Correlates of cruelty to animals in the United States: Results from the National Epidemiologic Survey on Alcohol and Related Conditions

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ABSTRACT

Objective: To examine the sociodemographic, behavioral, and psychiatric correlates of cruelty to animals in the US.

Materials and methods: Data were derived from a nationally representative sample of adults residing in the US Structured psychiatric interviews ($N = 43,093$) were completed by trained lay interviewers between 2001 and 2002. Personality, substance use, mood, and anxiety disorders and cruelty to animals were assessed with the Alcohol Use Disorder and Associated Disabilities Interview Schedule (DSM-IV) version.

Results: The lifetime prevalence of animal cruelty in US adults was 1.8%. Men, African-Americans, Native-Americans/Asians, native-born Americans, persons with lower levels of income and education and adults living the western region of the US reported comparatively high levels of cruelty to animals, whereas Hispanics reported comparatively low levels of such behavior. Cruelty to animals was significantly associated with all assessed antisocial behaviors. Adjusted analyses revealed strong associations between lifetime alcohol use disorders, conduct disorder, antisocial, obsessive–compulsive, and histrionic personality disorders, pathological gambling, family history of antisocial behavior, and cruelty to animals.

Conclusions: Cruelty to animals is associated with elevated rates observed in young, poor, men with family histories of antisocial behavior and personal histories of conduct disorder in childhood, and antisocial, obsessive–compulsive and histrionic personality disorders, and pathological gambling in adulthood. Given these associations, and the widespread ownership of pets and animals, effective screening of children, adolescents and adults for animal cruelty and appropriate mental health interventions should be deployed.

1. Introduction

Cruelty to animals, frequently referred to as animal cruelty, is defined as treatment of animals that causes gratuitous, unwarranted or unjustifiable suffering or harm (including death). Animal cruelty is gaining recognition as a serious social issue that may be reflective of more extensive psychopathology at the individual level (McPhedran, 2009). In recognition of the potential clinical relevance of animal cruelty, systematic research on animal cruelty in relation to psychopathology and antisocial behavior began to emerge in the 1980s (Douglas et al., 1986; Ressler et al., 1980). In 1987, the *Diagnostic and Statistical Manual of Mental Disorders, Third Edition-Revised* (DSM-III-R) incorporated animal cruelty as a diagnostic criterion for conduct disorder (CD) and Antisocial Personality Disorder (ASPD) (American Psychiatric Association, 1987).

Research on the etiology of animal cruelty is sparse. Two general threads of research examine the issue. On one hand, animal cruelty is viewed as a consequence of an individual's exposure to criminogenic environments (Currie, 2006; Duncan et al., 2005; Petersen and Farrington, 2007; Duncan, 2002). For instance, having witnessed animal cruelty in childhood appears to be associated with later acts of animal abuse (Thompson and Gullone, 2006) and studies of correctional and community samples indicate that males who

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are physically punished in childhood are more likely to commit subsequent acts of animal cruelty (Miller, 2001; Flynn, 1999). Despite some inconsistency across studies (Felthous and Kellert, 1987), research on animal cruelty suggests this behavior is associated with violence toward humans (Arluke et al., 1999; Miller, 1997; Tallichet, 2004; Merez-Perez and Heide, 2001). Other research examines pathological offenders, focusing on the correlation between child and adolescent animal cruelty and subsequent homicide offending. Prevalence estimates of lifetime animal cruelty among sexual murderers are exceptionally high with 36% and 46%, respectively, engaged in animal cruelty during childhood and adolescence (Douglas et al., 1986). Among sexual murderers, animal cruelty in childhood commonly co-occurs with childhood sexual victimization (Ressler et al., 1980). Other studies have linked animal cruelty to additional extreme forms of criminal offending including arson, bestiality, and violent interpersonal assault (Hensley and Tallichet, 2006; Hensley, 2008, 2005; Becer et al., 2004).

Unfortunately, the etiological nature of these relationships is unresolved. One factor hypothesized to underlie animal cruelty and violence is a deficit in the ability to empathize (McPhedran, 2009; Petersen and Farrington, 2007; Felthous and Kellert, 1987). Demographically, males and persons with lower educational attainment are more likely than their counterparts to commit acts of animal cruelty (Hensley and Tallichet, 2006; Hensley, 2008, 2005). Other sociodemographic relationships to animal cruelty, such as racial, ethnic, regional, and income differences remain largely unexplored. A major limitation of studies to date has been their use of small and nonrepresentative samples leading to uncertainty regarding the generalizability of prior animal cruelty findings. Finally, the psychiatric epidemiology of animal cruelty has received little attention, particularly examinations of psychiatric disorders associated with animal cruelty. Although animal cruelty is included in the DSM-IV-TR diagnostic criteria sets for CD and ASPD, specific antisocial behaviors associated with animal cruelty have not been adequately delineated.

The purpose of this study was to examine associations between psychiatric disorders and among persons reporting that they had been intentionally cruel to animals compared to persons without a history of animal cruelty using a nationally representative sample of US adults. The primary study aims were to (1) examine the correlates of lifetime animal cruelty in relation to sociodemographic characteristics, antisocial behaviors, and lifetime mood, anxiety, and personality disorders, and (2) estimate the strength of associations between animal cruelty and these characteristics while controlling for sociodemographic factors and substance use/psychiatric disorders.

2. Materials and methods

2.1. Participants

Study findings are based on data from the 2001–2002 National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). The NESARC survey is a nationally representative sample of 43,093 non-institutionalized US residents aged 18 years and older (Grant et al., 2003). The survey gathered information on alcohol use and comorbid conditions 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. The NESARC utilized a multistage cluster sampling design, oversampling young adults, Hispanics, and African-Americans in the interest of obtaining reliable statistical estimation in these populations, 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 US adult population as assessed during the 2000 Census. Study participants provided written informed consent. The US Census Bureau and the US Office of Management and Budget approved the research and consent procedures.

2.2. Diagnostic assessment and sociodemographic measures

Data were collected through face-to-face interviews conducted by US Census workers trained by the National Institute on Alcohol and Alcoholism and US Census Bureau. Interviewers administered the Alcohol Use Disorder and Associated Disabilities Interview Schedule – DSM-IV version (AUDADIS-IV), shown to have good-to-excellent reliability in assessing alcohol and drug use and substance use disorders in the general population (Grant et al., 1995; Hasin et al., 1997).

Animal cruelty was assessed with an item embedded in the antisocial personality disorder interview module. All NESARC respondents were asked the following question: "In your entire life, did you ever hurt or be cruel to a animal or pet on purpose?" NESARC respondents who answered yes were defined as having a history of animal cruelty. The test-retest reliability for the NESARC antisocial personality disorder diagnosis is 0.69. (Grant et al., 2003), whereas the internal consistency reliability for the antisocial personality disorder criteria set is $\alpha = 0.86$ (Blanco et al., 2008).

Consistent with prior research (Grant et al., 2004a,b; Goldstein et al., 2006), personality disorder diagnoses reflected long-standing impairments, characteristic patterns of behavior, and exclusion of cases where substance use intoxication or withdrawal, other medication use, or physical illnesses could have affected behavior. In addition to antisocial personality disorder, other personality disorders assessed were avoidant, dependent, obsessive–compulsive, paranoid, schizoid, and histrionic personality disorders. Numerous control variables were used to reduce confounding in multivariate analyses including lifetime alcohol (alcohol abuse/dependence) and drug (abuse/dependence on heroin, hallucinogens, cocaine/crack, marijuana, stimulants, painkillers, tranquilizers, and sedatives) use disorders, nicotine dependence, and pathological gambling. Also included as control variables and assigned in accordance with DSM-IV specifications were lifetime mood (major depression, dysthymia, and bipolar disorder) and anxiety (social phobia, generalized anxiety disorder, panic disorder, and specific phobia) disorders. Family history of antisocial behavior based on any parental or sibling history was also assessed. Sociodemographic response categories for region of residence in US, urbanicity, race/ethnicity, sex, age, marital status, educational background, unemployment status, and individual and family income are listed in Table 1.

2.3. Statistical analyses

Weighted prevalence estimates and standard errors were computed using SUDAAN Version 9.0 (Research Triangle Institute, 2004). This system implements a Taylor series linearization to adjust standard errors of estimates for complex survey sampling design effects including clustered data. Multivariate logistic regression analyses were conducted with simultaneous entry of sociodemographic (i.e., region of residence in US, urbanicity, race/ethnicity, sex, age, marital status, educational background, unemployment status, and individual and family income) and diagnostic (i.e., lifetime alcohol abuse/dependence, drug abuse/dependence, nicotine dependence, pathological gambling, major depression, dysthymia, bipolar disorder, social phobia, generalized anxiety disorder, panic disorder, and specific phobia) and family history of antisocial behavior control variables. Adjusted odds

Table 1
Sociodemographic characteristics of adults with and without a lifetime history of animal cruelty.

Characteristic	History of cruelty to animals (N = 728) % (95% CI[a])	No history of cruelty to animals (N = 41,203) % (95%CI)	OR[b] (95%CI)
Sex			
Men	83.78 (80.65–86.50)	47.14 (46.51–47.76)	**6.10 (4.90–7.59)**
Women	16.22 (13.50–19.35)	52.86 (52.24–53.49)	1.00
Race			
Hispanic	7.56 (5.56–10.20)	11.61 (9.34–14.36)	**0.63 (0.44–0.90)**
Indian/Alaska/Asian/ Native American	7.85 (5.20–11.67)	6.46 (5.50–7.58)	1.37 (0.82–2.28)
African American	14.36 (11.23–18.18)	10.94 (9.73–12.28)	**1.36 (1.06–1.76)**
White	70.24 (65.42–74.65)	70.98 (67.68–74.08)	1.00
Nativity			
Born in the US	91.09 (87.60–93.66)	85.31 (82.04–88.08)	**1.96 (1.26–3.04)**
Born in a Foreign Country	8.91 (6.34–12.40)	14.69 (11.92–17.96)	1.00
Age (years)			
65+	40.75 (36.11–45.55)	31.44 (30.58–32.32)	**0.20 (0.14–0.29)**
50–64	32.75 (28.54–37.26)	31.05 (30.42–31.69)	**0.69 (0.52–0.91)**
35–49	21.29 (17.94–25.09)	21.04 (20.52–21.57)	0.77 (0.59–1.00)
18–34	5.21 (3.86–6.99)	16.47 (15.81–17.16)	1.00
Education			
Less than High School	15.26 (12.12–19.03)	15.53 (14.57–16.54)	1.10 (0.82–1.47)
High School Graduate	28.55 (24.47–33.01)	29.32 (28.22–30.44)	0.96 (0.77–1.19)
Some College or Higher	56.19 (51.62–60.66)	55.15 (53.88–56.41)	1.00
Income			
0–19,999	24.86 (20.76–29.46)	23.42 (22.46–24.39)	**1.72 (1.22–2.43)**
20,000–34,999	21.13 (17.96–24.69)	20.10 (19.43–20.78)	**1.41 (1.07–1.87)**
35,000–69,999	32.51 (28.65–36.62)	32.19 (31.52–32.86)	1.20 (0.93–1.53)
70,000+	21.51 (18.05–25.42)	24.30 (22.93–25.72)	1.00
Marital status			
Never Married	59.21 (54.97–63.33)	62.02 (61.09–62.94)	**0.75 (0.57–0.97)**
Widowed/separated/divorced	16.28 (13.43–19.61)	17.37 (16.90–17.85)	1.26 (0.98–1.61)
Married/Cohabitating	24.50 (20.89–28.51)	20.61 (19.69–21.56)	1.00
Urbanicity			
Urban	30.81 (25.83–36.28)	29.44 (25.29–33.96)	1.02 (0.82–1.28)
Rural	69.19 (63.72–74.17)	70.56 (66.04–74.71)	1.00
Region			
Northeast	13.54 (9.13–19.64)	19.84 (13.88–27.55)	**0.53 (0.37–0.76)**
Midwest	27.78 (21.10–35.62)	23.08 (17.35–30.03)	0.84 (0.63–1.12)
South	31.25 (25.19–38.03)	35.19 (28.98–41.94)	**0.62 (0.47–0.81)**
West	27.43 (20.95–35.01)	21.89 (15.65–29.73)	1.00

Note: OR values in bold are statistically significant (*p*-value <.05).
[a] CI: confidence interval.
[b] OR: odds ratio.

ratios (AORs) and 95% confidence intervals are presented to reflect association strength and significance. Adjusted odds ratios were considered significant if associated confidence intervals did not include the value 1.0 (Table 2).

3. Results

3.1. Sociodemographic characteristics

Table 1 provides comparisons of the NESARC sociodemographic sample characteristics of persons who reported a lifetime history of animal cruelty and those who self-reported no lifetime history of animal cruelty. The overall prevalence animal cruelty in US adults was 1.8%. Unadjusted analyses reveal that persons reporting a lifetime history of animal cruelty were more likely to be male (OR = 6.10, 95% CI = 4.90–7.59), born in the US (OR = 1.96, 95% CI = 1.26–3.04), African-American (OR = 1.36, 95% CI = 1.06–1.76), and less likely to be Latino/Hispanic (OR = 0.63, 95% CI = 0.44–0.90). Compared to married and widowed/separated individuals never married persons were less likely (OR = 0.75, 95% CI = 0.57–0.97) to report animal cruelty. Uniformly, younger persons and individuals with lower levels of annual household income were more likely to report animal cruelty. Compared to other regions

of the country (Northeast, Midwest, South), persons from the West were more likely than other areas to report animal cruelty.

3.2. Animal cruelty and associated antisocial behaviors

The prevalence of all antisocial behaviors was higher among persons with a lifetime history of animal cruelty compared to persons without a lifetime history of animal cruelty. The most common behavior for persons with a history of animal cruelty was doing something that one could be arrested for irrespective of whether they were caught or not (61.70%, CI = 57.31–65.92%). The least prevalent behavior was forcing someone to have sex (1.20%, CI = 0.59–2.41%). The strongest associations between antisocial behaviors and animal cruelty were found for robbing or mugging another person (OR = 17.93, 95% CI = 11.49–27.97), fire setting (OR = 12.79, 95% CI = 8.85–18.49), and harassing and threatening someone (OR = 12.64, 95% CI = 9.90–16.14).

3.3. Multivariate logistic regression analysis assessing associations between animal cruelty and lifetime psychiatric comorbidity

Table 3 compares prevalence rates of lifetime psychiatric comorbidity for persons with and without a history of animal

Table 2
Antisocial behaviors of adults with and without a lifetime history of cruelty to animals.

Behavior	History of cruelty to animals (N = 728) % (95%CI[a])	No history of cruelty to animals (N = 41,203) % (95%CI)	OR[b] 95% CI
Cut class and leave without permission	44.94 (40.43–49.52)	21.52 (20.80–22.25)	**2.98 (2.46–3.60)**
Stay out late at night	49.37 (44.83–53.91)	25.36 (24.48–26.26)	**2.87 (2.36–3.49)**
Bully/push people	31.93 (27.77–36.40)	5.78 (5.40–6.18)	**7.65 (6.18–9.47)**
Run away from home overnight	15.59 (12.35–19.49)	4.94 (4.63–5.28)	**3.55 (2.70–4.67)**
Be absent from work/school a lot	21.20 (17.58–25.34)	6.63 (6.25–7.04)	**3.79 (2.98–4.80)**
Quit a job without knowing where to find another	33.63 (29.15–38.42)	11.22 (10.63–11.83)	**4.01 (3.22–5.00)**
Quit a school program without knowing what to do next	11.72 (9.45–14.44)	3.68 (3.38–4.00)	**3.48 (2.69–4.50)**
Travel around more than 1 month without plans	12.48 (9.98–15.49)	3.28 (3.03–3.55)	**4.21 (3.23–5.47)**
Have no regular place to live at least 1 month	9.97 (7.46–13.20)	2.63 (2.37–2.93)	**4.09 (2.92–5.73)**
Live with others at least 1 month	28.45 (24.18–33.16)	10.85 (10.16–11.59)	**3.27 (2.60–4.10)**
Lie a lot	21.35 (18.12–24.99)	5.00 (4.70–5.31)	**5.16 (4.19–6.36)**
Use a false or made up name/alias	12.07 (9.26–15.59)	1.97 (1.80–2.15)	**6.84 (5.05–9.26)**
Scam/con someone for money	12.14 (9.70–15.09)	1.32 (1.16–1.51)	**10.32 (7.76–13.72)**
Do things that could have easily hurt you/others	49.25 (44.74–53.78)	13.48 (12.56–14.47)	**6.23 (5.19–7.48)**
Get three or more traffic tickets for reckless driving/causing accidents	27.01 (23.03–31.39)	8.35 (7.74–8.99)	**4.06 (3.28–5.04)**
Have a driver's license suspended/revoked	24.09 (20.23–28.42)	7.49 (6.99–8.02)	**3.92 (3.12–4.93)**
Start a fire on purpose	10.92 (7.96–14.81)	0.95 (0.83–1.09)	**12.79 (8.85–18.49)**
Fail to pay off your debts	16.35 (13.38–19.82)	3.96 (3.63–4.31)	**4.74 (3.68–6.11)**
Steal anything from others	48.08 (43.79–52.41)	8.28 (7.74–8.85)	**10.26 (8.48–12.42)**
Forge someone's signature	12.04 (9.51–15.12)	1.97 (1.79–2.18)	**6.80 (5.05–9.05)**
Shoplift	46.65 (42.04–51.32)	10.67 (9.99–11.40)	**7.32 (6.01–8.90)**
Rob or mug someone or snatch a purse	4.00 (2.72–5.84)	0.23 (0.18–0.29)	**17.93 (11.49–27.97)**
Make money illegally	16.62 (13.59–20.17)	2.52 (2.29–2.78)	**7.72 (5.96–9.99)**
Do something you could have been arrested for, regardless of whether you were caught or not	61.70 (57.31–65.92)	14.67 (13.81–15.59)	**9.37 (7.73–11.36)**
Force someone to have sex	1.20 (0.59–2.41)	0.12 (0.08–0.17)	**10.14 (4.52–22.75)**
Get into a lot of fights that you started	16.51 (13.52–20.02)	2.56 (2.35–2.80)	**7.51 (5.86–9.64)**
Get into a fight that came to swapping blows with someone like a husband, wife, boyfriend or girlfriend	17.20 (14.11–20.81)	6.45 (6.03–6.89)	**3.02 (2.36–3.85)**
Use a weapon in a fight	13.73 (10.93–17.09)	2.49 (2.29–2.70)	**6.24 (4.77–8.18)**
Hit someone so hard that you injure them	24.19 (20.39–28.45)	5.68 (5.30–6.09)	**5.30 (4.22–6.64)**
Harass/threaten/blackmail someone	15.86 (12.97–19.24)	1.47 (1.30–1.66)	**12.64 (9.90–16.14)**
Physically hurt others on purpose	28.00 (24.47–31.81)	4.64 (4.31–5.00)	**7.98 (6.54–9.75)**

Note: OR values in bold are statistically significant (*p*-value <.05).
  [a] CI: confidence interval.
  [b] OR: odds ratio.

cruelty. Odds ratios are adjusted for sociodemographic factors (i.e., race, sex, education, marital status, age, income, region, urbanicity) and previously described lifetime DSM-IV psychiatric diagnoses. The most common psychiatric disorders among persons with a history of animal cruelty were any lifetime alcohol use disorder (63.69%, CI = 58.71–68.38%), family history of antisocial behavior (53.87%, CI = 49.40–58.28), lifetime nicotine dependence (36.16%, CI = 31.39–41.21%), and antisocial personality disorder (35.84%, CI = 31.53–40.40%).

Largest adjusted odds ratios were found for conduct disorder (AOR = 9.53, 95% CI = 6.07–14.97) and antisocial personality disorder (AOR = 6.68, 95%CI = 5.05–8.85). Smaller yet significant associations were found for pathological gambling (AOR = 2.23, 95% CI = 1.04–4.78), a family history of antisocial behavior (AOR = 2.12, 95% CI = 1.73–2.58), obsessive–compulsive personality disorder (AOR = 1.65, 95% CI = 1.24–2.20), histrionic personality disorder (AOR = 1.62, 95% CI = 1.14–2.31), and lifetime alcohol use disorder (AOR = 1.56, 95% CI = 1.20–2.03).

4. Discussion

To our knowledge, this is the first national study examining the association between animal cruelty and psychiatric disorders. Findings indicated that the prevalence of animal cruelty varied by sociodemographic status, was associated with all antisocial behaviors, and following adjustments for numerous confounding variables was associated with several lifetime psychiatric diagno-

ses. Specifically, our investigation found that the prevalence of animal cruelty was higher among males, African-Americans and Native-Americans/Asians, native-born Americans, and individuals with lower levels of income and education. There was a regional effect in that, compared to the western region of the US, individuals in other regions were less likely to report a lifetime history of animal cruelty. We can only speculate that this might stem from human–animal relationships in ranch or similar settings involving livestock or larger predatory animals. Animal cruelty was also associated with a broad array of antisocial behaviors particularly behaviors that exercise a physical threat over other persons such as robbery, harassment, and forcing someone to have sex. Setting fires on purpose was also highly associated with animal cruelty suggesting that previous clinical research related to these two behaviors is supported (Douglas et al., 1986; Ressler et al., 1980; Becer et al., 2004).

In controlled analyses, animal cruelty was uniquely associated with numerous psychiatric disorders characterized by self-control deficits including lifetime alcohol use disorder, pathological gambling, conduct disorder and antisocial personality disorder, and several personality disorders such as obsessive–compulsive, paranoid, and histrionic. Animal cruelty was also associated with a family history of antisocial behavior. Although it was unsurprising that CD/ASPD and a family history of antisocial behavior were highly associated with animal cruelty, significantly findings for associations of obsessive–compulsive and histrionic personality disorders and animal cruelty suggests follow-up studies on these disorders are warranted. While emotional and cognitive dysregulation are

Table 3
Psychiatric comorbidities of individuals with and without a lifetime history of cruelty to animals.

Comorbid psychiatric disorder	History of cruelty to animals (N = 728) % (95% CI[a])	No history of cruelty to animals (N = 41,203) % (95% CI)	Sociodemographic characteristics and other psychiatric disorders AOR[b] (95% CI)
Mood disorders			
Major depressive disorder	32.77 (28.38–37.48)	16.58 (15.89–17.29)	1.27 (0.75–1.69)
Bipolar disorder	19.57 (15.80–23.98)	5.50 (5.18–5.84)	0.99 (0.70–1.39)
Dysthymia	11.71 (9.40–14.49)	4.23 (3.95–4.53)	1.17 (0.81–1.70)
Anxiety disorders			
Panic disorder	7.49 (5.46–10.21)	4.03 (3.77–4.32)	0.89 (0.59–1.34)
Social phobia	13.84 (11.07–17.16)	4.93 (4.55–5.35)	1.13 (0.82–1.55)
Specific phobia	16.81 (13.88–20.22)	9.49 (8.89–10.13)	1.03 (0.76–1.38)
Generalized anxiety disorder	10.75 (8.29–13.83)	4.12 (3.79–4.48)	1.14 (0.75–1.72)
Substance use disorders			
Alcohol use disorder	63.69 (58.71––68.38)	29.77 (28.28–31.30)	**1.56 (1.20–2.03)**
Nicotine dependence	36.16 (31.39–41.21)	17.56 (16.63–18.54)	0.93 (0.71–1.22)
Marijuana use disorder	27.90 (23.87–32.32)	8.15 (7.62–8.71)	1.05 (0.77–1.44)
Other illicit drug use disorder	19.92 (16.38–24.01)	5.02 (4.63–5.44)	1.05 (0.77–1.43)
Psychotic disorder	3.63 (2.19–5.95)	0.74 (0.64–0.86)	1.14 (0.59–2.22)
Conduct disorder	8.29 (5.66–11.98)	0.94 (0.83–1.08)	**9.53 (6.07–14.97)**
Personality disorders			
Avoidant	9.89 (7.26–13.33)	2.27 (2.06–2.51)	1.50 (0.97–2.30)
Dependent	2.66 (1.39–5.01)	0.46 (0.38–0.57)	0.76 (0.33–1.71)
Obsessive–compulsive	26.56 (22.53–31.01)	7.74 (7.30–8.21)	**1.65 (1.24–2.20)**
Paranoid	18.09 (14.79–21.93)	4.27 (3.98–4.58)	1.34 (0.93–1.94)
Schizoid	9.54 (7.17–12.59)	3.09 (2.85–3.35)	0.70 (0.44–1.12)
Antisocial	35.84 (31.53–40.40)	3.13 (2.88–3.40)	**6.68 (5.05–8.85)**
Histrionic	10.69 (8.12–13.94)	1.72 (1.56–1.90)	**1.62 (1.14–2.31)**
Pathological gambling	3.02 (1.56–5.75)	0.39 (0.32–0.47)	**2.23 (1.04–4.78)**
Family history of antisocial behavior	53.87 (49.40–58.28)	22.49 (21.45–23.56)	**2.12 (1.73–2.58)**

Note: AOR values in bold are statistically significant (*p*-value <.05).
[a] CI: confidence interval.
[b] AOR: odds ratio adjusted for sociodemographic variables, lifetime psychiatric disorders, and a family history of antisocial behavior.

common in these disorders, we speculate that the rigidity of persons with obsessive–compulsive personality could be reflected in aggressive behavior toward animals (e.g., when pets have excretory "accidents" in the home), and the dependent reliance on others (including perhaps pets) for nuturance and support of persons with histrionic personality disorder may predispose them to violent actions toward pets.

Given the significant associations found between animal cruelty and other antisocial behaviors and psychopathology, animal cruelty in childhood appears to be a marker for a host of maladaptive behaviors (McPhedran, 2009; Petersen and Farrington, 2007). Thus, youth should be screened for animal cruelty in clinical and other service settings. Although identification of animal cruelty in childhood provides a potential opportunity for prevention interventions, it is difficult to determine whether animal cruelty after age 15 is a consequence of a developing psychiatric disorder or substance intoxication – chronic or episodic. The current study was unable to determine these causal sequences. Nevertheless, findings from this study provide a unique psychiatric epidemiologic informed report of the problem previously unavailable.

Present study findings need to be interpreted within the context of several limitations. The major limitation is the data are cross-sectional. Therefore, associations between animal cruelty and psychiatric comorbidity do not resolve etiological issues previously identified. However, findings do suggest that the origins of animal cruelty and psychopathology, in particular impulse-control disorders, are intertwined. The prognostic relationship between animal cruelty and psychiatric disorders will require longitudinal study designs. The NESARC excludes persons under age of 18 and therefore relies on retrospective self-reported recall of animal cruelty spanning potentially long swaths of time. There may also be response bias in that persons are unwilling to admit being cruel to an animal and those that do represent the more callous-unemotional and antisocial. Given that NESARC is a nationally representa-

tive sample, it is uncertain how associations between animal cruelty and psychiatric comorbidity would be similar or different if selected samples, such as persons in jails or prisons or in clinical settings, were employed. Excluding these samples combined with the tendency to underreport animal cruelty likely means that the prevalence estimate reported (1.8%) is quite conservative. For example, analysis by the authors' of animal cruelty in the National Longitudinal Survey of American Life, a national survey of adolescents, and found the prevalence to be 3.0%. In addition, the data on animal cruelty did not include important information regarding frequency of abuse. The dichotomous measure of animal cruelty combines single (low threshold) and multiple episodes of abuse thereby blurring potentially important distinctions between the two. Also, there is a lack of data on situational factors involved in animal cruelty. Data on precipitating factors, such as concurrent alcohol usage and severity of cruelty would be illuminating. Also, victim information such as type of pet or animal is potentially important. Moreover, the relationship of the perpetrator to the animal is unknown. Future studies on animal cruelty would benefit from including these natural history features in such assessments.

Finally, the study was limited by its reliance on one item for a determination of lifetime animal cruelty and by the self-report nature of the assessment. Given that respondents may tend to under report a behavior such as animal cruelty and that rates of such behavior among institutionalized populations are likely higher than in the general population, we believe the true prevalence of animal cruelty may be higher than that that identified in this study. Conversely, it is possible that some respondents may have been hunters and responded affirmatively to the item on that basis alone. The failure to identify significant differences between urban and rural respondents in prevalence of animal cruelty argues against this interpretation, although higher rates of such cruelty in the Western region of the US may be consistent with this interpretation.

Contributors

Michael Vaughn conceptualized the study, led the literature review and study design, and analytic strategy. Qiang Fu conducted the statistical analysis. Matt DeLisi, Kevin Beaver, Katie Terrell, Brian Perron, and Matthew Howard reviewed literature and contributed writing.

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Conflict of interest

The authors have no financial or personal conflicts of interest.

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