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BRIEF REPORT

Traumatized Witnesses: Review of Childhood Exposure to Animal Cruelty

Roshni Trehan Ladny[1] · Laura Meyer[2]

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The multifaceted nature of the human-animal bond has been well-documented throughout history (Braje 2011). Much attention has been paid to the benefits that may accrue, at least to humans, from interacting with non-human animals (referred to in this paper as simply "animals"), and fields of study have developed around the therapeutic potential of these interactions (Braje 2011; Flynn 2011). What is less understood, but is of equal relevance to researchers, is the "dark side" of the bond: animal cruelty, including abuse and neglect.

National and cultural variation in attitudes toward these behaviors have been noted; countries and cultures with more progressive ideas about animals have widely acknowledged the pain and fear they experience, and how these responses are analogous to those of humans. In contrast, cultures in which animals are devalued and their abuse normalized may foster the social acceptability and frequency of cruelty (Plant et al. 2016). Animal cruelty has also been consistently linked to intimate partner violence (IPV) and child abuse, including emotional abuse (DeGue and DiLillo 2009). In addition to the potential for being physically victimized by an animal abuser in the home, researchers and clinicians have recognized that simply *witnessing* animal cruelty may have negative effects; for example, women who witnessed animal abuse by their domestic partner reported more psychological distress and lower levels of social support than either men or binary individuals (Riggs et al. 2018). There is growing evidence that witnessing animal abuse can negatively affect children as well (e.g., Ascione et al. 2007; Becker et al. 2004; Daly and Morton 2008; Girardi and Pozzulo 2015; McDonald et al. 2016). This paper will review will explore the sequelae of childhood witnessing of animal cruelty.

A growing body of research implicates witnessing animal cruelty as a predictor of various maladaptive behaviors in children, (e.g., aggression and violence), which may continue throughout the individual's lifespan (Thompson and Gullone 2006). The purpose of this review is to synthesize the literature on the sequelae of childhood witnessing of cruelty to animals, specifically externalizing symptoms (negative behaviors directed towards others) or internalizing symptoms (negative behaviors directed inward) and later cruelty to animals and humans.

Little research exists on how exposure to animal cruelty can be a traumatic experience, with cascading negative consequences for child witnesses. The mechanisms by which witnessing animal cruelty affects behavior have been debated by experts in the field, who have proposed various theories and models to explain the relation. Social learning theory suggests that children may reenact witnessed animal cruelty (Baldry 2003; DeGue and DiLillo 2009). Further, it has been suggested that children who witness animal cruelty are more likely to abuse animals if the abuser is a friend or relative (Thompson and Gullone 2006) or an individual to whom the child feels close – a significant other (Plant et al. 2016).

The most comprehensive review to date of studies examining the relationship between childhood witnessing of animal cruelty and negative emotionality and behavior is Gullone's 2012 review on the role of exposure to domestic violence, animal cruelty, and media violence in the commission of subsequent animal cruelty. The key assessments from Gullone's review include: 1. Childhood witnessing of violence and aggression towards people and animals is one of the prime risk factors for the perpetration of animal cruelty and violent acts in general, 2: Youth exposed at an early age to hurting or angry aggression towards animals are more likely to commit animal cruelty and to do so more frequently than youth exposed to such cruelty at older ages, 3: Witnessing of cruelty is not only a potential pathway for animal cruelty, but also for bullying and other forms of human aggression, 4: Children who

✉ Roshni Trehan Ladny
rladny@ut.edu

[1] Department of Criminology and Criminal Justice, The University of Tampa, Tampa, FL 33606-1490, USA

[2] Graduate School of Professional Psychology, University of Denver, Denver, CO, USA

witness significant others, such as parents or older siblings, committing violence towards humans and/or animals are more likely to report committing animal cruelty and aggression towards others.

The current literature review builds upon Gullone's analysis in three specific ways: 1. Identifies additional studies since 2012 that have found associations between exposure to animal cruelty and any type of maladaptive behavior or negative emotionality, 2: Organizes the existing study findings by the specific types of behavioral outcomes associated with exposure to animal cruelty to gain an understanding of which types of negative symptomology are more common among children who witness cruelty and 3: Integrates the current review findings into the specific context of the societal problem of exposure to animal cruelty in countries where there is a social and cultural acceptance of animal cruelty. The vulnerability of children to witnessing animal cruelty, and the prevalence of this type of cruelty in regions in which animal cruelty is the norm or government sanctioned (Plant et al. 2016), underlines the importance of attempting to understand and address these issues.

The objectives of this review are to synthesize the current literature on the relationship between childhood witnessing of cruelty toward animals and violence toward animals, as well as toward other humans; to review the short- and long-term trauma outcomes of witnessing animal cruelty in childhood; and finally, to discuss how these findings can be used to address the issue of childhood exposure to animal cruelty in countries where it is commonplace or culturally accepted.

Origins and Rationale of Current Review

This review had its genesis in an international project conducted by Teesside University researchers in the United Kingdom that explored the large-scale correlates of exposure to animal abuse in countries where no such research had previously been conducted. Entitled "Making The Link," this project had three objectives: 1) to collect data on the intricate connections between widespread cultural tolerance of animal cruelty and the psychological health of children exposed to such cruelty, 2) to examine the relationship between animal cruelty and exposure to domestic violence, and, 3) to use the data to develop multiple "stepping stones" towards the creation of the first "Link" infrastructure in Eastern and Southeast Europe (Plant et al. 2016). Conceptually, the "Link" is grounded in a long-standing empirical demonstration of the interconnectedness and possible causal correlation between violence towards animals and violence towards humans Flynn 2011).

"Link" organizations are more active in countries such as the United States, as evidenced by the creation of the National Link Coalition (http://nationallinkcoalition.org/what-is-the-link).

However, there are challenges to creating a "Link" infrastructure in Eastern European countries such as Russia, Romania, Ukraine, and Bulgaria, where inhumane treatment of animals is more common and animal welfare laws are lacking, according to the rankings from the World Animal Protection Organization (WAPO, https://www.worldanimalprotection.org/our-work). Animal and child welfare experts argue that government-sanctioned exposure of children to brutal violence may be a form of psychological violence against youth (Gullone and Plant 2014; Tedeschi 2014). Hence, if governments choose to condone, be complicit in, or ignore this violence exposure, despite having knowledge of the dire psychological and social consequences for youth exposed to this cruelty, it can be argued that their actions (or inaction) constitute a violation of basic human rights. To illustrate, the European Union Charter of Fundamental Rights posits that 1. *Children shall have the right to such protection and care as is necessary for their well-being. They may express their views freely. Such views shall be taken into consideration on matters which concern them in accordance with their age and maturity and 2. In all actions relating to children, whether taken by public authorities or private institutions, the child's best interests must be a primary consideration* (European Union 2010). To remediate this cycle of violence and trauma, animal welfare and control policies and procedures should be strengthened via an evidence-based approach that demonstrates how animal cruelty adversely affects not only the animals, but individuals and the community. This much-needed "Link" infrastructure, if established in Eastern and South East Europe, will provide support for identified "at risk" individuals, families, and animals through the interagency cooperation (makingthelink.org and http://nationallinkcoalition.org).

Definitions and Prevalence of Animal Cruelty

Defining animal cruelty. Animal cruelty has been defined as "treatment of animals that causes gratuitous, unwarranted or unjustifiable suffering or harm" (Vaughn et al. 2009, p. 1213) and as "nonaccidental, socially unacceptable behavior that causes pain, suffering or distress to and/or the death of an animal" (Ascione and Shapiro 2009, p. 570). It is frequently associated with other aggressive, antisocial behaviors (McPhedran 2009). In this paper, the term "animal cruelty" is used to refer to physical abuses such as beating, shooting, and torture of animals, i.e., not neglect, hoarding, slaughter on farms, or emotional abuses. This definition coincides with previous conceptualizations of animal cruelty (Baldry 2003; Lockwood 1998).

It is important to clarify that the *context* of childhood exposure to violence towards animals may moderate its effects on youth wellbeing. For example, some children grow up in environments where witnessing animals being slaughtered on family farms is a regular occurrence. While we acknowledge

Table 1 Study findings of sequelae of childhood witnessing of animal cruelty, 1997 - 2017

Reference	Sample	Country	Childhood Sequelae	Adulthood Sequelae	Outcome *
Miller and Knutson (1997)	Inmates ($n = 314$)	USA		Physical coercion* sexual coercion**	1
Flynn (1999)	Undergraduates ($n = 267$)	USA	Animal cruelty* Self-report of negative psychological impact*	Approval of using violence within relationships*	1, 2, 3
Baldry (2003)	13 to 19 years ($n = 1392$)	Italy	Animal cruelty **		3
Becker et al. (2004)	Mother-child dyads ($n = 336$)	USA	Firesetting*, official referrals for violent offenses and general delinquency**		1, 2
Henry (2004)	17–46 years ($n = 206$)	USA	Animal cruelty more prevalent among those who witnessed cruelty before age of 13 ** Delinquent behaviors (included assault)**		3
Hensley and Tallichet (2005)	Adult inmates ($n = 261$)	USA	Animal cruelty *	Animal cruelty*	3
Thompson and Gullone (2006)	12–18 years ($n = 281$)	USA	Animal cruelty **		3
Ascione et al. (2007)	Mothers ($n = 147$) Children ($n = 39$)	USA	Internalizing and externalizing symptoms as result of witnessing animal cruelty *and* domestic violence*		2
Daly and Morton (2008)	Undergraduates ($n = 427$)	USA		Hardening of emotions (less distress) **	2
Gullone and Robertson (2008)	Secondary school ($n = 249$)	Australia	Animal cruelty ** Bullying **		1, 3
Volant et al. (2008)	Mothers reporting on children ($n = 204$)	USA	Animal cruelty more prevalent among those who witnessed animal cruelty *and* family violence.		3
DeGue and DiLillo (2009)	College students ($n = 860$)	USA		Animal cruelty**	3
Girardi and Pozzulo (2015)	College students ($n = 318$)	Canada	Higher rates of anxiety* and depression**		2
Browne et al. (2016)	Adult inmates ($n = 257$)	USA	Animal cruelty age of onset earlier for those who witness sibling commit cruelty compared to parents*	Animal cruelty*	3
McDonald et al. (2016)	7–12 years ($n = 291$)	USA	Attention problems, social problems, internalizing behaviors, externalizing problems, empathy, callous traits		2
McDonald et al. (2017a)	7–12 years ($n = 291$)	USA	Empathy, attention problems, social problems, callous traits and justification of animal cruelty		2
Plant et al. (2016)	13–17 years ($n = 280$)	Germany Romania	Animal cruelty more prevalent in areas where witnessing animal cruelty is more common**		2, 3

*Outcome category (1 = violence towards humans, 2 = externalizing/internalizing symptoms 3 = animal cruelty)

*= $p < 0.05$, **=$p < 0$

that these animals experience pain, the absence of "angry aggression" directed towards the animal, in conjunction with the understanding that the killing is done for the sole purpose of food, may dampen the effects of such exposure on the child's emotional and mental health. In contrast, witnessing an act in which an animal is brutally attacked for the enjoyment of the perpetrator or to cause suffering to the animal (i.e., angry aggression) may increase any negative sequelae from exposure to the violent act. Given ample empirical evidence, it is likely that such types of exposure to cruelty negatively affect the mental and emotional development of youth. Unfortunately, studies examining the effects of sanctioned cases of violence towards animals (i.e., witnessing hunting, exposure to slaughter on farms) on youth wellbeing are extremely rare, to the best of the authors' knowledge. For the purposes of this review, the authors focused on studies in which "exposure to animal cruelty" was defined as the witnessing of intentional acts towards animals that cause unnecessary physical pain and suffering.

Prevalence of Cruelty

Assessing animal cruelty prevalence rates is notoriously difficult, given definitions that are too vague or ambiguous; differences in measurement of the behaviors; varied cultural attitudes toward cruel behaviors; and the fact that until recently animal cruelty has not been listed as a specific crime reportable in national or state crime databases (Reyes 2016). The largest nationally representative study ($n > 43{,}000$) conducted to date in the U.S.A found a lifetime prevalence of animal cruelty of 1.8% for adults, with higher frequencies of cruel behaviors reported by men and persons of low income and education (Vaughn et al. 2009). International data are more difficult to obtain, but some numbers are available. A sample of 3,600 Swiss teenagers revealed a lifetime prevalence of 12% (Lucia and Killias 2011). Baldry's study found that 50.8% of Italian youths had committed some form of cruelty to animals (2003), although a more recent study of this population found a prevalence of 18% (Pagani et al. 2008. These discrepancies in prevalence statistics reveal the challenges of gathering accurate data (and reconciling differences in definitions of these terms), which make it more difficult to accurately assess rates of childhood exposure to animal cruelty.

Prevalence of Childhood Witnessing of Animal Cruelty

There is great variation in study findings on the prevalence of witnessing animal cruelty during childhood. Thompson and Gullone (2006) found that 57.3% of 281 secondary school children had witnessed animal cruelty "a few times," 17.4% reported witnessing it "several times," and 2.8% had witnessed it "frequently." DeGue and DiLillo (2009) found that 21.6% of their sample of 860 American college students had witnessed animal cruelty, most of which was perpetrated by friends or acquaintances. A survey of urban Australian adolescents found that 37.3% of these individuals had witnessed animal cruelty at least "sometimes" (Gullone and Robertson 2008). Witnessing of animal cruelty is significantly more likely to occur in homes where family violence is also present. One of the earlier studies to explore this link found cruelty toward animals in 88% of homes with physically abused children (DeViney, Dickert, & Lockwood, 1983). Up to 76% of animal cruelty in the home occurs in the presence of children (Faver & Strand, 2003).

Method

Prior to searching for literature addressing the correlates and sequalae of childhood witnessing of animal cruelty, the authors identified three separate, albeit connected, relationships that are central to understanding the overall effect of witnessing animal cruelty. The relationship between witnessing any type of animal cruelty and (i) deleterious internalizing and externalizing symptoms, (ii) perpetration of animal cruelty, and (iii) violence perpetration against humans. Studies that examined any one of these three different relationships are included in the literature review, which is organized to reflect these distinctions.

The authors used a variety of databases during their search, including Social Science Premium Collection, PsycINFO, Academic Search Complete, Sociological Abstracts, Web of Science, and Animal Science Database. They also searched Google Scholar to capture any articles that may have not been identified through the other databases. Search terms included animal cruelty, animal maltreatment, animal neglect, and animal abuse; each term was combined with the following words: exposure, witness, experience, and observe. The following criteria were used to ensure the quality and relevancy of studies:

1) Witnessing animal cruelty had to be an independent variable or a predictor in at least one of the study models.
2) If present, internalizing and externalizing symptoms had to be a dependent variable in at least one of the study models.
3) If present, violence towards humans had to be a dependent variable in at least one of the study models.
4) If present, violence towards animals or any type of animal cruelty had to be a dependent variable in at least one of the models.
5) All studies had to be available in English.
6) There had to be a statistical test of the correlation between witnessing some type of animal cruelty and negative behavior. This had to minimally be a bivariate association;

most of the studies used some type of multivariate analysis.

Articles in this Review

A total of 17 studies, published between 1996 and 2017, were found that met the search criteria. Seventeen of these showed statistically significant findings for at least one of the relevant outcome variables. Samples varied, with 3 of the 17 studies sampling college students, 7 studies sampling school age children, 3 studies surveying incarcerated offenders, and the remaining 4 sampling mothers and/or mother-child dyads. Four of the studies used samples from countries other than the United States. Of note is that, although these studies span the past 21 years, 16 studies are from after the year 2000. Most research on animal cruelty before the mid-1990's centered on the relationship between childhood commission of animal cruelty and subsequent violence towards people, overlooking any role of witnessing animal cruelty. Growing interest in the intersectionality of family violence and animal cruelty (specifically, interest in domestic violence abusers who use animal cruelty to control victims) has led researchers to include questions in their inventories that measure children's exposure to violence against animals, in attempts to understand prior factors that lead to commission of animal cruelty.

Findings

Witnessing violence predicts and increases a child's engagement in maladaptive behaviors, including the perpetration of violence towards humans *and* animals. The mechanisms by which witnessing violence may lead to perpetrating violence involve desensitization, decreased empathy, learned maladaptive coping mechanisms and other learned behaviors, and unresolved feelings of anger, fear, and resentment (Buka et al. 2001; Dutton, 2002; Holt et al. 2008). These processes are believed to be very similar, regardless of whether the child witnesses violence toward humans or toward animals; thus, both potentially lead to violence against animals/or people. The severity and nature of the child's cruel treatment toward any sentient being (Lockwood 1998) is one important factor in predicting whether a child goes on to perpetrate future acts of violence, continuing the cycle of violence.

One factor that may influence a child's outcome behaviors is the co-occurrence of family violence *and* witnessing animal cruelty. Although family violence and animal cruelty are studied together, witnessing animal cruelty can have traumatic effects on its own. This concept is illustrated in several recent studies examining the impact of animal cruelty and family violence on children (McDonald et al. 2017a; McDonald et al. 2016). One study found that youth who jointly experienced animal cruelty and family violence had more severe maladjustment than youth who experienced family violence alone (McDonald et al. 2016). A follow-up mixed methods study from McDonald et al. (2017a) revealed that children exposed to intimate partner violence and animal cruelty who experienced more emotional disturbances than the group of asymptomatic children, were more likely to express justification and normalization of animal cruelty. Together, these studies shed light on the unique traumatic effects witnessing animal cruelty can have on a child.

The various negative sequelae of witnessing animal cruelty during childhood can be categorized into three groups: internalizing and externalizing behaviors including trauma-specific effects, perpetration of violence towards animals, and perpetration of violence towards other humans. Some child witnesses exhibit all three types of behaviors. These effects may occur during childhood and have far-reaching effects into adulthood (Daly and Morton 2008; Flynn 1999; Miller & Knutson, 1997). Although these categories are invariably linked, they are distinct in that not every child who witnesses cruelty towards animals will experience any of these effects. Certain children may be more prone to desensitization from witnessing such cruelty, while others may become more emotionally distraught from witnessing cruelty. Likewise, some of these children may be more likely to aggress against people, but not against animals. Various individual and societal level factors, such as age of witnessing animal cruelty (Henry 2004; Hensley and Tallichet 2005), may also influence the path towards each maladaptive outcome.

Relationship between Witnessing Cruelty toward Animals and Deleterious Trauma Outcomes Research exploring the link between witnessing animal cruelty and maladaptive outcomes in childhood consistently reveals internalizing symptoms such as depression, anxiety, withdrawal, and victimization at school. Often, these symptoms are a result of joint exposure to family violence and animal cruelty; however, some studies show these effects from witnessing animal cruelty alone (Daly and Morton 2008; Girardi and Pozzulo 2015). After interviewing 318 undergraduate students, researchers found that negative childhood experiences with family pets, such as witnessing animal cruelty, were significantly associated with higher rates of anxiety and depression in individuals who had a medium level of bonding with their pets (Girardi & Pozzula, 2015). McDonald and colleagues found that, in a sample of 291 ethnically diverse children, ages 7 to 12, who had witnessed intimate partner violence, exposure to concomitant animal cruelty was predictive of membership in one of two groups: children with non-clinically significant internalizing and externalizing behavior problems, and clinically significant internalizing and externalizing behavior problems, attention problems, and social problems (McDonald et al. 2016). In a follow-up study, McDonald and colleagues found that witnessing animal cruelty was a stronger predictor of

internalizing behaviors, such as depression and anxiety, than of externalizing behaviors, and a stronger predictor of justification of animal maltreatment (McDonald et al. (2017a).

These studies suggest that children's negative symptomology may be heightened by their emotional attachment to the family pet. However, studies looking at the effects of witnessing violence towards animals that are *not* pets find negative behavioral outcomes as well. Daly and Morton (2008) found that witnessing the inhumane killing of an animal was negatively related to personal distress, suggesting a process of desensitization and a "hardening" of emotions in response to violence. In their examination of the effects of exposure to IPV, Ascione and colleagues found that children from homes with IPV were more likely to witness animal cruelty (2007) and to score higher on the Child Behavior Checklist for internalizing and externalizing problems (e.g., somatic complaints, depression, rule-breaking behavior, and aggression) than children who had not witnessed domestic violence or animal cruelty. Over 90% of children who responded to a question about how they felt when their pet was abused expressed being emotionally upset (Ascione et al. 2007). Additionally, qualitative data suggest that children risk victimization when trying to save a pet from its abuser (McDonald et al. 2017a).

Some children may demonstrate externalizing symptoms such as substance abuse, aggressive and antisocial behaviors, and juvenile crime after witnessing animal cruelty (Ascione et al. 2007; Becker et al. 2004). A study on the problems associated with exposure to animal cruelty in childhood showed that children who witnessed animal cruelty reported higher rates of psychological impact, with most children reporting being emotionally affected by witnessing such cruelty (Flynn 1999). McDonald et al. (2017b) found that callousness mediated the effects of witnessing animal maltreatment on children's externalizing behaviors.

Relationship between Witnessing Cruelty toward Animals and Later Treatment of Animals Research indicates that witnessing animal cruelty is strongly associated with subsequent perpetration of this type of cruelty. Thompson and Gullone (2006) found that animal cruelty was more prevalent among adolescents who had witnessed it than among those who had not. Witnessing animal cruelty was also shown to be a significant predictor of animal cruelty in a study conducted on a large sample of American college students (DeGue and DiLillo 2009). Flynn also found that children who reported witnessing cruelty towards animals were more likely to report committing cruelty towards animals (1999). In one study, interviews with 261 inmates revealed that those who witnessed animal cruelty in childhood were more likely to engage in animal cruelty as children and as adults (Hensley and Tallichet 2005).

Other findings show that contextual factors, such as age of witnessing animal cruelty and relationship of animal cruelty perpetrator to the child, can predict the likelihood of children committing animal cruelty. Hensley and Tallichet found that the younger the age of witnessing, the younger the age of commission of animal cruelty (2005). Henry (2004) found that men who first witnessed animal cruelty before the age of 13 were more likely to perpetrate cruelty than men who first witnessed it later in life. Inmates who reported witnessing a sibling hurt an animal reported an earlier onset of animal cruelty than inmates who reported witnessing a parent commit the cruelty (Browne et al. 2016). Results from yet another study revealed that children who witnessed their parents engaging in animal cruelty were more likely to commit animal cruelty and to engage in other delinquent behaviors during childhood and adolescence (Becker et al. 2004). These findings provide evidence of the ramifications of exposure to violence during early developmental phases and to violence perpetration by loved ones.

Urban Australian adolescents who witnessed animal cruelty were more likely to engage in violence towards animals (Gullone and Robertson 2008). In another study, mothers' reports revealed that youth from violent Australian families were more likely to have witnessed and committed animal cruelty than youth in non-violent homes. Although the results were not statistically significant due to the small sample size of the youth in the nonviolent home who committed animal cruelty, they highlight the link between exposure to domestic violence and subsequent violent behavior (Volant et al. 2008). A study of nearly 1400 Italian school children revealed that the strongest predictive factors for perpetration of animal cruelty by children who had been abused *and* exposed to animal cruelty were male gender and witnessing peer violence against animals, followed by exposure to mother's violence against the father and the mother's violence toward animals (Baldry 2003). Similar results obtained for children who had been exposed to animal cruelty but not abused, although the third highest predictor for this group was exposure to mother and father's violence toward animals. To understand the role of cultural acceptance of violence toward animals in the commission of animal cruelty, Plant et al. (2016) surveyed adolescents from two different national cultures: Romania and Germany. Findings revealed that Romanian youth were more likely to witness and to engage in animal cruelty due to a greater cultural acceptance of such behavior. Further, Romanian youth were more likely to witness and commit animal cruelty than urban youth. These findings coincide with higher rates of domestic violence in rural parts of Romania (Plant et al. 2016).

Relationship between Witnessing Cruelty toward Animals and Violence toward Other Humans In a review of the evidence for the link between domestic violence and abuse of animals and children, Becker and French (2004) identified several themes, two of which are "animal abuse as part of the continuum of abuse within the family" and "animal abuse

as an indicator of the existence of child abuse" (p. 401). Of great concern is the potential for childhood cruelty toward animals to not only escalate in intensity, but to foreshadow later abuse of other humans (Becker and French 2004). Many studies suggest an association between witnessing violence in childhood and perpetrating violence as an adult (Widom 1989; Murrell et al. 2005; Evans et al. 2008). Research suggests that the effects of witnessing animal violence resemble the effects of witnessing interpersonal violence. Finally, a survey of 249 secondary school children showed that witnessing animal cruelty was a significant predictor of bullying peers (Gullone and Robertson 2008).

Results from a self-report questionnaire assessing abusive childhood environments and witnessing of animal cruelty in a group of 314 inmates revealed that approximately 66% of respondents reported exposure to cruelty, with modest associations between witnessing animal cruelty and physical and sexual coercion in intimate partner relationships, and between witnessing animal cruelty and punitive childhood environments. To determine if these findings were due to the nature of an incarcerated sample, the researchers completed a similar study with undergraduates and found modest associations between witnessing animal cruelty and coercion in intimate relationships, and between punitive childhood environments and witnessing animal cruelty (Miller & Knutson, 1997).

Evidence also indicates an indirect relationship between witnessing cruelty towards animals as a child and endorsing the use of violence in adult intimate relationships. Specifically, youth who witnessed animal cruelty were more likely to report engaging in cruelty.

In a 10-year prospective study, researchers assessed the effects of childhood witnessing of paternal animal cruelty and other family variables. Results revealed that children who witnessed cruelty towards animals by a paternal figure were more likely to start fires than children who did not witness such cruelty. Fire setting is a serious externalizing behavior associated with low frustration tolerance and aggressive behavior towards people and animals (Felthous and Bernard 1979; Larsen 1982). Separate analyses also revealed that the children who were classified as fire setters (children who were more likely to have reported witnessing paternal animal cruelty) were 3.3 times more likely to be referred to juvenile courts for violence offenses, even after controlling for presence of conduct disorder (Becker et al. 2004).

In summary, the most commonly cited outcomes, in order, were animal cruelty, internalizing and externalizing behaviors, and aggressive behaviors toward humans.

Discussion

This review indicates that the Link's definition requires expansion to include witnessing animal cruelty. There is evidence that witnessing animal cruelty can have lasting, deleterious effects on a child even when the child is not abused by the perpetrator. The authors explored three broad categories of sequelae for children who witness animal cruelty: internal and/or external symptomology, animal cruelty, and human violence. Using a combination of the search terms *animal cruelty, animal maltreatment, animal neglect, animal abuse, exposure, witness, experience*, and *observe*, the authors found 17 published quantitative studies that examined the effects of exposure to mistreatment. Throughout the search, the authors came across studies that explored the effects of exposure to family violence and in conjunction, the prevalence of childhood witnessing of animal cruelty. However, very few studies examined the individual role of witnessing animal cruelty. Of note is that, out of the 17 studies found, 16 contained statistically significant findings, with one study's lack of statistical findings most likely due to a small sample size. Also, these effects were observed for both males and females, for people from several different countries, and collectively for student, inmate, child, and general populations.

There are several reasons why the findings described in the previous section may underestimate the prevalence and the severity of the consequences of witnessing animal cruelty:

1. Numerous studies in the animal cruelty literature emphasize the effects of childhood commission of animal cruelty as opposed to witnessing of cruelty. These studies showed a general trend of children who commit animal cruelty being more likely to engage in violence towards humans (Flynn 2011; Kellert & Felthous, 1985; Merz-Perez et al. 2001; Wright & Hensley, 2003). However, retrospective studies in this review show that most people who committed animal cruelty also witnessed animal cruelty. Thus, it is possible that many of the studies examining the sequelae of childhood commission of animal cruelty also capture the sequelae of witnessing animal cruelty.
2. Studies showing that childhood exposure to family violence is related to commission of animal cruelty, trauma symptoms, and violence towards humans, often do not address the joint presence of witnessing animal cruelty at home. Since violence towards pets is more common in domestic violence households, the traumatic effects on children who are exposed to domestic violence may be result of *both* exposure to human violence as well as exposure to violence towards animals, especially in cases where the child has an emotional bond with the household pet (Ascione et al. 2007; McDonald et al. 2016).
3. The majority of the research findings on childhood witnessing animal cruelty are based on individual-level data from regions where the prevalence of this witnessing is not the norm. Little is known of the potential effect of exposure to cruelty at the macro level, especially where animal cruelty may be widespread (Plant et al. 2016). Thus, existing research does not lend much insight into the detrimental effects of animal cruelty that are intertwined with cultural and socio-political norms.

A central focus of the current review is to situate the research findings in the context of childhood exposure to animal cruelty in regions where such cruelty is endemic and animal welfare policy is lacking. Hence, two themes from the current review have a direct bearing on the implications of childhood exposure to animal cruelty in such countries: 1. Age of childhood exposure to animal cruelty moderates the relationship between witnessing animal cruelty and negative psychopathology and/or aggressive behavior, such that the younger the age of witnessing animal cruelty, the younger the age of perpetration of such cruelty (Gullone 2012; Henry 2004; Hensley and Tallichet 2005), and 2. Witnessing a parent or family member or sibling commit animal cruelty is associated with a greater potential for perpetrating cruelty and/or aggression towards humans than witnessing a stranger commit such acts (Baldry, 2005; Becker, 2014; Gullone 2012; Thompson and Gullone 2006). In countries where brutal mistreatment of animals is accepted and where the majority of children have witnessed an act of brutal animal cruelty, exposure to animal maltreatment may occur at younger ages. Similarly, in countries where animal cruelty is endemic, it is possible that children may be *more likely* to observe family members commit animal cruelty than in regions where animal cruelty is more harshly sanctioned. In both situations, children may be at a higher risk of continuing the cycle of violence towards animals and people, given that in such an environment aggression and violence are undoubtedly normalized. While data on the prevalence of children who witness acts of animal cruelty in select Eastern European countries do exist (Plant et al. 2016), there are no available data on the percentage of these acts that are perpetrated by a parent or close relative. Given the significantly higher prevalence of mistreatment towards animals in those regions, we hypothesize that the percentage of youth who witness relatives commit animal cruelty is higher in countries where strong protective laws on animal welfare do not exist.

Limitations

The limitations of this literature review include potential differences in how study respondents interpret animal cruelty; lack of full disclosure of cruel behavior; and, in studies with inmate samples, the possibility that prisoners lie to gain favor with the interviewers or make themselves sound more masculine. One primary limitation of this literature review, common to studies where past individual experiences are of interest, is that all but two of the studies (McDonald et al. 2016) used retrospective data. Retrospective data pose several limitations to internal validity, the most problematic being recall bias, in which some of the responses to study measures may be inaccurate or distorted. Memory accuracy is dependent on the time that elapsed between the event being recalled and the time of assessment (Hassan, 2005). Recall bias becomes more of an issue the longer the time interval between the event and the time of assessment. Given that nine of the 15 studies included in the literature review were based on self-reports of school-aged children (Ascione et al. 2007; Baldry 2003; Becker et al. 2004; Flynn 1999; Gullone and Robertson 2008; Thompson and Gullone 2006; McDonald et al. 2016; McDonald et al. 2017a; Plant et al. 2016; Volant et al. 2008), recall limitations do not apply, especially for the studies where similar questions were asked of both child and mother such that any discrepancies in responses could be addressed (Becker et al. 2004; Ascione et al. 2007). Another measure taken to minimize recall bias with adult samples includes limiting participants to early adulthood such that time lapses between childhood events are adult recall are minimized. In this review, four of the 15 studies used college samples or young adults (Daly and Morton 2008; DeGue and DiLillo 2009; Flynn 1999; Girardi and Pozzulo 2015). Yet another example of how recall bias can be minimized is reflected in Girardi and Pozzulo's 2015 study: anticipating the limitation of memory bias, the researchers not only limited their adult sample to participants age 25 and younger, but also included an interview question in the pilot study to gauge participants' ability to remember details from childhood.

Clinical and Policy Implications

On a broader sociopolitical level, this review points to a need for changes to current policies regarding the treatment of street animals in countries such as Romania. Several key policy and programming areas have the potential to reduce the impact of child witnessing of animal abuse: 1. Introducing humane spay and neuter programs, and 2. Developing Humane Education Programs (HEP).

Spay and Neuter Programs

Reducing the sheer number of stray animals in areas where much of the violence occurs will correspondingly reduce opportunities for the commission of violence. There is increasing interest in addressing this issue in Europe, given the current numbers of stray animals, acknowledgement of the enormity of the problem, and its implications for both human and animal welfare (Voslarova and Passantino 2012). In the past, efforts have been directed toward extermination, with an estimated 144,000 dogs brutally killed in Bucharest alone between 2001 and 2007, a population control strategy that has been deemed ineffectual by the World Health Organization (Berrend n.d.). Individuals who are tasked with developing and enacting policy around stray animal population control should focus on creating education programs that increase awareness of animal suffering and human accountability and

developing humane spay and neuter programs that have proven efficacy in reducing the stray population.

Humane Education Programs

Henry (2004) suggested that empathy may mediate the relation between age of witnessing animal cruelty and participation in these acts; thus, one possible approach to reducing animal cruelty is via the teaching and development of compassion and empathy. Humane Education Programs (HEP) represent a formalized attempt to instill in children those values, such as empathy and compassion, most likely to reduce animal cruelty and other violent behaviors (Faver 2009). According to Arbour et al. 2009 HEP "usually have the development of pro-animal attitudes as their central aim, with any concomitant benefits to humans as a secondary (although still highly important) factor" (p. 138). Faver (2009) noted that HEP feature age-appropriate books that introduce humane education concepts designed to support empathy development, kindness, compassion, and responsibility for animals' welfare.

HEP outcome data have been promising. Arbour et al. (2009) found that a pilot HEP increased scores on empathy and treatment of animal in 4th grade boys. An HEP for Australian 4th graders resulted in increased empathy and humane behavior toward animals, although the changes were statistically significant for the male students only (Arbour et al. 2009), who may have more room for empathy growth since males, on average, have less empathy than females (Baron-Cohen and Wheelwright 2004; Plant et al. 2016). Another HEP, conducted with first-graders in the US, resulted in increased scores on the Primary Attitude Scale from pre-test to post-test; three years post-study, many participants were still discussing the HEP with the humane educator, suggesting a lasting interest in the program (Nicoll et al. 2008). Similarly, Canadian children aged 6–12 demonstrated significantly closer relationships with their pets after participating in a five-day summer-camp HEP, although the effect was larger for female and younger children (Tardif-Williams & Bosacki, 2015).

It would also be beneficial to explore the humane implications of exposing children who have witnessed violence toward animals to culture-specific contexts in which animals are viewed positively. A model for this type of HEP can be an immersive experiential program, such as the one offered at a university in the US, in which college students visited farmers and a farmers' market to learn about the relationships these professionals had with their animals (Dolby 2017). Reflection, a focus on trying to understand an animal's perspective, and discussions of concrete strategies for improving the lives of animals were integral elements of this program. It is possible that this type of program might benefit children who have witnessed violence toward animals, and who may have never been encouraged to consider animals as individual beings, much less their perspective and experience of suffering. Specific components could be thoughtfully incorporated into this type of HEP to make it more meaningful, i.e., engagement with positive and beneficial human-animal interactions that are culturally and regionally relevant.

Research Implications

A more thorough understanding of childhood witnessing of animal cruelty will necessitate the development of 1) standardized and broadly accepted definitions of the various forms of cruelty and 2) more sophisticated approaches to counting incidents of cruelty. The authors suggest that longitudinal studies be conducted in areas where animals are devalued, animal cruelty is normalized, and/or where childhood witnessing of this cruelty is a cultural norm. These prospective studies should focus on potential mediating or moderating factors, not just outcomes. The authors recommend that researchers conduct cross-sectional comparisons of outcomes between regions or countries with verifiably different attitudes toward animal cruelty (and the witnessing of such by children). Other studies might also address frequency of witnessing, cultural attitudes to witnessing, and protective factors.

While this review clearly documents the relationship between witnessing animal cruelty and psychopathology and/or violence in youth, the causal mechanisms that link these factors are unclear. One explanation is psychoanalytic in nature, in that the experience of violence generates pathologies that disturb the mind and in turn increase the likelihood of destructive behaviors. Another explanation may be differential association, whereby youth acquire values and behaviors condoning and necessitating the use of violence from association with significant others who are violent – they learn to be who they are, regardless of pathology. To assist in isolating factors that can be modified in programming to promote more humane treatment towards animals and break the cycle of violence, research should explore the roles of differential association and psychopathology development in mediating the link between witnessing cruelty and subsequent violence.

At present, HEP may represent the most powerful intervention for preventing the development of negative outcomes of childhood witnessing of violence toward animals. However, these programs vary widely in their content, implementation, and outcomes, and caution must be used in making inferences about their effects. At a deeper level, researchers must examine the foundational assumptions underlying most HEP: that animal interactions and/or ownership induce empathy in children. Researchers must determine whether HEP generate lasting changes in children and, if so, which outcomes are most stable over time. Additional research should 1) identify the mechanisms by which HEP effect change; 2) establish which

HEP elements are most effective; and 3) determine how long known effects last.

Conclusion

This review has important implications for practitioners and researchers involved with the Making The Link project and other animal and child welfare organizations in developing a novel HEP to be implemented in schools for youth in Bistria, Romania. Before-and-after measures are necessary to examine potential changes in key variables such as exposure to domestic violence, history of violent behavior towards animals and people, empathy levels, attitudes towards animals, antisocial attitudes, location of residence, gender, and other relevant variables. HEP have been shown to increase knowledge of animals' needs and pro-social behaviors, at least temporarily (Aguirre & Orihuela, 2010; Arbour et al. 2009; Nicoll et al. 2008; Tardif-Williams & Bosacki, 2015). Faver (2009) suggested that HEP be offered to children of all ages, not simply those who are deemed at high risk for offending or who have already offended. The values developed and instilled by HEP may serve as protective factors for these children, ameliorating the deleterious effects of witnessing animal cruelty.

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Compliance with Ethical Standards

Disclosure of Interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

Ethical Standards and Informed Consent This paper did not involve the use of human subjects.

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