.10$.

ing been threatened with a gun—as well as those who report ever using a gun in self-defense—tend to be individuals who report engaging in high-risk behaviors (eg, smoking, binge drinking) at some point.

Black adolescents are far more likely than white adolescents to be murdered with a firearm[4] and black college students are also more likely to report having been threatened with a gun.[28] In our survey, black California adolescents were also far more likely to report being threatened with a firearm. Interestingly, however, none of the black adolscents in our survey reported using a firearm in self-defense.

Our study indicates that gun threats against adolescents take many forms. Using our classification, the largest categories of gun threats were arguments, robberies, and threats by strangers for no apparent reason.

Self-defense gun use was uncommon; only 0.3% of the adolescents reported ever using a gun in self-defense. Most adolescents who reported using a gun in self-defense also reported ever regularly smoking, binge drinking in the past month, threatening others, having parents who do not know much about their whereabouts in the afternoon after school, and having a firearm in the home.

While it is sometimes assumed that self-defense gun use is beneficial for society, that idea is being viewed with increasing skepticism.[29-31] Even taking the self-reports as accurate and unbiased, most of the self-defense gun uses reported by these California adolescents seem to be little more than escalating arguments or armed conflicts among rivals. Such results are consistent with findings from other studies of youth. For example, a longitudinal analysis of weapons use among inner-city youth concluded that, "consistent with the literature, the distinction between protective and aggressive weapon use is often a blurry one."[32(piii)]

Table 3. Circumstances of Gun Threats Among California Adolescents, 2000-2001

Type of Gun Threat	No. of Instances
Argument	32
No reason by a stranger	29
Robbery	21
Fooling around	15
Gang related	15
Drive-by	9
Dating	5
Family	5
Police	5
Self-defense	4
Unclear	45
Probably not a gun threat	15
Total	**200**

What This Study Adds

Previous work has documented the incidence of adolescent deaths due to firearms, and less comprehensively, serious firearm injuries and gun carrying among adolescents. However, to our knowledge, no study has examined adolescent self-defense gun use or obtained descriptive information about gun threats against adolescents. The current study provides new information about noninjurious, interpersonal, firearm-related experiences of adolescents.

We find that adolescents report far more gun threats against them than self-defense gun use by them, and most gun threats seem to come from other teenagers. Self-defense gun use is rare, and most reported instances seem to be armed confrontations among teenagers. Adolescents who are threatened with guns disproportionately engage in various high-risk behaviors, such as smoking and alcoholic binge drinking.

Approximately 20% of the adolescents reported having a gun in the home.[33] This figure agrees with results from the Center for Disease Control and Prevention's 2001 Behavioral Risk Factor Surveillance System that found that 21% of the adults in California reported living in a home with a firearm.[34] In our study, in simple bivariate analysis we found that a gun in the home was associated with having been threatened with a gun and with using a gun in self-defense.

Although a strength of the CHIS adolescent survey was its ability to capture adolescents who have left school, fewer than 2% of the adolescents in the survey were not in school. These adolescents were more likely to be threatened with a gun (although the variable was not statistically significant after controlling for cigarette smoking and other correlates).

The CHIS has a variety of other strengths. It was designed to capture the diversity of California's population by administering the questionnaire in multiple languages. Survey questions were culturally reviewed, advance letters were sent in 6 languages to most of the potential sample, and interviewers trained in refusal conversions recontacted potential respondents who initially refused to participate.

Unfortunately, in recent years general response rates to telephone surveys seem to have decreased. Caller ID (identification), call blocking, and other technological changes, along with an increase in marketing calls masked as scientific surveys, may have contributed to the reduction. In the CHIS, while 84% of the adolescents contacted agreed to be interviewed, considering the dual layers of permission, the overall response rate was only 24%. In addition, it is estimated that 5% of the households in California do not have a telephone and, thus, were not part of the survey. These factors limit the generalizability of the results. The absence of households without telephones from the survey may mean some of the poorest adolescents at high risk for assault with a firearm are excluded from the analysis.

The survey has other limitations. The results come from only 1 state and may not be generalizable to other states. These data come entirely from the self-report of adolescents, with all such potential reporting bias. The definition of gun threats and self-defense gun use was left to the respondent and the open-ended descriptions given were usually short, and sometimes unclear. Our categories for gun threats and gun use in self-defense were created a posteriori after reading the short narratives. Nevertheless, the wide variety of gun threats suggest that there are many uses of guns against adolescents that may not be captured in any official statistics, such as youth public health surveillance surveys, crime reports, emergency department logs, or death certificates.

There are many reasons, including the limitations discussed above, why our results should not be extrapolated to obtain population-based estimates of the absolute number of gun uses by and against adolescents. Our results might be underestimates, if, for example, some adolescents did not want to make any admissions if they believed their parents might be within hearing distance. On the other hand, our results might be overestimates: some 30% of the gun threats were classified as "unclear" or "probably not a gun threat." A possible cause of major overestimates is the false-positive problem of rare events[35,36]: if we have as little as 0.3% random misclassification of self-defense gun use, our results could be off by an order of magnitude.

Finally, the data are cross-sectional, and the variables do not always deal with behavior over the same period (eg, ever use a gun in self-defense, ever regularly smoke, binge drink in the past month). Thus, the covariates of gun use cannot legitimately be labeled "risk factors."

Despite these limitations, our results suggest that gun threats against adolescents in California are far more common than gun uses by them in self-defense. It appears that gun threats against adolescents—at least for those instances when there was sufficient description to determine the age of the aggressor and what happened—are mainly by other adolescents and that the typical self-defense gun use involves teenagers in armed confrontations. The California adolescents in our study who had ever been threatened with a firearm were more likely than the average California adolescent to be male; to have engaged in high-risk behaviors such as cigarette smok-

ing, binge drinking, or threatening others; and to have parents who did not know much about their whereabouts in the afternoon after school.

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