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Do theories of crime or violence explain race differences in delinquency? ☆

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Abstract

We examine race differences in delinquency using the National Longitudinal Study of Adolescent Health. We use a new method that permits an examination of offense specialization. We argue that an examination of offense patterns provides an opportunity for testing theoretical explanations of race effects. If race differences in violent crime reflect race differences in serious crime, then theories of crime can explain race effects. Otherwise, theories of violence are needed to explain the phenomenon. Our results suggest that black adolescents have higher rates of violence, particularly armed violence, but they do not have higher rates of serious (or minor) property or drug crime. Race differences in violence are generally stronger for adolescents who would otherwise be at lower risk: girls and adolescents from educated and intact families. Puerto Rican adolescents also have higher rates of violence than Anglos, but other Hispanic groups do not. We conclude with a discussion of the implication of the empirical literature (including our results) for various theoretical explanations of race differences in violence.

Keywords: Race; Violence; Delinquency

1. Introduction

Arrest data and data from victimization surveys suggest that African-Americans have higher crime rates than White Americans (e.g., Bureau of Justice Statistics, 1995; Hawkins et al., 2000; see Sampson and Lauritsen, 1994). While race differences can ultimately be attributed to racism and the historic oppression of African-Americans (e.g., Hawkins, 1995; McCord, 1997; Sampson and Wilson, 1995), the more proximate causal

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process is unclear. In fact, we argue that it is not even clear what racial patterns in offending require explanation.

In this research, we use data from the National Longitudinal Study of Adolescent Health (hereafter AddHealth) to examine racial patterns in violence and delinquency (Udry, 1998). We attempt to determine whether blacks and whites differ in their tendency to engage in violence or in their tendency to engage in serious delinquency, violent or not. AddHealth is particularly useful for examining racial patterns because it is based on a large national sample, it over-samples African-Americans, and it uses a method that yields higher frequencies of self-reported delinquency (Harris et al., 2003). As a result, this research is more likely than past research to reveal the extent to which race effects are mediated and moderated by other demographic variables.

We use a method of theory testing that focuses on establishing the dependent variable rather than the introduction of mediating variables (although we do that as well). We argue that it is theoretically important to determine whether there are race differences in violent offenses or any type of serious offenses. If race is associated with violence but not other types of crimes, then one must look to theories of violence, not crime, for an explanation. On the other hand, if race is associated with all types of crime, or serious crime, then theories of crime and norm violation are likely to provide the explanation. Our goal, therefore, is to examine what group of theories is likely to explain race differences.

Our methods also differ from the methods used in earlier studies. First, we rely upon a statistical method that yields a true measure of specialization and that allows us to determine exactly what types of offenses vary by race (Deane et al., 2005). This method is well-suited to the analysis of criminal behavior, since most offenders commit a variety of offenses, and offenses cannot easily be rank ordered. The versatility of many offenders, however, does not preclude the possibility that predictors might be different for different types of criminal behaviors (Nagin and Paternoster, 1993; Horney et al., 1995).

2. Discriminant prediction

Some theories attempt to explain why people engage in deviance, while others attempt to explain why they engage in aggression. The task is complicated by the fact that deviance and aggression are overlapping domains: some aggressive behavior violates norms (and is therefore deviant behavior) and some deviant behavior involves intentional harm-doing (or aggression). For example, spanking children involves violence but not deviance, the use of illegal drugs involves deviance but not aggression, and violent crime involves both deviance and aggression (see Felson et al., 1994). The pattern of offending is therefore important in determining what type of theory is most useful for explaining the behavior. If an offender engages in violence but not other deviant behavior then a theory of aggression is necessary to understand the behavior. If an offender engages in criminal behavior generally, then a theory of deviance is needed to understand the behavior.

Stinchcombe (1968) emphasizes the importance of proper conceptualization of the dependent variable in his classic work on theory construction. He uses delinquency as an example, pointing out that different kinds of action that concern the police may turn out to have different causes:

> ...natural variables that create administrative problems are not the same variables that have a unique set of causes. Sometimes applied researchers formulate this by saying that a natural variable 'has multiple causes.' From the scientific point of view, this means that the applied researcher is trying to explain the wrong thing. (p. 41)

Gottfredson and Hirschi (1990) provide the most well-known example of using offense patterns as evidence for theoretical claims (see also Felson, 2002). They argue that the tendency of offenders to engage in a variety of criminal offenses (as well as other impulsive behavior) supports their theory of self-control and argues against theories of aggression to explain violent crime. Another example is Zimring and Hawkins's (1997) analyses and discussion of evidence showing that homicide rates but not other crime are relatively high in the United States. Their work suggests that crime theories are not useful for explaining this international pattern. Finally, Felson (1996) reviews evidence showing that children exposed to media violence engage in antisocial behavior generally, not just violent behavior, casting doubt on the idea that the children are modeling the violence they observed.

We argue that scholars interested in race differences may be trying to explain the wrong phenomenon. Criminological theories attempt to explain race differences in criminal behavior (or deviance) while research often examines race differences in violence (e.g., Sampson and Wilson, 1995; McNulty and Bellair, 2003a,b). This strategy is not problematic if violent behavior is viewed as an indicator of crime or serious crime. However, if there are race differences in violence but not other serious crime, a theory of violence is required.

We believe that an understanding of race differences in offense patterns is necessary before theoretical progress on this important issue is possible. It is important to establish what facts require explanation, before attempting to explain them. In statistical language, it is necessary to determine the appropriate dependent variable before examining potential mediating variables. Moreover, since different theories imply different racial patterns, such an analysis provides a test of those theoretical explanations. This method of theory testing might be called "discriminant prediction (see Felson, 2002)." A theoretical explanation is *not* supported if: (1) race is only related to certain types of criminal offending when the theory predicts it should be related to all offending; or (2) race is related to all types of offending when the theory predicts it should be related to only some types of offending.[1] More generally, a theory is not supported if evidence fails to confirm its predictions that either (1) X affects all Ys or (2) X affects Y_1, but not Y_2, or Y_n. The difference between discriminant prediction and discriminant validity is that the former refers to the validity of a theory while the latter refers to the validity of measurement.

This research described below uses this method to test theories of crime and theories of aggression as explanations for race differences. Crime theories (e.g., strain, control, and social disorganization theories) predict that African-Americans are more likely to commit a variety of offenses, not specialize in a particular type of crime. They would not have much difficulty explaining why race differences are stronger for more serious offenses than minor offenses, but they would have trouble explaining differences in violent offenses alone. On the other hand, theories of violence (i.e., the frustration–aggression approach; the subculture of violence thesis and the code of the streets) can explain race differences in violence, but they cannot explain race differences in general offending.

Note, however, that these theories of crime and violence are all middle-range theories. General theories of human behavior that emphasize incentives and costs (i.e., social learning theory and the rational choice perspective) could conceivably explain any offense patterns. In addition, the routine activity approach can accommodate different offense patterns, if opportunities for deviance and aggression are different. However, it would be necessary for these theories to suggest a theoretical mechanism to account for the offense patterns observed.

We first describe the empirical literature on race and offense patterns and consider the role of social-demographic factors as mediators and moderators of race effects. We then examine race differences in specific offenses in order to determine whether there are race differences in all offending, serious offending, or violent offending. Finally, in the discussion, we consider the implications of the research literature for specific theories of crime and aggression.

3. Prior research on race and offense patterns

Prior research suggests that race differences in offending vary depending on the type of offense. Thus, the Uniform Crime Statistics reveals stronger race differences in arrests for violent crime than property crime or drug abuse violations (see Zimring and Hawkins, 1997). Further, both arrest data and data from the National Crime Victimization Survey show stronger race differences in offending for robbery than assault, and for aggravated assault compared to simple assault (Bureau of Justice Statistics, 1997). In federal prisons, black inmates have higher rates of violence than white inmates but lower rates of drug violations (Harer and Steffensmeier, 1996). On the other hand, self-report data obtained from 12 year olds participating in the 1997 National Longitudinal Survey of Youth reveal that non-whites have higher rates of property crime, lower rates of drug use, and similar rates of assault (Hawkins et al., 2000).

[1] Note that a theory may still help explain race differences even if cannot account for offense patterns; another theory may be required to explain why race is associated with one outcome but not another. For example, a theory of variation in criminal opportunities may explain why race differences are observed for "street crimes" but not "white-collar crimes."

It may be that the race patterns observed in the UCR reflect the seriousness of the offense rather the presence of violence. While violent crime is generally perceived as more serious than property crime (Rossi et al., 1974), violence and seriousness are conceptually distinct. Thus, property crimes vary in their seriousness, as reflected in the different penalties for grand larceny, petty larceny, burglary, and shoplifting. Drug violations also vary in their seriousness: we punish offenders more severely for selling drugs than using drugs and we evaluate it more severely (Rossi et al., 1974). Finally, injurious violence is considered more serious than violence in which the offender causes no injury and armed violence is considered more serious than violence in which the offender is unarmed.

An analysis of UCR tables supports the idea that race differences are stronger for serious offenses. The correlation between percentage black offenders and the seriousness of 29 crime categories, using a ranking based on Federal sentencing recommendations, is .36 ($p = .025$; one-tailed test).[2] However, it is impossible to disentangle the effects of violence and seriousness in the UCR data, i.e., to determine whether race differences are stronger for violent offenses or serious offenses, or both.

Hindelang et al. (1981) provide some evidence that addresses this issue in their analyses of self-reported delinquency among adolescents in Seattle in 1978. Their analyses of black/white ratios for different offenses provided mixed evidence: blacks were more likely than whites to engage in violence and some more serious forms of theft, but not most property or drug crimes. However, they did not control for socioeconomic status and other demographic characteristics associated with race. Thus, it is not clear from their data whether race has net effects.

In general, the literature is unclear about whether blacks are more likely than whites to commit serious crimes or violent crimes. To address this issue it is necessary to examine race differences in serious and minor violent crime and serious and minor non-violent crime. In addition, our method allows us to examine specialization by controlling for any race differences in the general tendency to offend. The traditional method in which specific offenses are examined separately confounds the tendency to commit particular offenses with the tendency to offend generally.

4. The role of other demographic factors

Race effects are to some extent mediated by other social-demographic factors. Black youth are more likely than white youth to be raised in single parent impoverished families, and to live in impoverished, urban neighborhoods. All of these are well-known risk factors for delinquency. However, research on the net effects of race, controlling for these variables, is somewhat limited. One problem with UCR data and victimization surveys is that they have limited information on the demographic characteristics of offenders. Surveys of youth based on self-reports have much more extensive information on offenders, but these studies find that violence and crime are either unrelated or only weakly related to race and other demographic factors (e.g., Elliot, 1994; Markowitz and Felson, 1998; Bridges and Weis, 1989; Farrington et al., 2003; McLeod et al., 1994; Paschall et al., 1996). For example, McNulty and Bellair (2003a) find a small relationship between race and involvement in fights at, or on the way, to school. The relationship is no longer statistically significant in their longitudinal analysis when demographic variables, a lagged measure of fighting, and other measures are controlled. In a longitudinal analysis of AddHealth data, McNulty and Bellair (2003b) found that neighborhood disadvantage and other variables mediated effects of race on change in serious violence over a two-year period. Note, however, that the inclusion of lagged variables limits the size of race effects (see also Kaufman, 2005).

It may be that most self-report surveys tap less serious forms of violence and crime, since more serious offenses are relatively rare.[3] As indicated above, the effects of race and other social-demographic variables are probably stronger for serious offenses (Elliot and Ageton, 1980; Loftin, 1991; Bureau of Justice Statistics, 1995). One approach to this problem is to survey high risk-populations. For example, Farrington et al. (2003)

[2] The percentage of offenders who are black is highest for homicides, followed by robbery, aggravated assault, simple assault, and property crime.

[3] In addition, some studies focus on "anti-social" behaviors that are not criminal (e.g., McLeod et al., 1994; Deater-Deckard et al., 1998).

over-sample delinquent boys in the Pittsburgh Youth Study. They find a race difference in self-reported violence, with controls for other demographic factors, although that difference is much smaller than the race difference in the level of violence reported to the police.[4]

Rowe et al. (1994) argue, and provide evidence, that the effects of race and other demographic factors are additive. Others have reported a variety of statistical interactions (e.g., McLeod et al., 1994; Deater-Deckard et al., 1998; Paschall et al., 1996). The theoretical basis for predicting statistical interactions, however, is weak. Perhaps multiple disadvantages are most likely to lead to crime when they occur in combination. In other words, adolescents who are exposed to one risk factor—and thus have a predisposition to commit crime—are particularly likely to offend if they are exposed to some other risk factor. For example, one might expect that black adolescents from impoverished families or neighborhoods are particularly likely to experience discrimination. Paschall et al. (1996) found support for the multiple disadvantage interaction pattern based on their study of young adults in a largely urban county. Race was more strongly related to violence for respondents of lower economic status. On the other hand, Farrington et al. (2003) found an interaction in the opposite direction: socioeconomic status was more highly related to violence for whites than blacks. Statistical interactions between race and socioeconomic status have also been examined in aggregate level research on homicide rates. These studies tend to show that economic deprivation has stronger effects on homicide rates for whites than for blacks, but the evidence is mixed, and at least one study reports a statistical interaction in the opposite direction (e.g., Loftin, 1991; Ousey, 1999; Messner and Sampson, 1991; Lafree and Drass, 1996; Harer and Steffensmeier, 1992).

It is not clear whether to expect statistical interactions between race and residence in urban or disadvantaged neighborhoods. A neighborhood's social disorganization might have similar effects regardless of the characteristics of its residents. However, Wilson's (1987) thesis about the de-industrialization of northern cities implies that the increase in crime in African-American communities is largely an urban phenomenon (see also Short, 1997). Anderson's discussion of the code of the streets focuses on black youth living in impoverished, urban neighborhoods where the threat of violence is strongest. His argument suggests that African-American youth who experience the greatest threat of violence should have the highest violence rates. He therefore implies statistical interactions between race and urban residence, and between race and neighborhood disadvantage. However, there is no strong theoretical reason to expect that race effects are stronger in disadvantaged or urban neighborhoods.

Nor is it clear whether to expect statistical interactions between race and gender. Elliot (1994) found no gender differences in race effects using self-reports of serious violence from the National Youth Survey. Hindelang et al. (1981), using victimization data from the National Crime Survey, also found additive effects of race and gender on assault but stronger race effects for males on robbery offending. Hindelang et al. (1981) study of the Seattle data found stronger race differences in violence among girls than boys. In addition, research on spousal violence shows that black women are more likely than black men to kill their spouse, while the reverse is true for whites (Daly and Wilson, 1988).

Finally, it is not clear whether one should expect a statistical interaction between race and age. A strain perspective (e.g., Agnew, 1987; Messner and Rosenfeld, 1994) might imply that race differences should be stronger for older adolescents than younger adolescents since economic and other opportunities are likely to be more salient.

5. Methodology

We first describe the data and measurement, and then provide an extended discussion of our incident-based approach to data analysis. The extended discussion is necessary because of the novelty of this method.

[4] Of course it may that race differences are actually weak or non-existent and that arrest data reflects the effect of racial discrimination by the criminal justice system. However, racial discrimination cannot easily explain the race differences in offending found in victimization surveys.

5.1. The AddHealth study

AddHealth is a large longitudinal data set based on a nationally representative sample of adolescents in grades 7 to 12 (Harris et al., 2003). The data are useful in examining race effects for several reasons. First, previous survey research typically relies on more local, and less representative samples. The use of a national sample allows us to determine to what extent race differences are an urban phenomenon. Second, because the sample is so large, research can examine more serious, but less frequent offenses. Using incident-based analyses that allow us to examine the commission of specific offenses, we can determine exactly what offenses vary by race. Third, AddHealth's use of computers for eliciting more sensitive information yields higher frequencies of self-reported crime than the usual methods (Turner et al., 1998). Underreporting may be a problem in examining race differences using survey research.[5] Fourth, unlike most youth surveys examining race, AddHealth surveys girls as well as boys. This feature enables us to examine whether race effects are conditioned by gender. Fifth, AddHealth provides independent information on ethnic background and race, enabling us to disentangle their effects. Past research has typically ignored violent crime among Latino groups, a large and growing segment of the population (Martinez and Lee, 1999). Finally, the sample includes a large number of African-Americans (including a special sample of middle-class blacks). This sampling method provides more reliable estimates of race effects and increases our power to detect interactions.

AddHealth is a complex survey sample that includes regional stratification, a cluster sample design using schools as primary sampling units (PSUs), and over-samples of special populations. Our analyses are based on the in-home sample that includes the core ($N = 12{,}105$) and several special samples. One of the special samples includes 1038 Black adolescents from well-educated families, i.e., at least one parent has a college degree. The special samples combined with the core sample (which includes 2400 Blacks) yield a combined sample (after listwise deletion) of 15,430.[6]

All students who completed an in-school questionnaire, plus those who did not complete a questionnaire but who were listed on a school roster, were eligible for selection into the study sample. The respondents attended 144 schools in 80 school districts.[7] Students and their parents (usually mothers) were interviewed at home between April and December, 1995.

5.2. Measurement

We examine the prevalence of nine types of criminal behaviors: armed violence; unarmed violence; group violence; seriously injuring someone; armed robbery; selling drugs; using drugs; serious property crime; and minor property crime (see Appendix A). Our selection is motivated by our interest in distinguishing violent crimes from other crimes and serious crimes from minor crimes. We recognize that there is some ambiguity about which offenses are more serious than others. We consider alternative classifications and examine their effects in the results section.

We used multiple items when they were available (five of our nine categories). We code the behavior as 1 if the respondent gave an affirmative response on any of the items. Note that the items for armed violence and drug use are based on life-time incidence while the other items are based on the last twelve months. While items that are not time-bound result in higher prevalence rates, it is unlikely that they affect the relative size of our coefficients. It is possible that behavior categories based on single items have more measurement error than those categories based on multiple items, but we shall see that some of the strongest effects are observed for the single item categories. The distributions of the categories are shown in Table 1.

[5] Evidence suggests that African-Americans are less likely than whites to self-report violent or serious crime (Bridges and Weis, 1989; Hindelang et al., 1981). Perhaps some black respondents fear that reporting criminal behavior will encourage stereotyping and prejudice.

[6] We account for Add Health's complex survey design in our statistical analyses via a strategy similar to that recommended by Korn and Graubard (1991). Stratification and special sample weights are accounted for by including the variables (e.g., region, race, education, etc.) used in defining these aspects of the survey design in the right hand side of the regression equation (see Korn and Graubard's "E analyses"), while Add Health's cluster design is explicitly accounted for in the GEE methodology we employ (described in the Section 5.3).

[7] Some districts included high schools and their feeder middle schools.

Table 1
Distributions of criminal offenses

Criminal behavior	Number of respondents reporting behavior[a]	Response percentage[b]	Incidence percentage[c]
Armed violence	925.73	6.00	2.82
Unarmed violence	6307.52	40.87	19.21
Group violence	3099.90	20.09	9.44
Cause serious injury	2863.16	18.56	8.72
Armed robbery	611.32	3.96	1.86
Sell drugs	1160.14	7.52	3.53
Use drugs	4729.42	30.65	14.40
Serious property crime	2299.92	14.91	7.00
Minor property crime	5581.31	36.17	17.00
No criminal offense	5256.58	34.07	16.01
	$n^* = 32{,}835$		100.00

[a] Fractional counts result from application of sample weights.
[b] Response percentages based on number of respondents ($n = 15{,}430$).
[c] Incidence percentages based on number of respondents reporting behavior ($n^* = 32{,}835$).

AddHealth allows respondents to choose multiple racial identifications, but also asks respondents "if you had to choose only one race, what race would you choose?" We used responses to this question to code race. Ethnicity is measured separately from race since Latinos and Blacks are not mutually exclusive groups. In addition, it is important to distinguish between different Latino groups (see Martinez and Lee, 1999). For example, Martinez (1996) finds that Latinos have a lower homicide rate than Anglos in Miami but a higher rate in El Paso, reflecting substantial differences in homicide rates between Cuban and Mexican-Americans. Accordingly, we code respondents as Mexican/Mexican-American, Cuban, Puerto Rican, Central American, Other Hispanic, or Non-Hispanic.

Other demographic predictors are age, gender, and place of residence. Place of residence is a dichotomy reflecting whether the adolescent is an urban resident or not. We use Add Health's constructed variable which is based on the 1990 census definition of urban area except that it does not include places outside urbanized areas of 2500 or more people. Information on whether or not the respondent is living in a single-parent (either female- or male-headed) family is obtained from the parents' questionnaire. We use two measures of socioeconomic status: parents' education and whether the family was on public assistance. Both measures were derived from the parents' questionnaire. Parents' education is based on the *highest* educational attainment of a parent. Our use of the public assistance indicator is consistent with evidence that criminal violence may be more an effect of poverty than a linear function of socioeconomic status (Brownfield, 1986). Such an argument is implied in the notion of concentration effects (Wilson, 1987).

Our final explanatory variable is a neighborhood concentrated disadvantage index. AddHealth provides selected contextual measures from the 1990 Census for the tract group in which respondents' reside. Following Sampson et al. (1997), we create a standardized component measure of neighborhood concentrated disadvantage based on the proportion in the tract who are younger than age eighteen, receiving public assistance, unemployed, living in poverty, African-American, and living in female-headed households. Some scholars might question the inclusion of the age and race components in this measure. However, in alternative analyses (not presented), we omitted the age and race components and achieved similar results.

5.3. Model estimation

We argue that it is theoretically important to determine whether there are race differences in violent offenses or any type of serious offences. If race is associated with violence but not other types of crimes, then one must look to theories of violence, not crime, for an explanation. However, there is considerable evidence that those who commit violent crimes tend to commit non-violent crimes as well.[8] If offenders commit more than one offense and more than one type of offense, the adjudication between generalized and offense specialization

[8] For recent reviews of the issue, see Sullivan et al. (2006) and Deane et al. (2005).

becomes analogous to the problem of decomposing explained variation in a dependent variable from among correlated independent variables or blocks of variables. The correlation precludes a unique solution to the decomposition of variation. In other words, because of multiple offending, criminal behaviors as categories of a multiple-category dependent variable are collinear in the same way that independent variables in a multiple regression are. And, just as if our interest is partitioning effects of independent variables in a multiple regression, if our interest is in partitioning offenses so that we can see offense specializations, we need a method to account for their shared variation. We use a method, marginal logit modeling, that captures and quantifies the correlation between criminal behaviors and sheds a different light on adolescent offense specialization (Deane et al., 2005).

Marginal logit modeling preserves a nominal measurement of the breadth of criminal offending and allows respondents to contribute as many affirmative responses as necessary to fully represent their offense history. Investigations of similarities and differences between people who commit each offense type should prefer this method because it does not violate the regression assumptions that residuals are independent and identically distributed. We estimate nine regressions, one for each behavior. Under this approach, the dependent variable is coded 1 if a respondent engaged in the behavior, 0 otherwise and each of the regressions could share the same k predictors (although a more general model would allow a different set of predictors in each regression). Because respondents can contribute more than one observation to the study sample, respondents are effectively clusters (i.e., clusters that were not part of the survey design) of correlated data. Marginal logit models estimate the strength of the correlation in the residuals across the equations and adjust the estimated standard errors accordingly. As such, marginal logit models are an application of generalized estimating equations for correlated data.

A respondent may contribute up to nine counts to the frequency distribution shown in column two of Table 1. This results in a percentage distribution (based on the sample of 15,430 respondents) that sums to greater than 100 percent (shown in column three). The distribution of offenses in Table 1 indicates a study sample of $n^* = 32{,}835$ observations. We refer to this as the ''apparent'' sample size because in actuality slightly less than half ($15{,}430/32{,}835 = 0.47$) of these observations are independent.[9] It is, of course, a simple matter to percentage the responses based on the apparent sample size. Unfortunately, it is not such a simple matter to estimate regression models from multiple response data.

Generalized estimating equations (GEE) provide a computationally simple approach for estimating parameters in such data. Liang and Zeger (1986) introduced GEE as a method for dealing with correlated data within the framework of the generalized linear model. This method is a multivariate extension of quasi-likelihood methods, in which one must provide structure only for how the variance depends on the mean and for the correlation structure of the correlated responses, without stating a particular distribution (Agresti and Liu, 2001). In its original form (Liang and Zeger, 1986; Bye and Riley, 1989), this method exploited the fact that under the naïve assumption that responses are independent, model parameter estimates are unbiased, but standard errors are not. We use SAS' PROC GENMOD to implement the GEE method using an exchangeable (symmetrical) correlation structure and the empirical dependence of the sample data to adjust the standard errors.

6. Results

In Table 2, we present race effects on the nine offenses using the marginal logit regression methodology described above. The table compares race effects when mediating and control variables are left out of equations (total effects) with race effects when those variables are included in the equations (partial/net effects). In Model 1 (''unadjusted'' or ''total effect'' model), we see statistically significant differences between blacks and whites on all types of violent criminal behavior. Race differences in drug offenses and property crimes, on the other hand, are not statistically significant. Race effects are strongest for armed violence. For example, a black adolescent is about three times more likely to commit armed violence than a white adolescent and over

[9] Fractional counts shown in column 1 of Table 1 result from the application of sample weights.

Table 2
Marginal logit regressions of criminal offense on race

	Armed violence	Unarmed violence	Group violence	Cause serious injury	Armed robbery	Sell drugs	Use drugs	Serious property crime	Minor property offenses
Model 1 unadjusted effect[b]									
Race[c]									
Black	**1.092**	**0.659**	**0.400**	**0.477**	**0.751**	0.195	0.062	0.152	−0.067
	0.109	*0.058*	*0.071*	*0.072*	*0.135*	*0.112*	*0.064*	*0.083*	*0.061*
Other race	**0.645**	**0.352**	**0.484**	**0.191**	**0.595**	0.167	−0.003	**0.392**	**0.380**
	0.134	*0.068*	*0.079*	*0.085*	*0.151*	*0.121*	*0.071*	*0.088*	0.069
Intercept	**−2.741**	**−0.581**	**−1.446**	**−1.562**	**−3.273**	**−2.529**	**−0.842**	**−1.892**	**−0.383**
	0.110	*0.056*	*0.068*	*0.069*	*0.135*	*0.100*	*0.057*	*0.078*	*0.054*
Model 2 adjusted effect[b]									
Race[c]									
Black	**0.772**	**0.481**	**0.225**	**0.282**	**0.488**	−0.102	**−0.306**	−0.009	−0.068
	0.134	*0.075*	*0.086*	*0.092*	*0.144*	*0.133*	*0.081*	*0.100*	*0.075*
Other race	**0.440**	0.111	**0.277**	0.051	**0.365**	−0.017	−0.056	**0.281**	**0.296**
	0.158	*0.080*	*0.091*	*0.100*	*0.181*	*0.140*	*0.083*	*0.102*	*0.077*
Hispanic origin									
Mexican	0.110	0.123	0.181	−0.022	0.336	0.368	0.019	0.240	0.197
	0.217	*0.111*	*0.122*	*0.133*	*0.236*	*0.193*	*0.118*	*0.140*	*0.107*
Cuban	0.408	−0.052	0.002	−0.191	**−1.477**	−0.668	−0.174	−0.043	0.230
	0.412	*0.226*	*0.271*	*0.268*	*0.553*	*0.463*	*0.242*	*0.281*	*0.219*
Puerto Rican	0.432	**0.665**	**0.406**	0.238	**0.805**	0.381	0.047	−0.195	**0.469**
	0.282	*0.166*	*0.184*	*0.185*	*0.327*	*0.283*	*0.169*	*0.237*	*0.162*
Central American	−0.068	0.029	0.083	−0.136	−0.630	−0.497	**−0.641**	**−0.515**	0.109
	0.371	*0.190*	*0.212*	*0.257*	*0.527*	*0.368*	*0.215*	*0.259*	*0.182*
Other Hispanic	−0.770	0.066	−0.512	**−0.682**	−0.451	0.316	−0.245	0.285	−0.044

	0.413	*0.239*	*0.280*	*0.298*	*0.501*	*0.317*	*0.231*	*0.290*	*0.225*
Male	**1.261**	**1.066**	**0.493**	**1.098**	**0.743**	**0.804**	**0.130**	**0.435**	**0.515**
	0.103	*0.048*	*0.056*	*0.061*	*0.115*	*0.091*	*0.049*	*0.062*	*0.047*
Age	0.033	**−0.110**	**−0.106**	**−0.042**	−0.031	**0.217**	**0.257**	**0.070**	**−0.055**
	0.027	*0.014*	*0.016*	*0.016*	*0.030*	*0.024*	*0.015*	*0.17*	*0.013*
Place of residence	0.114	**0.133**	0.090	**0.153**	0.130	**0.302**	**0.183**	**0.158**	**0.196**
	0.098	*0.050*	*0.061*	*0.063*	*0.121*	*0.095*	*0.053*	*0.069*	*0.050*
Public assistance	**0.433**	0.142	0.047	**0.254**	0.159	−0.030	−0.016	0.098	0.036
	0.141	*0.090*	*0.097*	*0.105*	*0.171*	*0.151*	*0.091*	*0.109*	*0.088*
Single-parent family	**0.462**	**0.386**	**0.208**	**0.313**	**0.518**	**0.687**	**0.684**	**0.409**	**0.317**
	0.104	*0.053*	*0.062*	*0.066*	*0.124*	*0.094*	*0.054*	*0.067*	*0.053*
Parent's education	**−0.033**	**−0.069**	**−0.053**	**−0.049**	−0.000	**0.045**	**0.026**	0.006	**0.026**
	0.016	*0.009*	*0.010*	*0.010*	*0.019*	*0.017*	*0.009*	*0.011*	*0.009*
Concentrated disadvantage	0.059	0.032	0.044	0.015	0.015	−0.001	0.030	−0.025	**−0.080**
	0.049	*0.030*	*0.034*	*0.036*	*0.056*	*0.054*	*0.032*	*0.040*	*0.031*
Intercept	**−3.886**	**1.312**	0.581	**−1.079**	**−3.537**	**−7.609**	**−5.682**	**−3.559**	−0.420
	0.556	*0.271*	*0.317*	*0.323*	*0.623*	*0.510*	*0.292*	*0.345*	*0.262*

Model 1 reports unadjusted (total) effect of race and Model 2 reports adjusted (net of additional covariates) effect of race.[a]

[a] Model 1 and Model 2 control for U.S. Census region to match stratification in AddHealth.

[b] Regression coefficients that are statistically significant for a two-tailed test at $p < .05$ are shown in **bold** in the table and their standard errors are shown below the regression coefficients in *italics*.

[c] Reference category for Race is white.

twice as likely to commit armed robbery. The race difference in group violence is either similar to or slightly smaller than race differences in individual violence.

Race effects are reduced with the introduction of mediating and control variables—but the pattern of race differences in violent offenses observed in Model 1 is still very much evident in Model 2. Race differences in violence are still substantial for armed violence, as are race differences for armed robbery and unarmed violence. In addition, consistent with past research, blacks are less likely than whites to use drugs, but only after adjusting for other predictors of drug use. The race difference in violence, but not other crime, or other more serious crime, is not consistent with crime theories.

As indicated earlier, some might question our classification of some offenses as more serious than others. For example, we classified driving a car without the owner's permission as a serious property crime, since it involved the theft of an expensive item. One might question this classification since some of these automobiles may be returned after a "joy ride." However, we obtained similar results when we reanalyzed the data omitting this response. We also did a separate analysis of stealing more than $50 and less than $50 since the former is clearly more serious than the latter. Race did not have a significant effect on either type of theft. Finally, we investigated our decision to include marijuana with other drugs as multiple indicators of drug use. Results are unchanged when we use marijuana as a single indicator. Very few respondents use drugs other than marijuana.

6.1. Other effects

Model 2 also shows that adolescents from single-parent families are more likely to commit all types of crime. The effects are particularly strong for drug offenses. Urban residence also shows a positive effect across all criminal offenses, although the effects are not statistically significant for armed violence, group violence, and armed robbery. Urban residence has its strongest effect on selling drugs. This evidence suggests that family structure and urban residence mediate race effects on delinquency generally.

Socioeconomic status has effects on violent crime but not drug or property crime. Adolescents whose parents receive public assistance are more likely to engage in armed violence and injurious violence. Adolescents whose parents are less educated are more likely to engage in violent crime, except armed robbery, but they are less likely to engage in drug-related and minor property offenses. This evidence suggests that the family's socioeconomic status mediates race differences in violence but not drug or property crime.

Age and gender differences are also observed in the table. As adolescents age, their involvement in drug and serious property crime increases while their involvement in unarmed and group violence, injurious violence, and minor property crime declines. Gender differences are stronger for violence, particularly violence involving weapons, and (relatively) weaker for property crimes and drug use.

Model 2 reveals ethnic differences, primarily for adolescents from Puerto Rican backgrounds. Adolescents with Puerto Rican backgrounds are more likely than Anglos to engage in violent offenses (although not all coefficients are statistically significant) as well as minor property offenses. Adolescents with Mexican, Cuban, and Central American backgrounds, on the other hand, are no more likely than Anglos to commit any type of crime. In fact, Cubans are less likely to engage in armed robbery and Central Americans are less likely to use drugs and commit serious property crime. Note that the evidence does not support the idea that Hispanic cultures produce higher rates of violence because of an emphasis on machismo.

Finally, we find no evidence that adolescents from disadvantaged neighborhoods are more likely to engage in criminal behavior net of individual-level characteristics. Only one of the coefficients attains even marginal statistical significance (using a two-tailed test) and it is not in the predicted direction. The results are inconsistent with McNulty and Bellair's (2003b) analysis of AddHealth data which found that neighborhood disadvantage was associated with serious violence. However, their contextual measure is based on block groups while ours is based on census tracts.

6.2. Statistical interactions

In Table 3, we present the interaction effects between race and the other explanatory variables (except Hispanic origin) for each criminal behavior. Each race interaction is estimated separately. For example, in the first model, we enter only a race by gender interaction in addition to the full set of explanatory variables. Using this

Table 3
Marginal logit regressions of criminal offense on full set of explanatory variables and race interactions[a,b]

	Armed violence	Unarmed violence	Group violence	Cause serious injury	Armed robbery	Sell drugs	Use drugs	Serious property offenses	Minor property offenses
Black x									
Male	**−0.783**	**−0.489**	0.180	**−0.299**	−0.081	**0.568**	**0.388**	−0.141	0.083
	0.235	*0.118*	*0.137*	*0.147*	*0.238*	*0.131*	*0.161*	*0.121*	*0.126*
Age	−0.046	**−0.078**	−0.033	−0.075	−0.069	**−0.148**	**−0.115**	−0.072	**−0.092**
	0.058	*0.035*	*0.038*	*0.040*	*0.067*	*0.059*	*0.037*	*0.045*	*0.034*
Place of residence	0.042	0.217	−0.094	0.289	−0.001	−0.132	0.049	−0.103	−0.167
	0.220	*0.123*	*0.141*	*0.151*	*0.268*	*0.235*	*0.135*	*0.164*	*0.144*
Public assistance	−0.350	−0.317	0.156	−0.414	0.379	0.028	0.005	0.286	0.121
	0.275	*0.189*	*0.202*	*0.216*	*0.353*	*0.304*	*0.191*	*0.231*	*0.187*
Single-parent family	−0.199	**−0.336**	0.133	−0.058	0.090	−0.365	−0.095	0.029	0.015
	0.224	*0.124*	*0.145*	*0.151*	*0.269*	*0.230*	*0.135*	*0.167*	*0.126*
Parent's Education	0.052	**0.065**	**0.052**	**0.061**	0.017	0.033	0.012	0.012	0.008
	0.034	*0.022*	*0.023*	*0.024*	*0.039*	*0.035*	*0.024*	*0.029*	*0.022*
Concentrated disadvantage	−0.073	**−0.192**	−0.084	−0.146	**0.272**	0.117	−0.113	−0.014	0.007
	0.098	*0.061*	*0.068*	*0.073*	*0.118*	*0.112*	*0.065*	*0.082*	*0.062*

[a] For simplicity, table only reports interactions with dummy variable for Black. See Table 2 for the full list of variables. Interaction terms for Other Race were also included in the analysis but they are not reported here.
[b] Interaction effects that are statistically significant for a two-tailed test at $p < .05$ are shown in **bold.** Standard errors are shown below the regression coefficients in *italics*.

method, the race main effect shown in Table 2 is conditioned by only one other explanatory variable. For the sake of simplicity we only report the interaction coefficients (and their standard errors) in Table 3.[10] The coefficients should be interpreted as raising or lowering the main effects of race shown in Table 2. When the *z*-ratio associated with the coefficient is not statistically significant, the main effect of race shown in Table 2 is unchanged.[11]

The results suggest that race differences in violence are stronger for youth from educated families. All five coefficients involving the multiplicative effects of race and parents' education are positive, although only three are statistically significant. The pattern is contrary to the multiple disadvantage argument.

We also find evidence of interactions involving race and gender. The negative signs for the interactions indicate that race differences in armed violence, unarmed violence, and injurious violence are stronger for girls than for boys. For example, African-American boys are almost 1.8 times more likely to commit armed violence than white boys while African-American girls are almost 4 times more likely to commit armed violence than white girls. On the other hand, race differences in selling and using drugs are stronger among boys.

We also observe statistical interactions involving race and age. All the coefficients are negative, although only the coefficients involving unarmed violence, selling drugs, using drugs, and minor property crimes are statistically significant. Apparently, black adolescents engage in drug-related offenses and minor property crimes at younger ages than do white adolescents. Whites catch up as they get older.

We observe a few other scattered interactions in the table. Race differences in unarmed violence are weaker for youth from single parent families and from poor neighborhoods. Race differences in armed robbery are stronger in poor neighborhoods.

6.3. *Effects of the marginal logit methodology*

With conventional methods it is difficult to estimate the effects of variables on the commission of specific offenses, since offenders typically commit more than one type of offense. As noted earlier, this dependence among multiple offenders could bias the standard errors of the regression estimates. The marginal logit method does, in fact, make a difference in our results. While the regression coefficients reported in Tables 2 and 3 are very similar in sign and magnitude to those estimated using uncorrected binomial logistic regressions, the standard errors are often different. In general, the uncorrected standard errors are smaller than the corrected standard errors, although in some instances the reverse is true. For example, twenty statistically significant ($p < .05$) *z*-ratios in Model 2 of Table 2 drop below the critical value following GEE estimation—while one non-significant *z*-ratio exceeds the critical value after GEE estimation (due to the precipitous decline in its standard error).

7. Discussion

This research suggests that black adolescents are more likely than white adolescents to engage in violent crime but not property or drug crime. In fact, blacks are *less* likely to use illegal drugs, when demographic variables are controlled. For African-American youth: crime is not the problem.[12]

Some of our evidence is consistent with evidence from earlier studies, but we control for social demographic variables and use a large, nationally representative, sample. Most importantly, we show for the first time that race differences in violence among youth are not due to race differences in the tendency to commit more serious crime. Effects are no stronger for serious delinquency than for minor delinquency, i.e., they are no stronger for selling drugs than for using drugs, for injurious violence than for other violence, or for serious property crime than for minor property crime.

Race differences in violence are mediated to some extent by demographic factors. Controls for family structure, urban residence, and socioeconomic status reduce the size of race effects on violent crime. In other words, black adolescents are more likely to engage in violent crime than white adolescents because they are more

[10] The full set of coefficients is available from the authors upon request.

[11] A search for three-way interactions involving race failed to reveal any other consistent effects.

[12] Note that the race pattern does not imply that blacks specialize in violent offenses, only that they are more likely than whites to have violent offenses in their offense histories. Black youth, like white youth, still commit more non-violent offenses than violent offenses.

likely to reside in urban areas, their parents are more likely to be poor and uneducated, and their families are more likely to be headed by a single parent. However, demographic variables only partially explained why black adolescents are more likely than white adolescents to engage in violent crime. The race difference in violence that remains when demographic factors are controlled is substantial.

The race difference in armed violence is particularly strong. A black adolescent is more than twice as likely to commit violence with a weapon than a white adolescent, controlling for demographic variables. Unfortunately, we cannot determine with our item whether this difference involves firearms or other weapons. While the literature focuses on firearms (e.g., Blumstein, 1995), an examination of assault data from the National Crime Victimization Survey (not presented) shows that, during an assault, black offenders are more likely than white offenders to use other weapons as well as firearms.[13]

We do not find evidence that race combines with other forms of disadvantage to produce particularly high rates of violent crime. The results are not consistent with the idea that youth who are predisposed to engage in crime because they experience one risk factor are particularly likely to offend if they experience some other risk factor. Our analysis of statistical interactions is more consistent with the argument that race effects on violence are stronger for adolescents who would otherwise be at lower risk of violence: girls and adolescents from educated and intact families. This pattern is consistent with much, but not all, of the prior research cited earlier.

It is interesting to note that socioeconomic status, like race, is associated with violence but not other crime. Adolescents from lower status families are more likely to engage in most forms of violent crime but they are no more likely to engage in drug or property crime. In fact, adolescents with educated parents are *more* likely to engage in drug-related and minor property offenses. In addition, adolescents whose parents receive public assistance are particularly likely to engage in armed violence. Thus, poverty *and* race are most strongly related to armed violence.

We also examined crime patterns for Hispanic adolescents, a neglected topic in the literature. The extensive race/ethnicity questions and the large sample size of AddHealth allowed us to examine delinquency among a variety of Hispanic groups, and disentangle race from ethnic effects. This has not been done before. The results show that most Hispanic groups have similar crime rates as Anglos, suggesting that violence is not associated with machismo Hispanic culture. Puerto Ricans are a notable exception: they are more likely to commit a variety of crimes than Anglos. Their rates of unarmed violence and armed robbery are particularly high, suggesting some violence specialization.[14] However, the pattern is not as clear as it is for African-Americans, as they are also more likely to commit minor property offenses. At any rate, our results suggest that it is important to distinguish different Hispanic groups when studying crime and delinquency. Unfortunately, most crime surveys group all Hispanics into the same category.

Measurement error is always an important issue in research that relies on self-reports. The evidence cited earlier suggests that computer assisted method used in AddHealth yields higher rates of reporting of deviant behavior than self-administered questionnaires. In addition, the race differences we observe have been observed with arrest and victimization data, although those studies lack adequate controls and do not disentangle effects on violence from effects on serious crime. Finally, it is difficult to imagine how measurement error could account for either the violence differential or the statistical interactions. It seems unlikely, for example, that African-Americans over-report violent behavior but not other criminal behavior, and that this bias is particularly strong for girls and adolescents from intact or middle-class families. However, it may be that, because of measurement error, this survey is not sensitive enough to detect differences in non-violent crime but that these differences are not as strong as race differences in violence.

Our study is also limited by the fact that it is based on a school sample. Serious delinquents are under-sampled because some of them have dropped out of school. In addition, Blacks and Hispanics are more likely to drop out of school than non-Hispanic whites (Hauser et al., 2000). Note, however, that race differences in violence are just as strong at younger ages before adolescents are likely to leave school. Another potential limitation is our reliance on a self-report survey. Minor forms of delinquency are likely to have a stronger influence on results from self-report surveys than serious forms of delinquency because they are much more

[13] The analyses are based on 16,672 assaults from a pooled sample (1993–1998).

[14] We also examined statistical interactions between Puerto Rican background and the other demographic variables. None were statistically significant.

frequent. It is not clear how these sampling biases would affect our results. Perhaps, we would have found some race differences in serious non-violent delinquency if the category focused on the most serious property and drug offenses. It would still be necessary to explain why the race difference in violence is so much greater.

8. Implications for specific theories

Our main goal in this research was to describe racial patterns of adolescent offending and to determine whether theories of crime or violence could explain them. Our results suggest that neither strain theory nor control theories, nor the social disorganization approach can explain the *net* effects of race that we observed since they imply race differences in a variety of offenses, not just violent offenses (e.g., Agnew, 1987; Hirschi, 1969; Gottfredson and Hirschi, 1990; Sampson and Wilson, 1995). Strain, control, and social disorganization could have indirect effects, however. For example, it may be that a subculture of violence develops in a social disorganized neighborhood. But then one must explain why only attitudes toward violence are affected. Should not a subculture of delinquency or an "oppositional culture" also develop in these neighborhoods and lead to more criminal behavior generally (e.g., Rose and McClain, 1998). Note also that our results say nothing about the general validity of these theories. For example, control theories may very well explain individual differences or the effects of growing up in single-parent families or social disorganized neighborhoods. Our purpose was only to examine whether crime or violence theories can explain the race differences in offending that remain when other demographic variables are controlled.

Our results point to theoretical explanations that focus on violence. For example, frustration–aggression theories could possibly explain race differences in violence but then one must interpret most violence by African-Americans as displaced aggression, since most of it is directed at other blacks. Studies of violent disputes, however, suggest that offenders typically target their adversaries, not innocent third parties (Luckenbill, 1977; Tedeschi and Felson, 1994). In addition, frustration–aggression approaches cannot easily account for our finding that race differences in armed robbery—generally recognized as instrumental violence—are just as strong as race differences in assault. Finally, prior research suggests that blacks are no more likely than whites to engage in verbal aggression (e.g., Steadman and Felson, 1984; Atkin et al., 2002; Harris, 1992). A frustration–aggression argument implies that blacks should be more likely to engage in all types of expressive aggression, not just its relatively rare physical manifestation. In general, frustration–aggression approaches are not supported by the test of discriminant predictions.

The contagion process implied in Anderson's (1999) "code of the streets" might help explain race differences in violence. Structural or historical factors may have led to high crime rates in African-American communities, providing a starting mechanism. For example, the association between race and poverty, urban residence, and single parent households may have led initially to group differences in violence and other crime. Violence may then have spread in these communities because of residential segregation and because violence is more contagious than other crime. The contagiousness is due to an "adversary effect:" the threat of violence leads adversaries to use violence to protect themselves and to retaliate when attacked. A competitive or adversarial process, implied in Anderson's code of the streets, produces more contagion than peer support or subcultural beliefs do alone. Adversary effects also lead to an arms race and therefore help explain the strong race differences in armed violence.

The fact that we did not find evidence that race effects are stronger in urban areas might be viewed as contrary to the idea of adversary effects implied in Anderson's approach. Note, however, that our measure of urban residence is based on population density not location in an "inner city" or residential segregation. Future research should examine whether violence is particularly likely to spread in segregated African-American communities.

A competitive contagion process, however, cannot explain strong race differences in committing robbery or sexual assault, race differences in the use of physical punishment by parents, or race differences in violence observed in colleges and prisons (e.g., Bureau of Justice Statistics, 1997; Gil, 1970; Volkwein et al., 1995; Harer and Steffensmeier, 1996). These patterns imply some degree of internalization of norms and attitudes conducive to violence among African-Americans. They imply a type of contagion produced by differential association or a subculture of violence (e.g., Wolfgang and Ferracuti, 1967). While research on race differences in attitudes toward violence yields mixed results, attitudes regarding violence are complex and contingent on cir-

cumstances, and measuring them is difficult (see, e.g., Blumenthal et al., 1972; Rossi et al., 1974; Erlanger, 1974; Luckenbill and Doyle, 1989; Markowitz and Felson, 1998; Wolfgang et al., 1985; Cao et al., 1997).

More general theories of human behavior—social learning and rational choice—can explain race differences, but they must posit some process that produces differences in violence alone. In fact, the contagion and subcultural arguments just described are based on rational choice and social learning perspectives. Our point is that it is necessary to examine variation in the social learning of violence, not crime. Finally, the routine activities approach (e.g., Felson, 1994) could account for differences in effects on violent and non-violent crime if the opportunities to commit these crimes vary by race. Violent crime is different from other crimes in that it requires personal contact between offender and victim and poses a greater risk of reprisal for potential guardians who intervene. Perhaps, black communities are more likely than white communities to bring potential offenders and victims into contact in places where potential guardians are afraid to intervene. On the other hand, the evidence showing race differences in violence in prisons and universities is difficult for the routine activities theory to explain.

With the exception of poverty, violent crime may be the most important issue in the study of race in American society. Yet, perhaps because of the sensitivity of this issue, the research literature is limited. Our research suggests that there are race differences in violence, not crime generally, net of other social-demographic factors, and that we need to consider theories of violence rather than theories of crime in order to understand these patterns. Blacks and whites in American society differ in their use of physical forms of aggression, not in their tendency to break rules or in their intention to do harm. We have not yet found the house but we think we know what street it is on.

Appendix A

Armed Violence (1 item): "Have you ever used a weapon in a fight?"

Unarmed Violence (2 items): "In the past 12 months, how often did you get into a serious physical fight?" "During the past 12 months how often did . . .you got into a physical fight?"

Group Violence (1 item): "In the past 12 months, how often did you take in a fight where a group of your friends was against another group?"

Cause Serious Injury (1 item): "In the past 12 months, how often did you hurt someone badly enough to need bandages or care from a doctor or nurse?"

Armed robbery (1 item): "In the past 12 months, how often did you use or threaten to use a weapon to get something from someone?"

Sell Drugs (1 item): "In the past 12 months, how often did you sell marijuana or other drugs?"

Use Drugs (4 items): "During your life, how many times have you used cocaine?" "How old were you when you tried marijuana for the first time? If you never tried marijuana, enter '0.'"

"How old were you when you tried inhalants, such as glue or solvents, for the first time? If you never tried inhalants such as these, enter '0.'" "How old were you when you first tried any other type of drug, such as LSD, PCP, ecstasy, mushrooms, speed, ice, heroin, or pills without a doctor's prescription? If you never tried any other type of illegal drug, enter '0.'"

Serious Property Crime (3 items): "In the past 12 months, how often did you go into a house or building to steal something?" "In the past 12 months, how often did you steal something worth more than $50?" "In the past 12 months, how often did you drive a car without its owner's permission?

Minor Property Crime (4 items): "In the past 12 months, how often did you paint graffiti or signs on someone else's property or in a public place?" "In the past 12 months, how often did you deliberately damage property that did not belong to you?" "In the past 12 months, how often did you take something from a store without paying for it?" "In the past 12 months, how often did you steal something worth less than $50?"

References

Agnew, Robert, 1987. On testing structural strain theories. Journal of Research in Crime and Delinquency 24, 281–286.

Agresti, Alan, Liu, Ivy, 2001. Strategies for modeling a categorical variable allowing multiple category choices. Sociological Methods and Research 29, 403–434.

Anderson, Elijah, 1999. Code of the Street. W.W. Norton & Company, New York.
Atkin, Charles K., Smith, Sandi W., Roberto, Anthony J., Fediuk, Thomas, Wagner, Thomas, 2002. Correlates of verbally aggressive communication in adolescents. Journal of Applied Communication Research 30, 251–268.
Blumenthal, Monica, Kahn, Robert L., Andrews, Frank M., Head, Kendra B., 1972. *Justifying Violence*: Attitudes of American Men. Institute for Social Research, Ann Arbor, MI.
Blumstein, Alfred, 1995. Youth violence, guns and the illicit-drug industry. Journal of Criminal Law and Criminology 86, 10–36.
Bridges, George S., Weis, Joseph G., 1989. Measuring violent behavior: effects of study design on reported correlates of violence. In: Neil Alan, Weiner, Wolfgang, Marvin E. (Eds.), Violent Crime, Violent *Criminals*. Sage, Beverly Hills, CA, pp. 14–35.
Brownfield, David, 1986. Social class and violent behavior. Criminology 24, 421–437.
Bureau of Justice Statistics. 1997. Criminal Victimization in the United States—1994. Washington, DC: U.S. Government Printing Office.
Bureau of Justice Statistics. 1995. Sourcebook of Criminal Justice Statistics, 1994. Washington, DC: U.S. Department of Justice.
Bye, Barry V., Riley, Gerald F., 1989. Model estimation when observations are not independent: application of Liang and Zeger's methodology to linear and logistic regression analysis. Sociological Methods and Research 17, 353–375.
Cao, Liqun, Anthony Adams., Vickie J. Jensen. 1997. A Test of the Black Subculture of Violence Thesis: A Research Note. Criminology 35, 367–379.
Daly, Martin, Wilson, Margo, 1988. Homicide. Aldine de Gruyter, Hawthorne, NY.
Deane, Glenn D., Armstrong, David P., Felson, Richard B., 2005. An examination of offense specialization using marginal logit models. Criminology 43, 955–988.
Deater-Deckard, Kirby, Dodge, Kenneth A., Bates, John E., Pettit, Gregory S., 1998. Multiple risk factors in the development of externalizing behavior problems: group and individual differences. Development and Psychopathology 10, 469–493.
Elliot, Delbert S., 1994. 1993 Presidential address: serious violent offenders: onset, developmental course, and termination. Criminology 32, 1–23.
Elliot, Delbert S., Ageton, Suzanne S., 1980. Reconciling race and class differences in self-reported and official estimates of delinquency. American Sociological Review 45, 95–110.
Erlanger, Howard S., 1974. The empirical status of the subculture of violence thesis. Social Problems 22, 280–291.
Farrington, David P., Loeber, Rolf, Magda, Stouthamer-Loeber, 2003. How can the relationship between race and violence be explained? In: Hawkins, Darnell F. (Ed.), Violent Crime: Assessing Race and Ethnic Differences. Cambridge University Press, New York, pp. 213–237.
Felson, Marcus, 1994. Crime and Everyday Life. Pine Forge Press, Thousand Oaks, CA.
Felson, Richard B., 1996. Mass media effects on violent behavior. Annual Review of Sociology 22, 103–128.
Felson, Richard B., 2002. Violence and Gender Reexamined. American Psychological Association, Wash., D.C.
Felson, Richard B., Liska, Allen E., South, Scott J., McNulty, Thomas J., 1994. The subculture of violence and delinquency: individual vs. school context effects. Social Forces 73, 155–174.
Gil, David., 1970. Violence Against Children: Physical Child Abuse in the United States. Harvard University Press, Cambridge, MA.
Gottfredson, Michael, Hirschi, Travis, 1990. A General Theory of Crime. Stanford University Press, Stanford, CA.
Harer, Miles D., Steffensmeier, Darrell J., 1992. The differing effects of economic inequality on black and white rates of violence. Social Forces 70, 1035–1054.
Harer, Miles D., Steffensmeier, Darrell J., 1996. Race and prison violence. Criminology 34, 323–355.
Harris, Kathleen Mullan, Francesca Florey, Joyce Tabor, Peter S. Bearman, Jo Jones, J. Richard Udry. 2003. The National Longitudinal Study of Adolescent Health: Research Design [WWW document]. URL: <http://www.cpc.unc.edu/projects/addhealth/design>.
Harris, Mary B., 1992. Sex, race, and experiences of aggression. Aggressive Behavior 18, 201–217.
Hauser, R.M., Simmons, S.J., Pager, D.I. 2000. High School Dropout, Race-Ethnicity and Social Background from the 1970s to the 1990s. Center for Ecology and Demography Working Paper No. 2000-12, University of Wisconson-Madison.
Hawkins, Darnell F. 1995. Ed. Ethnicity, Race and Crime: Perspectives across Time and Place. Albany, NY: SUNY Press.
Hawkins, Darnell F., Laub, John H., Lauritsen, Janel L., Cotghern, Lynn, 2000. Race, Ethnicity and Serious and Violent Juvenile Offending. Juvenile Justice Bulletin. Dept of Justice, Washington: US.
Hindelang, Michael, Travis, Hirschi, Joseph, Weis, 1981. Measuring Delinquency. Sage, Beverly Hills, CA.
Hirschi, Travis, 1969. Causes of Delinquency. University of California Press, Berkeley, CA.
Horney, Julie D., Osgood, Wayne, Marshall, Ineke H., 1995. Criminal careers in the short- term: intra-individual variability in crime and its relation to local life circumstances. American Sociological Review 60, 655–673.
Kaufman, Joanne M., 2005. Explaining the race-ethnicity violence relationship: neighborhood context and social psychological processes. Justice Quarterly 22, 224–251.
Korn, Edward L., Graubard, Barry I., 1991. Epidemiologic studies utilizing surveys: accounting for the sampling design. American Journal of Public Health 81, 1166–1173.
Lafree, Gary, Drass, Kriss A., 1996. Variables affecting arrest rates of black and whites, 1957 to 1990. American Sociological Review 61, 614–634.
Liang, Kung-Yee, Zeger, Scott L., 1986. Longitudinal data analysis using generalized linear models. Biometrika 73, 13–22.
Loftin, Colin. 1991. Socioeconomic Status and Race. Memorandum prepared for the Panel on Understanding and Control of Violent Behavior established by the Committee on Law and Justice a Subcommittee of the Commission on Behavioral and Social Sciences and Education a Division of the National Research Council, Washington DC.
Luckenbill, David F., 1977. Criminal homicide as a situated transaction. Social Problems 25, 176–186.

Luckenbill, David F., Doyle, Daniel P., 1989. Structural position and violence: developing a cultural explanation. Criminology 27, 801–818.
Markowitz, Fred, Felson, Richard B., 1998. Social-demographic differences in attitudes and violence. Criminology 36, 117–138.
Martinez Jr., Ramiro, 1996. Latinos and lethal violence: the impact of poverty and inequality. Social Problems 43, 131–146.
Martinez, Ramiro, Lee, Matthew T., 1999. Extending ethnicity in homicide research: the case of latinos. In: Smith, Dwayne M., Zahn, Margaret A. (Eds.), Homicide: A Sourcebook of Social Research. Sage, Thousand Oaks, CA, pp. 211–220.
McLeod, Jane D., Kruttschnitt, Candace, Dornfeld, Maude, 1994. Does parenting explain the effects of structural conditions on children's antisocial behavior? A comparison of blacks and whites. Social Forces 73, 575–604.
McCord, Joan, 1997. Violence and Childhood in the Inner City. Cambridge University Press, Cambridge, MA.
McNulty, Thomas L., Bellair, Paul E., 2003a. Explaining racial and ethnic differences in adolescent violence: structural disadvantage, family well-being, and social capital. Justice Quarterly 20, 1–31.
McNulty, Thomas L., Bellair, Paul E., 2003b. Explaining racial and ethnic differences in serious adolescent violent behavior. Criminology 41, 709–748.
Messner, Steve F., Rosenfeld, Richard, 1994. Crime and the American Dream. Wadsworth Publishing Company, Belmont, CA.
Messner, Steve F., Sampson, Robert J., 1991. The sex ratio, family disruption, and rates of violent crime: the paradox of demographic structure. Social Forces 69, 693–713.
Nagin, Daniel S., Paternoster, Raymond, 1993. Enduring individual differences and rational choice theories of crime. Law and Society Review 27, 467–496.
Ousey, Graham C., 1999. Homicide, structural factors, and the racial invariance assumption. Criminology 37, 405–426.
Paschall, Mallie J., Ennett, Susan T., Flewelling, Robert L., 1996. Relationships among family characteristics and violent behavior by black and white male adolescents. Journal of Youth and Adolescence 25, 177–197.
Rose, Harold M., McClain, Paula D., 1998. Race, place, and risk revisited: a perspective on the emergence of a new structural paradigm. Homicide Studies 2, 101–129.
Rossi, Peter, Waite, Emily, Bose, Christine E., Berk, Richard E., 1974. The seriousness of crime: normative structure and individual differences. American Sociological Review 39, 224–237.
Rowe, David C., Vazsonyi, Alexander T., Flannery, Daniel J., 1994. No more than skin deep: ethnic and racial similarity in developmental processes. Psychological Review 101, 396–413.
Sampson, Robert, Lauritsen, Janet, 1994. Violent victimization and offending: individual-, situational-, and community-level risk factors in understanding and preventing violence. In: Reiss, Albert J., Roth, Jeffrey A. (Eds.), Social Influence, vol. 3. National Academy Press, Washington, DC, pp. 1–115.
Sampson, Robert J., Raudenbush, Stephen W., Felton, Earls, 1997. Neighborhoods and violent crime: a multilevel study of collective efficacy. Science 277, 918–924.
Sampson, Robert J., Wilson, William J., 1995. Toward a theory of race, crime, and urban inequality. In: Hagan, John, Peterson, R.D. (Eds.), Crime and Inequality. Stanford University Press, Stanford, CA.
Short, James, 1997. Poverty, Ethnicity, and Violent Crime. Boulder, CO, Westview.
Steadman, Henry, Felson, Richard B., 1984. Self-reports of violence: ex-mental patients, ex-offenders, and the general population. Criminology 22, 321–342.
Stinchcombe, Arthur L., 1968. Constructing Social Theories. University of Chicago Press, Chicago.
Sullivan, Christopher J., McGloin, Jean Marie., Pratt, Travis C., Piquero, Alex R., 2006. Rethinking the "norm" of offender generality: investigating specialization in the short-term. Criminology 44, 199–233.
Tedeschi, James T., Felson, Richard B., 1994. Violence, Aggression, and Coercive Actions. American Psychological Association, Washington, DC.
Turner, Charles F., Ku, Leighton, Rogers, Susan M., Lindberg, Laura D., Pleck, Joseph H., Sonenstein, Freya L., 1998. Adolescent sexual behavior, drug use, and violence: increased reporting with computer survey technology. Science 280, 867–873.
Udry, J.R. 1998. The National Longitudinal Study of Adolescent Health (AddHealth), Waves I & II, 1994–1996 [machine-readable data file and documentation]. Chapel Hill, NC: Carolina Population Center, University of North Carolina at Chapel Hill.
Volkwein, Fredericks J., Szelest, Bruce P., Lizotte, Allen J., 1995. The relationship of campus crime to campus and student characteristics. Research in Higher Education 36, 647–670.
Wilson, William J., 1987. The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy. University of Chicago Press, Chicago, IL.
Wolfgang, Marvin E., Robert M. Figlio, Paul E. Tracey, Simon I. Singer. 1985. The National Survey of Crime Severity. Washington D.C.: U.S. Department of Justice, Bureau of Justice Statistics.
Wolfgang, Marvin E., Ferracuti, Franco, 1967. The Subculture of Violence. Tavistock, London.
Zimring, Franklin, Hawkins, Gordon, 1997. Crime is not the Problem: Lethal Violence in America. Oxford University Press, New York.