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Authors

Hopwood, Christopher J

Bleidorn, Wiebke

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Antisocial personality traits transcend species

Christopher J. Hopwood and Wiebke Bleidorn

University of California, Davis

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Contact:

Christopher J. Hopwood, PhD
Professor of Psychology
Young Hall
UC Davis
Davis, CA 96616
chopwoodmsu@gmail.com

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Abstract

Antisocial personality is generally used to describe people who treat other people with callous disregard and disrespect. Although animal cruelty is diagnostic of conduct disorder, a precursor of antisocial personality in children, it is unclear whether the term antisocial also encompasses disregard and disrespect toward non-human animals among adults. In this study we examined associations between three anti-animal attitudes and behaviors - speciesism, hunting/fishing, and lack of sympathy for animal rights - and traits that underlie adult antisocial behavior. We found consistent links between antisocial personality traits and anti-animal attitudes and behaviors in two samples. These effects were generally specific to traits linked to antisociality (although we also found associations with low openness), and these traits were stronger as predictors of variation among meat eaters than as predictors of differences between vegetarians and meat eaters. These results suggest that the term antisocial applies to negative attitudes and behaviors towards both humans and non-human animals and imply the potential value of considering anti-animal attitudes and behaviors in the clinical assessment of antisocial personality.

Keywords: antisocial, animal rights, speciesism, vegetarian, diet, psychopathy, five factor model, personality disorder, DSM, diagnosis

The *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5; American Psychiatric Association, 2013) lists cruelty to non-human animals (hereafter, animals) as a symptom of childhood conduct disorder. Conduct disorder is, in turn, a symptom of adult antisocial personality disorder (ASPD). However, the presence of anti-animal attitudes and behaviors that manifest during adulthood is not a diagnostic criterion of adult personality disorder. The central questions of this study are whether and to what degree anti-animal attitudes and behaviors reflect antisocial personality traits in adults.

Two distinct lines of research hint at the link between antisocial personality traits and anti-animal attitudes and behaviors – clinical studies on antisocial personality and animal cruelty and basic science on the personality traits associated with vegetarian diet. However, limitations in each of these areas of research leave a number of questions about potential links between antisocial personality traits and anti-animal attitudes and behaviors unanswered. We review existing evidence and methodological limitations in the following sections, after which we describe the goals and approach of the studies presented in this paper.

Evidence-Based Dimensions of Antisocial Personality

Many scholars have conceptualized cruelty to animals as falling within the general domain of interpersonal violence based on the robust theoretical and empirical connection between animal abuse and other forms of

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antisocial behavior (Alleyne & Parfitt, 2019; Arluke et al., 1999; Ascione, 1993; McPhedran, 2009; Miller, 2001; Thompson & Gullone, 2003). For example, Gleyzer, Felthous, and Holzer (2002) found that a history of animal cruelty was associated with ASPD. Arluke, Levin, Luke, and Ascione (1999) found that people with a history of animal abuse were more likely to be violent towards other humans and involved in criminal behavior (see also Febres et al., 2014). Links between animal abuse and a range of psychopathology, substance-related, and criminal behavior variables were replicated in more than 40,000 participants by Vaughn et al. (2009).

Much of this work has been organized around the polythetic diagnostic category “antisocial personality disorder” as instantiated in the DSM. However, it is established that categorical polythetic diagnoses are prone to psychometric issues including unreliability, non-specificity, and attenuated validity (Markon, Chmielewski, & Miller, 2011), all of which could constrain or distort effect size estimates. Even when treated as continuous symptom counts, polythetic diagnostic constructs complicate interpretation by mixing qualitatively different traits together into global composites.

A separate body of research documents personality correlates of vegetarian diet. Although vegetarian diet can be influenced by a variety of factors (Hopwood et al., 2020; Rosenfeld & Burrow, 2017a), vegetarians generally exhibit more positive attitudes and behaviors towards non-human animals than non-vegetarians, and animal rights is a primary motivation for many vegetarians (Rosenfeld & Burrow, 2017b). Of note, vegetarian diet is

typically positively associated with traits that are negatively related to antisocial personality (Jones, Miller, & Lynam, 2011) such as agreeableness, communal values, and conscientiousness (Forestell & Nezelek, 2018; Pfeiffer & Egloff, 2018a, b; Furnham, McManus, & Scott, 2003; Herzog & Matthews, 1997).

However, this work has been characterized by several design issues that complicate inferences about the role of antisocial personality features in attitudes towards animals. First, early research often used relatively small samples, contributing to inconsistent findings across studies. Later studies with larger samples often used very brief measures with limited content breadth and reliability. Almost all studies in this area have focused on normal range trait domains that may not capture the extreme, specific, and maladaptive aspects of personality that are most closely related to anti-animal attitudes or behaviors. Thus, neither measures of the antisocial diagnosis nor brief, normal range personality measures are optimal for capturing the antisocial personality features most likely to reflect anti-animal attitudes and behavior.

Research during the last few decades has identified traits from the domain of agreeableness/antagonism as core dispositions underlying a broad range of antisocial behaviors and PD symptoms (Jones, Miller, & Lynam, 2011; Lynam & Miller, 2019; Miller, Lynam, & Leukefeld, 2003). These traits span measured both normal and maladaptive forms of this general domain, and include facets that depict variation in antagonistic behavior that can be

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antisocial in different ways. It is possible that specific trait facets that capture the maladaptive range of personality variation would be more sensitive to attitudes and behaviors toward animals. Indeed, research suggests that eating meat is reliably related to maladaptive aspects of antisocial personality such as authoritarian, hierarchical values (Allen & Ng, 2003; De Backer & Hudders, 2015), aggressive masculinity (Loughnan & Davies, 2019), and animal exploitation (Dhont & Hodson, 2014). Moreover, initial work links these traits to attitudes and behaviors towards animals beyond vegetarian diet. For instance, Erlanger and Tsytsarev (2012) found negative associations between several anti-animal attitudes and agreeableness (but no other five factor model trait) and several studies suggest an important role for empathy (Akdemir & Gölge, 2020; Amiot & Bastian, 2016; Parfitt & Alleyne, 2016), which can be conceptualized as a facet of agreeableness.

Inspired by this general approach, in this study we assessed normal and maladaptive variants of the agreeableness/antagonism domain as well as five maladaptive facets that have been linked with anti-animal attitudes or behavior in previous research: lack of empathy (McPhedran, 2009; Paul 2000), callousness or indifference to the suffering of others (Dadds, Whiting, & Hawes, 2006), and entitlement or self-centeredness (Kavanaugh, Signal, & Taylor, 2013). We supplemented these maladaptive trait indicators with social dominance orientation, a strong correlate of antisocial personality (Gram-Kevan, 2011; Yokota, 2012) and anti-animal attitudes (Dhont et al.,

2014). We expected each of these antisocial personality features to be related to anti-animal attitudes and behaviors.

Animal Attitudes and Behaviors

A variety of variables can be used to represent variation along the broad spectrum of attitudes and behaviors towards animals (Amiot & Bastian, 2015). Most previous research has sampled variables at the extreme tails of this broad spectrum: On one tail is overt animal cruelty, a clear but relatively uncommon indicator of anti-animal behavior in the general population (e.g., Arluke et al., 1999). The low base rate of severe animal cruelty makes it difficult to sample and raises concerns about the generalizability of results to most people. On the other side of the spectrum is vegetarian behavior that is explicitly rooted in animal rights motives (i.e., ethical veganism; e.g., Kessler et al., 2016). While this behavior is a clear indicator of pro-animal attitudes, it is also relatively uncommon, and thus suffers the same practical problems for researchers as animal cruelty. We sought to find intermediary variables that would both clearly reflect attitudes and behaviors towards animals but also vary appreciably in the population. We focused on three attitudes and behaviors towards animals that are more normally distributed in the general population: speciesism, hunting/fishing, and animal rights sympathy.

Speciesism is the belief that animals are morally inferior to humans (Singer, 1975; Caviola et al., 2018). This belief enables other more severe

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anti-animal behaviors by providing an ostensible moral justification: if animals are morally inferior to humans, they have fewer rights, and this may include rights to safety and respect. Caviola et al. developed a brief speciesism questionnaire whose scores were moderately correlated with values known to be associated with antisocial personality features, including social dominance orientation, conservatism, and right-wing authoritarianism. Speciesism was also correlated with beliefs that animals are less intelligent and less capable of suffering, as well as ethical food choices. Subsequent work showed reliable links between speciesism and other forms of prejudice (Everett et al., 2018) and a robust connection with vegetarian diet (Rosenfeld, 2019). Thus far, associations between speciesism and trait-based indicators of antisocial personality have not been examined.

People who engage in *hunting and fishing* may have a variety of motivations, potentially including prosocial or even pro-animal motives (Treves, 2009). Nevertheless, the behavior results in pain, serious injury, or death for animals (Braithwaite, 2010; Bartholomew & Bohnsack, 2005; Cooke et al., 2002; Muoneke & Childress, 1994), and thus hunting and fishing exemplify clear instances of anti-animal behavior (Brown, 2015; Scruton, 1998). Moreover, research suggests that people who engage in other types of pro-animal behaviors are much less likely to hunt or fish than those in the general population (Driscoll, 1995), and that interests in hunting/fishing are related to low agreeableness (Tirre & Dixit, 1995) and other forms of antisocial behavior (Flynn, 2002). However, associations between hunting or

fishing and the traits and values that underlie antisocial behavior have not been established.

Animal rights sympathy is a common motivator for vegetarian diet and other pro-animal behaviors (Hill, 1993; Janssen, Busch, Rödiger, & Hamm, 2016). Hopwood, Bleidorn, Chen, and Schwaba (2020) recently developed the Vegetarian Eating Motives Inventory (VEMI), which includes a scale measuring the degree to which people find animal rights argument for pro-animal behavior compelling. Among vegetarians, scores on this scale reflect the degree to which concerns for animal right impact dietary choices. Among non-vegetarians, scores on this scale reflect the respondents' degree of sympathy for an animal rights argument for a vegetarian diet, even if they do not necessarily act on that belief in their day to day lives. This scale was positively correlated with measures of agreeableness and communal values (e.g., peace, harmonious relationships) across three diverse samples in the validation research. However, associations with maladaptive traits and values characteristic of antisocial personality have not yet been evaluated. We expected each of these variables to be associated with a wide array of antisocial personality features.

Study Aims

Anti-animal attitudes and behaviors are symptomatic of conduct disorder in childhood and adolescence, which is itself a precursor to antisocial personality disorder. However, anti-animal attitudes and behavior

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is rarely discussed in the adult personality disorder literature. Existing research suggests that antagonistic trait characteristic of antisocial personality may be associated with a lower likelihood of being vegetarian and more negative attitudes towards non-human animals. In this study, we built on this research in two ways. First, rather than conceptualizing antisocial personality as a psychiatric category or a broad normal range trait, we assess a range of specific facets and values related to antisocial personality, under the general rubric of agreeableness/maladaptive antagonism. Second, rather than focusing on low base rate behaviors such as vegetarian diet or animal cruelty as a proxy for animal-related attitudes and behaviors, we assess constructs that more directly indicate the psychological orientation of most individuals towards animals. Our overall goal was to establish the empirical association between antisocial personality features and these more prevalent anti-animal attitudes and behaviors.

We used two studies to achieve this goal. In Study 1, we sampled individuals from a North-American undergraduate population to test our hypothesis that antisocial personality features would correlate with anti-animal attitudes and behaviors. We expected strong, specific, and consistent correlations between these sets of variables.

In Study 2, we sampled individuals who identified as either vegetarian or not vegetarian using an online data collection platform. This allowed us to a) replicate previous research linking vegetarian diet to less antisocial

personality features, b) replicate the findings from the first study in a sample that included a relatively even proportion of vegetarian and non-vegetarian participants, and c) compare the effects of antisocial personality features in relation to vegetarian status as opposed to psychological variables that underlie interspecies attitudes. We hypothesized that vegetarians would have lower levels of antisocial features than meat eaters, that associations between antisocial features and anti-animal attitudes and behaviors from study 1 would replicate in study 2, and that anti-animal attitudes and behaviors would be stronger correlates of antisocial personality than vegetarian status. We used the benchmarks proposed by Funder and Ozer (2018) to classify correlations as small ($> .10$), medium ($> .20$), large ($> .30$), or very large ($> .40$). This research was declared exempt by the local IRB. Data from both studies are available at <https://osf.io/xvc7d/>.

Study 1

Study 1 consisted of 754 out of 771 participants from a university subject pool who completed at least 80% of survey items. The average age was 19.51 (SD = 1.99). There were 619 women, 131, and 4 other genders. There were 342 Asian, 210 white, 15 black, 2 Native American, 2 Pacific Islander, 63 multiracial participants and 110 members of other races; 184 reported Latinx ethnicity.

Participants completed three measures of anti-animal attitudes and behaviors. The *Speciesism Scale* (Caviola et al., 2019; $\alpha = .75$) has 6 items

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scored from 1 (strongly disagree) to 7 (strongly agree). Items include “Morally, animals always count for less than humans” and “Humans have the right to use animals however they want to”.

Four items, rated on a 1 (not at all) to 5 (very much) scale, were combined to assess hunting and fishing, respectively – “do you enjoy hunting/fishing” and “do you think hunting/fishing is an admirable hobby”. These were collapsed into a single hunting and fishing scale ($\alpha = .79$).

Animal rights motives were assessed using the 6-item animal rights scale from the *Vegetarian Eating Motives Inventory* (VEMI; Hopwood et al., 2020; $\alpha = .95$). Items are scored on a 1 (not important) to 7 (very important) scale. Example items include “It is important for me to eat less meat or fewer animal products ...” “so animals do not have to suffer” and “...because it is does not seem right to exploit animals”.

Participants completed 6 measures with scales measuring antisocial personality features. We used the 60-item version of the *International Personality Item Pool* (Maples-Keller et al., 2019) to assess the normal range traits neuroticism, extraversion, agreeableness, and conscientiousness (mean $\alpha = .73$). Responses ranged from 1 (strongly disagree) to 5 (strongly agree). We used the *Brief Personality Inventory for DSM-5* (APA, 2013) to assess maladaptive traits negative affectivity, detachment, psychoticism, antagonism, and disinhibition (mean $\alpha = .73$). Responses ranged from 1 (very false) to 4 (very true). We used the callousness ($\alpha = .75$) and self-centeredness ($\alpha = .79$) scales from the *Elemental Psychopathy Assessment*

(Lynam et al., 2011) and the entitlement ($\alpha = .83$), indifference ($\alpha = .85$), and lack of empathy ($\alpha = .78$) scales from the *Five Factor Narcissism Inventory* (Glover et al., 2012) to assess maladaptive antagonism facets. Responses to these scales ranged from 1 (strongly disagree) to 5 (strongly agree). Finally, we used the *Social Dominance Orientation scale* (Pratto, Sidanius, Stallworth, & Malle, 1994) to measure social dominance orientation ($\alpha = .93$). Responses ranged from 1 (very negative) to 7 (very positive).

Study 1 Results and Discussion

Table 1 shows correlates between anti-animal attitudes and behaviors and antisocial personality features in sample 1. All correlations were significant ($p < .01$) with the exception that speciesism and animal rights sympathy were not significantly related to indifference. Effect sizes tended to be medium to large for speciesism, small for hunting/fishing, and medium for animal rights sympathy. To summarize these effects, we generated composite scores for both anti-animal attitudes and behaviors and antisocial personality features using maximum likelihood factor analysis. The first eigenvalues for the model for the three anti-animal attitudes and behavior scales explained 59% of their covariance, and pattern coefficients were $-.82$ for animal rights motives, $.62$ for hunting/fishing, and $.85$ for speciesism. The first eigenvalues for the antisocial factor explained 54% of the covariance in antisocial variables, and pattern coefficients ranged from $.34$ (indifference) to $.88$ (self-centeredness). The correlation between these factors was $.46$,

suggesting a robust association between antisocial personality traits and anti-animal attitudes and behaviors.

To test the specificity of this association to antagonistic traits, we correlated the anti-animal attitudes and behavior factor with normal range and maladaptive variants of the other big five traits. The two strongest correlations were with agreeableness (-.40) and antagonism (.29); other significant ($p < .01$) associations included -.21 with openness, -.11 with negative affectivity, .and 12 with disinhibition. Only the associations with openness and negative affectivity persisted with agreeableness and antagonism controlled; associations between the anti-animal attitudes and behavior factor and both agreeableness and antagonism remained significant with all other traits controlled. These results imply that the personological core of anti-animal attitudes and behavior is low agreeableness/antagonism from a big five perspective.

Study 2

Sample 2 consisted of 682 participants from the Prolific data collection service (<https://www.prolific.co>). We initially invited 387 participants to participate in the study if they were not vegetarian and 343 to participate in the study if they were vegetarian. These invitations were sent to people who had previously registered with Prolific as either vegetarian or not – the invitations themselves did not specifically mention dietary habits. Of these participants, 356 in the non-vegetarian sample and 326 in the vegetarian

sample completed the survey. However, 91 of the individuals invited into the vegetarian version of the study responded affirmatively to having “generally eaten meat” (Rosenfeld & Burrow, 2018) within the survey, and 16 of the individuals invited into the non-vegetarian version of the survey indicated that they do not generally eat meat. We classified respondents as vegetarian only if they reported not generally eating meat (people in this group could have eaten animal products such as milk or eggs; i.e., they identified as vegetarian or vegan). This left 431 (356 - 16 + 91) participants in the meat-eating group and 251 (326 - 91 + 16) in the vegetarian group. There were 246 men, 422 women, and 14 people reporting other genders; the average age was 31.04 (SD = 11.18, range = 18-80). Most respondents (495) were white; 40 were black, 82 Asian, 3 Pacific Islander, 43 multiracial, and 19 other races; 58 reported Latinx ethnicity. The vast majority of respondents (661) were North American; others came from Europe (16), Asia (3), South America (1), or Oceania (1). This research was declared exempt by the local IRB.

Participants completed the same measures as in study 1: the *Speciesism Scale* ($\alpha = .82$), hunting and fishing scales ($\alpha = .84$), VEMI animal rights scale ($\alpha = .97$), *International Personality Item Pool* traits (mean $\alpha = .76$), *Brief Personality Inventory for DSM-5* traits (mean $\alpha = .75$), the callousness ($\alpha = .79$) and self-centeredness ($\alpha = .81$) scales from the *Elemental Psychopathy Assessment*, the entitlement ($\alpha = .85$), indifference

($\alpha = .89$), and lack of empathy ($\alpha = .84$) scales from the *Five Factor Narcissism Inventory*, and *Social Dominance Orientation* ($\alpha = .95$).

Study 2 Results and Discussion

Our first goal was to replicate associations found in Study 1 in a sample that included relatively even proportions of meat eaters and vegetarians. All correlations in sample 2 were significant with the exceptions of hunting / fishing with normal range agreeableness. Effects were again in the medium to strong range for speciesism and animal rights sympathy and in the medium range for hunting/fishing. We again computed composite scores via maximum likelihood factor analysis. The first factor in the anti-animal attitudes and behavior model explained 68% of the variance in animal rights motives (pattern coefficient = $-.81$), hunting/fishing ($.50$), and speciesism ($.87$); the first factor in the antisocial personality model explained 57% of the variance and pattern coefficients ranged from $.34$ (indifference) to $.91$ (callousness). The correlation between these factors was $.44$. These findings largely replicated results from study 1.

Specificity tests also generally replicated. In sample 2, there was a strong correlation between the anti-animal attitudes and behaviors factor and openness to experience ($-.43$, $p < .001$) and no other significant correlations with normal range or maladaptive trait domains. The association with openness persisted with agreeableness and antagonism controlled. Likewise, with openness controlled, the anti-animal attitudes and behaviors

factor also continued to be significantly correlated with both agreeableness and antagonism.

We next tested mean differences on the antisocial personality and anti-animal attitude and behavior variables between vegetarian and meat eaters in (Table 3). As expected, meat eaters had appreciably more anti-animal attitudes and behaviors than vegetarians, with Cohen's d values near 1 for all three variables. There were also significant group differences suggesting that meat eaters were less agreeable and more callous, self-centered, entitled, indifferent, and lower in empathy and that they were higher in social dominance orientation and agentic values. However, this pattern was not consistent (e.g., differences were not significant for antagonism). It should also be noted that the mean scores were in the low range for these scales, indicating that meat eaters were not in fact meaningfully callous, indifferent, or entitled in an absolute sense. Moreover, the largest effect size ($d = .45$) translates to a small to medium sized correlation of $r = .20$ in the Funder and Ozer (2019) framework, and group difference effect sizes were generally lower, when placed on the same scale, than the associations between antisocial features and anti-animal attitudes and behaviors among meat eaters reported above. These findings implied that anti-animal attitudes and behaviors are a stronger indicator of antisocial personality features than vegetarian status. To test this hypothesis more directly, we regressed the antisocial personality factor described above on vegetarian status and the anti-animal attitudes and behaviors factor in the entire

second sample. The coefficient for vegetarian status was not statistically significant ($\beta = .02$, $t = .43$, $p = .67$) whereas the coefficient for anti-animal attitudes and behaviors was significant and large ($\beta = .44$, $t = 11.45$, $p < .001$).

Discussion

This work bridges work from clinical personality research on the link between animal abuse and antisocial personality (Vaughn et al., 2009), particularly among children with conduct disorder diagnoses (Miller, 2001), and work from basic personality science showing a link between normal range agreeableness, vegetarian diet, and other animal-related attitudes (Pfeiler & Egloff, 2018a, b). We found associations in the medium to strong range (Funder & Ozer, 2019) between the traits and values that underlie antisocial personality and anti-animal attitudes and behaviors. This finding indicates that the term *antisocial personality* is a general referent for antagonistic, disrespectful, and abusive relations to others, regardless of species. We also found a consistent correlation between anti-animal attitudes and behaviors and the personality trait openness to experience.

Vegetarian status has often been used in the past research as an indicator of attitudes towards animals. In this study, psychological variables that reflect anti-animal attitudes and behaviors distinguished levels of antisocial personality among meat eaters more strongly than vegetarian status. This finding highlights significant and meaningful variation among

meat eaters in terms of attitudes towards animals. Indeed, many people who eat meat hold relatively positive or at least neutral attitudes about animals (Herzog & Burghardt, 1988). Likewise, the relatively average scores on antagonism scales among meat eaters in this study shows that this group is not, on the whole, antisocial. Indeed, in the current study, the meat eaters would be most accurately described as being agreeable, and not really at all callous, entitled, or self-centered as their scores were in the lower range of these scales.

That being said, positive attitudes towards animals are logically incompatible with supporting and benefiting from industries that confine and kill them. As described above, the results from this study indicate that many people who eat meat nevertheless consider themselves fairly agreeable in an absolute sense (Table 3). Although awareness of the impact of industries that exploit animals generally causes distress (Dowsett et al., 2018), this dissonance appears relatively easy to suppress for most people most of the time (Rothberger, 2014). A person who avoids thinking about the consequences of eating animals to avoid being disturbed is rather different than a person who would eat or otherwise mistreat animals despite full awareness of the pain it inflicts. This difference is analogous to behavior with antisocial consequences that are not consciously intended, such as buying clothing produced in sweatshops, in contrast to the callous indifference to other humans' pain characteristic of clinically antisocial individuals (O'Connell & Marcus, 2019). In other words, findings suggest that it is not

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antisocial, per se, to passively engage in socially normative behaviors that harm animals (e.g., eating meat). However, consciously holding explicitly anti-animal attitudes, as manifest in speciesism, a lack of sympathy for animal rights, or hunting/fishing, may reflect underlying antisocial traits.

This finding supports the consideration of negative attitudes toward animals, such as speciesism or the denial of animal rights, in the clinical assessment of antisocial personality for adults (Hofer et al., 2018; Shapiro & Henderson, 1998). Although anti-animal behavior is diagnostic of childhood conduct disorder, it is not included as a specific symptom of adult antisocial behavior in either the legacy or alternative DSM-5 personality disorder system. This is likely because the base rate of direct and extreme animal cruelty is higher in children, albeit certainly not absent among adults. However, the links between antisocial traits and anti-animal attitudes and behaviors identified here suggests a more general relationship between antisociality and human-animal relations. Indeed, the meta-analytic correlation between agreeableness and clinical measures of antisocial personality disorder ($\sim .35$; c.f. Samuel & Widiger, 2008) is in the same range as many of the effects we observed in this study - indicating that agreeableness is as strong an indicator of anti-animal attitudes and behaviors as it is of antisocial personality disorder symptoms.

These findings suggest that antisociality transcends species, such that people who do not respect other humans are also likely to disrespect other kinds of animals, as well, and vice versa (Dhont et al., 2014; Flynn, 2011;

Gullone, 2011). To the extent that anti-animal attitudes and behaviors predict other forms of antisociality including criminal or violent behaviors (Febres et al., 2014; Merz-Perez & Heide, 2004; Miller, 2001), they may have value for day to day clinical assessment whether or not they are formally included in diagnostic manuals (Levitt, 2018).

Future Directions

The main limitations of this work are the use of convenience samples and monomethod assessment measures. This could have influenced the results in a variety of ways. One possible consequence of our use of convenience samples is that participants may have been more sympathetic to animals, in general, than would be the case in a representative sample. For this reason, it is possible that anti-animal attitudes and behaviors were more socially deviant (and thus more correlated with antisocial personality features) in this sample than would be the case in others. Frequencies of clinically significant antisocial behavior were also low, and this could have impacted study findings. The connection between human-animal relations and personality may also vary by language and culture, particularly given that anti-animal behaviors are culturally important for some people, and are thus likely to have a variety of intraspecies prosocial correlates. Overall, future work should sample more diverse participants.

As there are a variety of well-known problems with monomethod assessment in general and questionnaires in particular, it would be useful to replicate and extend these results using other methods. Behavioral

assessments of attitudes and behaviors towards animals and informant reports of personality would be particularly informative. There are also a variety of different theoretical models of antisocial behavior, and it would be useful to replicate these effects with those other models. This may also help articulate the specific aspects of antagonism, psychopathy, and antisocial personality that are most strongly associated with anti-animal attitudes and behaviors.

Likewise, there are a wide variety of indicators of anti-animal attitudes and behaviors, and a more comprehensive assessment of this domain could help better articulate how these phenomena are related to antisocial personality features. As mentioned above, this assessment approach could also help delineate the general dimension underlying different aspects of human / non-human exchange implied by findings in this study. Moreover, a variety of non-personological factors influence attitudes and behaviors towards animals. Research in which these factors were included, in addition to comprehensive personality assessments, could help generate a more inclusive model of the factors that lead to the unethical treatment of animals (Alleyne & Parfitt, 2018; Amiot & Bastian, 2015).

Finally, one of the most important potential implications of this research is the value assessing anti-animal attitudes and behaviors might have for clinical assessment of personality pathology. In particular, these findings suggest that it is not just extreme acts of animal cruelty that signal an antisocial personality structure, but also more socially normative, less

severe anti-animal attitudes and behaviors. Further research on the validity of this set of variables in clinical settings is needed to determine the importance of this domain for psychiatric assessments.

Conclusion

In summary, in this study we found links between a range of traits, problems, and values linked to antisocial personality and anti-animal attitudes and behaviors. These links suggest the potential value of considering relations with non-human animals in clinical assessments of personality disorder. This is a common practice in children because cruelty to animals is a symptom of conduct disorder; these results suggest that this practice could be extended upward to adults and outward to account for other less extreme and more common anti-animal attitudes and behaviors. At a broader level, study findings suggest that the term antisocial personality transcends species, in that it applies to people who treat others, whether human or non-human, with callous disrespect.

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Table 1. Correlations between antisocial personality features and anti-animal attitudes and behaviors in sample 1.

	Speciesism	Hunting/Fishing	Animal Rights Sympathy
Agreeableness	-.42 (-.48, -.35)	-.20 (-.28, -.12)	.28 (.20, .34)
Antagonism	.33 (.27, .40)	.16 (.09, .24)	-.15 (-.22, -.09)
Callousness	.40 (.32, .47)	.20 (.11, .29)	-.22 (-.30, -.15)
Self-Centeredness	.40 (.33, .47)	.19 (.11, .27)	-.26 (-.33, -.19)
Entitlement	.34 (.27, .42)	.15 (.06, .23)	-.12 (-.19, -.04)
Indifference	.06, ns (-.01, .14)	.12 (.04, .21)	-.02, ns (-.09, .06)
Lacks Empathy	.39 (.32, .46)	.21 (.13, .30)	-.27 (-.34, -.21)
SDO	.46 (.39, .52)	.30 (.21, .38)	-.36 (-.43, -.28)

Note. All effects $p < .01$ unless otherwise noted. 95% Confidence intervals in parentheses are based on 1000 bootstrapped samples. SDO = Social Dominance Orientation.

Table 2. *Correlations between antisocial personality features and anti-animal attitudes and behaviors in sample 2.*

	Speciesism	Hunting/Fishing	Animal Rights Sympathy
Agreeableness	-.33 (-.40, -.26)	-.16 (-.25, -.08)	.33 (.26, .40)
Antagonism	.23 (.15, .32)	.15 (.06, .24)	-.14 (-.22, -.07)
Callousness	.37 (.30, .45)	.26 (.17, .35)	-.33 (-.41, -.25)
Self-centeredness	.35 (.28, .42)	.25 (.16, .34)	-.35 (-.42, -.27)
Entitlement	.23 (.15, .31)	.12 (.04, .20)	-.16 (-.24, -.10)
Indifference	.17 (.09, .25)	.23 (.11, .31)	-.20 (-.27, -.12)
Lacks Empathy	.37 (.29, .44)	.28 (.19, .36)	-.38 (-.45, -.31)
SDO	.46 (.40, .52)	.22 (.15, .30)	-.31 (-.37, -.25)

Note. All effects $p < .01$ unless otherwise noted. 95% Confidence intervals in parentheses are based on 1000 bootstrapped samples. SDO = Social Dominance Orientation.

Table 3. *Mean Differences in antisocial personality features between vegetarians and meat eaters in sample 2.*

	Meat Eaters		Vegetarians		<i>t</i>	<i>p</i>	<i>d</i>
	Mean	SD	Mean	SD			
<i>Antisocial</i>							
<i>Traits</i>							
Agreeableness	3.87	.52	3.98	.45	-2.90	< .01	-.22
Antagonism	.59	.52	.52	.46	1.74	.08	.14
Callousness	1.80	.79	1.58	.63	3.71	< .01	.30
Self-	1.88	.75	1.63	.60	4.41	< .01	.36
<i>Centeredness</i>							
Entitlement	1.78	.78	1.61	.69	2.84	< .01	.23
Indifference	2.75	.99	2.41	.97	4.29	< .01	.35
Lacks Empathy	2.07	.83	1.72	.67	5.70	< .01	.45
Social	2.09	1.13	1.63	.85	5.52	< .01	.45
<i>Dominance</i>							
Antisocial	.13	1.02	-.23	.83	4.78	< .01	.38
<i>Factor</i>							
<i>Anti-Animal Attitudes and Behaviors</i>							
Speciesism	2.86	1.19	1.96	.91	10.3	< .01	.83
Hunting/	2.04	.94	1.27	.47	12.0	< .01	1.0
Fishing					1		0
Animal Rights	4.87	1.58	6.26	1.13	-	< .01	-.98
					12.2		
					2		