

The relationship between animal cruelty in children and adolescent and interpersonal violence: A systematic review



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ABSTRACT

The following study is a systematic review of the relationship between animal cruelty and interpersonal violence. The systematic literature review following PRISMA guidelines and combined with the application of inclusion and exclusion criteria, enabled us to locate 32 studies published between 1995 and July 2017. Overall, the results show that episodes of animal cruelty during childhood and adolescence tend to co-occur alongside other forms of violent and antisocial behaviors. Cruelty to animals was associated with bullying, behavioral problems, experiences of abuse (emotional, physical and sexual), and juvenile delinquency. Furthermore, recurrent animal cruelty during childhood and adolescence was a significant predictor of the future adult perpetration of interpersonal violence. Specifically, drowning animals or committing sexual acts with them predicted future adult violence directed against other humans. These findings lend empirical support to the progression, or graduation, hypothesis and the deviance generalization hypothesis. The implications of these results for clinical practice and future research are discussed. Finally, since this review has found significant limitations in the literature analyzed, methodological recommendations are provided and discussed.

1. Introduction

In 1987 the American Psychiatric Association (APA, 1987) included animal cruelty in the Diagnostic and Statistical Manual of Mental Disorders (DSM-III) as one of the earliest and most severe symptoms of a Conduct Disorder. A Conduct Disorder is diagnosed in children or adolescents who violate the basic rights of others, or age-appropriate societal norms or rules, repetitively and persistently. This stance carried over to the DSM-IV (APA, 2000), and DSM-V (APA, 2013).

Animal cruelty is defined as a socially unacceptable behavior that intentionally causes useless pain, suffering or anguish to the animal and/or its death (Ascione, 1993). From this viewpoint, animal cruelty is any act or omission that contributes to the pain, suffering, or unnatural death of animals or that otherwise threatens their welfare (Beirne, 2011). Thus, animal cruelty may be physical, psychological, emotional or sexual, may involve active maltreatment or passive neglect or omission, and may be direct, or indirect, intentional or unintentional (Lockwood & Arkow, 2016).

This definition of animal cruelty is often dependent upon the cultural contexts and factors that contribute to its ambiguity, and it does not include certain agricultural and veterinary practices or legalized

hunting (Hensley, Browne, & Trentham, 2018). Thus, some forms of animal cruelty are socially acceptable.

Animal cruelty remains both a marginal and marginalised area for criminological research (Hughes & Lawson, 2011). Few researches have focused on identifying the characteristics of animal cruelty as a form of crime in and of itself (Grugan, 2018). However, understanding the underlying motivations for animal cruelty, the resulting effects on the animal victim and method can provide insights into the potential risks the alleged perpetrator may pose to other animals and human (Salvagni et al., 2017). This knowledge may be helpful to the court and mental health professionals in selecting the most appropriate intervention for those found guilty of animal cruelty (Lockwood & Arkow, 2016). Also, such insights can be important to identify the nature of animal cruelty in order to formulate policy responses (Grugan, 2018).

1.1. Motivations for cruelty to animals

Cruelty to animals is a complex phenomenon, involving a multitude of different situational factors, motives and other potential causes (Grugan, 2018). The literature has presented numerous psychological motivations and risk factors for perpetrators of animal cruelty. For

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instance, Kellert and Felthous (1985) described a classification of 9 motives for cruel and extremely aggressive behavior toward animals. They pointed out the following motives: (1) to control an animal or shape an animal's behavior; (2) to retaliate against an animal; (3) to satisfy a prejudice against a species or breed (possibly associated with cultural values); (4) to express violent, aggressive behaviors through an animal toward other people or animals; (5) to improve one's aggressive skills or to impress others with a capacity for violence; (6) to entertain friends; (7) to retaliate against another people; (8) to displace hostility from a person to an animal; and (9) lacking any particular provocation or especially hostile feelings toward an animal. Consequently, each motivation for committing acts of animal cruelty requires a different response from the legal and health system and health professionals. Each case of animal cruelty must be considered within a complex matrix of psychological motivations, individual and social risk factors and settings (Lockwood & Arkow, 2016).

1.2. Animal cruelty and interpersonal violence

Cruelty to animals is a widespread phenomenon with serious implications not only for animal welfare but also individual and societal wellbeing (Lockwood & Arkow, 2016; Prino, Longobardi, & Settanni, 2018). The relationship between episodes of animal cruelty during childhood and interpersonal aggression has long been of interest to developmental psychologists, psychiatrists, and other specialists, but its empirical study is relatively recent. The literature has produced a number of empirical studies, which present results that are sometimes controversial. Some studies found that animal cruelty is related to other forms of interpersonal violence and antisocial behavior, including bullying, juvenile delinquency, and adult criminality involving both violent and nonviolent actions (e.g., Ascione, Thompson, & Black, 1997; Baldry, 2005; Currie, 2006; Gullone & Robertson, 2008; Kellert & Felthous, 1985; Longobardi, Iotti, Jungert, & Settanni, 2018; Tapia, 1971); however, other studies did not report this relationship (e.g., Miller & Knutson, 1997; Walters, 2017). For example, Felthous and Kellert (1987) conducted a meta-analysis of 15 studies examining the relationship between childhood animal abuse and later interpersonal violence. Five of the studies found a link between acts of animal cruelty and later violence, while ten of the studies did not. These authors argued that this failure to find such a link could be based on the fact that these studies had significant methodological limitations, including poorly defined variables, the evaluation of single acts of interpersonal violence (as opposed to recurrent acts), and reliance on chart review for data collection. In fact, the five studies that did uncover a link measured recurrency, while the ten remaining studies that did not find a link based on their meta-analysis did not measure recurrency. That is, those that did identify an association tended to evaluate participants for recurrent acts of interpersonal violence and utilized direct interviews with subjects.

Trentham (2016), using data from 257 inmates at a medium-security prison in the Southern region of the USA, found that the only statistically significant predictor of recurrent adult interpersonal violence was recurrent childhood animal cruelty. In this way, inmates who engaged in recurrent childhood animal cruelty were more likely to commit recurrent adult interpersonal violence. The sociodemographic characteristics of the participants, such as race, education, and childhood residence, were not significant predictors of the adult interpersonal violence.

1.3. Theoretical models

The theoretical models used to explain the relationship between animal cruelty and interpersonal violence are the progression or graduation hypothesis and the deviance generalization hypothesis, which have been reviewed carefully by Gullone (2014). These models can be summed up by the phrase “violence begets violence.”

The progression hypothesis model assumes a direct causal connection between animal cruelty and interpersonal violence. According to this model, animal cruelty precedes interpersonal violence and determines its methods. As Flynn (2011) pointed out, evidence favoring the progression hypothesis normally derives from retrospective samples of violent criminals – serial killers, rapists, child molesters – who report animal abuse committed during their childhood. Recently, Walters (2013) conducted two separate meta-analyses to test the postulate of the violence graduation hypothesis. The first meta-analysis conducted with 14 studies revealed that individuals classified as violent offenders had higher rates of prior animal cruelty than individuals classified as non-violent offenders. A second meta-analysis performed with four studies demonstrated that prior animal cruelty correlated equally as well with violent and non-violent offenses as it did with violent offenses; however, the results showed a large heterogeneity.

The deviance generalization hypothesis holds that “a wide range of criminal behaviors are positively correlated with one another either because one form of deviant behavior leads to involvement in other forms of deviance or because different forms of deviance have the same underlying causes” (Arluke, Levin, Luke, & Ascione, 1999, p. 965). That is, aggressive behaviors have the tendency to present themselves alongside other forms of antisocial behavior, such as crimes against property, substance abuse, animal cruelty, and so forth. Therefore, individuals who commit animal cruelty are likely to commit other forms of deviance as well, both violent and nonviolent. From this point of view, no assumptions are made with regard to chronological order; consequently, animal cruelty might occur before, after or concurrently with human violence.

1.4. Purpose of the systematic review

Our aim was to conduct a systematic review of published studies that have investigated childhood animal cruelty associated with later interpersonal violence and possible moderating factors of this association in order to summarize and clarify the current body of scientific knowledge on this topic. Systematic reviews help to map out areas of uncertainty and identify research gaps, as well as helping to ensure that clinical practice is kept up-to-date with the best research evidence available. Additionally, recommendations are offered in order to improve further research on this topic.

Our study aims to provide an unbiased synthesis of research in this area for the use of practitioners, policymakers, academics, and any others interested in this topic. To understand the link between animal cruelty and later interpersonal violence, it is vital to successfully intervene. In addition, identifying weaknesses and strengths in the current literature is equally important to better inform future studies.

2. Method

2.1. Study selection criteria

In order to be included in this systematic review, the studies had to fulfill the following criteria: (1) they were required to have been published in indexed journals in the period ranging between 1995 and July 2017; (2) they had to present original research (quantitative or qualitative); (3) they had to examine the relationship between episodes of animal cruelty during childhood and adolescence and subsequent episodes of interpersonal violence (e. g., delinquent or criminal behavior, antisocial behavior, etc.) (4) they had to be available in full-text form; and (5) due to language limitations, the studies were required to have been written in English, Spanish or Italian.

2.2. Search strategy

The search was performed in two electronic databases (Scopus and ISI Web of Science) using the following keywords: animal cruelty,

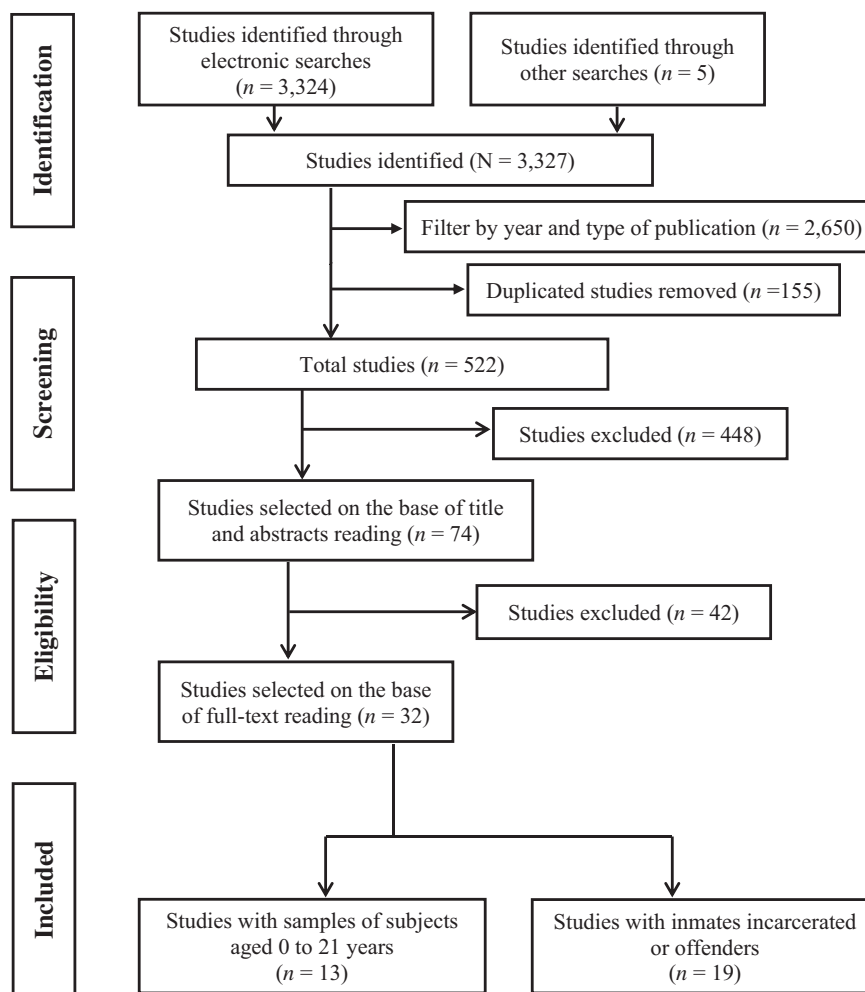


Fig. 1. Flow Chart of the systematic review on animal cruelty and interpersonal violence.

children animal cruelty, animal violence, animal abuse and pet abuse. Additionally, the reference sections of all included studies, previous literature reviews and meta-analyses (Flynn, 2011; Miller, 2001; Monsalve, Ferreira, & Garcia, 2017; Patterson-Kane & Piper, 2009), and the relevant studies on animal cruelty were checked for possible eligibility.

The screening process was carried out independently by two researchers. A consensus process was undertaken for the studies that aroused disagreement. Fig. 1 presents a flowchart describing the screening and selection process of the studies. The search strategy produced a total of 3329 manuscripts.

In order to filter the results, we applied criteria such as the restriction of the publication period (e.g., between 1995 and July 2017) and the document type (e.g., articles presenting original research that were published in indexed journals). Following this step, the eligible articles amounted to 677. After removing the duplicates, the number of articles was reduced to 522. The titles and abstracts of the 522 studies were scanned, and the relevant studies were pre-selected based on the inclusion and exclusion criteria. The number of pre-selected studies was 74.

Therefore, 74 studies were reviewed in full-text form. The review of these studies led us to exclude 42 of them for not meeting the criteria. In conclusion, 32 articles fulfilled the selection criteria. All of them were written in English and published between 1995 and July 2017.

3. Results

3.1. Descriptive characteristics of the studies

The characteristics of studies are described in Table 1. Overall, most of the studies were conducted in the United States of America (USA, 26 studies), used non-probabilistic sampling methods (28 studies), and employed cross-sectional or retrospective designs (27 studies). The study sample sizes ranged from 5 (Wright & Hensley, 2003) to 41,931 participants (Vaughn et al., 2009). Participant age ranged from 6 years (Becker, Stuewig, Herrera, & McCloskey, 2004) to 88 years. The majority of the participants were Caucasian males.

The study samples consisted of different types of participants. Most of the samples consisted of prison inmates (18 studies) from the USA (17 studies) and Finland (1 study). It should be noted that several studies were carried out by selecting the same samples of participants. For example, the studies by Hensley et al. (2018), Hensley, Tallichet, and Dutkiewicz (2009, 2010, 2012), Henderson, Hensley, and Tallichet (2011), and Overton, Hensley, and Tallichet (2012) used the same sample of 180 male inmates, taken from medium- and maximum-security prisons. The same pattern can be noted in the studies conducted by Hensley and Tallichet (2008, 2009), Hensley, Tallichet, and Singer (2006), and Tallichet and Hensley (2004). These studies shared a sample of 261 male inmates, taken from medium- and maximum-security prisons. Finally, Walters (2014) and Walters and Noon (2015) also shared the same sample. This fact should be taken into account when interpreting the results.

Table 1
Characteristics of the studies.

Study/loc	RD	N	Sampling	Setting	Mean age	% of men	% of Caucasian	Animal cruelty definition	Interpersonal violence definition
Arluke and Madfis (2014) USA	R	23	C	Perpetrators of school massacres from 1988 to 2012	< 20	NR	NR	Unique	School massacres
Arluke et al. (1999) USA	CS	306	C	MSPCA	31 Range:11–76	95.42	NR	Unique	Violent offenses from official records
Baldry (2005) Italy	CS	532	C	Elementary/middle schools	11.8 Range:9–12	50.37	49.62	PET	Bullying perpetration: OBQ Bullying victimization: unique
Baxendale et al. (2015) Australia	CS	542	P	Secondary schools	Range:13–17	48	NR	PET adaptation	Victimization: unique Perpetration: unique
Becker et al. (2004) USA	P	363	C	Mothers and children from battered women's shelters and the general population	T1: 9.27 Range:6-T2: 12 19	50.7	NR	Unique CBCL	Violent offenses records, YSR and unique
Boat et al. (2011) USA	CS	110	C	Child Psychiatric Hospitals	Range:16–23 11.3 Range:3–17	71.8	81.8	Unique	Bullying perpetration and victimization: unique abuse victimization unique Behavioral problems: unique Antisocial personality disorder
Gleyzer et al., 2002 USA	R	96	C	Criminal defendants	31.7 Range:17–62	100	28.55	Repeatedly hurting animals on purpose in a manner likely to cause serious injury PET	Bullying perpetration and victimization: PRQ
Gullone and Robertson (2008) Australia	CS	241	C	Secondary schools	13.8 Range:12–16	42.17	13.75	PET	
Henderson et al. (2011) USA	R	180	C	Medium/maximum security prison	33.5	100	50.6	Hurt or kill animal on purpose: drowned, hit, shot, kicked, choked, burned and/or had sex with animals	Murder or attempted murder; rape or attempted rape, aggravated or simple assault and number of times they had committed each of these interpersonal crimes SRD adaptation
Henry (2004) USA	CS	169	C	University	23.9 Range:17–55	45.6	75	IARE-M	
Henry and Sanders (2007) USA	CS	185	C	University	22.2 Range:18–48	100	72	IARE-M Kill, hurt or torture animal on purpose	Bullying perpetration and victimization: OBQ-M
Hensley et al. (2018) USA	R	180	C	Medium/maximum security prison	33.5	100	50.6	Hurt or kill animal on purpose: drowned, hit, shot, kicked, choked, burned and/or had sex with animals	Murder or attempted murder; rape or attempted rape, aggravated or simple assault and number of times they had committed each of these interpersonal crimes
Hensley and Tallchiet (2008) USA	R	261	C	Medium/maximum security prison	33.5	100	70	Hurt or kill animal on purpose: drowned, hit, shot, kicked, choked, burned and/or had sex with animals	Murder or attempted murder; rape or attempted rape, aggravated or simple assault and number of times they had committed each of these interpersonal crimes
Hensley and Tallchiet (2009) USA	R	261	C	G	33.5	100	70	Hurt or kill animal on purpose: drowned, hit, shot, kicked, choked, burned and/or had sex with animals	Murder or attempted murder; rape or attempted rape, aggravated or simple assault and number of times they had committed each of these interpersonal crimes
Hensley et al. (2009) USA	R	180	C	Medium/maximum security prison	33.5	100	50.6	Hurt or kill animal on purpose: drowned, hit, shot, kicked, choked, burned and/or had sex with animals	Murder or attempted murder; rape or attempted rape, aggravated or simple assault and number of times they had committed each of these interpersonal crimes
Hensley et al. (2010) USA	R	180	C	Medium/maximum security prison	33.5	100	50.6	Hurt or kill animal on purpose: drowned, hit, shot, kicked, choked, burned and/or had sex with animals	Murder or attempted murder; rape or attempted rape, aggravated or simple assault and number of times they had committed each of these interpersonal crimes

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Table 1 (continued)

Study/loc	RD	N	Sampling	Setting	Mean age	% of men	% of Caucasian	Animal cruelty definition	Interpersonal violence definition
Hensley et al. (2012) USA	R	180	C	Medium/maximum security prison	33.5	100	50.6	Hurt or kill animal on purpose: drowned, hit, shot, kicked, choked, burned and/or had sex with animals	Murder or attempted murder, rape or attempted rape, aggravated or simple assault and number of times they had committed each of these interpersonal crimes
Hensley et al. (2006) USA	R	261	C	Medium/maximum security prison	33.5	100	70	Hurt or kill animal on purpose: drowned, hit, shot, kicked, choked, burned and/or had sex with animals	Murder or attempted murder, rape or attempted rape, aggravated or simple assault and number of times they had committed each of these interpersonal crimes
Levitt et al. (2016) USA	R	150	C	Adult males who were arrested for animal cruelty, animal neglect, or Animal Sexual Abuse between 2004 and 2009	> 18	100	NR	Animal cruelty offense from official records: cruelty, neglect or sexual abuse	Assault, sex offenses, and homicide from official records
Loeber et al. (2005) USA	P	724	P	First, fourth, and seventh grades from public schools (convicted of homicide, convicted of serious violence, and participants who self-reported serious violence)	T1: 7, 10 and 13 respectively	100	42	CBCL	Problems behavior: CBCL Antisocial behavior: SRA Delinquency: SRD
Lucia and Killias (2011) Switzerland	CS	3648	P	Schools	Range:13–16	49.9	NR	Hurt an animal on purpose and frequency (once or twice, three or more times), type of animal maltreated, and if another person was present	Self-reported delinquency: assault
Merz-Perez et al. (2001) USA	R	90	C	Medium/maximum security prison	32.3	100	45.5	CAAI	Violent offenses from official records
Overton et al. (2012) USA	R	180	C	Medium/maximum security prison	33.5	100	50.6	Hurt or kill animal on purpose: drowned, hit, shot, kicked, choked, burned and/or had sex with animals	Murder or attempted murder, rape or attempted rape, aggravated or simple assault and number of times they had committed each of these interpersonal crimes
Salter et al. (2003) UK	P	104	C	Children's Hospital (victims of sexual abuse)	T1: 10.7 T2: 22.02	100	54.80	Unique	Sexual abuse (rape or indecent assault) from clinical and social service case records
Santilla and Haapasalo (1997) Finland	R	89	C	Prison		100	>	Unique	SR LCS
Simons et al. (2008) USA	R	280	C	Medium/maximum security prison (sexual offenders)	35.7	100	>	Frequency and severity of physical and sexual maltreatment of animals	Sexual abuse from official records, RSASHDQ and SAS.
Tallichet and Hensley (2004) USA	R	261	C	Medium/maximum security prison	33.5	100	70	Hurt or kill animal on purpose: drowned, hit, shot, kicked, choked, burned and/or had sex with animals	Inter adult violence and physical and emotional abuse (CTS-M) Murder or attempted murder, rape or attempted rape, aggravated or simple assault and number of times they had committed each of these interpersonal crimes
Vaughn et al. (2009) USA	CS	41,931	P	Households and group settings such as shelters, college dormitories, and group homes	Range:18–65 +	46.49	70.61	Hurt or be cruel to an animal or pet on purpose	Mugging, threats, harassment, sexual abuse
Walters (2014) USA	P	1336	C	Adjudicated delinquent	T1: 16.04 Range:14–19	86.4	20.5	Physically hurt animals on purpose	Aggressive offense: forced someone to have sex, killed someone, shot someone, shot at someone, took by force with a weapon, took by force without a weapon, beat someone up, participated in a fight, beat someone up as part of a gang: SRO

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Table 1 (continued)

Study/loc	RD	N	Sampling	Setting	Mean age	% of men	% of Caucasian	Animal cruelty definition	Interpersonal violence definition
Walters (2017) USA	R	496	C	Massachusetts Treatment Center for Sexually Dangerous Persons (MTC)	36.42	100	91.3	Unique	Violent offending: sexual offense involving direct victim contact (e.g., rape, sodomy, incest, carnal knowledge, or indecent assault) or a non-sexual offense involving violence (e.g., assault, assault and battery, robbery, murder, manslaughter)
Walters and Noon (2015) USA	P	1354	C	Adjudicated delinquent	T1: 16.04 Range:14–19	86.4	20.5	Physically hurt animals on purpose	SRO
Wright and Hensley (2003) USA	R	5	C	Serial murderers	NR	80	NR	Unique	Serial murder

Note. Loc = Study location, USA = United States of America; UK = United Kingdom. RD: Research Design, CS = Cross-sectional; R = Retrospective; P = Prospective. Sampling: C = convenience sample; P = Probabilistic sample. Setting: MSPCA = Massachusetts Society for the Prevention of Cruelty to Animals. Mean age: T1 = time 1, T2 = time 2. NR = Not Reported. % of Caucasian: > predominantly. Animal Cruelty: Cruelty animal definition: CAAI = Child and Animals Assessment Instrument; CBCL = Child Behavior Checklist; CTS-M = Conflict Tactics Scale Modified; IARE-M = Inventory on Animal-Related experiences Modification, PET = Physical and Emotional Tormenting against animals Scale. Interpersonal violence: CBCL = Child Behavior Checklist; OBQ = Olweus Bullying Questionnaire; OBQ-M = Olweus Bullying Questionnaire Modified; PRQ = Peer Relations Questionnaire; RSASHDQ = Redirecting Sexual Aggression Sexual History Disclosure Questionnaire; SAS = Sexual Abuse Scale; SRA = Self-Reported Antisocial Behavior Scale; SRD = Self-Reported Delinquency Questionnaire; SRLCS = Self-Reported Lifetime Criminality Scale; SRO = Self-Reported Offending; YSR = Youth Self-Report.

The samples of the other studies were composed of students (undergraduates, secondary/primary school students from the USA and Europe), hospitalized children from the USA and UK (Boat et al., 2011; Salter et al., 2003), serial killers (Wright & Hensley, 2003), perpetrators of school massacres (Arluke & Madfis, 2014), non-institutionalized individuals (Vaughn et al., 2009;) and women and children who were victims of domestic violence and had contacted anti-violence centers (Becker et al., 2004).

The data was retrieved mostly through self-report methods. Nevertheless, a number of factors were investigated through third-person reports as well, such as maternal (Becker et al., 2004) or medical personnel reports of the children's behavior (Boat et al., 2011), in order to ensure data completeness. Additionally, a number of studies reviewed the charts, judicial acts, and clinical files of the participants, in order to obtain a complete picture of the situation (Arluke & Madfis, 2014; Boat et al., 2011; Merz-Perez, Heide, & Silverman, 2001).

There was no consensus across studies concerning the definition of animal cruelty and its relevant dimensions. Eight studies used standardized measurement instruments, such as the Child Behavior Checklist (CBCL), Child and Animal Assessment Instrument (CAAI), Inventory on Animal-Related Experiences, and the Physical and Emotional Tormenting Against Animals Scale (PET). However, most researchers used their own varying definitions of animal cruelty. For example, they asked: "How often did you hit a domestic animal with an object?" (Simons, Wurtele, & Durham, 2008); "In your entire life, did you ever hurt or be cruel to an animal or pet on purpose?" (Vaughn et al., 2009); and "Did you ever physically hurt animals on purpose?" and "What did you do?" (Walters, 2014; Walters & Noon, 2015). In other studies, the definition of animal cruelty included any action where the respondent hurt or killed animals as a child (other than for hunting purposes) (e.g., Hensley et al., 2009, 2012; Tallichet & Hensley, 2004). In this sense, the participants were asked to indicate: "How many times have you ever hurt or killed animals, other than for hunting?" (Tallichet & Hensley, 2004) or "What do you do to hurt or kill animals?" by circling each of the methods that were listed on the survey. These included drowning, hitting, shooting, kicking, choking, burning, and/or having sex with animals (Hensley et al., 2012).

Concerning interpersonal violence, several different behaviors were measured (e.g., abuse, bullying, victimization, perpetration of a school massacre, antisocial behavior, and other forms of delinquency). Most of the studies employed their own definition of interpersonal violence (e.g., Hensley et al., 2012; Hensley & Tallichet, 2009; Tallichet & Hensley, 2004). For example, five studies assessed bullying (Baldry, 2005; Baxendale, Lester, Johnston, & Cross, 2015; Boat et al., 2011; Gullone & Robertson, 2008; Henry & Sanders, 2007), but most of them used their own definition of bullying. In the study by Baldry (2005), the measurement of direct bullying experiences involved asking students how often they had been called bad names, physically hurt, had their belongings taken away, or been threatened in the past three months (four items), and the measurement of indirect bullying experiences included students having rumors spread about them, and being isolated by their peers (e.g., "No one would stay with me during recess" and "No one would talk with me"). Juvenile delinquent behavior was measured in 21 studies, but these studies also used different measurement instruments, such as official records (e.g., Becker et al., 2004; Salter et al., 2003), questionnaires (e.g., Walters, 2014; Walters & Noon, 2015), and specifically developed items. The items included questions such as: "Have you ever committed or attempted murder?"; "Have you ever committed or attempted rape?"; "Have you ever committed aggravated or simple assault?"; and "Have you ever committed robbery?" (e.g., Hensley et al., 2012; Hensley & Tallichet, 2009; Tallichet & Hensley, 2004). In addition, the participants were asked how many times they had committed each of these crimes (e.g., Hensley et al., 2012; Tallichet & Hensley, 2004).

3.2. Animal cruelty and interpersonal violence

Overall, the studies carried out with samples of subjects aged 0 to 21 years found that cruelty toward animals was related to problems with peers, experiences of sexual abuse (Boat et al., 2011), bullying (Baldry, 2005; Baxendale et al., 2015; Boat et al., 2011; Gullone & Robertson, 2008; Henry & Sanders, 2007), and juvenile delinquency (e.g., Becker et al., 2004; Henry, 2004; Loeber et al., 2005; Lucia & Killias, 2011; Walters, 2014). However, childhood episodes of animal cruelty were not associated with experiences of homicidal behavior, self-harm, assault, running away, fire setting, property destruction, poor impulse control, current drug/alcohol dependency, weapon use, and gang involvement (Boat et al., 2011).

3.2.1. Animal cruelty and bullying

The findings showed that animal cruelty was positively related to the perpetration of bullying and victimization (Baldry, 2005; Gullone & Robertson, 2008; Henry & Sanders, 2007) for both physical and verbal bullying (Baxendale et al., 2015; Henry & Sanders, 2007), and that the relationship was present for both boys and girls (Baldry, 2005). Nevertheless, Boat et al. (2011) did not find a link between animal cruelty and bullying victimization in a child psychiatric sample. Furthermore, subjects who had been involved in multiple episodes of animal cruelty were significantly more likely to be bullies and/or to have been bullied than either one-time abusers or those who had never abused animals (Henry & Sanders, 2007). Finally, the results of multiple regression analyses showed that having witnessed animal cruelty was a significant predictor of bullying (Gullone & Robertson, 2008).

3.2.2. Animal cruelty and delinquent behavior in samples of non-institutionalized individuals

Overall, the findings showed that animal cruelty was correlated to various types of offenses, such as robbery or mugging, vandalism, violent offenses, serious property offenses, and shoplifting, harassment, and forcing someone to engage in sexual acts (Becker et al., 2004; Henry, 2004; Loeber et al., 2005; Lucia & Killias, 2011; Salter et al., 2003; Vaughn et al., 2009; Walters, 2014). Specifically, in samples of students the link between animal cruelty and delinquent behavior was stronger for offenses such as vandalism, violent offenses, and serious property offenses than for more common misdemeanors or minor violence and nonviolent offenses, such as shoplifting (Lucia & Killias, 2011). In addition, individuals who reported participating in more than one episode of animal cruelty also reported more delinquent involvement than those who had not engaged in multiple acts of animal cruelty, or who had reported participating in one or fewer acts of animal cruelty (Henry, 2004).

On the other hand, in a nationally representative sample of 41,931 participants non-institutionalized US residents aged 18 years and older, Vaughn et al. (2009) found that animal cruelty was associated with a broad array of antisocial behaviors, particularly behaviors that exercise a physical threat over other persons, such as robbery or mugging, harassment, and forcing someone to engage in sexual acts. The strongest association between antisocial behaviors and animal cruelty was found for robbing or mugging other people. Furthermore, the study also found that setting fires on purpose was highly associated with animal cruelty.

Finally, prospective studies showed that animal cruelty predicted aggressive offenses and income offenses or non-violent offenses (Becker et al., 2004; Loeber et al., 2005; Salter et al., 2003; Walters, 2014), even after controlling for demographic variables, such as age, sex, and ethnicity, and behavioral variables, such as the early onset of behavior problems (Walters, 2014), or controlling for family income and the mother's education (Becker et al., 2004).

3.2.3. Animal cruelty and delinquent behavior in samples of institutionalized individuals

Overall, retrospective studies carried out with male inmates or offenders found a relationship between the inmates' recurrent childhood and adolescent acts of animal cruelty and their subsequent repeated acts of aggression against humans in general (e.g., Arluke et al., 1999; Henderson et al., 2011; Hensley et al., 2018; Hensley & Tallichet, 2009; Hensley et al., 2006; 2009; Hensley et al., 2009; Hensley et al., 2010, 2012; Levitt, Hoffer, & Loper, 2016; Merz-Perez et al., 2001; Overton et al., 2012; Santtila & Haapasalo, 1997; Tallichet & Hensley, 2004; Wright & Hensley, 2003). Therefore, the inmates who had committed more acts of childhood animal cruelty were more likely to have engaged in repeated acts of interpersonal violence as adults, even after controlling for ethnicity, education, and their geographic location of origin – rural versus urban (Hensley et al., 2009).

Moreover, animal cruelty was also related to being convicted of personal crimes, the number of said convictions, and the number of siblings (Hensley et al., 2006; Hensley et al., 2010; Santtila & Haapasalo, 1997; Tallichet & Hensley, 2004), a diagnosis of antisocial personality disorder (APD) (Gleyzer, Felthous, & Holzer III, 2002), and various types of antisocial behavior, such as robbery or mugging, drug offenses, serious property offenses, and public disorder offenses (e.g., Arluke et al., 1999; Gleyzer et al., 2002).

Additionally, a negative significant association was found between age of first animal abuse and recurrent interpersonal violence. Nevertheless, only recurrent childhood and adolescent acts of animal cruelty and the number of siblings predicted recurrent interpersonal violence (Hensley et al., 2018; Tallichet & Hensley, 2004). Inmates who had a greater number of siblings and who had committed more acts of animal cruelty as children or adolescents were more likely to have engaged in repeated acts of human violence during adulthood. This suggests that the effects of the non-significant factors are mediated by frequency and number of siblings in the regression analysis. Finally, Santtila and Haapasalo (1997) compared groups of homicidal offenders, violent offenders, and nonviolent offenders across a set of risk factors that included animal cruelty, and found that the presence of episodes of animal cruelty differentiated the homicidal offenders from one or both of the other groups of offenders. The findings showed that inmates who committed violent crimes as adults were significantly more likely to have committed acts of animal cruelty as children than other adult non-violent offenders (Merz-Perez et al., 2001; Santtila & Haapasalo, 1997).

Nevertheless, recent research by Walters (2017), using a male sex offender sample, and by Walters and Noon (2015), with a sample of youths who had been judged delinquent, did not find a link between animal cruelty and subsequent violence and aggressive behavior. Animal cruelty was associated with family context and externalizing variables, such as the temperament dimensions of fearlessness and disinhibition. Consequently, animal cruelty may be an important indicator of future offenses by virtue of its link with the temperament dimensions of fearlessness and disinhibition, rather than because of any direct effect it may have on subsequent violence and aggressive behavior (Walters, 2017; Walters & Noon, 2015).

3.2.4. The link between methods of animal cruelty and later interpersonal violence

Four studies analyzed the association between methods of animal cruelty and acts of adult interpersonal violence in samples of institutionalized individuals (Henderson et al., 2011; Hensley et al., 2012; Hensley & Tallichet, 2009; Levitt et al., 2016). They found that animal cruelty methods, such as drowning animals or having sex with them (e.g., bestiality) during childhood and adolescence, predicted later acts of violence against humans. In this sense, inmates who had drowned animals or engaged in acts of bestiality during their childhood and adolescence were more likely to have engaged in, and been convicted of, repeated violent crimes later in life (Hensley et al., 2012; Hensley & Tallichet, 2009). However, Henderson et al. (2011), using similar tests,

found that only bestiality and the age the inmates began abusing animals predicted later acts of violence against humans. Therefore, the inmates who reported having engaged in acts of bestiality during their childhood, and those who reported engaging in animal cruelty at a younger age, were more likely to engage in recurrent acts of interpersonal violence as adults. It is noteworthy that acts of animal cruelty directed toward pets or stray animals, such as kicking, hitting, or shooting them, were reported more frequently than those involving drowning, choking, burning, or having sex with animals (Henderson et al., 2011; Hensley & Tallichet, 2009).

3.2.5. Motives behind animal cruelty

Three studies attempted to analyze the motives behind animal cruelty (Hensley & Tallichet, 2008; Levitt et al., 2016; Overton et al., 2012; Wright & Hensley, 2003). The motivations most commonly reported by the participants were to vent their anger, harass or torment another person, have fun, dislike for the animal, and a desire for imitation (Hensley & Tallichet, 2008; Levitt et al., 2016; Wright & Hensley, 2003). However, only harassing or tormenting another person and having fun had a statistically significant relationship with interpersonal violence (Levitt et al., 2016), and only having fun predicted subsequent violent crime convictions (e.g., assault, rape, and murder) (Hensley & Tallichet, 2008). In this sense, inmates who had committed childhood and adolescent acts of animal cruelty for fun were more likely to have engaged in, and been convicted of, repeated acts of interpersonal violence (Hensley & Tallichet, 2008).

4. Discussion

This evidence provides empirical support to the deviance generalization hypothesis and the progression or graduation hypothesis in clarifying the association between engaging in animal cruelty during childhood and adolescence and the subsequent perpetration of interpersonal violence.

Regarding the deviance generalization hypothesis, the findings provide further empirical support for the co-occurrence of animal cruelty and interpersonal violence in adolescents, in forms such as bullying, behavioral problems, and fire-setting (Arluke et al., 1999; Baxendale et al., 2015; Boat et al., 2011; Gullone & Robertson, 2008; Henry & Sanders, 2007; Vaughn et al., 2009). Furthermore, the results indicate that animal cruelty in adolescence is correlated to various forms of juvenile delinquency (Henry, 2004).

The association is stronger for serious offenses (e.g., vandalism, violent offenses, serious property offenses, robbery) than for more common misdemeanors (e.g., shoplifting). This suggests that animal cruelty might be closer to serious violence and other pathologies than to other common behavior problems which may be encountered during adolescence (Longobardi, Prino, Fabris, & Settanni, 2017a; Longobardi, Prino, Fabris, & Settanni, 2017b; Lucia & Killias, 2011; Vaughn et al., 2009). These findings are consistent with those from earlier studies (e.g., Slavkin, 2001; Tapia, 1971). For example, Tapia found that children who had been cruel to animals showed many other aggressive symptoms, such as destructiveness, bullying, fighting, stealing, and fire-setting. Slavkin (2001), in a sample of juvenile firesetters, found that juveniles who were identified as being cruel to animals were more likely to engage in recidivistic firesetting behaviors than those who were not cruel to animals.

With regard to the progression or graduation hypothesis, retrospective studies employing inmate samples indicate that acts of animal cruelty committed during childhood and adolescence are a relatively persistent predictor of adult interpersonal violence, such as offenses (Arluke et al., 1999; Hensley et al., 2006; Hensley et al., 2009; Hensley et al., 2010, 2012; Hensley & Tallichet, 2009; Merz-Perez et al., 2001; Tallichet & Hensley, 2004; Wright & Hensley, 2003). These findings are in line with previous studies (e.g., Flynn, 1999; Hellman & Blackman, 1966; Kellert & Felthous, 1985; Sendi & Blomgren, 1975). For example,

Kellert and Felthous (1985) examined the relationship between childhood episodes of animal cruelty and aggressive behaviors among criminals and non-criminals during adulthood. Their results showed that the episodes of childhood animal cruelty occurred to a significantly greater degree among aggressive criminals than among non-aggressive criminals or non-criminals.

Additionally, the results from the retrospective studies reviewed are in line with those found by the prospective studies analyzed in this paper (Becker et al., 2004; Loeber et al., 2005; Longobardi, Settanni, Prino, & Gastaldi, 2018; Salter et al., 2003; Walters, 2014), which also suggests that animal cruelty is not only related to later offenses, but that it may precede delinquency in general. In other words, the findings suggest that animal cruelty precedes offenses more often than the other way around (Becker et al., 2004).

However, the choice of animal cruelty methods also correlates to later acts of adult violence against humans. In this sense, drowning animals or having sex with them (e.g., bestiality) during childhood and adolescence predicted later engagement in acts of adult violence against humans (e.g., violent offending). These findings provide further support to the sexually polymorphous theory that childhood bestiality might be a potential precursor to adult interpersonal violence (Hensley et al., 2010). In addition, more violent offenders were found to have engaged in more severe acts of animal cruelty (Hensley et al., 2012; Merz-Perez et al., 2001). Therefore, it is possible that more severe animal abuse (e.g., torturing and killing animals in childhood) was a product of homicidal ideation which would be expressed in age-grade behavior. In this way, cruelty to animals might be early-life indicators for this ideation. From this viewpoint, animal abuse would hide the offender's true motivation which would be to murder another person (DeLisi et al., 2017).

Finally, incidences of abusing animals for fun during youth predicted later engagement in recurrent acts of interpersonal violence against humans (Hensley & Tallichet, 2008). As these authors pointed out: "Committing animal abuse for fun suggests the need for thrill seeking as a perverted form of entertainment or the release of pent-up emotions on objects perceived to be weaker" (p. 182).

Therefore, given the significant associations found between animal cruelty during childhood and adolescence and the perpetration of other antisocial behaviors, animal cruelty during childhood might be an individual risk factor, a marker for later engagement in acts of violence perpetuated against humans and other antisocial behaviors (Flynn, 2011; Loeber et al., 2005; Lucia & Killias, 2011; McPhedran, 2009; Petersen & Farrington, 2007; Vaughn et al., 2009). Consequently, it might be a good investment to screen youth for animal cruelty in clinical and other service settings (Vaughn et al., 2009).

Nevertheless, it is important to keep in mind that risk factors in general, and individual risk factors in particular, are not always decisive for those who present them. As Flynn (2011) points out, most children who abuse animals don't go on to be violent toward humans, that is, they will never progress to being violent against humans. Most children tend to have limited experiences with animal cruelty. Additionally, individual factors, such as animal cruelty, are not sufficient to explain the occurrence of subsequent episodes of violence against humans. Consequently, overemphasizing the relationship between animal cruelty and later acts of interpersonal violence might lead authorities to falsely label and stigmatize some children as potential abusers or worse, creating rather than reducing deviance.

To better understand animal cruelty in childhood and its link to adult violence, we also need to examine a series of social and cultural factors, such as domestic environments, child-care arrangements, schools, peer groups, and neighborhoods (Ascione & Arkow, 1999). In this sense, McPhedran (2009) points out that the context within which animal cruelty occurs contributes to the development of both the animal cruelty itself, and the perpetration of other violent behaviors. In this sense, an abusive family context may be a better predictor of adult violence than childhood animal cruelty (Boat et al., 2011; Currie, 2006;

Duncan & Catherine Miller, 2002). For example, Becker et al. (2004) found that family variables increase the likelihood of childhood fire-setting and animal cruelty, and that these behaviors are also related to the emergence of adolescent delinquency. Consequently, intervening in abusive home environments in a holistic fashion may represent an effective way to break the link between animal cruelty and interpersonal violence (McPhedran, 2009; Petersen & Farrington, 2007). Nevertheless, it should be taken into account that interpersonal violence is a complex phenomenon, which cannot be explained solely by environmental factors. A more comprehensive solution that analyzes all biopsychosocial factors is required (Flynn, 2011).

4.1. Limitations and directions for future research

We acknowledge several limitations in this study, which are related to the research design of the articles reviewed in our paper. In this sense, most of the studies analyzed employed a convenience sample taken from the population of children, adolescents, or inmates from the USA (who were mostly Caucasian), which makes it difficult for our findings to be generalized to a wider population. Consequently, future research is needed to investigate this topic in other societies and cultures, using research designs and statistical analyses that ensure an adequate methodological quality.

Another limitation encountered in this study was the spotty definition of animal cruelty. The most common definition used by the studies that investigate this phenomenon is the one presented by Ascione (1993), which defines animal cruelty as a socially unacceptable behavior that intentionally causes useless pain, suffering or anguish to the animal and/or its death. Such a spotty definition increases the risk of labelling as animal cruelty those accidental forms of violence that might occur sometimes, which are otherwise recognized as exploratory/curious animal abuse (Ascione, 2001). Additionally, there was no cross-study consensus concerning the definition of animal cruelty and its relevant dimensions. Therefore, most authors employed their own various definitions. In order to facilitate greater comparisons between studies, it is important that future studies use the same definitions and measurement instruments.

However, most of the studies analyzed used cross-sectional designs or relied on retrospective accounts of events that may have transpired decades earlier, which did not allow us draw precise inferences about cause-effect relationships (e.g., Hensley et al., 2009; Merz-Perez et al., 2001) – that is, whether the acts of animal cruelty had occurred before or after the acts of interpersonal violence. Furthermore, as Flynn (2011) points out, it is possible that animal cruelty and interpersonal violence are the result of a third factor, rather than being causally related to each other. For example, animal cruelty may be relevant to future offenses by virtue of its link to the temperament dimensions of fearlessness and disinhibition, rather than because of any direct effect it may have on subsequent violence and aggressive behavior (Walters, 2012, 2017). As Walters and Noon (2015) point out, animal cruelty might be a marker of nonviolent and violent offenses by virtue of its position in the proactive subdimension of the externalizing spectrum. Therefore, prospective or longitudinal studies are needed to improve our understanding of how the relationship between animal cruelty and later interpersonal violence (e.g., offenses) develops.

Concerning the data collection methods, the information obtained through self-report questionnaires is hard to verify and is often falsified in order to protect or increase a person's level of social desirability. This problem persists even when researchers use anonymous questionnaires in their studies. Furthermore, there is the additional issue of the intrinsic limits of retrospective studies, which owe to the progressive deterioration of memories and the consequent low reliability of the participants' reports. In fact, participants are asked to report on events that took place decades before the study was carried out, and the information obtained cannot be considered to be completely reliable and precise. However, the use of indirect and alternative sources of

information, such as clinical files (Boat et al., 2011), also presents problems that are relative to the quality of the documentation obtained, and to the interpretation of events given by the interviewer or medical professional that compiled the information at the time. Nevertheless, the use of interviews instead of the more common pen-and-paper questionnaires is advised. Interviews allow researchers to obtain more personal and detailed information concerning the participants, and they also allow for the inclusion of illiterate individuals in the studies since they would not be able to participate otherwise. Finally, the use of longitudinal studies and of studies that analyze bigger samples that are more representative of the population, such as national surveys, is advisable since they would allow a better generalization of the results and a better understanding of the phenomenon in question.

Future research should focus on collecting more precise information on the age at which the first episodes of animal cruelty took place, the methods used, and the motivations that led the participants to engage in this behavior since the information we possess at the moment is still incomplete. In conclusion, it would also be important to investigate gender differences in animal cruelty since all the studies we reviewed focused exclusively on male participants, and the literature shows that men and women have different ways of behaving (Baldry, 2005).

5. Conclusions

There is a need for a clear and complete analysis of the relationship between animal cruelty and interpersonal violence for the purpose of developing better prevention and intervention programs in the future. In this sense, it is important to remember the substantial difference between physiologically violent behaviors directed at animals that take place during preschool and/or primary school, when children still might lack the notion of caring for and treating animals humanely (e.g., exploratory/curious animal abuse), and pathological animal abuse, which is carried out at a later age and is symptomatic of other psychological disorders (Ascione, 2001). In the first case, an educational intervention is sufficient to deter this behavior; in the second case, clinical interventions are advised.

Concerning children and adolescents, identifying early episodes of animal abuse is vital for the prevention of future antisocial behaviors, and because these behaviors could be distress signals emitted by individuals who are victims of domestic or parental abuse. Domestic abuse is a serious problem that should be tackled by law enforcement agencies, doctors, and social workers. Alongside the solution of problematic domestic situations there should be the creation of prevention programs since animal abuse takes place mostly during early adolescence (e.g., before age 15) (McVie, 2007). Prevention strategies would be more efficient if they were inserted into educational settings and programs, preferably from primary school forward. Group work, which uses peer influence to modify deviant behaviors, could be a good instrument upon which to base interventions, especially during adolescence. It is evident that the best results against violent behaviors can be obtained only through multidisciplinary approaches that include different settings, such as schools, domestic environments, healthcare centers, and social assistance.

Concerning adults, instead, such as the inmates studied by Tallichet et al. or Merz-Perez et al. (Hensley et al., 2006; Hensley et al., 2010, 2012; Hensley & Tallichet, 2009; Merz-Perez et al., 2001; Tallichet & Hensley, 2004), although sanctions are necessary, they are not sufficient to reduce violent behaviors. In this context as well, the promotion of nonviolent behaviors should be carried out through different means, such as the creation of special events that sensitize individuals on the topic of personal respect and individual rights.

Conflict of interest

The authors declare that they have no conflict of interest.

References¹

- American Psychiatric Association (1987). *Diagnostic and statistical manual of mental disorders* (3rd revised.). (Washington, DC: Author).
- American Psychiatric Association (2000). *Diagnostic and statistical manual of mental disorders* (4th ed. revised text). (Washington, DC: Author).
- American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). (Washington, DC: Author).
- *Arluke, A., Levin, J., Luke, C., & Ascione, F. R. (1999). The relationship of animal abuse to violence and other forms of antisocial behavior. *Journal of Interpersonal Violence*, 14, 963–975. <https://doi.org/10.1177/088626099014009004>.
- *Arluke, A., & Madfis, E. (2014). Animal abuse as a warning sign of school massacres: A critique and refinement. *Homicidal Studies*, 18, 7–22. <https://doi.org/10.1177/1088767913511459>.
- Ascione, F. R. (1993). Children who are cruel to animals: A review of research and implications for developmental psychopathology. *Anthrozoös*, 6, 228. <https://doi.org/10.2752/089279393787002105>.
- Ascione, F. R. (2001). *Animal abuse and youth violence*. *Juvenile Justice Bulletin* (September, 2001). Washington, DC: Office of Juvenile Justice and Delinquency Prevention (Author).
- Ascione, F. R., & Arkow, P. (1999). *Child abuse, domestic violence, and animal abuse: linking the circles of compassion for prevention and intervention*. West Lafayette: Purdue University Press.
- Ascione, F. R., Thompson, T. M., & Black, T. (1997). Childhood cruelty to animals: Assessing cruelty dimensions and motivations. *Anthrozoös*, 10, 170–177. <https://doi.org/10.2752/089279397787001076>.
- *Baldry, A. C. (2005). Animal abuse among preadolescent directly and indirectly victimized at school and at home. *Criminal Behaviour and Mental Health*, 15, 97–110. <https://doi.org/10.1002/cbm.42>.
- *Baxendale, S., Lester, L., Johnston, R., & Cross, D. (2015). Risk factors in adolescents' involvement in violent behaviours. *Journal of Aggression, Conflict and Peace Research*, 7, 2–18. <https://doi.org/10.1108/JACPR-09-2013-0025>.
- *Becker, K. D., Stuewig, J., Herrera, V. M., & McCloskey, L. A. (2004). A study of fire-setting and animal cruelty in children: Family influences and adolescent outcomes. *Journal of the American Academy of Child & Adolescent Psychiatry*, 43, 905–912. <https://doi.org/10.1097/01.chi.0000128786.70992.9b>.
- Beirne, P. (2011). Animal abuse and criminology: Introduction to a special issue. *Crime, Law and Social Change*, 55, 349–357. <https://doi.org/10.1007/s10611-011-9306-5>.
- *Boat, B. W., Pearl, E., Barnes, J. E., Ricchey, L., Crouch, D., Barzman, D., & Putnam, F. W. (2011). Childhood cruelty to animals: Psychiatric and demographic correlates. *Journal of Aggression, Maltreatment & Trauma*, 20, 812–819. <https://doi.org/10.1080/10926771.2011.610773>.
- Currie, C. L. (2006). Animal cruelty by children exposed to domestic violence. *Child Abuse & Neglect*, 30, 425–435. <https://doi.org/10.1016/j.chiabu.2005.10.014>.
- Delisi, M., Tahja, K., Drury, A. J., Caropreso, D., Elbert, M., & Heinrichs, T. (2017). The criminology of homicidal ideation: Associations with criminal careers and psychopathology among federal correctional clients. *American Journal of Criminal Justice*, 42, 554–573. <https://doi.org/10.1007/s12103-016-9371-5>.
- Duncan, A., & Catherine Miller, C. (2002). The impact of an abusive family context on childhood animal cruelty and adult violence. *Aggression and Violent Behavior*, 7, 365–383. [https://doi.org/10.1016/S1359-1789\(01\)00064-7](https://doi.org/10.1016/S1359-1789(01)00064-7).
- Felthous, A. R., & Kellert, S. R. (1987). Childhood cruelty to animals and later aggression against people: A review. *American Journal of Psychiatry*, 144, 710–717.
- Flynn, C. (1999). Animal abuse in childhood and later support for interpersonal violence in families. *Society and Animals*, 7, 161–172. <https://doi.org/10.1163/156853099X00059>.
- Flynn, C. (2011). Examining the links between animal abuse and human violence. *Crime, Law and Social Change*, 55, 453–468. <https://doi.org/10.1007/s10611-011-9297-2>.
- *Gleyzer, R., Felthous, A. R., & Holzer, C. E., III (2002). Animal cruelty and psychiatric disorders. *The Journal of the American Academy of Psychiatry and the Law*, 30, 257–265.
- Grugan, S. T. (2018). The companions we keep: A situational analysis and proposed typology of companion animal cruelty offenses. *Deviant Behavior*, 39, 790–806. <https://doi.org/10.1080/01639625.2017.1335513>.
- Gullone, E. (2014). An evaluative review of theories related to animal cruelty. *Journal of Animal Ethics*, 4, 37–57.
- *Gullone, E., & Robertson, N. (2008). The relationship between bullying and animal abuse behaviors in adolescents: The importance of witnessing animal abuse. *Journal of Applied Developmental Psychology*, 29, 371–379. <https://doi.org/10.1016/j.appdev.2008.06.004>.
- Hellman, D. S., & Blackman, N. (1966). Enuresis, firesetting and cruelty to animals: A triad predictive of adult crime. *American Journal of Psychiatry*, 122, 1431–1435. <https://doi.org/10.1176/ajp.122.12.1431>.
- *Henderson, B. B., Hensley, C., & Tallichet, S. E. (2011). Childhood animal cruelty methods and their link to adult interpersonal violence. *Journal of Interpersonal Violence*, 26, 2211–2227. <https://doi.org/10.1177/0886260510383038>.
- *Henry, B. C. (2004). The relationship between animal cruelty, delinquency, and attitudes toward the treatment of animals. *Society and Animals*, 12, 186–207.
- *Henry, B. C., & Sanders, C. E. (2007). Bullying and animal abuse: Is there a connection? *Society and Animals*, 15, 107–126.
- *Hensley, C., Browne, J. A., & Trentham, C. E. (2018). Exploring the social and emotional

¹ An asterisk has been placed next to references that are included in the systematic review.

- context of childhood animal cruelty and its potential link to adult human violence. *Psychology, Crime & Law*, 24(5), 489–499. <https://doi.org/10.1080/1068316X.2017.1346101>.
- *Hensley, C., & Tallichet, S. E. (2008). The effect of inmates' self-reported childhood and adolescent animal cruelty motivations on the number of convictions for adult violent interpersonal crime. *International Journal of Offender Therapy and Comparative Criminology*, 52, 175–184. <https://doi.org/10.1177/0306624X07303913>.
- *Hensley, C., & Tallichet, S. E. (2009). Childhood and adolescent animal cruelty method and their possible link to adult violent crimes. *Journal of Interpersonal Violence*, 24, 147–158. <https://doi.org/10.1177/0886260508315779>.
- *Hensley, C., Tallichet, S. E., & Dutkiewicz, E. L. (2009). Recurrent childhood animal cruelty: Is there a relationship to adult recurrent interpersonal violence. *Criminal Justice Review*, 34, 248–257. <https://doi.org/10.1177/0734016808325062>.
- *Hensley, C., Tallichet, S. E., & Dutkiewicz, E. L. (2010). Childhood bestiality: A potential precursor to adult interpersonal violence. *Journal of Interpersonal Violence*, 25, 557–567. <https://doi.org/10.1177/0886260509360988>.
- *Hensley, C., Tallichet, S. E., & Dutkiewicz, E. L. (2012). The predictive value of childhood animal cruelty methods on later adult violence: Examining demographic and situational correlates. *Journal of Offender Therapy and Comparative Criminology*, 56, 281–295. <https://doi.org/10.1177/0306624X10397120>.
- *Hensley, C., Tallichet, S. E., & Singer, S. D. (2006). Exploring the possible link between childhood and adolescent bestiality and interpersonal violence. *Journal of Interpersonal Violence*, 21, 910–923. <https://doi.org/10.1177/0886260506288937>.
- Hughes, G., & Lawson, C. (2011). RSPCA and the criminology of social control. *Crime, Law and Social Change*, 55, 375–389. <https://doi.org/10.1007/s10611-011-9292-7>.
- Kellert, S. R., & Felthous, A. R. (1985). Childhood cruelty toward animals among criminals and noncriminals. *Human Relations*, 38, 1113–1129.
- *Levitt, L., Hoffer, T. A., & Loper, A. B. (2016). Criminal histories of a subsample of animal cruelty offenders. *Aggression and Violent Behavior*, 30, 48–58. <https://doi.org/10.1016/j.avb.2016.05.002>.
- Lockwood, R., & Arkow, P. (2016). Animal abuse and interpersonal violence: The cruelty connection and its implications for veterinary pathology. *Veterinary Pathology*, 53, 910–918. <https://doi.org/10.1177/0300985815626575>.
- Loeber, R., Pardini, D., Homish, D. L., Wei, E. H., Crawford, A. M., Farrington, D. P., ... Rosenfeld, R. (2005). The prediction of violence and homicide in young men. *Journal of Consulting and Clinical Psychology*, 73, 1074–1088. <https://doi.org/10.1037/0022-006X.73.6.1074>.
- Longobardi, C., Iotti, N. O., Jungert, T., & Settanni, M. (2018). Student-teacher relationships and bullying: The role of student social status. *Journal of Adolescence*, 63, 1–10. <https://doi.org/10.1016/j.adolescence.2017.12.001>.
- Longobardi, C., Prino, L. E., Fabris, M. A., & Settanni, M. (2017a). School violence in two Mediterranean countries: Italy and Albania. *Children and Youth Services Review*, 82, 254–261. <https://doi.org/10.1016/j.childyouth.2017.09.037>.
- Longobardi, C., Prino, L. E., Fabris, M. A., & Settanni, M. (2017b). Violence in school: An investigation of physical, psychological, and sexual victimization reported by Italian adolescents. *Journal of School Violence*, 1–13. <https://doi.org/10.1080/15388220.2017.1387128>.
- Longobardi, C., Settanni, M., Prino, L. E., & Gastaldi, F. G. M. (2018). Emotionally abusive behavior in Italian middle school teachers as identified by students. *Journal of Interpersonal Violence*, 33(8), 1327–1347. <https://doi.org/10.1177/0886260515615144>.
- Lucia, S., & Killias, M. (2011). Is animal cruelty a marker of interpersonal violence and delinquency? Results of a Swiss national self-report study. *Psychology of Violence*, 1, 93–105.
- McPhedran, S. (2009). Animal abuse, family violence, and child wellbeing: A review. *Journal of Family Violence*, 24, 41–52. <https://doi.org/10.1007/s10896-008-9206-3>.
- McVie, S. (2007). *Animal abuse among young people aged 13 to 17: Trends, trajectories and links with other offending*. Royal Society for the Prevention of Cruelty to Animals.
- *Merz-Perez, L., Heide, K. M., & Silverman, I. J. (2001). Childhood cruelty to animal and subsequent violence against humans. *International Journal of Offender Therapy and Comparative Criminology*, 45, 556–573. <https://doi.org/10.1177/0306624X01455003>.
- Miller, C. (2001). Childhood animal cruelty and interpersonal violence. *Clinical Psychology Review*, 21, 735–749. [https://doi.org/10.1016/S0272-7358\(00\)00066-0](https://doi.org/10.1016/S0272-7358(00)00066-0).
- Miller, K. S., & Knutson, F. K. (1997). Reports of severe physical punishment and exposure to animal cruelty by inmates convicted of felonies and by university students. *Child Abuse & Neglect*, 21, 59–82. [https://doi.org/10.1016/S0145-2134\(96\)00131-7](https://doi.org/10.1016/S0145-2134(96)00131-7).
- Monsalve, S., Ferreira, F., & Garcia, R. (2017). The connection between animal abuse and interpersonal violence: A review from the veterinary perspective. *Research in Veterinary Science*, 114, 18–26. <https://doi.org/10.1016/j.rvsc.2017.02.025>.
- Overton, J. C., Hensley, C., & Tallichet, S. E. (2012). Examining the relationship between childhood animal cruelty motives and recurrent adult violent crimes toward humans. *Journal of Interpersonal Violence*, 27, 899–915. <https://doi.org/10.1177/0886260511423256>.
- Patterson-Kane, E. G., & Piper, H. (2009). Animal abuse as a sentinel for human violence: A critique. *Journal of Social Issues*, 65, 589–614. <https://doi.org/10.1111/j.1540-4560.2009.01615.x>.
- Petersen, M. L., & Farrington, D. P. (2007). Cruelty to animals and violence to people. *Victims and Offenders*, 2, 21–43. <https://doi.org/10.1080/15564880600934187>.
- Prino, L. E., Longobardi, C., & Settanni, M. (2018). Young adult retrospective reports of adverse childhood experiences: Prevalence of physical, emotional, and sexual abuse in Italy. *Archives of Sexual Behavior*, 1–10. <https://doi.org/10.1007/s10508-018-1154-2>.
- Salter, D., McMillan, D., Richards, M., Talbot, T., Hodges, J., Bentovim, A., ... Stevenson, J. (2003). *Lancet*, 361, 471–476.
- Salvagni, F. A., de Siqueira, A., Fukushima, A. R., de Albuquerque Landi, M. F., Pongeferreira, H., & Maiorka, P. C. (2017). Animal serial killing: The first criminal conviction for animal cruelty in Brazil. *Forensic Science International*, 267, e1–e5. <https://doi.org/10.1016/j.forsciint.2016.08.033>.
- *Santtila, P., & Haapasalo, J. (1997). Neurological and psychological risk factors among young homicidal, violent, and nonviolent offenders in Finland. *Homicide Studies*, 1, 234–253. <https://doi.org/10.1177/1088767997001003003>.
- Sendi, I. B., & Blomgren, P. (1975). A comparative study of predictive criteria in the predisposition of homicidal adolescents. *American Journal of Psychiatry*, 132, 423–427. <https://doi.org/10.1176/ajp.132.4.423>.
- *Simons, D. A., Wurtele, S. K., & Durham, R. L. (2008). Developmental experiences of child abusers and rapists. *Child Abuse & Neglect*, 32, 549–560. <https://doi.org/10.1016/j.chiabu.2007.03.027>.
- Slavkin, M. L. (2001). Enuresis, firesetting, and cruelty to animals: Does the ego triad show predictive validity? *Adolescence*, 36, 461–466.
- Tallichet, S. E., & Hensley, C. (2004). Exploring the possible link between recurrent acts of childhood and adolescent animal cruelty and subsequent violent crime. *Criminal Justice Review*, 29, 304–316. <https://doi.org/10.1177/073401680402900203>.
- Tapia, F. (1971). Children who are cruel to animals. *Child Psychiatry and Human Development*, 2, 70–77. <https://doi.org/10.1007/BF01434639>.
- Trentham, C. E. (2016). *The link between recurrent childhood animal cruelty and recurrent adult interpersonal violence*. Master's thesis Tennessee: University of Tennessee. Retrieved from <http://scholar.utc.edu/theses/467/>.
- Vaughn, M. G., Fu, Q., DeLisi, M., Beaver, K. M., Perron, B. E., Terrell, K., & Howard, M. O. (2009). Correlates of cruelty to animals in the United States: Results from the National Epidemiologic Survey on alcohol and related conditions. *Journal of Psychiatric Research*, 43, 1213–1218. <https://doi.org/10.1016/j.jpsychires.2009.04.011>.
- Walters, G. D. (2012). *Crime in a psychological context: From career criminals to criminal careers*. Thousand Oaks, CA: Sage.
- Walters, G. D. (2013). Testing the specificity postulate of the violence graduation hypothesis: Meta-analyses of the animal cruelty-offending relationship. *Aggression and Violent Behavior*, 18, 797–802. <https://doi.org/10.1016/j.avb.2013.10.002>.
- *Walters, G. D. (2014). Testing the direct, indirect, and moderated effects of childhood animal cruelty on future aggressive and non-aggressive offending. *Aggressive Behavior*, 40, 238–249. <https://doi.org/10.1002/ab.21514>.
- *Walters, G. D. (2017). Animal cruelty and firesetting as behavioral markers of fearlessness and disinhibition: Putting two-thirds of Macdonald's triad to work. *The Journal of Forensic Psychiatry & Psychology*, 28, 10–23. <https://doi.org/10.1080/14789949.2016.1244856>.
- *Walters, G. D., & Noon, A. (2015). Family context and externalizing correlates of childhood animal cruelty in adjudicated delinquents. *Journal of Interpersonal Violence*, 30, 1369–1386. <https://doi.org/10.1177/0886260514540328>.
- *Wright, J., & Hensley, C. (2003). From animal cruelty to social murder: Applying the graduation hypothesis. *International Journal of Offender Therapy and Comparative Criminology*, 47, 71–88. <https://doi.org/10.1177/0306624X02239276>.