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Animal Abuse among High-Risk Youth: A Test of Agnew's Theory

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Abstract

Concern over animal abuse among policy-makers, law enforcement officials, and the general public remains high. Although research has marked animal abuse as an indicator of a variety of deviant outcomes, fewer projects have examined the correlates of cruelty towards animals. In this study, we apply Agnew's theory of animal abuse to explore how a wide-range of characteristics relate to deviance towards animals. In support of Agnew's theory, results reveal that a combination of individual traits and behaviors, socialization experiences, and mechanisms of social control significantly relate to animal abuse. However, measures of strain do not appear to relate to animal abuse, providing only partial support to the theory.

Introduction

Despite the overall importance of animals to society (Moorehead 2016), research on the deviant act of animal abuse remains relatively underdeveloped. While significant strides have been made over the last several years (see Burchfield 2016; Grugan 2018; Parfitt and Alleyne 2018; Vaughn et al. 2011; White and Quick 2018), there remains a relative dearth of research applying sociological and criminological theory to understand the process, antecedents, and correlates of being cruel towards animals. While theories that purport to explain the totality or generality of deviant behavior have been successful at explaining deviance and crime, their concepts are applied relatively infrequently to studying animal abuse (Agnew 1998).

Although social scientists have been somewhat reticent to study animal abuse as an outcome in its own right, animal abuse has been tied to other deviant behaviors including interpersonal violence, illegal gun possession, substance use, and antisocial behaviors later on in life (Ascione 2001; Ascione et al. 2007; Tallichet and Hensley 2004; Vaughn et al. 2011; Walters and Noon 2015; Walton-Moss et al. 2005). In addition to research that ties animal abuse to a wide-range of deviant acts, media outlets, law makers, and the general

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public have recently shown heightened concern over issues related to animal cruelty (see Addington and Randour 2017 for an overview). In 2016, for example, the Federal Bureau of Investigation expanded the National Incident-Based Reporting System (NIBRS) to collect data on animal cruelty as a specific category of crime. Previously, animal abuse had been under a broad “other” category. As Addington and Randour (2017) note, the increased concern over animal abuse from law enforcement agencies occurred following pressure from policy makers and the general public (see also Federal Bureau of Investigation 2016). Despite these increased societal concerns as well as research that has clearly established a connection between animal abuse and other forms of deviance, research examining animal abuse *as a specific outcome* remains relatively underdeveloped.

Though there is a relative lack of research on the correlates of animal abuse, there is ample reason to believe that established criminological and sociological theoretical traditions are valuable in explaining animal cruelty (Agnew 1998). At the same time, the process of cruelty towards animals is a unique outcome, meaning that social science research would benefit tremendously from having a sociologically-informed theory of deviance specific to animal abuse. Such a theory would ideally cover established factors currently used to explain the generality of deviance, including factors that focus on deviant peer associations, broken family ties, bonds to society, and strain. Interestingly, such a theory already exists - Agnew’s (1998) theory of cruelty towards animals. As an integrated theory of animal abuse, Agnew’s (1998) theory covers how factors relevant to socialization (e.g., peers and families), strain (e.g., anxiety), social bonds (e.g., attachment to school), and personal traits (e.g., empathy) and behaviors (e.g., alcohol use) may coalesce in a manner which increases the likelihood of one engaging in cruel behavior towards animals.

In this study, we use Agnew’s theory as an organizing concept to study animal abuse as an outcome. Using multilevel models and data from the Pathways to Desistance study (Mulvey 2011), we draw upon Agnew’s theoretical model to examine how a variety of factors relevant to the integrated theoretical framework explain the outcome of engaging in cruelty towards animals. In addition to testing the core assumptions of Agnew’s theory, we also extend the theoretical model to more effectively capture some key concepts and findings which align with the core of this theory. Prior to discussing the specifics of this study, however, we offer a detailed review of Agnew’s theory of animal abuse. Next, we devote effort to explaining how the theory could be expanded in a way which maintains the integrity of the theoretical tenets of the theory while also incorporating valuable concepts from contemporaneous research.

Agnew’s theory of cruelty towards animals

About twenty years ago, Agnew (1998) described a theory of animal abuse. Focused primarily on how psychosocial factors may predict animal cruelty, Agnew’s theory contains strong undertones of differential association (Sutherland 1947) and social learning theories (Akers 2009; Burgess and Akers 1966), social control theory (Hirschi 1969), and general strain theory (Agnew 2006). As a result of the focus on these theoretical frameworks, Agnew’s (1998) theory places a key emphasis on interpersonal relationships with peers, bonds to family, and anxiety/strain. Accordingly, Agnew’s concept clearly fits into a

theoretical framework that recognizes the value of an integrated approach to understanding deviant behavior (see Messner, Krohn, and Liska 1989).

In addition to providing a comprehensive viewpoint into why animal cruelty may occur, Agnew's (1998) theory carries the key advantage of being highly testable in empirical research. In particular, Agnew (1998) places a specific emphasis on how individual characteristics and behaviors may relate to animal cruelty. Factors that should protect against animal cruelty are high levels of empathy, effective socialization via prosocial behavioral models, carrying prosocial and moral beliefs, low levels of strain, high levels of social bonds to families and schools, and high levels of supervision. These hypothesized correlates of animal cruelty fall into four specific factors: 1) Individual traits and behaviors (e.g. age, empathy, and physical location), 2) factors and processes inherent in socialization (e.g., moral beliefs), 3) strain (e.g., anxiety) and 4) social control (e.g., parental monitoring and bonds to school)

In this study, we draw on the extensive versatility of Agnew's (1998) theory by treating it as a means to think about how various social processes, factors, and relationships might relate to animal cruelty. In addition to testing core concepts from Agnew's theory, we use his 'four factors' to organize a set of theoretical statements and hypotheses about how variables that are relevant to an integrated theoretical approach may combine to explain against animal deviance. Specifically, we incorporate constructs from other research on criminological theory (Gottfredson and Hirschi 1990), developmental and life-course criminology (Krohn, Lizotte, and Perez 1997; Patterson et al. 1998), and an expanding body of research on cruelty to animals in the criminological literature (Burchfield 2016; Grugan 2018; White and Quick 2018). Before the specific research questions and hypotheses are described, we first elaborate on the logic behind extending Agnew's model with an eye to modern research.

A new viewpoint on an older model: updating agnew's theory

While Agnew's (1998) theory of animal cruelty is a useful, integrated concept, the core of the model could be strengthened by providing an update to the four factors (individual traits and behaviors, socialization, strain, and social control) that reflects the more modern scope of research. In light of research across the last twenty years, we argue that two of the four factors of the theory are in most need of expansion: The factor of interpersonal traits and behaviors and the factor encompassing socialization.

Research on individual traits and behaviors associated with crime has expanded considerably in the two decades since Agnew's theory was developed. In light of this, we argue first that developmental research has increasingly underscored the importance of early onset offending (Broidy et al. 2003). While committing deviance is a relatively normal occurrence in the lives of adolescents (Laub and Sampson 1993; Moffitt 1993), beginning to engage in large amounts of deviant behavior during early, middle, or late childhood (pre-12 years of age) is not normal. Given the research tying early onset offending to more frequent and severe offending later on in life (Farrington and Hawkins 1991), there is also good reason to expect that early onset offending will correlate with animal abuse. This is further underscored by the repeated finding that people, and especially adolescents, tend to commit

deviant acts with little to no specialization (Farrington 2003; Ha and Andresen 2017; McGloin et al. 2007; Piquero, Farrington, and Blumstein et al. 2003; Sullivan et al. 2006). As such, it is likely that that early onset offending will be a significant correlate of deviance against animals.

Offending behaviors are also routinely linked to histories of substance use (Fazel, Brains, and Doll 2006). Even among juveniles, research has shown that substance use and criminal offending “tend to ebb and flow together” (Sullivan and Hamilton 2007: 497). As such, those who choose to engage in substance use tend to commit higher amounts of deviance. Again, due to research failing to find that people specialize, substance use may correlate with cruelty towards animals in much the same way it would any other type of deviant behavior.

A final personal trait that could be linked to animal abuse under Agnew’s (1998) factor of personal traits and behaviors is self-esteem. Those who have low self-esteem have been found to have issues with conduct disorder (Mier and Ladny 2018). In a recent meta-analysis, Mier and Ladny (2018) concluded that low self-esteem has a significant impact on a wide range of crime and delinquency. Because researchers (e.g., Mier and Ladny 2018) have concluded that there is a relationship between conduct disorder and low self-esteem and “those with lower self-esteem [display] the most negative views of animals” (Beatson and Halloran 2007: 628), it is reasonable to expect that an important personal trait which may be related to cruelty towards animals is low self-esteem.

In Agnew’s (1998) theory, the second factor - socialization - is heavily reliant on social learning theory. Despite this, research on social learning and peer networks has also progressed rather substantially since the conceptualization of Agnew’s theory of cruelty towards animals. Relevant to the second factor of socialization, researchers have concluded that some people are more prone to be influenced by peers than others. Referred to as ‘susceptibility’ to peer influence, people who have high susceptibility tend to be more deviant (Miller 2010; Monahan, Steinberg, and Cauffman 2009).

Susceptibility to peer influence is a marker relevant to Burgess and Akers’s (1966) social learning theory (see also Akers 2009). However, it is incorrect to say that susceptibility exclusively taps one of social learning theory’s four elements (definitions, differential association, differential reinforcement, and imitation). The difficulty in aligning peer susceptibility with only one of social learning’s main tenets is bolstered by research which seeks to understand factors that may predict susceptibility to peer influence. A major factor which appears to put people at a higher predisposition of being susceptible to peer influence is low self-control (Meldrum, Miller, and Flexon 2013). While also discussed in Agnew’s (1998) theory as a personal trait, the epistemological disagreement between self-control theory and social learning theory (see Akers 1996; Hirschi and Gottfredson 2000) serves to underscore the independence of peer susceptibility as a marker tapping something that is unique in the context of social learning.

Putting susceptibility into the context of cruelty towards animals, people who are highly susceptible to peers tend to engage in much higher amounts of crime and deviance than

those who are resistant to peer influence (Meldrum, Miller, and Flexon 2013; Miller 2010; Monahan, Steinberg, and Cauffman 2009). Again, since people tend to not specialize in one type of crime, it is a reasonable assumption that the overall higher levels of deviance among those who are very susceptible to peer influence will be reflected in a positive relationship between peer susceptibility and deviance against animals.

Current study

Although the last several years have seen a rapid expansion of research on cruelty to animals (see Burchfield 2016; Grugan 2018; White and Quick 2018), an overall lack of research on the topic remains a serious shortcoming in the deviance literature. Succinctly, the correlates of cruelty towards animals continue to be poorly understood despite it occurring with detectable frequency (Humane Society of the United States 2018). In light of this, the flexibility of Agnew's (1998) theory provides for a unique and valuable opportunity to use concepts from several proven theories of crime to explain a socially deleterious behavior - animal abuse.

Using data from the Pathways to Desistance project and guided by Agnew's (1998) theory of cruelty towards animals, our broad research question asks: To what extent does Agnew's theory explain animal abuse? As an exploratory study, we do not make specific hypothesis. However, we do generally expect that the core tenets of Agnew's theory will provide for an empirically-grounded and supported means of assessing the relationship between established theoretical predictors and animal cruelty.

Data

Data for this project come from wave one of the Pathways to Desistance dataset (Mulvey 2016). Pathways to Desistance, a multisite and longitudinal data collection effort, was designed to "inform the ongoing debate in the justice system regarding the treatment and processing of serious adolescent offenders" (Pathways to Desistance 2018: n.p). Data were collected between 2000 and 2010 and encompass 1,354 adjudicated youth located either in Maricopa County, Arizona, or Philadelphia County, Pennsylvania (Mulvey 2011). To be eligible for inclusion in the Pathways to Desistance data, youth needed to be at least 14 years old, but less than 18 years old, at the time of committing their first offense. Each adolescent also had to be found guilty of a serious offense at some point (see Mulvey 2016 for an overview).

Wave one data were collected between November, 2000 and January, 2003. Specifically, data were collected from youth across six primary domains. Respondents were asked about their 1) background (e.g. offense history, demographics), 2) individual functioning (e.g. school performance and antisocial behaviors), 3) psychosocial attitudes (e.g., moral disengagement and impulsivity), 4) family (e.g., family relationships), 5) personal relationships (e.g., peer delinquency), and 6) community (e.g., neighborhood conditions). Although the Pathways to Desistance data are longitudinal and contain 11 waves spanning several years, we use only wave one data in the current study because the dependent variable (animal abuse, described below) was only captured at wave one.

Dependent measure

The dependent measure in the current studies captures *animal abuse*. Respondents were asked if they had ever physically hurt an animal (or animals) on purpose. Possible valid responses were binary (1 = yes, 0 = no). Overall, about 14% of the sample reported having physically hurt an animal on purpose in contrast to about 86% who had never hurt an animal on purpose. Descriptive statistics for this measure, as well as all variables used in the current study are displayed in Table 1.

Individual traits and behaviors

We include *age*, as a continuous measure, in the analysis. The mean age in the Pathways data at wave one is 16.04 years, with a standard deviation of 1.14, and a range from 14 to 18 years old. We also include *gender* as a binary measure by contrasting females (14.3% of the sample) to males (85.7% of the sample). In addition to age and gender, we also include *race/ethnicity* as a series of binary variables representing whether the respondent was Black (41.3% of the sample), Hispanic (33.2%), or non-Black/non-Hispanic (25.5%; contrast group). We also control for a measure capturing *employment* at wave one as a binary measure (1 = employed, 0 = not employed). Overall, 25.7% of the sample reported being employed at wave one, and 74.3% were not employed.

To account for the influence of substance use, we draw data from nine questions assessed along an eight point Likert-scale (0 = not at all, 1 = one or two times, 2 = less than once a month, 3 = once a month, 4 = two-three times per month, 5 = once per week, 6 = 2–3 times per week, 7 = four or five times a week, and 8 = every day). Specifically, respondents were asked how often they used cocaine, stimulants, opiates, ecstasy, hallucinogens, inhalants, nitrates, marijuana, or sedatives. To create a variety index of *substance use*, we combined the frequency responses for each question. Substance use has a mean of 5.38, a standard deviation of 7.15, and an observed range of 0 to 48. We also include a measure capturing *alcohol use* as a separate covariate measured along the same scale (0 = not at all, 8 = every day). The mean for alcohol use is 2.88 with a standard deviation of 2.399.

To capture *early onset offending*, we drew data from five questions asking the respondent if, prior to age 11 (1 = yes, 0 = no), they had been in trouble for: cheating, disturbing class, being drunk/stoned, stealing, and/or fighting. These items were summed together to create a variety score. This measure has an overall mean of 1.49, a standard deviation of 1.16, and ranges from 0 (no early onset offending) to 5 (a great deal of early onset offending).

To tap into the construct of self-esteem, we covary a measure of *inferiority* derived from the Brief Symptom Inventory (Derogatis and Melisaratos 1983). This scale is comprised of three items that capture interpersonal sensitivity to feeling inferior (e.g., “Feeling inferior to others”) and ranges along a standardized scale from 0 (very low levels of inferiority) to 4 (very high levels of inferiority). Similarly, we also include a standardized scale capturing *empathy*. This scale was derived from the Psychopathy Checklist: Youth Version (Forth, Kosson, and Hare 2003). Based on eight items, the standardized scale of empathy has a mean of 5.034, a standard deviation of 3.414, and ranges from 0 (no empathy) to 20 (a great deal of empathy).

Per Agnew's (1998) theory, we control for self-control by capturing a measure of *impulsivity*. This measure was derived from the Weinberger Adjustment Inventory (Weinberger and Schwartz 1990) and is composed of eight questions that asked the individual about impulse control (e.g., "I say the first thing that comes into my mind without thinking enough about it") along a 5 point scale (1 = false, 5 = true). The measure of impulsivity has a mean of 2.97 with a standard deviation of .933 and a range of 1 (low impulsivity) to 5 (high impulsivity).

To capture socialization experiences, we include a measure capturing *deviant peer associations*. This measure was constructed by calculating the mean score across a series of items originally contained in the Peer Delinquent Behavior scale used in the Rochester Youth Study (Thornberry et al. 1994). These items include both antisocial behavior (e.g., how many of your friends have sold drugs), and influence (e.g., how many of your friends have suggested that you should sell drugs). This overall scale has a mean of 4.12, standard deviation of 1.62 and ranges from 0 (no delinquent peer influence) to 10 (a great deal of delinquent influence).

To account for *peer susceptibility*, we control for a measure capturing resistance to peer influence. This scale is a standardized measure derived from ten items (e.g., "I go along with my friends" and "I hide my true opinion from my friends"). The mean of this scale is 2.977 with a standard deviation of .568 and a range from 1 (very low susceptibility) to 4 (very high susceptibility).

Measures that capture the respective number of times the respondent had been *suspended* and/or *expelled* are also covaried. The mean number of suspensions is 14.829 (standard deviation = 44.756; the range is 0 to 900¹). The mean for expulsion is .607 with a standard deviation of 5.213 and a range from 0 to 29.

In addition to school punishment, we also include a measure of *moral beliefs* derived from the Mechanisms of Moral Disengagement instrument (Bandura et al. 1996). Specifically, this measure captures an individual's score across a wide range of moral orientations (e.g., attribution of blame, dehumanization, distorting consequences). This measure has a mean of 7.165, a standard deviation of 5.213, and a range of 0 (very low moral beliefs) to 28 (very high moral beliefs).

To capture strain, we use two measures. First, we use a variable that asked the respondent if they were happy with the way their life is turning out. Valid responses were yes (coded "0") or no (coded "1"). Overall, 54.5% reported that they did not feel that they were achieving their *life goals*. Second, a measure capturing *anxiety* is included. Derived from the Brief Symptom Inventory (Derogatis and Melisaratos 1983), this standardized measure was created from nine items (e.g., "I feel tense or keyed up"), has a mean of .459, a standard deviation of .641, and ranges from 0 (no anxiety) to 4 (a great deal of anxiety).

¹We examined the influence of outliers on the results by removing outliers from the analysis. The results of the model both with and without the outliers were substantively the same. Thus, we include the outliers in the analysis but use the natural logarithm to reduce the influence of the skewness on the analysis.

To account for social control, we include a number of measures. First, we include a count measure of the total number of *community activities* the respondents reported engaging in. This scale has a mean of .265, a standard deviation of .585, and ranges from 1 (no activities) to 5 (many activities). We also include a measure capturing *bonds to teachers* (e.g., “Most of my teachers treat me fairly”) as well as *bonds to the school* (e.g., “Schoolwork is very important to me”). The mean score for bonds to the school is 3.565 with a standard deviation of .742 and a range from 1 (very low bonds to the school) to 5 (very high bonds to the school). The mean value for bonds to teachers is 3.350 (standard deviation = .837; the range is 1 to 5). We also include a measure of *parental supervision* that contains the average of four items capturing the extent to which respondents engage in unsupervised activities with others (e.g., “How often did you get together with friends informally?” [without a parent]). This measure has a mean of 3.859, a standard deviation of .838, and ranges from 1 (very little supervision) to 5 (a great deal of supervision). Finally, we also include a measure that captures *parental warmth*. This measure is derived from the Quality of Parental Relationships Inventory (Conger et al. 1994) (e.g., “How often does your mother let you know she really cares about you?”) and has a mean of 3.218, a standard deviation of .689, and ranges from 1 (very little warmth) to 4 (very high warmth).

Missing data

Of the 1,354 individuals included in wave one of the Pathways to Desistance data, we use data from 952 individuals, or about 70 percent of the original sample. To ensure our findings were robust to missing data, we took two steps. First, we performed an attrition analysis (Brame and Paternoster 2003) by performing a series of t-tests which compared individuals not included in our models to those included in the models across each variable used in the forthcoming analyses. Results of these t-tests (not shown, but available upon request from the corresponding author) demonstrated no significant difference in any measure between those included in the analyses and those removed. Second, we estimated all models using multiple imputation by chained equations (MICE) (White, Royston, and Wood 2010). Results using MICE demonstrated substantively the same results as the analyses not using multiple imputation. Taken together with the results of the attrition analyses, we conclude that missing data is not substantively biasing the results of the forthcoming models.

Analytic strategy

Since the Pathways to Desistance data were collected from respondents in two separate locations (Arizona and Pennsylvania), the data are nested. Consequently, a model is required that accounts for this nesting effect due to a lack of independence and correlated error terms. To account for this effect, we use a multi-level model that introduces a random intercept which allows individuals to vary randomly by location (Rabe-Hesketh and Skrondal 2012). Because our outcome is binary (1 = animal abuse, 0 = no animal abuse), we use a generalized linear mixed-effects model (Rabe-Hesketh and Skrondal 2012).²

²Because there are only two clusters, we also tested a single-level model with robust standard errors. The results were substantively the same. Due to it being a more appropriate model for the nature of the data, we report the multi-level models in this paper.

One of the assumptions of the mixed model is called the assumption of equality of coefficients. Essentially, mixed-effects models rely on the assumption that the within-unit estimates are approximately equal in magnitude to the between-unit estimates for all predictors. To examine whether this assumption was supported in each model, we conducted Hausman tests (Rabe-Hesketh and Skrondal 2012). Each test yielded non-significant results, thereby ensuring that the assumption of coefficient equality was satisfied and validating the use of the mixed models.

To work our way through the four factors of Agnew's (1998) theory, we implement a model building approach. In model 1, we regress animal abuse onto factor one variables (the factor capturing individual traits and behaviors). Model 2 retains the measures from factor one and adds in measures relevant to the socialization factor. Similarly, models 3 and 4 introduce the third (strain) and fourth (social control) factors of Agnew's (1998) theory, respectively. Since model 4 contains estimates from variables of all four factors, it can be thought of as being the full theoretical model.

Results

Results of the mixed-effects generalized regression models are shown in Tables 2 and 3. All models are presented with model fit statistics. As can be seen as a general trend, significant chi-square values that increase with each subsequent model suggest close and improving fit to the data through the model building process.

Model 1 regresses animal abuse onto variables capturing the first factor (individual traits and behaviors). This is the first step of the model building process. The results from model 1 indicate that Black respondents report significantly greater odds of animal abuse than White respondents. Likewise, alcohol consumption and early life offending are also associated with increased odds of animal abuse. Finally, higher scores on the scales capturing inferiority and impulsivity are both significantly associated with increased odds of cruelty towards animals.

Model 2 introduces the socialization measures. Despite the substantive results of the prior model remaining the same, new patterns in the results emerge as suspensions and moral beliefs appear as significant correlates of animal abuse. Specifically, individuals who report a greater number of suspensions report significantly higher odds of committing animal abuse. On the other hand, greater levels of moral beliefs are associated with lower odds of committing animal abuse.

In the third step of the model building process, measures of strain are introduced (see model 3 in Table 3). After accounting for individual traits and socialization behaviors, neither life goals nor anxiety are significantly associated with animal abuse behaviors. The substantive results of the individual trait and behavior measures as well as the socialization measures remain substantively the same as the prior model.

Finally, model 4 presents the full theoretical model which introduces measures of social control. Results of this full model show that a variety of individual traits and behaviors remain significantly correlated with animal abuse. Specifically, Black respondents report 147 percent higher odds of animal abuse relative to White respondents, though we observe

no difference between White and Hispanic respondents. Higher scores on the scale capturing inferiority are associated with a 50.3 percent greater odds of animal abuse, while lower scores on the impulsivity scale are related to a 24.7 percent lower odds of animal abuse. Greater alcohol use and early life offending are associated with a 12.2 percent and 20.7 percent higher odds of cruelty towards animals. The socialization measures demonstrate that individuals with greater suspensions report a 23.8 percent increase in the logged odds of animal abuse, while higher scores on the moral beliefs scale relate to 4.6 percent lower odds of animal abuse. Finally, turning to the social control measures, results show that youth who are more bonded to the school report a 25.7 percent lower odds of animal abuse. No other social control measures reach statistical significance.

Discussion and conclusions

The broad goal of this project was to apply Agnew's (1998) theory of animal abuse to a sample of juveniles in order to provide insight into the correlates of cruel acts of deviance towards animals. As an exploratory study, we did not make specific hypotheses. Despite this, a variety of factors from Agnew's (1998) theory - as well as our update and extension of it - emerged as substantively important correlates of animal abuse. We now turn back to Agnew's theory and prior research on cruelty towards animals to unpack findings from this study.

Agnew's (1998) theory outlines a series of individual traits and behaviors that should relate to animal abuse. Since several individual traits and behaviors appear to relate to animal abuse, results of the mixed-effects generalized linear models provide support to Agnew's expectations. Specifically, findings demonstrated that race/ethnicity, alcohol use, early life offending, inferiority, and impulsivity were all significantly associated with cruelty towards animals. Prior work has found some race/ethnic differences in animal abuse. In a study examining police arrests for animal abuse in Chicago, Burchfield (2016: 379) found that areas of the city with greater levels of animal abuse were characterized by "more socioeconomic hardship and more African-American residents". Further, research has found that individuals living in predominately Black, urban areas report more extensive and widespread animal abuse than individuals located in predominately White, rural areas (Tallichet and Hensley 2005). Our findings regarding the significant difference in animal abuse between White and Black youth could be an outcome of location since Black youth were more likely to live in urban areas and White youth were likely to live in suburban areas. This explanation aside, it is clear that future research should seek to untangle the relationship between individual-level characteristics (e.g., race) and structural-level characteristics (e.g., urbanicity) and cruelty towards animals.

Respondents who reported more alcohol use and greater levels of early life offending also reported higher odds of committing animal abuse. Prior research has linked early onset offending to higher levels of severity and frequency of offending (Loeber and Farrington 2000). Thus, it is likely that alcohol use and early onset offending are indicators of high levels of offending in much the same way that animal abuse is tied to other offending behaviors.

Results also revealed that lower levels of self-esteem and greater levels of impulsivity related to increased odds of engaging in cruelty towards animals. In both cases, these results support Agnew's (1998) theory as well as prior research. Several studies have suggested that lower levels of self-esteem are related to a higher risk of animal abuse (Trzesniewski et al. 2006; cf. Luk et al. 1999). Likewise, it appears that Agnew's (1998) emphasis on low self-control being an important individual trait in relation to animal abuse is correct, thereby speaking to the generality of Gottfredson and Hirschi's (1990) theory. Our findings align with this literature by adding a replicative value to the notion that self-esteem and selfcontrol are meaningful factors which provide understanding to the context of cruelty towards animals.

In addition to individual traits and behaviors, two specific socialization factors also emerged as significant correlates of animal abuse. First, individuals who reported a greater number of suspensions reported higher odds of engaging in animal abuse. Although the cross-sectional nature of the study (discussed as a limitation in further detail in the next pages) limits our ability to make firm conclusions regarding this finding, we offer two potential explanations. First, it could be that the most delinquent youth engage in a wide-range of offenses (including animal abuse) and, consequently, are also likely to be punished more in school. However, it could also be the case that punishment amplifies offending (Wiley and Esbensen 2016). For example, prior research has tied formal punishment like school suspension (Wolf and Kupchik 2017) and arrest (Mowen, Brent, and Bares 2017) to increased offending. In this light, it could be that greater levels of school suspensions amplify cruelty towards animals. Second, the other socialization factor that emerged as significantly related to animal abuse was moral beliefs. Specifically, we find that youth with greater moral beliefs report lower odds of animal abuse. This conclusion supports prior work that has shown that strong moral beliefs can inhibit, or reduce, deviance (Schoepfer and Piquero 2006).

The results relevant to the strain component of Agnew's (1998) theory also merit discussion. In short, strain mechanisms do not appear to be significant. As a result, we cannot offer support to Agnew's expectations in this capacity. Instead, we find that future goals/expectations and anxiety do not significantly relate to animal abuse in the context of the full model. However, as Brezina (2017: 12) notes, "most strains have a subjective component". It could be that anxiety and future goals/expectations do not capture the subjective nature of strain to individuals in this sample. If true, this would indicate that these factors are not significantly associated with animal abuse even though other, unmeasured components of general strain theory may be. As a result, future work should consider the relationship between additional forms of strain and animal abuse.

Only one measure of social control emerged as a significant correlate of animal abuse: bonds to the school. Prior research has found that attachment to school is related to reduced forms of some delinquency (Free 1994; Yuksek and Solakoglu 2016). Further, a variety of sociologists and criminologists (e.g., Payne and Welch 2016) have argued that schools play a significant role during important developmental stages of adolescence. Thus, bonds to the school may exert an effect on deviant behavior even when bonds to others - such as parents or peers - do not influence deviance.

Collectively, this study has provided for a partial test of Agnew's (1998) theory on animal abuse and cruelty. Despite only the mixed support, this study highlights a key advantage behind Agnew's theory: The theory is extremely flexible. The comprehensive nature and integrated theoretical framework of the theory make it extremely useful in explaining the unique outcome of cruelty towards animals. In particular, Agnew's (1998) four factors of personal traits and behaviors, socialization, strain, and social control have proven to be highly adaptable and can be adjusted to incorporate factors and concepts from developmental and life-course criminology. Despite this, it is noteworthy that the theory's four factors did not all empirically relate to animal abuse. Future research should seek to further refine Agnew's theory using an integrative framework.

Despite the contributions of this project, it is not without important limitations. First, because animal abuse was only assessed at wave one in the Pathways to Desistance data, this study is cross-sectional. The cross-sectional design precludes us from making any causal claims. Future research should examine animal abuse within a longitudinal context to establish temporal ordering and examine the causes of animal abuse. Additionally, prior research has highlighted the importance of neighborhood and structural context in understanding trends in animal abuse and cruelty (White and Quick 2018). We are unable to account for structural or neighborhood conditions that may also explain trends in animal abuse. This is a major reason behind why we are only offering a partial test of Agnew's theory. Additionally, Agnew (1998) asserts that beliefs about animal abuse and orientations towards animals are likely important theoretical correlates of animal cruelty. Unfortunately, the Pathways data do not contain any information about orientations towards and/or beliefs about animals. Future research should aim to fill this void. Finally, the Pathways data is comprised of high risk, adjudicated youth. As a result, findings from this study are likely not generalizable to the broader population. Although this population of seriously offending youth may be of particular interest for researchers and policy-makers alike, future research should consider examining factors that promote - or reduce - odds of animal abuse among the broader population.

This study contributes to a rapidly growing body of literature examining the causes and consequences of cruel behavior towards animals (Burchfield 2016; Grugan 2018; Parfitt and Alleyne 2018; Vaughn et al. 2011; Walters and Noon 2015; White and Quick 2018). Our findings suggest that a wide range of individual traits and behaviors, socialization experiences, and mechanisms of social control bear considerable importance in understanding cruelty towards animals. Further, our findings highlight that factors such as alcohol use, early onset offending, and suspensions significantly relate to animal abuse. Due to their utility, we recommend that factors like these be included in future research examining animal abuse as an outcome. As a result of animal abuse garnering increased attention from media, law enforcement, politicians, and the general public alike (Addington and Randour 2017), researchers should place a priority on using sociologically-informed theories - including Agnew's - to formulate a more precise and comprehensive viewpoint into the causes and correlates of cruelty towards animals.

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Table 1.Descriptive statistics of measures used in the pathways to desistance data ($n = 952$).

Variable	Mean	S.D.	Minimum Value	Maximum Value
Dependent Measure				
Animal Abuse	0.142	0.349	0	1
Individual Traits and Behaviors				
Age	16.038	1.142	14	18
Male	0.857	0.350	0	1
Black	0.413	0.493	0	1
Hispanic	0.332	0.472	0	1
Employed	0.257	0.437	0	1
Substance Use	5.378	7.146	0	48
Alcohol Use	2.884	2.399	0	8
Early Life Offending	1.494	1.159	0	5
Inferiority	0.436	0.622	0	4
Empathy	5.034	3.414	0	20
Impulsivity	2.967	0.933	1	5
Socialization				
Deviant Peer Associations	4.119	1.621	0	10
Susceptibility to Peer Influence	2.977	0.568	1	4
Suspensions	14.829	44.756	0	900
Expulsions	0.607	1.197	0	15
Moral Beliefs	7.165	5.213	0	28
Strain				
Life Goals	0.545	0.498	0	1
Anxiety	0.459	0.641	0	4
Social Control				
Community Activity	0.265	0.585	1	5
Bonds to the School	3.565	0.742	1	5
Bonds to Teachers	3.350	0.837	1	5
Parental Supervision	3.859	0.838	1	5
Parental Warmth	3.218	0.689	1	4

Notes: n = sample size, S.D. = standard deviation

Table 2.Results of multi-level generalized linear models assessing animal abuse ($n = 952$).

Variable	MODEL 1			MODEL 2		
	Coef.	S.E.	O.R.	Coef.	S.E.	O.R.
Individual Traits and Behaviors						
Age	0.019	0.088	1.019	0.038	0.089	1.039
Male	0.525	0.338	1.691	0.357	0.346	1.430
Black	0.833	0.270 **	2.299	0.908	0.358 **	2.480
Hispanic	0.459	0.274	1.582	0.431	0.280	1.540
Employed	0.213	0.220	1.238	0.278	0.224	1.320
Substance Use	-0.001	0.015	0.999	-0.003	0.016	0.997
Alcohol Use	0.100	0.043 *	1.106	0.106	0.045 *	1.112
Early Life Offending	0.253	0.087 ***	1.288	0.184	0.091 *	1.202
Inferiority	0.358	0.139 *	1.431	0.369	0.145 *	1.446
Empathy	-0.033	0.029	0.968	-0.009	0.031	0.991
Impulsivity	0.431	0.119 *	1.539	0.297	0.129 *	1.346
Socialization						
Deviant Peer Associations	-	-	-	-0.029	0.072	0.972
Susceptibility to Peer Influence	-	-	-	-0.235	0.184	0.791
Suspensions	-	-	-	0.289	0.104 **	1.335
Expulsions	-	-	-	-0.145	0.222	0.865
Moral Beliefs	-	-	-	-0.055	0.020 **	0.946
Strain						
Life Goals	-	-	-	-	-	-
Anxiety	-	-	-	-	-	-
Social Control						
Community Activity	-	-	-	-	-	-
Bonds to the School	-	-	-	-	-	-
Bonds to Teachers	-	-	-	-	-	-
Parental Supervision	-	-	-	-	-	-
Parental Warmth	-	-	-	-	-	-
Constant	-3.026	1.505		-3.558	1.613	
Chi-Square	64.53 ***			76.19 ***		

*
 $p < .05$,**
 $p < .01$,***
 $p < .001$

Notes: Coef. = coefficient; S.E. = standard error; O.R. = odds ratio

Table 3.Results of multi-level generalized linear models assessing animal abuse ($n = 952$).

Variable	MODEL 3			MODEL 4		
	Coef.	S.E.	O.R.	Coef.	S.E.	O.R.
Individual Traits and Behaviors						
Age	0.040	0.090	1.041	-0.009	0.092	0.991
Male	0.364	0.347	1.439	0.554	0.359	1.740
Black	0.941	0.360 **	2.562	0.907	0.293 **	2.476
Hispanic	0.452	0.281	1.571	0.486	0.285	1.625
Employed	0.269	0.225	1.309	0.242	0.228	1.274
Substance Use	-0.002	0.017	0.998	-0.005	0.017	0.995
Alcohol Use	0.105	0.045 *	1.111	0.115	0.046 *	1.122
Early Life Offending	0.188	0.092 *	1.207	0.188	0.091 *	1.207
Inferiority	0.403	0.183 *	1.496	0.407	0.185 *	1.503
Empathy	-0.010	0.031	0.990	-0.003	0.031	0.997
Impulsivity	0.301	0.129 *	1.351	0.284	0.130 *	1.329
Socialization						
Deviant Peer Associations	-0.022	0.073	0.979	-0.005	0.075	0.995
Susceptibility to Peer Influence	-0.245	0.184	0.782	-0.251	0.183	0.778
Suspensions	0.282	0.105 **	1.325	0.213	0.095 **	1.238
Expulsions	-0.130	0.223	0.878	-0.003	0.219	0.997
Moral Beliefs	-0.054	0.020 **	0.948	-0.047	0.020 *	0.954
Strain						
Life Goals	-0.223	0.207	0.800	-0.239	0.209	0.788
Anxiety	-0.019	0.188	0.981	-0.025	0.186	0.975
Social Control						
Community Activity	-	-	-	-0.142	0.191	0.868
Bonds to the School	-	-	-	-0.297	0.152 *	0.743
Bonds to Teachers	-	-	-	0.080	0.135	1.083
Parental Supervision	-	-	-	-0.035	0.136	0.965
Parental Warmth	-	-	-	-0.275	0.148	0.760
Constant	-3.493	1.616		-0.930	1.806	
Chi-Square	77.40 ***			82.17 ***		

*
 p .05,**
 p .01,***
 p .001

Notes: Coef. = coefficient; S.E. = standard error; O.R. = odds ratio