

**PAPER****PSYCHIATRY & BEHAVIORAL SCIENCES**

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## Vicious Dogs Part 2: Criminal Thinking, Callousness, and Personality Styles of Their Owners

**ABSTRACT:** Every year over 885,000 dog bites require serious medical attention. Based on human injury and insurance claims, six dog breeds were designated as “vicious” (Akitas, Chows, Dobermans, Pit Bulls, Rottweilers, and Wolf-mixes). This study was conducted to expand on previous research examining antisocial tendencies and personality styles of people choosing to own vicious breeds. Seven hundred and fifty-four college students completed a questionnaire assessing type of dog owned, criminal thinking, callousness, personality, alcohol usage, and deviant lifestyle behaviors. Vicious dog owners reported significantly higher criminal thinking, entitlement, sentimentality, and superoptimism tendencies. Vicious dog owners were arrested, engaged in physical fights, and used marijuana significantly more than other dog owners. However, the homogeneous sample utilized could impact the generalizability of these findings. Choosing to own a vicious dog may be a “thin slice” indicator of more antisocial tendencies.

**KEYWORDS:** forensic science, vicious dogs, dog owners, criminal thinking, forensic science, personality

There are about 77,500,000 dogs in the United States and c. 39% of U.S. households have at least one dog (1). Unfortunately, dogs bite 4.5 million Americans every year and 885,000 bites require medical attention (2). Based on high rates of human injury and insurance claims, the American insurance industry has designated six breeds of dogs (Akita, Chow, Doberman, Pit Bull, Rottweiler, and Wolf-Mix) as vicious (3). The Center for Disease Control found that between the years of 1979 and 1998 there were 327 fatal dog bites. On average, 16 dog bite fatalities occurred each year over the 20-year period (4). Pit Bulls and their mixes accounted for 33% of these deaths, followed by Rottweilers, which were responsible for 18% of dog bite deaths. Thus, Pit Bulls and Rottweilers accounted for 51% of the deaths during this 20-year time frame (4). Consequently, many communities have enacted controversial legislation to prohibit the ownership of Pit Bulls and other vicious dogs (5). Supporters of these dogs contend that the vast majority of such breeds never bite or injure anyone. The American Kennel Club argues that “it is not the dog *breed* but the dog *deed*” (3). Regardless, certain dog breeds are associated with a high risk to humans.

Why do some people choose to own and raise “vicious dog” breeds? While there have been many casual observations of the similarity between dogs and their owners in terms of temperament and appearance, the first scientific study was conducted in England in 1997. Podberscek and Serpell (6) examined Cocker Spaniels (not classified as a vicious dog breed) of high and low aggression and compared them with personality traits of their owners. The Cocker Spaniels were separated into “high” and “low” aggression

groups, as determined by owner report. Based on the Cattell 16 Personality Questionnaire (7), 157 owners of “high” aggression Cocker Spaniels were significantly more tense, shy, undisciplined and emotionally less stable than the 128 owners of “low” aggression Cocker Spaniels. Podberscek and Serpell (6) speculated that the behaviors of anxious, tense, and neurotic owners may influence their pets to become more aggressive or badly behaved by picking up on characteristics of their owners’ actions. Roy and Christenfeld (8) found that observers could accurately match pure-bred dogs to their owners’ just on physical resemblance.

The first researchers to examine the association between human personality style and antisocial behaviors of owners of vicious dogs were Barnes et al. in 2006 (9). Based on data from the Hamilton County Clerk of Courts in Ohio, they found that 166 “vicious” dog owners were 6.8 times more likely to be convicted of an aggressive crime, 2.8 times more likely to have carried out a crime involving children, 2.4 times more likely to have perpetrated domestic violence, and 5.4 times more likely to have an alcohol conviction when compared with 189 owners of nonvicious dogs. To explain these results, Barnes et al. (9) proposed a general social deviance theory which asserts that unlawful individuals are more likely to display multiple forms of criminal behaviors (e.g., drug trafficking, robbery, and assault) rather than only one type of criminal act (e.g., robbery). Therefore, these individuals may find it appealing to own vicious dogs that have the potential to seriously injure or kill someone. This decision represents yet another form of deviant behavior for these antisocial individuals (9). In sum, the general social deviance theory suggests that the decision to own a vicious dog may reflect underlying antisocial and deviant characteristics of the owners.

The current authors further investigated the relationship between antisocial behavior and psychological characteristics of vicious dog owners (10). Based on an anonymous online survey of 869

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undergraduates, 66 vicious dog owners were compared with owners of large dogs, small dogs, and a control group of participants that did not own a dog. The results showed that the owners of vicious dogs were significantly more likely to admit to engaging in violent criminal acts and in a greater variety of criminal behaviors (i.e., violent, property, drug, and status offenses) when compared to other types of owners. Vicious dog owners were also significantly higher on impulsive and sensation-seeking behaviors. Additionally, vicious dog owners endorsed more characteristics of primary psychopathy (e.g., carelessness, selfishness, and manipulative tendencies) when compared to owners of other dogs and a control group (10). These results corroborated the Barnes et al. (9) study and provide additional evidence that owners of vicious dogs display significantly more psychopathic characteristics and antisocial behaviors than other dog owners or nondog owners. This study supports the general social deviance hypothesis of Barnes et al. (9) and invites further examination of vicious dog ownership as a “marker” for antisocial characteristics across additional psychological dimensions.

### Criminal Thinking Patterns

One potentially relevant psychological dimension of antisocial behavior is criminal thinking patterns. Walters (11) defined criminal thinking as “thought content and process conducive to the initiation and maintenance of habitual lawbreaking behavior” (p. 88). Criminal thinking profiles have been associated with both juvenile and adult antisocial behavior (11,12). Data suggest that criminal thinking profiles can be predictive of important prison behaviors, such as treatment adherence (13), reconviction (14,15), and disciplinary infractions in prison populations (16,17).

Criminal thinking has shown broad application. For example, unique patterns of criminal thinking have been found among sex offenders (18), white-collar offenders (19), juvenile or young offenders (20,21), and, most recently, college students with and without criminal behaviors (22,23). The relationship between vicious dog ownership and criminal thinking has not yet been studied.

### Callousness Traits

Another psychological construct related to antisocial behavior is the personality dimension of callousness, an essential component to the construct of psychopathy. Callousness can be an essential trait in differentiating more severely antisocial or psychopathic individuals (24,25). It has also been predictive for reoffending adolescents released from an institution (25). In youth, callousness can designate a subgroup of antisocial adolescents that have a preference for novel, exciting, and dangerous activities, a decreased sensitivity to punishment signals when a reward-orientated goal is prepared, less reactivity to threatening and distressing stimuli, and deficits in cognitive and emotional empathy (26, p. 455).

In the two-factor model of psychopathy, callousness is one of the key traits of primary psychopathy. Because previous research has shown that vicious dog owners are higher in primary psychopathy (10), it is advantageous to replicate and further explore this finding by assessing callousness with a different measure than used in previous research.

### Five-Factor Model Personality Traits

We also explored whether vicious dog owners would differ on a broad measure of personality. The five factor personality traits consist of openness, agreeableness, conscientiousness, neuroticism, and

extraversion (27). These traits have been widely studied with a variety of different populations to understand their association with other behavioral characteristics, such as criminal behavior. Because vicious dog owners were shown to engage in more criminal behaviors and be higher in psychopathy (9,10), it is worthwhile to examine whether their personality characteristics are distinctive.

### Alcohol Use

Alcohol use has a known association with criminal activity, and when extreme, can be seen as a deviant lifestyle choice (28). For these reasons, it is important to investigate the relationship between vicious dog ownership and alcohol use. Because it is already known that criminal involvement is associated with vicious dog ownership (9,10), examining the alcohol use behaviors of these owners will allow a better understanding of additional factors that are associated with vicious dog ownership.

### Deviant Lifestyle Choices

We also explored whether vicious dog owners would display higher deviance in lifestyle choices, such as drug use and arrests. The choices people make on a daily basis are often a reflection of their self-image and their perception of the society. For example, choosing to engage in deviant or illegal behaviors says something about one’s self-image and view of the world. Choosing to own a dog is a significant life decision and the type of dog could convey a similar message to the society.

### Present Study

There is a small, but growing body of research examining the personality and behavioral characteristics of dog owners and vicious dog owners in particular. The current study was being conducted to expand upon previous research by Ragatz et al. (10) and further examine the association between criminal thinking patterns, callousness, personality traits, alcohol usage, and deviant lifestyle choices of vicious dog owners as compared to large dog owners, small dog owners, and nondog owners.

## Methods

### Participants

At a large eastern university, 773 undergraduates participated in this Institutional Review Board approved online study. Participants were eliminated from analyses if they completed the study measures in 10 min or less or did not provide enough information about their dog(s) to be accurately classified into one of the four dog ownership groups. A total of 754 (97.7%) participants formed the final sample of 202 (26.8%) men and 552 (73.2%) women. The mean age of the sample was 20.17 (SD = 2.91) and the majority of participants were Caucasian ( $n = 694$ , 92.0%).

A total of 93 (12.3%) participants owned vicious dogs. The breeds of vicious dogs owned by participants in the sample were Pit Bulls ( $n = 35$ , 37.2%), Rottweilers ( $n = 21$ , 22.3%), Chows ( $n = 18$ , 19.1%), Dobermans ( $n = 11$ , 11.7%), Wolf-mixes ( $n = 6$ , 6.4%), and Akitas ( $n = 2$ , 2.1%). The remainder of the participants that provided information regarding their dog ownership status were classified as large dog owners if their dog weighed more than 40 pounds ( $n = 311$ , 41.2%), small dog owners ( $n = 222$ , 29.4%), or controls (not a dog owner;  $n = 114$ , 15.1%). Some names of the vicious dogs were Rocky, Ox, Storm, Capone, and Spike. Large

dogs were frequently named Bear, Clyde, Buddy, Jake, and Molly, and common names for small dogs included Bella, Daisy, Princess, and Bailey. Table 1 contains demographic information describing the dogs and their owners.

## Materials

### Demographic Questionnaire

Participants responded to demographic questions regarding age, gender, ethnicity, marital status, and years of education completed. All questions were answered by selecting one multiple choice option, except for the question regarding age, which was a free response question.

### Dog Ownership Questionnaire

In response to the Dog Ownership Questionnaire, participants described up to two dogs they owned. They were asked to first describe their largest dog and then their second largest dog. Information gathered about each dog included: breed, name, weight, age, sex, neutered status, age of acquisition, reason for having the dog, number of hours spent engaging with the dog, professional training classes for the dog, if the dog slept outside, number of hours a day the dog spent chained outside, number of times the dog has bitten someone, frequency of dog park visits, if the participant ever misinformed someone else about the breed of their dog, and if so, who they misinformed.

For analyses, participants were categorized into four different ownership types. Participants owning a vicious dog (i.e., Akita, Chow, Doberman, Pit Bull, Rottweiler, or Wolf-mix) were classified in the vicious dog ownership category. If a participant owned a dog that weighed 40 pounds or more and the dog was not a vicious breed, they were classified in the large dog ownership category. If the participant owned a dog that was 39 pounds or less and was not a vicious breed, they were categorized in the small dog ownership group. Last, those participants that did not own a dog were included in the control group ownership category.

### The Psychological Inventory of Criminal Thinking Styles

The Psychological Inventory of Criminal Thinking Styles (PICTS) (11) is an 80-item self-report measure of attitudes that support participation in criminal acts. All responses are measured on a four-point Likert scale (4 = *strongly agree*, 3 = *agree*,

2 = *uncertain*, 1 = *disagree*). The measure consists of eight criminal thinking style subscales: mollification (i.e., blame external events for one's involvement in criminal acts), entitlement (i.e., belief that one deserves special rights or attention), cutoff (i.e., become angry quickly and consequently engage impulsively in antisocial behaviors), power orientation (i.e., strong need to be in control of situations), sentimentality (i.e., express care for others that is artificial and done to make oneself look good), superoptimism (i.e., believe that one can commit criminal acts without consequences), cognitive indolence (i.e., take shortcuts when working toward a goal), and discontinuity (i.e., distracted by and influenced by negative others into committing criminal acts). The general criminal thinking (GCT) score was calculated by adding the responses for all items on the eight criminal thinking style subscales. The Cronbach's alpha for the PICTS GCT score was 0.96.

The PICTS originally was developed for use with incarcerated populations; therefore, several items were reworded for use with a nonincarcerated, college sample. For example, the question "Despite the criminal life I have led, deep down I am basically a good person" was reworded to read "Despite some illegal behavior I have done, deep down I am basically a good person." This is identical to how the PICTS was modified for a nonincarcerated sample by McCoy et al. (22) and Walters et al. (23).

### Inventory of Callous-Unemotional Traits

The Inventory of Callous-Unemotional Traits (ICU) is a 24-item self-report questionnaire to assess callousness, a trait associated with the construct of psychopathy (26). This measure was based on the six-item Callous-Unemotional scale of the Antisocial Process Screening Device (29), which identifies youth displaying traits associated with psychopathy. While this measure was originally developed for use with adolescents, it was used in this study with college-age students because of their young adult age, as well as the ease and accessibility of the measure. The ICU contains three subscales of callousness (11 items), uncaring (eight items), and unemotional (five items) traits. All responses are measured on a four-point Likert scale ranging from 0 to 3 (0 = *not at all true*, 1 = *somewhat true*, 2 = *very true*, 3 = *definitely true*). The measure contains 12 positively worded items that require reverse scoring before calculating the total score and subscale scores.

The internal consistency for the ICU has an acceptable coefficient alpha of 0.77, with an internal consistency for callousness of 0.70, 0.73 for uncaring, and 0.64 for unemotional (26). It is believed that the marginal internal consistency for the unemotional scale is because of the scale only containing five items. This is comparable with the reliability found based on our sample of participants. The total measure had a Cronbach's alpha of 0.81, with callousness of 0.71, and uncaring and unemotional at 0.72.

### Five Factor Model Rating Form

The Five Factor Model Rating Form (FFMRF) is a 30-item self-report measure assessing personality traits (27). All responses are measured on a five-point Likert scale (5 = *extremely high*, 4 = *high*, 3 = *neither high nor low*, 2 = *low*, 1 = *extremely low*). The questions are grouped into five domains of six questions each. Each section assesses a particular continuum of personality traits. The five continuums are "neuroticism versus emotional stability," "extraversion versus introversion," "openness versus closedness to one's own experience," "agreeableness versus antagonism," and "conscientiousness versus undependability." An identifying term for each end of these continuums, along with two to four adjectives

TABLE 1—Descriptive data for dog categories and owners.

	Vicious Dogs N = 93	Large Dogs N = 311	Small Dogs N = 222	Controls N = 114
Sex of dog, n (%)				
Male	54 (58.1)	167 (53.4)	106 (47.7)	
Female	39 (41.9)	144 (46.6)	116 (52.3)	
Dog weight mean (SD)	69.66 (31.52)	78.53 (30.0)	18.60 (9.31)	
Bites to humans, n (%)	10 (11.5)	10 (3.3)	20 (9.3)	
Sex of owner, n (%)				
Male	27 (28.7)	81 (26.0)	52 (23.4)	38 (33.6)
Female	66 (71.3)	230 (74.0)	170 (76.6)	76 (66.4)
Owner age mean (SD)				
Male	20.65 (5.03)	20.81 (2.65)	20.45 (2.03)	20.74 (2.56)
Female	20.30 (3.12)	19.88 (3.03)	19.92 (2.96)	20.03 (2.08)

to describe each, are provided for all items (30). For example, *warmth* under the “extraversion versus introversion” continuum is accompanied by adjectives of cordial, affectionate, attached, while the opposite end of this pole is described as cold, aloof, indifferent.

The five personality traits that are measured are neuroticism, extraversion, openness to new experiences, agreeableness, and conscientiousness. A total is calculated for each of these five domains by adding the six items that are specific to each personality characteristic. High scores indicate an individual is high in that particular trait being examined (agreeableness, openness, neuroticism, conscientiousness, and extraversion), and low scores indicate that they are low in that trait.

Coefficient alphas for the five domain scales were generally found to be acceptable to good, ranging 0.51–0.78 (31). This is comparable with what was found in our sample of participants, with Cronbach’s alphas for the five domains ranging from 0.63 to 0.82.

#### *Alcohol Use Disorders Identification Test*

The Alcohol Use Disorders Identification Test (AUDIT) is a 10-item self-report questionnaire designed to assess an individual’s alcohol consumption and potential drinking problems (32). The first eight items of this questionnaire assess a variety of drinking behaviors, such as frequency, number of drinks consumed per day, frequency of six or more drinks on one occasion, inability to stop drinking, inability to meet responsibilities, drinking in the morning, feeling guilt or remorse after drinking, and an inability to remember what happened because of drinking. These questions are answered by selecting one of five options (question 1 and questions 3 through 8 are answered with: *Never, Monthly or less, 2–4 times a month, 2–3 times a week, or 4+ times a week*; question 2 is answered: *1 or 2, 3 or 4, 5 or 6, 7 or 9, 10 or more*). The last two questions ask whether the respondent or someone else has been hurt by their drinking and whether someone has been concerned about their drinking and suggest cutting down. These two questions can be answered with one of the following options: *No, Yes but not in the last year, or Yes during the last year*.

The AUDIT was developed with data collected from a multinational sample and is based on behaviors occurring in the recent past rather than over a lifetime (32). It has also been studied with a variety of populations, including primary care patients, emergency room patients, drug users, unemployed individuals, university students, elderly hospital patients, and persons of low socioeconomic status and has been continually found to have good discrimination across these settings and populations (32, p. 10). The AUDIT also has high test–retest reliability ( $r = 0.86$ ), indicating high overall reliability. This is comparable with the reliability found in our study of 0.84.

#### *Lifestyle Questionnaire*

The Lifestyle Questionnaire is a 39-item self-report questionnaire designed by the researchers to assess various lifestyle choices of participants. Questions include frequency of marijuana usage, frequency of other drug usage (e.g., opiates not prescribed to you, cocaine, ecstasy, methamphetamines, amphetamines not prescribed to you, sedatives not prescribed to you, tranquilizers not prescribed to you, or hallucinogens), number of visible tattoos (on face, hands, neck, or arms), piercings, traffic citations, arrests for misdemeanors or felonies, convictions for misdemeanors or felonies, and evictions. There were also questions regarding duration of longest employment, being fired from a job, quitting a job, number of class skipped per week, number of physical fights involved in over the

past 5 years, the number of people dated for longer than a month, and the longest relationship “exclusively” dating someone. Finally, the number of hours a week spent doing various activities on the internet, the number of hours a week spent playing different types of video games, and video games with various ratings were assessed (questionnaire available from authors upon request).

#### **Procedures**

Respondents completed the study online via a university-supported research website (SONA). The participants were provided with extra credit for taking part in the study if it was offered by their class instructor. All respondents first read an informed consent detailing the study purpose followed by the option to select the “I agree” button if they wished to participate. Next, participants were directed to the anonymous survey where they completed the questionnaires in counterbalanced order. Upon completion of the online study, participants were provided a written debriefing.

#### **Results**

All analyses were conducted using SPSS version 16.0 (IBM Corporation, Armonk, NY).

##### *Dog Bite Frequency*

We asked participants to report how many times their dog had bitten a human (excluding playful bites). A chi-square test for independence was conducted to determine whether the frequency of bites varied by type of dog. There was a significant difference in the frequency of bites to humans based on dog classification type,  $\chi^2(2, n = 602) = 11.17, p < 0.01$ . Vicious dogs were most likely to have bitten someone (11.5%), followed by small dogs (9.3%), and large dogs (3.3%; see Table 1). The Dog Ownership Questionnaire data on items such as neutering, training, dog park visits, etc., did not reveal any significant differences between dog ownership groups.

##### *Criminal Thinking Styles of Dog Owners*

We hypothesized that higher criminal thinking scores would be observed for vicious dog owners as compared to large dog owners, small dog owners, and controls. To evaluate this hypothesis we conducted a one-way, four-group (dog ownership type: vicious dog vs. large dog vs. small dog vs. control) analysis of variance (ANOVA) with the PICTS GCT score as the dependent variable. To control for unequal cell sizes, Unique Sums of Squares IV was used for this analysis and all subsequent ANOVA and multivariate analysis of variance (MANCOVA) analyses. Additionally, post hoc analyses were conducted with Tukey’s analyses and Dunnett-C when the Levene statistic was violated, as well as planned pairwise comparisons, as needed. There was a main effect for dog ownership type,  $F_{3,734} = 2.88, p = 0.035$ , partial  $\eta^2 = 0.01$ . Specifically, pairwise post hoc analyses demonstrated that vicious dog owners displayed significantly higher criminal thinking scores when compared to criminal thinking scores of large dog owners, small dog owners, and control participants (see Table 2).

The PICTS also contains eight thinking style subscales: mollification, cutoff, entitlement, power orientation, sentimentality, superoptimism, cognitive indolence, and discontinuity. To determine whether vicious dog owners differed on these criminal thinking style subscales when compared to all other dog ownership categories, a four-group (dog ownership type: vicious dog vs. large dog vs. small dog vs. control) MANOVA was conducted with

TABLE 2—Means for criminal thinking total score and thinking style subscales by dog ownership type.

	Vicious Dog		Large Dog		Small Dog		Control		<i>F</i>	<i>p</i>	Partial $\eta^2$
	M	SD	M	SD	M	SD	M	SD			
PICTS total score	118.90 <sup>a,b,c</sup>	29.36	110.33 <sup>a</sup>	24.83	110.48 <sup>b</sup>	25.34	109.71 <sup>c</sup>	31.47	2.88	0.035	0.012
Entitlement	13.39 <sup>a</sup>	4.65	12.07	3.84	11.84 <sup>a</sup>	3.80	11.80	4.10	3.83	0.010	0.015
Sentimentality	14.93 <sup>a</sup>	5.32	13.03 <sup>a</sup>	4.74	12.77 <sup>a</sup>	5.02	12.77 <sup>a</sup>	5.55	4.59	0.003	0.019
Superoptimism	13.68 <sup>a</sup>	5.05	12.30	3.75	12.16 <sup>a</sup>	3.49	12.50	4.39	3.56	0.014	0.014

PICTS, Psychological Inventory of Criminal Thinking Styles. Means with the same letter in the same row are statistically significantly different from one another at the level of  $p < 0.05$ . Pairwise comparisons were utilized to identify significant differences between the means of the PICTS total score.

dependent variables as the total scores on the eight criminal thinking style subscales measured on the PICTS. Analyses showed a main effect for dog ownership type,  $F_{3,731} = 1.68$ ,  $p = 0.021$ , partial  $\eta^2 = 0.02$ . Results of the univariate follow-up test are displayed in Table 2. The criminal thinking style subscales of mollification, cutoff, power orientation, cognitive indolence, and discontinuity are not included in the table because no significant differences were found for these subscales.

#### Callousness of Dog Ownership Types

The ICU was used to measure callousness. A four-group (dog ownership type: vicious dog vs. large dog vs. small dog vs. control) ANOVA was conducted to determine whether owners of vicious dogs had higher total ICU scores, as well as higher scores on the three subscales. Contrary to expectations, there were no significant differences between dog ownership types and ICU total scores and subscale scores (Table 3).

#### Five Factor Personality Characteristics of Dog Ownership Types

To determine whether vicious dog owners differed in personality characteristics from the other three ownership categories, five one-way, four-group (dog ownership type: vicious dog vs. large dog vs. small dog vs. control) ANOVAs were conducted with dependent variables of the total scores derived from the five personality scales measured on the FFMRF (neuroticism, extraversion, openness, agreeableness, and conscientiousness). There were no significant differences found on any of the five personality scales for any of the dog ownership categories (Table 3).

#### Alcohol and Drug Usage of Dog Ownership Types

We hypothesized that higher substance use scores would be observed for vicious dog owners compared with the other dog

ownership types. To evaluate this hypothesis, we conducted a one-way, four-group (dog ownership type: vicious dog vs. large dog vs. small dog vs. control) ANOVA with total scores on the AUDIT as the dependent measure. However, there was no significant effect between total AUDIT scores and dog ownership type.

#### Deviant Lifestyle Choices of Dog Ownership Types

We expected vicious dog owners to endorse more deviant lifestyle choices. Only three of 16 lifestyle items differed between groups. The number of arrests for a misdemeanor or felony, replicating Barnes et al.'s (9) results, frequency of marijuana use, and the number of physical fights engaged in over the last 5 years were significantly different based on dog ownership type (see Table 4).

The number of arrests for a misdemeanor or felony was significantly different based on dog ownership type,  $F_{3,717} = 4.12$ ,  $p = 0.007$ , partial  $\eta^2 = 0.02$ . Specifically, vicious dog owners had significantly more arrests ( $M = 0.22$ ,  $SD = 0.65$ ) than large dog owners ( $M = 0.10$ ,  $SD = 0.34$ ), small dog owners ( $M = 0.09$ ,  $SD = 0.31$ ), and control participants that did not own a dog ( $M = 0.05$ ,  $SD = 0.21$ ).

A one-way, four-group (dog ownership type: vicious dog vs. large dog vs. small dog vs. control) ANOVA was conducted to determine whether there was a difference in marijuana usage based on dog ownership type. There was a significant main effect for dog ownership type,  $F_{3,725} = 3.07$ ,  $p = 0.027$ , partial  $\eta^2 = 0.01$ . Vicious dog owners used marijuana ( $M = 2.10$ ,  $SD = 1.41$ ) significantly more frequently as compared to small dog owners ( $M = 1.65$ ,  $SD = 1.18$ ). However, none of the dog ownership categories differed in the frequency of other drug use (opiates, cocaine, ecstasy, methamphetamines, amphetamines, sedatives, tranquilizers, or hallucinogens).

There was a significant main effect for dog ownership type based on the number of physical fights engaged in over the last 5 years,  $F_{3,736} = 3.41$ ,  $p = 0.017$ , partial  $\eta^2 = 0.01$ . Vicious dog owners engaged in significantly more physical fights ( $M = 0.90$ ,

TABLE 3—Means for callousness and five factor personality traits.

	Vicious Dog		Large Dog		Small Dog		Control		<i>F</i>	<i>p</i>	Partial $\eta^2$
	M	SD	M	SD	M	SD	M	SD			
ICU total	16.34	7.38	14.95	5.86	15.04	6.48	16.04	6.78	1.77	0.152	0.007
Callousness	4.85	4.16	4.12	2.71	4.40	3.34	4.85	3.33	2.14	0.094	0.009
Uncaring	5.66	3.04	5.15	2.77	5.11	2.81	5.64	2.69	1.68	0.170	0.007
Unemotional	5.83	2.28	5.68	2.43	5.52	2.29	5.63	2.28	0.414	0.743	0.002
Five factor model rating form											
Neuroticism	15.48	3.66	14.76	4.13	15.01	3.82	15.40	3.88	1.24	0.294	0.005
Extraversion	22.37	3.15	22.34	3.50	22.15	3.50	21.63	3.91	1.24	0.294	0.005
Openness	20.68	3.15	20.26	3.29	20.10	3.24	20.94	3.20	2.04	0.107	0.008
Agreeableness	21.69	3.25	21.89	3.78	21.93	3.48	21.37	3.09	0.759	0.517	0.003
Conscientiousness	22.17	3.32	22.49	3.89	22.31	3.68	21.63	4.24	1.45	0.228	0.006

ICU, Inventory of Callous-Unemotional Traits.

TABLE 4—*Deviant lifestyle choices of dog ownership categories.*

	Vicious Dog		Large Dog		Small Dog		Control		<i>F</i>	<i>p</i>	Partial $\eta^2$
	M	SD	M	SD	M	SD	M	SD			
Arrests for misdemeanor or felony	0.22 <sup>a</sup>	0.65	0.10	0.34	0.09	0.31	0.05 <sup>a</sup>	0.21	4.12	0.007	0.017
Frequency of marijuana usage	2.10 <sup>a,b,c</sup>	1.41	1.75 <sup>a</sup>	1.28	1.65 <sup>b</sup>	1.18	1.66 <sup>c</sup>	1.14	3.07	0.027	0.013
Frequency of physical fights	0.90 <sup>a,b</sup>	1.57	0.55 <sup>a</sup>	1.11	0.52 <sup>b</sup>	1.14	0.81	1.46	3.41	0.017	0.014

Means with the same letter in the same row are statistically significantly different from one another at the level of  $p < 0.05$ . Planned pairwise comparisons were utilized to identify significant differences between the means.

SD = 1.57) than both large dog owners ( $M = 0.55$ ,  $SD = 1.11$ ), and small dog owners ( $M = 0.52$ ,  $SD = 1.14$ ).

## Discussion

The goal of this study was to extend the limited research examining the relation between vicious dog ownership and owner characteristics (6,9,10). Specifically, this study investigated whether college students who owned vicious dogs demonstrated unique criminal thinking patterns, lifestyle choices, and personality traits as compared to other dog owners and nonowners. This study did show that owners of vicious dogs displayed more antisocial thinking styles. In addition, vicious dog owners were more likely to use marijuana have an arrest history, and past involvement in a physical altercation.

One of the major contributions of this study was the examination of criminal thinking patterns among college-age vicious dog owners. As findings from this study show vicious dog owners endorsed higher levels of overall criminal thinking patterns than all dog owners and nonowners. Moreover, when examining the eight criminal thinking dimensions vicious dog owners were significantly elevated on three of the eight dimensions: entitlement, sentimentality, and superoptimism. High levels of criminal thinking have been linked to a greater propensity for an individual to take part in and repeat illegal acts (11,12,14,15). Previous research shows that vicious dog owners are more likely to engage in an array of criminal acts (9,10). This study extends this research by showing vicious dog owners also have the attitudes conducive to criminal behavior.

Next, we sought to replicate the Barnes et al. (9) and Ragatz et al. (10) studies by exploring whether vicious dog owners were more likely to be involved in illegal acts (e.g., number of arrests, number of physical fights, and frequency of use of various drugs). Study findings showed vicious dog owners had significantly more arrests compared with all other study participants. Also, vicious dog owners were found to use marijuana to a significantly greater extent than small dog owners. Finally, vicious dog owners admitted to being involved in significantly more physical fights than all other participants. In sum, these findings support previous research (9,10) and the general social deviance theory. Specifically, as this study confirms owning a vicious dog seems to be an indicator of involvement in various antisocial acts (e.g., drug use, and physical fights).

The AUDIT was used to assess for the frequency of alcohol use among participants. The AUDIT has previously demonstrated validity in detecting alcohol problems in college student samples (33). No significant findings were demonstrated for the AUDIT between college-age vicious dog owners and all other owners. Previous research (9,10) is limited because it did not examine use of different drugs and alcohol individually. This study did examine the use of the different drugs separately. Therefore, this study confirms and extends upon Barnes et al. (9) and Ragatz et al. (10) by

demonstrating vicious dog owners are more likely to use the illegal drug of marijuana, but are not more likely to use alcohol or other illegal drugs than other dog owners and nonowners.

The study also investigated whether vicious dog owners exhibited an array of behaviors that could be perceived as deviant, but not necessarily illegal such as having several tattoos, multiple piercings, skipping class, being fired from a job, being evicted from an apartment, playing violent video games, etc. Findings demonstrated that there were no differences between vicious dog owners and other owners or nonowners on these variables. Many of these deviant behaviors (e.g., number of tattoos, number of piercings, and job termination) have previously been correlated with a greater likelihood of engaging in various illegal acts (34,35). These deviant behaviors may not have been significant for vicious dog owners because we looked at male and female vicious dog owners collectively. Future research could examine whether male owners of vicious dogs differ from female vicious dog owners on these various deviant and illegal behaviors. In this study, the sample of male vicious dog owners was not large enough to make gender comparisons.

Several personality variables explored in this study did not show significance. For instance, this study demonstrated that there was no difference between vicious dog owners, other dog owners, and nonowners on the variable of callousness. This finding was unexpected given that past research demonstrates vicious dog owners are higher in primary psychopathy compared with all other dog owners (10). Callousness is a principal component of primary psychopathy (24,25). This suggests that there may be other components (e.g., egocentricity, superficial charm, lack of remorse for wrongdoings, and manipulativeness) of primary psychopathy that are more prominent among vicious dog owners. Alternatively, perhaps there were no differences in callousness because vicious dog owners actually do not differ from other dog owners and nondog owners on this variable. Further research in this area could better clarify this finding and ultimately inform dog owner training programs and legislation.

We know from previous research that vicious dog owners are more inclined to take part in criminal acts (9,10) and that certain five-factor traits have been linked to participation in criminal acts (36). For instance, Corff and Toupin (36) found that delinquent adolescents were lower in agreeableness and higher in neuroticism when compared to nondelinquent adolescents. Furthermore, Ragatz et al. (10) demonstrated that vicious dog owners do differ in personality (i.e., higher levels of sensation-seeking) compared with other dog owners and nonowners. Therefore, it was surprising that no significant differences existed between the different dog owners and nonowners on the five factors of personality. In this study, we used a brief five-factor measure of personality (i.e., FFMRF [27]). Future research could use more extensively validated personality measures (e.g., Revised NEO Personality Inventory [37]) to examine the differences between owners. It is also possible that vicious dog owners do not differ from other dog owners and nondog owners on these five broad personality characteristics. Perhaps more

specific or detailed personality assessments would better capture personality differences between these groups if they exist.

#### *Limitations and Future Directions*

Findings from this study are limited because we utilized a college student sample that was predominately female and Caucasian. Therefore, the findings of this study may not generalize well to the community at large. To increase the generalizability of these findings, future researchers could possibly recruit dog owners from neighborhoods, dog parks, pet stores, or veterinary clinics. Additionally, recruiting participants from larger, metropolitan areas, rather than a college town, could enhance the diversity of vicious dog owners and their reasons for ownership. Recruitment from these venues could help to increase the diversity of the sample.

Several moderating variables, which may influence dog behavior, were not investigated in this study. For instance, male vicious dogs that are not neutered may be more vicious than neutered male vicious dogs and female vicious dogs. Unfortunately, few vicious dogs in this study were not neutered, so we could not make this comparison. Another moderating factor could be type and frequency of punishment an owner utilizes with the dog. Vicious dogs may be more aggressive if owners are likely to use physical punishment rather than other modes of punishment (e.g., verbal reprimanding, withholding a reinforcement [e.g., treat or toy] from the dog) with their dog.

#### *Implications of the Research*

Although vicious dog ownership is not considered a criminal act, it can lead to crimes such as dog fighting, animal abuse, and even manslaughter (if the dog kills a person or their bites result in a person's death). As both this study and previous studies (9,10) illustrate, vicious dog owners were also more likely to engage in multiple forms of criminal behavior (e.g., violent, property, drug, and status offenses). Because research shows vicious dog owners have greater criminal involvement than other dog owners and non-dog owners, examining and understanding their criminal thinking patterns could inform lawmakers involved in dog bite prevention legislations, as well as other dog bite prevention programs, breeders, and dog adoption agencies.

Moreover, knowing that ownership of a vicious dog is related to engagement in an assortment of antisocial actions, particularly physically aggressive acts, is important. Specifically, asking about dog ownership status could potentially be a useful variable for psychologists to assess for when conducting violence risk assessments. Currently, psychologists show moderate to low capability in predicting criminal violence. However, actuarial risk assessments tend to be better predictors of future violence when contrasted with clinical risk assessments. This is problematic as such risk assessments are used by the courts to make major decisions such as whether a defendant should receive capital punishment, whether a psychiatric patient should be released from a hospital, treatment recommendations, and whether a sexual offender should be civilly committed (38). Future research could investigate whether adding questions regarding dog ownership to actuarial risk assessment measures in fact helps to increase the capacity for clinicians to predict an individual's level of future risk for violence.

Last, in this study, we evaluated whether vicious dogs were treated differently than small and large dogs regarding the variables of playful interaction time with owners, training class participation, and duration of time chained outside. We found no differences in treatment for the different dog groups on these factors. However,

even with equivalent treatment on these variables, vicious dogs were still reported to bite humans more often than other dog breeds. This finding speaks about the importance of properly training vicious dogs to prevent injury. In particular, this research suggests that vicious dogs may require additional training classes, beyond that required of nonvicious dogs, to decrease their future chance of becoming aggressive.

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