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Differential Prediction of Young Adult Arrests for Property and Personal Crimes: Findings of a Cohort Follow-up Study of Violent Boys from North Carolina's Willie M Program

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Abstract—Which characteristics of violent youth predict adult arrest for property crimes (e.g. burglary), and for personal crimes (e.g. assault)? We addressed this question by focusing on a group of particularly violent and assaultive boys. Separate logistic regression analyses were conducted to predict property and personal crime arrests as a function of adolescent psychiatric diagnosis, behavior problem history, race and IQ. Property crime arrest was predicted by an adolescent history of property offenses, conduct disorder diagnosis, and race (more arrests among non-whites than whites). Personal crime arrest was predicted by adolescent history of property offenses and adolescent history of substance abuse.

Keywords: Arrests, aggression, cohort follow-up study, adolescents, young adults

Introduction

Increasing evidence demonstrates the continuity of antisocial and criminal behavior from childhood into adulthood. Farrington's (1986) research indicated that, "The kinds of youths who were convicted or who admitted large numbers of delinquent acts were identified as troublesome, daring, dishonest, and aggressive by their teachers, peers, and parents from an early age" (p. 382). Reviewing much of the latest research on the continuity of antisocial behavior, Patterson, DeBaryshe and Ramsey (1989)

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concluded that, "Antisocial behavior appears to be a developmental trait that begins early in life and often continues into adolescence and adulthood" (p. 329).

As such reviews indicate, early antisocial behavior is clearly a risk factor for later adult criminal behavior; however, it is also true that substantial percentages of aggressive, antisocial youth grow up to become adults who are free of significant antisocial or criminal behavior (see, e.g. Farrington, 1986; Loeber & Stouthamer-Loeber, 1987). Thus, a key task for researchers is to identify factors that predict *which* antisocial youth are apt to commit crimes upon entry into adulthood (see a review of such research by Loeber & Stouthamer-Loeber, 1987).

Particularly valuable is research investigating whether particular child or adolescent factors are associated with particular types of adult crime. For example, some have suggested that different constellations of child or adolescent factors predict property crimes (e.g. burglary) as opposed to personal crimes (e.g. assault). Specifically, property crimes have been linked to economic conditions (see, e.g. Farrington, 1986), whereas personal crimes have been linked to problems in self-control and social relationships (see, e.g. Patterson *et al.*, 1989). Loeber (1988) has begun to examine possible developmental progressions by which youngsters may move into patterns of aggressive, violent personal offenses versus patterns involving non-aggressive and property offenses. Intuitively, it does seem possible that individuals willing to commit crimes involving aggressive confrontation with a victim would show different patterns of personality and behavioral development than individuals who are not willing to do so and whose only crimes involve property.

In contrast to this reasoning, some researchers (e.g. Kohlberg, Ricks & Snarey, 1984) have argued that differential prediction of personal and property crimes is unlikely, and that different types of adult offenses are predicted by similar child and adolescent characteristics. In support of this argument, it should be noted that a substantial number of criminal offenders commit both personal and property crimes; for these individuals, it is certainly true that the same developmental antecedents have predated *both* types of crime.

Loeber and Stouthamer-Loeber (1987) suggest that the success or failure of differential prediction may depend on the nature of the sample that the investigators employ in their research. They indicate that studies employing general population samples (e.g. Wadsworth, 1979) have found different predictors for personal versus property crimes more often than have studies employing select samples of *only* aggressive or problem-ridden youngsters (e.g. Mitchell & Rosa, 1981). On the other hand, relatively few studies, thus far, have used such select samples to investigate differential prediction of adult personal and property crimes. We sought to add to this literature, using a sample of highly aggressive youth, youngsters from North Carolina's Willie M Program (see Weisz, Walter, Weiss, Fernandez & Mikow, 1990).

The Willie M Program grew out of a class action suit brought against state officials on behalf of violent and assaultive youth under age 18 (one of them named Willie M.) who were thought to be in need of social, school, and mental health services. The settlement of the suit led to standardized screening and assessment procedures for determining Willie M class membership. Certification for class membership requires administration of standardized tests (e.g. IQ tests), psychiatric interview, and collection of detailed information on a child's past history of violent and assaultive

behavior (e.g. school and police records); certification requires that individuals be judged seriously emotionally, neurologically, or mentally handicapped and that they show a clear history of violent or assaultive behavior (for further details see Behar, 1985). In general, once a youth is certified as a class member, he or she remains in the Program until age 18. Because class membership requires a history of significant violence, Willie M youth are homogeneous with respect to this characteristic; thus, all qualify as significantly at risk for adult offenses. Moreover, the Program provides for detailed assessment of child and adolescent characteristics and behavioral history. For these reasons, Willie M youth constitute a particularly useful focus for the study of child and adolescent predictors of adult offenses. On the other hand, the fact that the Willie M population *all* show significant histories of violence means that any Willie M sample will be more homogeneous than a general population sample. This limitation on sample variability may restrict the number of possible precursors of crime that can be identified, relative to a predictive analysis using a general population sample.

Method

Sample selection

A stratified random sample of 196 males was drawn from the full population of 794 certified Willie M class members who turned 18, and thus left the Willie M Program, between October 1981 and January 1986. The sample was stratified by certification duration. Complete research data were available for 159 (81%) of the 196 males; thus, these 159 subjects are the focus of this report.

Checking for sample bias. Did dropping the incomplete cases bias our sample with respect to the variables of interest in this study? To address this question, we compared the 37 incomplete cases to the 159 complete cases on all relevant variables in our data set. The comparisons revealed no significant group differences on characteristics at the time of certification—including DSM-III diagnoses, problem behavior histories, race, age, or IQ—or on days between certification and 18th birthday, days between 18th birthday and the date of our follow-up, percentage arrested for adult property crimes, or percentage arrested for adult personal crimes. Only one difference was significant: the group with incomplete information had a smaller proportion of persons with a history of alcohol abuse than the group with complete information ($p < 0.05$). So, dropping subjects for whom data were incomplete did not appear to bias the sample substantially.

Assessment

The Willie M standardized screening and assessment forms (completed as a part of the Willie M certification process) were reviewed for information on adolescent factors which might be predictive of later adult criminal behavior. The mean age of the youngsters at the time this information was gathered was 15.97 (SD = 1.01). Four types of variables were included as potential predictors: (1) *demographic characteristics* including race and age at certification in the Willie M Program; (2) *problem behavior history* including documented presence versus absence of violence against property, violence against other persons, violence against self, substance abuse, and sexual deviancy; (3) *primary DSM-III psychiatric diagnosis;* and (4) *IQ* at certification. The information in each category was taken directly from the Willie M forms, with no ratings or judgments required by the recorders; however, two independent recorders were used for all data, and any discrepancies between the two were checked against the original record to insure accuracy.

Arrest information was gathered from comprehensive records of the NC State Bureau of Investigation (SBI). The data covered all post-age-18 arrests occurring within North Carolina. The mean age of our subjects at the time arrest data were collected was 24.17 (SD = 1.16). For purposes of analysis, subjects were classified as having been arrested for property crimes if the record showed arrests for larceny,

burglary, fraud, arson, fencing, or shoplifting. Subjects were classified as having been arrested for personal crimes if the record showed arrests for simple assault, aggravated assault, robbery, threatening, or murder. Here again, arrest data were recorded directly from the SBI printouts, with no ratings or judgments required by the recorders; two recorders worked independently on all data, and any discrepancies between the two were checked against the original record to insure accuracy. Note that our classification system made it possible for an individual to be included in both arrest categories. In cases where multiple crimes occurred in the same episode, data were entered according to the arrests generated; thus, if both personal and property crime arrests followed the same episode, the arrested individual would have been coded as having arrests in both categories.

Results

Number arrested and types of crimes

Of the 159 cohort members, 64 (40%) were arrested for a *property crime* after their 18th birthday. Within this group of 64, the number of property arrests for individual subjects ranged from 1 to 30, with a mean of 5.6. Table 1 shows that larceny (78%) and burglary (67%) were the most common offenses among these 64. Of the 159 in the full sample, 36 (23%) were arrested after their 18th birthday for a *personal crime.* Within this group of 36, the number of personal arrests for individuals ranged from 1 to 13, with a mean of 2.0. Table 1 shows that the most common offenses were assault and robbery, but that even murder and manslaughter were represented in the sample. Some 30 subjects had been arrested for both property and personal crimes.

Table 1. Number of subjects arrested for specific types of crimes and mean number of counts of arrest per crime category

Property arrests ($N = 64$)				Personal arrests ($N = 36$)			
	N	(%)	M (SD)		N	(%)	M (SD)
Larceny	50	(78)	2.11 (2.67)	Simple assault	12	(33)	0.56 (1.21)
Burglary	43	(67)	1.72 (2.13)	Aggravated assault	12	(33)	0.53 (0.97)
Fraud	13	(20)	1.06 (4.06)	Robbery	10	(28)	0.39 (0.80)
Arson	12	(19)	0.27 (0.67)	Sex offense	6	(17)	0.19 (0.47)
Fencing	11	(17)	0.25 (0.64)	Threatening	3	(8)	0.08 (0.28)
Shoplifting	3	(5)	0.06 (0.30)	Murder/Manslaughter	2	(6)	0.06 (0.23)

Note: Percentages sum to more than 100% because individual subjects were often arrested for more than one type of crime.

Table 2 presents descriptive statistics for subjects who were arrested, and those who were not arrested, for each type of crime. Note that although the racial distribution was similar in the group arrested for personal crimes and the group not arrested for personal crimes, there was a larger percentage of non-whites in the group arrested for property crimes than in the group not so arrested (see analysis below). Note also, that of all the psychiatric diagnoses showing appreciable frequencies, conduct disorder appeared to discriminate most strongly between those arrested and those not arrested, particularly in the area of property arrests (see analysis below). Nearly all subjects in all groups had a documented history of violence toward other persons, whereas

violence toward property showed more variability across groups. Means were relatively similar across groups on age and IQ at certification, months certified in the Willie M Program, and months between age 18 and date of follow-up.

Table 2. Subject characteristics stratified by arrest at follow-up

	Property arrest(s)				Personal arrest(s)			
	Yes ($N=64$)		No ($N=95$)		Yes ($N=36$)		No ($N=123$)	
	N	(%)	*N*	(%)	*N*	(%)	*N*	(%)
Race								
White	23	(36)	48	(51)	18	(50)	53	(43)
Non-white	41	(64)	47	(49)	18	(50)	70	(57)
Psychiatric diagnosis								
Conduct disorder	40	(63)	42	(44)	22	(61)	60	(49)
Personality disorder	16	(25)	27	(28)	8	(22)	35	(28)
Mental retardation	1	(2)	10	(11)	1	(3)	10	(8)
Schizophrenia	3	(5)	5	(5)	2	(6)	6	(5)
Anxiety	0	(0)	3	(3)	0	(0)	3	(2)
Depression	1	(2)	2	(2)	2	(6)	1	(<1)
Other	3	(5)	6	(6)	1	(3)	8	(7)
Behavior history								
Violence to others	61	(95)	94	(99)	34	(94)	121	(98)
Violence to property	58	(91)	58	(61)	32	(89)	84	(68)
Violence to self	16	(25)	23	(24)	12	(33)	27	(22)
Sex problems	15	(23)	26	(27)	9	(25)	32	(26)
Alcohol abuse	23	(36)	22	(23)	15	(42)	30	(24)
Drug abuse	23	(36)	26	(27)	17	(47)	32	(26)
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)
Age at certification	16.09	(1.07)	15.89	(0.97)	16.02	(1.01)	15.95	(1.02)
IQ	79.92	(12.24)	78.12	(20.67)	83.11	(11.51)	77.60	(19.05)
Months certified	22.95	(12.88)	25.32	(11.64)	23.77	(12.16)	24.54	(12.21)
Follow-up (months)	75.10	(15.30)	72.26	(12.76)	74.60	(14.31)	73.05	(13.77)

Logistic regression analyses

Logistic regression procedures (Hosmer & Lemeshow, 1989) were employed to construct two models: one to predict the presence or absence of an adult property crime arrest, the other to predict personal crime arrest. A forward selection procedure was employed in which the following variables were eligible to enter the model as predictors: (1) *demographic characteristics* including race and age at certification; (2) *problem behavior history* (coded by six indicator variables: violence to others, violence to property, violence to self, sex problems, alcohol abuse, and drug abuse); (3) *DSM-III diagnosis* (coded by four indicator variables: conduct disorder, personality disorder, schizophrenia, and mental retardation); and (4) *IQ* at certification (assessed via the age-appropriate Wechsler scale). In addition, two control variables were forced into both models at the initial model building step: (1) *certification duration* (i.e. number of months as a certified member of the Willie M class); and (2) *follow-up duration* (i.e. number of months from the subject's 18th birthday to the date of follow-up). The

certification duration variable provided control for possible benefits of class membership, since Willie M youth are eligible for case management and other services (see Behar, 1985). The *follow-up duration* variable provided control for the number of days the former class members could have been subject to arrest after their 18th birthday. A Type I error rate of 0.05 was employed in all statistical tests.

Logistic regression model for property crime arrests. The final logistic model for property arrest, shown in Table 3, included five predictor variables. Two of these were the two control variables—certification duration and follow-up duration—which were forced into the model but which proved to be unrelated to property arrests. The three predictor variables which were significantly related to property arrests were: (1) history of violence to property ($p < 0.0001$); (2) diagnosis of conduct disorder ($p < 0.007$); and (3) race ($p < 0.029$; more non-whites arrested). Examination of the resultant odds ratios showed that subjects with a history of violence to property at the time of certification were 7.55 times as likely to be arrested for a property offense in adulthood as were those with no history of property violence, when all other factors in the model were controlled. The analogous odds ratios indicated that property arrests were 2.93 times as likely in subjects who had been diagnosed with conduct disorder as in subjects who had not, and 2.29 times as likely in non-whites as in whites, when the effects of the other variables in the model were controlled.

Table 3. Arrest prediction models: logistic regression coefficients, with associated odds ratios, 95% confidence intervals, and *p* values

Variable	Coefficient	Odds ratio	95% C.I.	*p* value
Property crime arrest model				
Property violence	2.02	7.55	2.78, 20.50	0.0001
Conduct disorder	1.08	2.93	1.34, 6.43	0.0072
Race	0.83	2.29	1.09, 4.83	0.0291
Months certified	0.01	1.01	0.96, 1.10	0.7103
Months of follow-up	0.03	1.03	0.99, 1.07	0.1629
Personal crime arrest model				
Property violence	1.30	3.67	1.20, 9.28	0.0230
Drug abuse	0.88	2.40	1.09, 5.28	0.0294
Months certified	<0.01	1.00	0.95, 1.06	0.8614
Months of follow-up	0.01	1.01	0.97, 1.06	0.6164

Logistic regression model for personal crime arrests. The final logistic model for personal crime arrests included four predictor variables. As in the property crime model, the two control variables—certification duration and follow-up duration—were forced into the model for statistical control purposes, but neither proved to be significantly related to arrests. The two significant predictors were: (1) history of property violence ($p < 0.023$), and (2) history of drug abuse ($p < 0.029$). Examination of the odds ratios for these two predictors revealed that men with a youthful history of violence towards property were 3.64 times as likely as men with no such history to be arrested for personal crimes in adulthood, when the effects of all other predictors in the model

were controlled. Men with a history of drug abuse were 2.32 times as likely as non-drug abusers to experience such arrests, with the other predictors controlled.

Discussion

Aggressive and antisocial youth are known to be at high risk for criminal behavior as young adults (Patterson *et al.*, 1989), but substantial percentages of such youth do not grow up to be either antisocial or criminal (Farrington, 1986; Robins, 1979). The present study was designed to contribute to the search for predictors that distinguish those at-risk youth who show criminal behavior in young adulthood from those who do not. An unusual feature of the study was its focus on a particularly high risk group, youth so violent that they met criteria for the legally mandated Willie M Program. While this group may be of special interest, it also differs in several respects from a general population sample, and possibly even from the general category of aggressive youth. This is true not only because of the characteristics of the Willie M group at certification but also because Willie M youth have access to a variety of social, school, and mental health services during their period of certification. Thus, it should be kept in mind that the factors which predicted adult arrests in this highly select sample could be different from those which might predict adult arrests in a general population sample, and possibly even in a more heterogeneous sample of aggressive youth.

Within this Willie M sample, we investigated whether adult property crime arrest and personal crime arrest would be predicted by the same constellation of variables, thus supporting a "generalist" model of criminal careers (see Loeber & Stouthamer-Loeber, 1987), or by different variables, thus supporting a "specialist" model. We found that one variable, a history of violence towards property, predicted both property and personal crime arrests; however, it was a stronger predictor of the former than the latter. Three other variables—conduct disorder, race, and substance abuse—were differentially associated with the two arrest outcomes. Property crime arrest was predicted by an earlier diagnosis of conduct disorder and by race, whereas personal crime arrest was predicted by a history of drug abuse.

Our findings with respect to conduct disorder might be compared to those by Loney, Whaley-Klahn, Kosier and Conboy (1983), showing that hyperactivity was a significant early predictor of property crimes but not of personal crimes. Conduct disorder and hyperactivity often co-occur. In fact, in his review of factor analytic research on child and adolescent problem behavior, Quay (1979) concluded that ". . . on the basis of considerable empirical evidence there is serious doubt as to the existence of hyperactivity as a disorder independent of other patterns, especially conduct disorder" (p. 22).

Our findings with respect to drug abuse should be viewed in the light of mounting evidence on the psychological correlates of abuse. That evidence indicates that, although drug *use* tends to be stongly linked to peer influence, drug *abuse* is more powerfully linked to internal psychological problems (Kandel, Kessler & Margulies, 1978; Newcombe & Bentler, 1989). This suggests the possibility that adult males arrested for personal crimes may have had greater internal psychological distress and/or

emotional dysfunction during adolescence than did males who were not thus arrested. Alternatively (or additionally), dysfunction caused by the cumulative effects of drug abuse over time, especially during the biologically sensitive period of rapid development in adolescence, may need to be considered as a potential cause in the mix of factors that lead to personal crimes.

To properly interpret our finding that race predicts property crimes, we considered Farrington's (1986) theory of criminal behavior. Farrington notes that his theory has been "put forward to explain the most common varieties of male delinquency (crimes of dishonesty such as thefts and burglaries)" (p. 380); thus, his theory appears to apply primarily to property crimes among males. Farrington argues, and his survey data provide support, that criminal acts of this type are most often committed "for the material goods obtained and for excitement" (p. 380), and that poorer males may be drawn into property crimes, in part because they "tend to fail in school and hence tend to have erratic, low-status employment histories" (p. 381): thus they have fewer legal means of obtaining desired material goods than do middle and upper class males.

To explore whether Farrington's model helps to explain our findings, we conducted a *post hoc* analysis using 76 of our subjects for whom information concerning high school graduation was available. Of these 76 subjects, 35 were white, and 19 (54%) of the 35 were high school graduates; 41 subjects were non-white, and 9 (22%) of the 41 were high school graduates. So, whites were more than twice as likely to have graduated than non-whites. Failure to graduate was, indeed, a risk factor for adult property crime arrest, but not for adult personal crime arrest. Across all 76 subjects, non-graduates were twice as likely as graduates to experience an adult property arrest. Moreover, the risk associated with non-graduation appeared to be more pronounced for non-whites than for whites: 63% of the non-white drop-outs were later arrested for property crimes, compared to 22% of the non-white graduates (relative risk: 2.86); by contrast, 44% of the white drop-outs were later arrested for property crimes, versus 32% of the white graduates (relative risk: 1.38). Furthermore, when we re-ran the logistic regression analysis on these 76 subjects, including a variable for high school graduation in the model, we found that the race effect disappeared, the other effects reported above remained constant, and high school graduation was a significant predictor, with drop-outs being more likely to have been arrested for property crimes ($p = 0.04$). Thus, findings from the subsample tend to support Farrington's (1986) model. If we assume that the subsample of 76 is representative of our entire sample of 159, the findings of these supplemental analyses suggest that the apparent race effect identified here may have less to do with race than with risk factors associated with academic failure and concomitant socioeconomic disadvantage.

As suggested thus far, the study yields some support to the notion that different constellations of adolescent factors predispose to adult property crime arrests compared to adult personal crime arrests. However, several cautionary comments are in order. First, as suggested above, the adolescent prognostic factors associated with adult criminal behavior in this consistently violent sample may not necessarily be identical to the prognostic factors for adult criminal behavior which might be found for a more heterogeneous sample. As an example, consider the variable of a youthful history of interpersonal violence. Previous research, and common sense, suggest that such a history should be a risk factor for later adult arrest. However, in the present sample,

this variable did not predict arrest, nor could it have done so, because there was so little variability in the Willie M group—i.e. almost 100% of the sample had a youthful history of interpersonal violence.

A second cautionary note is that our study relied on arrest records as the sole source of information on subjects' adult criminal activity. It could be argued that self-report data on delinquent and criminal acts would add important information to that provided here. Some evidence (e.g. Hardt & Peterson-Hardt, 1977) suggests adequate agreement between self-reports of criminal activity and information gleaned from arrest records. But nonetheless, the addition of self-report data might be a useful objective for future research.

Third, we emphasize that the distinction between perpetrators of personal and property crimes is rarely definitive. Many offenders commit both types of crimes, and there was certainly overlap in the present sample. Moreover, when an incident involves multiple offenses, some involving persons and others involving property, there may be a bias in some settings toward arrests for one type of crime (e.g. personal crimes) rather than other types. Finally, because predictive studies like the present investigation involve limited time frames, it is always possible that individuals arrested for one type of crime before the data collection date go on to commit the other type of crime beyond the time frame of the study.

For these reasons, the findings presented here do not provide a final clarification of the predictive picture with respect to personal and property arrests. Indeed, no single study could do this. On the other hand, these data add significantly to the growing body of evidence on crime prediction, particularly because the unusual sample employed here represents such an extreme group of violent youth. Distinct predictors were identified for each type of adult arrest in this high risk group. Personal crime arrests were linked to a youthful history of drug abuse, whereas property crime arrests were linked to a youthful diagnosis of conduct disorder and to race, with the race finding perhaps reflecting educational (and possibly socioeconomic) disadvantage (see Farrington, 1986). Although such predictive findings do not establish causality, they certainly suggest hypotheses about differential causal sequences leading to personal versus property crimes. If such hypotheses were borne out in future research, potentially important implications would emerge for the prevention of these two forms of crime.

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