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One-Year Prospective Prediction of Violence Perpetration Among High Risk Youth from Personal and Social-Environmental Variables

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One-year Prediction of Violence Perpetration Among High-risk Youth

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***Objective*: Measures of drug use, law-abidance beliefs, sensation seeking, fear of victimization, high-risk group identification, self- protection needs and behaviors, and demographics were investigated as longitudinal predictors of violence perpetration among 870 high-risk adolescents. *Method*: Self-reports from the same youth were obtained 1-year apart. *Results*: In addition to baseline violence perpetration, marijuana use, relatively young age, male sex, high-risk group self-identification, low perceived efficacy of the police department, and nonavoidance of dangerous places predicted later perpetrated violence. *Conclusion*: Personal and social factors beyond baseline violent behavior predict risk for future violent behavior.**

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Violence perpetration among youth is a major concern among public health professionals because of the increase in number of such events compared to 40 years ago, as well as the dramatic impact of these events.[1] In 1995, 19% of all those arrested for violent crimes in the United States were 18 years old or younger, and homicide was the second leading cause of death among 15-to-24-year-old youth.[2-5] A better understanding of the prospective predictors of violence perpetration may help improve our knowledge of its etiology and suggest effective preventive interventions.

Current knowledge indicates that predictors of youth violence include several personal and social-environmental factors.[1,5] Personal variables are behaviors or beliefs that reflect a person's inclinations, as opposed to direct interaction with a larger social environment. One personal variable is substance use. Those youth who are involved in some or multiple violent acts also tend to be problem drug users.[1,6-8] One may conjecture whether or not this association is due to the composition of an illicit drug distribution system, direct effects on nervous system function, or other reasons.

Another personal variable is one's beliefs pertaining to law abidance. Youth may create ways of comprehending reality that generate violent behavior. For example, law-abidance beliefs that defend perpetration of illegal acts (such as drug use and drug dealing) may involve the same types of logic that defend or facilitate violent behavior, as an aspect of

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general delinquency.[6-10] A third type of personal variable is affect related. One such variable is sensation seeking. Youth who like to do things that are a little frightening to have fun, for example, might act out through violence.[7] In addition, youth who feel stressed or depressed may respond more aggressively to interpersonal conflicts.[8-9]

Social-environmental variables place youths and their behavior within a larger social context. For example, youth who perceive others as hostile toward them may engage in aggressive forms of self-protection.[7,11-13] These perceptions, and subsequent violent behavior, may be influenced by previous experiences with being victimized by others, as was found by Cooley-Quille and colleagues.[14] Other social-environmental variables include one's peer group and methods of self-protection. Youth who have belonged to a high-risk group such as a gang might act out through violence as an expression of group norms.[7,13] In addition, youth who fail to stay away from places that are unsafe and who carry a weapon may be more likely to participate in violent behavior.[1,7,15]

Still other social-environmental variables include demographics. Older male adolescents are involved in a relatively greater number of violent events, due to several biopsychosocial influences (e.g., beliefs in physical prowess or testosterone levels).[16] Youth from single-parent homes and from a lower socioeconomic status are relatively likely to perpetrate violence due to social-environmental disadvantages. Also, African American youths are more likely than youths from other ethnic groups to be involved in violence, probably due to greater socioeconomic-related strains such as blocked pathways of economic opportunity.[1,9,12-13]

The Present Study

This study explored personal and social-environmental variables that may predict violence perpetration in high-risk youth. Personal variables were divided into three types: drug-use measures, law abidance-related beliefs, and affect-related measures. Social-environmental variables were divided into 4 types: victimization-related measures, high-risk group identification measures, self-protection measures, and demographics.

A baseline violence measure was included as a variable in all prediction models for 2 reasons. First, the best predictor of future behavior is past behavior.[17-18] Second, to identify whether other variables can predict risk of future violence perpetration independently of their link to baseline violence perpetration, it is necessary to control for baseline violence perpetration in the analyses.

This study explored personal and social-environmental variables that may predict violence perpetration in high-risk youth.

These measures were administered to a longitudinal cohort of continuation high school youth from 21 schools at baseline and 1 year later. Continuation high schools were first established in 1919 based on the California Educational Code (Section 48400), which requires California youth (<18 years of age) to have continuing (part-time) education. Continuation high school youth have transferred out of the regular system (comprehensive high school) due to functional problems (e.g., lack of credits, truancy, violent behavior, drug use).[19-20] These youth are an appropriate population in which to examine the prospective prediction of violence because such behavior is likely to occur more frequently than in a low-risk sample, yet sufficient variation in violence exists to be able to examine covariation among predictors and self-reported violence 1 year later.

METHODS

School Selection

A total of 29 school districts from a 5-county region of southern California were recruited for participation in a previously conducted study using a procedure approximating random selection.[21] Each of those cooperating districts contained one continuation high school. Twenty-one continuation high schools were selected from that pool for participation in the present study by eliminating schools with atypical student-enrollment size (fewer than 50 or more than 500 students).

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Subjects

Subjects (n=962 pretested students) varied from 14 to 19 years of age at baseline; 93% of this sample was 16 to 18 years old (mean age=16.7 years, SD=0.8). The sample was 55% male, 37% white, 49% Latino, 4% Asian American, 8% African American, and 2% Native American; only 1.2% of the sample reported a preference for a language other than English; 46% lived with both parents; approximately 60% of youths' parents completed high school, and modal occupations were skilled or semiskilled laborers among the fathers (42%), and minor professionals or small business owners among the mothers (31%). A total of 70% of the sample reported having perpetrated some type of violent act against another person or property in the previous year.

Data Collection

Prior to baseline survey administration, all students in the accessible classes were asked to have their parents sign and return an internal review board-approved consent form providing written permission or refusal for participation in any part of the testing. For all students who did not return a signed form, attempts were made by project staff to contact the parent by telephone to describe the study and obtain verbal permission or refusal.

Baseline measures were collected during single classroom sessions during regular school hours from October 1994 to July 1995. Different measures were placed in three different questionnaire "sections." Demographic and drug use-related items were placed in a core section, which was always at the beginning of the surveys. Psychosocial items, such as sensation seeking, were placed in a psychosocial section of the questionnaire. Knowledge and belief items were among those placed in a knowledge section. The psychosocial and knowledge section placement order was rotated at baseline. Questionnaire forms were randomly distributed to subjects within classrooms. The questionnaire completion rate was sufficiently high (84%) that a fixed item order was used at 1-year follow-up.

A follow-up data collection effort was completed an average 13.5 months after the baseline (SD=1.7 months) and serves as the outcome endpoint for the present analysis. Follow-up surveys were administered in several different ways. If a targeted student was still enrolled at the continuation high school (23% of those surveyed), project staff (previously unknown to the student) went to the school and surveyed that student using a paper-and-pencil questionnaire. The majority of follow-up students (77%) were surveyed by telephone using an interview format. Project staff (previously unknown to the student) contacted the subjects by telephone, read the questionnaire items to them, and recorded their responses on a survey form. Survey items and response categories were identical to the in-school questionnaire format, and subject responses generally consisted of innocuous words, such as numbers, letters, agree-disagree, or true-false. All collection efforts were stopped after 4 months of attempting to followup a given subject (mean number of follow-up days=25.8, SD=32.9 days).

Of the pretested students, 1,587 (79%) provided parental consent allowing a resurveying of the student in the future. The homes of 76% of the targeted sample were reached at the 1-year follow-up. However, 6% of the students were not available for interview after repeated attempts, and 3% of the youth or their parents refused to continue participation. Successful resurveying of 1,074 (67%) of the target follow-up sample was achieved. The follow-up measurement rate obtained in this study is comparable to that obtained with traditional school samples at 1-year follow-up as documented in a review by Hansen and colleagues.[22]

The retained sample size for the present analyses varied between 808 and 962, depending on the statistical model. Attrition analyses indicated that there were no statistically significant baseline value differences on any variable assessed for this study between subjects measured at both occasions and all those measured at baseline.[23-24] Thus, the analysis sample approximated a random subsample of baseline subjects, indicating good exter-

nal validity for analyses to be completed. In addition, the confidential data collected by telephone did not differ from the full sample, and those measured by telephone at follow-up did not differ in their baseline in-person reports from those measured anonymously at baseline.[23-24]

Measures

The measures presented include a violence-perpetration measure, personal measures (current drug use, law-abidance beliefs, and affect related), and social-environmental variables (fear of victimization/victimization related, peer-group identification, self-protection, demographics). To establish internal consistency on measures composed of two items, a Pearson's r correlation was used, and when the sample consisted of three or more items, Cronbach's alpha was calculated.

Violence-Perpetration Measure

Violence perpetration was an index adapted from the 1981 Monitoring the Future survey form 2[25] (Cronbach's alpha=.82) and consisted of the mean response of four 6-point items (response anchors ranged from "never" to "5 or more") that assessed "In the last 12 months, how many times have you": "used a weapon like a knife, gun, or club to injure someone?", "used a weapon like a knife, gun or club to threaten a person?", "slapped, punched, kicked, or beaten up someone?", or "damaged or stolen someone else's property on purpose?" The original violence-perpetration measure consisted of seven items. Three original items that pertained to theft or property damage were combined into one item. One item that pertained to threatening someone without a weapon was deleted. The other 3 items were worded exactly as in the original measure. At follow-up, 16% of the sample reported having used a weapon to injure someone, 20% reported having used a weapon to threaten someone, 58% reported having attacked someone physically, and 31% reported having damaged or stolen someone else's property. The property-destruction item was highly correlated with the others in the measure (item-total measure correlation=.56), and the pattern of all results to be reported is the same whether or not this item is included. Thus, we retained this item in the measure.

The baseline sample reported a mean of .40 (SD=0.82) hard drugs used in the last 30 days.

Personal Measures

Current Drug-use Measures

To access current drug-use behavior at baseline, subjects were asked "How many times in the last month have you used..." each of eight different drug categories. Questions were directed to frequency of use of "cigarettes," "alcohol," "marijuana," "cocaine (crack)," "hallucinogens (LSD, acid, mushrooms)," "stimulants (ice, speed, amphetamines)," "inhalants (rush, nitrous)," and "other drugs (depressants, PCP, steroids, heroin, etc.)." Eleven response choices were offered on each item; the first choice was "0", and other response choices were provided increasing in intervals of 10 (e.g., "1-10 times," "11-20 times") with a last category being "91-100+ times." A total of 57%, 65%, and 55% of the baseline sample reported use of cigarettes, alcohol, and marijuana in the last 30 days. Cigarette, alcohol, and marijuana use were standardized and measured as separate items. The remaining 5 items were standardized and averaged to form an illicit-drug-use index at baseline (Cronbach's alpha=.82). A total of 31% of the baseline sample reported use of a hard drug in the last 30 days. In addition, current use of the 5 remaining illicit drugs was re-coded as binary current use items, and their mean composed an index of how many of these drugs the subjects used at least once in the last 30 days. The baseline sample reported a mean of .40 (SD=0.82) hard drugs used in the last 30 days. The test-retest reliability of these measures has been previously demonstrated.[26] These items are of the format used by the Monitoring the Future Study. A final, sixth drug-use related measure was addiction concern, a 2-item index that assessed concern about becoming a drug addict or alcoholic (r=.63).[27]

Law-Abidance Beliefs

Five binary variables included items

The sensation-seeking measure consisted of 11 true-false items from the Zuckerman-Kuhlman Personality Questionnaire.

such as "Frank was very drunk; he walked by the car of a schoolmate he does not like. He scratched the paint near the car door with his keys. Was he responsible?" Responses included "yes" versus "no, the schoolmate probably had it coming, the car's insured anyway." Another example is "When one gets into trouble with the authorities because of drug use..."; responses included "the authorities often are picking on someone they don't like" versus "the authorities are trying to protect people from harm." A final, sixth law-abidance belief consisted of two 4-point items that assessed the degree to which one perceives that drug use is "wrong" and they would feel "guilty" if they used drugs (morality of drug use; r=.59).

Affect Related

The sensation-seeking measure consisted of 11 true-false items from the Zuckerman-Kuhlman Personality Questionnaire.[28] One item included "I like doing things for the thrill of it" as an example (Cronbach's alpha=.75). Perceived stress included 3 binary items: "In the last month, I have often been upset because of something that happened," "In the last month, I have often felt unable to control the important things in my life," and "In the last month, I have often felt nervous and stressed" (adapted from the Perceived Stress Scale (Cronbach's alpha=.68).[29] Three of the original 14 perceived-stress items were retained, and responses were changed from a rating scale format to binary responses, for easier completion by adolescents. Depression in the last week was measured by calculating the mean score on the 20-item Center for Epidemiological Studies-Depression Scale, CES-D.[30] The 4 response choices ranged from "rarely or none of the time (less than 1 day)" to "most of the time (5-7 days)" (Cronbach's alpha=.84).

Social-environmental Variables

Victimization-related Measures

Three measures were assessed. The violence-victimization measure was an index adapted from the 1981 Monitoring the Future survey-form 2 in the same way as the current violence-perpetration measure.[25] (Cronbach's alpha=.77), and consisted of four, 6-point items that assessed being injured with a weapon, threatened with a weapon, injured by someone without a weapon, or having had property damaged or stolen in the last 12 months. We were also interested in assessing perceived vulnerability to future victimization, which was not included in the Monitoring the Future survey. Therefore, we created our own measure, using the same format as the perpetration and victimization measures. It consisted of four 4-point items that assessed perceived likelihood of being injured with a weapon, threatened with a weapon, injured by someone without a weapon, or having one's property damaged or stolen in the next 12 months (Cronbach's alpha=.81). Finally, perceptions regarding the efficacy of the police department was measured with one 5-point item, "In your opinion, how often is the police department effective in protecting you from crime?" ("never" to "always"). This one item was measured at the 1-year follow-up, whereas all other items were measured at baseline. This item was included because it provided a measure of trust of institutionalized protection agents. Although this was not a prospective measure, it was theoretically useful, and the results of the study on other variables did not change by not including it.

High-risk Group Identification

Two measures were included. One item asked if the subject had ever been a member of a gang (not a tagging crew) and was coded as yes or no. A total of 25% of the sample reported having ever been a member of a gang. The second item asked the subject which one group or clique the subject currently most identified with from a list of 17 group names. Those 5 groups that were high risk (ie, "rappers (rap club)," "stoners (burnouts, druggies)," "heavy metalers (rockers)," "gang member," or "taggers") were coded as "high-

risk" and all others were coded as "non-high-risk".[21] Examples of non-high-risk groups are "jocks (athletes)," "brains," and "popular (socials, preppies)." This list of names was developed from a series of studies that began as open-ended coding of names and subsequently involved closed-ended categories. In the present study, as opposed to some previous work that examined multiple general groups,[21] a simple high-risk/non-high-risk group dichotomy was used. A total of 26% of the sample reported currently identifying with a high-risk group. A total of 44% of those who had reported ever being in a gang also reported identification with a high-risk group. Conversely, a total of 43% of those who reported current identification with a high-risk group also reported having ever been in a gang.

Self-protection

Nine measures were included. All of these measures were assessed in response to the question "How often have you done each of these things in the last year to feel more safe?" (Five-point responses ranged from "never" to always.") One measure, weapon carrying, consisted of the mean of three 5-point items, "carry a blunt object such as a bat or club," "carry a knife," or "carry a gun" (Cronbach's alpha=.75). The other 8 measures were assessed as separate items: "avoid walking alone," "stay away from people who might hurt you," "not go to a party, because you thought it might be dangerous," "avoid fights," "stay away from places that you think are unsafe," "use alcohol or other drugs to feel more safe," "deliberately not use alcohol or other drugs to stay aware," and "work out to build muscle strength or take self-defense training." These items originally were generated through a previous self-report study, using open-ended items (n=504; unpublished data). Means of self-protection to feel more safe were assessed. In that study, 22 self-protection responses had been generated. Those 11 responses that were within the subjects' control, and were endorsed by at least 20% of the sample, were retained for further study.

Demographics

Eight measures were assessed. Age in years was derived from birth date. Gender was assessed. Ethnicity was coded into four binary variables as White/non-White, Latino/non-Latino, African American/non-African American and Other ethnicity (ie, Asian or Native American)/non-Other ethnicity. Socioeconomic status was measured through use of a 4-item rating scale-type index,[31] based on a weighted score of parent education (two, 6 forced-choice scales) and occupation (two, 9 forced-choice scales), averaged over mother and father (Cronbach's alpha=.68). Socioeconomic status was composed very similarly to the original measure, except that "location in city" was not coded along with education and occupation, and both father's and mother's education and occupation were coded as opposed to only the head of the household to account for the greater current prevalence of 2-income homes. Finally, living situation was coded to assess whether or not one was living with both parents (or stepparents).

A total of 44% of those who had reported ever being in a gang also reported identification with a high-risk group.

ANALYSIS AND RESULTS

Three-Stage Prediction of Drug Use

A 3-stage general linear model (GLM) analysis protocol was completed on prospective data.[32] In all models calculated, the dependent variable was violence perpetration. Also, violence perpetration was measured both at baseline (as a predictor) and at 1-year postbaseline in all models.

First-stage models. The first set of 1-year prospective models examined the prediction of violence perpetration from baseline perpetration and each predictor examined singly (ie, 15 personal variables and 22 social-environmental variables). These prospective 2-predictor models permitted elimination of those variables that did not have a direct effect on later perpetration, controlling for baseline perpetration. The Ns in the addiction-concern and socioeconomic-status models were 855 and 899, respectively; the Ns on all other of these models varied from 927 to 962. All model Fs(2,N-1) were sig-

TABLE 1
Predicting Violence Perpetration From Personal or Social-environmental Variables

Predictor	Effect F
Personal Variables	
Addiction concern	6.30**
Current cigarette smoking	15.63***
Current alcohol use	5.05*
Current marijuana use	19.07***
Current hard drug use	13.29***
Number of hard drugs currently used	16.92***
"Probably had it coming" belief	<1.00
"Authorities pick on people" belief	1.17
"It's no big deal to break the law" belief	1.36
"People who suspended her, too rigid" belief	<1.00
"Drug dealing is okay" belief	3.10+
Morality of drug use	11.98***
Sensation seeking	4.24*
Perceived stress	2.06
Depression	<1.00
Social-environmental Variables	
Fear of victimization	16.57***
Victimization	12.21***
Not trust police	26.64***
Self-identify with high-risk group	21.18***
Ever member of gang	6.78**
Not avoid walking alone	<1.00
Not stay away from dangerous people	5.69*
Go to a dangerous party	<1.00
Not avoid fights	7.39**
Not stay away from unsafe places	10.89***
Use alcohol or drugs to feel safe	1.33
Not use alcohol or drugs to stay aware	<1.00
Work out for self-defense	<1.00
Carry a weapon	10.48***
Younger age	16.27***
Male gender	11.30***
White ethnicity	1.79
African American ethnicity	4.24*
Latino ethnicity	<1.00
Other ethnicity	<1.00
Live with parents or step-parents	<1.00
Lower socioeconomic status	4.21*

Note. +p<.1, *p<.05, **p<.01, ***p<.001

nificant at p<.001 (Fs ranged from 114.76 to 136.02; R-squares ranged from .20 to .23), due to the predictive effects of baseline perpetration (effect Fs ranged from 137.93 to 260.58). Twenty-one of 37 other predictor Fs were significant at p<.05, and 1 additional test was marginally significant. Only 2 such tests would have been significant at p<.05 by chance alone. These results are shown in Table 1.

Second-stage models. The second stage of analysis placed all significant predictors from the first-stage models in simultaneous multivariable regression

TABLE 2
Predicting Violence Perpetration One Year Later From Baseline Perpetration and Other Predictor Sets

Model F	R2		
33.42***	.23	**Drug Use Predictor Set Effects**	
		Addiction concern	1.70
		Current cigarette smoking	2.33
		Current alcohol use	<1.00
		Current marijuana use	3.70*
		Current hard drug use	<1.00
		Number of hard drugs used currently	<1.00
Model F	**R2**	**Fear of Victimization/Victimization Predictor Set Effects**	
78.88***	.25	Fear of victimization	8.73**
		Victimization	3.86*
		Not trust police	24.50***
Model F	**R2**	**High-risk Peer Group Predictor Set Effects**	
91.03***	.23	Self-identify with high-risk group	17.15***
		Ever member of gang	4.67*
Model F	**R2**	**Self-protection Predictor Set Effects**	
78.88***	.25	Not stay away from dangerous people	<1.00
		Not avoid fights	<1.00
		Not stay away from unsafe places	4.45*
		Carry a weapon	8.20**
Model F	**R2**	**Demographics Predictor Set Effects**	
59.87***	.25	Younger age	21.32***
		Male gender	17.64***
		African-American ethnicity	4.50*
		Lower socioeconomic status	2.45

Note. +p<.1, *p<.05, **p<.01, ***p<.001

models, grouped by personal and social-environmental substantive categories. Of 3 personal categories (drug use, law-abidance beliefs, and affect related), more than 1 significant predictor in a category was found only for drug use (six of 6 measures had been significant in the first-stage analysis). Only 1 of 6 law-abidance-belief measures had been significant (ie, morality of drug use), and only sensation seeking had been significant in the first-stage models among the affect-related measures.

Of 4 social-environmental categories (fear of victimization/ victimization, peer group, self-protection, and demographics), more than 1 significant predictor in a category was found for fear of victimization (3 of 5 measures had been significant), peer group (2 of 2 measures had been significant), self-protection (4 of 9 measures had been significant), and demographics (4 of 8 measures had been significant). To the extent that a variable's coefficient in these 4 models decreases from those of the first-stage model, the variable's influence must be either indirect, through 1 or more other predictor variables correlated with it in these models, or spurious.

The results of the 1-year prospective models are shown in Table 2. Baseline perpetration was a significant predictor in all models (Fs=193.20, 152.12, 161.00, 103.98, and 110.23, all ps<.001; ns=899, 808, 937, 910, and 939, respectively). In the drug-use model, only current marijuana use was a significant predictor. Those who reported greater marijuana use were relatively likely to report having perpetrated violence the next year. All 3 fear-of-victimization/victimization mea-

TABLE 3
One-year Prospective, Multivariable Prediction of Violence Perpetration (n=868)

Model F	R2	Predictor Effect		Cumulative Effect- # of Significant Predictors	
24.83***	.29	Baseline perpetration	47.96***		
		Current marijuana use	8.25**		
		Morality of drug use	<1.00	0	25%
		Sensation seeking	<1.00	1	31%
		Fear of victimization	2.80+	2	39%
		Victimization	3.33+	3	51%
		Not trust police	10.52***	4	63%
		Identify with high-risk group	6.61**	5	78%
		Ever member of gang	<1.00	6	87%
		Not stay away from unsafe places	3.69*	7	93%
		Carry a weapon	<1.00		
		Younger age	13.47***		
		Male gender	3.70*		
		African American ethnicity	3.57+		

Note. +p<.1, *p<.05, **p<.01, ***p<.001

sures were significant predictors of violence perpetration. In the peer-group predictor set, both self-identification with a high-risk group and ever being a member of a gang were significant predictors of violence perpetration. Among the self-protection measures, weapon carrying and tendency to not stay away from places that one thinks are unsafe were significant predictors. Finally, among the demographic measures, age, gender, and African American ethnicity were significant predictors. Those who were relatively young, male, and of African American ethnicity were relatively likely to report violence perpetration the next year.

Third-stage model. The third stage of analysis placed all significant predictors from the first- and second-stage models in the same simultaneous multivariable regression model. To the extent that a variable's coefficient in this model decreases from those of the first-stage or second-stage models, the variable's influence must be either indirect, through 1 or more other predictor variables correlated with it in this model, or spurious. Marijuana use, morality of drug use, sensation seeking, fear of victimization, victimization, not believing that the police department is effective in protecting one from crime, self-identification with a high-risk group, report of ever being in a gang, weapon carrying, tendency to not avoid dangerous locations, age, gender, and African American ethnicity were entered as predictors. The results of the 1-year prospective multivariable model are shown in Table 3. Baseline violence perpetration, current marijuana use, not believing that the police department is effective in protecting one from crime, self-identification with a high-risk group, tendency to not avoid dangerous locations, relatively young age, and male gender were the significant predictors ($p<.05$). Fear of victimization, victimization, and African American ethnicity were only marginal predictors ($p<.1$).

Cumulative Effect Analysis

The observed probability of being above the median on violence perpetration 1 year later by number of significant baseline multivariable predictors was calculated. This analysis was completed to conform with earlier work that states that the more drug-related "risk factors" one is exposed to, the more likely one will use drugs later on.[13,33] To do this analysis,

a median split of violence perpetration at both time points and of significant other predictors (marijuana use, the police-department measure, high-risk group self-identification, tendency not to avoid dangerous places, relatively young age, and gender) was completed. Then, the percentage of subjects above the median level of violence perpetration at 1-year follow-up was calculated across combinations of the significant multivariable predictors. (Inclusion of marginally significant predictors from the multivariable model does not improve prediction. Thus, only significant predictors at $p<.05$ from these models were retained for this analysis.)

The prospective, cumulative effect results are shown in Table 3. The probability of being above the median on violence-perpetration reports 1 year later varied from 25% to 93%, depending on whether or not the subject was above the median on violence perpetration and current marijuana use at baseline, and was below the median on age, believing that the police department is effective in protecting one from crime, reporting not identifying with a high-risk group, reporting a tendency to avoid dangerous locations, and reporting being female.

DISCUSSION

The 2-predictor first-stage models indicated that all drug use-related variables, morality of drug use, sensation seeking, fear of victimization, victimization, lack of trust of police as protection agents, identification with a high-risk group, gang membership, not staying away from dangerous people or places, not avoiding fights, carrying a weapon, relatively young age, male gender, African American ethnicity, and relatively low socioeconomic status all predict later violence perpetration. This pattern of results is consistent with previous studies and suggests that violence-perpetration behavior reflects being embedded in a cultural milieu in which drug use, thrill seeking, and getting hurt and hurting others are normative behavior among lower socioeconomic status males, particularly African Americans.

The second-stage multivariable-sets models indicated that among the drug use-related variables, marijuana use remained the only statistically nonredundant predictor. Fear of victimization, victimization, and not trusting the police all remained significant predictors when placed in the same model. High-risk group self-identification and being a member of a gang also remained significant predictors when placed in the same model. Among the self-protection predictors, only not staying away from unsafe places and weapon carrying remained nonredundant predictors. Among the demographic variables, relatively young age, male gender, and African American ethnicity remained significant predictors. When these predictors were placed in a final, third-stage multivariable model, only marijuana use, not trusting the police as protection agents, self-identifying with a high-risk group, not staying away from unsafe places, relatively young age, and male gender, along with baseline violence perpetration, remained nonredundant predictors at $p<.05$. As median split-type risk factors, these 5 variables together predicted 93% of those above the median on violence perpetration as reported 1 year later.

The probability of being above the median on violence-perpetration reports 1 year later varied from 25% to 93%...

It is not surprising that previous violence perpetration is by far the strongest predictor of later perpetration; the best predictor of a behavior is its occurrence in the past.[17] Perhaps violence perpetration becomes a habit; it may become taken for granted within the social milieu in which it occurs.

It is curious that marijuana use was the only nonredundant drug use-related predictor of violence perpetration. The relevance of marijuana use to the perpetration of violence has been debated for at least 60 years in the United States.[34] Some work has suggested that marijuana use might inhibit expression of aggression, but most studies do indicate a positive association between marijuana use and violence perpetration controlling for variables such as other drug use.[34-35] One might speculate that recent pro-marijuana rap music associates marijuana

It is curious that marijuana use was the only nonredundant drug use-related predictor of violence perpetration.

use with potentially violent behavior within a subculture of youth, that direct effects on loss of inhibitions leads to violence, that the illegality of its use tends to become associated with other deviant or problem-prone actions such as violence, or that marijuana-use prevalence is higher and a more reliable predictor of various behaviors than is the use of other illicit drugs. All of these possible explanations should be pursued.

It also is curious that not trusting police as protection agents and venturing into dangerous areas are both nonredundant prospective predictors of violence perpetration. Perhaps neighborhoods that continually undergo rapid population changes encourage less attachment to the neighborhood and less surveillance of public places; thus, violence perpetration and victimization rates increase.[36] (Both fear of victimization and victimization were marginal predictors in Table 3.) Alternatively, or in addition, possibly some youths take it upon themselves to protect their neighborhood, leading to zealous attempts at controlling or patrolling others. These youth may identify with a high-risk group that associates itself with a social image of being tough. Of course, these interpretations are speculative. Future research should examine these implications of neighborhood disorganization.

High-risk group self-identification was a significant predictor in all models, suggesting either the operation of a violent social milieu or social perceptions that condone or facilitate violent behavior. Because high-risk group self-identification was a better predictor of violence perpetration than reporting ever being in a gang, possibly there are more self-identified groups than just gangs that are associated with violence. An examination of violence perpetration at follow-up from specific group names at baseline reveals that all self-identified high-risk groups reported relatively high and equivalent mean levels of violence the next year. The one exception was for the "heavy metalers," who reported a mean level of violence that was lower than the other high-risk groups but still higher than the mean for all others. Thus, being a "rapper," "stoner," or "tagger," and to a lesser extent, a "heavy metaler," or being a "gang member," signifies greater risk for violent behavior. Apparently, high-risk group self-identification suggests youths' awareness of their status as problem-prone youth, at risk for a variety of social maladies including drug use and violence.[20-21]

Finally, relatively young age and male gender within this sample of continuation high school youth remained a significant predictor of violence perpetration (African American ethnicity was a marginal predictor in Table 3). Possibly, older youths have adjusted to their new, continuation high school environment after leaving the regular high school system. Alternatively, older youths may have become more focused on graduating and changing their lives. On the other hand, younger male youths may feel a need to demonstrate their prowess in their new school context. By engaging in violent acts, they may be trying to protect themselves (albeit unsuccessfully) from threats from new school acquaintances. Again, more research is needed to examine this issue within this school system, especially because a positive association is found between age and violence among general populations of youth.[16]

Potential prevention-program implications of these results include the need for correction of misperceptions regarding the appropriateness of violent behavior under different circumstances, the need for expanded or improved agents of protection in changing neighborhoods (eg, police relations campaigns or more police), instruction in effective violence-avoidance strategies in dangerous areas, and programming to help youth transition smoothly to the continuation high school environment. These implications are speculative, of course, but worthy of testing in the development of violence-prevention programming. Exposure to traumatic events has been found to be associated with posttraumatic symptomatology in male adolescent juvenile offenders,

such as hypervigilance, nightmares, phobias, and somatic complaints.[37] Thus, some attention to posttraumatic stress disorder symptom reduction (eg, flooding or cognitive restructuring) may also need consideration in future work with these youth.

LIMITATIONS AND CONCLUSIONS

There are at least 8 limitations of the information presented. First, the results of this study are only generalizable to subjects who are similar to those examined in this study. Continuation high school students differ in many important ways from general population youth.[19-20] Also, this sample was highly heterogeneous ethnically. It is possible that these results differ from other, more homogeneous populations of youths. However, the relatively large number of schools (21) and students (approximately 870) used in this study provides some confidence that results would replicate for similarly composed populations. Second, future research should examine ethnic-group differences in the meanings of violence. For example, perhaps violence is a means of self-protection for one group but a means of acquiring status for another. A thorough list of such variables is not contained herein. Third, self-report inherently incurs potential for bias in any study. However, the associations found were not likely to be caused by response biases because the reports from the baseline anonymous surveys did not differ from those of the confidential surveys. Fourth, the police-protection measure used was a limitation. This measure was tacked on only measured at the second wave. Additionally, this measure consisted of only 1 item. Still, our other results do not change if the measure had not been used. Our findings suggest the importance of perceptions of police protection, but more work is needed with multiple items measured at a first wave. Fifth, several of the instruments measured herein should be examined further to better demonstrate their construct validity (eg, violence perpetration should correlate with school suspensions and arrest records). Sixth, most of the variance in violence perpetration remained unexplained, even though the R-square was moderately high for a psychosocial-type model; much more research into the prediction of violence perpetration needs to be completed. Seventh, these results are limited to those who had telephones. Those without telephones may or may not exhibit more problem behaviors later in time, although those followed up at school (not followed by telephone) did not differ from the full sample at follow-up on the measures included herein. Also, the data collected confidentially at baseline (which became the pool of those subjects followed up later, primarily by telephone) did not differ from the data obtained anonymously.[23-24] Thus, it is not likely that responses varied due to differing response demands. Finally, although prospective empirical studies such as the present one are sorely needed, more theoretically rich studies are imperative to better understand the roots of adolescent violence.

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