

# Is Crack Cocaine Use Associated with Greater Violence than Powdered Cocaine Use? Results from a National Sample

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**Background:** The question of whether crack cocaine use is associated with increased violence compared to powdered cocaine use has not been adequately explored in large nationally representative general population samples. **Methods:** This study used data from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) to 1) determine the comparative prevalences of violent behaviors among crack cocaine users and powdered cocaine users, 2) examine these differences while controlling for sociodemographic variables, lifetime psychiatric, alcohol and drug use disorders (a majority of cocaine users use other substances), and levels of crack cocaine and powdered cocaine use. **Results:** The likelihood of violence associated with crack cocaine users was greater compared to powdered cocaine users at the bivariate level. However, these differences were almost uniformly statistically nonsignificant when demographic, mood and non-cocaine substance use disorders were controlled for. **Conclusions:** The substantial attenuation of the association of crack cocaine use with violence after adjustment suggests that the sociodemographic characteristics, psychiatric variables, and non-cocaine substance use disorders that make some individuals more likely to use crack cocaine than powder cocaine are responsible for the increased prevalence of violence observed among crack users, rather than crack itself.

**Keywords:** aggression, cocaine, crack cocaine, violence

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## INTRODUCTION

In the 1980s, there was considerable alarm surrounding a presumed link between crack cocaine use and violence (1–3) and crack cocaine continues to be viewed in a more negative light compared to powdered cocaine. Approximately half of all illicit cocaine produced in the United States is in the form of crack cocaine (4). Cocaine, regardless of the form in which it is used, has been associated with violence (5, 6). Although used legally in the United States for many years, recognition of cocaine's danger resulted in the passage of the Harrison Act of 1914 that prohibited non-medical use of cocaine (7).

Crack cocaine, a crystallized form of the drug that is typically smoked, raised a social and political panic that resulted in passage of controversial drug laws that levied disproportional sentences for crack cocaine users relative to powder cocaine users. These laws, which partly fueled the rise in incarceration over the past twenty years were based on the U.S. Drug Abuse Act of 1986, are still in place. The crime drop of the 1990s was explained by leading scholars as a direct result of the reduction in violence associated with crack cocaine markets (8). This explanation is consistent with one component of Goldstein's tripartite (1985) framework on drugs and violence, the view that crack cocaine markets and violence represent *systemic*-related violence. The other two forms of drug-related violence in the tripartite framework are *psychopharmacological* (i.e., drug-induced) violence and *economic-compulsive violence* (9).

Although some scholars have provided evidence that violence associated with crack cocaine use is not a consequence of the pharmacological actions of the drug but instead reflects involvement in criminal acts, and that the drug laws regarding usage were largely class driven and racist in nature (10, 11), there are reasons to suspect that crack cocaine use may result in increased violence by users compared to powdered cocaine use. When crack cocaine is smoked, it is taken up into the body more rapidly than powdered cocaine. This is because the lungs possess greater permeable surface (12) compared to the major route of administration for powdered cocaine, nasal insufflation (i.e., “snorting”). Although the biological and psychological effects of crack cocaine and powdered cocaine are similar, crack cocaine use is associated with increased abuse and dependence liability and thus potentially greater violence (13). Theoretically, if acute symptoms of cocaine such as paranoia, irritability, and insomnia are related to violence, one would expect that use of more concentrated forms of cocaine would produce more of these kinds of effects and increase the likelihood of violence.

In a study of 194 cocaine users, those who were free-basing/crack smoking or using via intravenous injection exhibited greater violence than those using via nasal insufflation (14). One of the problems with studies examining route of administration effects, however, is that antisocial persons may be more inclined generally to smoke crack cocaine and free base than less antisocial persons; thus, route of administration effects may be confounded with antisociality and other individual factors.

Another reason there may be an association between crack cocaine usage and greater violence may be a function of cost. Crack cocaine “rocks” or pellets are less costly in relative terms, and thus potentially greater quantities can be ingested for less money in a shorter amount of time and with greater intensity of effect than powdered cocaine. This may increase the likelihood of rage or paranoia-induced aggression among crack cocaine users compared to powdered cocaine users. Further, since most crack cocaine users have histories of intranasal users (13), these users may represent a more deviant user group.

One of the weaknesses of prior research on crack cocaine and violence is an overreliance on nonrepresentative samples, including those drawn from clinical and forensic populations. Overall, previous studies have not been derived from highly varied populations, and this is a gap in the research that needs to be filled. The question of whether crack cocaine use is associated with increased violence compared to powdered cocaine use has not been adequately explored in large nationally representative general population samples. Thus, the purpose of the present investigation is to compare crack cocaine users to powdered cocaine users vis-à-vis violent behavior using data from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). The view that crack cocaine use is especially associated with violence is still widespread. Thus, our specific aims were to 1) determine the comparative prevalences

of violent behaviors among crack cocaine users and powdered cocaine users and 2) examine these differences while controlling for sociodemographic variables, lifetime psychiatric, alcohol and drug use disorders (a majority of cocaine users use other substances), and levels of crack cocaine and powdered cocaine use.

## MATERIALS AND METHODS

### Participants

Study findings are based on data from the 2001–2002 National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). NESARC is a nationally representative sample of 43,093 non-institutionalized U.S. residents aged 18 years and older (15). The survey gathered information on alcohol use and comorbid psychiatric disorders from individuals living in households and group settings such as shelters, college dormitories, and group homes in all 50 states and the District of Columbia. NESARC utilized a multistage cluster sampling design, oversampling young adults, Hispanics, and African-Americans in the interest of obtaining reliable statistical estimation in these subpopulations, and to ensure appropriate representation of racial/ethnic subgroups, with an overall response rate of 81%. Data were weighted at the individual and household levels to adjust for oversampling and non-response on demographic variables (i.e., age, race/ethnicity, sex, region, and place of residence). Data were also adjusted to be representative (based on region, age, race, and ethnicity) of the U.S. adult population as assessed during the 2000 Census. Study participants provided fully informed consent. The U.S. Census Bureau and the U.S. Office of Management and Budget approved the research protocol and informed consent procedures.

### Diagnostic Assessment and Sociodemographic Measures

Study data were collected through structured face-to-face interviews conducted by U.S. Census workers trained by the National Institute on Alcohol Abuse and Alcoholism and U.S. Census Bureau. Interviewers administered the Alcohol Use Disorder and Associated Disabilities Interview Schedule–DSM-IV version (AUDADIS-IV), which has demonstrated good-to-excellent reliability in assessing alcohol and drug use in the general population (16, 17).

Information regarding powdered cocaine and crack cocaine were based on items embedded in the medicine use module. All NESARC participants were asked the following question: “Not counting crack, have you ever used cocaine?” and “Not counting cocaine, have you ever used crack?” The response categories for these items were dichotomous (yes/no). Accordingly, we created a dichotomous dependent variable of crack use that includes participants who used both crack and powdered cocaine and those who used powdered cocaine only. As expected, the unweighted number of persons responding yes to powdered

cocaine ( $N = 1938$ ) was larger than crack cocaine ( $N = 465$ ). Additional questions queried respondents with respect to route of administration and also as expected the vast majority of powdered cocaine users used nasal insufflation while the majority of crack users smoked the substance.

Violent behaviors were measured using 10 items from the antisocial personality disorder module of the AUDADIS-IV. Subjects self-reported whether they exhibited any of the behaviors in their lifetime (summarized in Table 2). Each item was dichotomously scored (yes/no). The occurrence of each behavior was examined in relation to crack cocaine and cocaine use. Additionally, the items were also used to form a single dichotomous measure representing any violent behavior.

Several lifetime DSM-IV substance use and psychiatric disorders were assessed in NESARC. We used lifetime alcohol (alcohol abuse/dependence) and drug (abuse/dependence on heroin, hallucinogens, marijuana, stimulants, painkillers, tranquilizers, and sedatives) use disorders, and lifetime DSM-IV mood disorders (major depression, dysthymia, and bipolar disorder) as control variables in order to rule out confounding effects of other substance use disorders and mood states. Response categories for region of residence in the United States, urbanicity, race/ethnicity, sex, age, marital status, educational background, unemployment status, and individual and family income are listed in Table 1.

### Statistical Analyses

Weighted prevalence estimates and standard errors were computed using SUDAAN Version 9.0 (18). This software system implements a Taylor series linearization to adjust standard errors of estimates for complex survey sampling design effects including clustering effects common in this type of data. Following presentation of sociodemographic characteristics, cross-tabulations of violent behaviors and crack cocaine and powdered cocaine are reported. Next, multivariate logistic regression analyses were conducted with simultaneous entry of sociodemographic covariates, alcohol and other substance use disorders, and mood disorders to determine the relationship of crack cocaine use to violence after adjusting for potentially confounding variables. Due to small cell sizes, we were unable to examine the effects of route of administration among powdered cocaine and crack cocaine users in relation to violence. Adjusted odds ratios (AORs) and 95% confidence intervals are presented to reflect association strength and significance. Adjusted odds ratios were considered significant only if associated confidence intervals did not include the value 1.0.

## RESULTS

### Sociodemographic Characteristics

Table 1 provides comparisons of persons with and without a history of crack cocaine use across NESARC sociodemographic characteristics. Compared to powdered cocaine users,

crack cocaine users were more likely to be male (OR = 1.64, 95% CI = 1.20–2.24), African-American (OR = 4.53, 95% CI = 3.02–6.79), and possess lower levels of educational attainment, including less than high school (OR = 2.24, 95% CI = 1.40–3.58). A clear divergence with income was observed, with crack cocaine users being more likely to report lower levels of income and powdered cocaine user higher levels of income. Crack cocaine users were nearly four times more likely to earn less than \$20,000 per annum (OR = 3.67, 95% CI = 2.18–6.19). Respondents residing in the Northeast (OR = 0.62, 95% CI = 0.39–0.99) were significantly less likely than persons living in the West to report crack cocaine use. There were no significant differences with respect to age, nativity, marital status, and urbanicity.

### Crack Cocaine, Powdered Cocaine, and Associated Antisocial Behaviors

As revealed in Table 2, crack cocaine users reported engaging in a greater number of violent behaviors compared to powdered cocaine users. The highest prevalence rates were found for doing things that could have easily hurt self or others (55.3% versus 46.0%), getting into a fight that came to swapping blows with husband/wife or boyfriend/girlfriend (34.5% versus 18.0%), and hitting someone so hard that you injure that person (30.0% versus 20.5%). Low prevalence rates were found for robbing/mugging someone (4.6% versus 1.8%) and forcing someone to have sex (2.4% versus 0.6%). Unadjusted odds ratios indicated that individuals who used crack were significantly more likely to have engaged in all violent behaviors measured compared to individuals who used powder cocaine. The second set of odd ratios was adjusted for sociodemographic factors (i.e., race, sex, education, marital status, age, income, region, and urbanicity) and previously described lifetime DSM-IV alcohol, drug, and mood disorders. Adjustment for these covariates (overall model,  $F$ -value = 20.64 [DF = 35],  $p < .0001$ ) attenuated the relationship of crack use with violence for all of the behaviors examined, such that all but one association became statistically nonsignificant. The remaining statistically significant difference was for the behavior getting into a fight that came to swapping blows with husband/wife or boyfriend/girlfriend (OR = 1.55, 95% CI = 1.05–2.28). Specifically, age, male gender, low income, low levels of education, race (African-American), and bipolar disorder were significant in final regression models. Overall, the likelihood of violence associated with crack cocaine users was greater compared to powdered cocaine users at the bivariate level. However, these differences were almost uniformly statistically nonsignificant when demographic, mood and non-cocaine substance use disorders were controlled for.

## DISCUSSION

To our knowledge, this is the largest national epidemiological study examining associations between crack cocaine use

TABLE 1.  
Sociodemographic characteristics of adult NESARC respondents with a lifetime history of crack or powdered cocaine use.

Characteristic	Powdered Cocaine	Crack Cocaine	OR 95% CI
	(N = 1938)	(N = 465)	
	% CI	% CI	
Sex			
Men	63.05 (60.13–65.88)	72.05 (67.42–76.26)	<b>1.64 (1.20–2.24)</b>
Women	36.95 (34.12–39.87)	27.95 (23.74–32.58)	1.00
Race			
Hispanic	8.96 (7.12–11.22)	10.82 (7.07–16.21)	1.14 (.65–1.98)
Asian/Alaska/Indian	4.67 (3.51–6.19)	6.49 (4.13–10.04)	.62 (.15–2.62)
Native American	4.49 (3.51–6.19)	16.87 (13.53–20.84)	2.01 (1.04–3.91)
African American	81.88 (79.28–84.22)	65.83 (59.42–71.71)	<b>4.53 (3.02–6.79)</b>
White			1.00
Nativity			
Born in the United States	95.39 (94.13–96.39)	95.46 (90.36–97.92)	1.13 (.43–3.01)
Born in a foreign country	4.61 (3.61–5.87)	4.54 (2.08–9.64)	1.00
Age (years)			
65+	.53 (.31–.91)	.34 (.05–2.24)	.33 (.03–3.43)
<b>50–64</b>	12.94 (11.26–14.82)	7.85 (5.70–10.71)	<b>.38 (.22–.67)</b>
35–49	57.07 (46.33–57.88)	52.14 (46.33–57.88)	.76 (.53–1.10)
18–34	29.47 (26.88–32.19)	39.68 (33.76–45.90)	1.00
Education			
Less than high school	9.57 (7.96–11.47)	20.51 (16.09–25.76)	<b>2.24 (1.40–3.58)</b>
High school graduate	24.54 (22.13–27.11)	40.13 (34.11–46.46)	<b>2.16 (1.56–2.99)</b>
Some college	65.89 (63.00–68.67)	39.36 (33.87–45.14)	1.00
Income			
0–19,999	15.22 (13.24–17.43)	33.55 (28.61–38.87)	<b>3.67 (2.18–6.19)</b>
20,000–34,999	18.51 (16.32–20.92)	23.78 (19.14–29.14)	<b>2.56 (1.48–4.45)</b>
35,000–69,999	32.90 (30.25–35.67)	31.50 (26.31–37.20)	<b>1.97 (1.20–3.26)</b>
70,000+	33.37 (29.92–37.01)	11.18 (7.62–16.11)	1.00
Marital status			
Never married	20.80 (18.63–23.16)	31.72 (26.42–37.53)	1.23 (.87–1.73)
Widowed/separated/divorced	18.41 (16.56–26.12)	20.96 (16.59–26.12)	1.17 (.78–1.75)
Married/cohabitating	60.79 (58.08–63.44)	47.32 (41.13–53.59)	1.00
Urbanicity			
Central city	32.89 (28.34–37.79)	37.46 (31.10–44.29)	1.02 (.74–1.39)
Rural/suburban	67.11 (62.21–71.66)	62.54 (55.71–68.90)	1.00
Region			
Northeast	21.26 (14.07–26.53)	15.88 (10.30–23.69)	<b>.62 (.39–.99)</b>
Midwest	19.56 (14.07–26.53)	18.17 (12.26–26.07)	.77 (.49–1.20)
South	25.16 (19.40–31.95)	32.42 (24.70–41.24)	.96 (.65–1.43)
West	34.02 (25.45–43.79)	33.52 (23.87–44.78)	1.00

Note: <sup>a</sup>CI: confidence interval, <sup>b</sup>OR: odds ratio OR values in bold are statistically significant

and violent behaviors. As such, it represents an important sample to test whether crack cocaine use is associated with greater violence than powdered cocaine use. The present findings do not support the notion that drug laws should be different for crack cocaine use compared to powdered cocaine use based on

their putatively greater propensity to commit violent acts. More specifically, the greater propensity of crack cocaine users to commit violent acts compared to power cocaine users does not appear to derive from their use of different forms of cocaine. The argument that the systemic violence associated with trafficking

Table 2.  
Violent behaviors of adults with a lifetime history of crack cocaine or powder cocaine use.

Violent behaviors	Powdered Cocaine % (95% CI) <sup>a</sup>	Crack Cocaine % (95% CI)	Odds Ratio <sup>b</sup> (unadjusted) (95% CI)	Odds Ratio <sup>c</sup> (adjusted) (95% CI)
Bully/push people	17.44(15.26–19.87)	23.27(19.01–28.17)	<b>1.44 (1.04–1.97)</b>	.82(.57–1.19)
Do things that could have easily hurt you/others	46.01(42.66–49.41)	55.26(49.02–61.33)	<b>1.45 (1.07–1.96)</b>	1.24(.84–1.84)
Rob/mug someone or snatch a purse	1.78(1.19–2.64)	4.55(2.66–7.71)	<b>2.63 (1.35–5.12)</b>	.89(.41–1.93)
Force someone to have sex	.63(.33–1.20)	2.36(.91–5.93)	3.78(1.19–12.00)	2.56(.71–9.21)
Get into lots of fights that you started	9.42(7.90–11.20)	15.36(12.01–19.44)	1.74(1.24–2.45)	.85(.56–1.29)
Get into a fight that came to swapping blows with husband/wife or boyfriend/girlfriend	17.98(15.59–20.66)	34.47(29.19–40.16)	<b>2.40 (1.76–3.27)</b>	<b>1.55 (1.05–2.28)</b>
Use a weapon in a fight	8.92(7.48–10.60)	19.87(15.84–24.63)	<b>2.53 (1.83–3.50)</b>	1.18(.80–1.73)
Hit someone so hard that you injure them	20.48(18.16–23.01)	30.01(24.57–36.07)	<b>1.66 (1.23–2.25)</b>	.79(.53–1.18)
Harass/threaten/blackmail someone	6.80(5.56–8.29)	12.27(9.20–16.20)	<b>1.92 (1.34–2.74)</b>	.93(.59–1.46)
Hurt an animal on purpose	5.59(4.44–7.02)	8.78(6.09–12.51)	<b>1.63 (1.04–2.54)</b>	.88(.55–1.40)

Note: <sup>a</sup>CI: confidence interval, <sup>b</sup>OR: odds ratio, <sup>c</sup>Odds ratios adjusted for sociodemographic characteristics, lifetime mood and alcohol and substance use disorders, OR values in bold are statistically significant.

of crack cocaine is another issue and previous research does indeed support linkages with “street” violence surrounding the distribution of crack cocaine in disadvantaged neighborhoods (8). It is important that policy debates surrounding illicit drug use and violence draw distinctions between the psychopharmacological effects of the substance and the effects involving global and local markets where violence is associated with a host of other factors such as cost, distribution competition, and availability of weapons that have little to do with the effects of the substance on the user.

The substantial attenuation of the association of crack cocaine use with violence after adjustment suggests that the sociodemographic characteristics, mood and non-cocaine substance use disorders that make some individuals more likely to use crack cocaine than powder cocaine, are perhaps responsible for the increased prevalence of violence observed among crack users, rather than crack itself, compared to powdered cocaine users. The lone significant item was “Get into a fight that came to swapping blows with husband/wife or boyfriend/girlfriend.” We can only speculate that this item is connected to a greater probability of engaging in domestic violence by persons who have used crack.

### Limitations

As is the case with other studies, current study results require interpretation within the context of several limitations.

One limitation is the data are cross-sectional. As such, the findings cannot clarify the causal relations between forms of cocaine use and violent behavior. However, findings do show that the associations between violence and crack cocaine use are nonsignificant when controlling for potentially confounding variables. Although NESARC is a nationally representative sample, it is uncertain how the association between forms of cocaine use and violent behavior would be similar or different if enriched correctional or clinical samples were employed. In addition, there is limited information available in NESARC on the contextual, situational, and precipitating events related to crack cocaine use and violence. Further, biological data such as specific genetic polymorphisms related to addiction and aggression would be useful to have included in order to facilitate a fuller biosocial analysis. Despite these limitations, findings from this study provide suggestive evidence that crack cocaine use is not uniquely associated with violence compared to powdered cocaine use. As studies of violence associated with different types of illicit substance use are costly, in-depth analyses of large representative data sets are an important source of guidance for policy makers.

### Declaration of Interest

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## REFERENCES

1. Blendon RJ, Young JT. The public and the war on illicit drugs. *JAMA* 1998; 279:827–832.
2. Fagan JA, Chin KL. Initiation into crack and cocaine: A tale of two epidemics. *Cont Drug Prob* 1989; 16:579–618.
3. Reinerman C, Levine HG. *Crack in America: Demon Drugs and Social Justice*. Los Angeles, CA: University of California Press, 1997.
4. Greydanus DE, Patel DR. The adolescent and substance abuse: Current concepts. *Disease-a-Month* 2005; 51:392–431.
5. Fagan JA. Interactions among drugs, alcohol, and violence. *Health Affairs* 1993; 12:65–79.
6. Kosten TR, Singha AK. Stimulants. In Galanter M, Kleber HD (Eds.) *Textbook of Substance Abuse Treatment* (2nd ed.). Washington, DC: American Psychiatric Press, 1999, pp. 183–193.
7. Derlet RW. Cocaine intoxication. *Postgraduate Med* 1989; 86:245–253.
8. Blumstein A, Wallman J. The recent rise and fall of American violence. In Blumstein A, Wallman J (Eds.) *The Crime Drop in America*. New York, NY: Cambridge University Press, 2000.
9. Goldstein PJ. The drugs/violence nexus: A tripartite conceptual framework. *J Drug Issues* 1985; 15:493–506.
10. Clear TR. *Imprisoning Communities: How Mass Incarceration Makes Disadvantaged Neighborhoods Worse*. Oxford, UK/New York, NY: Oxford University Press, 2007.
11. Fagan JA, Chin KL. Violence as regulation and social control in the distribution of crack. In De la Rosa M, Lambert EY, Gropper B (Eds.) *Drugs and Violence: Causes, Correlates, and Consequences*, Rockville, MD: US Department of Health and Human Services, National Institute on Drug Abuse, 1990, vol. 103, pp. 8–43.
12. Niehoff D. *The Biology of Violence: How Understanding the Brain, Behavior, and Environment Can Break the Vicious Circle of Aggression*. New York, NY: The Free Press, 1999.
13. Hatsukami DK, Fischman MW. Crack cocaine and cocaine hydrochloride. *JAMA* 1996; 276:1580–1588.
14. Giannini AJ, Miller NS, Loiselle RH, Turner CE. Cocaine-associated violence and relationship to route of administration. *J Sub Abuse Treat* 1993; 10:67–69.
15. Grant BF, Dawson DA, Stinson FS, Chou PS, Kay W, Pickering R. The Alcohol Use Disorder and Associated Disabilities Interview Schedule-IV (AUDADIS-IV): Reliability of alcohol consumption, tobacco use, family history of depression and psychiatric diagnostic modules in a general population sample. *Drug Alc Dep* 2003; 71:7–16.
16. Grant BF, Harford T, Dawson DA, Chou PS, Pickering RP. The Alcohol Use Disorder and Associated Disabilities Interview schedule (AUDADIS): Reliability of alcohol and drug modules in a general population sample. *Drug Alc Dep* 1995; 39:37–44.
17. Hasin D, Carpenter KM, McCloud S, Smith M, Grant BF. The alcohol use disorders and associated disabilities interview schedule (AUDADIS): Reliability of alcohol and drug modules in a clinical sample. *Drug Alc Dep* 1997; 44:133–141.
18. Research Triangle Institute. *Software for Survey Data Analysis, SUDAAN*. Version 9.0. Research Triangle Park, NC: Research Triangle Institute, 2004.