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The Psychology of Childhood Animal Harm:
Risk Factors, Pet Relationships, and Novel Intervention
Evaluation

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Thesis submitted in fulfilment of the requirements for the degree of
Doctor of Philosophy (Ph.D.) in Clinical Psychology

To

The University of Edinburgh

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Declaration

I declare that the thesis has been composed by myself and that the work has not been submitted for any other degree or professional qualification. I confirm that the work submitted is my own, except where work which has formed part of jointly-authored publications has been included. My contribution and those of the other authors to this work have been explicitly indicated below. I confirm that appropriate credit has been given within this thesis where reference has been made to the work of others.

The work presented in Chapter 2 was previously published in *Anthrozöos* as “Understanding and Conceptualizing Childhood Animal Harm: A Metanarrative Systematic Review” by Laura Wauthier (PhD student) and Prof. Joanne Williams (primary supervisor). This study was conceived by all of the authors. I carried out the literature search, synthesized results, drafted the manuscript, and made revisions following peer-review.

The work presented in Chapter 3 was previously published in the *Journal of Interpersonal Violence* as “A Qualitative Study of Children’s Accounts of Animal Cruelty: Uncovering the Roles of Trauma, Exposure to Violence, and Attachment” by Laura Wauthier (PhD student), the Scottish SPCA, and Prof. Joanne Williams (primary supervisor). This study was conceived by the first and last authors. I carried out the interviews with children, transcribed, and analysed the results, drafted the manuscript, and made revisions following peer-review.

The work presented in Chapter 4 was previously published in *Anthrozöos* as “A Preliminary Exploration of the Psychological Risk Factors for Childhood Animal Cruelty: The Roles Attachment, Self-regulation and Empathy” by Laura Wauthier (PhD student), Steve Farnfield, the Scottish SPCA, and Prof. Joanne Williams (primary supervisor). This study was conceived by the first and last authors. I carried out the interviews with children, analysed the results, drafted the manuscript, and made revisions following peer-review.

The work presented in Chapter 5 was previously published in *Human Animal Interactions* as “The Role of Attachment in Children’s Relationships with Pets: From Pet Care to Animal Harm” by Laura Wauthier (PhD student), Steve Farnfield, and Prof. Joanne Williams (primary supervisor). This study was conceived by all of the authors. I carried out the interviews with children, coded video data, analysed the results, drafted the manuscript, and made revisions following peer-review.

Signed: Laura Wauthier

Date: 19/12/2022

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Dedication

To all the childhood pets who accompanied me

Pelotte, Peluche, Paws, and Plume

and to the horses who taught me so much

Axel, Ceasefire, Atlanta, and Lily

Abstract

Research consistently demonstrates that animal harm is associated with a range of serious psychosocial issues. Despite the importance of early identification and intervention, little research has been carried out directly with children, and evidence on how to effectively intervene to prevent continuing cycles of harm is lacking. This thesis aims to fill this gap. It adopts a child-centred approach to understand the psychological risk factors for animal harm and evaluates Animal Guardians, a novel educational intervention delivered by the Scottish Society for Prevention of Cruelty against Animals (SPCA) for high-risk children.

The first study is a meta-narrative systematic review of research carried out between 2010-2020 on childhood animal cruelty (CAC). This study reviews 69 publications, including theoretical and empirical research in criminology, social work, and psychology. A range of themes emerge across the literature. Environmental risk factors include exposure to childhood adversity, experiences of violence, and witnessing animal cruelty. Psychological risk factors include externalizing disorders, low empathy, low self-esteem, poor family functioning, and being accepting of cruelty. Results also suggest that CAC which is recurrent or extreme links to later interpersonal violence, and that many psychosocial barriers exist in measuring and reporting CAC. The review also highlights issues regarding inconsistent operationalization and discusses issues with definitions which are often disconnected from animal welfare legislation and child development.

The second study takes a qualitative approach, interviewing ten children referred to the Animal Guardians programme (average age= 8.8 years, n=9 males). It uses a variety of child-friendly techniques including crafts, vignettes, open questions, and standardized measures. Interviews were analyzed using content analysis to answer specific questions and interpretative phenomenological analysis (IPA) to extract overarching themes. Content analysis suggested that referred children (a) tended to have small attachment networks which often included pets, (b) tended to interpret ambiguous situations predominately negatively, (c) tended to like animals and see them as sentient, and (d) struggled admitting to cruelty. Three main superordinate themes emerged from the IPA: (a) Bonding to animals, (b) Exposure to/normalization of violence, and (c) Signs of emotional issues/trauma. Together, these results suggest that children who were referred for animal cruelty toward their pets came from vulnerable backgrounds, had complex circumstances surrounding their at-risk or cruel behaviour, and sometimes had trouble regulating their emotions and behaviours.

The third study takes a quantitative approach to understanding the psychological risk factors for childhood animal harm by comparing nine children referred to the Animal Guardians programme to 18 classmate controls. A range of parametric and non-parametric tests of difference were used to analyse differences on a range of novel and established psychological measures. Children at high-risk of animal harm were more likely to be

insecurely attached, scored significantly higher on Strengths and Difficulties and Callous Unemotional traits as rated by their teachers, scored lower on cognitive empathy, and performed more poorly on an executive functioning task. No significant differences were found between high-risk and low-risk children on self-reported empathy or emotion recognition. Drawings indicated secure children tended to feel closer to mothers and siblings, while pets' proximity did not vary according to attachment strategy. Although insecure children scored lower on mentalising about pets, caregiving behaviour towards pets, and parental help in resolving conflict with pets, both groups similarly used pets as sources of comfort. Thus, although insecure attachment was an important risk factor for harming animals, secure and insecure children had similar capacity for bonding with their pets.

The fourth study is an evaluation of Animal Guardians, using a matched-control sample of 48 children (24 referred to AG and 24 controls) who completed a pre- and post-test activity pack measuring targeted constructs. Mixed ANOVAs showed that children receiving the AG program improved significantly more than controls on welfare knowledge, behaviour towards animals, cognitive and behavioural empathy. Furthermore, post-hoc tests showed that referred children improved significantly on belief in animal minds and affective empathy. The intervention was equally effective for girls and boys, and independent of harm-severity at referral. Younger children had a marginally greater improvement than older children, and post-hoc tests showed this was because they started with lower levels of welfare knowledge. These results show that AG is an effective program and suggests that educational interventions can be a positive way of reducing risk of animal harm.

This thesis provides an in-depth and child-centred exploration of the risk factors for childhood animal harm and provides the first evaluation of an intervention targeting this behaviour. The effectiveness of the Animal Guardians programme is promising and suggests that early educational intervention is feasible. Implications for animal welfare, clinical practice, and intervention development are also discussed.

Lay Summary

Why should we care about children's relationships with animals? We know that interacting with animals can have many benefits, and that pets play an important role in children's lives. However, we understand much less about why some children harm animals, and how to help prevent this from happening. These situations are often complex but can be a sign that something is wrong in the child's life, and that they need more support. The Scottish SPCA, one of Scotland's largest animal welfare charities, teamed up with a research team at the University of Edinburgh to try and help children who had hurt animals. Together, the teams designed Animal Guardians, a new education programme for children in primary school (ages 4-12). This thesis presents the results of this collaboration, including what we have learned about why children hurt animals, and how well Animal Guardians works as a programme.

The first study (Chapter 2) analyses the research published in the past ten years, on the topic of childhood animal harm. It establishes that animal harm is often linked with witnessing violence, but also with difficulties regulating emotions, with low empathy, and with negative attitudes towards animals. Furthermore, it recommends that researchers adapt their tools and make them age appropriate for children. For instance, using certain stigmatizing terms, definitions, and measures might prevent children from discussing these issues. Finally, viewing childhood animal harm as part of a spectrum of interaction with animals will allow researchers to explore more nuanced questions.

The second study (Chapter 3) explores interviews done with ten children who had been referred to Animal Guardians after animal harm incidents, during the programme's very first year. These children completed activities and were asked questions about their understanding of animal harm and their relationships with animals. This first step was necessary because very few studies had previously been done directly with children (most studies are with adults asked about their childhood). The chapter explores themes in children's responses and found that: children showed that they usually liked animals, knew that harming an animal was not right, and often felt bad for having done so. However, most of the children had problems controlling their emotions and behaviour, and/or had experienced trauma. They had often seen other people hurt animals or had seen animals being aggressive (and so thought it was a normal way for animals to behave).

The results of the third study are split into Chapters 4 and 5. They compare answers given by children referred to Animal Guardians with answers to the same questions asked to children from their class who had not hurt animals (the "control" group). This was done to understand what differences there might be between the two groups, to find out what type of support would benefit the referred children. The results presented in Chapter 4 show that children referred to Animal Guardians had less secure bonds with their parents

(attachment), had more difficulties with self-regulation (executive functions), and had some issues understanding others' feelings (empathy). Chapter 5 explores children's relationships with their pets. It finds that even children who did not have secure attachment bonds with their parents could use pets as sources of comfort. However, these children found it more difficult to understand pets' emotions or their needs than children who enjoyed secure bonds with their parents. This was true both for the children who had been referred to Animal Guardian and for the children in the "control" group. Being able to trust parents to help when ambiguous situations arose seems to make the biggest difference.

The fourth study (Chapter 6) evaluates how well the Animal Guardians programme works to help children improve on some of these issues. Results show that the programme improves children's understanding of both human and animal emotions. It also strengthens their knowledge about what animals need to stay happy and healthy, and it does reduce how often they report harming animals. Animal Guardians worked just as well for girls and for boys, no matter how serious the harm they had caused an animal. It worked slightly better for the younger children, suggesting that early support is especially important.

In summary, this work explores animal harm from the child's perspective, and shows that while children who harm animals are often from vulnerable backgrounds or have difficulties, we can indeed help them improve their interactions with animals. The hope is that by helping children early, they can build positive relationships with animals and enjoy the benefits of interacting with them (without harming them).

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Chapter 1: Introduction

Child-Animal Interactions in Psychological Practice

The importance of adopting a holistic, child-centred approach to research and practice is increasingly being recognized across a range of psychological disciplines. In Scotland, Get it Right for Every Child (GIRFEC) is the national approach to improving child wellbeing, and emphasizes the importance of “placing the child and their family at the heart” and “understanding wellbeing as being about all areas of life” (Scottish Government, 2022). In fact, adopting a comprehensive view of a child’s development provides opportunities for more nuanced and effective approaches for prevention and treatment and is part of a broader movement away from a medical and diagnostic model of mental illness into one which emphasizes mental wellbeing and resilience (see e.g., Children and Young People’s Mental Health Taskforce, 2015). Despite the prevalence and importance of animals in children’s lives (Melson, 2005; Purewal et al., 2017), child-animal interaction is rarely included in this holistic view. This introduction argues that psychology should take a greater interest in the developmental significance of children’s relationships with animals across a spectrum from harm to positive interactions.

This introduction (1) explores how animals are present in the lives of many children, (2) analyses how this is underutilised in healthcare practice, (3) presents tools and definitions for more holistic study, (4) describes relevant research on risk and protective factors, illustrating these with three case studies, and (5) makes recommendations for intervention in cases of animal harm.

1.1 Animals In the Lives of Children

Current statistics suggest that more than three-quarters of children in Western countries live with pets (Wall, 2022; Purewal, 2019; Marsa-Sambola et al., 2016). In fact, children are more likely to grow up with a pet than a sibling (about 42% of families in the UK have only one child) or their biological father (20% children live with single mothers; Office of National Statistics, 2022; see also Melson, 2005). Given this high prevalence, it is surprising that the effects of animals on children’s development has not yet received more attention. Despite the scarcity of research, Gail Melson’s (2005) book *Why the Wild Things Are* highlights the psychological importance of animals in the lives of children and presents a thorough account of the mechanisms involved. In line with the *biophilia hypothesis* (Kellert & Wilson, 1993), Melson argues that animals are deeply psychologically rooted in humanity’s

evolutionary past, which creates a predisposition to attune to animals. From there, she explores at least five ways in which animals impact the lives of children:

- 1) Through the roles pets play as part of the family in children's expanding **attachment** networks, especially in developing **caregiving** behaviours.
- 2) Through the use of animals in **educational settings**, especially as naturally attractive ways of engaging **attention** and developing various **cognitive skills** such as biological knowledge, theory of mind, and concepts of morality and welfare.
- 3) Through the potentially **therapeutic benefits** of interactions with animals, including through physiological pathways, and because animals may be seen as less threatening than humans, especially in cases of trauma and abuse.
- 4) In the way animal imagery and **symbology** pervades children's culture, from stories and fairy tales to toys and as a "first vocabulary" for understanding self and other.
- 5) The concerning link between childhood **animal cruelty**, exposure to violence, and later commitment of interpersonal violence, accompanied by the contradictory messages children receive on what counts as animal cruelty.

Melson cautions that research into child-animal interaction should not try to answer the one-dimensional question: "Do pets or other animals affect children?". Rather, adopting the lens of *environmental specificity*, we should ask: "Which aspects of child-pet relationships affect which children, in which ways, and at what times?" (p. 192). Melson concludes by arguing for a *biocentric approach* to child development: "Opening up the study of children's development, currently framed solely in terms of other people, to include nonhuman animals illuminates neglected corners of childhood," and may "lead to new insights about children's thoughts, feelings, and ties, to other humans" (p. 190).

Melson was right, if we don't ask the right questions, we will not get relevant answers. For instance, studies investigating the effect of pet *presence* on children have tended not to show significant effects (see e.g., Purewal 2019), but studies investigating the *quality* of children's relationships to pets have found that closer bonds lead to positive effects (see e.g., Marsa-Sambola et al., 2017). Furthermore, research has noted that different types of

pets may provide different benefits (Muldoon et al., 2019b), and that benefits change developmentally, from infancy to childhood and into adolescence (Muldoon et al., 2019a).

Melson was also right that animals are deeply imbedded in children's social and psychological development. On the one hand, children view pets as members of their family (Marsa-Sambola et al., 2016) and as sources of support (McNicholas & Collis, 2001), can be impacted by pet bereavement (Schuurman, 2020), and can develop a range of psychological skills through interactions with pets (Vidovic et a., 1999). On the other hand, we also know that animal abuse in families is associated with higher risk of child abuse (McDonald et al., 2019; Ascione & Arkow, 1999), and that children who harm animals are at higher risk of having a range of psychological issues and developing behavioural disorders (Hawkins et al., 2017). It seems that children's interactions with animals could act as valuable markers for child wellbeing, but questions about animals are not routinely included in clinical practice or social work in the UK. It is worth noting that much of this research continues to be spearheaded by animal welfare organizations hoping to reduce cases of animal harm and improve animal wellbeing¹.

1.2 Childhood Animal Interaction in Practice

Current mental health practice does not provide guidelines on how to discuss child-animal interaction nor how to integrate it into care, even though the link between animal harm and various psychopathologies is established. Furthermore, interpersonal violence seems to be both a cause and consequence of childhood animal harm (CAH), while positive interactions with animals promote wellbeing through development. This section argues that this is a blind spot for practitioners and aims to raise awareness of the implications.

1.2.1 Conduct Disorder and Other Psychopathologies

In current clinical practice, children's interactions with animals are only discussed for the diagnosis of conduct disorder (CD). CD is defined as a "repetitive and persistent pattern of behaviour in which the basic rights of others or major age-appropriate societal norms or

¹ This echoes history: the first child protection lawsuit was spearheaded by members of the American Society for the Prevention of Cruelty to Animals (Unti, 2008).

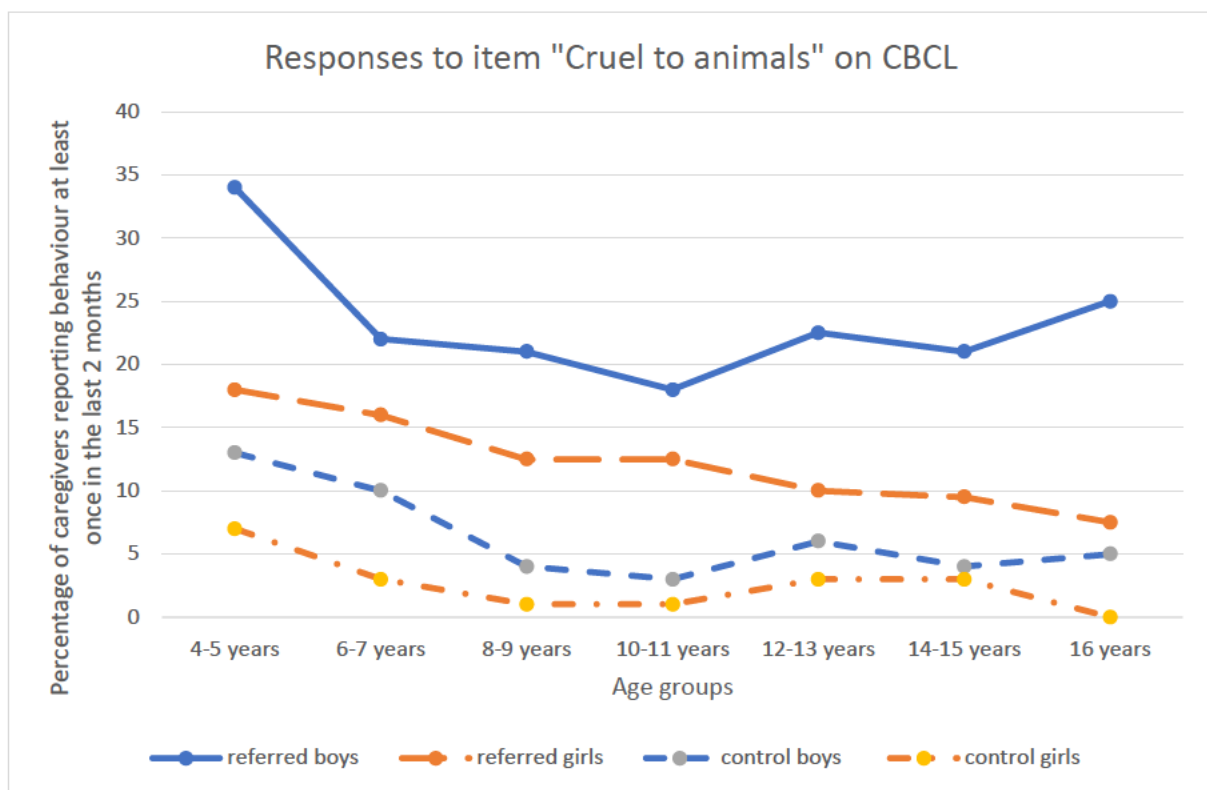
rules are violated” (American Psychiatric Association [APA], 2013). In 1987, animal cruelty was added to a list of one of 15 behaviours which could indicate CD, and since then childhood animal cruelty has been found to be one of the earliest indicators of childhood-onset CD, with an average age of onset around 6.5 years (Miller, 2001). Conduct disorder is one of the most prevalent childhood mental health conditions affecting 5% of children and is the most common reason for referral to Child and Adolescent Mental Health Services (CAMHS; National Institute for Health and Care Excellence [NICE], 2013). CD is the childhood precursor to antisocial personality disorder (ASPD) in adulthood, and both diagnoses are highly correlated with deviance and offending behaviour (Robert & Coid, 2010). There are various subtypes of childhood-onset CD, and childhood animal cruelty seems particularly associated with the subset of children displaying *callous unemotional (CU)* traits (Dadds et al., 2006). CU traits are defined as low affect combined with lack of empathy, remorse, or guilt, and are associated with more severe outcomes and the development of psychopathy (Frick & White, 2008). Furthermore, within children diagnosed with CD, those who have been cruel to animals have significantly greater histories of abuse and exposure to domestic violence (Duncan et al., 2005).

Although *diagnostically* only applicable to CD, childhood animal harm is associated with a wide range of mental health issues and psychological risk factors. Nearly 30% of therapists surveyed in the USA reported dealing with animal abuse issues in therapy sessions (Schaefer et al., 2007), suggesting it is not a rare issue. Animal harm behaviour can occur in children with a range of externalising disorders, including children with ADHD (Becker et al., 2004), and is likely linked more generally to trait impulsivity (Newberry, 2018). Animal harm is also reported to be more likely in populations with lower rates of empathy or reduced perspective taking skills, including those with CU traits or children with autism spectrum disorder (ASD; Burrows et al., 2008), either because children do not realise what they are doing is causing distress (low cognitive empathy) or because they do not care (low affective empathy). From a risk perspective, childhood animal cruelty can be a red flag for exposure to family violence (DeGue & DiLillo, 2009; Lee-Kelland & Finlay, 2018), trauma and adverse childhood experiences (ACEs; Bright et al., 2018), and witnessing animal abuse (Browne & Hensley, 2017). In adolescence, animal abuse can be related to delinquency and emerging patterns of antisocial behaviour (Lucia & Killis, 2011; Longobardi & Badenes-Ribera, 2019).

Signal et al. (2013) provide one of the only studies investigating how psychologists use information about animal cruelty in diagnosing and treating children. They presented 69 psychologists registered to practice in Queensland, Australia, with two vignettes (based on real cases), corresponding to either a diagnosis of ADHD or CD, and both containing incidents of animal harm. Although most psychologists paid attention to animal cruelty in the CD vignette, endorsing it as both a primary indicator for diagnosis and key target for intervention, there was a much lower tendency to indicate animal cruelty as a primary indicator for the ADHD vignette, and addressing animal cruelty was the *least frequently* endorsed area for primary intervention. Signal et al. highlight that this low level of concern outside of CD diagnosis is worrying, given that childhood animal cruelty is a red flag for a number of issues. They suggest that childhood animal cruelty should become a psychological diagnostic tool irrespective of CD diagnosis. Randour (2007) notes that until professional organisations of psychologists (e.g., the APA, BPS) recognise the importance of childhood animal cruelty, many psychologists will not enquire about or pursue disclosures, and Signal et al. suggest that the DSM is “unintentionally creating a barrier to considering childhood animal cruelty as an indicator worthy of consideration regardless of presenting behaviours” (p. 85).

The item “cruel to animals” was added to the Child Behaviour Checklist (CBCL) in 1991, and results from a national survey in the USA provide interesting insights into possible rates of prevalence and illustrates the usefulness of childhood animal cruelty to act as a marker for a range of psychopathologies (Achenbach et al., 1991). Figure 1.1 shows rates of animal cruelty as reported by parents of children of different ages (adapted from Ascione, 2005). We can see that rates are much higher in girls and boys referred for *any* problem to a mental health clinic compared to a nationally representative sample of controls screened for absence of mental health issues. We can also see a sustained difference in boy’s and girl’s rates of animal cruelty and that cruelty rates are highest in young children and tend to decrease with age, except in the clinically referred group of boys. However, an important caveat is that there can be issues in the reliability of parent’s reports of animal cruelty (Walters, 2018) because the behaviour can be hidden, stigmatised, and there are definitional issues regarding what constitutes childhood animal cruelty (Ascione, 2005).

Figure 1.1: Rates of animal cruelty by age.



Note: reported by parents for a representative sample of referred and control children. Adapted from *Children and Animals: Exploring the Roots of Kindness and Cruelty* by Ascione, 2005, p. 35. Data was from a personal communication based on Achenbach et al., 1991.

1.2.2 Childhood Animal Cruelty and Interpersonal Violence

If clinical psychology has taken such a limited interest in childhood animal cruelty, which areas of practice have investigated it? Most of the early research on childhood animal cruelty was carried out from a forensic psychology perspective and focused on its ability to predict interpersonal violence. Based on research carried out with violent psychiatric patients, the *MacDonald triad* proposed that the co-occurrence of enuresis (bed wetting), fire-setting, and animal cruelty in childhood was predictive of later violence, especially serial-killing (Felthous & Bernard, 1979). However, later research struggled to replicate this finding, and the triad seems more likely to be predictive of dysfunctional home environments or children who are having difficulty coping with stress (Parfitt & Alleyne, 2020). The *violence graduation hypothesis* (VGH) proposes that there is a direct causal mechanism linking childhood animal cruelty to later interpersonal violence (Wright & Hensley, 2003) because animal cruelty provides the individual with the opportunity to

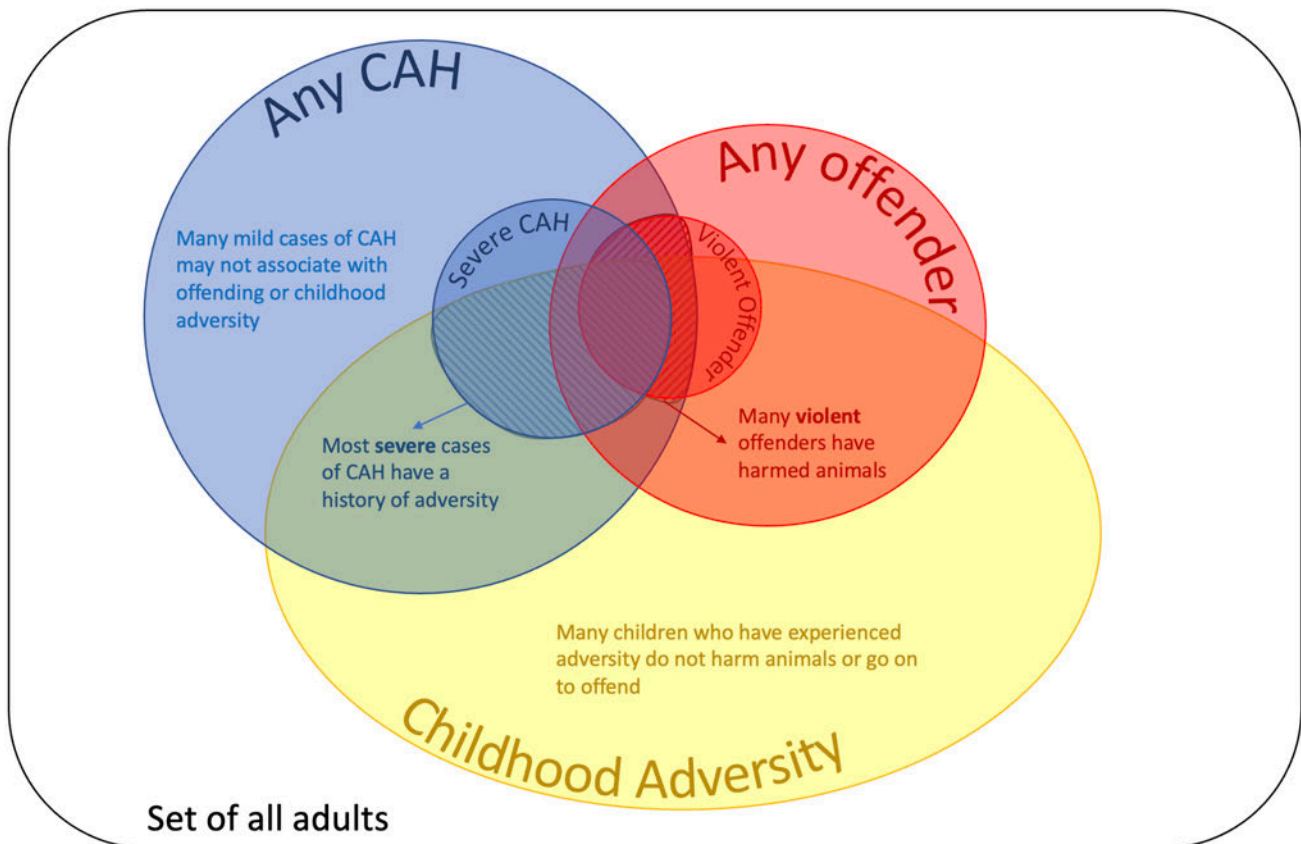
practice violence and be desensitised to its consequences. Research for this hypothesis came from studies which found that rates of childhood animal cruelty were higher in samples of violent offenders when compared to non-violent offenders (see e.g., Merz-Perez et al., 2001), including serial killers (e.g., Wright & Hensley, 2003) and school shooters (Arluke & Madfis, 2014). The problem is that these are atypical samples using retrospective methods, which create biases and reduce generalisability. In fact, a meta-analysis controlling for various sources of bias showed that childhood animal cruelty correlated equally well with violent and non-violent offending (Walters, 2013).

Unlike the previous two theories, the *deviance generalisation hypothesis* (DGH) does not suggest that childhood animal cruelty leads specifically to later interpersonal violence, but simply notes that a wide range of offending behaviours tend to co-occur (Arluke et al., 1999). It suggests that someone who is cruel to animals will be more likely to commit other offenses, “either because one form of deviant behaviour leads to involvement in other forms of deviance or because different forms of deviance have the same underlying causes” (Arluke et al., 1999, p. 965). This theory has received support from a range of research and is probably the most substantiated (Walters, 2013). Gullone (2013) provides an excellent synthesis on the link between animal cruelty and interpersonal violence, while Longobardi & Badenes-Ribera (2019) provide a systematic review of this literature. The developing consensus seems to be that childhood animal cruelty that is *intentional, severe, and recurrent* is particularly predictive of psychopathology and later interpersonal violence.

Another discipline which has informed research on the link between childhood animal cruelty and interpersonal violence is social work. Research has long noted the “The Link” between animal abuse and other forms of abuse in the household such as domestic violence and child abuse (DeViney et al., 1983; Jegatheesan et al., 2020). Furthermore, witnessing animal abuse can be a traumatic experience leading to later internalising and externalising behaviour issues (Ladny & Meyer, 2020). There have been repeated calls for better cross reporting between social work and animal welfare charities to identify cases of abuse earlier (Randour et al., 2021). Children who are cruel to animals are more likely to have been maltreated, although only a minority of children who had been maltreated were cruel to animals (McEwen et al., 2014).

One of the lessons from these literatures is that when researching “rare” characteristics, we need to be very careful of how we generalise patterns back to the population level. Figure 1.2 illustrates this by showing that while a certain trait (e.g., “those who have done any CAH” or “those who have experienced childhood adversity”) can make up a large part of a group (e.g., “those who become violent offenders” or “those who have committed severe CAH”), the reverse association is not necessarily true (“violent offenders” do not make up the majority of “Any CAH” and “severe CAH” does not make up the majority of “childhood adversity” cases). Furthermore, the dangers of trying to predict future violence using retrospective data (as in the case of studies with violent offenders) has been highlighted by Ascione (2005) and Patterson-Kane (2009), as has the tendency to use faulty logic to make these generalisations (Herzog, 2018). This figure also illustrates that the way we define CAH will have a big impact on how it associates with other factors, including psychopathologies and risk factors.

Figure 1.2: *Overlap Between Childhood Animal Harm (CAH) and Other Factors.*

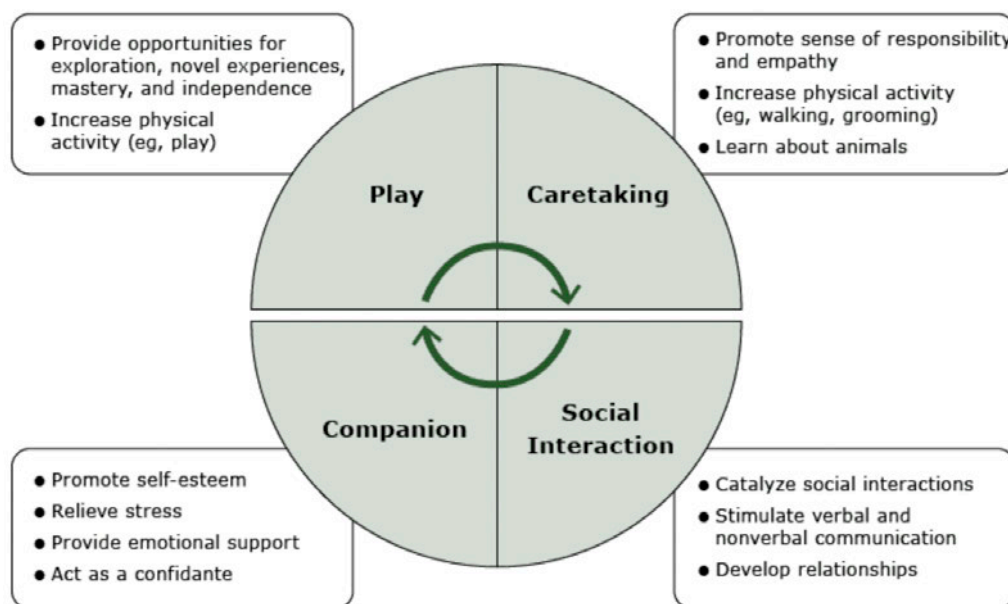


Note. Theoretical Venn diagram illustrating possible proportional overlaps between sets of people who have harmed animals as children, those who have experienced childhood adversity, and those who have become offenders as adults.

1.2.3 Positive interactions

Positive interactions and relationships with animals are not routinely asked about or considered in clinical practice either. However, research with primary healthcare providers found that “asking about pets in the family reveals clinically relevant information, improves communication, and strengthens the therapeutic alliance” (Hodgson et al., 2017). Pets can also motivate healthy behaviour by increasing physical activity and as complements to patient daily life (Martin et al., 2015). Gadomski et al. (2015) found that children with pet dogs had lower levels of anxiety and suggest that pet ownership could become part of a preventative approach at population level. They provide a model summarizing how dog ownership has been shown to benefit the development of children 4-10 years old (see Figure 1.3).

Figure 1.3: Positive effects of pet dogs on child development



Note. This model was produced by Gadomski et al. to summarize findings on how pet dogs influence physical and mental health of children 4-10 years old. From “Pet Dogs and Children’s health: Opportunities for Chronic Disease Prevention?” by Gadomski et al., 2015, *Preventing Chronic Disease*, 12, p.2. https://www.cdc.gov/pcd/issues/2015/15_0204.htm. Copyright the authors, used under Creative Commons CC BY-SA license.

The links between animal health and human health is also being increasingly recognized as part of the One Health movement, which argues that considering human, animal, and environmental health as part of a greater whole is often an efficient way of increasing welfare across all three domains (see e.g., Figure 1.4; Centre for Disease Control [CDC],

2022). From a developmental perspective, having pets in childhood may aid the development of empathy (Daly & Morton, 2006), children who are more attached to their pets rate their family climate as more positive (Vidovic et al., 1999), and positive engagement with pets may buffer the impacts of witnessing domestic violence on children's development of CU traits (Murphy et al., 2022). Together these results suggest that positive childhood pet ownership might be an important protective factor against the development of other issues. An emerging body of literature is also starting to demonstrate that animal assisted therapy (AAT) can have positive effects for a range of childhood mental health issues such as ASD (O'Haire, 2013), ADHD (Busch et al., 2016), and victims of trauma or abuse (Hoagwood et al., 2017). More broadly educational animal assisted interventions (AAI) have been found to help with social development (Pendry et al., 2014), in the reduction of aggression (Long, 2009), and with emotional regulation (Brelsford et al., 2017). Thus, AAI/Ts seem to be a promising way of engaging with a range of childhood developmental issues.

Figure 1.4: *One Health infographic created by the CDC*



Note. Part of the online social-media graphic resources created by the CDC to raise awareness for One Health. Issues they tackle include preventing the spread of zoonotic diseases, antibiotic resistance, food safety and security, environmental contamination, and mental health. From <https://www.cdc.gov/onehealth/images/social-media/zoonotic-infections-fb-tw.jpg>. Copyright CDC, used under Creative Commons Attribution CC BY-SA license.

1.2.4 Why is child animal interaction not discussed more often in child psychology?

Unfortunately, routine clinical practice is still a long way away from incorporating questions about pets or using AAls. These topics appear nowhere in NICE guidelines for work with children (although interestingly AAT is now recommended for dementia patients; NICE, 2018). This may be partially explained by the fact this is a relatively new area of research, so studies are often underpowered, there are few manualised approaches, and there are only a small number of systematic reviews available (Herzog, 2015). Still, given that (1) negative interactions with animals can act as a marker for a range of psychopathological difficulties, (2) positive relationships with animals can act as protective/resilience building factors, and (3) AAI/Ts may be effective at improving symptoms across a range of conditions, why is this not a greater point of interest for child psychology?

There seem to be at least three connecting reasons why this topic has been a difficult to integrate into psychological practice. Firstly, research on child animal interaction has tended to be heavily dichotomized into positive and negative interactions, specifically studies investigating risk factors and repercussions of childhood animal cruelty (childhood animal cruelty) on the one hand and studies on positive pet effects or AAT on the other. Thus, rather than viewing children's relationships with animals as a window into psychological processes ranging from psychopathology to positive development, research has remained relatively isolated from broader developmental theories. Secondly, child animal interaction is fundamentally an interdisciplinary area, with research coming from animal welfare science, veterinary medicine, social work, forensic psychology, psychotherapy, and educational psychology. Synthesizing research across these fields can be challenging, further impeding the development of an integrated model. Finally, research on childhood animal cruelty has historically focused on its ability to predict interpersonal violence in adulthood, which meant studying more extreme cases of animal harm with delinquent or inmate populations (see e.g., Longobardi & Badenes-Ribera, 2019). This forensic focus had several repercussions: the behaviour was (further) stigmatized, there was little research carried out directly with children, and there was wide variability in definitions (see Chapter 2). Even now, we do not have good estimates of the prevalence of childhood animal cruelty, which have been reported to vary between 1.8% (Vaughn et al., 2009) and 50.8% (Baldry, 2003), nor are there generally accepted definitions or operationalizations of the behaviour.

Understanding the psychological mechanisms underlying the spectrum of children's interaction with animals first requires a clear conceptual framework and set of definitions.

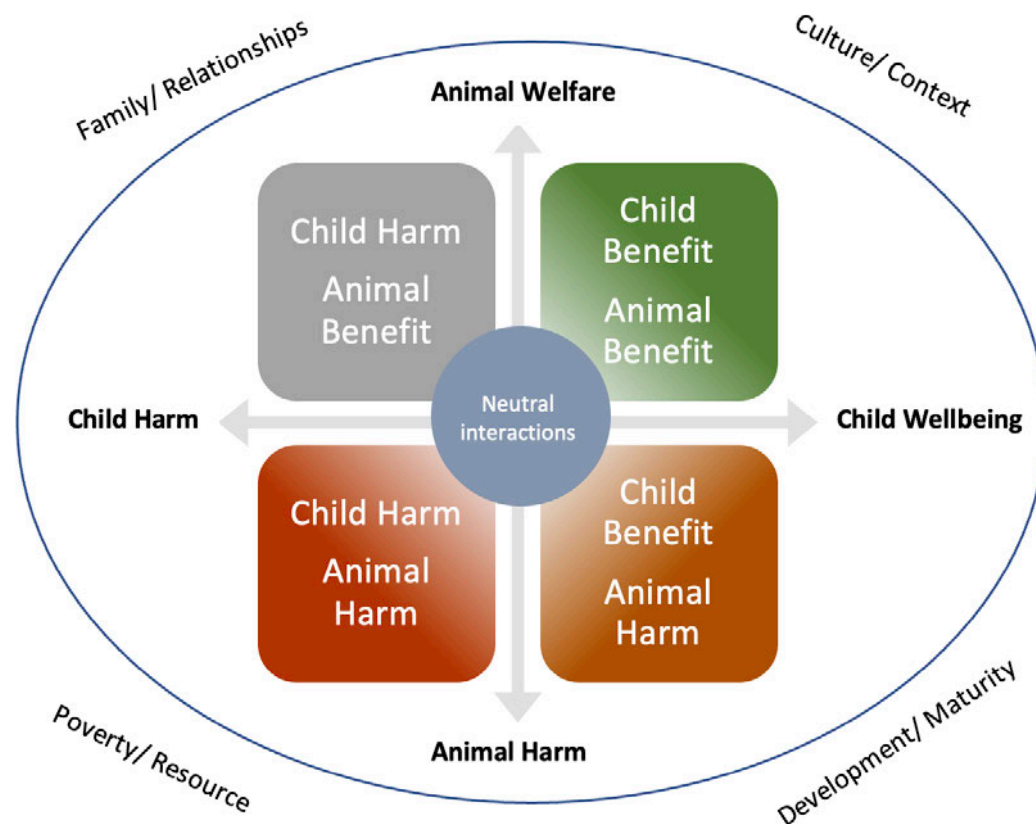
1.3 Spectrums and Definitions: Tools for a Holistic Approach

To coherently study outcomes for both the child and the animal, we need to define terms precisely and use them appropriately within animal welfare and child development frameworks. This establishes the need to adopt a multidimensional spectrum approach to risks and benefits in child animal interaction.

1.3.1 Outcomes for Children and Animals

Williams and Wauthier (in press) encourage researchers and practitioners to view child-animal interaction along a spectrum, and propose a simple classification highlighting four potential outcomes (Figure 1.5): reciprocal benefits for child and animal; reciprocal harm to child and animal; benefits to child but harm to animal; or harm to child and benefits to animal. Most research has focused on the positive side, especially the benefits of pet ownership or the impact of animal assisted interactions for children's mental health and wellbeing (O'Haire, 2013; Brelsford et al., 2017). Unfortunately, animal welfare is not always measured so we cannot say with certainty whether these interactions are always beneficial for the animal, and there are calls to increase research on this dimension (Ng, et al., 2015). Two outcomes involve animal harm: harm to the animal but not to the child (e.g., a child hitting a dog) and reciprocal harm to the child and the animal (e.g., a child hits dog who then bites the child). Especially in cases of reciprocal harm, prevention is not only an animal welfare issue but can also be a child safety issue and can prevent a cycle of phobias or negative attitudes (see for example the literature on dog bite prevention; Touré et al., 2015). This model is useful for classifying single interactions but should not be used to categorise a child's overall relationship to animals. In fact, although this thesis focuses on understanding childhood animal harm, it quickly became apparent that a single negative interaction with an animal, borne out of frustration or lack of knowledge, was not necessarily representative of the child's general relationships with animals, as they could often feel attached to their pets and view animals positively.

Figure 1.5: Positive and negative outcomes during child-animal interactions



Note. Adapted from “Psychological risk factors of animal harm and abuse among children and young people”, by Williams & Wauthier, in press.

1.3.2 Defining Childhood Animal Harm

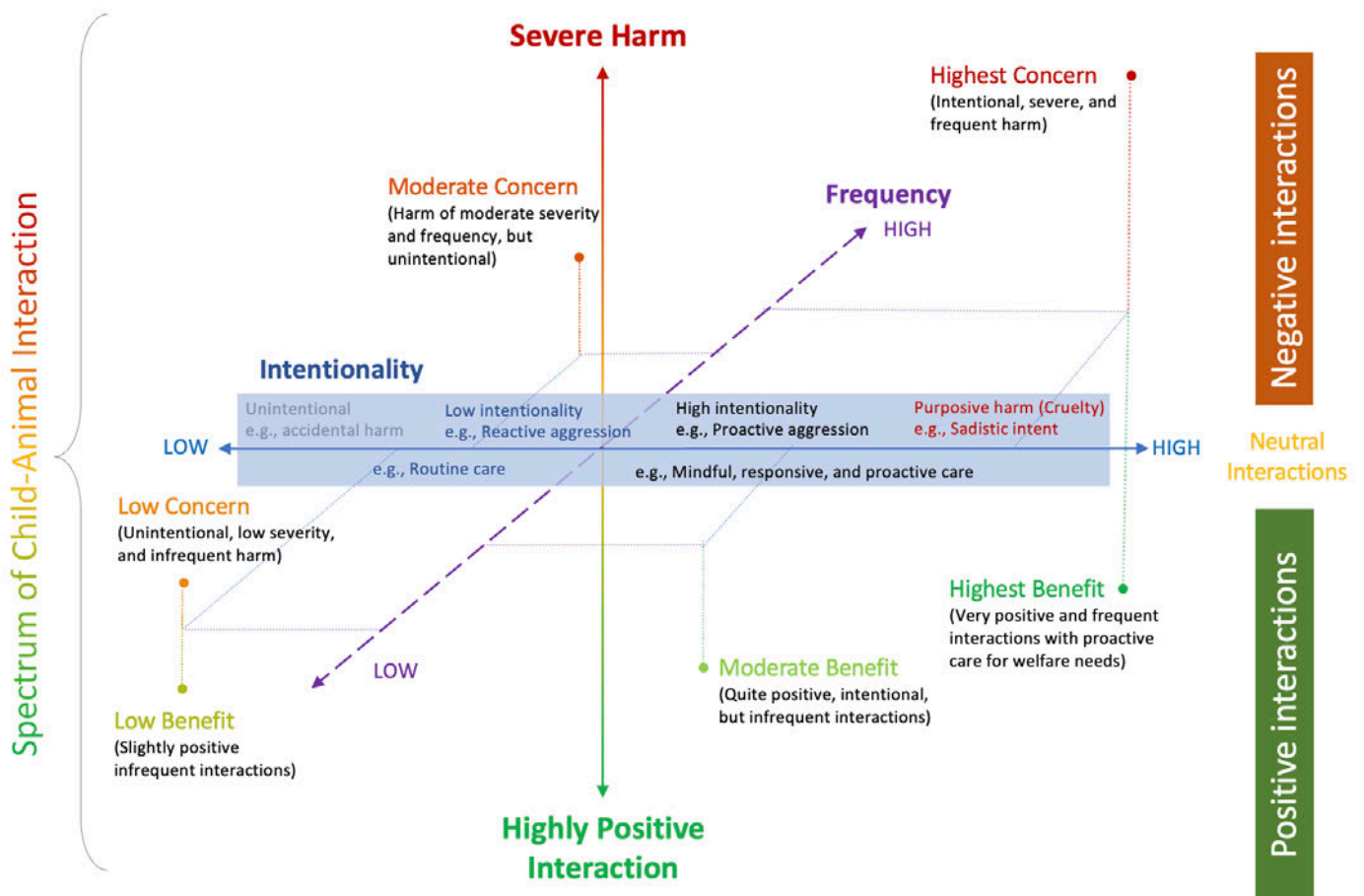
As we have seen, patterns of childhood animal harm can provide valuable insights into a range of pathological processes, but a lack of standardised definitions and operationalisation, as well as a focus on extreme cases, have hindered research and implementation. Historically, research focused on *animal cruelty*, for which the most used definition is “non-accidental, socially unacceptable behaviour that causes pain, suffering or distress to and/or the death of an animal” (Ascione & Shapiro, 2009, p. 570). However, as I discuss further in Chapter 2, childhood *animal cruelty* is an unnecessarily stigmatising and narrow term which does not align with child development or animal welfare legislation. Instead, I argue for the adoption of the more general term childhood animal harm (CAH), defined as follows: *any act, of commission or omission, where a child negatively impacts an animal’s welfare, intentionally or unintentionally*. This definition includes behaviours on the whole spectrum of intentionality, from less concerning accidental behaviours to acts which

could be described as “abuse” and “cruelty”. Capturing the full spectrum of intentionality is important because many cases of childhood animal harm fall in a grey area, including: inappropriate play or exploration, false beliefs about animal care and the use of punishment, mimicking adult actions, and lashing out as a result of issues with emotional regulation (see Chapters 2, 3; Ascione, 2005). Furthermore, this definition can work alongside animal welfare organisations and removes the need to rely on the ambiguous idea of “social norms”. For much of this thesis, I will be exploring the psychology of childhood animal *harm*. However, since it is *cruelty* which has been researched (even though children’s intentionality is often not assessed), I use the term “childhood animal cruelty” when discussing literature that uses that term.

1.3.3 Multi-dimensional Approach to Risks and Benefits

Psychologically, we are not simply interested in classifying single interactions, but in understanding what a child’s pattern of interaction with animals can tell us about underlying psychological processes. Figure 1.6 presents one way in which we might conceptualise a spectrum of child-animal interaction and categorise corresponding psychological risk or benefit. The dimension on the y-axis represents the degree of harm or benefit to the animal, the dimension on the x-axis represents the intentionality of the child’s actions, while the dimension on the z-axis represents the frequency of the behaviour. These dimensions align with literature on childhood animal cruelty, since acts which are severe, repeated, and intentional are the most predictive of future violence (see Chapter 2 for more detail). Acts with only some of these dimensions occupy a space of moderate concern, while acts of low concern would be low-harm, isolated, and accidental. This diagram also suggests the reverse pattern operates for positive beneficial behaviours, with frequent, intentional, and positive welfare-centred interactions bringing the greatest benefit. These dimensions align with research in positive psychology, which shows that frequent and intentional (or mindful) behaviours provide greater benefits to the animal and potentially the child (Zelazo & Lyons, 2011). For example, research has demonstrated that mindfulness training may enhance benefits of nature exposure such as improved mood and feelings of nature connectedness (Nisbet et al. 2019).

Figure 1.6: Multidimensional model of psychological risks and benefits in child animal interactions



Note. X-axis represents child’s intentionality, y-axis the degree of harm or benefit to the animal, and z-axis the frequency of the behaviour. Several points are labeled showing low, moderate, and high benefit or concern.

1.4 Risk and Protective Factors in Child Animal Interaction

Understanding the risk and protective factors involved over the whole spectrum of child animal interactions is important for early prevention, appropriate intervention, and ensuring animal welfare. The following overview of factors draws on two frameworks commonly used in developmental and health psychology: the biopsychosocial model and bioecological systems model². Chapter 2 will cover some of the same topics, as it presents a systematic review of the literature on childhood animal harm, for publications between 2010-2020³. To illustrate how these factors interact, I present three case studies at the end

² Williams & Wauthier (in press) present an overview of risk and protective factors using a similar framework.
³ Hawkins et al., (2017) also provide a relevant systematic review of psychological risk factors for CAH.

of this section, inspired by the children I interviewed for this thesis and the evaluation of the Scottish SPCA's novel education programme at high-risk of animal harm, Animal Guardians.

1.4.1 Frameworks for developmental and health psychology

A *dynamic biopsychosocial model* is a useful way of organising the reciprocal influences of biological, psychological, and social factors on a person's health over time (see e.g., Barrel-Corrio et al., 2004), and has recently been used to help scaffold literature on the wide range of processes involved in human-animal interaction (Gee et al., 2021). Bronfenbrenner's *bioecological systems model* (Bronfenbrenner & Ceci, 1994) places an individual and their psychological risks within nested layers of social and environmental context, starting with the person's immediate day-to-day interactions such as the family and home environment (the microsystem) and moving out to consider institutions such as schools and neighbourhoods (the mesosystem) and the broader cultural and political systems (the macrosystem). Figure 1.7 presents an overview of the factors considered and how they are organised using these two frameworks. The focus here is synthesizing research which is 1) useful for practice, 2) covers the whole spectrum of CAI, and 3) provides insights across all domains of the biopsychosocial model.

1.4.2 Biological Factors

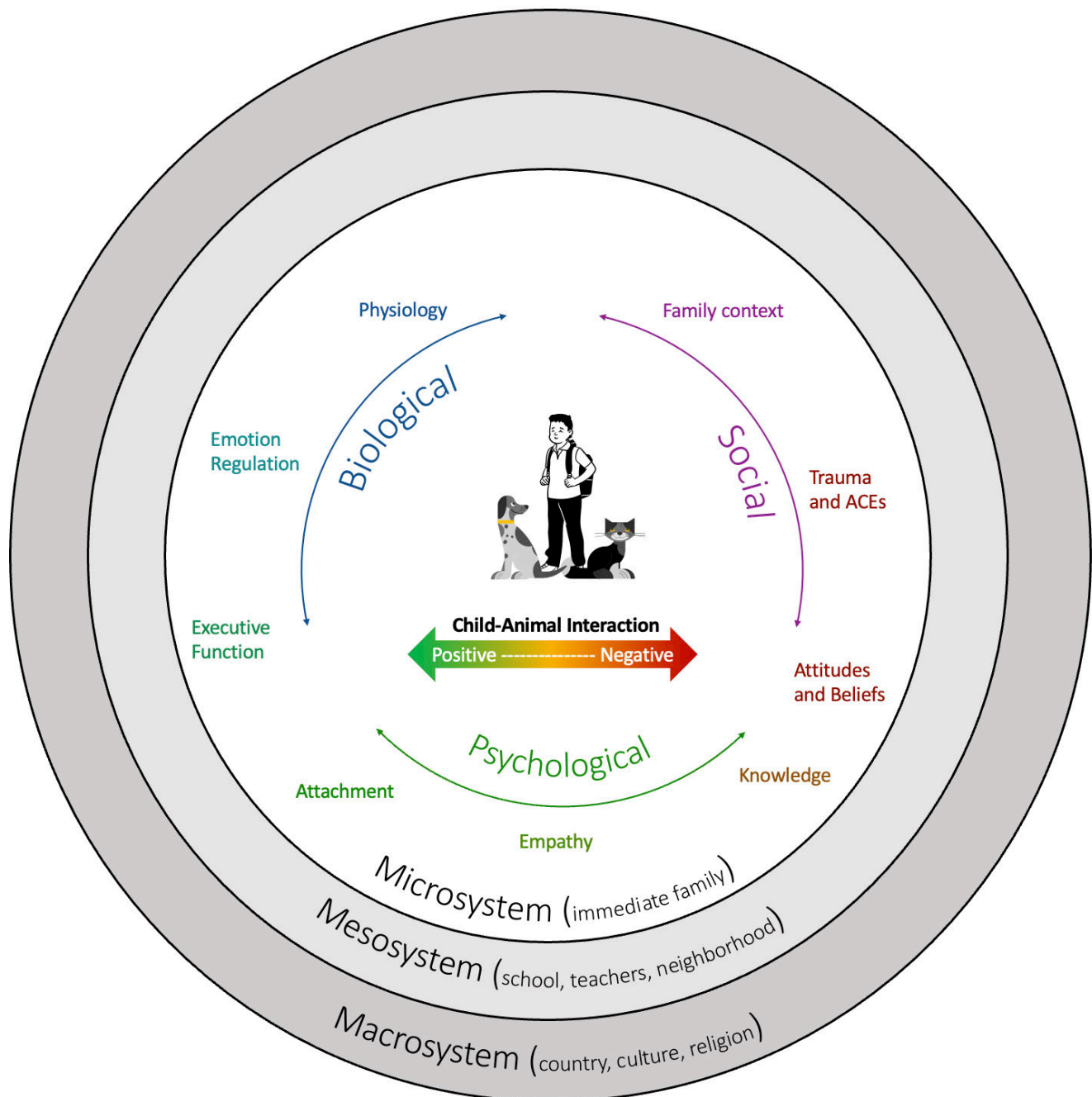
Biological factors include the impacts of age, sex, and genetic or hormonal influences. Although these factors are generally not viable targets for intervention, understanding their role in priming certain types of behaviours or psychological processes is important to clarify which children are more at risk and what is typical in different groups.

1.4.2.1 Bio-salience

E.O. Wilson proposed the *biophilia hypothesis*, which states that humans have an evolutionary cognitive bias to pay attention to natural stimuli, or an "innate tendency to focus on life and life-like processes" (p. 1; Wilson, 1984). Wilson proposes that biophilia is mediated by processes of prepared and counter-prepared learning, including for the development and extinction of phobias. This explains why a fear of spiders and snakes develops much more readily than a fear of bunnies or flowers, since the former are

associated with higher morbidity in primate evolution (see e.g., Bertels et al., 2020). Furthermore, a recent meta-analysis found that exposure to natural environments increases positive affect and decreases negative affect (Gaekwad et al., 2022). Even though the

Figure 1.7: Risk and protective factors involved in child-animal interactions



Note. Simplified illustration using biopsychosocial model and bioecological systems theory to structure relationships between risks and protective factors. “Zooming in” we can see the spectrum of child and animal interaction, and “zooming out” we see progressively larger social structures.

positive effects of nature have received the most research, there is not necessarily an overall positive affiliation to natural stimuli (Kahn, 1997). A better name for biophilia may therefore be *bio-salience*, or the idea that natural features are salient for attentional and learning processes, whether the association is positive or negative. There is a wide range of evidence supporting the salience of animals in infant development. For example, infants aged 4-12 months attended more readily to films, stationary images, and point-light displays of animals compared to similar stimuli of objects (DeLoache et al., 2011), and infants presented with a live rabbit, a toy turtle that moved, and a stranger were much more interested in the rabbit than the toy turtle and were wary of the stranger (Ricard & Allard, 1993). The reason it is important to reframe the issue as *bio-salience* is that the nature of children's relationships with animals is framed by their experience, their family, and their cultural environment. In other words, animals are highly evocative stimuli and targets of behaviour, whether that be for positive or negative interaction.

1.4.2.2 Sex

Biological sex has been shown to have an impact on a range of processes involved in interpersonal interactions, including empathy, aggressivity, and emotional expressivity, and this extends to interactions with animals. Boys are consistently found to be more likely to engage in animal abuse than girls (Dadds et al., 2006). This may reflect overall rates of aggression, which are 10 times higher in males than females, a relationship mediated primarily through testosterone (Anderson & Bushman, 2002). These sex differences in aggression start in early childhood. For example, both boys and girls both engage in rough and tumble play, which is an important part of socialisation and self-regulation (Pellegrini, 2002). However, young boys are more likely to engage in play which is aggressive, especially if they have not had high-quality rough-an-tumble play with their fathers (Flanders et al., 2009), which may be an avenue for accidental animal harm. Boys also tend to have higher rates of impulsivity and score lower on measures of emotion recognition and empathy than girls (Christov-Moore et al., 2014), which are themselves risk factors. Socialisation and gender-role identification also play a role in the development of these traits (Löffler & Greitemeyer, 2021). In fact, taking care of animals may provide a particularly useful avenue for boys to practice nurturing and caregiving behaviours, since research suggests it may

have fewer gender associations than taking care of other people (Melson, 2005, p.57). Intriguingly, one study found that male prison inmates benefited more from dog assisted therapy than female inmates (Stetina et al., 2020), although exactly why this occurred is not clear.

1.4.2.3 Genetics

Although there are no studies directly investigating the roles of genetics in child animal interactions, several genes have been identified as increasing a child's risk of externalizing disorders such as CD and ADHD (Fairchild et al., 2019). For example, one study reports that low-activity variants of the MAOA enzyme increase risk of aggressive behaviour when male children are also exposed to abuse (Fergusson et al., 2011). This also illustrates the importance of considering Gene x Environment interactions. Other genetic variants implicated in psychopathy and aggression include alleles of 5-HTTLPR, OXTR, and DRD2 genes, which are related to serotonin, oxytocin, and dopamine pathways, respectively. These pathways are implicated in mood regulation, social interaction, and reward driven behaviours (see e.g., Salvatore & Dick, 2018). Since oxytocin has also been linked to owner's bonding with their dogs during mutual eye-gazing (Nagasawa et al., 2105) it seems likely that genetic variants that either up- or down- regulate these pathways are relevant across the CAI spectrum.

1.4.2.4 Age

Age and developmental maturity impact the way children interact with animals. Certain studies suggest animal cruelty is highest in the young children (4-5 years old) and decreases with age (McEwen et al., 2014), but others have found that rates are highest in adolescence (Gullone, 2013, p. 116). This disparity may reflect differences in definitions of animal cruelty, since *severity* is likely to increase with age: adolescents are stronger and more likely to harm animals as a group or as part of delinquent pattern of behaviour, so will appear to have higher rates if only more severe acts are counted. In any case, the patterns, motivations, and severity of animal harm shift through development. In fact, Ascione (2005) suggested a typology of animal cruelty based on age: 1) exploratory animal harm in young children resulting from low knowledge and more likely if children are poorly supervised, 2) pathological animal harm in middle childhood symptomatic of psychological disturbances,

and 3) delinquent harm in adolescence more likely to be part of a group. Although age alone does not allow for a sufficiently nuanced typology (Ascione, 2005), this classification reflects overall trends. Age has also been implicated in positive child animal interactions, with younger children reporting they are more closely attached to their pets than older children or adolescents (Muldoon et al., 2019a). However, older children are more likely to be involved in caring responsibilities, and increased levels of pet care are predictive of a greater bond between child and pet (Triebenbacher, 1999; Hall et al., 2016).

1.4.3 Social/Environmental Factors

Children's family, social, and cultural environments frame their relationships with animals. Chapter 3 provides a much deeper exploration of the role of some of these contextual factors, especially exposure to violence, in explaining children's animal harm behaviours. Although these factors can be difficult to intervene on directly, they are important as a way of supporting interventions to identify risk or protective factors that need to be addressed or encouraged (respectively).

1.4.3.1 Exposure to Violence and Adverse Childhood Experiences

Exposure to adversity in childhood has been consistently shown to increase risk for a range of psychopathologies, including animal cruelty. For example, exposure to family trauma as measured through Adverse Childhood Experiences (ACEs) has been linked to higher rates of animal cruelty (Bright et al., 2018). Exposure to violence seems to be a particularly strong risk factor, and children who witness domestic violence or animal abuse are at high risk of harming animals (Currie, 2006; see also: Ascione, 2005; Gullone, 2013). Children who have experienced sexual abuse also have a greatly increased risk of animal cruelty (Becker & French, 2004). Exposure to violence increases risk of childhood animal harm through social learning, since children will model the behaviours they witness (Bandura & Walters, 1977; Henry, 2018) and through hyper-activation of the HPA axis, which interferes with brain development and reduces capacity for arousal regulation (Van der Kolk, 2003). Children exposed to family violence will also tend to have schemas of the world as an unsafe place, which can lead to hostile attribution biases and an increased likelihood of an aggressive response (Zhu et al., 2020). In fact, a qualitative study found that children who had harmed animals made hostile attributions and had anthropomorphic beliefs about the animal they

had harmed (McDonald et al., 2018; we return to this theme in Chapter 3). However, animals can also be less threatening to children who have been maltreated and therefore do not trust humans, which can make animals effective adjuncts to therapy (Parish-Plass, 2008).

While the presence of animals in households with high levels of violence increases the risk of childhood animal harm, animals can also serve as protective factors in such situations. For example, one study that found that for children exposed to intimate partner violence (IPV), the relationship between IPV and CU traits, internalising problems, and post-traumatic stress were all moderated by positive engagement with pets (Hawkins et al., 2019; Murphy et al., 2022). Other research has shown that children who are abused are simultaneously at higher risk of harming pets but also derive more comfort from pets (Yamazaki, 2010). These findings highlight the differential effects children's interaction with animals can have depending on the context and whether the relationship to the animal is a positive or negative.

1.4.3.2 Family Context

Certain parenting factors have been implicated in childhood animal harm, although this has received much less research. Consistent with the above findings, children of parents using corporal punishment were more likely to abuse animals (Flynn, 1999), and children of parents who did not like animals are also more likely to harm animals (Akdemir and Golge, 2020). Perhaps a more subtle relationship is the role of "parental warmth". One study found that adults who described their parents as "not loving" were more likely to have harmed animals as children (Fielding et al., 2011). These environmental factors interact with children's developing capacity for emotional regulation and their cognitive schema, discussed more in the following section. Socioeconomic disadvantage also associates with higher rates of childhood animal harm, although there seems to be an interaction with age and child maltreatment as predictors (McEwen et al., 2014). Another important way in which family and social context impacts risks of animal harm is through *moral disengagement*: the set of socio-cognitive tactics (such as cognitive restructuring, minimising, and disregarding the consequences), which a person can use to reduce the cognitive dissonance, blame, and guilt, they feel when they act in a harmful way (Bandura,

1999). Moral disengagement is highly related to both negative family functioning and harsh parenting (Hyde et al., 2010) and has been shown to predict bullying behaviour in children (Hymel & Bonanno, 2014), which is itself linked to animal harm (Henry & Sanders, 2007). These strategies are central to Angew's (1998) conceptualisation of the determinants of animal abuse. Pets can also interact with family contexts in positive ways, for example Marsa-Sambola et al., (2017) found that adolescents with higher attachment to pets had better communication with parents and friends, an effect mediated through caring activities related to cat and dog ownership. Furthermore, relationships with pets may be especially important to children who have few other opportunities for human attachment, such as only children and children in single-parent households (Wanser et al., 2019).

1.4.3.3 Attitudes, Beliefs, and Schemas

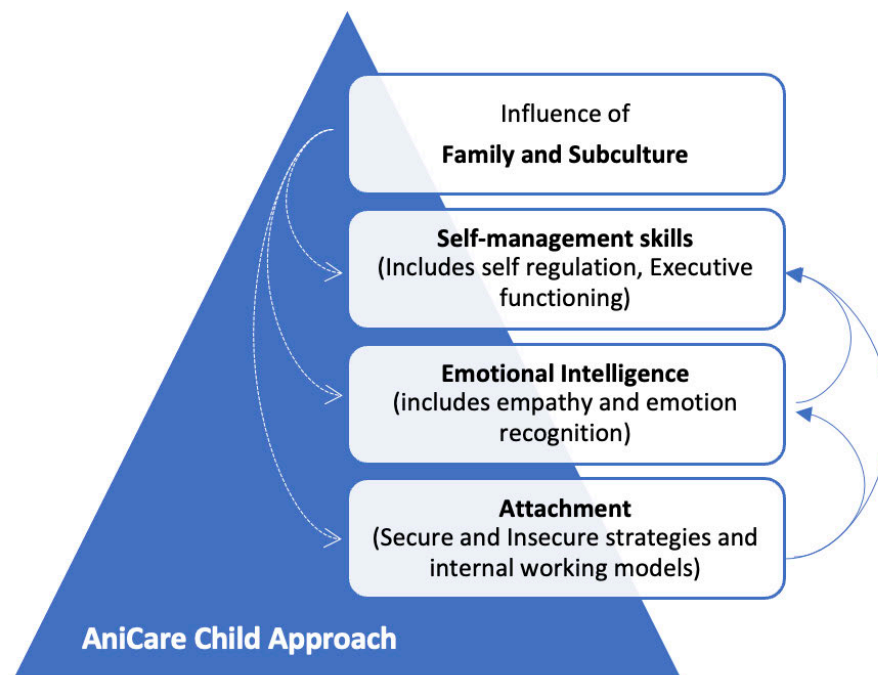
A child's broader environment is likely to impact their relationship to animals both directly and through influences on attitudes and beliefs. Examples of direct influences include neighbourhood conditions and the availability of support services. For example, Reese, Vertalka and Richard (2020) found the neighbourhood conditions of economic stress, vacancy, and crime rates were predictive of cases of animal abuse. In conceptualizing animal abuse using bioecological systems theory, Jagatheesan et al. (2020) highlight that collaboration between animal welfare agencies and human support services (part of the macrosystem) allows for more effective interventions, and so children in areas with an awareness for this link will be more likely to receive holistic support. Cultural factors have also been shown to impact the quality of relationships children have with animals and their attitudes to animal harm. For example, Plant et al. (2016) found the adolescent from Romania, where animal abuse is more socially acceptable, were more likely to have harmed animals than adolescents from Germany, and that Romanian children from rural areas were more likely to have harmed animals than those from urban areas. Furthermore, familiarity with animals is associated with greater belief in animal sentience (Morris et al., 2012) which is predictive of less acceptance of animal cruelty (Hawkins & Williams, 2016). Finally, Signal et al. (2018) found that animal type (classified in their study as "pet", "pest", or "profit") impacts attitudes to harm, and correlates differentially with factors such as empathy.

Underlying these processes, and at the intersection of social influences and psychological constructs lies the concept of schemas. Schemas are generalised and abstracted knowledge structures that organize cognitive and emotional content related to a particular concept (Fiske & Linville, 1980). The formation of schemas depends on lived experiences, and act (mostly unconsciously) as a guiding heuristic for behaviour. Schemas contain core beliefs, which lead to intermediate beliefs (such as attitudes, assumptions), which in turn are expressed as automatic thoughts and ultimately behaviour (Dozois & Beck, 2008). Henry (2018) explores the roles of schemas in understanding animal cruelty, using Dodge's Social Information Processing (SIP) model (reviewed in more detail in Chapter 6), and shows how the rapid moment-to-moment processing occurring in social situations rely on the latent constructs and knowledge held in schemas. Henry highlights that aggression and abuse is often rooted in schemas of the world as a hostile threatening place. Schemas can include views of self, other, and the world, and deep schemas such as these can be understood as the cognitive component of attachment strategy. In fact, unmet attachment needs are associated with "early maladaptive schemas", which can lead to a range of psychopathologies (Simmard et al., 2011) and can also be the focus of therapeutic intervention (Pugh, 2015). Although a measurement of schema was outside the scope of this thesis, we measure related constructs such as attachment, attitudes, and beliefs. As such, schemas can be a useful to keep in mind as a latent organising structure which helps organise the relationships between these concepts.

1.4.4 Psychological Factors

Psychological processes develop as an interaction between innate tendencies (biological factors) and environmental context and are often targets for intervention. Shapiro et al. (2013) provide a model of the four factors they consider most important for treating childhood animal abuse: attachment, self-regulation, empathy, and family context (see Figure 1.8). Chapter 4 provides an in-depth discussion and evaluation of these factors in explaining childhood animal harm, Chapter 5 focuses down on the influence of attachment in children's relationship with their pets, and Chapter 6 tracks how some of these factors change following Animal Guardians (AG) targeted educational intervention. As a result, this section focuses on providing an overview of developmental trends for each factor and discusses how each has historically been studied in relation to child-animal interactions.

Figure 1.8: Psychological factors outlined in the AniCare Child Approach as being relevant for the assessment and treatment of childhood animal harm



Note. Adapted from a figure in *The Assessment and Treatment of Children Who Abuse Animals*, by Shapiro et al., 2013, p.8. Copyright 2014 by Springer International Publishing. Adapted with permission.

1.4.4.1 Attachment

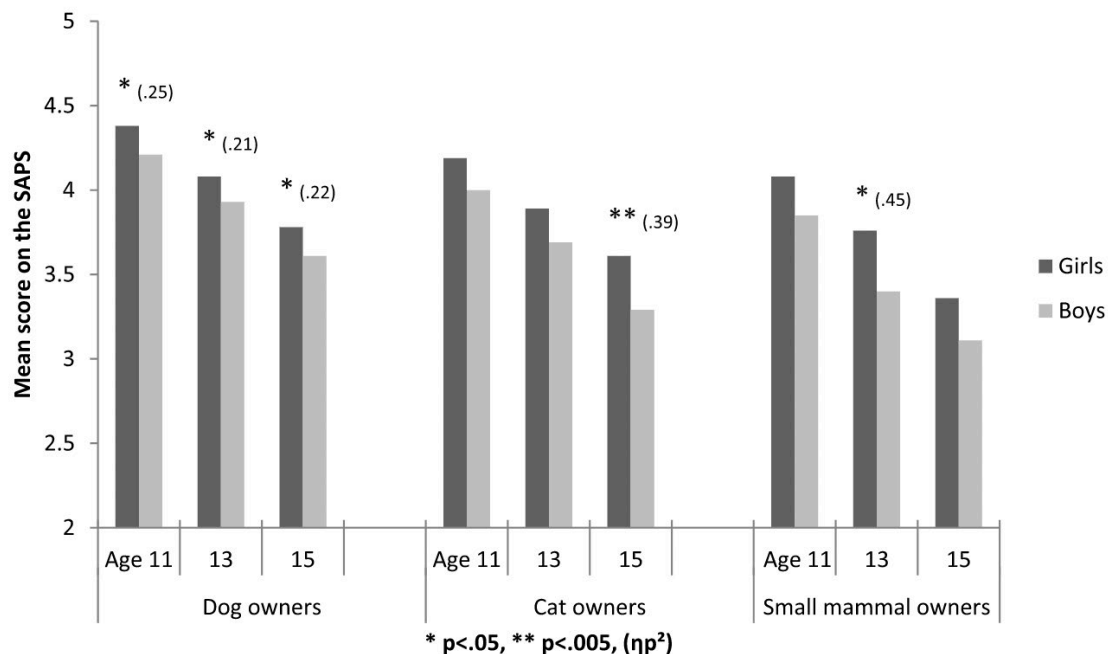
Originally described by Bowlby (1969), attachment theory describes the instinctive process through which infants form a bond with their primary caregiver to maintain proximity and ensure safety, which then expands to accommodate an increasing number of social relationships (Bretherton, 1992). Secure attachment leads to a positive view of self and other, while insecure forms lead to negative views of self and other (Clark & Symons, 2009). This strategy generally remains stable through development but can be affected by changes in family environment (Waters et al., 2003). Attachment quality impacts many psychological processes, including arousal regulation (Schore, 2005), empathy (Stern & Cassidy, 2018), and social skills (Verissimo et al., 2014), and insecure forms of attachment have been associated with a range of psychopathologies (Mikulincer & Shaver, 2012). Attachment is relevant to childhood animal harm through two routes: via overall attachment strategy and via attachment specifically to pets.

The way a child's *overall* attachment strategy impacts their interactions with animals is often mentioned but there has been very sparse direct research. In Hawkins et al.'s (2017) systematic review on the psychological risk factors for childhood animal harm, only one study investigates this: Thompson and Gullone (2008) found that adolescent attachment to parents predicted antisocial behaviours, including animal harm, via the mediating effect of empathy. There are studies indirectly linked to this topic investigating the effects of abuse or trauma on interactions with animals (see e.g., McEwen et al., 2014), since both are known to relate to insecure attachment (Erozkan, 2013). One reason this has received so little research is that attachment in early to middle childhood (8 years and less) is difficult to measure through self-report, and assessments which use observational or task-based measures, although considered more reliable, are time-consuming (Jewell et al., 2019).

There is a growing body of research on children's attachment to pets and its effects on children's interactions with animals (Wanser et al., 2019), but core questions are still being addressed. Firstly, do children's relationships with pets qualify as attachment relationships? Although pets cannot act as primary caregivers, several authors argue that pets can act as secondary attachment figures which meet the criteria for attachment (secure base, haven of safety, maintenance of proximity, and separation distress; Ainsworth, 1991, see also, Julius et al., 2013). Secondly, how does attachment to pets relate (or not) to human attachment relationships? There is little direct research on this, but it seems that human attachment representations may not generalise to animals. An unpublished study found that childhood attachment to pets did not correlate with their attachment representations towards people (Julius et al., 2010) and children who have been victims of abuse may form attachment to animals more easily than to humans (Yamazaki, 2010). This has implications for psychological practice and the usefulness of AAT in building trust and addressing trauma in these populations (Wanser et al., 2019; Parish-Plass et al., 2008) and for the significance of pets in foster care settings (Carr & Rocket, 2017). Finally, how do we validly measure pet attachment and assess its effects in childhood? Currently, the only options are self-report measures such as the Short Attachment to Pets Scale (SAPS; Marsa-Sambola et al., 2016), but this has not been validated observationally or related to human attachment. Still, higher scores on the SAPS are associated with more caregiving behaviours and lower acceptance of

animal cruelty (Hawkins et al., 2017), and we have emerging developmental data for how attachment to pets changes through adolescence (Figure 1.9; Muldoon et al., 2019).

Figure 1.9: Attachment to different pet types through early adolescence



Note. SAPS score by gender and age; asterix show significant differences in score between girls and boys. From “Differences in boys’ and girls’ attachment to pets in early-mid adolescence”, by Muldoon et al., 2019, *Journal of Applied Developmental Psychology*, 62, p. 53. Copyright 2019 by Elsevier Inc. Reprinted with permission.

In summary, attachment processes seem to have a variety of strong impacts on CAI, but this is a methodologically difficult area to study and much more research is needed to understand the mechanisms involved. Chapters 3, 4, and 5 investigate various gaps in our understanding of the links between attachment and child-animal interaction.

1.4.4.2 Executive Function and Self-Regulation

Many cases of childhood animal harm stem from poor self-regulation, which can include children being over-excited, lashing out in moments of frustration, or acting impulsively around animals. Parfitt and Alleyne (2018) argue the need to consider the role of emotional regulation in cases of animal abuse in both children and adults. A range of overlapping psychological terms relate to a child’s ability to control their emotions and behaviour, including impulsivity, executive functioning (EF), externalizing behaviours, and arousal-

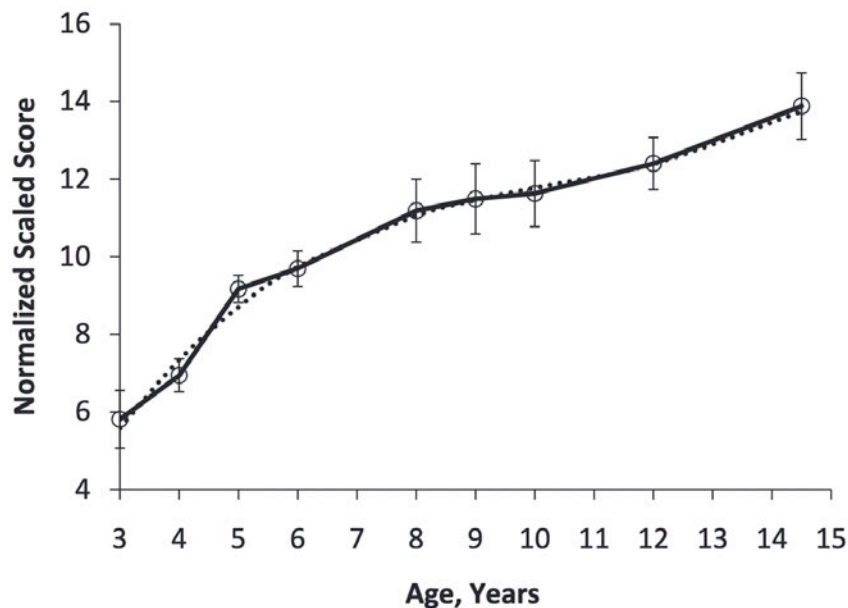
regulation. Because childhood animal harm has predominantly been studied through the lens of psychopathologies such as CD, it has mostly been linked to high impulsivity (Newberry, 2018), externalizing behaviour issues (Walters & Noon, 2015), and related personality disorders (Gleyzer et al., 2002). Despite the relevance of EF skills to these issues (Kleine et al., 2020) and the potential for CAI to improve EF skills (Ling et al., 2016), this construct has received little attention.

Zelazo (2020) defines EF skills as “the set of neurocognitive skills that support the conscious, top-down control of thought, action, and emotion”. EF skills are typically measured behaviourally as three skills: 1) inhibitory control, 2) working memory, and 3) cognitive flexibility (Diamond, 2013). EF skills are often considered to run on a continuum from “hot EF”, which refers to EF in emotionally salient, often reward-driven settings, to “cool EF” which is more cognitive in emotionally neutral settings. The most reliable tools, such as the Dimensional Change Card Sort (DCCS) used in this thesis, assess cool EF skills (Zelazo et al., 2006). Hot EF skills can be more difficult to measure in children and tasks such as the marshmallow test that tap into this construct through delayed gratification can be unreliable (Diamond, 2018, *personal communication*). Although the research in this thesis does not explore hot EF skills, these are likely to also be involved in cases of animal harm, as they are linked to emotional intelligence and problem behaviours (Zelazo, 2020). Still, hot and cool EF skills do correlate, and improvements in cool EF skills can improve hot EF skills through processes of reflection and self-directed speech, for example (Zelazo, 2020).

EF skills improve gradually through childhood, with two notable periods of rapid development: in early childhood (3-5 years) and adolescence (12-15 years; see Figure 1.10 Zelazo & Carlson, 2012). EF skills are well studied in relation to cognitive development, can be improved through intervention (Blair et al., 2018), and are implicated across the spectrum of psychological functioning, with poor EF skills being a risk for poor outcomes, while higher EF skills are linked to resilience and wellbeing (Diamond, 2013; Zelazo, 2020). Chapter 3 thematically explores how issues with self-regulation relate to childhood animal harm, while Chapter 4 compares EF skills in high risk and control children. Specifically, although the DCCS is often described as a measure of cognitive flexibility due to the rule switching, it also involves working memory to maintain rules in mind, and inhibitory control

to suppress attention to previously relevant stimuli (Doebel & Zelazo, 2015). The DCCS can therefore be considered a fairly complete measure of the three basic cool EF skills in its standard form (variations have been created where hot EFs can be measured using rewards or emotional stimuli for the cards).

Figure 1.10: *Development of Executive Functions across age groups*



Note. Measured using the National Institute of Health (NIH) Dimensional Change Card Sort task. From “Hot and Cool Executive Function in Childhood and Adolescence” Development and Plasticity” by Zelazo and Carlson, 2012, *Child Development Perspectives*, 6(4), p. 355. Copyright 2012 The Society for Research in Child Development. Reprinted with permission.

1.4.4.3 Empathy

Empathy is a complex construct which has historically had a variety of definitions and conceptualisations (Cuff et al., 2014). As a result, empathy has been difficult to consistently operationalise and measure, with debates on whether it is best conceptualised as a uni- or multi- dimensional construct, and concerns around self-report methodologies being sensitive to issues like social desirability bias (Neumann et al., 2015). This problem is especially pronounced in childhood, and only a handful of measures of empathy have been developed for children, with little data on developmental trends (Sesso et al., 2021). Several of the measures are an adaptation of the older but frequently used adult measure, the Interpersonal Reactivity Index (IRI; Davis, 1980), which has received a range of criticism for not having clearly defined dimensions and poor factor loadings (Ingoglia et al., 2016). Still, there is growing consensus that empathy has *at least* cognitive and affective dimensions

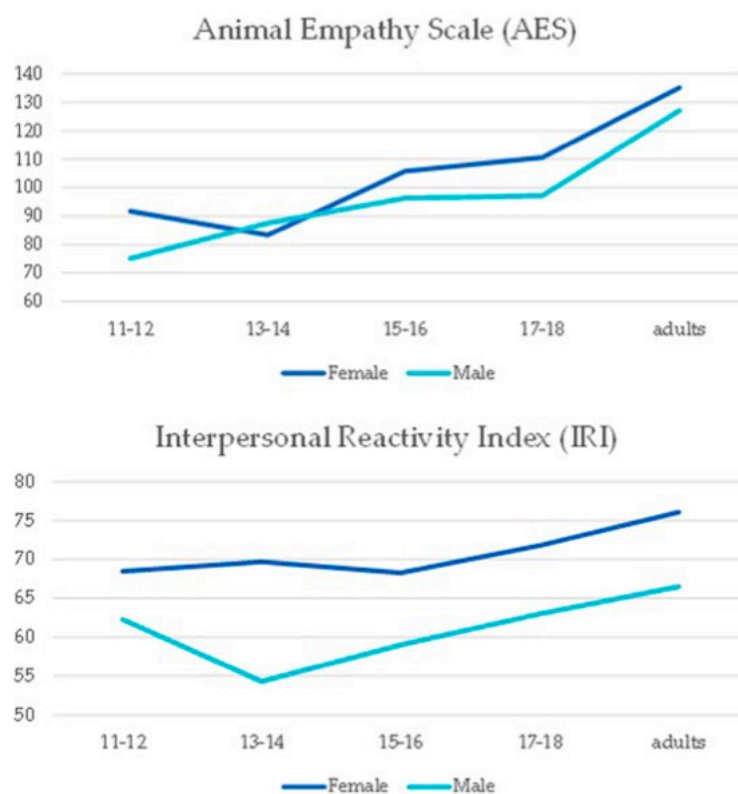
(Sesso et al., 2021), although with some disagreement on whether there are additional relevant dimensions such as a behavioural dimension (variably also referred to as prosocial behaviour and “intention to comfort”) or emotional disconnection (e.g., Bensalah, 2016).

The approach taken in this thesis follows a three-dimension conceptualisation taken by Reid et al. (2013) and Overgaauw et al. (2017), with: 1) *cognitive empathy*, the ability to recognize and understand another’s feelings, 2) *affective empathy*, the tendency to share or be affected by others’ feelings, and 3) *behavioural empathy* (or compassion), the inclination to act with others in mind and help those in distress (Reid et al., 2013; Overgaauw et al., 2017). Bensalah et al. (2016) carry out one of the only studies of the development of empathy across dimensions in children from 6 years old. Using the Basic Empathy Scale, they find that the three-factor found in adults applies to the children as well. Specifically, they find that cognitive empathy increases with age, while affective empathy (which they term emotional contagion) remains stable. With regards to sex differences, they found that girls experience more affective empathy than boys, but there were no sex differences in cognitive empathy. This may suggest that cognitive empathy is likely to develop through learning and experiences, while affective empathy is more reflective of a temperament less amenable to change.

Empathy’s role in childhood animal harm has had sustained research interest due to its well-established association with psychopathy and CU traits (Waller et al., 2020). Results have generally confirmed that low human-directed empathy is a risk factor for childhood animal harm (e.g., Thompson & Gullone, 2008), although results are sometimes conflicting: one study found that only cognitive empathy was lower when controlling for social economic status (Hartman et al., 2019) while another found it was only affective empathy (Plant et al., 2019). These somewhat mixed results may reflect the difficulty in accurately measuring empathy in childhood, since studies use different self-report measures, some of which do not differentiate between dimensions of empathy (e.g., Bryant’s empathy scale; Bryant, 1982). Furthermore, these studies all measure empathy towards humans rather than animals, which Paul (2000) correlated only moderately in a sample of adults. Gaspar and Esteves (2022) found a similar result in a study tracking the development of human- and animal-directed empathy through adolescence, and they also found that differences

between males and females were smaller on animal-directed empathy than on human-directed empathy (Figure 1.11). Furthermore, we have little research on animal emotion recognition in childhood, which may be an important factor in accidental cases of childhood animal harm. Aldridge & Rose (2019) explored this topic through the lens of dog-bite prevention, and found that children struggled to identify dog emotions, and would approach a frightened dog as often as a happy dog. Through this thesis, the role of both human- and animal-directed empathy in childhood animal harm are explored using a variety of methods: Chapter 4 presents differences between children at high risk of childhood animal harm and controls using a self-report empathy scale, a picture-based measure, and an emotion recognition task, while Chapter 6 presents a specially developed picture-based measure of child- and animal-directed empathy looking across all dimensions to evaluate the effects of the Animal Guardians educational intervention.

Figure 1.11: Animal- and human-directed empathy in adolescence and adulthood, by sex



Note. Y-axis shows scores obtained using two different self-report measures of empathy. From “Empathy development from adolescent to adulthood and its consistency across targets”, by Gaspar and Esteves, *Frontiers in Psychology*, 13. Copyright 2022 Gaspar and Esteves. Used under Creative Commons license CC-BY.

1.4.4.4 Knowledge of Animals

Children's animal knowledge impacts the quality of child-animal interaction in a variety of ways, and can include knowledge of an animal's natural behaviours, their welfare needs, and how to act appropriately around them. These topics are cognitive complex and can be loosely grouped with children's ability to understand scientific and biological concepts, which increases through development (Muldoon et al., 2016). Low levels of knowledge of animal welfare needs and low understanding of animal minds seem to be risk factors for unintentional animal harm (Hawkins & Williams, 2016). Even very young children (3-5 years old) can readily learn information about animals from books, but Ganae et al. (2014) found that children presented with anthropomorphized animals (Figure 1.12) were more likely to endorse anthropomorphic traits for those animals than children presented with factually accurate animals and language. This is concerning because anthropomorphizing is also linked to childhood animal harm (McDonald et al., 2018) and compromised animal welfare even with adult owners (Mota-Rojas et al., 2021). Fortunately, age-appropriate educational interventions can effectively improve children's knowledge of animal welfare needs (Hawkins et al., 2017). What is less clear is how well this translates into improvements in behaviour, and additional support may be needed to develop skills around handling and interacting with animals. Chapter 4 includes a measure of child welfare knowledge used with children at high-risk for animal harm referred to Animal Guardians and classmate controls, and this measure is used again in chapter 6 to explore whether the Animal Guardians effectively improves welfare knowledge, and how this relates to positive and negative behaviours towards animals.

Figure 1.12: Examples of the realistic and anthropomorphic illustrations used by Ganea et al.



Note. Top: cavies; bottom: oxpeckers. From “Do cavies talk? The effect of anthropomorphic picture books on children’s knowledge about animals”, by Ganea et al., 2014, *Frontiers in Psychology*, 5, p. 3. Copyright the authors. Used under Creative Commons CC-BY license

1.4.5 Case Studies and Formulation

Three case studies are presented below to illustrate how these risk and protective factors can come together and to demonstrate how a child’s relationships with animals can be used to inform holistic formulation. Each case study is designed to reflect major themes from subsequent chapters, specifically: Case 1 relates to chapter 3 by exploring the roles of exposure to violence and developmental trauma, Case 2 relates to chapter 4 and focuses on the roles of emotional-behavioural dysregulation, and Case 3 relates to chapter 5 and explores nuance around attachment issues and attachment to pets. These case studies are in no way exhaustive and many other reasons for animal harm can also be conceptualized. For example, Williams and Wauthier (in press) provide case studies which cover accidental harm, harm linked to CU traits, and harm arising within a pattern of delinquency. To ensure children’s anonymity and confidentiality, please note that these case studies are fictitious and draw on elements emerging *across* interviews with different referred children.

Case 1: Animal abuse linked to exposure to violence and possible trauma

Background: James is a six-year-old boy referred to the Scottish SPCA's Animal Guardians programme for having killed a rabbit. The referral was made through the Scottish SPCA, and the other rabbit was removed. He lives with his mum, her partner, and an older teenage brother who has behavioural issues. Although the family are known to social services, they were not aware of issues with James. Teachers report that he occasionally has minor outbursts in class, but he is a sweet boy and generally well behaved. The mother has agreed for James to participate in AG but does not seem to want to get involved further.

Child-Animal Interaction Interview: As the interview starts, James is compliant but seems shy and wary of the recording equipment. When asked to "draw anyone important" he starts by drawing two rabbits and the family dog, pausing before quickly drawing his mum in a corner and saying he does not want to include his brother. He says that his mum hits him when he "is bad", and that his brother has been kicked out of the house several times for behaving aggressively towards the dog. He says he loves the dog, but sometimes she will growl at him because she is "a bit grumpy". He explains enthusiastically that rabbits are his favourite animals because they are the cutest. He is very reluctant to talk about the rabbit's death, although eventually mentions that one of the rabbits bit him. He does not elaborate further and implies that the rabbits still live with him. James asks for the interview to end soon afterwards.

Formulation: This is a complex case which brings together many of the risk factors described above. Long term predisposing factors are likely to include insecure attachment and developmental trauma, which will have negatively impacted his ability to regulate his emotions and adopt other's perspectives (mentalizing). Shorter term precipitating factors may be witnessing his brother harm the family dog and regularly seeing the dog behave aggressively, which will have normalized negative interactions, and it is unclear how much supervision James gets when around the animals. Protective factors include generally good relationships with teachers, as well as a love for animals and desire for close relationships with them. The unstable home environment might become a perpetuating factor as well as any misconceptions family members might have about managing animal behaviour and welfare.

Notes for practice: This case highlights some of the biggest difficulties and opportunities in intervening in cases of childhood animal harm. Difficulties include the delicate nature of the incident, the problematic family environment, lack of parental engagement, and how to manage the child's desire to engage with animals without compromising animal welfare. It also illustrates the complexities of interviewing children- in this case James does not disclose his animal harm and pretends he still lives with the rabbits (possibly out of shame or because he wishes they were still there). This incident has revealed that

James is struggling, something which may otherwise not have been noticed for a long time. Animal Guardians is an opportunity to support James in a positive school setting to help him learn how to appropriately interact with animals, including the family dog, hopefully before her behaviour escalates. Long-term coordination between Scottish SPCA, school, and social work will be important to monitor the situation, and it may also be good to assess James further to determine whether he would benefit from therapeutic approaches.

Case 2: Animal harm linked to externalizing problems

Background: Adam is a 9-year-old boy who regularly “plays” roughly with the family dog and will lash out against it when he is frustrated. Parents are very concerned about his behaviour and have asked the school to refer him to Animal Guardians. Parents explain that Adam was adopted, that his biological mother had substance misuse issues, and that he has always had trouble regulating, but only recently has he started turning this against the dog. Teachers confirm that he is difficult to manage in class, has few friends, and say that he has a pending diagnosis of ADHD.

Child-Animal Interaction Interview: Adam is energetic and seems happy to be doing the activities one-to-one. He is open while discussing his mum and dad although he draws his dog first. His attachment assessment suggests that he is insecurely anxiously attached, but that this is within normative range and not pathological. He does poorly on the executive functioning task because he keeps getting mixed up with the rules and struggles to concentrate on the empathy and welfare knowledge tasks, saying “I don’t know” and “I’m rubbish” when he gets frustrated, which lowers his score. When answering questions about negative behaviour around animals he admits to some things but insists that this is “only once” and “by accident”.

Formulation: Adam’s case is one where the animal harm seems to be occurring as a broader pattern of externalizing issues. Predisposing factors include being exposed to substances in utero and the knock-on effects on temperament and subsequent attachment. It is not clear if there are specific precipitating factors, although he may be struggling to calm himself down and gets frustrated when he doesn’t understand the dog’s behaviour. Difficulties concentrating and remembering things make his performance on the empathy measure very sporadic. Protective factors include highly engaged parents, a positive view of his dog, and awareness that some of his behaviours are harmful.

Notes for practice: This is a case of animal harm which is part of an already known issue, and where adopting a holistic approach prevents the situation from further deteriorating. Animal Guardians provides an additional avenue for intervention which Adam seems

motivated to engage with. This may be good for improving his self-esteem and his relationships with his dog, and will reduce the chance that he is labelled as a “bad kid”. Practicing EF skills, gentle animal handling, and calming techniques could synergize with other aspects of his ADHD treatment. Although he may never have “normative” regulation skills, learning about animal welfare needs is another avenue to increase Adam’s protective factors. Early intervention also reduces the risk Adam will be bitten or that the dog will be removed, and so protects the animal’s welfare while removing some tension between Adam and his parents.

Case 3: Attachment to pets as a protective factor

Background: Sam is a 10-year-old girl who is struggling at school: she doesn’t engage in class, doesn’t have any friends, and is very withdrawn. Teachers are concerned but they notice that she lights up when she talks about animals. Her foster family is also concerned, because although she engages positively with their cats, she has started locking herself in the room with them and gets defensive when told not to do this. Previous foster placements have broken down due to challenging behaviours with pets, and although the current cats have not been physically harmed yet, the school and foster parents decide to refer her to Animal Guardians as a precaution.

Child-Animal Interaction Interview: Sam originally does not want to participate in the interview but eventually agrees when told she can just talk about animals if she wants. She declines to add anyone to her drawing, saying that “no one is important” to her. She says she is very happy to take part in Animal Guardians because she wants to work as a rescue officer in the Scottish SPCA one day, and that she looks forward to being an adult so she can have as many animals as she wants. During her empathy measure, she seems to understand emotions well but has a negative view of people as “always mean” and says that she only wants to help the animals. When doing attachment stories about people and animals, she turns to animals for sources of comfort rather than people, and her attachment style to parental figures in the story is very avoidant.

Formulation: Although we have little information about any previous traumas, Sam clearly has a pathological form of insecure attachment, does not trust people, and has turned to animals as replacement attachment figures. As a result, her relationships with animals is both a risk and protective factor, and she may be showing early signs that she could become an animal hoarder in adulthood. Removing the animals or having the foster situation break down again because of issues around the pets would only confirm to her she cannot trust people. Fortunately, she wants to engage in AG, and family and school environment are keen to support in any way they can.

Notes for practice: This is an example of how working on relationships with animals might be a way through to addressing deeper issues. Although it is not the place of Animal Guardians to address underlying trauma or attachment problems, it provides a first step for Sam to positively engage in a school setting while ensuring animal welfare is protected and that she starts to understand that it is her responsibility to look after animal needs. As the foster family is very engaged, organizing visits to Scottish SPCA rehoming centres may be a way of allowing a positive experience for everyone around animal themes. In future, since Sam may struggle to trust a therapist, a way of engaging her could be AAT, which can also include family sessions if appropriate.

1.5 Intervening in Cases of Animal Harm

Interventions need to address relevant issues and be of the appropriate intensity to support children across incident severities to prevent animal harm from being repeated. The following section describes existing interventions targeting childhood animal harm, discusses the significant gaps in practice and research, and motivates the need for an integration of prevention and intervention.

1.5.1 Existing targeted interventions

Until now, no intervention for childhood animal harm has been evaluated and there is no consensus about which interventions need to be used in what circumstances. Lack of evaluated treatment options contributes to the view that cruelty to animals is an irrelevant part of diagnosis and discourages active treatment. Signal et al., (2013) found that even for the vignette where there was severe animal harm and a diagnosis of CD, only about half of psychologists said that they were “very likely” to include a specific intervention for animal cruelty in the treatment plan, and only a quarter were “very likely” to include intervention for animal cruelty for the ADHD vignette. Chapter 6, which evaluates the AG programme, examines some of these themes further in the context of broader animal welfare education.

Gupta et al. (2017) review interventions for animal abuse based in the USA. They note very few programmes are available, and that “at this time, we are unaware of significant

intervention efforts taking place in other [countries], though this is likely to change as attention to this topic increases” (p. 498). They describe three interventions for children⁴:

1. **The AniCare Child Approach** (Shapiro et al., 2013): is aimed at psychotherapists and other mental health practitioners and discusses assessment and treatment options for childhood animal abuse relating to three main themes: attachment problems, insufficient empathy, and self-regulation (see figure 1.8). This is the only published manual approach and is discussed in more detail in Chapters 4 and 6.
2. **Children and Animals Together** (CAT; Risley-Curtis, 2014): is a systems approach developed from the lens of social work. To start, a thorough biopsychosocial in-home assessment is carried out to determine the level of support required by the child, including whether referral for more intensive therapeutic interventions is required. The intervention is 14 weekly sessions at a local animal shelter focusing on learning prosocial skills while interacting with animals (see <https://vimeo.com/92286039?signup=true> for a presentation on the CAT program’s development, structure, and some case studies, by Dr. Risley-Curtis)
3. **Teaching Love and Compassion- juvenile** (spcaLA): This programme was designed and delivered by the Los Angeles SPCA to work with the court system and intervene with juvenile animal cruelty offenders 8-18 years old. The programme covers conflict resolution, empathy, animal care education, and working with shelter dogs.

There seems to be greater demand for these types of interventions in the USA, possibly because court-mandated therapy and rehabilitation increases demand for intervention. This approach has not yet been widely adopted in Scotland, but the Scottish government has recently commissioned a report on the use of restorative justice and empathy-based interventions for animal welfare and wildlife crimes (Wyatt et al., 2022). It is likely that there will be a growing need for evidence-based intervention once non-custodial sentence and restorative justice approaches are rolled out, which is planned to happen in 2023.

⁴ They do not mention UK-based programmes such as RSPCA’s “Breaking the chain” programme nor the Scottish SPCA’s welfare education programs (discussed further in Chapter 6).

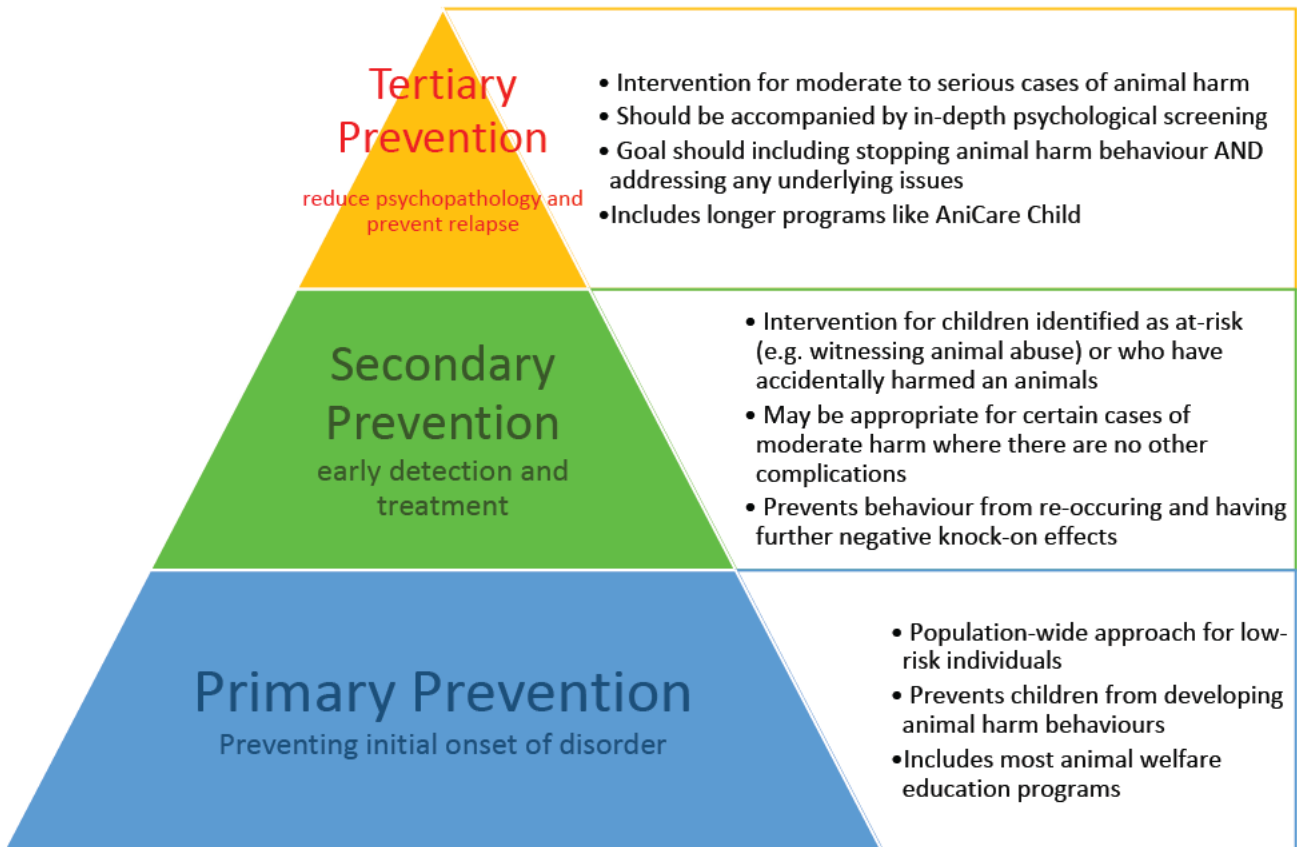
Gupta et al. (2017) also analysed some of the factors that have hindered the development of interventions. Firstly, they explore issues with referral pipelines, including: lack of prosecution in animal cruelty cases, low awareness of available interventions within the justice system, lack of parent/guardian referrals for child cases, and lack of “incident revelation” when clients are undergoing intervention for other issues. The second issue they highlight is the lack of practitioners who are trained to intervene for cases of animal abuse. In line with the arguments made earlier in this chapter, they state: “perhaps the single most powerful change that could be made systematically is to integrate material on animal abuse and human-animal relationships into the standard training of human service professionals” (p. 508). Finally, they highlight the need to intervene with a “finer paintbrush”: having different intervention approaches for different types of animal abuse, as well as “bridging the prevention/intervention divide” by approaching prevention and intervention as a continuum⁵.

1.5.2 Graded levels and types of intervention

Intervening across cases of animal harm requires developing a structured approach to delivery. Gupta et al. (2017) suggest adopting the public health model of primary, secondary, and tertiary prevention (Leavell & Clark, 1965). This is a very useful framework to guide population-wide implementation and can easily be translated to animal harm prevention in childhood (see Figure 1.13). Animal welfare education programmes fit within primary intervention and programmes like AniCare child correspond to tertiary prevention; what becomes clear is that there are no secondary prevention approaches to intervention for childhood animal harm. Chapter 6 delves deeper into this “missing” intermediate level of intervention to motivate the importance of additional approaches.

⁵ It is encouraging that this thesis has independently reached similar conclusions, advocating for view of CAH as a spectrum and an integration of prevention with more acute interventions.

Figure 1.13: *The public health prevention model applied to childhood animal harm*



The other aspect to consider is whether secondary and tertiary levels should have different *types* of intervention. For example, should separate interventions be designed for cases of childhood animal harm associated with low-knowledge, low-empathy, low-self-regulation, and those with issues that could lead to complex psychopathologies (e.g., trauma, disorganised attachment)? Currently we do not have enough data determine how this should be done. In fact, it is not clear that children could be divided into neat typologies (due to frequent comorbidities), nor how this could be reliably assessed. One solution could be to design flexible interventions capable of addressing a wide set of known risk factors, where problem areas can be focused on.

1.5.3 How should we design targeted interventions for childhood animal harm?

In light of these gaps, Muldoon and Williams (2021) completed an online Delphi study of professionals working in animal welfare education across the UK, in order to start establishing a consensus on intervention design, implementation, and evaluation. Results

highlight tension around terminology (including stigma around terms like “animal cruelty”), uncertainty around how to systematically evaluate outcomes, and lack of focus regarding which constructs should be primary targets for interventions. Since so few interventions for childhood animal harm had been manualized or published, designing a new intervention required drawing on best practice from a range of sources. For example, aspects regarding improving animal welfare knowledge, beliefs, and attitudes can be adapted from effective mainstream animal welfare education programmes (Hawkins et al., 2017). For aspects of childhood animal harm relating to issues with behavioural regulation and aggressions, relevant elements can be incorporated from established school-based interventions for other problems, such as anti-bullying programmes (e.g., KiVa programme; Garandeau, 2022), programmes for conduct problems (e.g., Incredible Years; Pidano & Allen, 2015), or programmes designed to improve EFs (e.g., Tools of the Mind; Blair et al., 2018). It is also important for childhood animal harm interventions to be clear on which risk factors they are not equipped to deal with. For example, childhood attachment issues and trauma require specialized therapeutic approaches, which would be out-with the scope of most programmes at the secondary prevention level. Finally, to become part of evidence-based practice, the programme needs to be designed with evaluation built in, which requires clear guidelines on target population, intervention elements, and measurable outcomes.

This thesis forms the research basis of a collaborative effort between the University of Edinburgh and the Scottish SPCA to address this gap in Scotland. This collaboration led to the development of Animal Guardians, a targeted animal harm intervention which incorporates the criteria detailed above. Funding for the first three years of the Animal Guardians programme was provided by the RS Macdonald Trust, on the basis that research and evaluation were integrated into the design and delivery process from the start. This thesis was funded by the College of Arts Humanities and Social Science Doctoral Research Awards allowing me to fulfil that research requirement under the supervision of Professor Joanne Williams, one of the RS Macdonald Trust grant holders.

Animal Guardians was designed collaboratively. It uses an overarching manualised structure, but the number of sessions spent on each key area is flexible and left at the discretion of the education officers depending on the child’s intervention needs (see Chapter 6 for full details

on programme structure). The Scottish SPCA was in a unique position to deliver this intervention: as a centralized animal welfare charity with statutory powers in Scotland, it investigates most incidents of animal harm and can create a nationwide plan with coordinated levels of intervention. Working towards this goal, the Scottish SPCA created Animal Wise[®] (See Figure 1.14), which is an approach to primary prevention across development, and has interventions for early years (preschool), childhood (primary school), young people (secondary school), and adults or families. The Animal Guardians programme was in turn developed with the intention of providing targeted help for at-risk children or those who had already harmed animals, starting to fill the gap for secondary prevention.

Figure 1.14: How Animal Guardians fits within the Scottish SPCA’s Animal Wise approach



Note. Figure created using images adapted from the Scottish SPCA’s education pages. See <https://www.scottishspca.org/animal-wise> and <https://www.scottishspca.org/animal-guardians>.

The coordination of research and practice over a long period of time, made possible through this collaboration, provided a unique opportunity to: 1) work directly with children who had harmed animals (a highly specific and vulnerable group) on variety of linked studies, 2) iteratively refine the design and delivery of the intervention, 3) integrate methods for evaluation into the long-term delivery Animal Guardians.

1.6 Thesis Summary

This introduction has explored how childhood animal harm fits within broader psychological practice and shown that despite what we know about risk factors, there are no evidence-based interventions for childhood animal harm. To start filling this gap, the University of Edinburgh and the Scottish SPCA launched Animal Guardians, a novel targeted educational intervention. The overall aim of this thesis was to work with children referred to the Animal Guardians programme, adopting a child-centred lens to evaluate the effectiveness of the programme. Please note that research for this thesis was published progressively and Chapters 2, 3, 4, and 5 presents this work as publications.

Chapter 2 sets the scene with a meta-narrative systematic review of the literature on childhood animal harm. It covers both theoretical and empirical work carried out over the last 10 years in a variety of fields, including psychology, social work, and criminology, and explores conceptual and methodological issues in the literature, which later chapters attempt to partially address. Chapter 3 is a qualitative study which was carried out with the first set of ten children referred to the Animal Guardians programme, during its piloting phase. This provided a real opportunity to adopt a child-centred approach from the start of the research process, and themes from these informed the constructs explored qualitatively in later chapters. Chapters 4 and 5 split the results of a larger study involving a set of 27 children who were interviewed in-person using a variety of task-based and self-report measures. Chapter 4 explores the psychological risk factors for animal harm, by comparing children referred to the Animal Guardians programme to classmate controls and focuses on the dimensions laid out in Shapiro et al.'s (2013) model (Figure 1.8). Using the same set of children, Chapter 5 is a deep dive into children's attachments to pets, the relationship with their overall attachment style, how this informs their likelihood of animal harm, using a new measure to explore children's representations of animals. Chapter 6 is an evaluation of the Animal Guardians programme using a third set of 48 children: 24 referred children and 24 matched controls assessed using a pre- and post- test activity pack. It also introduces a novel measure of empathy designed specially to assess child- and animal- directed empathy through development. Finally, Chapter 7 discusses the implications of these results for

theory and practice and reflects on the benefits of working collaboratively with charities for greater impact.

1.6.1 A note on exploratory and confirmatory research

When interpreting the results of the studies presented in this thesis, it is important to distinguish between exploratory and confirmatory research (also referred to as *a priori* research), as these have different threats to validity and support different kinds of inferences (Kimmelman et al., 2014; Schwab & Held, 2020). Kimmelman et al. note that exploratory research is best suited to developing theories, which then subsequently enables the research on the efficacy of treatment approaches in confirmatory studies. Exploratory studies tend to use flexible methodological approaches where the full set of constructs to be analysed are not necessarily set out at the start; the focus is on high sensitivity and reducing the risk for false negatives. In contrast, confirmatory studies have pre-specified designs, hypothesis, and analyses; the focus is on high specificity and reducing the risk of false positives. Issues arise if one presents exploratory findings as the result of a confirmatory process, also known as HARK-ing (Hypothesis After the Results are Known; Kerr, 1998), which increases the risk that false-positives will become established, and decreases the likelihood of the result being reproducible, replicable, or generalisable.

The studies in this thesis exist at different places along the “spectrum” of exploratory and confirmatory research. As an initial qualitative investigation, Chapter 3 is completely exploratory. Chapter 4 is mixed: it explored *a priori* concepts, as detailed by the AniCare child model, but delves deeper into the role of attachment in an exploratory way. Chapter 5 is more exploratory again, as it’s analysis emerged based on the strong findings we had for the importance of attachment (evident in both chapters 3 and 4). Although there was always an intention to probe children’s relationships with pets through the story stems, hypotheses were not evident beforehand, and data were sufficiently rich that this grew into its own study. Chapter 6 takes the most confirmatory approach, as it explores constructs which we expected would change through the intervention based on previous research, namely: welfare knowledge, empathy, behaviour, and relationships to pets.

Chapter 2:

Meta Narrative Systematic Review

Understanding and Conceptualizing Childhood Animal Harm

This chapter is published Open Access in Anthrozöos:

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Note: there are some minor formatting and typographical errors in this chapter which are being addressed with the publisher

2.1 Overview and Rationale

Historically, research on childhood animal cruelty has come from a variety of disciplines, which each have their respective conceptualisations of this behaviour and its risk factors. This has created inconsistencies in definitions, approaches to measurement, and theoretical accounts of the behaviour, which have impeded progress in this field. Particularly concerning is the lack of research from a developmental perspective, but also of research is aligned with animal welfare legislation. For example, the leading definition of animal cruelty is “all socially unacceptable behaviour that intentionally causes unnecessary pain, suffering, distress and/or death to an animal” (Ascione, 1993, p. 83). This definition does not make allowances for differences between adult and children (e.g., what does it mean for a behaviour to be intentional in a 6-year-old child?), nor does it align with animal welfare research, which is not dependant on “social acceptability”. As a result, this definition leaves big gaps for practice, and seems to account only for the more severe and intentional acts.

Two systematic reviews had been recently carried out (Hawkins et al., 2017, Longobardi & Badenes-Ribera, 2019), but these were discipline-specific and explored all existing literature (since the 1960s). The purpose of the present meta-narrative systematic review was therefore to widen the search *across* disciplines and focus only on the most recent literature, since older research, theories, and definitions may no longer be as relevant. The motivation was to establish what work, if any, had been done to bring definitions and theories of childhood animal cruelty in line with theories of child development and animal welfare legislation. By exploring methodologies used across studies, we could also determine how theory and measurement had informed each other and whether there might be biases in the existing literature. Finally, this provided an opportunity to establish gaps in the research that could be addressed in the work carried out for later chapters.

Understanding and Conceptualizing Childhood Animal Harm: A Meta-Narrative Systematic Review

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ABSTRACT

Several perspectives inform research on Childhood Animal Cruelty (CAC), but these perspectives are poorly integrated with each other and there is little dialogue with the rest of the child–animal interaction (CAI) literature. This study reviews the current empirical and theoretical literature on CAC to explore issues regarding research definitions and methodologies. Following the RAMESES guidelines, we performed a meta-narrative review of the CAC literature from 2010 to 2020, including theoretical papers and original research published in English. Four databases (OVID, Web of Science, PubMed, and EBSCOhost) were searched for terms relating to children, animals, and harm in the title and keyword fields. This generated 416 results, and 69 publications were reviewed here. We explore theories of CAC in relation to the historical research strands and discuss how well they are supported by existing empirical evidence. We thematically classified empirical study findings, which showed that (1) environmental factors that predict CAC include exposure to childhood adversity, especially experiences of violence and witnessing animal cruelty, (2) only CAC which is recurrent has strong links to later interpersonal violence, (3) psychological risk factors linked to CAC include externalizing disorders, lower empathy, lower self-esteem, poorer family functioning, and attitudes accepting of cruelty, (4) witnessing animal cruelty is a serious risk factor for a range of internalizing and externalizing behaviors, and (5) a range of psychosocial barriers exist in measuring and reporting CAC. Issues with measures, population selection, and definitions focusing only on more severe forms of CAC are factors which potentially constrain the generalizability of results. We highlight the need for developmentally appropriate definitions of CAC and methods of measurement and argue that the CAC literature is not well aligned with animal welfare legislation. We propose that CAC should be integrated into a broader spectrum of childhood behaviors toward animals.

KEYWORDS

Animal cruelty; animal harm; animal welfare; childhood; human–animal interaction

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The study of child–animal interaction (CAI) started in the mid-1960s (Ascione, 2005) with two strands of research: one showed that violent criminals and serial killers had often been cruel to animals as children (Macdonald, 1963; Mead, 1964), while Levinson (1965) demonstrated the positive effects that animals could have on children in therapeutic contexts. These two research directions, cruelty as the “dark” side of CAI on the one hand, and the positive developmental effects of CAI on the other have grown as separate fields of study, a rift first highlighted by MacDonald (1979). The “positive” CAI literature has expanded into a range of domains (McCune et al., 2014), with findings suggesting that animals can reduce stress (Beetz et al., 2012), can be sources of attachment (Julius et al., 2012; Muldoon et al., 2019), and can help with children’s socialization and empathy building (Daly & Morton, 2009). By contrast, cruelty to animals is a red flag for cycles of violence and trauma (DeGue & DiLillo, 2009), with children modeling aggressive behaviors they witness toward animals (Thompson & Gullone, 2006), is related to emotional behavioral disorders (Hawkins et al., 2017) and predictive of later violent crime (Longobardi & Badenes-Ribera, 2019). However, this rift between “positive” and “negative” CAI dichotomizes the spectrum of children’s relationships with animals and separates phenomena which can co-occur, such as attachment and harm behaviors.

The most commonly adopted definition of animal cruelty is: “all socially unacceptable behavior that intentionally causes unnecessary pain, suffering or distress and/or death to an animal” (Ascione, 1993, p. 83). While this definition provides common ground for research on animal cruelty, it is disconnected from definitions of animal welfare. From a welfare perspective, it omits several categories of mistreatment, including neglect and behaviors which are unintentionally harmful, while the reference to “social acceptability” omits certain harms depending on social or cultural context. A disconnect between animal welfare legislation and research definitions of animal cruelty is problematic because animal welfare legislation guides court cases, interventions delivered by animal welfare organizations, and cross-reporting (Ascione, 2005; Vincent et al., 2019). The Humane Society of the United States states that “Most reported animal cruelty comes in the form of neglect, with direct violence occurring less” (HSUS, 2020). The UK Animal Welfare Act (2006) states that owners are responsible for the welfare of their animals, based on the Five Freedoms (DEFRA, 2004), which includes both acts of commission and omission and unintentional harm. The link between animal welfare and childhood cases of animal harm is further complicated: parents typically have a legal duty of care for pets (in the UK, until the age of 16; Animal Welfare Act, 2006), but children can still negatively impact animal welfare.

To date, several reviews on Childhood Animal Cruelty (CAC) have been carried out (Chan & Wong, 2019; Felthous & Kellert, 1987; Miller, 2001), but only two have been systematic reviews (Hawkins et al., 2017; Longobardi & Badenes-Ribera, 2019) and both are discipline-specific (clinical psychology and criminology respectively), so that neither provides a synthesis of the whole literature. Hawkins et al. (2017) reviewed psychological risk factors for CAC and presented two major findings. First, experiences that are associated with the risk of CAC include abuse, neglect, witnessing animal cruelty, bullying, and victimization. Second, psychological issues observed to co-occur with CAC include behavioral disorders, Conduct Disorder (CD) and its modifier Callous–Unemotional (CU) Traits, and low empathy. Longobardi & Badenes-Ribera (2019) reviewed the link between CAC and interpersonal violence, finding that CAC is linked to bullying and delinquent behavior,

although motives and methods of cruelty were not reliable predictors. Despite only sharing six publications, both Hawkins et al. (2017) and Longobardi & Badenes-Ribera (2019) highlight similar issues in the field: definitions of CAC being inconsistent, methodologies relying heavily on retrospective accounts, and populations being quite narrow and therefore difficult to generalize from.

Systematic reviews typically define a set of focused research questions *within* a field, using stringent eligibility criteria to methodically select publications which answer their research questions (Page et al., 2021). Classic systematic reviews answer specific questions, but due to their narrow focus cannot provide an overview of a topic informed by multiple disciplines. A meta-narrative approach to the systematic review is designed to allow researchers approach interdisciplinary topics, fostering dialogue between the fields and the theory underpinning a topic (Wong et al., 2012). We felt an interdisciplinary review of CAC was required to explore historical changes, methodological tendencies, and review theoretical and conceptual trends. We had four objectives: (1) explore the interdisciplinary theories informing the CAC literature, (2) provide an overview of current empirical findings, (3) establish what methodological issues might affect the literature as a whole; and (4) review definitions of CAC to assess developmental appropriateness and congruence with welfare legislation. To carry out these objectives, we tested four research questions:

What are the theoretical models proposed in CAC literature?

1. What are the empirical risk factors and correlates of CAC?
2. Are there methodological issues and limitations in research on CAC?
3. How is CAC typically defined and operationalized?

Methods

Search Procedure and Eligibility Criteria

All publications relating to CAC from 2010 to 2020 were included to provide a focused review of contemporary empirical research and theoretical papers. This time frame was chosen for three reasons: (1) the two existing systematic reviews cover older publications in some detail, (2) due to the interdisciplinary nature of this review, narrowing the timespan made it more feasible, and (3) we hoped to capture the most up-to-date literature on this topic.

Using both the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA; Page et al., 2021) guidelines and the related Realist And MEta-narrative Evidence Syntheses: Evolving Standards (RAMESES; Wong et al., 2012) guidelines, the literature search was carried out, across four research databases, initially in April 2020 and a second time in March 2021, as outlined in Figure 1. Eligibility criteria were that publications had to (1) be in the English language, (2) be peer-reviewed in the form of either journal articles or academic book chapters, and (3) relate to children/adolescent harm toward animals or witnessing of animal harm, assessed either directly with children or adolescents, adults commenting retrospectively on their childhood, or through parent or professional report. All research publications were included: empirical papers, case studies, theoretical papers, and literature reviews. Owing to the broad scope, search terms were applied to the Title field and, where databases permitted, additionally to

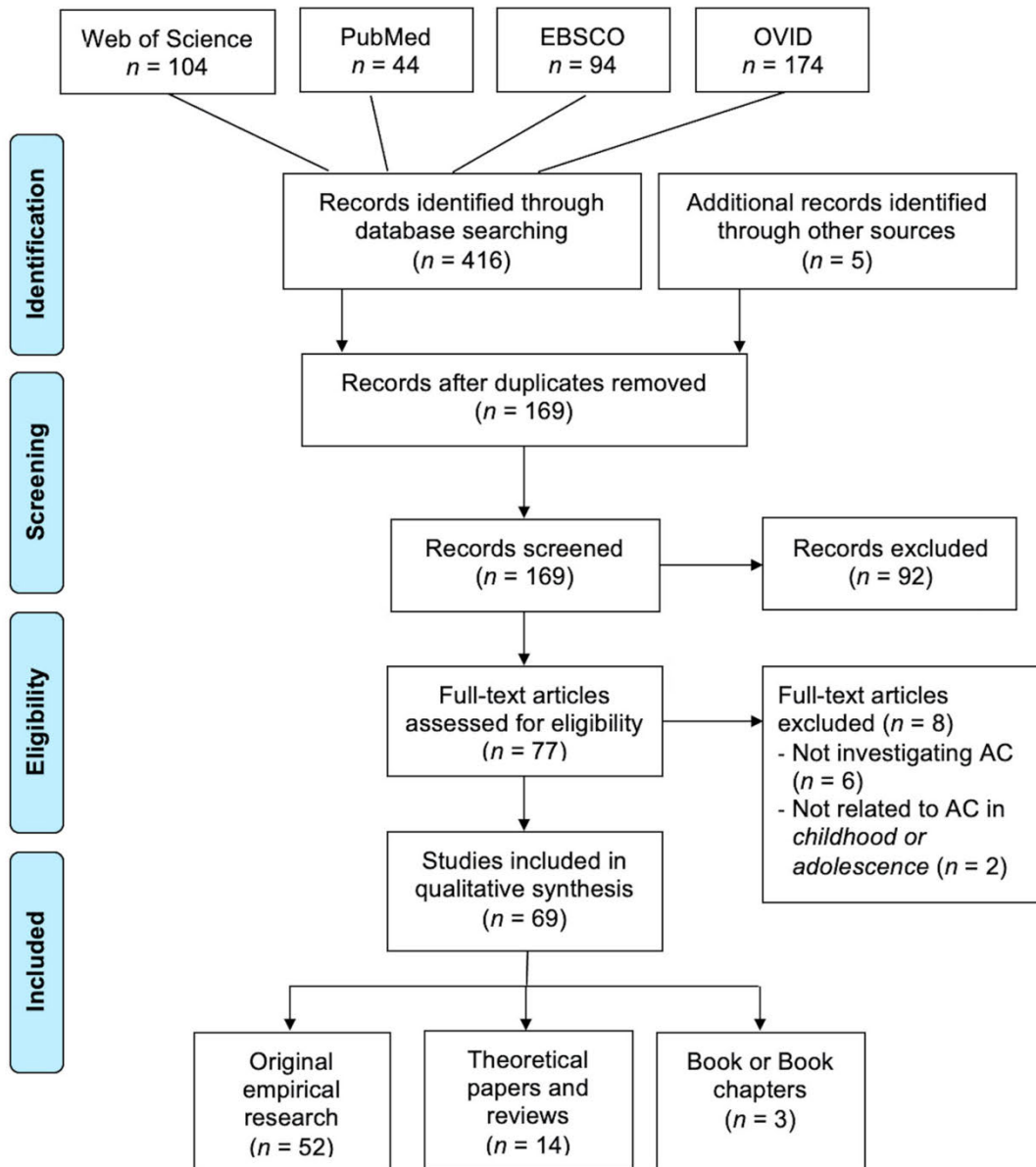


Figure 1. PRISMA diagram for studies included in the current meta-narrative systematic review.

keyword fields (OVID and Web of Science). In all the databases, the same key words were used, with (1) one identifier for target age group (child* OR adolescen* OR juvenil* OR youth OR young OR teen), (2) one identifier for animals (animal* OR pet*), and (3) one identifier for harm (harm* OR cruel* OR abus* OR neglect* OR aggressi*). These three groups were combined using the Boolean operator AND. The screening and study selection process was carried out by the first author.

Data Extraction and Evaluation

Information extracted from the final selection of publications included author(s), year of publication, publication title, country of research, participant demographics (such as child,

parent report, inmate retrospective report), population characteristics relating to exposure to violent or antisocial behavior (such as offenders, victims of domestic violence), adopted definition of the animal harm, and summary of the study's main findings. These are summarized in [Tables 1 and 2](#).

The narrative synthesis was in two parts: First, findings from theoretical papers/reviews were synthesized in the context of historical and disciplinary trends; second, empirical studies were thematically classified into five overarching themes: (1) psychological behavioral correlates of CAC, (2) CAC as a predictor of future violent behavior, (3) environmental factors predictive of CAC, (4) children's exposure to or witnessing AC, and (5) psychosocial barriers to reporting CAC and associated issues with measurement. All studies were coded by each author independently (inter-rater agreement of 94%).

A methodology quality assessment procedure was not carried out for the current review for two reasons: (1) there was too wide a range of study designs (e.g., cohort, cross-sectional, qualitative, mixed-method, theoretical), precluding a single quality assessment tool from being used, and (2) quality assessment tools do not identify issues *across* study types in a way that would meaningfully answer research questions for the current study.

Results

Databases generated 416 results; once duplicates were removed, 124 entries remained, which were screened for relevance using title and abstract. In addition, references from the two existing systematic reviews along with reference lists/annotated bibliographies published online by the *Animals and Society Institute* and *The National Link Coalition* were consulted to determine whether any publications relating to animal cruelty in childhood had been missed; this generated an additional five studies. Records that were not peer-reviewed, did not have full publication available, and did not relate to animal harm involving children or adolescents were removed ($n = 47$). The full text of the 77 remaining articles was assessed, and eight were excluded owing to their insufficient focus on childhood or adolescent animal harm. This process is summarized in [Figure 1](#) and resulted in the 69 publications reviewed here.

Descriptive Characteristics of the Studies

[Table 1](#) provides details for the theoretical/review publications, while [Table 2](#) summarizes results of the empirical studies. Most publications were original empirical research ($n = 52$), followed by reviews ($n = 10$), theoretical papers ($n = 4$), and book or book chapters ($n = 3$). Studies were predominately carried out in (or had authors affiliated with) the USA ($n = 41$), followed by the UK ($n = 10$), other European countries ($n = 4$), China ($n = 3$), Australia ($n = 2$), Canada ($n = 2$), an international collaboration ($n = 2$), and one each in India, Japan, Bahamas, Brazil, and Turkey. Some studies used the same pool of participants for several publications. Specifically, six studies used sub-samples of a larger dataset of women and children from 22 Domestic Violence shelters (Matijczak et al., 2020; McDonald et al., 2015, 2017, 2018a, 2018b, 2019), four studies used the same sample of 180 prison inmates from medium- and maximum-security prisons (Hensley et al., 2012a, 2012b, 2018; Overton et al., 2012), two studies used a sample from the Pathways to

**Table 1.** Summary of key characteristics for theoretical and review articles on childhood animal cruelty (CAC).

#	Author(s)	Date	Title	Country ^a	Publication type	Classification	CAC definition	Summary of findings
1	Faver	2010	School-based humane education as a strategy to prevent violence: Review and recommendations	USA	Review	Social Work/ "The Link"	Mixed	Recommends that humane education become more mainstream and that professionals such as teachers and school psychologists become more familiar with existing resources.
2	DeGue	2011	A triad of family violence: Examining overlap in the abuse of children, partners, and pets	USA	Book Chapter	Social Work/ "The Link"	Not specified	Summarizes the existing evidence for the overlap between different forms of family violence (IPV, child abuse, and animal abuse), emphasizing the importance of cross-reporting since once form of abuse may act as a "red-flag." Suggestions for the identification and therapeutic treatment of animal cruelty in childhood.
3	Shapiro et al.	2013	The assessment and treatment of children who abuse animals	USA	Book	Psychology	Not specified	Reviews and summarizes the existing literature on the link between violence and AC, and suggests educators are in a unique place to influence children and model good interactions.
4	Stanek	2014	The treatment of animals within families of young children: Antecedents of compassion and cruelty.	USA	Book Chapter	Social Work/ "The Link"	Not specified	Description of the legal status of AC across the United States, and a proposition for the classification of bestiality based on motivation.
5	Holoyada & Newman	2016	Childhood animal cruelty, bestiality, and the link to adult interpersonal violence	USA	Review	Criminal-legal	Mixed	Highlights psychological risk factors associated with CAC, including behavioral and personality problems, along with experiences that increasing risk, including abuse, bullying, and witnessing AC.
6	Hawkins et al.	2017	Psychological risk factors for childhood non-human animal cruelty	UK	Review	Psychology	Ascione 1993	This review finds strong evidence for "the Link" between animal harm and violence to people, but few publications on this topic from the veterinary perspective; it suggests
7	Monsalve et al.	2017	The connection between animal abuse and interpersonal violence: A review from the veterinary perspective	Brazil	Review	Social Work/ "The Link"	Not specified	

8	Feithous and Calhoun	2018	Females who maltreat animals	USA	Review	Psychology	Mixed	vets should receive more training on how to intervene. Animal cruelty in males is likely different than in females, especially when they are older and are more likely to predominate in animal hoarding. Animal abuse committed by older children and females is more likely to be suggestive of child abuse.
9	Lee-Kelland and Finlay	2018	Children who abuse animals: when should you be concerned about child abuse? A review of the literature	UK	Review	Social Work/ "The Link"	Ascione 1993	Describes the application of Social Information Processing (SIP) theory to our understanding of animal cruelty.
10	Henry	2018	Applying socio-cognitive models of interpersonal aggression to animal cruelty	USA	Theoretical paper	Psychology	"Infliction of unjustified physical or emotional pain, suffering, injury or death on a non-human animal that occurs outside the boundaries of social norms"	Drawing on other literature of interpersonal violence and emotion regulation, the authors argue this is an important topic to understand for animal cruelty, which can result from either <i>under-</i> or <i>mis-</i> regulation of emotion.
11	Parfitt and Alleyne	2018	Animal abuse as an outcome of poor emotion regulation: A preliminary conceptualization	UK	Theoretical paper	Psychology	Ascione 1993, but distinguishes animal cruelty from animal abuse	Highlights the increased risk of committing AC if exposed to domestic violence, and that AC is predictive of later IPV. Reviews deviance generalization, graduation hypotheses, social learning, and frustration theories.
12	Chan and Wong	2019	Childhood and adolescent animal cruelty and subsequent interpersonal violence in adulthood: A review of the literature	China	Review	Criminal-legal	Ascione 1993	AC during childhood is linked to other forms of violent/antisocial behaviors. AC was associated with bullying, behavioral problems, experiences of abuse, and juvenile delinquency. Recurrent CAC was a significant predictor of adult
13	Longobardi and Badenes-Ribera	2019	The relationship between animal cruelty in children and adolescent and interpersonal violence: A systematic review	Italy, Spain (EU)	Review	Criminal-legal	Ascione 1993	

(Continued)

Table 1. Continued.

#	Author(s)	Date	Title	Country ^a	Publication type	Classification	CAC definition	Summary of findings
14	Mowen and Boman	2020	Animal abuse among high-risk youth: A test of Agnew's theory	USA	Theoretical paper (with original research)	Criminal-legal	Have you ever physically hurt an animal (or animals) on purpose? (Pathways to Desistance) – SR	perpetration of interpersonal violence. Mixed level model finds partial support for Agnew's theory of AC, which is a four-factor model implicating personal traits, socialization, strain (stress), and social control.
15	Ladny and Meyer	2020	Traumatized witnesses: Review of childhood exposure to animal cruelty	USA	Review	Social Work/ "The Link"	Physical abuses such as beating, shooting, and torture of animals	A range of negative outcomes were associated with witnessing AC in childhood, including trauma, perpetrations of animal cruelty, and violence towards humans. Recommendation that witnessing AC is included in work on "the Link."
16	Jegatheesan et al.	2020	Understanding the link between animal cruelty and family violence: The bioecological systems model	International	Theoretical paper	Psychology	Ascione 1993	The authors propose using Bronfenbrenner's bioecological systems model to bring together the risk factors which tend to occur around instances of animal harm, illustrating this with case studies.
17	Randour et al.	2021	Animal abuse as a type of trauma: Lessons for human and animal service professionals	USA	Review	Social Work/ "The Link"	Mixed	Presents evidence for the link in a review of legal cases and argues that not enough is done in practice to investigate AC by services such as social work or child protection workers.

^aRefers the country of the authors' main affiliation. Ascione 1993 refers to the classic definition of animal cruelty: "socially unacceptable behavior that intentionally causes unnecessary pain, suffering, or distress to and/or the death of an animal."

Table 2. Summary of key characteristics for original research articles on childhood animal cruelty (CAC).

#	Author(s)	Date	Title	Country ^a	Participant demographic	CAC instrument/definition	Summary of findings	SC
1	Yamazaki et al.	2010	A comparison of maltreated children and non-maltreated children on their experiences with animals – A Japanese study	Japan	Survey with children, <i>n</i> = 139 (Maltreated = 26, Control = 113) (M/A)	BIARE (Boat Inventory of Animal Related Experiences) – SR	Compared with control children, children from maltreated background used animals as a source of support and had more interaction with animals, but were also more likely to commit and/or witness animal abuse.	1
2	Boat et al.	2011	Childhood cruelty to animals: Psychiatric and demographic correlates	USA	Analysis of psychiatric intake data, <i>n</i> = 110 (NV)	Yes/No on “animal cruelty item” – HWR	Children who were cruel to animals were more likely to have accompanying behavioral issues, such as CD, bullying, and being sexually abused.	3
3	Fielding et al.	2011	A first look at harm toward animals by Bahamians in childhood	Bahamas	Retrospective Study with adults, <i>n</i> = 1,881 (NV)	CAI (Cruelty to Animals Inventory; included harms to invertebrates) – SR	Adults who had harmed animals as children were more likely to come from homes which had domestic violence, where guns were present, and in homes participants did not consider to be “loving.”	1
4	Henderson et al.	2011	Childhood animal cruelty methods and their link to adult interpersonal violence	USA	Retrospective survey with prison inmates, <i>n</i> = 180 (PI)	“Any action where the respondent hurt or killed animals when they were children” – SR	Hitting was the most common method of animal cruelty (4/5), followed by kicking or shooting (1/3), and sex (1/5). Only sex and age of first incident were predictive of later interpersonal offences.	2
5	Lucia and Killias	2011	Is animal cruelty a marker of interpersonal violence and delinquency? Results of a Swiss national self-report study	Switzerland	National adolescent survey, <i>n</i> = 3,648 (NV)	“Have you ever hurt an animal on purpose?” – SR	Animal cruelty was linked to more serious forms of offending, especially violence, vandalism, and acts with components of anger.	2
6	Vaughn et al.	2011	Effects of childhood adversity on bullying and cruelty to animals in the United States: Findings from a national sample	USA	National Epidemiologic Survey: Retrospective interviews with adults, <i>n</i> = 34,653; animal cruelty = 475 (NV)	CD scale as part of longitudinal survey (“In your entire life, did you ever hurt or be cruel to an animal or pet on purpose?”) – SR	Childhood adversities increase the risk of animal cruelty, but there is less of a cumulative effect for animal cruelty behaviors than bullying behaviors.	1
7	Xu et al.	2011		China			Parents reported higher cruelty for boys, and parents had higher	5

(Continued)

Table 2. Continued.

#	Author(s)	Date	Title	Country ^a	Participant demographic	CAC instrument/definition	Summary of findings	SC
8	Arluke	2012	Childhood cruelty to animals: Do mothers' and fathers' reports agree?	USA	Survey using parent report, <i>n</i> = 700 parent pairs (NV) Qualitative retrospective interviews, <i>n</i> = 25 (NV)	CABTA (Children's attitudes and Behaviors towards Animals scale) – PR Unclear (semi-structured qualitative interview) – SR	agreement for boy's cruelty than girls. Friendship norms, such as being "one of the gang" stopped adolescents from reporting or stopping witnessed animal cruelty.	5
9	Arluke	2012	Interpersonal barriers to stopping animal abuse: Exploring the role of adolescent friendship norms and breeches. Bystander apathy in animal abuse cases: Exploring barriers to child and adolescent intervention	USA	Qualitative retrospective interviews, <i>n</i> = 25 (NV)	Unclear (semi-structured qualitative interview) – SR	Friendship norms, such as being "one of the gang" stopped adolescents from reporting or stopping witnessed animal cruelty.	5
10	Girardi and Pozzulo	2012	The significance of animal cruelty in child protection investigations	Canada	Survey of Child Protection Workers (HWR), <i>n</i> = 78	Unique – SR	Few CPWs routinely asked questions about AC, but those who did were more likely to report disclosures of AC. Many CPWs had directly observed AC and almost all indicated that AC was important to consider when making intervention decisions.	5
11	Hensley et al.	2012	The predictive value of childhood animal cruelty methods on later adult violence: Examining demographic and situational correlates	USA	Retrospective survey with prison inmates, <i>n</i> = 180 (PI)	"Any action where the respondent hurt or killed animals when they were children" – SR	Frequent CAC was linked to acts of drowning, shooting, kicking, or having sex with animals. Sex with animals was the only method of CAC that predicted the later commission of adult violent crimes.	2
12	Hensley et al.	2012	Exploring the age of onset and recurrence of childhood animal cruelty: Can animal cruelty be learned from witnessing others commit it?	USA	Retrospective survey with prison inmates, <i>n</i> = 180 (PI)	"Any action where the respondent hurt or killed animals when they were children" – SR	Exposure to animal cruelty, and earlier witnessing increased frequency of cruelty.	4
13	Overton et al.	2012	Examining the relationship between childhood animal cruelty motives and recurrent adult violent crimes toward humans	USA	Retrospective survey with prison inmates, <i>n</i> = 180 (PI)	"Any action where the respondent hurt or killed animals when they were children" – SR	Motives for cruelty did not correlate with interpersonal violence, but recurrence did.	2
14	Sanders et al.	2013	Bullies, victims, and animal abusers: Do they exhibit similar behavioral difficulties?	USA	Retrospective study with young adults, <i>n</i> = 250 (NV)	EWA (Experiences with animals- derived from BIARE) – SR	Animal abusers reported more bullying (traditional and cyber) and more acceptance of aggression than non-abusers.	3

15	Signal et al.	2013	When do psychologists pay attention to children harming animals?	Australia	Practicing Clinical Psychologists (HWR), <i>n</i> = 69	Vignettes for psychologists to interpret	Psychologists reported AC was a more important indicator for Conduct Disorder than ADHD, but was often not highlighted as an important area for intervention.	5
16	Wong et al.	2013	Childhood cruelty to animals in China: The relationship with psychological adjustment and family functioning	China	Survey using parent report, <i>n</i> = 729 parent pairs (NV)	CABTA (Children's Attitudes and Behaviors towards Animals scale) – PR	Parent reports of externalizing behavior predicted animal cruelty. Family functioning (paternal understanding) only had a small impact.	1, 3
17	Knight et al.	2014	Parental predictors of children's animal abuse: Findings from a national and intergenerational sample	USA	NYSFS Longitudinal survey using child and parent reports, <i>n</i> = 1,614; children = 1,067, parents = 547 (NV)	"When you were a child or teenager, did you hurt animals on purpose—to amuse yourself" – SR	Parent AC is predictive of IPV, which is in turn predictive of their children's AC. However parents AC is not directly predictive of children's AC.	1
18	McEwan et al.	2014	Is childhood cruelty to animals a marker for physical maltreatment in a prospective cohort study of children?	UK	E-Risk Longitudinal twin study using parent report, <i>n</i> = 2,232 children (NV)	"Cruel to animals" in CBCL – PR	Child maltreatment was predictive of AC, and strength of association increases with age, SES difficulty, and frequency of AC.	1
19	Walters	2014	Testing the direct, indirect, and moderated effects of childhood animal cruelty on future aggressive and non-aggressive offending.	USA	Pathways to Desistance, retrospective longitudinal survey with young offenders, <i>n</i> = 1,336 (AD)	"Did you ever physically hurt animals on purpose?" – SR	In a longitudinal study of inmates, AC was found to be predictive of both violent and non-violent offending, a relationship mediated by CU traits and interpersonal hostility.	2
20	Girardi and Pozzulo	2015	Childhood experiences with family pets and internalizing symptoms in early adulthood	Canada	Retrospective study with young adults, <i>n</i> = 213 (NV)	Exposure to Aggression Towards Pets Scale – SR	Findings suggest that bonding with pets may support mental health and that exposure to animal cruelty may lead to the development of internalizing symptoms.	4
21	McDonald et al.	2015	Children's experiences of companion animal maltreatment in households characterized by intimate partner violence	USA	Qualitative interview with children, <i>n</i> = 58 (IPV)	Semi-structured interview based on COEP (Children's Observations and Experiences with Animals Survey) – SR	Children exposed to animal maltreatment in an IPV context described a variety of reasons including power manipulation, and stating they sometimes tried to protect or intervene in some way.	4
22	Simmons et al.	2015		USA	NYSFS Longitudinal survey using child and	"When you were a child or teenager, did you hurt	Animal abuse in two generations is predictive of behavior problems,	2

(Continued)

Table 2. Continued.

#	Author(s)	Date	Title	Country ^a	Participant demographic	CAC instrument/definition	Summary of findings	SC
23	Walters and Noon	2015	Youthful animal abuse and later problem behavior outcomes: Findings from two generations. Family context and externalizing correlates of childhood animal cruelty in adjudicated delinquents	USA	parent reports, total <i>n</i> = 2,538 (NV) Pathways to Desistance, retrospective survey with young offenders, <i>n</i> = 1,354 (AD)	animals on purpose—to amuse yourself” – SR “Did you ever physically hurt animals on purpose?” – SR	including serious offending and substance abuse. AC correlated with a wide range of family context and externalizing variables in predicting offending behavior, and may be seen as an extension of proactive (but not reactive) subdimension of the externalizing spectrum.	2, 3
24	Hawkins and Williams	2016	Children’s beliefs about animal minds (Child-BAM): Associations with positive and negative child–animal interactions	UK	Survey with children, <i>n</i> = 1,217 (NV)	(CAAC) Children’s Attitude to Animal Cruelty – SR	Higher levels of Belief in Animal Minds related to less acceptance of cruelty and more humane behaviors.	3
25	Parfitt and Alleyne	2016	Taking it out on the dog: Psychological and behavioral correlates of animal abuse proclivity	UK	Retrospective study with young adults, <i>n</i> = 164 (NV)	Subsection of BIARE and AAPS (Animal Abuse Proclivity Scale) – SR	Childhood animal abuse and low empathetic concern (measured by IRI) were both predictive of direct and indirect animal abuse in adulthood.	3, 2
26	Satapathy et al.	2016	Psychological evaluation of an adolescent with bestiality behavior	India	Case study with an adolescent, <i>n</i> = 1	Bestiality and death of an animal – HWR	Describes a case study of an adolescent with bestiality behavior, along with some of the characteristics, including a history of sexual abuse, alcoholism, witnessing frequent domestic violence, and other factors.	1
27	Baglivio et al.	2017	Juvenile animal cruelty and fire-setting behavior	USA	Retrospective survey of adolescent offenders, <i>n</i> = 292,649, animal cruelty = 1,732 (AD)	Semi-structured interview: “What is the worst thing you’ve done to an animal?” – SR	No strong evidence for the co-occurrence of animal cruelty and fire-setting behavior.	2
28	Browne et al.	2017	Does witnessing animal cruelty and being abused during childhood predict the initial age and recurrence of committing childhood animal cruelty?	USA	Retrospective survey with prison inmates, <i>n</i> = 257 (PI)	“Any action where respondents hurt or killed animals when they were children” – SR	Physical abuse and witnessing caregivers engage in animal abuse resulted in earlier age of onset and more repeated childhood animal cruelty.	1
29	McDonald et al.	2017	The role of callous/unemotional traits in mediating the association between animal abuse exposure and behavior problems among	USA	Survey with children and parent report, <i>n</i> = 291 mother–child dyads (IPV)	PTS (Pet Treatment Survey) – SR and PR	Exposure to animal maltreatment is related to internalizing and externalizing problems, and CU traits are a significant mediator.	4

30	Parke and Signal	2017	Australia	children exposed to intimate partner violence Revisiting a link: Animal abuse, bullying, and empathy in Australian youth	Survey with adolescents, <i>n</i> = 63 (NV)	PET (Physical and Emotional Tormenting Against Animals Scale) – SR	Witnessing and/or directly engaging in AA significantly correlated with bullying. For males, engaging in AA, lower affective empathy and a high need for power were found to predict bullying.	3, 4
31	Alleyne and Parfitt	2018	USA	Factors that distinguish aggression towards animals from other antisocial behaviors: Evidence from a community sample	Retrospective survey with adults, <i>n</i> = 384 (NV)	Witnessing animal harm (childhood) and ATAS (Aggression Towards Animal Scale) – SR	Low animal-oriented empathy and low self-esteem distinguished animal abuse offenders. Low empathy mediated the relationship between animal abuse and animal harm exposure, and was stronger for participants with anger regulation issues.	3
32	Arluke et al.	2018	Various	Harming animals and massacring humans: Characteristics of public mass and active shooters who abused animals	Analysis of publicly reported cases of mass shooters, <i>n</i> = 20 (VO)	Unique	Public mass shooters who had abused animals were more likely to be younger, white, and kill more people.	2
33	Bright et al.	2018	USA	Animal cruelty as an indicator of family trauma: Using adverse childhood experiences to look beyond child abuse and domestic violence	Retrospective survey adolescent offenders, <i>n</i> = 81,000, animal cruelty = 466 (AD)	"What's the worst thing that you've ever done to an animal?" – SR	Children admitting to AC were younger at time of first arrest, more likely to be male, and more likely to be White. They are more likely have an array of ACEs beyond family violence and to have four or more ACEs.	1, 2
34	Connor et al.	2018	UK	Factors influencing the prevalence of animal cruelty during adolescence	Survey with adolescents, <i>n</i> = 979 (NV)	CAAC (Children's Attitudes to Animal cruelty), CACB (Children's Animal Cruelty Behaviors) – SR	Acceptance of animal cruelty predicted cruel behaviors, and younger adolescents were more likely to cause harm by accident.	3
35	Haden et al.	2018	USA	An exploratory study of domestic violence: Perpetrators' reports of violence against animals	Retrospective survey with prison inmates, <i>n</i> = 42 (PI)	"Being cruel to animals" item from the Interview for Antisocial Behavior measure	ASPD was linked to CAC. CAC was related to increased use of psychological abuse and sexual coercion in the context of intimate relationships, and threats/perpetration of animal abuse during relationship conflicts.	3, 2
36	Hartman et al.	2018	USA	Intimate partner violence and animal abuse in an immigrant-rich	Parent report, <i>n</i> = 291 (IPV)		Amongst perpetrators of IPV, Hispanic men were less likely than	4

(Continued)



Table 2. Continued.

#	Author(s)	Date	Title	Country ^a	Participant demographic	CAC instrument/definition	Summary of findings	SC
37	Hensley and Ketron	2018	sample of mother-child dyads recruited from domestic violence programs	USA	Retrospective survey with prison inmates, <i>n</i> = 257 (PI)	PTS (Pet Treatment Survey) and CAI (Cruelty to Animal Inventory) – PR	white men to harm pets. Psychological aggression was more predictive of harm to pets than physical assault.	2
38	Hensley et al.	2018	The predictive ability of childhood animal cruelty methods for later interpersonal crimes	USA	Retrospective survey with prison inmates, <i>n</i> = 180 (PI)	"any action where the respondent hurt or killed animals when they were children" – SR	Recurrent childhood animal cruelty and stabbing was predictive of recurrent interpersonal violence.	2
39	Hensley et al.	2018	Exploring the social and emotional context of childhood animal cruelty and its potential link to adult human violence	USA	Retrospective survey with prison inmates, <i>n</i> = 180 (PI)	"any action where the respondent hurt or killed animals when they were children" – SR	Recurrent childhood animal cruelty was predictive of recurrent interpersonal violence.	2
40	McDonald et al.	2018	Animal cruelty among children in violent households: Children's explanations of their behavior	USA	Qualitative interviews with children, <i>n</i> = 46 (IPV)	Children's Observation and Experiences with Animals Survey (COEP), Cruelty to Animals Inventory (CAI) – SR	Thematic analysis highlighted factors in children's harm of animals, including: history of witnessing animal cruelty/neglect, minimization of CAC, anthropomorphic beliefs, punishing pets out of anger, and others.	3, 4
41	McDonald et al.	2018	Concomitant exposure to animal maltreatment and socioemotional adjustment among children exposed to intimate partner violence: A mixed methods study.	USA	Mixed methods with child and parent report, <i>n</i> = 291 (IPV)	PTS (Pet treatment Survey); COEP (Children's Observation and Experiences with Animals Survey); CBCL (Child Behavior Checklist) – SR and PR	Children with Emotional Behavioral difficulties, as compared with resilient "asymptomatic" children were more likely to have been exposed to more severe AC, express justifications for AC, and have been victimized by IPV perpetrators.	3, 4
42	Newberry	2018	Associations between different motivations for animal cruelty, methods of animal cruelty and facets of impulsivity	UK	Retrospective survey with adolescents, <i>n</i> = 130 (NV)	BIARE (Boat Inventory of Animal Related Experiences) – SR	Specific motivations for cruelty (e.g., retaliation; amusement) were linked to specific methods (e.g., hitting; shooting) and specific types of impulsivity (e.g., negative urgency; sensation seeking) respectively.	3
43	Sanders and Henry	2018	The role of beliefs about aggression in cyberbullying and animal abuse	USA	Survey with young adults, <i>n</i> = 439 (NV)	EWA (Experiences with animals- derived from BIARE) – SR	AC linked to higher incidences of bullying and more acceptance of aggression, with normative beliefs	3

43	Trentham et al.	2018	USA	Retrospective study with prison inmates, <i>n</i> = 257 (PI)	Recurrent childhood animal cruelty and its link to recurrent adult interpersonal violence	USA	Retrospective study with prison inmates, <i>n</i> = 257 (PI)	"How many times they had hurt or killed animals" – SR	about aggression linking bullying to AC.	2
44	Walters	2018	USA	Survey of children and parents, <i>n</i> = 3,379 (NV)	Parent and child reports of animal cruelty and their correlations with parent and child reports of child delinquency	USA	Survey of children and parents, <i>n</i> = 3,379 (NV)	"Have you ever hurt an animal on purpose" as part of FFCW – SR	Recurrent childhood animal cruelty was predictive or recurrent interpersonal crimes. Parent but not child reported AC correlated with reports of delinquency.	2
45	Hartman et al.	2019	USA	Parent and child report, <i>n</i> = 290 (IPV)	Exploring empathy and callous–unemotional traits as predictors of animal abuse perpetrated by children exposed to intimate partner violence	USA	Parent and child report, <i>n</i> = 290 (IPV)	CAI (parent and child report) – SR and PR	High affective empathy, low cognitive, and CU traits predicted AC, but the effect of affective empathy disappeared when controlling for SES.	3
46	McDonald et al.	2019	USA	Qualitative parent report, <i>n</i> = 65 (IPV)	Intimate partner violence survivors' reports of their children's exposure to companion animal maltreatment: A qualitative study	USA	Qualitative parent report, <i>n</i> = 65 (IPV)	PTS (Pet Treatment Survey) – PR	Three themes emerged related to children's experience of animal maltreatment: (a) direct exposure to AC and related threats; (b) emotional and behavioral responses to AC exposure, and (c) AC as coercive control of the child.	4
47	Plant et al.	2019	Germany, Romania (EU)	Survey with adolescents, <i>n</i> = 270 (study 1); <i>n</i> = 60 (study 2) (NV)	It's a dog's life: Culture, empathy, gender, and domestic violence predict animal abuse in adolescents—implications for societal health	Germany, Romania (EU)	Survey with adolescents, <i>n</i> = 270 (study 1); <i>n</i> = 60 (study 2) (NV)	Unique: "I am cruel to animals" and "I have seen people be cruel to animals" – SR	Results showed that cultures more accepting of AC (Romania) than others (Germany) was predictive of more AC, and that the relationship between AC and gender was mediated by affective empathy.	1, 3
48	Akdemir and Golge	2020	Turkey	Questionnaire with children, <i>n</i> = 1,248 (NV)	Cruelty to animals in Turkish children: Connections with aggression and empathy	Turkey	Questionnaire with children, <i>n</i> = 1,248 (NV)	CAI (Cruelty to Animals Inventory) – SR	Children who were more aggressive and had less empathy were more likely to be cruel to animals. Supporting elements of social learning theory, children in families that did not love animal reported being more cruel to animals.	3
49	Hawkins, Scottish SPCA, & Williams	2020	UK	Questionnaire with children, <i>n</i> = 1,127 (NV)	Children's attitudes towards animal cruelty: Exploration of predictors and socio-demographic variations	UK	Questionnaire with children, <i>n</i> = 1,127 (NV)	CAAC (Children's Attitudes to Animal cruelty), CCA (Children's Compassion towards Animals) – SR	Acceptance of AC was predicted by lower empathy, attachment, and lower belief in animal minds. In turn, acceptance of AC predicted	

(Continued)

Table 2. Continued.

#	Author(s)	Date	Title	Country ^a	Participant demographic	CAC instrument/definition	Summary of findings	SC
50	Bégué	2020	Explaining animal abuse among adolescents: The role of speciesism	France (EU)	Questionnaire with adolescents, <i>n</i> = 12,344 (NV)	"Have you ever harmed or wounded an animal on purpose?"	lower compassion. There may be different developmental pathways for intentional and unintentional cruelty. AA was more frequent in adolescents with less positive family climate, lower support from friends, lower attachment to school, and with higher anxiety-depressive symptomatology. AA was related to more deviant behavior such as drunkenness and bullying. AA was higher among adolescents who endorsed speciesist attitudes.	3
51	Matijczak et al.	2020	Do animal cruelty exposure and positive engagement with pets moderate associations between children's exposure to intimate partner violence and externalizing behavior problems?	USA	Child and parent report using surveys, <i>n</i> = 2,014 (IPV)	Witnessing animal harm; Children's Treatment of Animals Questionnaire (CTAQ) for positive behaviors	Did not find evidence that positive engagement with pets or AC exposure moderated the association between IPV and externalizing problems.	4
52	Wauthier and Williams	2020	A qualitative study of children's accounts of cruelty to animals: Uncovering the roles of trauma, exposure to violence, and attachment	UK	Qualitative interviews with children, <i>n</i> = 10 (NV)	Qualitative interviews – SR	Qualitative analysis suggested that children referred for animal harm: had small attachment networks which often included pets, tended to interpret ambiguous situations negatively, saw animals as sentient, and struggled admitting to arm.	3

^aRefers to the country participants were from. SR = Self-report, PR = Parent report, HWR = Health worker report. NYSFS = National Youth Survey, FFCW = Fragile Families and Child Wellbeing longitudinal study. Sample violence classifications: NV = Non-violent sample, AD = Adjudicated delinquents, PI = Prison inmate, VO = Violent offenders, IPV = family exposed to Intimate Partner Violence, M/A = Maltreatment/abuse of child. SC = Study classification by theme: 1 = Studies investigating predictors of CAC, 2 = Studies where CAC is predictive of future violent behavior, 3 = Behavioral and psychological correlates of CAC, 4 = Child exposure to or witnessing AC, 5 = Reporting CAC.

Desistance longitudinal study (Walters, 2014; Walters & Noon, 2015), and two studies used data from the NYSFS longitudinal study (Knight et al., 2014; Simmons et al., 2015).

Research Question 1: What are the Theoretical Models and Conceptualization of CAC?

Three main disciplines have driven most of the theoretical work on CAC (see Figure 2): (1) criminal and legal perspectives; (2) social work and “The Link”; and (3) clinical and developmental psychology. To answer question 1, we have organized the theoretical and review publications in terms of discipline and main theories.

Legal and Criminal Perspectives

The criminal strand of CAC was established by Macdonald, who hypothesized that CAC, along with fire-setting and bed-wetting behavior, were predictive of homicidal tendencies in adulthood: the Macdonald triad (Macdonald, 1963). Although evidence for the triad is weak (Parfitt & Alleyne, 2020), it established CAC as a predictor of serious violent behavior. CAC, especially recurrent CAC, has been found to be predictive of various forms of aggression, violent crime, and incarceration (Gullone, 2012; Hensley et al., 2009). The most prominent theories for this link are the Graduation Hypothesis (Wright & Hensley, 2003) and the Deviance Generalization Hypothesis (Arluke et al., 1999; see also Gullone, 2014). The Graduation Hypothesis proposes that animal cruelty is a precursor to violent offending behavior and suggests it may be a form of rehearsal for later human interpersonal violence (Felthous & Kellert, 1987). The Deviance Generalization Hypothesis states simply that animal cruelty co-occurs with a range of other antisocial behaviors but does not necessarily lead to interpersonal violence.

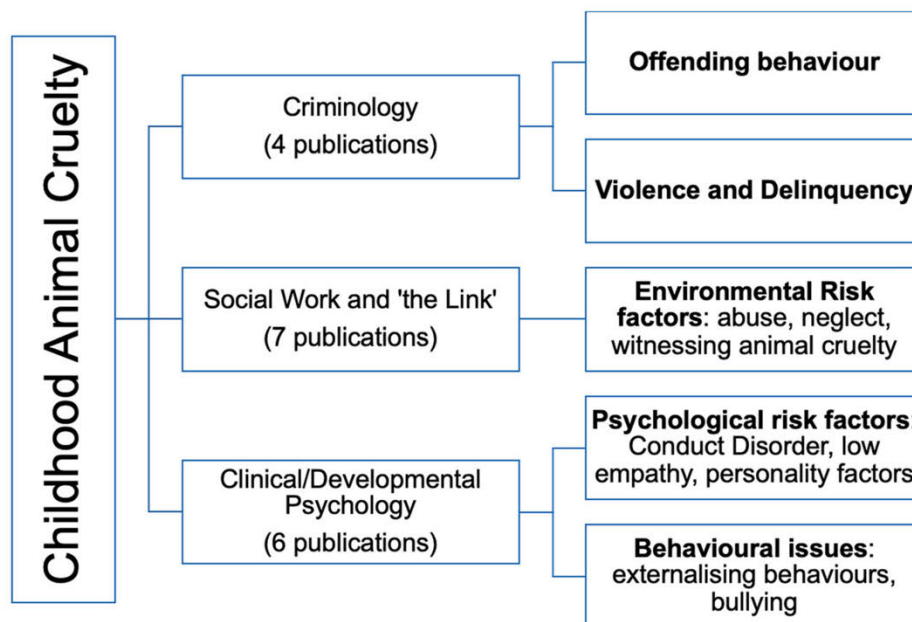


Figure 2. Diagram summarizing the classification of the historic research strands informing the study of childhood animal cruelty.

Four publications reviewed here had strong links to criminal and/or legal perspectives. Holoyada and Newman (2016) reviewed the legal status of animal cruelty in the USA, paying attention to bestiality as a marker for future offending behavior, especially sexual offending. They propose a classification scheme of bestiality behavior based on the motivation of the perpetrator. Longobardi and Badenes-Ribera (2019) undertook a systematic review of the literature on the relationship between animal cruelty in childhood and adolescence and the link to interpersonal violence. They found that *recurrent* childhood cruelty was predictive of adult interpersonal violence and noted that CAC was associated with bullying, behavioral problems, experiences of abuse, and juvenile delinquency.

Chan and Wong's (2019) non-systematic review of the literature (sharing 18 studies with Longobardi & Badenes-Ribera, 2019) describes five theories on the link between CAC and later interpersonal violence: the deviance generalization hypothesis and the graduation hypothesis (explored above), social learning theory, frustration theory, and sexual polymorphous theory. *Social learning theory* (Bandura & McClelland, 1977) suggests that CAC might be learned if children have observed and model cruelty toward animals and human-directed aggression. Updated *frustration theory* suggests that frustrations, as aversive events, generate aggressive inclinations only to the extent that they produce negative affect (Berkowitz, 1989). *Sexual polymorphous theory* (Merz-Perez & Heide, 2004) suggests that aggressive and sexual tendencies are merged in animal sexual abuse.

Mowen and Boman (2019) reviewed the evidence for Agnew's (1998) socio-psychological theory of animal abuse. Agnew hypothesized that four individual factors contribute to animal abuse: (1) individual traits and behaviors (e.g., age, empathy, and physical location), (2) social control (e.g., parental monitoring and bonds to school), (3) socialization (e.g., moral beliefs), and (4) strain (e.g., anxiety). Mowen and Boman (2019) used longitudinal data from 1354 serious adolescent offenders, finding strong support for the role of individual traits and socialization, some support for the role of social control, but no support for the role of strain in self-reported incidence of animal harm.

Social Work and "the Link"

The second strand of research into CAC comes from studies in social work demonstrating "The Link" between harm to animals and harm to people, including the associations between animal abuse and child abuse (Deviney et al., 1983), animal abuse and Intimate Partner Violence (IPV; Ascione, 2007), and witnessing animal cruelty or domestic violence and CAC (Currie, 2006; Gullone & Robertson, 2008). It underscores the importance of inter-agency cooperation in determining whether families might be at risk when cases of animal cruelty are found (LaCroix, 1998).

Seven publications explored "The Link" between AC and other forms of violence in the family. DeGue (2011) reviews the literature on the overlap of animal abuse with family violence, highlighting the importance of having both an adequate cross-reporting framework and humane education programs. Lee-Kelland and Finaly (2018) explore whether animal abuse committed by a child could be indicative of the child's own abuse at home. They concluded that older children (above 10 years) and females who harm animals are more likely to have been abused, but with children showing behavioral issues such as CD or attention deficit hyperactivity disorder (ADHD), the link was less

clear. Randour et al. (2021) reviewed both empirical research and legislation in the USA, concluding that there is strong evidence for the link between animal cruelty and violence in the home but poor inter-agency coordination and gaps in legislation. Faver (2010) reviews the literature on the role of humane education programs in interrupting the cycle of violence for children who may be exposed to violence and at risk of harming animals. Stanek (2014) introduces educators to “The Link” and suggests that educators can be part of the cross-reporting framework and are in a place to intervene by fostering compassion, building resilience, and facilitating the humane treatment of animals. Monsalve et al. (2017) consider the role of veterinary practitioners, finding that few publications explore “The Link” from a veterinary perspective and suggest that veterinarians should receive more training on this topic. Finally, Ladney and Meyer (2020) review the literature on the impacts of witnessing animal cruelty during childhood, finding that this can cause trauma and be a risk factor for future violence toward both animals and humans. They recommend that *witnessing* animal cruelty receive more attention as part of “The Link.”

Psychological Perspective

The third strand explores whether CAC can be deemed an early indication of underlying psychological issues. In 1987, CAC was first used as one of the criteria for CD in children, which is the precursor to antisocial personality disorder (ASPD; Gleyzer et al., 2002), and CAC was measured by the single item on the Child Behavior Checklist (CBCL): “cruel to animals” (Achenbach & Ruffle, 2000). CAC has been linked to various emotional behavioral difficulties, especially externalizing spectrum disorders, and “psychopathic” tendencies such as CD’s modifier CU traits (Dadds et al., 2006) and low empathy (McPhedran, 2009). CU traits are considered the childhood precursor to psychopathy and are defined by low empathy, low emotionality, and disregard for others. Many psychological theories link CAC to aggression, arguing that models such as the General Aggression Model (GAM) can be used to understand CAC (Gullone, 2012). The GAM is an integrative model bringing together existing theories, focusing on socio-cognitive aspects as proximate causes of aggression, and biological, environmental, and personality factors as distal causes (DeWall et al., 2011).

Six publications reviewed here took a range of psychological perspectives, from cognitive and emotional theories to integrative approaches and bioecological systems models. These models are generally compatible with one another and cover both proximal and distal processes and etiology of CAC. Henry (2018) suggests that Social Information Processing (SIP) may help conceptualize the cognitive processes involved in CAC. SIP is a socio-cognitive model of aggression that differentiates between proactive or reactive aggression and breaks down how children exposed to violence are more likely to interpret a situation as negative or threatening, triggering aggressive or violent behavior. Parfitt and Alleyne (2018) propose an Emotional Dysregulation model of animal harm, based on a process model of emotion proposed by Gross (1998). They argue that even complex multi-factor theories such as the GAM focus too much on cognitive processes, underestimating processes surrounding emotion and behavioral regulation. Jegatheesan et al. (2020) propose a more distal model, discussing the effects of the broader social environmental contexts (e.g., individual biological risks, family

factors, community influences, and cultural norms) on children's risk of CAC, as conceptualized in Bronfenbrenner's bioecological model (Bronfenbrenner & Morris, 2006). Felthous and Calhoun (2018) explore the correlation between gender and animal harm, especially the very different harm females tend to engage in, such as animal hoarding. Together, these theoretical and review papers highlight the importance of *interactions* between social environmental and biological/developmental factors in understanding childhood animal harm (CAH).

One publication is aimed at mental health professionals for the treatment of children who have abused animals: *The AniCare Child Approach* (Shapiro et al., 2013). Although the manual focusses on assessment and treatment, it also provides a brief overview of theories relevant to the treatment of CAC. Notably, the authors provide a four-level model of risk factors for CAC, which can be targeted at intervention. Attachment security (level 1) is seen as core to the child's developmental risk, followed by empathy and emotional intelligence (level 2), self-management skills (level 3), and the influence of family and culture (level 4).

Research Question 2: Empirical Research Studies and the Risks and Correlates of CAC

Five conceptually distinct categories emerged for the empirical research studies. Some studies explored more than one topic and were given two classifications. We found that studies mainly explored psychological and behavioral correlates of CAC ($n = 20$), followed by CAC as a predictor of future violent behavior ($n = 16$), environmental factors predictive of CAC ($n = 10$), the impact of exposure to AC on children ($n = 10$), and psychosocial barriers to reporting CAC and associated issues with measurement ($n = 5$):

- (1) *Environmental Predictors of CAC*: Studies investigated various risk factors increasing the likelihood of children engaging in animal cruelty. The most investigated risk factors were forms of child adversity (Vaughn et al., 2011), including as measured by Adverse Childhood Experiences (ACEs; Bright et al., 2018), exposure to violence (Knight et al., 2014), presence of domestic violence (Fielding et al., 2011), and child maltreatment or abuse, including sexual abuse (Boat et al., 2011; Browne et al., 2017; McEwan et al., 2014; Satapathy et al., 2016). Yamazaki et al. (2010) compared a group of maltreated children with control children; although the maltreated children were more likely to abuse animals, they were also more likely to use animals as a source of support. Studies also investigated the effects of cultural acceptance of harming animals, both at the country level (Plant et al., 2019) and family level (Akdemir & Golge, 2020). Additionally, McEwan et al. (2014) found that lower SES increased the strength of the link between child maltreatment and animal cruelty. One study found a small effect on family function: specifically, a father's understanding of their children's needs was negatively related to father-reported CAC (Wong et al., 2013). Relatedly, one study found that adults reporting they had grown up in families who were "not loving" were also more likely to report having harmed animals as children (Fielding et al., 2011).

- (2) *CAC as Predictive of Future Violent Behavior*: Sixteen studies investigated whether CAC was predictive of future violent behavior, especially delinquency and violent offending. The most frequent finding was that *recurrent* CAC was predictive of violent interpersonal offences (Hensley et al., 2018; Hensley & Ketron, 2018; Overton et al., 2012; Trentham et al., 2018). Studies also found a link between CAC and earlier offending (Bright et al., 2018) and various forms of delinquency (Walters, 2018), especially violent acts based on anger (Lucia & Killis, 2011). Some studies explored specific questions, such as whether the type of animal abuse was specifically predictive, finding that although hitting, kicking, and shooting were the most common forms of animal harm, only sexual acts with animals were predictive of later interpersonal offences (Henderson et al., 2011; Hensley et al., 2012b). Simmons et al. (2015) found that CAC was predictive of a host of later problems, including serious offending, substance abuse, and deviant beliefs (measured by asking how “wrong” it was to carry out behaviors ranging from driving over the speed limit to hitting others). Similarly, Walters and Noon (2015) found that CAC was predictive of both violent and non-violent offending and remained predictive when including variables measuring negative family context (e.g., parental arguing) and measures of *reactive aggression* (e.g., poor impulse control, interpersonal hostility). However, CAC was no longer predictive when including variables of *proactive aggression*, suggesting that CAC is a marker of the proactive externalizing spectrum. One study found that CAC was no more predictive of violent than non-violent offending, in contradiction with the Graduation Hypothesis (Walters, 2014). Another study found no evidence for the co-occurrence of animal cruelty and fire-setting behaviors in a population of adolescent offenders, in contradiction with the McDonald triad (Baglivio et al., 2017). Finally, one study found that, for public mass shooters, CAC was associated with younger age of shooting, more deaths, and being White (Arluke, 2018).
- (3) *Psychological and Behavioral Correlates of CAC*: The most investigated factor was empathy, although the results were somewhat mixed. Most studies found that low empathy was associated with CAC (Akdemir & Golge, 2020; Alleyne & Parfitt, 2018; Hawkins & Williams, 2020; Parfitt & Alleyne, 2016; Plant et al., 2019), with several of these studies suggesting it is low affective empathy rather than low cognitive empathy which predicts CAC. However, one study found a less direct link between CAC and empathy (Parkes & Signal, 2017), and one study found the link with affective empathy disappeared when controlling for SES (Hartman et al., 2019). Other psychological constructs investigated were the roles of positive beliefs about animals, belief in animal sentience, and low acceptance of cruelty as protective factors against CAC (Connor et al., 2018; Hawkins & Williams, 2016; Hawkins, Scottish SPCA, & Williams, 2020). Finally, one study, in a community sampling of adults who self-reported antisocial and illegal behavior, found that low self-esteem, along with low animal-oriented empathy, distinguished animal abusers from offenders who engaged in other antisocial behaviors (Alleyne & Parfitt, 2018).

Using a large sample of French adolescents, Bègue (2020) found a link between animal abuse and variables relating to social bonding and strain, including negative family climate, poorer support from friends, lower attachment to school, and higher

anxio-depressive symptoms, as well as the link between animal abuse and deviance, including drunkenness and bullying. Furthermore, they found that speciesist attitudes played a significant role in predicting adolescent animal abuse, as measured by items such as “The life of a human being has more value than animal’s life.”

In terms of behaviors, several studies found that CAC and bullying were linked (Boat et al., 2011; Parkes & Signal, 2017; Sanders et al., 2013; Sanders & Henry, 2018). Studies also reported a link between CAC and externalizing issues, sometimes generally (Walters & Noon, 2015; Wong et al., 2013) and sometimes specifically in the form of CD and/or CU traits (Boat et al., 2011; Hartman et al., 2019; McDonald et al., 2017). This was often found alongside greater aggression or acceptance for aggression (Akdemir & Golge, 2020; Sanders et al., 2013; Sanders & Henry, 2018). One study found that CAC was linked to ASPD and an increased use of psychological abuse, sexual coercion, and cruelty to animals in relationship contexts as an adult (Haden et al., 2018). One study found that different types of impulsivity were linked to different methods and motivations for cruelty: for example, while shooting animals was linked to sensation seeking, hitting was linked to negative urgency (Newberry, 2018). One study showed that children exposed to animal cruelty were more likely to have emotional-behavioral difficulties than asymptomatic children (McDonald et al., 2018a).

Finally, two studies took a qualitative approach to understanding CAC. McDonald et al. (2018) interviewed children about their animal harm; their thematic analysis found that factors included witnessing animal cruelty or neglect, minimizing AC, punishing pets out of anger, and anthropomorphic beliefs about animals. Wauthier et al. (2020) found that children struggled admitting to harm, saw animals as sentient, and tended to have small attachment networks in which they included their pets, suggesting that children have complex relationships with animals even in cases of harm.

- (1) *Children’s Exposure to AC*: Ten studies focused on the effects of witnessing animal cruelty in childhood, confirming that this can have serious effects especially in perpetuating cycles of animal cruelty (Hensley et al., 2012a; MacDonald, 2018a). Other negative effects associated with witnessing AC included increasing internalizing and externalizing problems (Girardi & Pozzulo, 2015; McDonald et al., 2017), increased bullying (Parkes & Signal, 2017) and increased emotional behavioral difficulties (McDonald et al., 2018b). There were some slightly conflicting results on the role positive relationship with pets played in mitigating some of these relationships: for example, while Girardi and Pozzulo (2015) found that positive relationships with pets might support mental health, Matijczak et al. (2020) did not find that relationships with pets moderated the association between IPV and externalizing problems. Some studies investigated the context of children’s exposure, suggesting that AC could be used to coercively control the child (McDonald et al., 2015; McDonald et al., 2019). One study, in a sample of mother-child dyads, reported that ethnicity and cultural background may correlate with a partner’s likelihood of harming pets, with Hispanics being less likely to harm pets than non-Hispanic US perpetrators (Hartman et al., 2018).

- (2) *Psychosocial Barriers to Reporting and Measuring CAC*: Five studies investigated how CAC is reported. One study found that parental reports of CAC generally agreed but that they reported higher cruelty for boys and there was more agreement between parents on boys' cruelty than girls' (Xu et al., 2011). Two studies reported that that peer pressure and appearing to be "one of the gang" were reasons preventing adolescents from reporting instances of AC they witnessed (Arluke, 2012a, b). One study, using vignettes, investigated the degree to which clinical psychologists identified CAC as an important indicator of either ADHD or CD (Signal et al., 2013). They found that they were much more likely to focus on CAC for the CD than the ADHD vignette but did not list it as an important area for targeted intervention in either. Finally, one study explored how Child Protection Workers (CPW) explored AC, finding that few CPWs routinely asked questions but that many had observed AC and almost all indicated it was important to consider when making intervention decisions (Girardi & Pozzulo, 2012).

Research Question 3: Methodological Issues and Limitations

Reporting CAC: Focus on Self-Report and Retrospective Methodologies

Original empirical research studies were classified based on participant demographics and report methodology. Most striking was the strong reliance on self-report, with 77% of empirical studies using it ($n = 40$), followed by parent report ($n = 9$) and health worker report ($n = 4$; note some studies used two methods). None of the studies reviewed used observational data for animal harm. Nearly half of the original empirical research studies were retrospective in nature ($n = 24$; 46%), using either inmate retrospective ($n = 9$), adolescent retrospective ($n = 7$), or adult (non-incarcerated) retrospective ($n = 8$) reports. In fact, only 35% ($n = 18$) of studies had at least one element which directly surveyed children or adolescents about recent or ongoing behavior.

Populations Characterized by Violence

There may be a tendency in the literature to rely on specific populations defined either by exposure to violence (e.g., victims of domestic violence) or perpetration of violence (e.g., prison inmates). This is potentially problematic for generalizability, especially if these studies investigate whether CAC is predictive of these same factors. Authors have cautioned that relying on inmate populations might inflate the relationship between CAC and later violent behavior (Arluke et al., 1999) while relying on groups with exposure to domestic violence without comparison makes it difficult to interpret results on the strength of "The Link" (Monsalve et al., 2017). To explore this issue, studies were classified using the population's pre-existing perpetration-of/exposure-to violence as a criterion. Nearly half of the original empirical research studies (47%) investigated a population associated with violence or antisocial behavior ($n = 21$): prison inmates ($n = 7$), adjudicated delinquents ($n = 5$), children or families exposed to IPV ($n = 7$), or other forms of violence ($n = 2$; maltreatment, mass shootings).

We sought to establish whether the studies reporting a link between CAC and various types of violence (e.g., CAC as a predictor of violent offending) relied on population

STUDY CLASSIFICATION BY DEMOGRAPHIC CRITERIA

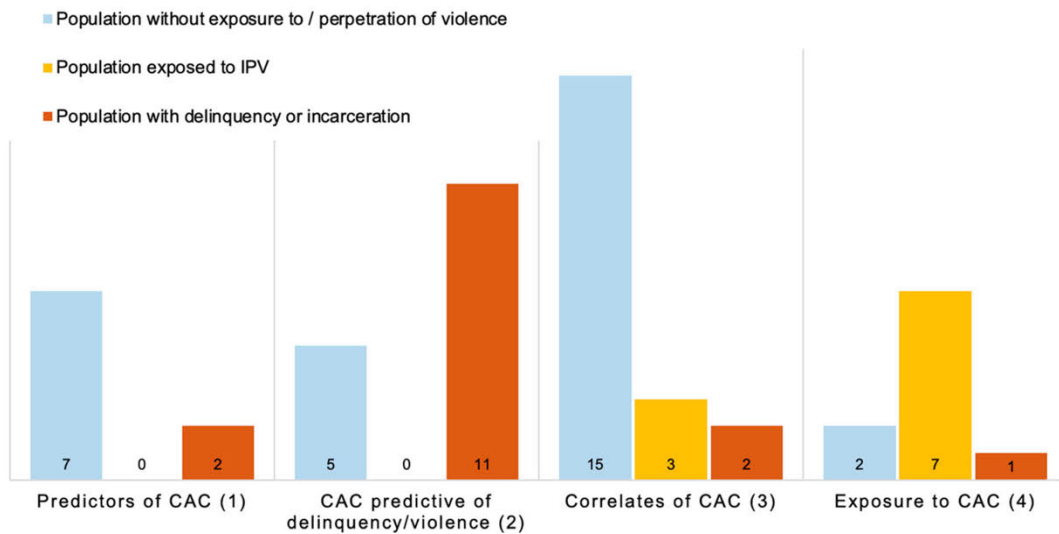


Figure 3. Visualization of empirical studies' main thematic classifications based on categorization of their sample population.

samples where violence was more common (e.g., prison inmates in medium or maximum-security prisons; Bottoms, 1999). Overlaps between the research question and inclusion criteria may threaten the external validity of studies, even if they are otherwise well designed. To visualize this, studies' exposure /perpetration of violence classification was graphed against the studies' main thematic classification (from the section above). **Figure 3** shows that the different thematic classifications tended to use different populations regarding perpetration of or exposure to violence. For example, prison inmate or adjudicated delinquent populations made up nearly 68% of studies investigating CAC as predictive of violent behavior, and populations exposed to IPV made up 70% of studies investigating the effects of exposure to AC in childhood. Other topic areas such as behavioral and psychological correlates of CAC had a more balanced distribution of populations, primarily using populations without exposure to violence.

Research Question 4: Definition and Operationalization of CAC

Definitions of animal cruelty are often inconsistent, making the comparison of results across studies difficult (Hawkins et al., 2017; Longobardi & Badenes-Ribera, 2019). Although Ascione's (1993) definition ("all socially unacceptable behavior that intentionally causes unnecessary pain, suffering or distress and/or death to an animal") seems widely adopted, this does not necessarily translate into consistent operationalization, which can vary from single items such as "cruel to animals" in the Child Behavior Check List (CBCL) to complex measures such as the Boat Inventory of Animal-Related Experiences (BIARE), which has 20 items in the full version. More recent measures, such as the Children's Attitudes toward Animal Cruelty (CAAC; Connor et al., 2018; Hawkins et al., 2019) use more precise language, specifying what counts as an "animal" (e.g., vertebrates) and which

Table 3. Summary of childhood animal cruelty (CAC) measures used in empirical studies.

Measure of CAC	Measure authors/original source	Number of studies
<i>Multi-item measures</i>		
Boat Inventory of Animal Related Experiences (BIARE) and derived measures	Boat (1999)	5
Pet Treatment Scale (PTS)	Ascione (2011)	4
Cruelty to Animal Inventory	Dadds et al. (2004)	3
Children's Observation and Experience with Pets Survey (COEP)	Ascione et al. (2007)	3
Children's Acceptance of Animal Cruelty (CAAC)	Connor et al. (2018)	3
Children's Attitudes and Behaviors Towards Animals (CABTA)	Guymer et al. (2001)	2
Aggression Towards Animals Scale (ATAS)	Gupta and Beach (2001)	1
Physical and Emotional Tormenting (PET)	Baldry (2004)	1
Animal Abuse Proclivity Scale (AAPS)	Alleyne et al. (2015)	1
Children's Treatment of Animals Questionnaire (CTAQ)	Thompson and Gullone (2003)	1
<i>Single item measures</i>		
Hurt or kill an animal	[Retrospective Prison inmate studies]	8
Hurt (or wound) on purpose	e.g., Pathways to Desistance survey	4
Cruel to an animal	e.g., Child Behavior Checklist	4
Hurt for amusement	e.g., NYSFS Longitudinal survey	2
Worst thing done to an animal		2

behaviors might be considered cruel (e.g., kicking, hitting, teasing, etc.). Table 3 summarizes the different measures used in the studies covered in this review (note: qualitative studies are not included).

In the current review, operationalizations of CAC were quite varied. Commonly used multi-item questionnaires included the BIARE, CAAC, and Cruelty to Animals Inventory. Single item questions (e.g., “any action where respondents hurt or killed animals when they were children”) were often used in larger surveys. Just under half of the empirical research studies used a multi-item measures ($n = 24$, 46%), with slightly less using a single item indicator ($n = 20$; 38%), and the remaining studies either did not report the measure they used, used a non-standardized unique measure, or only measured *exposure* to AC ($n = 8$). Studies also focused on a range of severities, from “any type of harm, including accidental harm” (CAAC; Hawkins & Williams, 2020) to “cruelty done on purpose with an intent to amuse oneself” (Knight et al., 2014; Simmons et al., 2015).

Another issue surrounding the definition of CAC is whether it is developmentally appropriate to apply the same definition to child and adult animal cruelty. Adult definitions of AC are heavily centered on the *intentionality*, but it is uncertain whether children can be said to be truly intentional in their actions of harm to animals. Neurodevelopmentally, the maturation of the prefrontal cortex during adolescence may be necessary for behavioral regulation and full moral judgement (Delmage, 2013). From a legal perspective, the UN Committee of the Rights of the Child sets the recommended minimum age of criminal responsibility at 12 years and advocates that it should be raised to 14 years.

None of the studies discussed the issue of childhood intentionality: most measures explicitly focused only on intentional actions (e.g., BIARE, PET), and even when measures were not explicitly worded to only include intentional actions

(e.g., CABTA), this was often implied (e.g., “my child causes harm to animals”). Only one measure, the CAAC, explicitly allows for animal harm which is accidental (Connor et al., 2018). In fact, Hawkins and Williams (2020) used this measure and highlight that there may be different developmental pathways for intentional and accidental harm. Parfitt and Alleyne (2018) do note that *abuse* and *cruelty* are often used interchangeably, even though they imply different things: cruelty hints at enjoyment and sadism, while abuse is a more general term. Yet even their discussion does not fully address the problem of intentionality, since abuse still carries connotations of intentionality and responsibility.

Discussion

The aim of this study was to provide a meta-narrative synthesis of recent CAC literature. While there is accumulating consensus on the correlates and risk factors associated with CAC, there may be methodological and conceptual issues that constrain the generalizability of our current understanding of CAC. First, we discuss research findings and how these relate to established theories (Research Questions 1 and 2); second, we discuss the impact of the conceptual and methodological issues in the CAC literature (Research Questions 3 and 4); and finally we present suggestions for future directions in research and practice.

Theoretical Models and Original Empirical Research

Models and theories of CAC belong to three historical strands: criminology; social work and “The Link”; and psychology. There are no “general” models of CAC integrating perspectives, and the existing models tend to be focused on pathological outcomes, viewing CAC as a marker of escalating violence (MacDonald triad; Graduation Hypothesis), delinquency (Deviance Generalization Hypothesis), or aggression (SIP, Emotional Dysregulation, GAM). The most extreme of these models, the MacDonald Triad and the Graduation Hypothesis, have not received empirical support (Parfitt & Alleyne, 2020; Walters, 2013; Walters, 2014).

Original research studies were thematically classified into five main categories, and the findings generally confirmed: (1) relations between violent environments and CAC, (2) CAC being predictive of problematic behaviors such as violence, deviance, or bullying, (3) certain psychological traits (e.g., low empathy, attitudes accepting of aggression) and behaviors (e.g., bullying) correlate with CAC, and (4) that witnessing AC is associated with serious issues, such as increasing behavior problems. These results can be accommodated by “milder” models of CAC, such as the Deviance Generalization Hypothesis, SIP (Henry, 2018), Emotional Dysregulation (Parfitt & Alleyne, 2018), alongside the importance of social environment (Jegatheesan et al., 2020) and culture (Akdemir & Golge, 2020; Plant et al., 2019). These theories are not mutually exclusive and may pave the way toward a more integrated understanding of the risk factors for CAC. Existing research shows that empathy, emotional dysregulation, aggression, self-esteem, and attitudes toward animals are linked (Garofalo et al., 2016; Schipper & Petermann, 2013; Taylor & Signal, 2005). Models considering the interaction between these factors more deeply would provide a more holistic understanding of CAC.

Certain risk and protective factors may be overlooked by the literature. One framework which has received sparse consideration is attachment (Thompson & Gullone, 2008). Attachment may tie many of the risk factors for CAC together; it is linked to empathy (Murphy & Laible, 2013), emotion regulation (Kerns et al., 2007), and behavioral disorders (Bureau et al., 2020). Insecure attachment has been linked to the incidence of CD and CU traits (especially disorganized attachment; Pasalich et al., 2012; Theule et al., 2016), poorer emotion regulation (Panfile & Laible, 2012), lower self-esteem (McCormick & Kennedy, 1994), and childhood aggression (Ooi et al., 2006). Linking theories of CAC to attachment may have the added benefit of allowing for greater dialogue with the “positive” CAI literature, which has noted the role of attachment to pets in explaining their positive effects, including on insecurely attached children (Wanser et al., 2019) and on children who witness IPV (Hawkins et al., 2019). In fact, attachment to animals does not necessarily correlate strongly with a person’s primary attachment pattern (Julius et al., 2012). Children who have experienced relationship trauma may show more secure attachment patterns toward their pets than to human attachment figures (Julius et al., 2010), despite experiencing abuse also being a risk factor for animal harm (Yamazaki et al., 2010).

Conceptual and Methodological Issues

This review highlights two methodological issues and two conceptual issues at risk of affecting the CAC literature: (1) over-reliance on retrospective self-reports, (2) disproportionate use of populations related to either IPV or perpetration of violence, (3) wide variety in operationalized definitions of CAC, (4) lack of consideration of childhood development regarding intentionality and responsibility for harm perpetrated.

Issues with Research Methodologies

Reliance on retrospective, self-report methodologies with potentially non-generalizable populations (see also Hawkins et al., 2017; Longobardi & Badenes-Ribera, 2019) remain problematic. Many of the studies relied on samples pre-defined by violence, either as perpetrators or as victims. The problem of studying troubled adults to draw conclusions about childhood cruelty has been highlighted before and has served as an argument against “strong” theories, such as the Graduation Hypothesis, and in favor of “milder” theories, such as the Deviance Generalization hypothesis (Arluke et al., 1999).

Retrospective self-reports are known to be inaccurate and prone to recall biases (Bernard et al., 1984). Self-report questionnaires were the most common method of investigation, which is concerning because social desirability bias is a well-established problem affecting self-report methodologies (van de Mortel, 2008). Given that animal cruelty is a highly stigmatized and undesirable behavior, we might expect a strong social desirability bias for items relating to animal harm. Consequently, people who will freely admit to animal cruelty may have a lower need for social desirability, which is a defining feature of psychopathy. Studies have demonstrated that people with psychopathic traits will have a reduced tendency to “fake good” in questionnaires (Verschuere, 2014). The issue is that the link between animal harm and psychopathic traits (Kavanagh et al., 2013) and its potential precursor, CD, in children (Dadds et al. 2006) may be artificially

magnified owing to self-report biases because people with those traits are the most likely to admit to cruelty. This is especially the case where measures use stigmatizing terminology, such as “which of these animals have you been cruel to?” (Cruelty to Animals Inventory), rather than using more neutral terminology, such as “have you ever hurt an animal?” (BIARE) or even listing specific behaviors, such as “have you ever hit an animal?” (CAAC).

Defining and Conceptualizing CAC

Definitions of CAC varied not only in their precision but also in the severity of cruelty investigated, with a focus on “severe” forms of cruelty. This seemed to link to the type of population investigated, suggesting that there may be issues with generalizability to less extreme populations and definitions. Furthermore, definitions of CAC were not tailored to child development and did not allow for the imprecise concept of intentionality in childhood. Children are more likely to lose control of their emotions and behavior, may lack knowledge of welfare needs and what causes harm (Burich & Williams, 2020; Muldoon et al., 2016), and are more likely to accidentally hurt an animal.

The stigma associated with labeling a child as “cruel” further raises the question of whether “cruelty” is an appropriate term. We propose that many cases traditionally labeled “child animal cruelty” or “child animal abuse” should simply be labeled as “child animal harm” (CAH), *especially* where the intentions and circumstances of the child’s harm are not known or fully explored. This is not to suggest that children do not sometimes harm animals with intent, but that this should be established rather than assumed. The focus on intentionality is also problematic because it is decoupled from animal welfare legislation. Animal harm can happen outside of intentionality, such as lack of knowledge or due to emotional and cognitive issues, and can take many forms: from emotional tormenting to physical injury or neglect.

In summary, the reason the CAC literature does not seem to have more nuanced models is likely to be both methodological and conceptual. Much of the historical research on CAC is based on “extreme” populations and “extreme” definitions of harm. There is no discussion of the *spectrum* of interaction or types of childhood harm toward animals, nor is there a discussion of the protective and risk factors which might increase or decrease the likelihood of infringing on the *whole range* of animals’ various welfare needs.

Theoretical and Practical Implications

We propose three shifts the child animal-harm literature could make to have a more nuanced conceptualization and which could improve access to early intervention:

- (1) *Focusing on All Types of Harm to Animals*: Focusing only on intentional physical harm toward animals causes a disconnect with animal welfare laws, which in the UK recognize many types of harm, such as neglect, emotional harm, and exploitation, and does not separate cases based on intentionality (UK Animal Health and Welfare Act, 2006). Understanding and studying the spectrum of animal harm can protect animal welfare across the five welfare freedoms: (1) freedom from thirst/hunger, (2) freedom from

pain, (3) freedom from discomfort/exposure, (4) freedom from fear or emotional distress, and (5) freedom to express normal behavior (see Mellor, 2016).

- (2) *An Approach to Animal Harm That is Not Stigmatizing or Pathologizing*: Focusing on pathological outcomes (e.g., violence or psychopathology) may prevent conceptualizing animal harm as a spectrum, with a range of developmental pathways. This in turn may reduce the incentive to develop evidence-based interventions for children. Furthermore, therapists argue it is important not to stigmatize animal-harm behavior during treatment (Gupta, 2019). The harm associated with making pathologizing or stigmatizing assumptions about childhood mental disorders is well established and can include: not seeking help or treatment, lower self-esteem, and discrimination or devaluation through stereotyping, especially mental disorders associated with “dangerousness” (Mukolo et al., 2010).
- (3) *Developmentally Appropriate Definitions*: Terminology referring to *cruelty* in childhood is dissociated from childhood development theory. Although there have already been calls to stop referring to CAC and instead adopt the term childhood animal *abuse* (Ascione, 2011; Parfitt & Alleyne, 2018), the terms *abuse* and *cruelty* are problematic, and the term CAH should be adopted unless there is clear evidence of intentionality. We propose the following definition of CAH: “Any act, of commission or omission, where a child negatively impacts an animal’s welfare, intentionally or unintentionally.” *Cruelty* might be reserved for behaviors that are both intentional and purposefully harmful (i.e., the primary intent is to cause harm to the animal), while *abuse* might be used for any intentional behavior, even if harm is not the primary intent (e.g., punishment). As children are still developing emotional regulation and executive functioning (Anderson, 2002; Lévesque et al., 2004), and have incomplete knowledge about animal welfare needs (Muldoon et al., 2016), it seems especially important to be cautious with this terminology.

Reconceptualizing child animal harm as a spectrum may help replace the current dichotomized approach to CAI. This allows for a graded approach, both for the design of animal welfare education interventions (Muldoon & Williams, *in press a, b*) and for more integrated research on factors which we might expect to influence CAI across the breadth of the spectrum. Of particular interest are constructs such as attachment and family functioning (Muldoon et al., 2019; Wanser et al., 2019), emotional as well as behavioral regulation (Wauthier et al., 2020), and empathy or attitudes (Hawkins & Williams, 2017). Finally, researchers should attempt to design methodologies that work directly with children, and refrain from relying too heavily on retrospective adult self-report and use of stigmatizing language.

Conclusions

Research on CAC is establishing a growing knowledge base on the risk factors, outcomes, and psychological and behavioral issues associated with cruelty to animals in childhood. However, extreme conceptualizations of CAH make the alignment of the CAC literature with animal welfare legislation difficult, may lead to pathologizing or stigmatizing assumptions, and could be developmentally inappropriate. It is important to approach

childhood animal interactions as a spectrum, from negative to positive behaviors, and to acknowledge that a child's relationship with an animal is rarely unidimensional. The extreme ends of this CAI spectrum are well captured by existing literatures, but the nuance of children's relationships with animals is yet to receive detailed exploration. Researchers should use the term CAH and conduct research directly with children or adolescents.

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Note: Please see the reference section at the end of this thesis for the references cited in this publication.

2.8 Further Discussion and Chapter Summary

As a meta-narrative review, this study sought to explore the contrasting and complementary ways in which researchers in different fields have studied animal cruelty in childhood. Research question 1 on theoretical models, was addressed by the studies in Table 1, research questions 2 and 3 on general findings related to childhood animal cruelty and methodological issues, were answered by the studies presented in Table 2, while research question 4 on definitions and operationalisations, was answered by looking across all studies. It is important to consider what conclusion can be drawn from this study, and what sources of bias may be of concern. For example, within the context of a meta-narrative review, research question 2 ("What are the empirical risk factors and correlates of childhood animal cruelty?") is best understood as exploring: "what areas of research have been evaluated in the domain of CAC", in line with the more general scope of meta-narrative reviews. This also explains why components often appearing in more traditional systematic reviews, like a quality appraisal of studies, do not appear here. While it may seem like this could introduce a source of bias (because methodologically strong and weak studies are weighed equally), the reason this is less concerning in meta-narrative reviews is because these are "primarily concerned with how issues are researched rather than synthesising findings, and so can be considered a form of multi-level configuration mapping" (Gough,

2013). As another example, this study only includes peer-reviewed literature, which can lead to publication biases (Francis, 2012). However, one of the criteria for meta-narrative review is that “studies in these separate traditions should be appraised using the quality criteria that a competent peer-reviewer within that tradition would be required to use” (Wong, 2013), so only including peer-reviewed publications ensured we were broadly staying within these bounds⁶. While issues around publication biases still stand, it is important to re-iterate that meta-narrative reviews are more concerned with exploring the history and current state of a research topic than commenting on what is and isn’t “true” based on specific studies’ findings. Discipline-specific systematic reviews on narrower questions are in a better position to comment on this, carrying out quality appraisal and closely analysing sources of bias for their specific topic.

Another point worth exploring is the implication of including studies carried out with adults retrospectively reporting on animal cruelty in their childhood/adolescence. With more traditional systematic reviews, the focus would generally be on research carried out with directly the population of interest (see e.g. the “Population-Exposure-Outcome” model often used for etiology/risk reviews; Munn et al., 2018), but as a meta-narrative review, the focus here was on providing an overview of the different lenses that have informed this topic. Since there has been a long-standing focus not only on what leads to animal cruelty in childhood (Hawkins et al., 2017), but also on whether childhood animal cruelty can predict adult violence (Longobardi & Badenes-Ribera, 2019), and on the effects that witnessing animal cruelty in childhood has on the risk of perpetrating animal harm (Ladny & Meyer, 2020), all of these questions form an important part of the research tradition and “narrative” around childhood animal cruelty. In total, this study included 18 research articles which were carried out with adults reporting in some way retrospectively on childhood or adolescent instances of animal cruelty (these can be identified in Table 2 in the column labelled “participant demographic”, and are classified as “retrospective studies with young adults/adults/prison inmates”). The conclusions of this review regarding the issues around a lack of developmentally appropriate definitions should not be seen as a critique applying to

⁶ Note that during the search phase, a few theses were found to be relevant but were ultimately not included following the peer-review process because they did not add any new information, and reviewers felt it muddied the waters in terms of study quality.

studies where the focus is explicitly on adult populations. Rather, this observation applies to the literature as a whole, and the inclusion of relevant studies from the adult literature offers a partial explanation for why definitions have tended to be focused in this way.

Overall, the findings from this systematic review demonstrate that the recent body of work on childhood animal cruelty continues to use definitions rooted in historic conceptualisations, focusing on the more “severe” intentional forms of the behaviour, its correlates (e.g., exposure to domestic violence), and its consequences (e.g., as a predictor of interpersonal violence in adulthood). This may lead to a self-perpetuating cycle, in which the difficulty of reliably carrying out research directly with children on this topic limits the creation of child-centred measures and perspectives, which in turn leads to continued focus on populations where the behaviour is more prevalent, hence reinforcing stigmatisation. It is notable that no study investigated children’s own understanding of animal cruelty and how this might apply to their behaviour, nor were there any intervention evaluations. Furthermore, there were few attempts to move beyond self-reports to study risk factors. Despite the role of attachment in the only publication describing an intervention (the AniCare Child approach; Shapiro et al., 2013), there was very little research on its role in cases of childhood animal harm. Finally, despite calls for more cross-reporting across agencies, there was little work on how to align animal cruelty research with animal welfare legislation or the cases typically handled by animal welfare agencies.

The following chapters in this thesis attempt to address the issues highlighted in this systematic review by adopting developmentally tailored definitions, terminology, and measures. The research in Chapter 3 uses a semi-structured interview to explore children’s own understanding of animal harm within their broader family context. Chapters 4 and 5 move beyond self-report to explore the role of attachment and other risk factors outlined in Shapiro et al.’s model. This informs the evaluation of the Scottish SPCA’s Animal Guardians programme, which is not only the first evaluation of an intervention for childhood animal harm but confirms that early support is likely to be particularly effective. Finally, through continued collaboration with the Scottish SPCA, work presented in these chapters is aligned with the cases of animal harm received by the animal welfare helpline. It reflects animal welfare legislation and is a useful conceptualisation for mainstream targeted prevention.

Chapter 3:

A Qualitative Study of Children's Accounts of Cruelty to Animals

*Uncovering The Roles of Trauma,
Exposure to Violence, And Attachment*

This chapter is published Open Access in the Journal of Interpersonal Violence:

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3.1 Overview and Rationale

Given the scarcity of research carried out with children and the biases potentially present in the literature, it became evident that the first step for this thesis should be to carry out a qualitative study using direct child interviews. Adopting an open-minded stance with open questions and a variety of activities made it possible to inductively formulate an understanding of animal harm behaviour from the child's perspective. I was especially careful to be *reflexive* both during the design and analysis phases, to ensure that the study would reflect children's own voices rather than any assumptions I might have had. One of the challenges in designing this study was the stigmatising nature of animal cruelty, which lead children to have issues openly discussing their animal harm incident, especially one-on-one with a stranger (myself). Compounding this issue is the problematic power-dynamic between child and adult which qualitative researchers must be extremely aware of (Ponizovsky-Bergelson et al., 2019). This prompted an approach to the interview's design which allowed the topic of animals to be discussed from a variety of perspectives, including both positive and negative interactions, and using a variety of verbal (open questions, closed questions) and non-verbal (e.g., drawings, play-doh) channels. Emphasis on child agency through the interview process was probably the single most important aspect for their engagement. In fact, the analysis technique used, Interpretative Phenomenological Analysis (IPA), was particularly suited to helping me "make sense of each child's sense-making" around animal harm. This is because IPA adopts an ideographic stance, which unlike in thematic analysis, encourages the researcher to deeply engage with each participant's individual perspective in turn, rather than capturing themes across the sample out of the individual's context (Smith, 1996). IPA also encourages a deeper interpretation of the process at play, using psychological theory to help the research "make sense" and "give voice" to participants (Larkin et al., 2006). Finally, This initial study was carried out during the pilot phase of Animal Guardians, and provided the opportunity to inform the programme's development and to collaborate with the Scottish SPCA to ensure adequate child protection procedures were in place should concerns arise.

Appendix A has additional materials for this chapter, starting with the Supplementary Materials associated with the publication, followed by copies of ethic permissions, consent forms, and the interview schedule.

A Qualitative Study of Children's Accounts of Cruelty to Animals: Uncovering the Roles of Trauma, Exposure to Violence, and Attachment

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Abstract

Childhood animal cruelty (CAC) is a risk for later interpersonal violence and a red flag for other forms of violence in the household, yet very few studies have spoken to children directly about their cruelty to animals. Animal Guardians (AG) is a humane education program run by the Scottish SPCA for children of age 5 to 12 years who have been cruel to animals or deemed at-risk. This research investigated how children referred to AG spoke about their experiences of animal cruelty and factors surrounding it. Research consent was obtained for 10 children (average

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age = 8.8 years, $n = 9$ males), referred concerning cruel/at-risk behavior toward their pets. The interview schedule combined techniques such as crafts, vignettes, open questions, and standardized measures. Interviews were qualitatively analyzed using content analysis and interpretative phenomenological analysis (IPA). Content analysis suggested that referred children (a) tended to have small attachment networks which often included pets, (b) tended to interpret ambiguous situations predominately negatively, (c) tended to like animals and see them as sentient, and (d) struggled admitting to cruelty. Three main superordinate themes emerged from the IPA: (a) *Bonding to animals*, (b) *Exposure to/normalization of violence*, and (c) *Signs of emotional issues/trauma*. Children who were referred for animal cruelty toward their pets were from vulnerable backgrounds, often had complex backdrops to their at-risk or cruel behavior, and sometimes had trouble regulating their emotions and behaviors. Programs hoping to address CAC should be aware of these complex emotional, psychological, and behavioral factors, tailoring interventions accordingly.

Keywords

animal cruelty, child psychopathology, violence, attachment, trauma

Introduction

Animal cruelty in children has been very sparsely researched: Few studies have worked with children directly (Hawkins et al., 2017; Longobardi & Badenes-Ribera, 2019) and even fewer have taken a qualitative approach (McDonald et al., 2018). As a result of this overreliance on mostly adult and quantitative data, little is known about how children experience cruelty, how to approach this sensitive topic with them, and even whether there are distinct “types” of childhood animal cruelty. Gaining insight into children’s own accounts of cruelty is a crucial step in developing early intervention, understanding risk factors, and developing an empathetic child-centered approach. Given the frequently documented comorbidity of animal cruelty with a range of issues, including aggressive behaviors, delinquency, family issues, and trauma, this research aims to shed more light on this “red flag” using a range of qualitative techniques.

Ascione (1993) defines animal cruelty as “nonaccidental, socially unacceptable behavior that causes pain, suffering or distress to and/or the death of an animal” (p. 228). Hawkins et al. (2017) systematically

reviewed research on psychological risk factors for childhood animal cruelty (CAC). Their findings can be conceptually divided into two dimensions. First, experiences which increased the risk of CAC including abuse, neglect, witnessing animal cruelty, bullying, and victimization. Second, psychological issues observed to co-occur with CAC including: behavioral disorders, conduct disorder (CD) and its modifier callous–unemotional (CU) traits, and low empathy. The two are not entirely separate: It is likely the environmental risk factor such as abuse result in emotional detachment and poor emotional control (Gullone, 2012).

Most research on CAC comes from retrospective self-report studies, often with incarcerated adults (Kellert & Felthouse, 1985; Merz-Perez et al., 2001), which has led to CAC being viewed as a predictor of future violence. However, evidence for associated constructs such as the MacDonald triad (Parfitt & Alleyne, 2020) or the graduation hypothesis (Walters, 2013) is inconsistent. Occurrence of CAC can correlate with family violence and domestic abuse, child maltreatment, and neglect (Becker & French, 2004; Bright et al., 2018). K. D. Becker et al. (2004) found that CAC was predicted by domestic violence and harsh parenting. Currie (2006) showed that children exposed to domestic violence were more likely to be cruel to pets. The emerging pattern is that CAC is not only a predictor of future violent behavior but is predicted by a history of family violence.

Psychological models of animal cruelty have attempted to bring some of these strands of evidence together, usually adapting human aggression models to understanding animal abuse. Parfitt and Alleyne (2018) adapt a process model of aggression formulated by Gross (1998) which argues that issues with emotional regulation and impulsivity, potentially arising from exposure to violence, are central to the development of aggression. Several authors propose that social information processing (SIP) theory could be used to explain animal cruelty (Henry, 2018; McDonald et al., 2018). SIP breaks down the process by which people choose actions using their learned experience through feedback loops, emphasizing that the interpretation of social cues as hostile can lead to aggression, with newer models also allowing for the role of emotions in choosing behavior (Lemerise & Arsenio, 2000). Henry (2018) also makes a distinction between reactive aggression, which is emotionally driven and often in response to provocation, and proactive aggression, which is “instrumental in nature” and often more premeditated (i.e., in pursuit of a goal, also known as predatory aggression). This is potentially important as different sociocognitive processes and/

or developmental pathways may underlie the two different forms of aggression (see Hoffer et al., 2018).

Although this focus on the link between CAC and violence is justified, other important developmental factors may be often overlooked. One study reviewed by Hawkins et al. (2017) mentioned the link between emotional attachment, animal cruelty, and empathy (Thompson & Gullone, 2008). From a practitioner's point of view, "attachment theory...is most helpful in formulating cases involving animal abuse" (Shapiro et al., 2013, p. 7), and the link between attachment and empathy is well known (Stern & Cassidy, 2018).

To capture other relevant developmental factors, it is important to carry out research directly with children involved in cruelty. However, only two studies have interviewed children about their cruelty to animals. Ascione et al. (1997) focused on examining the specifics of cruelty incidents to create a standardized set of questions, which became the basis for the Children and Animal Inventory (CAI; Dadds et al., 2004). McDonald et al. (2018) adopted a more qualitative approach, examining the narratives of mothers and children from homes with intimate partner violence (IPV) to understand the context of children's cruelty, their motivations for cruelty, and their belief in animal minds. They found that children came from families where normalizing harm or neglect of animals was common, that children anthropomorphized animal sentience, and that the main motivations for cruelty were punishment and curiosity. However, the study used interview notes rather than transcriptions of audio data, and interviewed a sample of children from households with IPV, potentially conflating issues around the context of violence.

Current Study

This study aims to close some of the gap in the literature regarding children's own accounts of their cruelty. A variety of techniques were used to triangulate results. These included a creative task based on hierarchical mapping techniques, a projective image interpretation task (to probe SIP theory), open questions and vignettes (to explore children's accounts of cruelty), and the CAI. Using the narratives of participating children, this research had two guiding questions:

Research Question 1 (RQ1): What are the environmental and psychological contexts of their cruelty to animals?

Research Question 2 (RQ2): How do children understand their animal cruelty behavior?

Method

Participants

Recruitment for the study was done alongside the referral process for Animal Guardians (AG) a humane education intervention program run by the Scottish SPCA. The AG program is aimed at children aged 5 to 12 years old in the Edinburgh area, and recruitment occurred from May to end October 2018. Referrals to the AG program came from a variety of sources, including teachers, social workers, children's charities (e.g., Barnardo's), and Scottish SPCA incidents. Parents could refer their children, but referrals were always processed using the child's school or other learning facilities, as interviews and interventions were not performed in their homes. Ethical approval was obtained from the University of Edinburgh Department of Clinical and Health Psychology.

Between May and October, AG received 30 referrals, of which 20 were appropriate for the program and within the inclusion criteria (mean age = 8.5 years, $n = 17$ males). Of these children, 16 were eligible to have research consent information sent to their parent/carer. We received parent/carer consent for 10 of these referrals (63% of eligible referrals). All children consented to participate in the research ($M_{\text{age}} = 8.8$ years, $SD = 2.1$, $n = 9$ males), but two children declined to have their interviews audio-recorded, so verbatim notes were taken. Two children were referred for *severe cruelty* (animal death), four children were referred for *moderate cruelty* (rough handling or hitting), and four children were identified as "at-risk," usually due to violent behavior toward peers and difficult home situations (see Supplemental Table 1). Basic demographic information on the child's family composition was also collected, using questions like "Who do you live with at home?" and "What pets do you have?." Children mostly reported living with their mothers ($n = 9$; one child lived in residential care), and most children had siblings ($n = 7$) although some did not live with them (older siblings, or when in residential care). Only two children reported living with their fathers, although some seemed to visit them, based on children's reports. Almost all children reported living with one or more pets ($n = 8$). The most common pets they lived with

were cats ($n = 5$) and dogs ($n = 5$), followed by small mammals ($n = 3$), but also with other pets such as birds, a turtle, and even a snail.

Interview Schedule and Measures

The interview schedule was designed using a variety of techniques, both to allow children to engage in a variety of ways, but also so that the research questions could be addressed using appropriate tasks. The first two tasks used (attachment mapping and the Thematic Apperception Test; TAT) were chosen to answer the first research question, on the environmental and psychological contexts of animal cruelty. Specifically, the attachment mapping task aimed to get some insight into the child's view of pets in a family context, while the "Animal-at-risk" TAT was chosen to investigate SIP, through the child's interpretation of ambiguous social scenes. The second set of tasks (vignettes and open questions, CAI) were used to more specifically answer the second research question, on children's understanding of animal cruelty behavior. These tasks focused on the treatment of animals, asking about animal cruelty, how children understood motivations for harm, and whether they understood how this contrasted to showing empathy and kindness to animals.

The interview was designed to be appropriate for children (Kortesluoma et al., 2003) and was piloted with four typically developing children spanning the expected age range of participants (5, 6, 10, and 15 years old). Following the pilots, the interview schedule was revised to make it easier to complete: The interview schedule was shortened, activities were "chunked" to allow for breaks, and pictures were added (especially, the consent procedure) to make it easier for younger children to follow. The pilot and research interviews were carried out by the first author.

Creative arts to map attachment. The first section allowed children to choose among a selection of crafts (drawing, play-doh, or fuzzy-felts; Irwin & Johnson, 2005), and had a dual purpose: building rapport with the child (Keller-Hamela, 2016) and enabling them to discuss their family relationships. Children were asked to draw/make themselves in a central circle and then draw/make "anyone who is really important to you, like family, or friends, or pets" in an outer circle. This specific procedure is novel, although with strong similarities to existing procedures, including a hierarchical mapping technique used to probe

attachment in adults (Rowe & Carnelley, 2005) and a task for mapping children's naïve understanding of family relatedness (J. M. Williams & Smith, 2010). While children created each element, they were asked to talk a little bit about it (e.g., "what do you like about your [mum]?"). If children tired, they could tell the researcher who else they wanted to include, and the researcher wrote down verbatim.

"Animals-at-risk" Thematic Apperception Test (AAR-TAT). Children's tendency to potentially interpret ambiguous situations negatively was probed using a subsection of the AAR-TAT, a set of images designed for an unpublished part of a study by Deviney et al. (1983), and as part of broader research on whether the presence of animals changed how social scenes were interpreted (Friedmann et al., 1993). This set of images was described as a way to elicit discussion "of events that might transpire within the family surrounding common situations that might create tension in the human-animal relationship" (p. 92, Shapiro et al., 2013). Children were presented with a subset of five AAR-TAT images (see Figure 1). For each image, children were asked: "Who do you think the people are?," "What do you think has happened?," "What is going to happen?" (Lockwood, personal communication, 2018), and an additional question, "How do you think they are feeling?," which was added to investigate how children understood emotion in social situations.

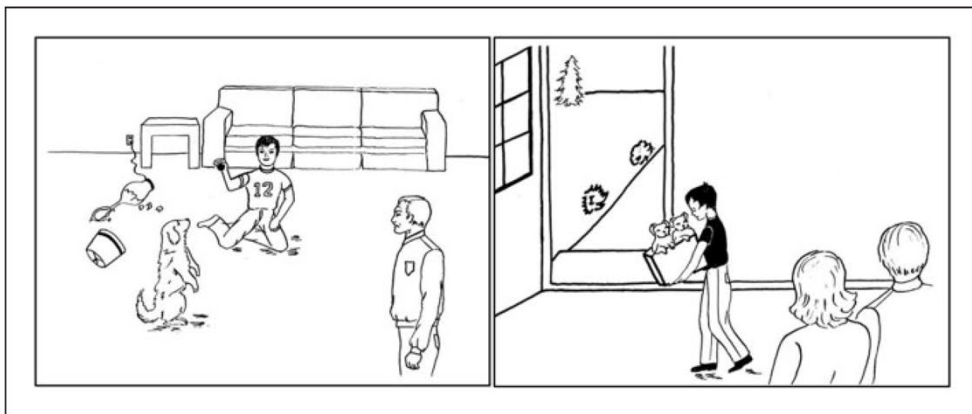


Figure 1. Two of the five images used as part of the Animals-at-risk Thematic Apperception Test (AAR-TAT).

Source. Randall Lockwood, Ph.D., used with permission. See also Shapiro et al., (2013).

Open questions and vignettes. The open questions aimed to probe children's understanding and experience of cruelty. Questions were phrased so as to be short, not to suggest a right or wrong answer, or to seem accusatory (Keller-Hamela, 2016). Children were asked six questions about their understanding of harm and how this related to animals, including the following: (a) whether human and animal harm was different, (b) whether they had seen an animal being hurt, (c) how they felt when this happened, (d) what might make someone want to hurt an animal, (e) how they would be nice to animals, and (f) if they liked animals (certain topics were suggested by MacDonald, personal communication, 2018).

The vignettes were designed to probe the child's own animal cruelty incident, allowing sensitive topics to be explored in a less personal way (Barter & Renold, 2000; Palaiologou, 2017). The vignette presented the child with a moderate animal cruelty scenario in four to five sentences. The child's cruelty incident(s) was the basis of the vignette (where information was available), but was written to reflect this in a moderate form (e.g., no specific mention was made of an animal dying). Where we had no details of a child's cruelty behavior, a standard "rough handling" vignette was used. The vignette was then followed with questions asking the child what they thought about what happened, how the child and animal in the story felt, and whether they had ever been in a similar situation.

Cruelty to Animals Inventory. The Cruelty to Animals Inventory (CAI) is a measure developed by Dadds et al. (2004) to investigate incidents of animal cruelty in children, with the child version being suitable for children as young as six. It was based on previous work by Ascione et al. (1997), which used a semi-structured interview technique with nine main dimensions. In the original study, the child version of the CAI was reported to have good reliability: An index of person separation of .90, which is a test statistic conceptually similar to Cronbach's alpha, but run as part of a Rasch scaling analysis because the CAI violated assumptions of normality (Dadds et al., 2004). The CAI was also shown to have good predictive validity, having an association with behavioral difficulties (as measured through the Strengths and Difficulties Questionnaire), and correlating significantly with observations of behavior toward mice in the classroom, with higher CAI scores predicting more cruelty behavior and less nurturing behavior (Dadds et al., 2004). For this study, the CAI was read aloud to children, along with the possible answers, and children were asked to choose the answer

which was closest to their experience. This was done to control for literacy, allow for discussion, and maintain higher response rates. However, nothing is known about how this impacts children's responses, and it is possible that either it introduced a social desirability bias or children became disengaged rather than admitting to behaviors they thought would be viewed as "bad." Given the often incomplete and inconsistent responses children gave, the questions in the CAI were analyzed as additional prompts within the qualitative analysis rather than being analyzed quantitatively.

Procedure

The interviews were carried out on a one-to-one basis in a quiet room (in two cases the child was accompanied by a teacher). Interviews lasted between 25 min and 1 hr. Children were given the option to take breaks during the interview, generally a break was offered every 20 min. Interviews were audio-recorded using a DS-30 Olympus audio recorder and transcribed into Microsoft Word using an Olympus transcription kit. Transcriptions were imported into nVivo 12 for coding and analysis. Interviews were read through multiple times and open-coded, before specific coding techniques were used.

Qualitative Analysis

Content analysis. Content analysis straddles the boundary between qualitative and quantitative methods (Elo & Kyngäs, 2008) by chunking participant's answers into categories. For each question, children's answers were summarized, and categories were inductively created. Where a child did not answer the question, an "uncodeable/no answer" category was included. In some cases, a child's lack of answer can be seen to carry meaning, such as suggesting the question is uncomfortable or the child has conflicting answers. Once all the interviews were coded by the first author, three interviews (30%) were randomly selected to be coded by the third author. Any major disagreements or points that lacked clarity were discussed to refine the coding throughout the interviews. Inter-rater agreement scores were calculated for each section and for the whole interview (95%). Further statistics were analyzed using IBM SPSS v24 including mean values, standard deviations, and Welch's *t*-tests (which assume unequal variance, given the very small sample size). Before running *t*-test, assumptions of normality were verified by visually inspecting histograms of data.

IPA. IPA bridges the gap between the quantitative methods used in social and clinical psychology, and qualitative discourse analysis (Smith, 1996). IPA is an idiographic approach, allowing for a degree of interpretation of cognitive and emotional processes underlying the account of each participant. IPA has a well-defined set of analysis steps, which ensure that researchers take a consistent approach (Smith & Osborn, 2004; Willig, 2008). Following standard IPA procedure, after transcription and familiarization, the interviews were analyzed individually. For each interview, themes were identified, and these were combined and structured into superordinate themes, before moving on and repeating the process for each interview. Finally, themes from individual interviews were combined into a list of master themes. For this research, coding and structuring into themes was performed by the first author, using a process which was entirely separate from the content analysis. An interim audit report was produced by the first author to be reviewed by the third author. This report contained descriptions of all superordinate themes, subordinate themes, and at least three coded examples of each subordinate theme. Concerns around theme structure, content, or clarity were discussed, and the IPA was revised accordingly.

Results

Content Analysis

Creative arts to map attachment. Children's responses were classified to show which individuals they tended to include in their networks, and the size of children's networks. Nine children made/drew themselves, and one child refused. The most common attachment figure included by children was their mothers ($n = 7$), followed by an animal or pet ($n = 5$) and siblings ($n = 3$). Interestingly, fathers were seldom included ($n = 2$). Children's attachment networks tended to be fairly small ($M = 1.9$, $SD = 1.2$), with one child not including anyone and three children only including one person. Although there was an overlap between who children reported they lived with and who they included in their attachment circles, there were some discrepancies. Generally, children included fewer categories of people in their attachment circles ($M = 1.9$, $SD = 1.2$) than categories of people who they reported to live with ($M = 2.6$, $SD = 1.3$), although this difference was not significant, $t(18) = -1.27$, $p = .22$; see also Supplementary Table 2.

“Animals-at-risk” TAT. Children’s responses were categorized along the following dimensions: (a) overall outcome and interpretation of events in the scene, (b) the emotions attributed to the humans in the scene, and (c) the emotions (if any) attributed to the animals in the scene. Answers were summed across the pictures for each child.

Outcomes were predominately interpreted as negative by children, with children interpreting 60% of scenes as having a negative outcome (such as punishment, danger, violence, and abandonment). The next most common answer was a neutral or mixed outcome (16%; such as scenes where children could see both positive or negative outcomes unfolding, or very neutral descriptors like “she will keep sleeping”) followed by positive outcomes (12%) and no answer (12%). Human emotion attribution followed a similar pattern although slightly less skewed, with 50% of attributed emotions being negative (this included emotions like sadness, anger and fear), followed by 20% neutral/mixed (including responses like sleeping, both sad and happy), 16% positive (this included happy, playing), and 14% no answer. Interestingly, attributions of animal emotions did not follow this strong bias, with 36% of emotion attributed being negative, 30% positive, 32% giving no answer, and interestingly only 2% attributing neutral or mixed emotions. Some children had consistent patterns of interpretation: two children consistently struggled to interpret scenes and three children consistently interpreted scenes negatively (see Supplemental Table 3).

When adding each child’s answers across categories (i.e., outcomes, human emotion attribution, and animal emotion attribution), children gave significantly more negative answers ($M = 7.3$, $SD = 3.65$) than positive answers ($M = 2.9$, $SD = 2.91$), $t(14) = 3.37$, $p = .004$. However, it is difficult to interpret these results conclusively without a noncruelty control group, as the images may be inherently interpreted more negatively even by the general population. Still, when dividing the children into either a “cruelty” category (children referred for severe or moderate cruelty, $n = 6$) as opposed to an “at-risk” category ($n = 4$), some interesting trends were observed. Children in the cruelty group tended to give *more negative* answers ($M = 7.67$, $SD = 4.55$) than children in the at-risk group ($M = 6.75$, $SD = 2.21$), although unsurprisingly this was not significant, $t(8) = 0.42$, $p = .68$. Although the very small sample size makes the lack of significance unsurprising, what is interesting is that the difference in mean values go in the directions we would expect from SIP theory: Children with more pronounced aggression issues (those

referred for cruelty) interpreted things more negatively than those identified as at-risk.

Open-ended cruelty questions and vignettes. Children generally responded empathetically to questions, saying that animal harm was as bad or worse than harm to a human ($n=9$), and almost all children saying they liked all animals ($n=7$), with some specifying they liked most animals but not insects ($n=2$). Children showed some good understanding of how to demonstrate kindness to an animal ($n=9$; responses included saying they would cuddle/stroke $n=5$, “help” the animal, give treats to, or play with animals), and most felt negative in some way when an animal was harmed ($n=6$; either sad $n=3$, angry $n=2$, or bad $n=1$; with the rest not giving an answer, or saying “I don’t know” $n=4$). Many children admitted to witnessing animal harm in some capacity ($n=6$), although this was mostly not admitting to their own cruelty directly and relaying a story instead ($n=5$). Regarding motivations for animal cruelty, the main two reasons were “punishment” ($n=3$) and “emotional lashing out” ($n=3$), while four children did not provide an answer. During the vignettes, there were additional questions on how the animal might have felt after the cruelty incident, and almost all children realized the animal might feel bad in some way ($n=9$; either scared $n=3$, sad $n=3$, angry $n=2$, or pain $n=1$).

CAI. For two children, there was insufficient time to complete the CAI, and results summarize the answers of the remaining eight. Many children seemed to struggle, giving inconsistent answers so that calculating a score as was done in Dadds et al. (2004) was not likely to produce meaningful results. For example, for “Have you ever hurt an animal on purpose?,” five children said “Never” and three said “Hardly ever,” but then for “How many times have you hurt an animal on purpose?,” three said “Never,” while five said “Once or twice.” In terms of the categories of animals harmed, most animals were “Pets” ($n=4$), followed by “None” ($n=2$), “Wild animals” ($n=1$), and “Don’t know” ($n=1$). Within this, the types of animals that were harmed were “Worms or insects” ($n=4$), “Birds or mammals” ($n=4$), “Fish, lizards, frogs” ($n=1$), “None” ($n=1$), and “No answer” ($n=1$) (children could choose more than one answer). Children’s responses suggested some empathy for animals, with five children saying they felt “Very bad for any animal they had hurt” (and the remaining three either saying they had never been cruel, or did not give an answer) and seven children saying they felt “Very sad and upset” about people hurting animals.

IPA

The IPA aimed to go beyond the content analysis to explore how children understood the context of their cruelty. Three superordinate themes emerged: (a) emotional bonding to animals, (b) normalization of violence, and (c) signs of emotional issues or trauma. Table 1 summarizes these superordinate themes and their subordinate themes.

Bonding to animals. This theme captures children's discussions of animals as positive figures and sources of comfort/friendship. The first subtheme, animals in attachment, captures children's explicit descriptions of attachment to animals, or by describing positive behavior toward animals. The second subtheme captures instances where children took the perspective of the animal, viewing them as sentient and empathizing with them. The third subtheme captured children's discourse about cruelty often viewing animal harm as something that made the perpetrator, even themselves, bad. Overall, the sense for this superordinate theme was that children had positive relationships with animals, although this ranged from strong attachment to discussing them as pleasant and friendly.

Animals in attachment. Children described many ways of relating positively to animals, even describing animals as friends and attachment figures. This was most explicit in the hierarchical mapping creative task,

Table 1. Theme Structure Derived From IPA.

Superordinate Theme	Subordinate Theme
Bonding to animals	Animals in attachment
	Understanding of animal sentience
	Cruelty as negative and diminishing cruelty to animals
Normalization of violence	Aggressive animal behavior
	Described instance of cruelty
	Exposure to violence
Signs of emotional issues or trauma	Signs of trauma
	Poor/insecure attachment
	Negative view of self
	Issues with behavioral control

Note. IPA = interpretative phenomenological analysis.

where children placed animals in relation to themselves (Supplemental Figure 1 shows the mapping task for four children who included animals in their attachment circles).

For Harry, his relationship with his cat was nearly as important as his relationship with his mum. As the interview continued, it became clear that Harry saw his cat as allied with him against his mum and his mum's cat "I brought my kitten up to be on my side, so the war is on!" This conflicted attachment to the mum is explored more in later sub-themes. In fact, Harry was one of the children who described one of the most intense relationships with his pet cat, spontaneously expressing sorrow at the idea of his cat's death: "I shouldn't have gotten one as well, because when they die you get really really sad."

For George, his description of interactions with his dog (who incidentally was the only family member he put in his relationship circles) seemed similar to descriptions of interaction with a friend or sibling. He gave his dog a nickname "Dumb Dog" and told stories of various interactions, such as teaching his dog things and bringing the dog into his bed:

When it was a puppy I had to teach it how to go up and down the stairs and then I went up to get my covers (mm-hmm) and want to go, and then I fell asleep, and the dog hit me with its tail [. . .] and I had to sleep uhmmm, besides my bed.

Understanding of animal sentience. An extension of how children relate to animals was their ability to talk about animals as sentient beings with intention. This was explored directly in the AAR-TAT, but also came through at other times during the interview. Children did not see animals as unfeeling or as objects, acknowledging their feelings and intentions. In fact, sometimes it seemed that children saw animal intention as less threatening than human intention, as something which was easier to explore, and a less dangerous conversation topic. For example, Charlie (who struggled to complete that TAT) wanted to discuss the animal emotions and intentions rather than the people's. For Frank, who could be violent toward his peers, he spoke very differently about being violent toward animals. He described violence as a way to retaliate against people who would hurt or offend him, and he said that he wouldn't want to hurt an animal because animals would not have a desire (intention) to harm him.

During the image interpretation, children saw animals as having simpler emotions, and sometimes while people were angry and deceitful, animals remained quite happy. Beyond believing animals were sentient, the sense that animals had less hostility and were not a threat for some children seemed to facilitate their interactions with animals.

Cruelty as negative and diminishing cruelty to animals. An extension of children's relationship with animals was that they struggled to acknowledge their harm to animals. This was expressed in a variety of ways, from children using very negative language to describe instances of cruelty, to denying the occurrence of any cruelty incident, or minimizing the extent of the cruelty. Many of the children seemed to be in conflict, having difficulty acknowledging their actions of harm, while maintaining that animals were important to them.

For example, Charlie, while looking at the pictures in the AAR-TAT, interpreted one of the pictures as two boys teasing a dog. He struggled to talk through his interpretation of the picture, but said, "It makes me feel angry cause they're bitches." Later, when asked about the rough handling incident in the vignette and why the child had hurt the cat, he answered, "Because he's evil." For some children, it seemed that when animal cruelty occurred, it was not simply the act which was cruel, but the person perpetrating the act. For Harry, this meant his own act of cruelty resulted in him viewing himself as evil. When asked why he slapped his cats to get them to fight, he responded, "Because I am evil" and "I'm a thug."

Particularly striking was Alex, who was involved in serious cases of cruelty, having killed kittens. During the CAI, Alex very briefly mentioned his own instances of cruelty. His language suggests that he saw cruelty as bad and that part of his difficulty in discussing the cruelty was because he saw himself as bad for having done it:

Alex: uh sometimes I hurt animals, but I don't actually hurt them very . . . I don't hurt them in badness, I just, sometimes I just hurt them by trying to help them

Interviewer: oh really, is that what happens? So it's like an accident?

Alex: yeah I've, I'm being good and bad (mm-hmm) yeah so I'm trying to help it because a needle's stuck in it but I pulled it out very fast into and hurt this kitten

Soon after, Alex asked to talk about something else, and the interview was ended. Near the beginning of the interview, he described an instance where his brother (“I’ve got a very bad brother”) was responsible for killing a fish and subsequently got kicked out of the house. Alex’s discussion of cruelty may be particularly difficult for him if he thinks his older brother was kicked out of the house because he killed their pet fish. If this is the case, he may have a fear of abandonment around his own cruelty.

Normalization of violence. This theme brings together children’s description of violent behavior in their daily lives in a way where it seemed normalized because of its intensity or implied frequency. The first subtheme describes incidents where children recalled violent animal behavior, suggesting they had not been supervised or taught to see animal aggression as abnormal. The second subtheme revolves around children’s description of cruelty events, including other people’s cruelty to animals. The last subtheme brings together other instances of violence children described, including domestic violence, incidents with the police, exposure to particularly graphic or violent video/game content, and violent or aggressive play themes during the interview itself.

Aggressive animal behavior. At least three children described being bitten by animals. Ben described being bitten by both his cat and a hamster. The bite was what triggered him to squeeze the hamster and kill it. Eddie described being bitten by a dog, as did George, who gave a vivid description:

George: when I was younger, this dog bit my leg

Interviewer: Oh, really? Did that hurt?

George: Yes

Interviewer: And, what happened?

George: X came down and the dog wouldn’t let me go, so they had to keep on hitting it

Interviewer: Really . . . And, how did you feel? [. . .]

George: Mad

Interviewer: Mad, yeah? At the dog?

George: Yes (mm-hmm) and then my dad came out and had to stop-hitting the dog as well . . .

These incidents suggest that children were often not supervised properly around animals and that children saw extremely aggressive adult behavior toward these animals in retaliation. For Katie, although she never described an instance of human–animal aggression, animal–animal aggression seemed fairly routine:

Katie: My cat's kind of vicious to dogs, she thinks they're funny but then she doesn't like them at the same time . . . she likes to roll around and try to attack them

Interviewer: And do you . . . does she do that with your dog as well at home?

Katie: Yeah she does it all the time

Interviewer: And what do you do, do you stop it or are you just like, that's what she does

Katie: Yeah she always does it, it doesn't work if you stop her

Described instance of cruelty. Almost all children described an instance of cruelty in their interviews. Occasionally, this was their own instance of cruelty, but fairly often, it was an instance of witnessed cruelty, usually in the household. For example, following the vignette story, Daniel described an instance of cruelty to a cat which he had witnessed at home, which caused him to retaliate:

Daniel: Actually, I saw someone do that . . .

Interviewer: You saw someone do that? Aha, can you tell me a bit about what happened?

Daniel: He picked up the cat with the tail, and swunged it like that and chucked it

Interviewer: Ahhhh . . . really? And how did you feel when you saw this happen?

Daniel: Sad . . . and I went mental on him for picking it up and chucking it in the house

It sometimes seemed that children mirrored their environment in their instances of cruelty toward animals. This was clearest for Harry, who's relationship with his cat mirrored his relationship with his mother, and was an outlet to express his anger/frustration. He viewed his cat as his ally, but then slapped his cat to get it to fight his mum and his mum's

cat. He also explained his mum slapped the cats, suggesting it might be a learned behavior:

Interviewer: But do you do it [smack the cat] anyways?

Harry: But I have to do it because he's being bad. I wish I had brought my cat up like even worse

Interviewer: Why?

Interviewer: Because I mean like even when we're sleeping, I never slap him actually, it's my mum who slaps him

Interviewer: Oh your mum slaps that cat? And . . . both cats?

Harry: I just slap him when he's being like, too good to her and like fight her, fight her, charge at her

Exposure to violence. Violence seemed pervasive for most of the children: of the 10 children interviewed, only one did not have themes of violence (Ian). Some of the violence was explicit, while other violence was "secondary" such as using graphic language or expressing violent play themes. Explicit violence often involved violence in the family. For example, Ben described an instance where his grandmother threw a bottle at him, hitting him in the eye. Interestingly, he also played quite "violently" with the puppets, pretending they were attacking him: "look the cat's pretending like he's dead. Look, he poked me in the eye, he smashed right in my eye like that." Charlie described an incident where he ran away from home and was apprehended by the police and proceeded to show the bruises on his arm. Harry described being hit by his mother, which seemed to create an internal struggle where he did not want to cry. Hitting his cat was potentially a way to play out his anger:

Harry: I am used to the slaps, I don't care, I'm just like . . . really?

Interviewer: Is that your mum that slaps you? (yeah) when you're bad?

Harry: I don't care, I'm just like, when I was little I couldn't even stand slaps, and now I can, like, by I mean like standing them I can I can just say . . . Aaaa

Interviewer: Did it make you sad before? Or does it still make you sad when you get slapped?

Harry: No

Interviewer: Did it before?

Harry: Yeah, I'm going to stop crying

Signs of emotional issues or trauma. This theme brought together psychological constructs: unresolved trauma, attachment issues, negative view of self, and issues with emotional reactivity and behavioral control. This superordinate theme suggests that the normalization of difficult and sometimes violent experience, combined with children's often insecure attachment frameworks, led to situations where animals could be harmed.

Signs of trauma. This subtheme included being preoccupied with an event, describing a particularly negative or violent event, or displaying signs of "stuck play." This analysis of trauma loosely follows the description of unresolved trauma in Crittenden's Dynamic Maturation Model (DMM; Crittenden et al., 2010). Of the 10 children interviewed, four children (Alex, Ben, Frank, and Harry) had discourse markers suggestive of trauma. In addition, two children (Frank and Eddie) refused to be recorded, and interestingly, both of these children had been interviewed by the police, which for a young child in a violent situation could be a traumatic experience.

For Alex, most of the trauma markers related to his cruelty incidents. In one of these incidents, he killed a kitten by poking its eye. Eyes became a motif in the interview, and when he created a play-doh tiger, he asked whether the interviewer could "make a dot" on its eye with their pen. Furthermore, Alex had some preoccupation around the events of the kittens' deaths and in wanting to make things better, which was clear in the way he recounted the story of what had happened. The other kitten Alex killed had been swung against a wall and died. Although Alex never admitted to this in his story, he vividly described a kitten getting a broken leg and this being fixed:

Alex: It lived still . . . It's body . . . it's leg, they gave it some medicine . . . to make it go to sleep (mm-hmm) and then they cut it's leg open because it's bone was broken, and then they took it's little bone out, and they took a bone off a bird, and gave it all the right size, and then put in the leg, and they tied it up, so then it was . . .

Interviewer: It was better?

Alex: And then it could be able to walk again

Ben struggled to answer questions around his cruelty saying he was afraid because he got in a lot of trouble for it before. Frank had

trauma from his history and was at a residential school for traumatized children. Most of his trauma revolved around time he had spent with his dad, even saying “I would have been dead if it wasn’t for my older brother.” Harry had some elements of trauma as well which directly impacted his relationships with his parents. He discussed his father being taken away by the police during what seemed an incident of domestic violence. Perhaps, even more preoccupying for Harry was the two incidents where he found his mother passed-out after strokes and he had to call an ambulance, which resulted in a preoccupation around his mother dying and the belief the strokes would occur again.

Poor/insecure attachment. Many children displayed signs of insecure attachment. For some children, this was around their parents, but for others, the tension came from siblings (Ian, who was adopted, explicitly stated not liking his sister). Some children did not include many people in their attachment circles, which can be indicative of poor attachment; from an IPA perspective, this is difficult to code as it is an absence of discussion. This is particularly the case for Eddie, George, and Katie, who all did not include any people in their attachment circle and did not discuss them much throughout the interview. For two of these children, their attachment needs may have been partially fulfilled by their relationship with their pets.

For some children, there was a nearly explicit link between an issue with attachment and their cruelty incident. This was particularly the case for Alex, Frank, and Harry. For Alex, there was a conflict around seeing his other brothers rough handling pets, but still feeling like he had to like them even though they were “really bad.” For Frank, his poor relationship with his father explicitly led to some incidents of cruelty, where he would be cruel to a cat as a form of retaliation: [paraphrased from notes] “He hated his father and father’s girlfriend and was purposefully cruel to her cat as a result. Pulled his dad’s girlfriend’s cat’s tail, because he hated her and wanted to get back at her and his dad.”

Harry gave the most complete picture of how his troubled attachment with his mother led to him being cruel toward the two pet cats. His description of his attachment with his mum while drawing her was quite vivid:

Harry: OK . . . she loves red so I’m going to draw her evil!

Interviewer: and do you get on with your mummy?

Harry: sort of, I kind of hate her but please don’t tell her

Negative view of self. For some children, there was striking use of negative language to describe the self. Interestingly, this was most obvious for the children with poor attachment described above. For Alex, this negative view of self became self-effacement, refusing twice to make himself in the attachment mapping task. Later, he mentioned that he did not want to be bad or hurt animals “in badness.” This might imply he had difficulty coming to terms with the implication of a bad self if he admitted to cruelty. Frank was more explicit in his negative view of self, mentioning “my brother is not messed up like me,” and further explaining that he has been diagnosed with attention deficit hyperactivity disorder (ADHD) and autism spectrum disorder (ASD) and has trouble controlling his behavior. Later on, Frank also explained he did not want to be bad anymore and that his harm behavior toward animals had not stemmed from lack of knowledge:

Frank: I felt bad for [the cat], but will never do it again.

Interviewer: What made you realise you shouldn't do it?

Frank: I knew it was bad before, and that it's just a stupid thing to do and I wouldn't do it again because I don't want to be a bitch

For Harry, the negative view of self was quite imaged, and made explicit when he drew himself, saying he had “black eye-balls, the black hole out of your eyes” and that his mouth was a “black hole of death.”

Issues with behavioral control. This subtheme was created to code some of the children's behaviors, rather than only the content of their interviews. Four of the interviewed children had difficulties concentrating and regulating their behavior during the interview (Ben, Eddie, Frank, and Harry). For example, some children got very distracted by the camera, even after being repeatedly told to ignore it. Other children needed to always have something in their hands, hitting objects in their play, or even biting themselves. Some children seemed to have a degree of awareness around this lack of control. When Frank was asked why the boy in the vignette story hurt the cat, he answered, “Because he was upset about something or about themselves, sometimes that can make people lash out.” Even though just under half of the children seemed to have issues with behavioral control, this theme suggested that for some children their ability to emotionally regulate and inhibit behavior was atypical and potentially linked to their cruelty incident. There was an overlap between the children who expressed some issues around self and attachment and those who had difficulty regulating their behavior.

Discussion

This study aimed to explore (a) the environmental and psychological context of children's cruelty to animals, and (b) how children understood acts of animal harm, with a goal of informing interventions for CAC. The use of several interview techniques helped triangulate the results of the study, and the results of the content analysis broadly supported the results from the IPA.

In answer to the first question, the content analysis provides tentative support for the idea that both attachment style (specifically insecure attachment) and SIP theory (through the negative interpretation of social scenes) might be important psychological factors in understanding CAC. The IPA further emphasizes these points and places them in context. The theme on bonding to animals suggests how animals integrate themselves into children's attachment, while the theme on the normalization of violence partially suggests children may be consistently interpreting scenes negatively because this reflects their own experience. Finally, the theme on emotional issues and trauma underlines the repercussions of many of these negative experiences in creating further psychosocial difficulties, including poor behavioral and emotional regulation.

In answer to the second question, the content analysis suggests children did not generally lack a conceptual understanding of animal emotion, harm, or how to show kindness to animals. The few children who managed to articulate an answer around motivations suggested it was an issue that might be classified as reactive aggression, either in the form a lack of behavioral/emotional control, or as a punishment for bad (animal) behavior. The IPA suggests that although children knew their behavior was "bad," they lacked the control to regulate their behavior, used cruelty to retaliate against others, and/or were modeling behavior which they were regularly exposed to.

Content Analysis

Mapping attachment. The hierarchical mapping technique revealed that children tended to have small attachment networks (just under two relationships on average) and that many children readily included pets in these networks. Although there is no direct research on using the total number of relationships placed in hierarchical mapping tasks to assess attachment, Rowe and Carnelley (2005) demonstrate that insecure relationships are less likely to be placed in attachment maps (in adults and teenagers). As children have a lesser capacity to form

relationships outside the home, it is possible that children cannot compensate for insecure attachment to family members by including other people, and that for these children, insecure attachment simply results in smaller networks. This is somewhat supported by the observation in this study that children did not usually include all the people they lived with in their attachment map, so that their maps had fewer people in them. It is interesting to speculate whether some children with poor attachment to parents (potentially George and Katie in this case) partially compensated for the lack of closeness to their parents with a relationship to a pet.

The second point ties in to existing literature on children's attachment to pets (Marsa-Sambola et al., 2016; Muldoon et al., 2019), which shows that children do include pets in their attachment networks, that pets can provide important social support, and that attachment to pets can be predictive of emotional wellbeing. These findings suggest that children who have harmed animals can, perhaps counterintuitively, be attached to the very pets they are harming. Understanding how children relate to their pets may be crucial to understanding their cruelty.

Interpreting social scenes. The “Animals-at-Risk” TAT revealed some interesting patterns in children's interpretation of social scenes with pets. Children tended to interpret the scenes negatively and attributed negative emotions to people more readily than to the animals. Children struggled more with attributing emotions to animals and did not attribute mixed feelings to them as often. This might suggest that although children could struggle with animal emotional attribution, animals were perhaps seen as less hostile or threatening. Some children had interpretation biases, consistently interpreting images either negatively (three children) or struggling to interpret scenes at all (two children). Furthermore, when children were separated into “cruelty” and “at-risk” groups, there was an interesting trend that suggested children in the cruelty group interpreted images more negatively than the at-risk group, although the sample size was far too small to yield significant results, especially without a control group. These observations lend some support to SIP theories of childhood aggression and its relevance to animal cruelty (Henry, 2018). Thus, for some of the children interviewed here, there seems to be a bias toward negative interpretation of social signals, and the suggestion is that difficulty in interpreting signals, or automatically interpreting ambiguous signals very negatively, could lead to aggressive or defensive behavior.

Understanding of animals and animal cruelty. The open questions revealed that children did not generally see harm to animals as different to humans, that they saw animals positively, and that they often did not have a desire to cause harm. Rather, motivations around cruelty were usually as punishment for bad behavior or due to lashing out or anger, which supports findings in previous research (McDonald et al., 2018). The CAI demonstrated just how difficult it was for children to admit to their cruelty, with inconsistent answers across questions making numeric or statistical analysis difficult. This suggests that in some cases, children may struggle to discuss their cruelty when asked directly.

IPA

Bonding to animals highlighted that animals were seen positively, that children usually did not express a direct desire to harm, and that some children were attached to their animals. This theme speaks to the literature on children's understanding of animals and their attachment to pets (Marsa-Sambola et al., 2016), and suggests that children who have abused animals do not necessarily have an inherently different relationship with their pets. This theme also develops McDonald et al.'s (2018) study, which found children anthropomorphized animal sentience. This suggests anthropomorphizing is perhaps a double-edged sword: Although it can foster attachment relationships and consequently empathy toward animals (Hawkins & Williams, 2017), it may also (as suggest by McDonald) be the reason for hostile attribution biases and the rationalization for harsh punishment. Finally, this suggests that attachment theories are relevant for understanding relationships to animals even in the context of cruelty, where the concurrent presence of cruelty and attachment to a pet might indicate broader attachment problems.

The second theme, *Normalization of violence*, captured children's frequent descriptions of violence both interpersonally and toward animals, which suggested that this was commonplace for them, and possibly had become part of their schemas for relationships. This recapitulates the literature on the effects of exposure to violence on children's emotional and behavior development, and to "the link" where animal cruelty has been observed to occur alongside other forms of interpersonal violence in the household (Ascione & Arkow, 1999). It also lends support to the idea that children who abuse animals are displaying learned behaviors, including the relevance of SIP models to understanding animal abuse (Henry, 2018; McDonald et al., 2018), but adds an additional dimension: not only was human aggression normalized for these children, but so was animal

aggression. This suggests that demonstrating positive animal interactions and good animal behavior may be important in helping these children reduce their instances of harm. It is interesting to note that aggression was also apparent in children's language, with some boys frequently using the derogatory word "bitch" to refer to both themselves and others, perhaps suggesting that were accustomed to adopting an aggressive stance in their daily language patterns.

Finally, *Signs of trauma and emotional issues*, attempted to capture the complex psychological backdrop to children's relationship patterns, including signs of unresolved trauma, insecure attachment, and the related issues of poor self-image and difficulty in regulating emotions and behavior. This points to two related literatures on trauma and attachment, and their effects on behavioral and emotional control (Dvir et al., 2014; Mikulincer et al., 2003). It also emphasizes the importance of not simply viewing animal cruelty as a developmental marker for issues around aggression and CD, but potentially as an indicator of other psychological issues, which need to be carefully assessed. The AniCare child approach highlights the importance of assessing not only for ADHD and CD, but for attachment issues (Shapiro et al., 2013, p. 23). These results suggest that trauma and problems with emotional regulation and behavioral control are also important factors to consider. Finally, this theme also suggests that low self-esteem may also be a factor for animal cruelty. Although the idea of a negative self-esteem being a factor for CAC is mentioned by certain animal welfare agencies (Los Angeles SPCA, 2020), few published research papers mention this. Alleyne and Parfitt (2018) found that low self-esteem was one of two predictors which reliably differentiated animal-directed aggression from other antisocial behaviors. Bringing all this together, Harry was probably the most obvious case of how trauma, insecure attachment, and poor self-esteem unfortunately translated into animal cruelty, despite also being attached to his pet.

This highlights the often overlooked importance of attachment in cases of animal cruelty, despite its relevance being known in the broader literature on aggression: insecurely attached partners are more likely to be aggressive (Babcock et al., 2000), insecure attached teenagers are more likely to bully (K. Williams, 2011), and abused and neglected children are more likely to have insecure attachment and be violent or socially withdrawn (Finzi et al., 2001).

Framework for the Psychological Context of Animal Cruelty

Tying in the superordinate themes from the IPA with existing models of animal abuse and aggression could help place them in a long-term

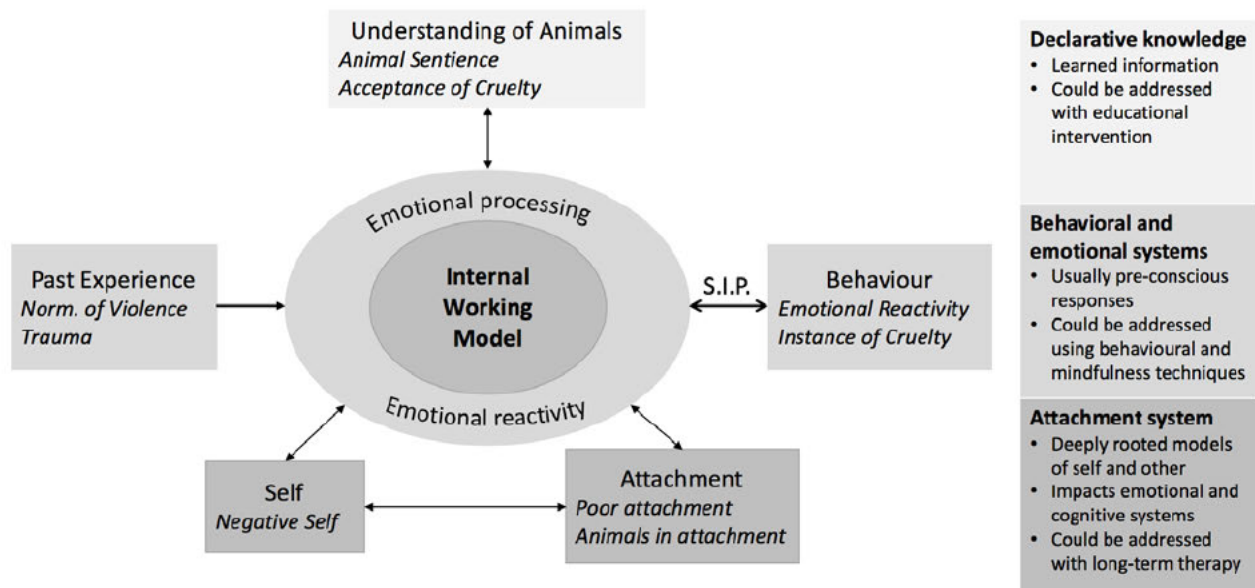


Figure 2. Hypothetical model showing how constructs described in the qualitative analysis (rectangles) might relate to the child’s internal models and internal processes (ovals).

Note. On the right, the boxes summarize the progression from “surface” level declarative knowledge processes to more deeply rooted processes such as behavioral control and attachment, highlighting that increasingly intense interventions are likely to be necessary to address deeper problems.

developmental context using theories such as emotional regulation (Parfitt & Alleyne, 2018), SIP (Henry, 2018), and the role of attachment (Thompson & Gullone, 2008). Bringing these themes together to consider how they create a distorted internal model for the child could help clarify how problems like emotional dysregulation, poor social information processing, and lower empathy often arise in tandem in children who abuse animals. Figure 2 illustrates how these concepts might come together. It is centered on the child’s attachment-based Internal Working Model (IWM; Dykas & Cassidy, 2011), which interfaces with observable constructs (rectangles) through the child’s emotional processing system. The rectangles are partially based on the extracted themes in the analysis (in italics). The idea of the IWM interfacing with other constructs through emotional processes is based on Crick and Dodge’s (2000) model of SIP which has a central “database” surrounded by emotional processes, and on the relationship between attachment systems and emotional regulation (Zimmermann, 1999).

The implication is that animals are integrated into the child’s psychological framework, and that animal abuse is likely not separable from other behavioral or psychological issues. This framework further suggests that risk factors for cruelty might build upon each other: the

more risk dimensions a child has (e.g., poor attachment, poor view of self, experience of violence, and low understanding of animals) the more at-risk the child might be for animal abuse, and possibly the worse and earlier the abuse will start. This “cumulative” negative effect has been demonstrated for adverse childhood experiences (ACEs) by Bright et al. (2018), who showed that juvenile offenders who had committed acts of animal cruelty were more likely to have four or more ACEs. This model is also somewhat aligned with Parfitt and Alleyne’s (2018) conceptualization of animal abuse, which is suited to models of reactive aggression. Specifically, the model in Figure 2 implies that longer term factors such as trauma, violence and poor attachment may give rise to poor emotional and behavioral regulation processes, which Parfitt and Alleyne argue are responsible for reactive aggression toward animals.

Limitations and Further Research

The main weaknesses of this study related to generalizability, and included having a small, fairly uniform sample, and not having a control group. As part of the homogeneous sampling required for IPA, participants were from a specific region, age range, and participating in the AG program. This sample of ten participants is in line with recommendations for IPA techniques, which focus on small, specific populations and in-depth analysis (Pietkiewicz & Smith, 2014), but limits the generalizability of the results. Furthermore, the results of the image interpretation and the attachment mapping tasks are tentatively interesting, but it is impossible to conclude whether the referred children would have exhibited differences if compared with controls. Finally, the fact children struggled to answer the CAI may be due to a weakness in methodology, as it is a validated measure which children should not struggle to complete. This may be because children struggled discussing their instance of cruelty in person, while the CAI was originally tested as a written measure to be completed individually.

Another limitation was the lack of basic demographic data collected, especially social economic status (SES) and ethnicity. This information was not collected because of the young age of participants, and the fact we did not use parent report. However, this makes the results more difficult to place in context. For example, Hartman et al. (2019), found that controlling for income impacted which factors came out as predictive of CAC: *higher* affective empathy, lower cognitive empathy and callous-unemotional traits predicted animal cruelty, but when controlling for income, the effect of affective empathy disappeared.

Their sample also had more ethnic diversity than this study (about half of respondents identified as Latino), and they note that cultural influences on empathy expression are important to consider. In fact, the significant impact of ethnicity on animal cruelty has been reported in a U.S. sample of adults, where Latinos were found to be less likely to perpetuate animal cruelty on average (Vaughn et al., 2009). Thus, without relevant data on the SES or ethnicity of participants, it is difficult to comment on the study's generalizability to other populations.

Finally, due to the recruitment procedure for this study, it is possible that our sample of CAC is biased toward harm resulting from reactive aggression. The relevance of reactive and proactive aggression to CAC is an ongoing discussion (Henry, 2018; Hoffer et al., 2018), but given that these forms of aggression may correlate with specific disorders, such as CD and broader externalizing problems with reactive aggression, and psychopathy with proactive aggression (Kempes et al., 2005), it may be important to distinguish between them. If these two forms of aggression apply to CAC, it is possible that the sampling procedure, which relied on caregiver referral, may favor the identification of more reactive types of animal harm. This is because reactive aggression tends to be unplanned and in response to provocation, so the child has less chance to conceal their behavior. However, proactive forms of aggression tend to be planned out or at least purposeful, and so have more scope to be secretive or concealed. In their development of the CAI, Dadds et al. (2004) give covertness a higher score, suggesting a link between secrecy and more severe cruelty, and found that it was fairly common for parents to underreport their children's acts of cruelty. Although this research did capture some forms of proactive aggression, especially where children harmed animals to indirectly harm people (Frank, Harry), we did not interview any children who reported sadistic intent in their animal harm. As this is still a relevant area of research, especially as a predictor of psychopathy (Stupperich & Strack, 2016), it is important to note that our results do not necessarily reflect the absence of such cruelty and may instead be an artifact of sampling.

Suggestions for Intervention

Given the wide range of factors discussed in this study, we thought it would be useful to translate these findings into suggestions for intervention. This list is not exhaustive nor entirely novel (see Shapiro et al., 2013 for guidelines on treating animal cruelty), but rather offers suggestions based directly on the results. These suggestions

should apply to a variety of interventions, from animal welfare education programs to therapy:

- The child's assessment should consider a variety of risk factors (e.g., family violence, attachment issues, trauma) which will inform the need for additional therapy or intervention.
- Be aware that many children may still be currently living with pets, and may be attached to them.
- Do not approach the cruelty in an accusatory fashion, but in a neutral and matter-of-fact way. Some children may need a few sessions to open up.
- Involve parents where possible, to educate them on animal welfare as well, and to help change the child's home environment.
- It is necessary to understand the context and motivations for harm, as these can be varied—from intentional to unintentional, proactive to reactive—and different intervention components may be necessary for different contexts.
- Help the child practice both “basic” emotion recognition and the interpretation of more complex scenes containing both humans and animals.
- Help the child understand their own context for the harm, as many children may struggle to analyze the events that lead to and triggered their behavior.
- Help the child practice safe behavior and handling around animals to minimize the risk of aggressive responses from animals. If safe and possible, model positive human–animal interaction.
- Incorporate strategies and exercises to help the child practice regulating their behavior that they can easily recall if caught in the “heat of the moment.”

Conclusion

These results are broadly consistent with previous research and suggest that CAC is a red flag not just for development of aggression, but for a range of psychological stressors, including poor attachment, exposure to violence, poor behavioral and emotional regulation, and trauma. Animals were embedded in children's broader psychological frameworks so that children's interactions with animals were informed by their learned experiences and often reflective of their broader environment. Even when cruelty had occurred, children could be attached to animals and seldom expressed desire to cause harm as a motive. In fact, children potentially interpreted animals as less threatening, and possibly as “safer” targets on

which to rehearse behaviors they would otherwise inhibit. Exploring some of the concepts uncovered in this qualitative analysis with larger groups of children with matched controls will help establish the generalizability of results and could help inform a comprehensive model of the development of animal cruelty for better intervention.

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Declaration of Conflicting Interests

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Note: Please see the reference section at the end of this thesis for the references cited in this publication.

3.8 Further Discussion and Chapter Summary

Although it was outside the scope of the publication to fully discuss, it is important to return to the possible effect of including four children who had been identified as “high risk” of animal harm (rather than having engaged in animal harm). These children were identified as high risk for one of the following reasons: behavioural problems in school where they may also have aggression towards people, witnessing animal cruelty, and/or where concerning behaviour towards animals was shown but perhaps stopped by an adult. It is important to note the these “high-risk” children *may* have harmed animals outside the knowledge of adults, that referring adults may have variable thresholds for what constitutes “actual” harm and what constitutes “at-risk” behaviour (e.g. does teasing a dog count?), and also that information may have been lost along the referral process (e.g. parents see an incident but don’t communicate this clearly to the teacher, so no incident is recorded). As such, it was still appropriate to ask these children the full range of questions on whether they had harmed an animal. In understanding the relevance of their inclusion, it is useful to frame

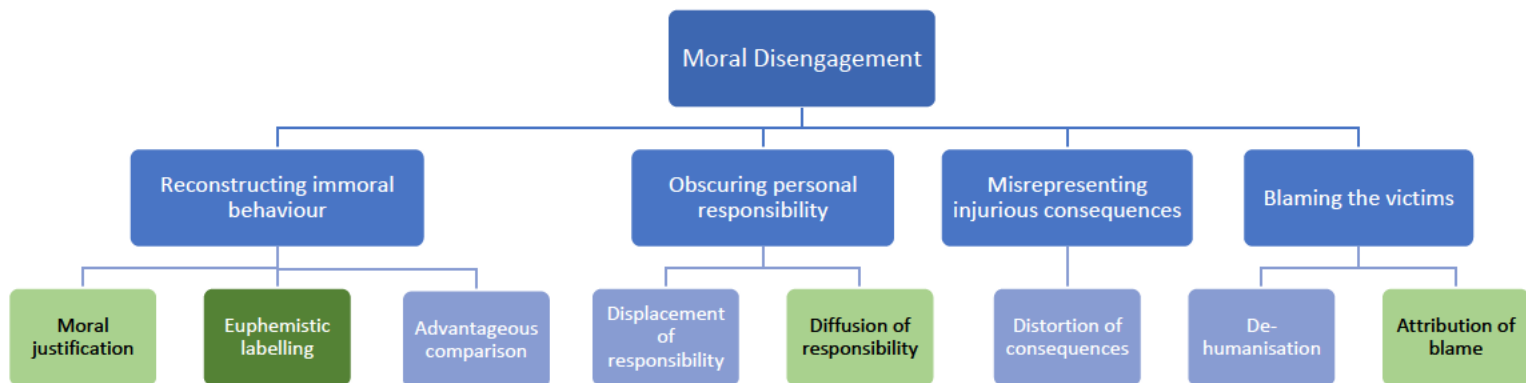
this study as an exploration of the types of children who are likely to be referred to animal harm interventions, rather than an exploration of “pure” cases of animal cruelty.

Another point which may require further clarification is why the subthemes themes ‘Cruelty as negative’ and ‘Diminishing cruelty to animals’ were combined. This was done because “diminishing cruelty to animals” can be seen as an extension of the view that animal cruelty is negative, which in turn can be explained by moral disengagement theory (Bandura, 1986). In this case, one of the mechanisms through which children might reduce cognitive dissonance after performing immoral act of hurting an animal is through “euphemistic labelling” saying it only hurt the animal “a bit”, or that it didn’t hurt “very much”. Although it was outside the scope of the publication to investigate animal cruelty from the lens of moral disengagement, it is relevant to reflect on this theory’s relevance, given its prevalence in the aggression and animal cruelty literature more generally (Walters, 2019).

Figure 3.3 shows the typology of moral disengagement as postulated by Bandura and highlights the dimensions that appeared in the interviews. Euphemistic labelling (i.e. ‘diminishing cruelty to animals’) was the most common, although there were a couple example of “moral justification” (e.g. saying an animal needed to be punished for acting badly), “attribution of blame” (e.g. saying it was the animal’s fault because they bit/scratched them), and diffusion of responsibility (e.g. saying it was an accident or result of the circumstances). What is particularly interesting, is that the children in this study actually did NOT seem to successfully fully morally disengage: they still saw themselves as bad for the acts they had committed, which comes through extensively in the “negative self” theme. Why might this be? There is very little research on how moral disengagement develops, with most studies focusing exclusively on adolescence (12+ years), but some research has found that moral disengagement tends to be lower before adolescence (Thornburg & Jungert, 2014); however, it’s not clear whether this is because children do not have the *cognitive capacity* to carry out the “mental gymnastics” required, or the *inclination* (Bussey, 2020). Future research might therefore inquire whether the reason only certain types of moral disengagement were present in this sample is: 1) trivially because our sample was too small, 2) because young children do not yet having the full set of options available,

3) due to the social situation of these children, and/or 4) because certain forms of moral disengagement are more likely to be used when animals are victims.

Figure 3.3: *Domains and subtypes of moral disengagement postulated by Bandura.*



Overall, this qualitative research encouraged me to adopt a nuanced approach to understanding children’s relationships with animals, which informed the design of the studies in Chapters 4, 5, and 6. One of the results that particularly stood out for further investigation was the way animals were embedded in children’s attachment networks, but also in their views of self and other. This prompted me explore ways of assessing attachment across primary school ages, and therefore to pursue a qualification in the Child Attachment Play Assessment, a technique based on story-stems used for Chapters 4 and 5. Another risk factor which stood out was the issues children seemed to have trouble regulating their emotions and behaviours during interview, which prompted me to measure executive functions. Although this study provided insights into under-explored risk factors and into children’s understanding of animal harm, it became clear that it would be difficult to draw generalisable conclusions without a low-risk comparison group, to establish what (if any) patterns of risk factors were present for referred children.

Chapter 4:

Psychological Risk Factors for Childhood Animal Cruelty

*Exploring the Roles of Attachment, Self-
Regulation, and Empathy*

This chapter is published Open Access in the Anthrozoös:

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4.1 Overview and Rationale

Following the qualitative study carried out during the pilot phase of Animal Guardians, the plan was to complete a larger quantitative study as the programme started being offered across a wider area of Scotland. Originally, the intention was for this study to include an in-depth investigation of risk factors for animal harm by comparing referred children with classmate controls *and* an evaluation of the effectiveness of Animal Guardians, with measures repeated at post-test to detect changes. However, in March 2020 restrictions and school closures due to COVID stopped delivery of Animal Guardians and interrupted data collection prematurely. Because restrictions lasted so long, the evaluation of Animal Guardians through the procedures designed for this specific study had to be scrapped (only four referred children and their classmate controls had completed the post-test). Fortunately, just enough data had been collected at pre-test to make a study on psychological risk factors viable, given the richness of the data that had been collected. There are serious limitations associated with the small sample size (nine referred children and 18 classmate controls), yet researchers also have an ethical duty to make use of collected data even in cases where studies may be under-powered (Bacchetti et al., 2005). These new circumstances prompted me to carry out additional in-depth analysis on attachment factors (Chapter 5) and led me to re-design the evaluation procedure as a questionnaire once Animal Guardians resumed (Chapter 6).

Appendix B has additional materials for this chapter, starting with the Supplementary Materials associated with the publication, followed by copies of ethical permissions, local authority consent forms (required due to separate recruitment of control children through schools), and the interview schedule.

A Preliminary Exploration of the Psychological Risk Factors for Childhood Animal Cruelty: The Roles of Attachment, Self-Regulation, and Empathy

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ABSTRACT

Despite growing awareness of the psychological issues associated with childhood animal cruelty, there is a scarcity of research carried out directly with children. This study investigates the psychological factors influencing the likelihood of a child harming animals, specifically the roles of attachment, empathy, executive functioning, issues related to externalizing behavior, and Callous Unemotional (CU) traits. The sample comprised children at high risk of animal harm referred to the Scottish Society for the Prevention of Cruelty to Animal's Animal Guardians program ($n = 9$) and low-risk controls ($n = 18$) matched for age and school class. A range of assessment techniques was used over three interview sessions for each child. Externalizing problems were measured using teacher reports; attachment was blind-coded using the Child Attachment Play Assessment; executive functioning was assessed using a Dimensional Change Card Sort (DCCS); and empathy was measured using self-report and picture-based tasks, the Kids Empathy Development Scale. Children at high risk of animal harm were more likely to be insecurely attached ($p = 0.002$), scored significantly higher on Strengths and Difficulties ($U = 1.5, p < 0.001$) and CU traits ($U = 6.4, p = 0.001$) as rated by their teachers, scored lower on cognitive empathy ($U = 36.5, p = 0.043$), and performed more poorly on the DCCS test of executive functioning ($U = 31.0, p = 0.014$). No significant differences were found between high-risk and low-risk children on self-reported empathy or emotion recognition. We also found that insecure attachment was related to an increased score for many psychological risk factors. This exploratory study demonstrates that childhood animal harm can act as an indicator of a range of psychological issues and highlights the importance of designing appropriate interventions for this vulnerable population.

KEYWORDS

AniCare® Child; attachment; childhood animal harm; empathy; executive functioning; human–animal interaction

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Research suggests that interactions with animals during childhood can have a range of positive effects, including the development of empathy (Daly & Morton, 2009), stress reduction (Beetz et al., 2012), and as helpful agents of therapeutic change (Feng et al., 2021; Levinson, 1965). By contrast, children's harm of animals is associated with behavioral issues and low empathy (Hawkins et al., 2017). It can be an indicator for both cycles of violence (DeGue & DiLillo, 2009) and/or adverse childhood experiences (Bright et al., 2018) and may be predictive of future violent behavior (Longobardi & Badenes-Ribera, 2019).

Existing Research on Childhood Animal Harm

Childhood animal harm can be defined as "any behavior, either intentional or unintentional, where a child negatively impacts an animal's welfare" (Wauthier & Williams, 2022). It encompasses a range of behaviors, from accidental harm due to lack of knowledge, to harm of high concern such as intentional cruelty, which has historically received the most research. The first studies of childhood animal cruelty, based on retrospective questionnaires with prison inmates, showed animal cruelty is predictive of later interpersonal violence (Macdonald, 1963), establishing it as a marker for psychopathic traits or their precursor in childhood, Callous Unemotional (CU) traits (Dadds et al., 2006). Animal cruelty was included as a diagnostic criterion for Conduct Disorder (CD) in 1987 (Gleyzer et al., 2002) and added to the Child Behavior Checklist (Achenbach & Ruffle, 2000). However, more recent studies suggest that animal cruelty is not more predictive of committing violent rather than non-violent crimes (Walters, 2014; Walters & Noon, 2015). Children who have harmed animals are at much higher risk of being caught in inter-generational cycles of family violence (Knight et al., 2014), of being abused themselves (DeViney et al., 1983; Lee-Kelland & Finlay, 2018), and of having psychological difficulties (Hawkins et al., 2017). Thus, childhood animal harm might be seen as an indicator for a range of developmental issues and an opportunity for targeted early intervention.

Psychological Factors that Influence Childhood Animal Harm

AniCare® Child (Shapiro et al., 2013) is the only existing treatment approach designed for psychological professionals to assess and treat children who have abused animals. It proposes a conceptual framework in which attachment underpins the development of further psychological factors involved in childhood animal abuse. It shows attachment as basal, followed by emotional intelligence, self-management, and finally the influence of culture and family (see Figure 1). Although promising, this conceptual framework has never been tested and the authors do not cite any supporting research. In the following sections, we review evidence for the role of each of these dimensions in explaining childhood animal harm and highlight gaps in the literature.

Attachment Style and Attachment to Pets

Attachment theory explains the drive to seek close emotional bonds, starting with primary caregivers in early childhood and gradually expanding to include bonds to a

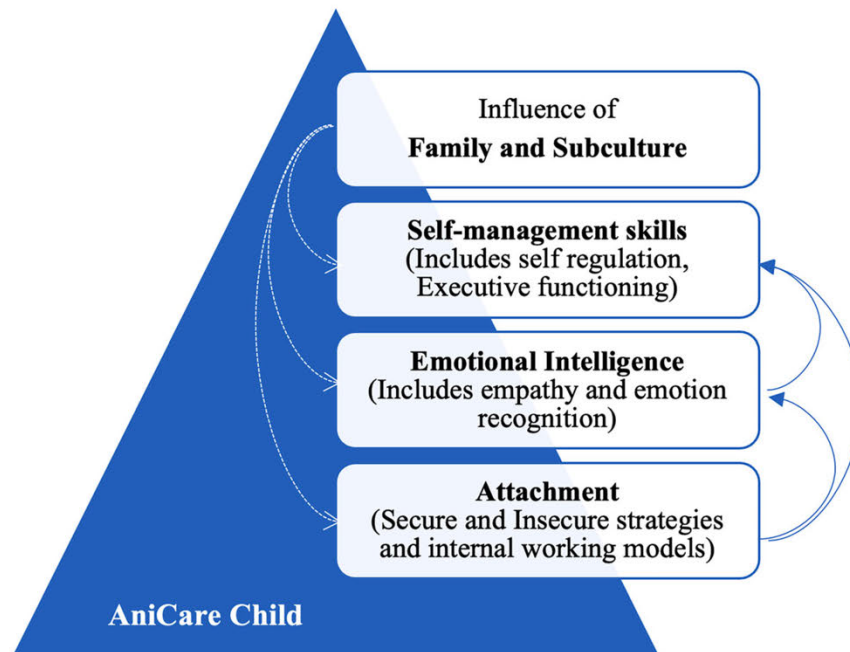


Figure 1. Schematic showing the different psychological factors informing the AniCare® Child approach. Attachment is the basis of the approach and interacts with additional psychological processes through top-down and bottom-up processes. Adapted from Shapiro et al. (2013) with permission from the authors.

wider network of secondary attachment figures, including peers, siblings, and romantic attachments (Ainsworth, 1989; Bowlby, 1969). Children can develop either “secure” or “insecure” representations of themselves and others, and the patterns in these attachment representations can be used to classify attachment styles (Ainsworth, 1979; Belsky, 2002). When discussing children’s animal harm, two aspects of attachment can be considered: children’s overall attachment style and their relationship to pets, which sometimes fulfills characteristics of secondary attachment (Marsa-Sambola et al., 2016; Wanser et al., 2019).

A range of negative developmental outcomes is linked to insecure attachment: lower empathy, lower self-esteem, poorer behavioral regulation, and higher risk for psychopathology (Mikulincer & Shaver, 2012), each of which has separately been found to increase a child’s risk for animal harm (Hawkins et al., 2017). Thompson and Gullone (2008) provide the only study that directly investigated the role of attachment in animal harm, finding that more securely attached adolescents have higher prosocial behavior and reduced animal harm behaviors, a correlation partially mediated by empathy. More indirectly, Fielding et al. (2011) found that people coming from “not loving” homes are more likely to have harmed animals as children, while a qualitative study by Wauthier and Williams (2020) found that children referred to an intervention for animal harm had signs of insecure attachment, even though the attachment networks included pets. In fact, attachment to animals does not correlate strongly with a person’s primary attachment pattern (Julius et al., 2012), and children who have experienced relationship trauma or abuse may use pets as sources of support over humans

(Beetz et al., 2012), even though they are also at higher risk of harming animals (Yamazaki, 2010). Unfortunately, there are currently no published studies directly relating attachment strategy to childhood animal harm behavior (CAHB).

Empathy and Emotion Recognition

Empathy is the capacity to imagine or feel another's (person or animal) experience and can be a powerful motivator for compassionate behavior. Empathy can be divided into three subtypes: (1) cognitive empathy, which is the capacity to recognize and understand others' emotions, (2) affective empathy, which is the degree to which another person's feelings influence one's own feelings, and (3) behavioral empathy, which is the desire to help someone in distress (Reid et al., 2013). Although several studies show that lower empathy is associated with animal harm (Akdemir & Gölge, 2020; McPhedran, 2009), the results are not always consistent. For example, Plant et al. (2019) found that affective empathy is especially predictive of animal harm, while Hartman et al. (2019) found that only cognitive empathy predicted animal abuse, and that affective empathy was not predictive when controlling for socio-economic status (Hartman et al., 2019). Empathy can also be studied through psychopathologies such as CD and its modifier CU Traits, which have repeatedly been linked to animal cruelty (Dadds et al., 2006; Hartman et al., 2019). Unfortunately, there is little research on the link between empathy toward humans and empathy toward animals; one study with adults showed a moderate correlation (Paul, 2000), but there is no published research with children. Given that animals express their emotions differently than humans, it seems important to establish whether any differences in empathy toward animals stem from a reduced ability to recognize emotion in animals or occur despite good emotion recognition.

Self-Regulation

Although AniCare® Child refers to self-management rather than self-regulation, the two concepts are overlapping (Zeidner et al., 2000). Self-regulation is a multi-dimensional construct relying on several psychological processes and can be defined as "the capacity of controlling or directing one's attention, thoughts, emotions, and actions" (McClelland & Cameron, 2012). Difficulties with self-regulation are linked to poorer school outcomes (Neuenschwander et al., 2012), higher rates of externalizing behavior problems (Perry et al., 2018), and bullying (Garner & Hinton, 2010), all of which are also risk factors for childhood animal harm (Hawkins et al., 2017; Wauthier & Williams, 2022). Self-regulation overlaps with executive functioning (EF; Diamond, 2013) and emotional regulation (Thompson et al., 2019). Although the role of executive functioning in childhood animal harm has never been directly tested, this seems a promising construct to explore: EFs can be reliably and validly measured (Zelazo et al., 2013), issues with EF have been linked to externalizing disorders such as CD and attention deficit hyperactivity disorder (ADHD; Holmes et al., 2010), and positive interactions with animals may improve EFs (Ling et al., 2016).

Attitudes, Beliefs, and Knowledge

Finally, recent research also provides support for Shapiro et al.'s (2013) theory that a child's social environment frames their relationships with animals, both directly and through interaction with other dimensions. For example, Plant et al. (2019) found that cultures more accepting of animal abuse are associated with higher rates of animal abuse in adolescence, while Amici et al. (2019) found that recognition of dog emotions is dependent on cultural background, exposure, and attitudes to dogs. Family and cultural environments will also inform a child's knowledge, attitudes, and beliefs about animals (Jegatheesan, 2015). In fact, research with children has found a role for attitudes toward cruelty (Hawkins et al., 2020), belief in animal sentience (Hawkins & Williams, 2016), and welfare knowledge (Muldoon et al., 2016) in predicting animal harm. These factors seem promising candidates for study as they can potentially be targeted through educational interventions, even with very young children (Williams et al., 2021).

The Current Study

The purpose of this exploratory study was to investigate the psychological factors involved in childhood animal harm, given its potential as an indicator for developmental psychopathology and the need for effective treatment and interventions. AniCare® Child is the only existing treatment approach addressing this, and our goals were: (1) to provide the first evaluation of its theoretical premises, and (2) to address gaps within the literature on childhood animal cruelty, including scarcity of research carried out with children, heavy reliance on self-report, and a lack of well-selected control groups (Wauthier & Williams, 2022). We triangulated results using a range of task-based, self-report, and teacher report methods to test differences between children at high risk for animal harm and children at low risk for animal harm on the four dimensions of AniCare® Child. We predicted that children at high risk of animal harm would (1) have higher rates of insecure attachment than children at low risk of animal harm, (2) score lower on measures of emotion recognition and empathy than low-risk children, (3) have lower scores on measures of executive functioning and self-regulation than low-risk children, and (4) would score higher on measures of attitudes to cruelty, such as acceptance of animal harm, than low-risk children.

Methods

This study was approved by the University of Edinburgh's Department of Clinical and Health Psychology [reference number: CLIN629], and Local Authority consent was obtained prior to establishing contact with schools and obtaining parent consent and child assent to participate in the research.

Participants

This study involved two groups of participants: "high-risk" children who had been referred to the Animal Guardians (AG) program, and "low risk" children who were recruited as partially matched controls from the referred children's school classes. AG is a targeted

humane education intervention program for children (aged 4–12 years) at high risk of animal cruelty, run by the Scottish Society for the Prevention of Cruelty to Animals (SPCA) in Scotland. Recruitment occurred from August 2019 to March 2020. Referrals to the program came from various sources: teachers, parents, social workers, and Scottish SPCA inspectors dealing with animal cruelty incidents. For the current sample, we received two referrals from Scottish SPCA incidents, two referrals from the children's charity Barnardo's, two referrals from the child's primary school, one referral from a specialist residential school, and one referral from a parent. Referrals always received AG intervention in the child's school, where research interviews were also carried out. Parental consent for the research was separate from consent for AG. Parents could refuse for their child to participate in the research without affecting their child's eligibility for the AG program. Once a referral was made, the child's class teacher was contacted and asked to hand out parental consent forms for up to four children who would be matched controls. Referred children completed the research interview before going through the AG program.

A total of 27 children were interviewed over three 30-minute sessions. This sample was composed of nine high-risk children referred to the AG program (three girls and six boys, mean age = 8.8 years, $SD = 2.1$, range = 4–11 years) and 18 low-risk matched-control children (ten girls and eight boys, mean age = 8.6 years, $SD = 2.5$, range = 4–11 years). Among the referred children, two were referred for "at-risk" behavior (no harm had occurred but referring adult was concerned it was likely), five were referred to for "minor harm/rough handling" of animals, and two were referred for "moderate harm" (physical or emotional harm had occurred). None of the children were referred for "serious harm" (animal needing veterinary care or animal died). Most children came from families that owned pets ($n = 19$): dogs ($n = 9$), cats ($n = 8$), small mammals ($n = 5$), and fish or reptiles ($n = 3$). See online Supplemental Table 1 for full demographic details on the children.

Materials and Measures

We used a range of measures to investigate the four dimensions proposed in AniCare® Child, including three measures related to empathy (self-report, task-based, and emotion recognition) three measures related to self-regulation (executive functions, behavioral difficulties in the classroom, and CU traits), and three measures related to social environment (attitudes, beliefs, and knowledge).

Attachment: The Child Attachment Play Assessment

The Child Attachment Play Assessment (CAPA; Farnfield, 2016) is a narrative story-stem procedure assessing attachment style in 3–11-year-old children, using the dynamic maturational model (Crittenden, 2006). For this research, children's attachment styles were grouped into three categories: secure (B), insecure "normal" (A1/2 and C1/2 classifications), and insecure "pathological" (A+ and C+ classification). In the CAPA procedure, the interviewer gave each child the beginning of a story-stem introducing a problem and asked, "tell me and show me what happens next," allowing the child to resolve the story however they chose. The stories are told with a set of simple props (human and

animal figures, furniture, and a doll house), and the procedure is videotaped for later coding. Children were given six “human stories,” which were taken from the standard story-stem procedures, and three “pet stories” designed for this study and using themes from Wauthier et al., (2020) to inform common sources of conflict in children’s relationships with pets. Videos were double-coded by certified reliable CAPA coders: by the first author, and blind-coded by a second reliability coder who was not aware of the child’s condition or background. Any disagreements in classification were discussed until a consensus was reached.

Emotional Intelligence

Measures of Empathy: We used two different measures of empathy: Bryant’s Empathy Index (BEI; Bryant, 1982) and a slightly modified version of the Kids’ Empathic Development Scale (KEDS; Reid et al., 2013). The BEI is a reliable self-report empathy measure originally developed for children 6–13 ($\alpha = 0.77$ in an adolescent sample; Del Barrio et al., 2004). Responses are given on a 5-point Likert scale (as in Del Barrio et al., 2004) and children are asked how much they agree with each statement (from “Not at all” to “A lot”). Although the BEI was originally designed as a 22-item measure, it was condensed to an 18-item scale for this study (transforming the eight items investigating gender-based empathy into four gender-neutral items).

The KEDS is an image-based measure of empathy designed for primary school children (Reid et al., 2013). Three dimensions of empathy are assessed by asking a series of questions for each image: affective empathy (“How do you think this girl/boy feels?”), cognitive empathy (“Why do you think he/she feels this way?”), and behavioral empathy (“What would you do if you were that boy/girl?”). The child infers the emotion of one or two characters in each scene based on body language and context. For this study, a sub-sample of six KEDS images were selected exploring four emotions (happy, sad, angry, scared) and were supplemented with four images depicting a child interacting with an animal. The KEDS procedure was video-recorded and scored by the first author and by one of three “blind” coders. Responses were scored on a 3-point scale, with 0 points for a “don’t know” or wrong answer, 1 point for a simple correct or nearly correct answer, and 2 points for a complex correct answer. The average agreement between the first author and reliability coders was 79.7% (Cohen’s Kappa = 0.70), which corresponds to “moderate agreement” (McHugh, 2012).

Emotion Recognition: Human and animal emotion recognition was assessed using a set of 20 color photographs showing five emotions (happy, sad, angry, scared, and neutral) across four species (human, dog, cat, and rabbit). Images for human emotions were taken from an existing photographic emotion recognition database, and animal images were collated from copyright-free images and then verified by the Scottish SPCA’s veterinary and behavioral team to ensure that the animal in each image displayed the intended emotion (see Figure 2). The images were split into two blocks (human emotions and animal emotions), each block starting with a practice image to verify the child’s comprehension of the task. Children saw one image at a time and were asked to select one of six options (happy, sad, angry, scared, neutral, and don’t know) to describe the emotion the person or animal displayed. Children’s responses were timed using the question timer in Qualtrics. Scores were calculated



Figure 2. Full set of images of dogs, cats, and rabbits displaying five emotions used in the animal emotion recognition task.

separately for each block: the total number of correct responses was divided by the average amount of time taken for the block. Thus, a higher score corresponds to more correct answers over a shorter amount of time.

Self-Regulation

Executive Functions: Executive functioning was measured using the Dimensional Change Card Sort (DCCS; Zelazo, 2006). Children are asked to sort a set of cards based on two target cards that can be matched on either shape or color. We used the following procedure: (1) demonstration of verbally cued phase and rule check, (2) 12 trials of verbally cued “shape and color game,” (3) demonstration of border-cued phase and rule check, (4) 12 trials of border version of “shape and color game.” In the verbally cued phase, the experimenter randomly prompted the child at the beginning of each trial by saying “play the shape game” or “play the color game,” ensuring a mix of switching and non-switching trials. In the border-cued phase, the experimenter randomly shuffled a deck of cards with and without borders and stated the rule “Remember, border means color game, no border means shape game” on the first, second, and seventh trial of the phase, but providing no feedback otherwise. This task was video-recorded so that both children’s scores and timings could be calculated.

Behavioral Difficulties: Children’s behavioral problems were measured through teacher report versions of two standard measures: the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997) and the Inventory of Callous Unemotional Traits (ICU; Ciucci et al., 2014). The SDQ has five subscales: conduct problems, hyperactivity, emotional problems, peer problems, and prosocial behavior. Teachers rate each item on a 3-point scale (from “Not true” to “Certainly true”), and an overall score is obtained by reverse coding the prosocial behavior items and calculating a total. The ICU is a 24-item questionnaire assessing CU traits (defined as lack of empathy, guilt, remorse, and emotion; Moran et al., 2009). The teacher report version of the ICU rates a child’s behavior on a 4-point scale (from “Not at all true,” to “Definitely true”) across three sub-factors: callous, unemotional, and uncaring. Because CU traits relate strongly to both low empathy (Waller et al., 2020) and to conduct problems (Longman et al., 2016) in childhood, results from the ICU can be used to lend support to both dimensions.

Effect of Social Learning Environment

Attitudes and Behaviors Toward Animals: Children’s self-reported attitudes and behaviors toward animals were measured using two related questionnaires: the Children’s Attitudes toward Animal Cruelty (CAAC; Connor et al., 2021) and Children’s Animal Harm Behaviors (CAHB; Connor et al., 2021). The CAAC is a self-report questionnaire that has been used with primary-school children with good reliability ($\alpha = 0.70$; Hawkins et al., 2020). It has 11 items describing harmful behaviors toward animals, including physical harm, emotional harm, neglect, and accidental harm. For this study, children were asked “Is it OK to ...” and had to rate each item on a 5-point scale, from “Very bad” to “Very good.” The CAHB also has good reliability ($\alpha = 0.79$; Connor et al., 2021) and has the same 11 items as the CAAC but asks “How often have you done the following?” and has the response options of “Never,” “Sometimes,” “Often,” and “Very often.” We supplemented the 11 items of the CAHB with three items investigating additional harm behaviors (“Play rough with a pet,” “Yell at or punish a pet if it misbehaves,” and “Treat an animal in a harsh way when angry or annoyed”).

Welfare Knowledge: Welfare knowledge was measured using a free-response task, asking the child to report on the welfare needs of dogs, cats, and rabbits. The worksheet

prompted the child to list “everything good for a [dog/cat/rabbit],” and “everything bad for a [dog/cat/rabbit].” Children were provided with six spaces on each side but were told they could fill in as much or as little as they wanted. Children were provided help with reading and writing as needed but were not given feedback. Answers were scored by giving one point for each of the Five Freedoms correctly identified on the negative side, and one point for each of the Five Provisions correctly identified on the positive side (see Mellor, 2016). Thus, each child could receive up to 10 points for each animal.

Belief in Animal Minds: The children’s view on animal sentience was measured using the Child’s Belief in Animal Minds (Child-BAM; Hawkins & Williams, 2016). The BAM was developed with children aged 6–13 years using a set of seven animals and has very good reliability ($\alpha = 0.92$). Here, four of the most common pets in the UK (dogs, cats, rabbits, and birds; PFMA, 2021) were shown and the child was asked whether they thought each animal: (1) was clever, and could feel (2) pain, (3) happiness, (4) sadness, and (5) fear. Each item was scored on a 5-point Likert scale, and each child’s overall BAM score was calculated by averaging their score, with a higher score corresponding to higher belief in animal sentience.

Procedure

Child interviews were carried out one-to-one in a quiet room at the child’s school over three 30-minute sessions on separate days. A child-consent procedure was followed on the first day of interviews and the child was free to withdraw at any time. Children were supported with reading and writing as necessary and were free to carry out self-report questionnaires by themselves if they preferred. Sessions 2 and 3 were recorded using a video recorder mounted on a tripod.

Session 1 included questionnaire measures carried out on a digital tablet using Qualtrics survey software (basic demographics, SAPS, Child-BAM, emotion recognition, CAAC-attitudes), as well as free-response measures carried out using a pen and paper (welfare knowledge). Session 2 focused entirely on the CAPA procedure, using a Playmobil house and assorted figures and furniture. Session 3 started with the executive functioning DCCS task and the KEDS empathy measure, ending with the remaining self-report questionnaire items carried out on Qualtrics (CAHB, BEI). At the end of each session, children could choose a small gift (Scottish SPCA stationary or animal figurine).

Data Handling and Analysis

Data were entered into Excel for preliminary handling, including downloading answers from Qualtrics, entering scoring from pencil-and-paper measures, reverse coding items, and calculating scores. The finalized dataset was then imported into SPSS v. 25 for statistical analysis and into RStudio to produce supplementary figures (using ggplot2 and corrplot). We first performed some preliminary analyses on the data to check the effects of potential confounding factors and to find any patterns of correlations across variables to inform our approach to the main analysis. For the main analysis, children’s scores were statistically compared across potential psychological risk factors between

high-risk (referred) and low-risk (control) children, using tests of frequencies for categorical outcomes (CAPA categorization) and nonparametric tests of mean difference for scale outcomes (Mann-Whitney U and Kruskal-Wallis). Effect sizes for these tests were calculated according to the formulas in Fritz et al. (2012).

Results

Preliminary Analyses

Due to time constraints and complications during the recruitment of control children, we were unfortunately not able to match them with referred children on the basis of sex.¹ As a result, we felt it was important to establish the extent to which this might act as confounding factor. Results of a series of Mann-Whitney U tests suggest that male and female children scored similarly on all measures except on the behavioral empathy sub-dimension of the KEDS, with females scoring significantly higher than males ($p = 0.007$, see online Supplemental Table 2). Although this does not eliminate the confounding effect of sex, it indicates that significant differences in our subsequent analyses between high-risk and low-risk children are not entirely attributable to differences in sex ratios.

A correlogram ordered using hierarchical clustering showed a range of interesting patterns across variables (see online Supplemental Figure 1). For example, although the three measures of self-regulation correlated with each other, measures for the other dimensions did not correlate with each other very well. As a result, we decided to organize results according to risk and protective factors and show results for each variable rather than taking averages by dimension. Furthermore, attitudes to intentional and accidental animal harm had very different correlation patterns, so were analyzed as two subdimensions rather than being averaged together. Although entirely exploratory, this correlogram shows other interesting patterns; for example, while empathy to children and animals correlated with each other, they had different correlation patterns with other variables, replicating the results Paul (2000) found with adults.

Psychological Factors for Childhood Animal Harm

Attachment styles were grouped into three categories: secure (type B), insecure normal (A1/2 or C1/2), and pathological insecure (A+ or C+). We sought to establish whether children referred as high risk for animal harm were more likely to have insecure attachment

Table 1. Frequencies for high-risk referred and low-risk control children by attachment classification.

	Secure (B)		Normal insecure		Pathological insecure		Total
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	
Control children	10	90.9	4	80	1	12.5	15
Referred children	1	11.1	1	20	7	87.5	9
Total	11	100	4	100	8	100	24

Note: The sample size is 24 as there were missing data on attachment classification for three control children.

Table 2. Mean ranks and results from Mann-Whitney *U* tests comparing high-risk referred and low-risk control children across psychological risk and protective factors.

		High Risk	Low Risk	Test result	η^2
Higher score is protective	KEDS – A	12.83	13.09	$U = 70.5, n = 25$	< 0.01
	KEDS – C	9.06	15.22	$U = 36.5, n = 25$	0.162*
	KEDS – B	10.33	14.50	$U = 48.0, n = 25$	0.074
	Emotion recognition (human)	13.50	13.50	$U = 72.0, n = 26$	< 0.01
	Emotion recognition (animal)	12.50	13.94	$U = 64.0, n = 26$	< 0.01
	BEI	12.11	14.24	$U = 64.0, n = 26$	0.018
	Welfare knowledge	12.61	14.69	$U = 68.5, n = 27$	0.015
	Executive function	8.44	16.81	$U = 31.0, n = 26$	0.231*
	Child-BAM	15.88	12.44	$U = 53.0, n = 26$	0.044
Higher score is a risk	CU traits	20.06	9.68	$U = 6.4, n = 25$	0.437**
	SDQ score	20.31	8.59	$U = 1.5, n = 24$	0.617***
	CAAC (intentional)	15.06	12.81	$U = 59.5, n = 26$	0.019
	CAAC (accidental/neglect)	15.94	12.42	$U = 52.5, n = 26$	0.048
	CAHB (intentional)	17.94	11.15	$U = 43.5, n = 26$	0.151*
	CAHB (accidental/neglect)	17.78	11.24	$U = 38.0, n = 26$	0.176*

Notes: Where the difference in mean rank is greater than 2, the higher value is bolded. BEI: Bryant's Empathy Index; CAAC: Children's Attitudes toward Animal Cruelty; CAHB: Children's Animal Harm Behaviors; Child-BAM: Child's Belief in Animal Minds; CU: Callous Unemotional; KEDS: Kids' Empathic Development Scale; SDQ: Strengths and Difficulties Questionnaire.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

patterns than control children at lower risk of animal harm. Because of the small sample size, the effect of attachment was investigated using the Fisher exact test (Kim, 2017). Table 1 shows that high-risk children's attachment patterns differed significantly from that of low-risk children ($p = 0.002$, Cramer's $V = 0.735$). High-risk children were more likely to have been classified as having a pathological insecure attachment pattern ($n = 7$, 78% of referred children) than low-risk children ($n = 1$, 7% of control sample; adjusted residual = 3.6). Rates of normal insecure were comparable between high-risk children ($n = 1$) and low-risk children ($n = 4$; adjusted residual = 0.9).

Table 2 presents the results for the scale variables: one side shows items where higher scores correspond to risk, the other shows those acting as protective factors. Referred children at high risk of animal harm had significantly lower scores than control children at lower risk of animal harm on cognitive empathy and on executive functioning, but not on measures of affective or behavioral empathy, BEI, emotion recognition, or Child-BAM scores. Although differences for these remaining measures were not significant, the mean rank for many of these measures was higher for low-risk children than high-risk children, suggesting the issue may be one of statistical power. High-risk children had significantly higher scores than low-risk children on CU traits, SDQ Difficulties, and both intentional and accidental self-report harm behaviors. Although scores on the CAAC were not significantly different between high-risk and low-risk children, the trend was again in the expected direction, with higher mean ranks for high-risk children.

Is There a Central Role for Attachment?

Given its central role in AniCare® Child, we wanted to examine in more detail how attachment impacted risk and protective factors. Although the limited sample size prevented us

Table 3. Mean ranks and results from Mann-Whitney *U* tests comparing securely and insecurely attached children across psychological risk and protective factors.

		Secure	Insecure	Test statistic	η^2
Higher score is protective	KEDS – A	15.55	9.27	$U = 29.5, n = 23$	0.212*
	KEDS – C	17.75	7.58	$U = 7.5, n = 23$	0.554***
	KEDS – B	15.70	9.15	$U = 28.0, n = 23$	0.229*
	Emotion recognition (human)	13.09	11.00	$U = 54.0, n = 23$	0.024
	Emotion recognition (animal)	12.82	11.25	$U = 57.0, n = 23$	0.013
	BEI	15.40	9.38	$U = 31.0, n = 23$	0.194*
	Welfare knowledge	15.73	9.77	$U = 68.5, n = 24$	0.178*
	Executive function	15.50	9.31	$U = 30.0, n = 23$	0.205*
	Child-BAM	11.23	12.71	$U = 57.5, n = 23$	0.012
Higher score is a risk	CU traits	7.27	15.73	$U = 14.0, n = 23$	0.426**
	SDQ score	6.80	14.82	$U = 13.0, n = 21$	0.422**
	CAAC (intentional)	10.82	13.08	$U = 53.0, n = 23$	0.029
	CAAC (accidental/neglect)	12.77	11.29	$U = 57.5, n = 23$	0.012
	CAHB (intentional)	11.00	12.77	$U = 47.0, n = 23$	0.063
	CAHB (accidental/neglect)	11.70	12.23	$U = 62.0, n = 23$	< 0.01

Notes: Where the difference in mean rank is greater than 2, the higher value is bolded. BEI: Bryant’s Empathy Index; CAAC: Children’s Attitudes toward Animal Cruelty; CAHB: Children’s Animal Harm Behaviors; Child-BAM: Child’s Belief in Animal Minds; CU: Callous Unemotional; KEDS: Kids’ Empathic Development Scale; SDQ: Strengths and Difficulties Questionnaire.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

from running regression models, we report nonparametric tests comparing securely and insecurely attached children in Table 3 (merging “normal insecure” and “pathological insecure”). CAPA classifications were dichotomized in this way to maximize statistical power. Securely attached children (regardless of whether they were in the high or low risk of animal harm group) scored higher on all empathy measures, as well as on welfare knowledge and executive functioning. Insecurely attached children scored significantly higher on CU traits and SDQ. No significant differences were found for emotion recognition, CAAC score, or self-reported harm behaviors. These patterns suggest that while attachment plays an important role, it likely does not account for all differences.

Finally, we were interested in exploring whether jumps in risk or protective factors occurred only for the “pathological insecure” group or whether differences with the secure children were already emerging for the “normal insecure” group. To do this, we calculated an average of the z-scores for KEDS, BEI, Welfare Knowledge, and Executive Functioning for the protective factors, and the z-scores for CU traits, SDQ score, total harm behaviors, and CAAC measures for the risk factors, and compared these averages across the three attachment groupings (secure, “normal insecure,” and “pathological insecure”). A Kruskal-Wallis test showed there was a significant difference in risk factor score between types of attachment ($H_{(2)} = 9.53, p = 0.009$, Epsilon squared = 0.423), with a mean rank of 8.91 for securely attached children, 10.40 for normal insecure, and 18.75 for pathological insecure. The opposite pattern was significant for protective factors ($H_{(2)} = 9.97, p = 0.007$, Epsilon squared = 0.431), with a mean rank of 17.41 for securely attached children, 8.40 for normal insecure, and 8.25 for pathological insecure. For risk factors, a post-hoc Dunn’s test showed a significant difference between pathological insecure and secure attachment ($p = 0.004$) and between pathological insecure and normal insecure ($p = 0.037$; although this result was no longer significant when applying the Holm-Sidak correction for multiple tests), but no difference between normal insecure and

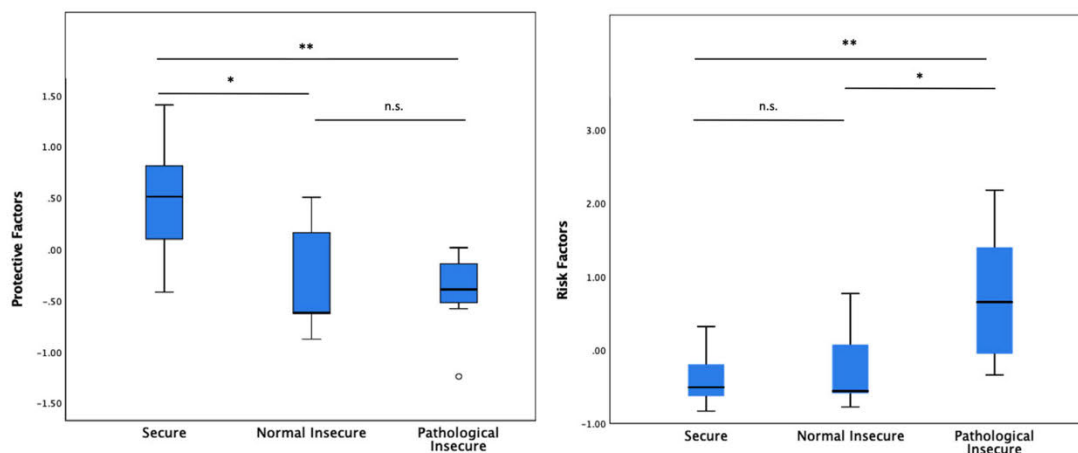


Figure 3. Boxplots showing patterns in children’s risk and protective factors across secure, normal insecure, and pathological insecure attachment classifications. Significance levels are for post-hoc Dunn tests. * $p < 0.05$, ** $p < 0.01$.

secure attachment. For protective factors, a post-hoc Dunn’s test showed there were significant differences between pathological insecure and secure attachment ($p = 0.008$) and between normal insecure and secure attachment ($p = 0.018$) but not between pathological insecure and normal insecure. This suggests that while the biggest jump in risk factors occurs between “normal insecure” and “pathological insecure” attachment style, the biggest loss in protective factors occurs between secure and “normal insecure” attachment styles. Figure 3 summarizes this pattern, while Supplemental Figure 2 shows boxplots across the three attachment categories for individual variables.

Discussion

Using a sample of children with both high risk and low risk for childhood animal harm, we investigated the significance of the psychological factors proposed in AniCare® Child for the treatment of childhood animal abuse. We found a consistent effect for attachment and variables relating to self-regulation (EF, SDQ), mixed effects for variables relating to empathy (KEDS, BEI, and CU traits), and no difference for emotion recognition, welfare knowledge, or attitudes toward cruelty. Attachment security correlated with lower scores across a range of psychological factors, lending support to its importance as a core psychological factor in animal harm. We discuss the implications of these results for each variable in turn, followed by a discussion of the implications for the treatment of childhood animal harm and a consideration of limitations and future directions.

Psychological Factors Involved in Childhood Animal Harm

The Role of Attachment

Children referred to the AG program as “high risk” were much more likely to be classified as pathological insecure than low risk control children. This is the first study to use a standardized observational measure of attachment to confirm the importance of attachment

style in children's risk of animal harm, with previous research being carried out with adolescents using self-report (Thompson & Gullone, 2008). We also found that securely and insecurely attached children had significantly different scores across all the measures of empathy, self-management, and welfare knowledge, but found no difference for emotion recognition, attitudes to animal cruelty, or self-reported animal harm behaviors. This is consistent with the role of attachment as a basal risk factor impacting both empathy and self-management and is in line with existing research (Boldt et al., 2020; Stern & Cassidy, 2018). Overall, secure attachment created a significant increase in scores on protective factors, while pathological insecure attachment created a significant increase in psychological risk factors. More research is needed to understand how a child's attachment style impacts their interactions with pets, including whether close relationships with pets can be protective in some cases of insecure attachment (Carr & Rockett, 2017), the extent to which children transfer attachment scripts between human and animal interactions, and whether animals can be helpful therapeutic aids in cases where insecure attachment prevents a child from forming a trusting relationship with a therapist (Parish-Plass, 2018).

Empathy and Emotion Recognition

Results on the role of empathy were mixed. There was no difference between high-risk referred children and low-risk control children on the self-report empathy measure. There was a difference only on the cognitive empathy dimension of the KEDS scale and there was a very strong difference between high-risk and low-risk children on CU traits. The lack of significant difference for the self-report measure may in part be explained by social desirability bias (Camerini & Schulz, 2018). The effects of CU traits are strongly aligned with existing literature (Dadds et al., 2006), although our results should still be interpreted with caution because teachers were not "blind" to the child's condition. The lack of significant difference on the "affective empathy" dimension of the KEDS mirrors the lack of significant difference on the emotion recognition task. However, referred children performed significantly worse than control children on the "cognitive empathy" dimension, which requires complex perspective taking. These results are broadly in line with existing research, which shows a mixed role for empathy in cases of animal harm: several studies show that empathy can play a role (Akdemir & Gölge, 2020; Plant et al., 2019), while other research shows a small or no effect (de Weid, et al., 2021; Hartman et al., 2019).

Self-Regulation

We used a DCCS task as a measure of executive function and the SDQ as a measure of general difficulties linked to emotional-behavioral dysregulation (Deutz et al., 2018). Both scores were strongly linked to risk of harm: the EF score was significantly lower in children referred to the AG program, while the SDQ score was significantly higher, supporting the importance of self-regulation in cases of animal harm. Although research has already linked childhood animal harm to externalizing difficulties such as ADHD and CD (Hawkins et al., 2017; Wauthier & Williams, 2022), this is the first study to quantitatively confirm the link between EF, emotional-behavioral dysregulation, and animal harm. However, because our sampling procedure relied on adult referral, it might

over-represent reactive cases of animal harm resulting from low self-regulation, compared with proactive cases where the animal is harmed in secret. In fact, while children with reactive aggression have lower inhibitory control, children with proactive aggression are not distinguishable from control children on measures of EF (Thomson & Centifanti, 2018). Given that these forms of aggression correlate with different disorders, such as CD and ADHD with reactive aggression, and psychopathy with proactive aggression (Kempes et al., 2005), it may be important to distinguish these psychological profiles.

Attitudes, Beliefs, and Knowledge

We used measures of attitudes to cruelty (CAAC), beliefs about animal minds (Child-BAM), and welfare knowledge as proxies for the effects of family and culture on a child's views of animals. Although there was not a significant difference between low- and high-risk children's scores, means varied in the expected direction. This may suggest the present study was under-powered to detect statistical differences. Existing research found effects for attitudes and beliefs on risk for harm using self-report questionnaires with much larger samples (e.g., Hawkins et al., 2017; $n = 1,217$) and comparing children from different countries (Plant et al., 2019). Children's attitudes and knowledge did differ significantly based on attachment style, reinforcing the idea put forward in AniCare® Child that attachment and social environment might interact.

Implications for Clinical Practice

This study reiterates that childhood animal harm can be indicative of a range of developmental difficulties and provides the first exploratory evaluation of the theoretical basis of AniCare® Child. Our results lend support to the importance of its basic components, and attachment was supported both as a direct risk factor and as a predictor for empathy and self-regulation. Self-regulation was also strongly supported, perhaps suggesting that our sample of high-risk children struggled with behavioral inhibition and had higher rates of emotional-behavioral dysregulation. The role of empathy was partially supported, suggesting that the type of empathy and measurement modality may be important confounding factors. Although scores on attitudes, beliefs, and knowledge were not significantly different, they were in the predicted directions. However, unlike AniCare® Child, our results do not necessarily suggest that empathy is "basal" to self-regulation. We suggest that childhood animal harm may arise due to lower empathy, lower self-regulation, or a combination of both factors, underpinned partially or entirely by attachment style. In fact, this supports the *treatment* approach proposed in AniCare® Child, which identifies empathy and self-management as dual targets for treatment, suggesting that practitioners identify where clients lie on a 2×2 matrix of low–high empathy and low–high self-management to determine the most useful therapeutic exercises (Shapiro et al., 2013, p. 34).

Given the significant role we found for attachment in cases of even moderate childhood animal harm, this seems like an important therapeutic target. Addressing childhood attachment difficulties can require specialist approaches, such as play therapy (Dousti et al., 2018) or parenting interventions (Wright & Edginton, 2016). We recommend that practitioners who work with children at high risk of animal harm screen for potential

attachment issues and that where attachments issues are known, precautions are taken to avoid situations where animals might be harmed. This may be especially important in foster care situations, where attachment disturbances are likely: although pets can help children adjust to their placements (Carr & Rockett, 2017), animal harm can also be a serious concern (see e.g., Ascione, 2005, p. 73). Although the current study was likely under-powered to find a role for attitudes, beliefs, or knowledge, these are still important psychoeducational targets: higher animal welfare knowledge might protect against harmful behaviors in cases of low self-regulation, and discussing animal sentience may increase empathy toward animals (Hawkins et al., 2017). In fact, integrated approaches may be most effective since addressing one issue could indirectly improve other constructs.

Limitations and Future Directions

Although small samples are common in in-depth research with specialist or difficult-to-reach populations, this design comes with limitations. The small sample means that many tests were likely under-powered, so a lack of significance does not necessarily indicate a lack of effect. Furthermore, small samples are known to inflate effect sizes (La Caze & Duffull, 2011), so the effect sizes reported here should be viewed as exploratory. We were not able to correct for the confounding effects of sex or pet ownership: future studies should strive to match children on these two variables. Another issue for generalizability is the homogenous sample, with predominantly white children drawn from primary schools in central Scotland. This cultural uniformity may further explain the weak effects of beliefs, attitudes, and knowledge, which may be stronger when comparing children from different areas or cultural backgrounds (Plant et al., 2019).

Although one of the strengths of this research was the wide range of measurement techniques, allowing triangulation of results, there are certain limitations to highlight with self-report. Self-report can introduce a range of biases, including social desirability bias (Camerini & Schulz, 2018), and individuals tend not to estimate their abilities very accurately (Murphy & Lilienfeld, 2019). These biases may have especially impacted scores on BEI and on the CAHB. Since larger samples are often only achievable using self-report, this will be one of the main difficulties for future research and will also make it difficult to collect data with young children.

This research requires replication studies with larger, more heterogenous, samples. Where large samples are difficult to achieve, rigorous matching may also address certain confounds. Future research may also wish to explore whether there are different profiles (such as low self-regulation and/or low empathy) and whether these have differentiating risk factors and treatment outcomes. This study provides a foundation for a full evaluation of AniCare® Child by demonstrating that its premises are sound and that effects are detectable across many of the dimensions. Going forward, it will be important to develop evaluations for a range of interventions targeting childhood animal harm, from education to therapeutic approaches. This will help deliver effective and targeted treatment earlier and in cases where practitioners may not have otherwise considered treatment options.

Conclusions

This research shows that childhood animal harm is an outcome of a complex interaction of psychological factors, including attachment, empathy, self-regulation, and learned attitudes, beliefs, and knowledge, providing support for the conceptual framework provided in AniCare® Child. Further research is required to validate these findings across a wider sample and to test the efficacy of interventions. Special focus should be given to the roles of attachment, whether childhood animal harm can be categorized along “low empathy” and/or “low self-regulation” pathways, and how this might impact outcomes. Targeted early interventions for childhood animal harm for highly vulnerable children may also provide opportunities to assess and treat broader psychological issues for this highly vulnerable and difficult-to-reach group.

Note

1. We had planned to match based on sex: we asked class teachers to hand out parental consent forms to up to four children of the same sex as the referred child. However, we often received parental consent for children of mixed sexes. Re-collecting parental consent would have significantly delayed the start of the intervention, so we decided to interview any children for whom we had received parental consent by the first interview day.

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Disclosure Statement

No potential conflict of interest was reported by the authors.

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Note: Please see the reference section at the end of this thesis for the references cited in this publication.

4.8 Further Discussion and Chapter Summary

There are a few limitations to highlight which were outside the scope of the publication to fully discuss. Firstly, the mixed results on the role of empathy as a predictor of animal cruelty may suggest there were some measurement artefacts across measures rather than a genuine lack of relationship. Although there are mixed results across the literature, generally the majority of studies do tend to find that lower empathy tends to relate to animal cruelty (Hawkins et al., 2017). Relatedly, there may have been issues with the way animal emotion-recognition was measured. Using still images with stereotyped behavioural markers has less ethological validity than using videos of animals expressing those emotions in real-life settings. Furthermore, the timed component means that the scores may conflate accuracy and rapidity. While timings are often used in emotion recognition tasks, this usually takes a different form: participants are presented the image for a short amount of time (typically 200 ms) rather than timing the response (see e.g. Kessels et al., 2014). Using response times may therefore introduce confounds around children's ability to concentrate on the task and reaction times. In fact, existing research confirms that accuracy and sensitivity, though correlated, are different constructs (Lyusin & Ovsyannikova 2016).

Another limitation for this study is that there was not scope to explore the effects of social economic status (SES) on animal harm risk. This would be important to investigate because animal harm *and* many of its risk factors are associated with lower SES (Shih et al., 2019; Reese et al., 2020). Although this may be somewhat mitigated by the fact that control children in this study were from the same school (and therefore catchment area) as referred children, it is possible that unintentional selection biases may have resulted in control children being of a higher SES than referred children. For example, if teachers selected control children whose parents they knew would return consent forms in a timely fashion, or children who were well behaved (externalising behaviours correlate with SES; Lansford et al., 2019). Future research should therefore explore whether we can tease apart the independent effects of SES on animal harm, and to reflect on how this should guide intervention approaches.

Overall, results in this chapter confirmed findings from the qualitative study in Chapter 3 and supported the role of the risk factors proposed by Shapiro et al. (2013) in their

theoretical model. In fact, associations between risk factors and protective factors may be more complex than initially conceptualised. For example, not only did attachment security play a central role across a range of processes like self-regulation and empathy, but pathological attachment strategies were particularly strongly associated with high scores on risk factors and low scores on protective factors. The strong effects around attachment encouraged me to explore whether it would be possible to uncover some of the mechanisms involved, which led to the in-depth exploratory study presented in Chapter 5. Unfortunately, it was not possible to replicate these results because time constraints and COVID restrictions prevented me from using these interview techniques and task-based measures again. Despite this, research in Chapter 6 goes on to demonstrate that some of these risk factors can be successfully shifted through intervention.

Chapter 5:

The Role of Attachment in Children's Relationships with Pets

Studying the Spectrum from Pet Care to Animal Harm

This chapter is published Open Access in Human Animal Interactions:

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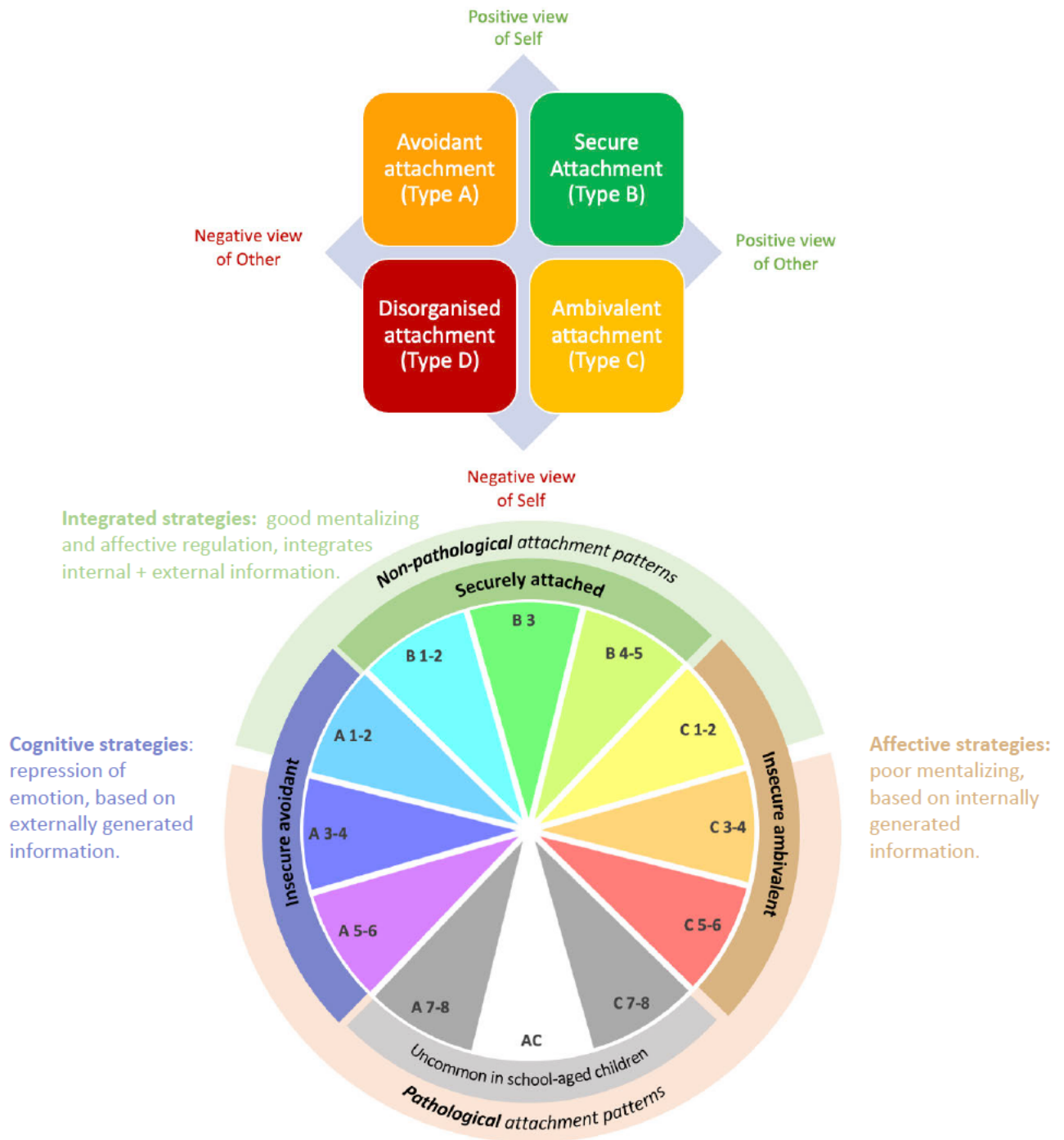
5.1 Overview and Rationale

Chapter 4 provided an in-depth, quantitative look at risk factors for childhood animal cruelty, confirming their theorised relevance as target in interventions. Although there were significant differences between referred children and classmate controls on a range of dimensions, attachment security stood out as a particularly important factor, being both a direct predictor and associated with a range of other risk and protective factors.

Furthermore, during the coding process in which I reviewed children's story stems to classify their attachment, I noticed different ways of relating to pets and using parental figures to scaffold interactions and resolve conflicts. Combined with the results from Chapter 3, this suggested that children's pet story-stems might provide a wealth of information on how children conceptualised animals within their broader attachment frameworks. Additionally, I was curious to explore whether difficulties associated with insecure attachment would transfer to children's internal representation of pets, especially given poorly evidenced theories stating that animal attachment representations are separate from human attachment representations (Julius et al., 2013). This led to the study in Chapter 5, which used these children's pet stories as the foundation for an exploration of how their relationships with pets links to their attachment strategy and the risk of animal harm they present.

It is useful to consider in more depth than was possible in the publication how attachment was measured and the implications of this for the interpretation of results. As in Chapter 4, attachment was measured using the Child Attachment Play Assessment (CAPA; Farnfield, 2015), which is a narrative story-stem procedure which classifies attachment using Dynamic Maturational Model (DMM; Crittenden, 2006). In contrast to the ABCD model (Main and Solomon, 1990) where Type D (disorganized) behaviours are viewed as a disruption or loss of strategy, the DMM interprets these patterns as more "extreme" strategies that develop under conditions of non-normative danger, producing the DMM classification of A+ (A3-A8; non-normative avoidant) and C+ (C3-C8; non-normative ambivalent). The choice of theoretical model, measurement technique, and coding/interpretation has theoretical and practical implications. The differences between the models are summarized in Figure 5.1.

Figure 5.1: The ABCD and Dynamic Maturational models of attachment



Note. The top model shows the four main categories described in Main and Solomon’s (1990) ABCD model. The bottom model shows the categories described for childhood in Crittenden’s (2006) Dynamic Maturational Model. Although the latter was the approach informing the attachment classifications carried out in this thesis, analyses did not use all the categories shown here, and children were either compared using secure/normal insecure/pathological insecure classification or secure/ambivalent/avoidant classifications.

The CAPA was chosen because it met our criteria for age-range (it has been validated for ages 3-11) and because it gives a particularly in-depth view of mentalizing ability (based on the work of Fonagy et al., 2004), the way play is altered by loss and trauma (based on Emde, Wolf, & Oppenheim, 2003; Winnicott 1971), the importance of affect/arousal regulation in attachment (Farnfield & Onions, 2021). Furthermore, the DMM, which bridges the gap between attachment and cognitive functioning, has been described by Peter Fonagy as “the most clinically sophisticated model that attachment theory has to offer at the present time” (Crittenden, 2017). Because the CAPA is flexible and very rich in its approach to coding (unlike other attachment classification systems, such as SSAB), it was possible to adapt the coding constructs that are usually relevant in human relationships (especially mentalizing, and dynamics of comfort and caregiving), and apply these same constructs to children’s relationships with pets. However, the richness and nuance of the CAPA and DMM, are seen by some as potential weaknesses. For example, some researchers criticize the DMM for having too many attachment classifications (van Ijzendoorn et al., 2018), while others have argued that the theory occasionally exceeds the available data and becomes speculative (see Landa & Duschinsky, 2013 for a discussion). As a result, careful judgement should be employed when interpreting the findings of this study, since different classification systems, especially those based on different theoretical models, may have yielded different results.

Appendix C has the Supplementary Materials associated with the publication. Copies of ethical permissions, local authority consent forms (required due to separate recruitment of control children through schools), and the interview schedule can be found in Appendix B.

RESEARCH

The role of attachment in children’s relationships with pets: From pet care to animal harm

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Abstract

Relatively little is known about how attachment influences children’s relationships to pets or mediates positive and negative interaction outcomes. We carried out in-depth interviews with 27 children, including nine children at high-risk for animal harm and 18 matched controls. We used the Child Attachment Play Assessment (CAPA), a drawing task and self-report measures including the Short Attachment to Pets Scale (SAPS) and Children’s Animal Harm Behaviours (CAHB). We also designed a novel measure, the ‘Pets In Children’s Attachment Stories’ (PICAS), to probe children’s mentalising about pets, caregiving-behaviours, comfort from pet and parental help. Children at high risk of animal harm were more likely to be classified as insecure ($p = 0.002$). Drawings indicated secure children tended to feel closer to mothers ($p = 0.014$) and siblings ($p = 0.007$), while pets’ proximity did not vary according to attachment strategy. Although insecure children scored lower on mentalising ($p = 0.013$), caregiving behaviour ($p = 0.028$) and parental help ($p = 0.002$), both groups similarly used pets as sources of comfort. There were no differences between attachment patterns on SAPS but there were differences for CAHB scores ($p = 0.048$). Thus, although insecure attachment was an important risk factor for harming animals, secure and insecure children had similar capacity for bonding with their pets. These results have implications both for how we treat cases of childhood animal harm and for how we understand the supportive role pets can play in children’s lives.

Keywords: attachment to pets, childhood animal harm, CAPA, mentalizing, caregiving

Introduction

Pets are part of the landscape of children’s development (Melson, 2001) and between 60–80% of children in the UK live with pets (Purewal et al., 2019; Marsa-Sambola et al., 2016a,b). Research suggests numerous psychological benefits are associated with pet bonding in childhood, including improved socio-emotional development (Poresky and Hendrix, 1990), improved self-esteem (Purewal et al., 2017), reduced anxiety (Gadomski et al., 2015) and buffering effects in cases of interparental conflict (Hawkins et al., 2019). In parallel, there is a growing awareness that childhood animal harm (CAH) can act as a red flag for a range of psychological issues, including conduct problems (Walters and Noon, 2015), low empathy (Hartman et al., 2019) and exposure to family violence (Degue and DiLillo, 2009). Both the benefits of child–animal interaction and risk of childhood animal harm have been linked to attachment mechanisms, yet few studies have directly investigated the role of attachment in contributing to positive or negative outcomes in child–pet interactions.

CHILDREN’S RELATIONSHIPS WITH PETS

The extent to which attachment theory explains the nature of children’s relationships with pets is still an open question. As Barlow et al. note: ‘the term ‘attachment’ is often applied loosely [...] It is un-clear whether traditional attachment theory relates directly to human-animal interaction or whether these interactions diverge from the theory in important ways’ (Barlow et al., 2012, p. 112). Julius et al. (2013) argue that relationships with pets can qualify as an attachment when they meet the following four criteria (Ainsworth, 1991): (1) they act as a *secure base* for exploration, (2) they are a *haven of safety* in times of stress, (3) they are associated with *maintenance of proximity* and (4) separation is associated with *separation distress*. Julius et al. suggest that attachment to pets operates through the same physiological pathways as human attachment relationships, including reduction in cortisol during interactions (Polheber and Matchock, 2014) and increase in oxytocin during mutual gazing (Nagasawa et al., 2015). Although this is a promising start, the focus in Julius et al.’s study

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is on adulthood and there is no discussion of the specific features of attachment to pets in childhood.

Wanser et al. (2019) provide the only review focused on childhood attachment to pets. They note the literature has a range of issues: definitions tend to be vague, research extrapolates back from studies with adults and there is a lack of appropriate methodologies. Despite this, three themes emerge: (1) children can feel very close to their pets (Jalongo, 2018), a bond which might decrease with age (Muldoon et al., 2019), (2) childhood attachment to pets may be stronger when there are fewer opportunities for human attachment relationships (Westgarth et al., 2013) and/or in cases of abuse and neglect (Yamazaki, 2010) and (3) childhood relationships with pets provide unique opportunities for children to practise caregiving behaviours (Hall et al., 2016). Contact with animals in therapy may also help scaffold positive interactions and shift insecure attachment patterns (Parish-Plass, 2008).¹

Although pets cannot act as primary caregivers or protect children from danger, they may still act as *secondary attachment* figures. A relevant point of comparison may be sibling relationships, which can feature caregiving behaviours, may 'complement parent–child bonds, but may also compensate for parental inadequacies in cases of stress or deprivation' (Whiteman et al., 2011; p. 127). However, there are also important differences. Research suggests some children may have closer relationships with their pets than siblings, with lower levels of conflict and higher levels of disclosure to pets (Cassels et al., 2017). In fact, since internal working models (IWMs) of insecure attachment to parents are transmitted to relationships with siblings, this results in higher rates of conflict (Volling, 2001). In contrast, Julius et al. (2013) argue that 'insecure attachment and caregiving representations are rarely transmitted to companion animals' (p. 147). Despite the theoretical and practical implications, research on this topic is scarce.

PETS: EARLY OPPORTUNITIES FOR CAREGIVING?

The caregiving behaviour system, which fully matures in adulthood, is complementary to the attachment behavioural system and accesses associated representations of self and other (Solomon and George, 1996). Caregiving is one of the main mechanisms mediating the intergenerational transmission of attachment (Kretchmar and Jacobvitz, 2002), and mothers with insecure attachment will provide less competent caregiving than their secure counterparts (Lyons-Ruth and Block, 1996). Even though children can display caregiving behaviours, these are considered to be in an immature form because they are fragmented and incomplete, and children are easily distracted (George and Solomon, 1999). Unfortunately, very little is known about how caregiving develops. Only a handful of studies investigate caregiving behaviour by pre-school children towards younger siblings (see e.g. Garner et al., 1994), and little to no research is available on caregiving behaviour in middle childhood (George and Solomon, 1999), even though sociological research shows that children take care of younger siblings regularly (Morrow, 2008).

Just as relationships with siblings, relationships with pets can provide unique opportunities for children to practise caregiving behaviours (Melson, 2001). Muldoon et al. (2015) carried out focus group interviews with Scottish children 7–13 years old and found that there was a huge range of experience in caregiving for pets, from having full responsibility to only playing, in which case there was a sense that parental restrictions prevented children from assuming full responsibility for their pets. Hall et al. (2016) found that if a child cared for their pet dog, the dog was more responsive and likely to succeed at a pointing task, which in turn was predictive of the child's self-reported attachment to the dog. In fact, humane education programmes (which teach compassion and respect for all living things) have argued that improving children's behaviours

towards animals is an opportunity to teach interpersonal skills and caregiving behaviours (Jalongo, 2014) and prevent violence (Faver, 2010). However, big gaps remain in our understanding of how to promote animal welfare and reduce animal harm, and the roles of attachment and caregiving in child–animal interaction.

CHILDHOOD ANIMAL HARM: THE OTHER SIDE OF THE SPECTRUM?

Most research on childhood animal cruelty has focused on its ability to predict violent behaviour (Gullone, 2012), its association with exposure to violence (Currie, 2006) and 'The Link' between animal abuse and broader cycles of abuse in families (Ascione and Arkow, 1999). There has been very little direct research on the role of attachment in these processes (see Wauthier and Williams, 2022 for a systematic review), despite attachment theory forming the basis of the AniCare Child Approach, the only published manual for the treatment of animal abuse in childhood (Shapiro et al., 2013). Insecure attachment is theorised to be both a direct and an indirect risk factor for animal abuse, self-regulation (Kerns et al., 2007) and empathy (Murphy and Laible, 2013). The only study directly investigating this link found that more securely attached adolescents had more prosocial behaviours and reduced animal harm behaviours, a correlation partially mediated by empathy (Thompson and Gullone, 2008). More indirectly, research has shown that people coming from 'not loving' homes were more likely to have harmed animals as children (Fielding et al., 2011), while lower attachment to pets is predictive of more acceptance of animal cruelty (Hawkins et al., 2020). Finally, although maltreated children were more likely to use animals as sources of support, they were also more likely to commit animal abuse (Yamazaki, 2010).

There are at least three reasons there has not been more direct research on the role of attachment in cases of childhood animal harm. Firstly, varying terms (including harm, abuse and cruelty) and definition have been proposed, making synthesis of findings difficult. For this study, we adopt the following broad definition of childhood animal harm: 'Any act, of commission or omission, where a child negatively impacts an animal's welfare, intentionally or unintentionally' (Wauthier and Williams, 2022). Secondly, the role of attachment in childhood animal harm is complex and likely mediated by a range of difficult-to-control environmental factors, including economic stress (Reese et al., 2020), exposure to violence, witnessing animal harm or trauma (Currie, 2006; Wauthier et al., 2022b). Finally, a lack of measures on child–animal attachment has made it difficult to investigate this topic in-depth.

ASSESSING ATTACHMENT TO PETS AND PEOPLE

Assessments of attachment provide valuable information on a person's strategies for interaction with others, capacity for self-regulation and associated IWMs. Most measures of childhood attachment are designed to provide a categorization of attachment strategy, usually: secure (type B), insecure avoidant (type A) and insecure ambivalent (type C), with variations in how pathological attachment strategies are classified, either adding the 'Disorganized' category developed by Main and Solomon (1986) or the A+/C+ categories in the Dynamic Maturational Model (DMM) developed by Crittenden (2006). In contrast, measuring the quality of specific relationships is usually done using self-report questionnaires; these typically provide a continuous score rather than a categorization (e.g. the Security Scale, Brumariu et al., 2018), but self-report and representational measures of attachment often have diverging results (Jewell et al., 2019), and there are no measures for use with young children. Developing measures of childhood attachment to pets and relating this to an overall attachment strategy are therefore complex. Existing measures mostly use brief child self-report with items investigating attachment constructs such as maintenance of proximity, separation distress and feelings of closeness. Recent examples include the Short Attachment to Pets Scale (Marsa-Sambola et al., 2016a,b) and the CENSHARE Pet Attachment Survey (Holcomb et al., 1985). Other less-targeted

¹ We note that this research relies on mammals (primarily dogs, cats and horses), and that very little research exists on relationships with other species (e.g. birds, reptiles, fish).

methods include measuring closeness to pets in drawings (Kidd and Kidd, 1995) and behaviourally oriented measures such as the Children's Treatment of Animal Questionnaire (CTAQ; Thompson and Gullone, 2003). Very little is known about whether there are different styles in child-pet relationship (e.g. secure/avoidant/ambivalent) and how this might affect the patterns of behaviour.

AIMS AND RESEARCH QUESTIONS

Using a sample of children who were identified as 'high-risk' of harm and classmate controls, this study sought to explore the role of attachment across the spectrum of children's relationships with pets. This broad objective was split into three more specific aims: (1) investigating how children's attachment impacts their relationships to pets, (2) linking attachment to caregiving and animal harm behaviour and (3) testing innovative ways of measuring children's relationships to pets. Our methods included a drawing task, a story-stem assessment of attachment with additional pet stems and self-report measures investigating attachment to pets, acceptance of cruelty and animal harm behaviours. Aligning the aims of the research to these specific methods, we sought to answer to the following research questions:

1. How does attachment strategy relate to children's drawings of their families and pets?
2. How does attachment strategy impact children's story stems about pets?
3. How does attachment strategy relate to self-report of relationships with pets?
4. How well do these measurement methods correlate with one-another?

Methods

ETHICAL APPROVAL

This study was approved by the Department of Clinical and Health Psychology Ethics Research Committee at the University of Edinburgh [reference number: CLIN629] and Local Authority consent was obtained prior to establishing contact with schools where children were interviewed.

PARTICIPANTS

There were two groups of participants for this study: 'high-risk' children had been referred to Animal Guardians (AG), a humane education programme run by the Scottish SPCA for children who have harmed animals or where a referring adult is concerned about the child's behaviour around animals. 'Low risk' children were recruited as matched controls from the referred child's school class. Recruitment of 'high risk' children was done alongside the referral process for AG, which was aimed at primary school-aged children (4–12 years old) in central Scotland. Referrals received between August 2019 to March 2020 were included in the current research. Sources of referrals included: teachers, parents, social work and Scottish SPCA animal cruelty incidents. Referrals were always processed through the child's school, which was where research interviews and the AG intervention were carried out. Parental consent for research was separate, and parents could refuse for their child to participate in research without affecting their child's eligibility for the AG programme. Once a referral was made, the child's class teacher was contacted and asked to hand out parental consent forms for up to four children who would act as matched controls. All children provided informed consent on the first day of interviews and were free to withdraw at any time.

Twenty-seven children were interviewed, each one over three sessions: nine children referred to the AG (three girls and six boys, mean age 8.8 years) and 18 matched-control children (ten girls and eight boys, mean age 8.6 years). Of the nine referred children, two were 'at-risk' of animal harm behaviour (e.g. prone to lashing out, family history of animal harm), five were referred to for 'minor harm/rough handling' of animals and two were referred

for 'moderate harm' (animal had been hurt but had not needed veterinary treatment). Most children came from families that owned pets ($n = 19$): dogs ($n = 9$), cats ($n = 8$), small mammals ($n = 5$) and fish or reptiles ($n = 3$).

MEASURES

Data were collected as part of a wider research project investigating psychological risk factors for animal harm, and a detailed account of the other constructs assessed, such as empathy, executive functioning and teacher-reported behaviours, can be found in Wauthier et al. (2022a). We used three approaches to assess different aspects of children's attachment and relationships (story stem, drawing and self-report) in order to triangulate results, since convergent validity between different types of attachment measure is often low (see Jewell et al., 2019). This was complemented with three additional self-report measures on belief in animal sentience, attitudes towards animal cruelty and animal harm behaviours.

The Child Attachment Play Assessment

The Child Attachment Play Assessment (CAPA; Farnfield, 2016) is a narrative story-stem procedure designed to assess attachment strategy in 3–11-year-old children and has good convergent validity with other measures using the Dynamic Maturational Model (DMM) of attachment. Story stems are drawn from the MacArthur Story Stem Battery (MSSB; Bretherton and Oppenheim, 2003) and the Story Stem Assessment Profile (SSAP; Hodges et al., 2003). The CAPA uses the DMM (Crittenden, 2006) to classify children's attachment strategies. The DMM provides a different classification of a child's attachment strategy than the ABCD model (Main and Solomon, 1986); rather than interpreting the Type D (disorganized) behaviours as a disruption of strategy, the DMM interprets these behavioural patterns as strategies that develop under conditions of non-normative danger, producing the DMM classification of A+ (non-normative avoidant) and C+ (non-normative ambivalent). For this research, children's attachment strategies were categorized using either a binary split comparing secure (type B) to insecure secure patterns (all type As and type Cs), or a three-way split, either comparing secure classifications (type B), with insecure 'normal' (A1/2 and C1/2) and insecure 'pathological' classifications (A+ and C+), or comparing secure classifications (type B) with anxious avoidant (all type A) and anxious ambivalent (all type C) classifications.

The CAPA uses the established narrative story stem procedure whereby the interviewer gives the child the beginning of a story ending at a point of conflict and asks the child to 'tell me and show me what happens next'. The stories are told with a set of simple props, including doll and animal figures, a doll house and some furniture. The procedure is videotaped so that it can be coded. For this study, children were given six 'human stories', which were taken from the standard story stem procedures, followed by three 'pet stories'. Videos were double coded by certified reliable CAPA coders. All videos were coded by the first author and blind coded by a second reliable coder who was not aware of the child's condition or background. Any disagreements in coding were conferenced until a consensus classification was reached.

Pets In Children's Attachment Stories (PICAS)

Three children's pet stories were designed for this study using themes from Wauthier et al. (2022b) drawing on common sources of conflict in children's relationships with pets. The pet stories explore increasingly challenging points of conflict with the pet: a pet refusing to fulfil a desire for comfort, a pet breaking a child's toy and a pet biting/scratching a child (see Table 1). The pet stories were analysed in two ways. First, they were reviewed to obtain an attachment classification using the same procedure as the 'human stories'; this was done to test if the child's overall attachment strategy remained the same when the focus was interaction with animals. Second, a new measure was developed, the Pets In Children's Attachment Stories (PICAS) to investigate different aspects of children's internal representations of their relationships with pets.

Table 1. Description of the pet story prompts.

1	Comfort from pet	'X is coming home from school and some of the children at school weren't very nice to him/her. When X comes home s/he wants a cuddle from [pet name]. But [pet name] has spent all day playing and wants to go to sleep, and doesn't want cuddles right now. Tell me and show me what happens next'.
2	Broken toy	'X has a favorite toy (option to prompt child what their favorite toy is). Pretend this is the toy, and X and [pet name] start playing with the toy. At first, they start playing fetch (show playing) but then they start playing tug-of-war, and then uh-oh! The toy rips, and X says "Hey you ripped my favorite toy!" Tell me and show me what happens next'.
3	Pet bite/scratch	'X goes to see [pet name], and they start playing. But then something happens, maybe you can tell me what, and [pet name] bites/scratches X, and X says "Ow! That really hurt, you bit/scratched me!". Tell me and show me what happens next'.

The PICAS went through an iterative design process, which aimed to capture three underlying constructs: mentalizing about pets, reciprocal relationship between child and pet and parental help in resolving conflict. A 9-item pilot version of the PICAS, scored on a four-point scale (0–3), was trialled by all authors and two reliable CAPA coders using a random selection of four children, to establish if items and scoring system were clear, matched theoretical dimensions, and likely to produce reliable results. Based on feedback, the scale was streamlined to increase clarity and reliability, by decreasing the number of items and scoring options. In the final version, 'mentalizing' was measured using two items scoring how well children discussed pets' thoughts and emotions, 'reciprocal relationship' was measured using two items, scoring caregiving towards pets and instances where the pet comforted the child, and 'parental help' was measured using a single item scoring whether parents helped resolve conflicts with pets in the stories. For each dimension, a child's story could receive a score of 0 (not evidenced), 1 (some evidence) or 2 (well evidenced); Table 2 shows the coding scheme.

Intra-rater and inter-rater reliability were calculated using weighted Kappa (see Gisev et al., 2013). For the calculation of intra-rater reliability, the whole data set was coded twice by the first author, six months apart, and with the second coding blind to the first; this yielded an average weighted Kappa of 0.78, which corresponds to substantial agreement (McHugh, 2012). For the calculation of the inter-rater reliability, the whole sample was coded blind by the second author, after an initial training coding using a random subset of children. This was then compared to the second round of coding carried out by the first author and yielded an average-weighted Kappa of 0.66. Supplementary Table 1 gives more detail on the reliability scores for each item on the PICAS scale.

Hierarchical Mapping Drawing Task

Children's closeness to family, friends and pets was assessed using a drawing task with concentric circles, where children were asked to draw themselves in the middle and 'anyone important like family, friends, or pets' around them. This 'bull's eye' hierarchical mapping task is similar to a task used with children in Wauthier et al. (2022b). Julal et al. (2017) used this procedure with adults to map attachment and found that insecure relationships were more likely to be placed further away from the core self or excluded from the image altogether. Children were able to draw up to eight people/animals in their pictures (there was no minimum). For analysis, the distance between the centre of the child and the centre of each figure was measured in centimetres. Children's relationships were divided into categories and where more than one character appeared in any category, the distances were averaged. The categories were: mother, father, pet(s), sibling(s) and other. Children's relationship 'score' for each category was calculated using the reciprocal of the distance (i.e. $1/[\text{distance measured in cm}]$) so that low scores corresponded to a larger distance to the self and were continuous with no figure being drawn, which received a score of zero.

Short Attachment to Pets Scale

The SAPS is a brief nine item self-report measure of attachment to pets designed for use with children (Marsa-Sambola et al., 2016a, b). It uses a five-point Likert scale for each item, from 'Strongly Agree' to 'Strongly Disagree' and has one item which needs to be reverse-coded. An overall average across the nine items was taken for each child, so that a higher score corresponded to higher attachment to pets. The scale has excellent internal reliability with a sample children aged 7–12 ($\alpha = 0.85$; Hawkins and Williams, 2017). The items relate to three of the four criteria an attachment figure must fulfil (Ainsworth, 1991; Trinke and Bartholomew, 1997): *haven of safety* (e.g. 'My pet knows I am upset and tries to comfort me'), *maintenance of proximity* (e.g. 'I spend time every day playing with my pet'), *separation distress* (e.g. 'There are times I would feel lonely without my pet'). For this study, each item also had the text 'or would if I had one', so that children who did not have pets could also answer the questions.

Childhood Belief in Animal Minds

The children's view on animal sentience was measured using the Child's Belief in Animal Minds (Child-BAM; Hawkins and Williams, 2016). This measure presents a range of animals and asks children to say whether they think each animal: (1) is clever, and can feel (2) pain, (3) happiness, (4) sadness and (5) fear. The original measure was developed for children 6–13 years and had excellent reliability ($\alpha = 0.92$) using a set of seven animals. For this study, we reduced this to a set of four animals for brevity, targeting the most common pets in the UK: dogs, cats, rabbits and birds (PFMA, 2021). This shortened version of the scale retained good reliability in the current sample ($\alpha = 0.81$). Each item was scored on a five-point Likert scale, and each child's overall BAM score was calculated by averaging their scores, with a higher score corresponding to higher belief in animal sentience.

Attitudes and Behaviours Towards Animals

Children's risk of animal harm was assessed using two questionnaires, the Children's Attitudes towards Animal Cruelty (CAAC; Connor et al., 2021) and an expanded version of Children's Animal Harm Behaviours (CAHB; Connor et al., 2021). The CAAC is a self-report questionnaire originally tested with adolescents (Connor et al., 2021), but has successfully been used with primary school children and has good reliability ($\alpha = 0.70$; Hawkins et al., 2020). It has 11 items describing harmful behaviours towards animals, including physical harm (e.g. 'Kick an animal on purpose'), emotional harm (e.g. 'Tease an animal'), neglect (e.g. 'Forget to give a pet food') and accidental harm (e.g. 'Hurt an animal by accident'). For this study, children were asked 'Is it OK to...' and had to rate each item on a five-point scale from 'Very bad' to 'Very good'. The CAHB also has good reliability in an adolescent sample ($\alpha = 0.79$; Connor et al., 2021) and has the same 11 items as the CAAC. However, instead of investigating how acceptable the children find the behaviours, it investigates how often children have done the behaviours. For this study, children were asked 'How often have you done the following?' and could select the options

Table 2. PICAS coding scheme across dimensions.

Mentalizing about pets		0	1	2
1. Does the pet in the story have THOUGHTS?	Pet thoughts are not mentioned		Some: thoughts are minimally discussed or only implied	Relevant and realistic thoughts clearly discussed
2. Does the pet in the story have EMOTIONS?	Pet emotions are not mentioned		Some: emotions are minimally discussed, implied, and/or may be unrealistic for pet	Relevant and realistic emotions clearly discussed
Reciprocal relationship with pet		0	1	2
3. Caregiving towards pet: Does the child in story show CAREGIVING behaviour towards the pet?	Child shows no caregiving behaviour whatsoever		Child shows some awareness of pet distress but does not have a full caregiving response and/or child forgives pet	Child shows a good level of caregiving behaviour towards pet
4. Comfort from pet: Does the child in the story receive COMFORT from the pet in the story?	Pet gives no comfort and does not realise ^a the child's distress		Pet has some realization of child distress or there is some attempt from the pet to comfort or forgive ^a the child	The pet realises the child's distresses AND provides comfort to the child
Parental help in resolving conflict		0	1	2
5. Does the parent help find an overall resolution?	No parental help in resolution		Some parental help which is mostly positive	Parent is very helpful in finding a positive resolution

^a Animals 'realising' the child is distressed and/or 'forgiving' the child is designed to capture how children conceptualised animals as sources of support within their stories; it does not imply that animals can necessarily do these things, nor that children literally think that animals have these capacities.

'Never', 'Sometimes', 'Often' and 'Very often', along with a 'I don't have a pet'. We supplemented the 11 items of the CAHB with three items investigating additional harm behaviours emerging from previous research 'Play rough with a pet', 'Yell at or punish a pet if it misbehaves' and 'Treat an animal in a harsh way when angry or annoyed' (Wauthier et al., 2022b).

PROCEDURE

Interviews were organised with the schools' head teacher and children's class teachers to be minimally disruptive and fit around children's schedules. One-to-one interviews were carried in a quiet room at the child's school over three 30-minute sessions on separate days. Children were first taken through the child consent procedure and were informed that they could withdraw at any time. Children were supported with reading and writing as necessary by the interviewer and were free to complete any self-report questionnaires by themselves if they preferred. Session 1 included questionnaire measures carried out on a digital tablet using Qualtrics survey software (basic demographics, SAPS, CAAC), as well as the drawing task. Session 2 was comprised entirely of the CAPA procedure, which was carried out using a Playmobil[®] house and assorted figures and furniture. Session 3 comprised measures of empathy and executive functioning (not analysed here) and finished with the remaining self-report questionnaire items in Qualtrics (CAHB). Session 1 was not audio- or video-recorded, as none of the measures required it, but sessions 2 and 3 were audio- and video-recorded using a video recorder mounted on a tripod. At the end of each session, children could choose a small present (Scottish SPCA stationary or small animal figurine).

DATA HANDLING AND ANALYSIS

Data were inputted into Excel for preliminary handling, including downloading answers from Qualtrics, entering scoring from pencil-and-paper measures, reverse coding items and calculating mean scores. The finalized data set was imported into Jamovi version 1.6 for statistical analysis. To retain robustness despite the small

sample size, we used Fisher's exact test (rather than Pearson's Chi square) for tests of frequency, since it is robust even when expected values in cells fall below five. Statistical analyses which compared scores based on attachment strategy were primarily carried out using a binary classification system, comparing all secure children (type B) to insecure children (type A or C), to retain statistical power without violating assumptions of parametric testing. Tests of mean difference were always carried out using versions robust to violations of equality of variance (Welch's t-test and Welch's ANOVA) as these are more reliable while retaining nearly the same statistical power (Ruxton, 2006). Normality of residuals was established using Shapiro-Wilk test, visual exploration of the data and Grubbs' test to identify outliers. Where assumptions for parametric tests were not met, we used non-parametric equivalents, such as Mann-Whitney U test, Kruskal-Wallis test and Spearman's rho. Tests are supplemented with boxplots showing the difference between A, B and C strategies and by exploratory analysis using three-way classifications, where relevant.

Results

ATTACHMENT CHARACTERISTICS OF THE SAMPLE

Of the 27 children interviewed, 24 had useable video data for CAPA classification (two video recordings malfunctioned and one was interrupted). As a result, analyses comparing results based on attachment strategy have a sample size of 24, while analyses correlating between measures have sample sizes ranging from 24 to 27. Of the 24 children with CAPA attachment classifications, eight children were anxious avoidant (type A), with five children classified as A+ and three children as A1/2, 11 children were classified as secure (type B) and five children were anxious ambivalent (type C), with three children classified as C+ and two children as C1/2. Supplementary Table 2 provides anonymized information on the basic characteristics of the sample.

Referred children were significantly more likely to be classified as having an insecure attachment pattern ($n = 8$, 89% of referred

children) than control children ($n = 5$, 33% of control sample; Fisher's exact test, $p = 0.013$; Cramer's $V = 0.540$). Specifically, referred children were more likely to be classified as having a pathological insecure attachment pattern ($n = 7$, 78% of referred children) than control children ($n = 1$, 7% of control sample; adjusted residual = 3.6; $p = 0.002$, Cramer's $V = 0.735$). Rates of normal insecure were comparable between referred children ($n = 1$) and control children ($n = 4$; adjusted residual = 0.9).

ATTACHMENT CLASSIFICATIONS AND DRAWINGS (HIERARCHICAL MAPPING TASK)

For research question 1, we sought to understand how children's drawings of 'the most important people, including, family, friends, and pets' related to their attachment classification. Assumption checks identified one child's data as an outlier ($p < 0.01$; Grubbs, 1969) as they drew almost all their figures extremely close to themselves and so had very high values (see Figure 2, child #7), so their data were removed from this analysis. For the remaining children, there was a significant difference in the drawings of securely attached children compared to those drawn by insecurely attached children. Specifically, secure children placed mothers and siblings significantly closer to themselves than insecurely attached children did, and a trend in the same direction existed for father (but was not significant). However, there was no significant difference in children's closeness to pets and in fact the relationship tended in

the other direction. Table 3 presents results for the Welch's t-tests carried out for each type of relationship, while Figure 1 shows the distribution of distances for each relationship by attachment strategy.

Taking a more qualitative approach, Figure 2 shows annotated examples of five representative drawings for each attachment category. A few trends appear when inspecting these images. Firstly, several insecure children had a 'pet only' drawing, where they included only pets and no human figures. This never occurred in the securely attached children, who seemed to have more complex attachment networks. When given the choice, a higher percentage of secure children drew the people in the image themselves (75%) compared to the insecure children (36%). Finally, we notice what might be the beginning of a 'bimodal' pattern in the type A children, where they either drew very sparse attachment networks, or very fully attachment networks; we have too few examples of type C children to determine whether this bi-modal pattern might emerge as well.

ATTACHMENT CLASSIFICATIONS AND PET STORIES (PICAS)

For research question 2, we explored children's representation of their relationship to pets using the PICAS. Welch's t-tests showed that insecure children received significantly lower scores ($M = 0.81$, $SD = 0.45$) than secure children ($M = 1.39$, $SD = 0.54$)

Table 3. Results for Welch's t-test on the hierarchical mapping task for closeness to mother, father, siblings and pets. A higher score corresponds to a closer relationship. Bolded values correspond to significant p-values: $p < 0.05$.

	Secure Mean (SD)	Insecure Mean (SD)	df	t	p	Cohen's d
Mother	0.25 (0.04)	0.14 (0.13)	13.6	2.81	0.014	1.15
Father	0.21 (0.12)	0.08 (0.13)	18.6	1.94	0.067	0.80
Sibling	0.22 (0.08)	0.10 (0.12)	20.9	2.97	0.007	1.23
Pet	0.11 (0.14)	0.22 (0.25)	20.6	-1.76	0.094	-0.73

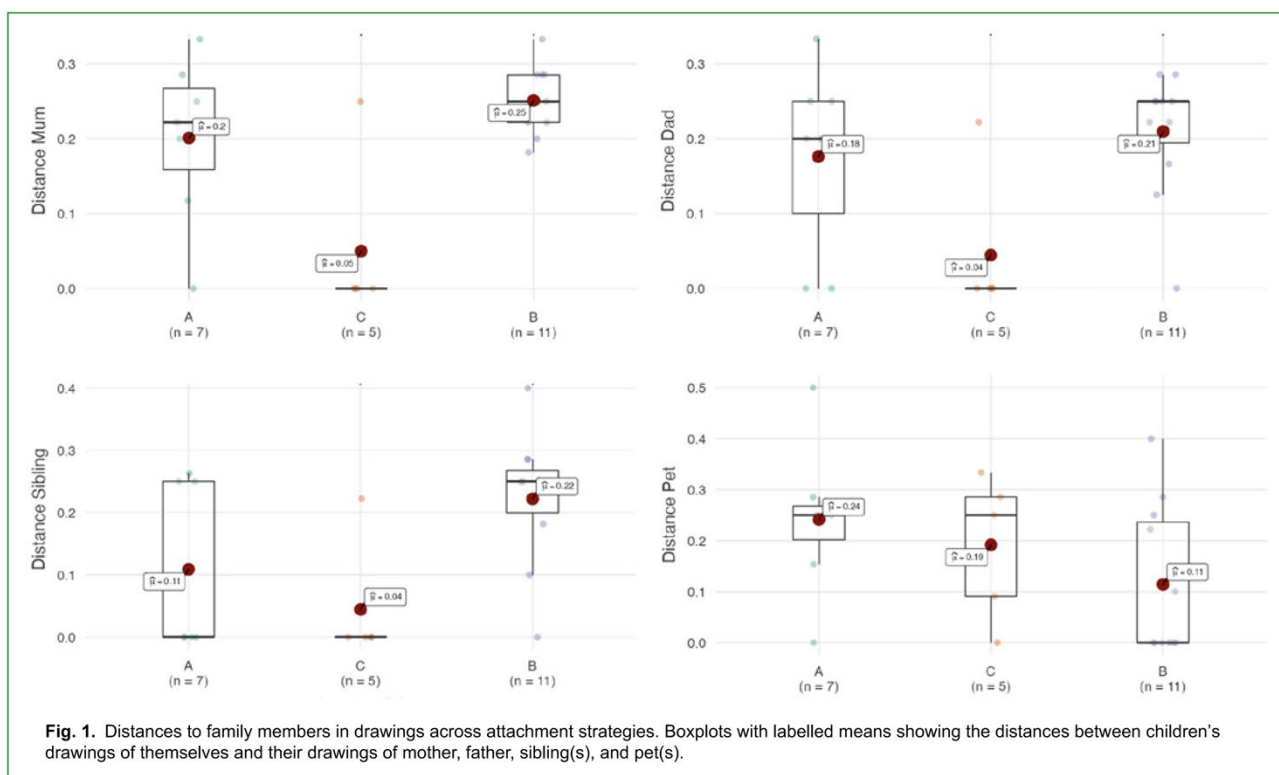
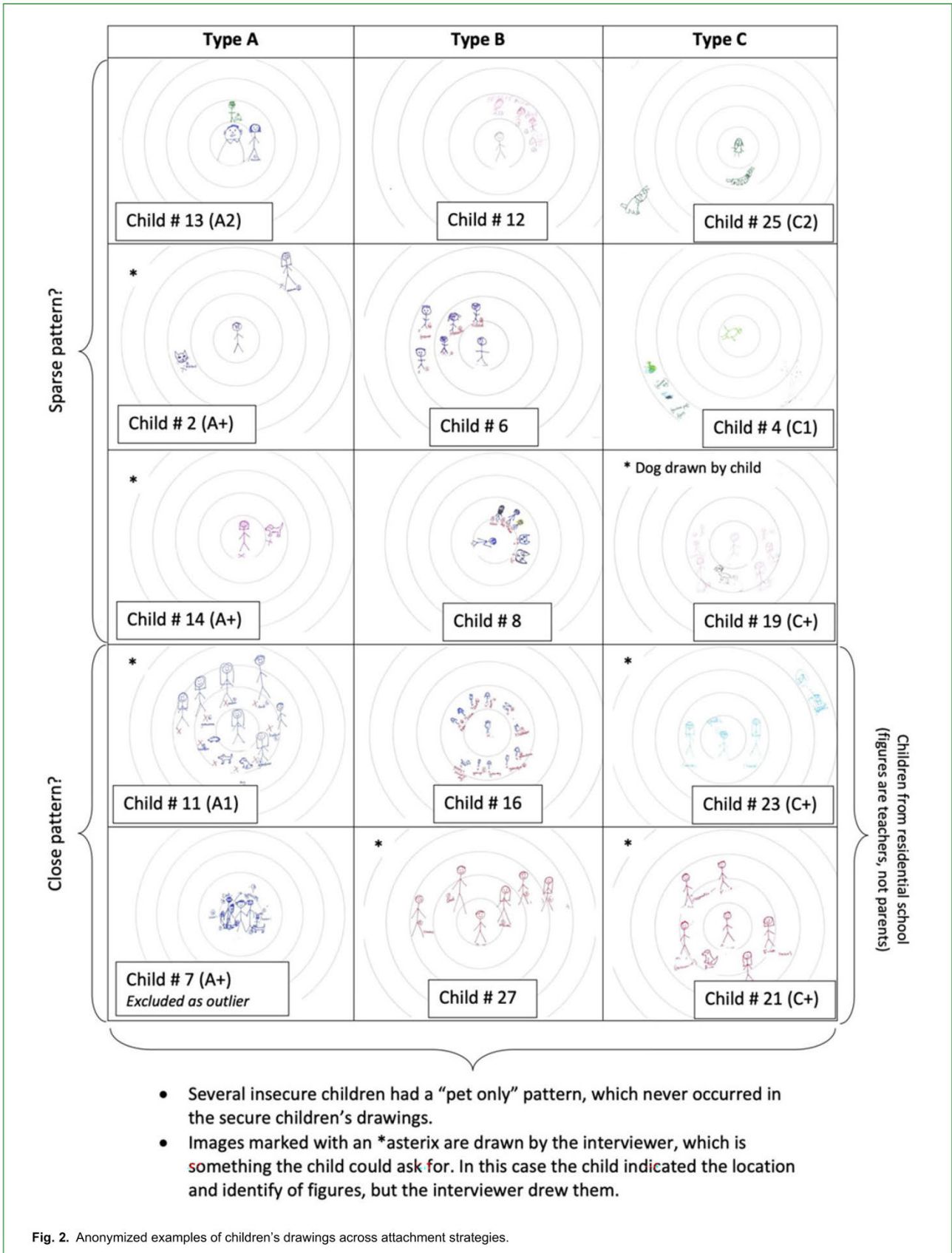


Fig. 1. Distances to family members in drawings across attachment strategies. Boxplots with labelled means showing the distances between children's drawings of themselves and their drawings of mother, father, sibling(s), and pet(s).



on mentalizing about pets, $t(20.6) = 2.702, p = 0.013$; insecure children received significantly lower scores ($M = 0.41, SD = 0.41$) than secure children ($M = 0.89, SD = 0.54$) on caregiving towards pets $t(18.5) = 2.385, p = 0.028$ and insecure children received

significantly lower scores ($M = 0.64, SD = 0.52$) than secure children ($M = 1.48, SD = 0.62$) on parental help in resolving conflict $t(19.7) = 3.544, p = 0.002$. However, there was no difference between insecurely attached children ($M = 0.78, SD = 0.61$) and

securely attached children ($M = 0.83$, $SD = 0.46$) on comfort from pets $t(18.5) = -0.238$, $p = 0.815$. Figure 3 visualizes the differences between the three categorisations of attachment across these four dimensions using boxplots.

ATTACHMENT CLASSIFICATIONS AND SELF-REPORT MEASURES

For research question 3, we explored whether attachment strategy impacted children’s answers on four self-report measures on their relationships and interactions with pets. The CAHB and child-BAM scales violated assumptions or normality, and so were compared using Mann-Whitney U tests, while the CAAC and SAPS were suitable for parametric testing and so groups were compared using Welch’s t-test. There were no significant differences between securely attached and insecurely attached children across any of these measures. For the non-parametric tests, there was no difference between securely attached children (Median = 1.14) and insecurely attached children (Median = 1.14) on CAHB score $U = 53.5$, $p = 0.761$ and there was no difference between securely attached children (Median = 4.85) and insecurely attached children (Median = 4.85) on child-BAM score $U = 57.5$, $p = 0.619$. For the parametric tests, there was no difference between securely attached children ($M = 1.57$, $SD = 0.24$) and insecurely attached children ($M = 1.64$, $SD = 0.31$) on CAAC score $t(20.4) = -0.57$, $p = 0.570$ and there was no difference between securely attached children ($M = 4.57$, $SD = 0.28$) and insecurely attached children ($M = 4.42$, $SD = 0.58$) on SAPS score $t(16.2) = 0.791$, $p = 0.440$.

We ran additional tests of mean differences using three-way groupings: based on the ‘severity’ of attachment insecurity (secure [type B, $n = 11$], normative insecure [A1/2 or C1/2, $n = 5$] and insecure ‘pathological’ [A+ or C+, $n = 8$]) and based on attachment strategy (secure [type B, $n = 11$], anxious avoidant [all type A, $n = 8$] and anxious ambivalent [all type C, $n = 5$]). Assumption checks showed that the child-BAM and CAHB measures would be compared using Kruskal-Wallis tests, while SAPS and CAAC

scores were compared using Welch’s ANOVAs. There was a significant difference in CAHB scores when grouping based on attachment severity ($H = 6.06$, $p = 0.048$), with *post hoc* tests suggesting that the ‘pathological’ insecure group (Median = 1.34) had higher rates of harmful behaviours than the ‘normal’ insecure group (Median = 1.00; $p = 0.047$). Furthermore, there was a significant difference in CAAC scores when grouping based on attachment strategy, $F(2, 8.08) = 6.84$, $p = 0.018$. A Games-Howell *post hoc* test suggests that anxious-ambivalent children ($M = 1.98$, $SD = 0.23$) had higher rates of acceptance of cruelty than anxious avoidant children ($M = 1.47$, $SD = 0.16$; $p = 0.033$), a difference which was nearly significant with secure children ($M = 1.57$, $SD = 0.23$, $p = 0.067$). This suggests that groupings can be an important consideration when considering the effects of attachment; however, these findings should be interpreted with caution as we were unable to correct for the number of tests performed due to the small sample size.

LINKS BETWEEN MEASURES

For research question 4, we ran three partial non-parametric correlation matrices while controlling for pet ownership. The main correlation matrix (Supplementary Table 3) used the whole sample of 27 children but did not account for the effects of different attachment strategies. The second and third correlation matrices partially address this issue by splitting the sample, with one set of correlations for securely attached children ($n = 11$, Supplementary Table 4) and one set of correlations for insecurely attached children ($n = 13$, Supplementary Table 5). However, splitting the sample in this way significantly reduced statistical power, and so results should be viewed as exploratory. Figure 4 visually summarizes results using a correlogram created in Affinity Designer, with the top-right half showing significant correlations in the split samples, while the bottom-left of the figure shows all correlations using the full sample.

There are some marked differences in the patterns of correlation for the securely and insecurely attached children, with the only shared

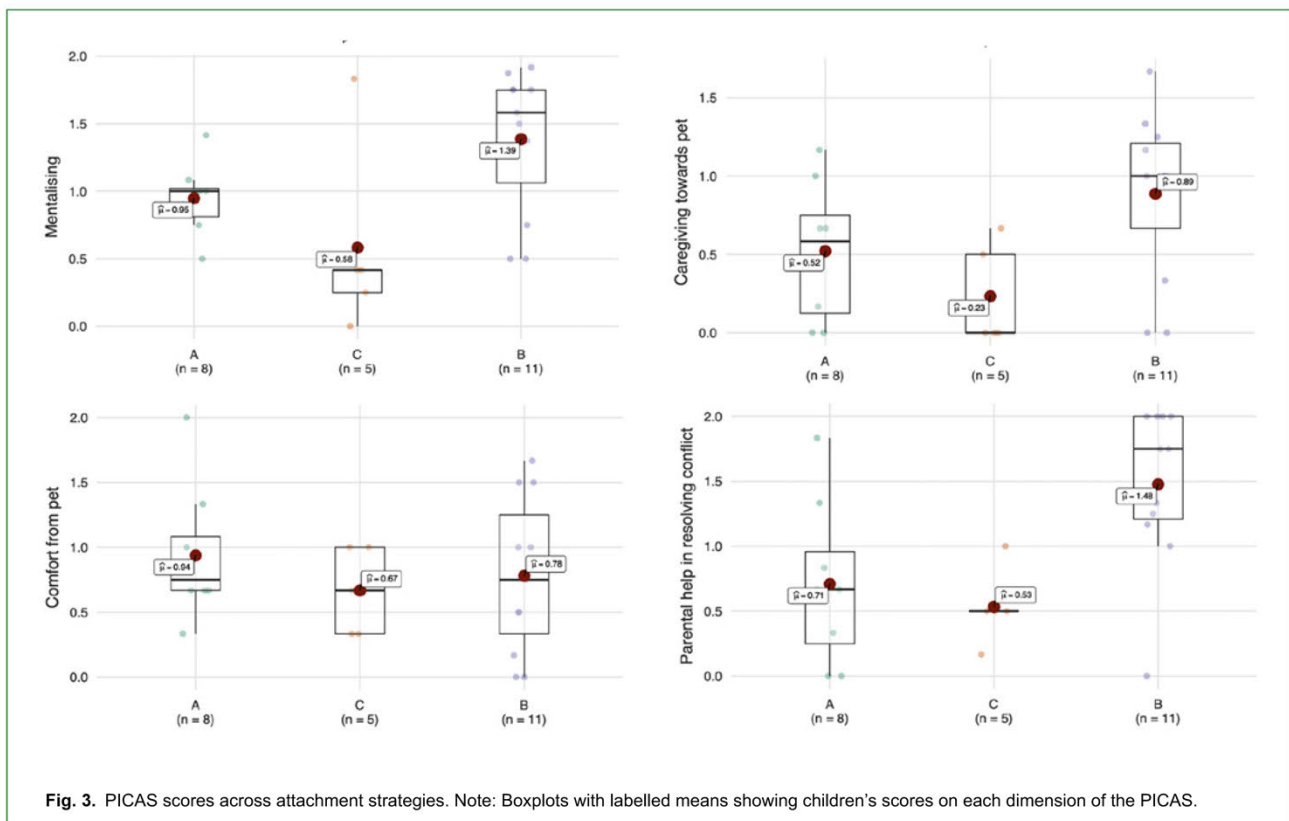
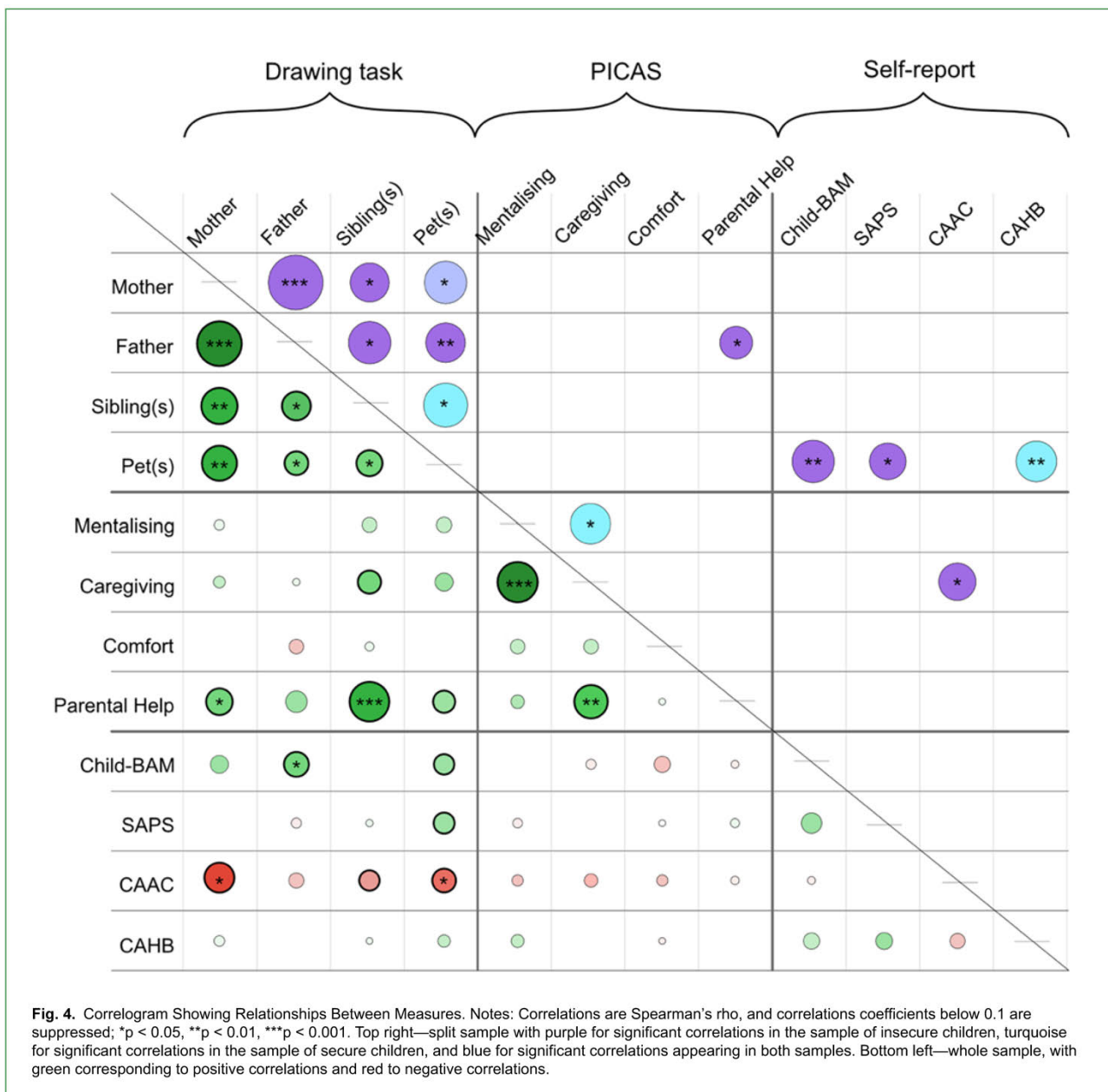


Fig. 3. PICAS scores across attachment strategies. Note: Boxplots with labelled means showing children’s scores on each dimension of the PICAS.



significant correlation being closeness to mother and closeness to pets. For example, closeness to pets is only significantly correlated to the self-report measures child-BAM and SAPS for the sample of insecure children. The different patterns may be due either due to measurement artefacts such as floor or ceiling effects, or to genuine differences in the way secure and insecure children form relationships. This highlights the importance of taking attachment strategy into account and is crucial to keep in mind for the analysis with the whole sample, as certain effects may be averaged out.

In the overall sample, closeness to mother and closeness to siblings both correlated with amount of Parental Help, which is suggestive that children who feel closer to their family are more able to use parental figures for help in resolving issues. Regarding self-report measures, closeness to pets and closeness to mother were significantly negatively correlated with CAAC score, while closeness to father was significantly correlated to child-BAM score. Although closeness to pets was not significantly correlated with SAPS score ($p = 0.08$) or child-BAM ($p = 0.09$), the fact these relationships were significant in the sub-sample of insecure

children suggest there may be an interaction with attachment strategy. Three of the PICAS dimensions were highly correlated with one another. Specifically, Mentalizing was significantly correlated with Caregiving, and Caregiving was significantly correlated with Parental Help. However, Comfort from pets was not correlated with any of the other PICAS dimensions, suggesting it taps a separate aspect in children's relationships to pets. None of the PICAS dimensions correlated significantly with the self-report measures, highlighting that these measurement techniques likely assess different constructs.

Discussion

This study aimed to investigate the link between attachment strategy, children's relationship to pets and risks of child animal harm using a sample of children with both high- and low- risk for animal harm. We found children at high risk of animal harm were more likely to have insecure attachment than control children, while self-report measures suggest that pathological attachment strategies may be especially linked to higher rates of animal harm

behaviour. Our results also suggest that children's relationships with pets do not necessarily follow the same patterns as their human attachment relationships. Insecure children drew pets just as close to themselves as secure children, there was no difference between secure and insecure children's self-reported attachment to pets, and insecure children perceived pets as sources of comfort just as much as securely attached children. However, it is important to note that lack of statistical differences might be a result of the small sample size, as the study was underpowered. Attachment did affect other dimensions of children's relationships with pets: insecure children had poorer mentalizing about pets, a reduced tendency to demonstrate caregiving behaviours, and were less able to use parents to help scaffold positive interactions with pets. Finally, correlations across measures confirm we cannot use measurement modalities interchangeably.

CONCEPTUALIZING CHILDREN'S RELATIONSHIPS WITH PETS

Our results suggest that pets occupy a distinct place in children's attachment networks. Insecure children felt just as close to and comforted by pets as secure children, despite marked differences in their closeness to mothers and siblings. This supports the theory that IWMs do not transfer to relationships with pets in the same way that they transfer to human relationships (Julius et al., 2013). To date, this idea has only received sparse attention: one study with adult dog-owners found no link between human- and pet-attachment using questionnaires (Kurdek, 2008), while an unpublished study found no link between children's attachment strategy as measured by the Separation Anxiety Test and a questionnaire on closeness to pets (Julius et al., 2010). What does this mean for how we conceptualise children's relationships with pets? Although attachment theory is certainly relevant, relationships with pets seem to diverge from other attachment relationships in important ways. More research will be needed to determine whether this is best conceptualised as a special type of secondary attachment, or whether we need to supplement this with theories such as 'biophilia' from evolutionary psychology (Kellert and Wilson, 1993), 'zoeyia' from the One Health movement (Hodgson and Darling, 2011), or 'multispecies kinship' from sociology (Charles, 2014), to have a full theoretical account of the processes involved.

Insecure children's poorer mentalizing about pets, reduced caregiving towards pets and inability to use parents to scaffold positive resolutions seem particularly relevant in explaining how attachment links to risk of animal harm. These dimensions are known to link attachment and poor outcomes in human interactions: for example, poor mentalizing has been shown to mediate the relationships between insecure attachment and peer problems in adolescence (Venta and Sharp, 2015), while insensitive caregiving is known to mediate the intergenerational transmission of insecure attachment (Kretchmar and Jacobvitz, 2002). There is also a well-established relationship between low empathy and childhood animal harm (Akdemir and Gölge, 2020; Hartman et al., 2019) and these results support the idea that attachment mechanisms underly this association. Poor mentalizing has been linked to lower cognitive empathy (Schnell et al., 2011), while insecure attachment interferes with compassionate caregiving (i.e. behavioural empathy; Mikulincer et al., 2005).

However, the link between insecure attachment and risk for animal harm is not necessarily bi-directional. There was no difference between secure and insecure children's self-reported rates of animal harm; the difference only emerged when children with DMM pathological (A+/C+) attachment strategies were analysed separately. This may suggest that it is predominately more serious forms of insecure attachment that lead to higher risks of animal harm, possibly through more pronounced deficits in mentalizing and caregiving, but also through other attachment-related mechanisms such as reduced emotional regulation (Mikulincer and Shaver, 2019). More research is needed to understand how

this interacts with additional factors, including exposure to violence (Degue and DiLillo, 2009) and negative cultural attitudes towards animals (Plant et al., 2019).

METHODS FOR MEASURING ATTACHMENT TO PETS

Research on children's relationships with pets has tended to rely on self-report, which is known to be prone to a range of issues, including social desirability bias (Camerini and Schulz, 2018), recall bias (e.g. in medical research; Van den Brink et al., 2001) and issues due to limited introspective abilities (Pronin, 2009) and verbal reasoning (Marsh, 1986). This study used a range of techniques, providing an opportunity to consider whether different methods measure the same underlying constructs. Self-reported attachment to pets (SAPS), closeness to pets (drawing task) and 'comfort from pets' (PICAS) did not correlate with each other. While there may be methodological reasons for the lack of correlation, these measures may be assessing different latent constructs. In fact, reviews have found quite low correlations between interview and self-report measures of attachment (Jewell et al., 2019), perhaps because self-report measures tap into conscious processes, while interview or projective methods tap into unconscious schemas and experiences. In another example, 'mentalizing about pets' did not correlate with child-BAM scores, even though both relate to children's concepts of animal sentience. However, 'mentalizing about pets' likely assesses an *ability*, while the child-BAM measures self-reported *beliefs*. Again, this is consistent with other research showing low equivalence between self-reported and task-based measures (Murphy and Lilienfeld, 2019). Ultimately, it may be necessary to develop observational measures of child-animal interaction to have valid and reliable data.

IMPLICATIONS FOR CLINICAL PRACTICE

Our results suggest that insecurely attached children can form close relationships to pets and join a growing literature on the positive buffering effects pets can have in children's lives, including in cases of inadequate human relationships (Wanser et al., 2019) and exposure to violence (Hawkins et al., 2019). It also supports the finding that it is a child's *bond* to their pet which is likely to have positive socio-emotional effects, rather than the simple presence of a pet (Poresky and Hendrix, 1990). In a family medicine context, asking about pets has been suggested to be useful to build rapport and leverage the health benefits of pet ownership (Hodgson et al., 2017); asking children about pets in a psychological context may have similar benefits. Our results may also have implications for animal-assisted therapy, since children's insecure attachment strategies did not seem to transfer to their relationships with animals. This supports the idea that therapy animals can act as 'transitional objects' aiding the formation of a therapeutic alliance when patients struggle to trust their (human) therapist (Levinson, 1965; Zilcha-Mano et al., 2011). However, there is very little research on whether positive relationships with animals can transfer back to human relationships, and we would caution against simply assuming this. Still, some research suggests that animal-assisted interventions can have positive effects on children and adolescents' social and relational functioning (Pendry and Roeter, 2013).

Finally, our results have implications for how childhood animal harm is treated. Our results support the model proposed by Shapiro et al. (2013) that attachment disturbances underly risk factors for childhood animal harm and suggest this may occur *via* poorer mentalizing, reduced caregiving skills and lack of parental support. These deficits could precipitate situations where an animal is harmed because its needs or intentions are misunderstood. These results may also provide a developmental perspective for issues in adulthood. For example, in animal hoarding, pathological attachment may lead owners to consider animals as primary sources of comfort, without having the mentalising capacity to see negative impacts on animal welfare (Patronek and Nathanson, 2009; Patronek and Weiss, 2012). We recommend

that practitioners who work with children (or adults) at high risk of animal harm screen for potential attachment issues.

LIMITATIONS AND FURTHER RESEARCH

The small sample size is the most significant limitation of this study. This was due in large part to the difficulty in reaching children who have harmed animals. Although every effort was made to perform statistical tests which would not introduce bias, our results should be viewed as exploratory. Furthermore, our sample was quite homogenous, comprised of predominantly white children drawn from primary schools in central Scotland, and whose parents consented to research. Future research should attempt to replicate these results with larger samples drawn from different countries, ethnicities and social backgrounds, to determine whether our findings generalize to broader populations. Measures such as drawing tasks or small vignette-based assessment may strike a balance of being scalable while providing detailed information complimentary to self-report typically seen in studies with larger samples. Finally, demographic factors not measured here, such as socio-economic status (Reese et al., 2020) or exposure to Adverse Childhood Experience (Bright et al., 2018), may be confounding factors which partially or completely underpin the association between certain variables, and future research may wish to tease apart these effects.

One of the gaps in the child attachment literature is the dearth of measures available to understand children's experiences of specific relationships (e.g. parents, siblings, friends, extended family and pets). The PICAS was developed to probe children's representations of relationships with pets using a story-stem task, and it may be interesting to explore whether it could be adapted for use with a wider range of relationships. For example, it may be interesting to measure whether there is a correspondence between pet and sibling relationships, since both may occupy the space of secondary attachment figures. More broadly, it could provide insights into how children's IWMs and schemas transfer between primary caregivers and increasingly distant relationships (e.g. sibling, kinship, friends, peers).

Conclusions

Pets occupy a unique place in children's attachment networks and can act as sources of comfort even in cases of insecure attachment. However, pathological insecure attachment patterns may be a predisposing risk for animal harm, and insecurely attached children may not have the interpersonal skills or parental support to resolve points of conflict with pets. Further research is required to validate these findings across a wider sample and to gain a fuller understanding of how pets fit within children's wider attachment networks. This research has implications for how we understand the role pets play in children's development, how we understand the way attachment transfer between relationships and how we address cases of animal harm.

CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

ETHICS STATEMENT

The authors confirm that the research meets any required ethical guidelines, including adherence to the legal requirements of the study country.

ACKNOWLEDGEMENTS

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AUTHORS' CONTRIBUTIONS

All authors contributed equally to the development of this article.

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DATA AVAILABILITY

Data available on request from the authors.

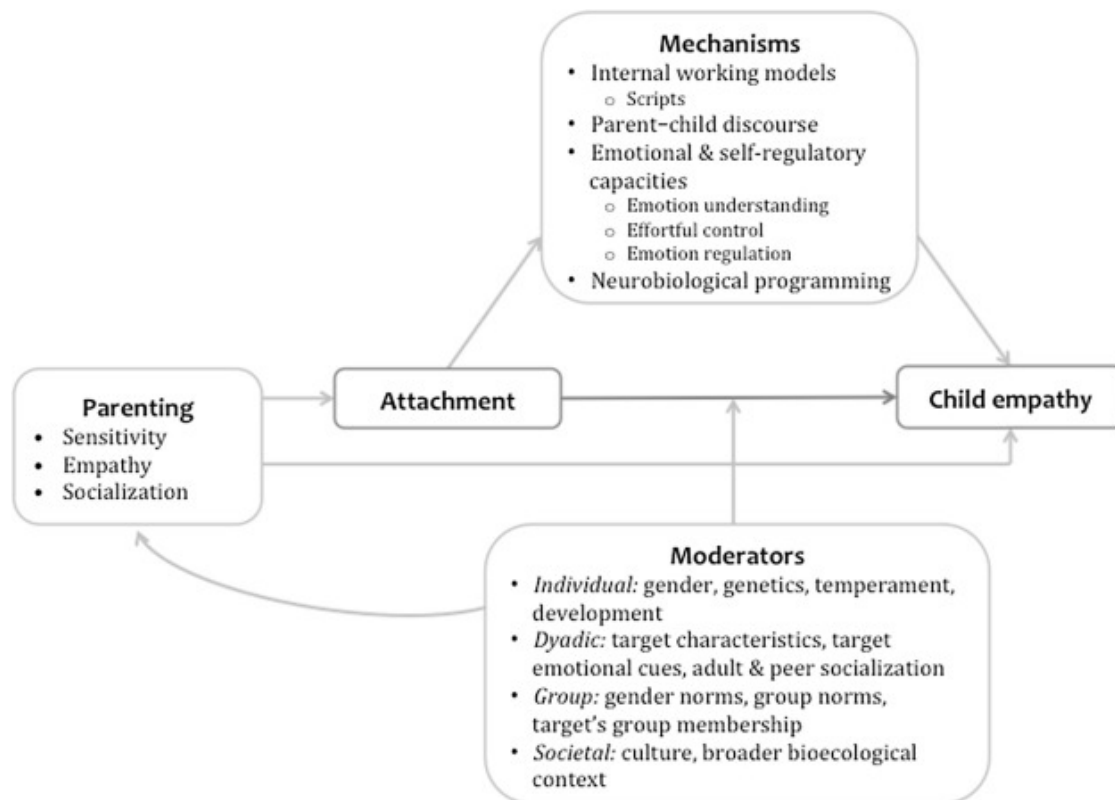
Note: Please see the reference section at the end of this thesis for the references cited in this publication.

5.7 Further Discussion and Chapter Summary

This study explored novel methods for investigating children's relationships with pets and provided some preliminary insights into how attachment to pets relates to human attachment and risk for animal harm. The mechanisms involved *seem* somewhat paradoxical: attachment to pets was not associated with overall (human) attachment strategy, however insecurely attached children had lower scores on three of the four dimensions in the PICAS. On further examination, the likely explanation seems to be that while representations of safety and comfort do *not* transfer from human to animal relationships, the *skills* developed through attachment, such as mentalising and emotional regulation, do transfer to children's interactions with animals. These results beg a thought-provoking question: would the skills developed through interaction with animals (e.g., in animal assisted therapy) transfer back to children's relationships with humans?

One aspect we wanted to further explore, but which was outside the scope of the publication, was how PICAS scores might correlate to scores on the KEDS empathy measure (described in Chapter 4), since the development of empathy is well known to be linked to attachment (Stern & Cassidy, 2018). Specifically, parenting factors, internal working models, and emotion understanding (i.e., mentalising) are all theorised to be mechanisms mediating the link between attachment and empathy (see Figure 5.6) and are closely related to dimensions measured with the PICAS. To explore whether these measures, used across Chapters 4 and 5, could detect these theorised relationships, I ran a series of non-parametric correlations (Spearman's rho) using children for whom we had full data on both the KEDS and the PICAS ($n=23$).

Figure 5.6: Theoretical model showing how attachment impacts the development of empathy.



Note. From “Empathy from infancy to adolescence: An attachment perspective on the development of individual differences” by Stern and Cassidy, 2018, *Developmental Review*, 47, p. 8. Copyright 2017 Elsevier Inc. Reprinted with permission.

Although mentalising about pets, caregiving towards pets, and comfort from pets did not correlate with affective, cognitive, or behavioural empathy, parental help in resolving conflict correlated significantly with all three: cognitive empathy ($\rho = 0.49$, $p = 0.019$), affective empathy ($\rho = 0.53$, $p = 0.009$), and behavioural empathy ($\rho = 0.50$, $p = 0.015$). This suggests that children whose parents modelled positive conflict resolution developed greater empathetic skills and is in line with the model presented above. However, because these dimensions average together scores of empathy towards children and animals, I also decided to separately analyse how PICAS dimensions related to human- and animal-directed empathy. Results from this analysis are presented in Table 5.4 and show that empathy towards animals but *not* empathy towards humans were related significantly to mentalising and caregiving towards pets as measured by the PICAS. This confirms what we might expect based on our existing results: since human and animal attachment representations are separate, it stands to reason that these differentially relate to human- and animal-directed

empathy. This further suggests that human and animal empathy should not be conflated: not only are they distinct constructs, but they are likely to develop through separate pathways.

Table 5.4. *Correlations between PICAS dimensions and human- and animal- directed empathy.*

		Mentalising about pet	Caregiving towards pet	Comfort from pet	Parental help	Empathy animal	Empathy child
Mentalising	Spearman's rho	—					
	p-value	—					
Caregiving towards pet	Spearman's rho	0.717 ***	—				
	p-value	< .001	—				
Comfort from pet	Spearman's rho	0.067	0.214	—			
	p-value	0.755	0.315	—			
Parental help in resolving conflict	Spearman's rho	0.461 *	0.665 ***	0.008	—		
	p-value	0.023	< .001	0.969	—		
KEDS: Empathy animal	Spearman's rho	0.489 *	0.512 *	0.058	0.654 ***	—	
	p-value	0.018	0.013	0.794	< .001	—	
KEDS: Empathy child	Spearman's rho	0.249	0.238	-0.154	0.483 *	0.599 **	—
	p-value	0.252	0.275	0.482	0.020	0.002	—

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

These results cemented the need to create a novel, dedicated measure of empathy for the evaluation of Animal Guardians, capable of validly assessing all three dimensions of empathy (cognitive, affective, and behavioural) simultaneously for both children and animals. A set of 13 images were carefully developed in which design considerations counterbalanced a range of factors (child sex, pet type, emotions displayed both congruently and incongruently). This was piloted with a large sample of adults and a subset of the images were then used for the evaluation of Animal Guardians, described in Chapter 6.

Chapter 6:
The Animal Guardians Programme

*Evaluating an Intervention for Children
Who Have Harmed Animals*

6.1 Abstract

Childhood animal cruelty is associated with poor psychological outcomes and may co-occur with delinquency and violent behaviour. Despite this, there are few established interventions for childhood animal harm and no research evaluating their effectiveness. This study is an evaluation of Animal Guardians (AG), a targeted educational intervention delivered by the Scottish Society for the Prevention of Cruelty against Animals (Scottish SPCA) for children who have harmed animals. AG is a bespoke programme for primary school children in Scotland which is delivered one-to-one in the child's school over a 6–10-week period and targets: (1) an understanding of animal sentience and emotions, (2) knowledge of animal welfare needs, (3) care and responsibilities towards animals, and (4) correct handling and behaviour around animals. Using a matched-control sample of 48 children (24 referred to AG and 24 matched controls) we evaluated the effectiveness of the intervention through a pre- post-test activity pack measuring targeted constructs. Mixed ANOVAs showed that children receiving the AG programme improved significantly more than controls on welfare knowledge, behaviour towards animals, cognitive and behavioural empathy. Furthermore, post-hoc tests showed that referred children improved significantly on belief in animal minds and affective empathy. The intervention was equally effective for girls and boys, and independent of animal harm-severity at referral. Younger children had a marginally greater improvement than older children, and post-hoc tests showed this was because they started with lower levels of welfare knowledge. These results show that AG is an effective programme and suggests that educational interventions can be a positive way of engaging children and reducing risk of animal harm. More research is required on whether positive changes are maintained over long periods and whether educational interventions might complement psychological interventions.

Key words: animal cruelty, humane education, empathy, human-animal interaction.

6.2 Introduction

Between 60-80% of children in the UK live with pets (Purewal et al., 2019; Marsa-Sambola et al., 2016). A growing body of research shows a range of benefits associated with pet ownership (Purewal et al., 2017) and animal assisted interventions (see e.g., Hoagwood et al., 2017), including improving children's mental wellbeing and activity levels (Wenden et al., 2021). However, there is much less research on childhood animal cruelty, which can act as a warning sign for child maltreatment (McEwen et al., 2014; Bright et al., 2018), psychological and behavioural difficulties (Hawkins et al., 2017), and can relate to later delinquency and interpersonal violence (Longobardi & Badenes-Ribera, 2019). Having child-specific research is important to design developmentally tailored interventions; for example, children are more likely than adults to *accidentally* mistreat animals (Ascione, 2005, p. 143; Connor et al., 2013) and have lower knowledge of animal welfare needs and emotions (Hawkins & Williams, 2016; Myers et al., 2014). This is not only a risk to animal welfare but also puts the children at higher risk of animal bites, scratches, or other fear-aggressive behaviour (Aldridge et al., 2019). Despite mounting evidence for the importance of early intervention across a range of childhood emotional-behavioural disorders (Hester et al., 2004), there are currently no evidence-based interventions specifically designed to address cases where children have harmed animals. This study aims to provide the first evaluation of a targeted animal welfare education programme for children who have harmed animals.

6.2.1 Childhood Animal Harm: Risk Factors, Typology, and Severity

Throughout history, childhood animal harm has been linked with patterns of interpersonal issues (Gullone, 2012). Research has historically focused on animal *cruelty* (Ascione, 1993), especially as a predictor for violence or delinquency in adulthood (Longobardi & Badenes-Ribera, 2019), and most research has been carried out with adults reporting retrospectively on their childhood behaviour (Wauthier & Williams, 2022). Disagreement on terminology and definitions has made it difficult to synthesise the literature, and lack of consistency in how it is operationalised has meant there is little agreement on issues like prevalence rates, which are commonly reported to range from 2-9% (see e.g., McEwen et al., 2014) to 50% (see e.g., Baldry, 2003). Muldoon and Williams (2021a) reported that even within an expert group of animal welfare educators, there was no consensus on the definition of animal cruelty in childhood, including whether it should include unintentional acts and neglect.

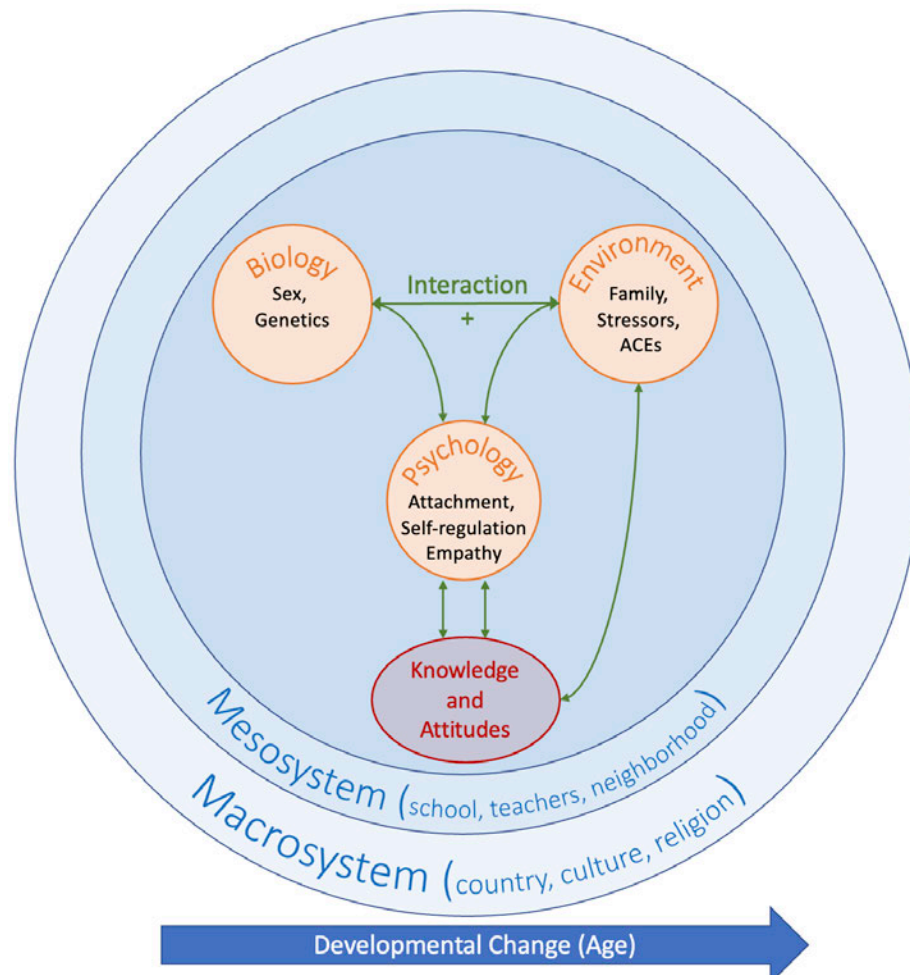
Adopting the term “childhood animal harm” (CAH) is more developmentally appropriate and allows harmful behaviours towards animals to be conceptualised along a spectrum of severity and typologies, so that more incidents can be identified and enabling support to be provided earlier (Chapter 2). Adopting this broader approach, childhood animal harm (CAH) can be defined as “Any act, of commission or omission, where a child negatively impacts an animal’s welfare, intentionally or unintentionally” (Wauthier & Williams, 2021, p. 199). This definition encompasses a range of types of harm, from minor accidental harm to serious intentional cruelty.

6.2.1.1 Risk Factors

Risk factors for CAH can be categorised into three interacting groups using a biopsychosocial model (Engel, 1981) set within an ecological systems framework (Bronfenbrenner, 1992; see Figure 6.1). Biological risk factors include being male (Gullone, 2012; Hawkins et al., 2017; McEwen et al., 2014) and certain genetic variants involved in conduct disorder which increase predisposition for impulsivity and aggressive behaviour (Fairchild et al., 2019). Environmental risk factors include trauma and adverse childhood experiences (ACEs; Bright et al., 2018), and exposure to violence or witnessing animal cruelty (Ladny & Meyer, 2020). Exposure to violence may operate by normalising violent behaviour towards animals and through social learning (Henry, 2018), while developmental trauma may interfere with brain development, especially by reducing capacity for arousal regulation (Van der Kolk, 2003). Biological and environmental risk factors interact to give rise to psychological risk factors, which include insecure attachment (Wauthier et al., 2022), low self-regulation and externalising disorders such as Attention Deficit Hyperactivity Disorder (ADHD) and Conduct Disorder (CD; Miller, 2001), and low empathy or psychopathic traits (Dadds et al., 2006; Hartman et al., 2019). These individual risk factors are then imbedded in the child’s social and cultural context, which can generate further risk factors such as: low knowledge of animal needs (Hawkins et al., 2020b), belief that animals are not sentient (Hawkins & Williams, 2016), or negative attitudes towards animals (Connor et al., 2019). These factors also change through development, as do rates animal harm (Ascione 2005; McEwen et al., 2014). The reverse of many of these risk factors may act as protective factors which can increase caregiving behaviour (Williams & Wauthier, *in press*). For example, high attachment to pets is related to greater compassionate behaviour towards animals and lower

acceptance of cruelty (Hawkins et al., 2017b), while low attachment to pets is associated with higher acceptance of animal cruelty (Hawkins et al., 2020b). Understanding these risk factors can help programmes identify the intervention targets likely to show improvement.

Figure 6.1: *Biopsychosocial Model of Risk Factors for Childhood Animal Cruelty*



Note. This model uses a biopsychosocial framework and ecological systems theory to summarise the main risks factors associated with childhood animal harm.

6.2.1.2 Typology and Severity

There is little consistency in the existing literature on how to categorise cases of childhood animal harm. Typologies developed from an animal welfare perspective tend to differentiate between types of abuse (e.g., physical, neglect, organised; Whitfort et al., 2021) or severity of abuse (Kellert & Felthouse, 1985). Psychological typologies have traditionally focused on motivations (Hensley & Tallichet, 2005) and age (Ascione, 2005), but in isolation these dimensions are not necessarily good predictors of psychopathology.

Recent reviews of the literature have highlighted that harm that is more severe, intentional, and frequent/recurring (Longobardi & Badenes-Rivera, 2019) is consistently related to worse outcomes, and these dimensions might be used to identify the most serious cases. Despite this complexity, patterns in the severity, typology, and psychological factors involved can help guide intervention delivery. Less severe, accidental harm is often associated with being younger and having low knowledge of animal needs; moderate, partially intentional harm might be associated with issues such as externalising disorders or emotional-behavioural dysregulation; while severe, fully intentional harm tends to be linked with more severe psychological issues such as trauma and/or low empathy and associated psychopathic traits (Shapiro et al., 2013; Ascione, 2005).

Several organisations highlight that intervening in cases of animal abuse requires “matching animal cruelty offenders to treatment based on risk, need and responsivity principles” (Treatment Interventions, 2013). To this end, and following the broad typology outlined above, the Animals & Society Institute (ASI) have developed three levels of intervention for use with adults (Lunghofer, 2018). ‘Level 1’ is Companion Animal Responsibility and Care (CARE), which covers minimum standards of care and knowledge of pet’s basics needs, ‘Level 2’ is Behaviour, Accountability, Responsibility, and Knowledge (BARK), which is for animal abuse offenders and focuses on accountability and factors that motivated the abuse or neglect, including attitudes and beliefs, and ‘Level 3’ is a one-to-one psychological intervention for complex cases of animal abuse using the AniCare approach, exploring psychological issues and co-occurring problems such as substance abuse or domestic violence.

6.2.2 Interventions for Childhood Animal Harm

Designing reliable and effective interventions for CAH is complex because of the spectrum of severity and the range of risk factors involved. Having graded intervention options, such as used by the ASI, can ensure the appropriate intensity and content for each case. However, developmental differences mean that the levels and content used with adults may not translate directly to use with children. For example, children are not typically pets’ ‘primary’ caregivers (Muldoon et al., 2015), are likely to have bigger gaps in knowledge (Muldoon et al., 2009), have lower capacity for emotional and self-regulation (Diamond & Aspinwall,

2003), and may be returning to difficult home environments over which they have little control. Currently, no frameworks have been proposed for the gradation or delivery of intervention in cases of CAH. Two broad approaches for CAH are described in the literature: (1) preventative animal welfare education which teaches children about animals' emotions, needs, and behaviours, and (2) and therapeutic interventions for severe cases, which address underlying psychological or social issues giving rise to the harm. Unfortunately, "intermediate level" programs, for cases where harm has already occurred but where intensive psychological intervention is either not necessary or possible, are lacking.

6.2.2.1 Animal Welfare Education Programmes

Animal Welfare Education (AWE) and humane education are two related approaches to the long-term prevention of animal harm. Humane education is a broader approach defined as "a form of character education that uses animal-related stories, lessons, and activities to foster respect, kindness, and responsibility in children's relationships with both animals and people" (Faver, 2010; p. 365), and has extended to include concern for the environment and emphasising the interconnectedness of animals, people, and the planet (Rule & Zhbanova, 2014). AWE is the approach often adopted in the UK and is generally more focused on teaching about specific animal needs and the prevention of unintentional harm due to lack of knowledge. Both AWE and humane education programs aim to improve knowledge, attitudes, and behaviours towards animals. Several such programs have had their effectiveness evaluated, including the Scottish SPCA's "Rabbit Rescuers" for 5–7-year-old children (Williams et al, 2020), and the "Prevention Through Education" programme for 7–13-year-old children (Hawkins et al., 2017a). These short school-based interventions demonstrated positive changes in knowledge of animal welfare needs, belief in animal sentience, and a reduction in acceptance of harmful behaviour towards animals. Humane education programs often also aim to increase empathy towards animals and argue that this can also help promote empathy towards humans (Jalongo, 2014). However, there is little direct research to substantiate this claim, partially due to a lack of appropriate animal-directed empathy measures for use with children. Going beyond simple prevention, the RSPCA provide a set of online resources for carers or professionals to work through with adolescents who have harmed (or might harm) animals ("Breaking the chain"; RSPCA, 2022).

However, the resources have not been evaluated, are not formulated as a full programme (this is left up to the facilitator), and are not adapted for use with younger children.

6.2.2.2 Therapeutic interventions

Psychotherapeutic interventions are often reserved for more serious cases, tend to be delivered one-to-one, and can be court mandated in some states in the USA (ALDF, 2021). Although there are a range of programmes (Gupta et al., 2017), few have been described in detail, and none have been empirically evaluated. The AniCare Child Approach (Shapiro et al., 2013) is the only manualised approach, and although it has not been evaluated as an intervention, the theoretical model underpinning the approach has received some support (Chapter 4). The model proposes that attachment dysregulations and accompanying interpersonal issues are the foundation for many of the problems leading to animal harm. Building on this, are the roles of emotional intelligence, self-management, and the influence of family and culture. The manual suggests that improving empathy and self-regulation are the two main targets for intervention, and highlights importance of adopting a trauma-informed approach and working with parents where possible.

6.2.2.3 Bringing research and practice together

While educational approaches have received promising support for improving knowledge, beliefs, and attitudes, it is unclear whether improving these “top-down” protective factors is useful in cases where there may be deeper issues and animal harm has already occurred. On the other hand, while we have evidence for the importance of deeper psychological risk factors such as insecure attachment, low empathy, and poor self-regulation in cases where harm has already occurred (Wauthier et al., 2022), there is no research evidence on whether therapeutic interventions such as AniCare successfully address these issues. In fact, research shows that insecure attachment can be difficult to shift (Bakermans-Kranenburg et al., 2005). In contrast, while empathy and self-regulation can be challenging to improve in certain populations, such as children with CD and accompanying callous-unemotional (CU) traits (Frick et al., 2014), research on skill-based interventions in schools with normative populations show empathy and self-regulation can effectively be enhanced (Malit et al., 2016; Pandey et al., 2018). Together, this body of research suggests that it should be possible to design an effective “intermediate level” intervention for CAH by supplementing

animal welfare education components with skill-based components covering self-regulation and empathy. Although such an intervention is unlikely to address deeper issues associated with more severe cases, it would be promoting protective factors and could act as a useful supplement to psychotherapeutic intervention where necessary.

6.2.2.4 A note on the use of animals

Currently, there is no research on whether live animals are an effective addition to animal harm interventions. Several authors (Ascione et al., 2010; Shapiro et al., 2013) explore the dilemma around using animal assisted activities (AAA) or animal assisted therapy (AAT) and there have been concerns raised in relation to animal welfare and child safety. An argument against AAA for CAH is that it would be unethical to expose an animal to a risk of harm (see Shapiro et al., 2013 and Melson, 2001 for case studies of animals being harmed in this context). Furthermore, working with live animals may be contraindicated in cases of phobias or strong negative attitudes towards the animal. On the other hand, AAT has been shown to be effective at addressing many of the risk factors associated with animal harm, including reducing aggression in delinquent populations (Villafaina-Dominguez et al., 2020), improving interpersonal skills (Pendry et al., 2014), addressing issues associated with trauma (O’Haire et al., 2015) or where participants struggle to trust humans (see e.g., Flynn et al., 2020). It is likely that animals could be useful complements to interventions, but are not strictly necessary, especially where alternatives can be used, such as robotic, toy, or puppet animals (Muldoon & Williams, 2021a). Where practitioners wish to include animals, basic precautions include: (1) using large, well-trained animals (e.g., dogs and horses) rather than vulnerable animals which can be harmed easily (e.g., rabbits, kittens, or puppies), (2) ensuring interactions are fully supervised, and (3) having “escape routes” for the animal to use if it becomes stressed and clear guidelines on terminating sessions.

6.2.3 Animal Guardians: A Novel Intermediate-level Programme

There are very few programmes for CAH between mainstream prevention and intervention for severe cases, and none have received evaluation. Intermediate programmes might aim to: (1) cover the same knowledge basics as humane education interventions (2) provide children with the opportunity to practice skills around positive animal handling, and (3)

include exercises that teach self-regulation and empathy, without attempting to address psychological issues (this should be reserved for psychotherapeutic interventions).

Animal Guardians (AG) is a novel humane educational and skills-based programme which aims to fill this gap. It is a free, bespoke intervention delivered by the Scottish SPCA's Youth Engagement Officers (YEO) for primary school children (4-12 years old) in Scotland who are at high risk of animal harm. AG was designed to take a child-friendly and non-stigmatizing approach to animal harm prevention (Chapter 3). It builds on the success of the Scottish SPCA's existing mainstream classroom-based interventions and is imbedded within the Scottish SPCA's Animal Wise[®] initiative, which aims to provide animal welfare education across the lifespan. Since AG targets children who are high-risk for animal harm and may have a range of specific needs, it is primarily game-based and delivered one-on-one within the child's school to allow for targeted and flexible delivery. Furthermore, YEOs receive child protection training and can link with social work, police, and Child and Adolescent Mental Health Services (CAHMS) where additional support is needed. Unlike therapeutic interventions such as the AniCare Child approach, AG does not attempt to address underlying psychological issues, but can be quickly deployed *alongside* formal therapy where the animal harm is suspected to be a symptom of deeper psychological issues.

6.2.3.1 Development of the Animal Guardians Programme

AG was developed with funding from the R S Macdonald Charitable Trust as a collaboration between the Scottish SPCA and University of Edinburgh. The intervention's intake procedures, content, and evaluation tools were informed by best practice in child development and refined using an iterative design process involving research and service-delivery. The programme was initially developed with the input of a multidisciplinary steering group including Police Scotland, Scottish Fire and Rescue, Barnardo's, Woman's Aid, Educational Psychology, and Social Work. The programme launched in September 2018 in the Edinburgh area, and in the first year the focus was on piloting the procedures alongside a qualitative study exploring children's understanding of animal harm (Chapter 3). This process highlighted the vulnerability of many of the children referred on the programme, but also demonstrated that they generally engaged positively with intervention and interview activities. It demonstrated that animal harm incidents often occurred in a "grey

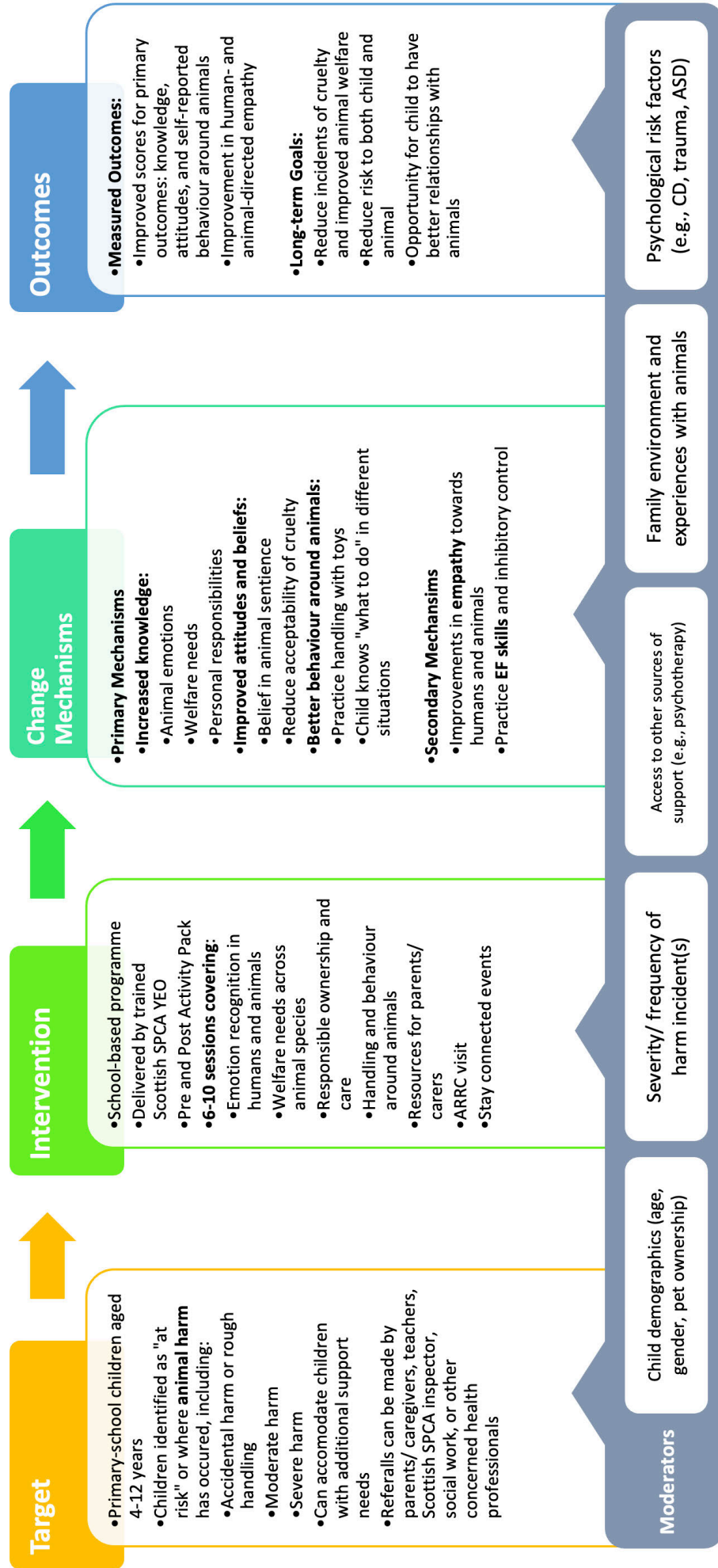
area” of intentionality: children typically understood that what they had done was harmful and typically liked animals, and the harm occurred as a by-product of emotion-behaviour regulation difficulties, normalisation of aggression or violence in their home environments, and possible issues surround self-esteem and attachment.

This was used to inform delivery in the second year (September 2019 – September 2020, but with gaps due to COVID-19), in which AG was expanded to include the whole Scottish central belt (Edinburgh, Glasgow and surrounding Local Authorities). Research went on to compare referred children to classmate controls to quantitatively confirm that there were issues with empathy, self-regulation, and attachment. Results not only confirmed the importance of these dimensions (Chapter 4) but highlighted that pets could still act as sources of support to the referred children despite patterns of insecure attachment (Chapter 5). This highlighted the importance of having exercises covering both empathy and self-regulation, and intervention materials were reviewed to ensure these domains were covered. Changes to procedures following this included streamlined intake, particularly to include animal harm incidents internally from the Scottish SPCA’s animal helpline, and integration of evaluation procedures within programme delivery.

6.2.3.2 Current AG Programme: Logic Model and Structure of the Programme

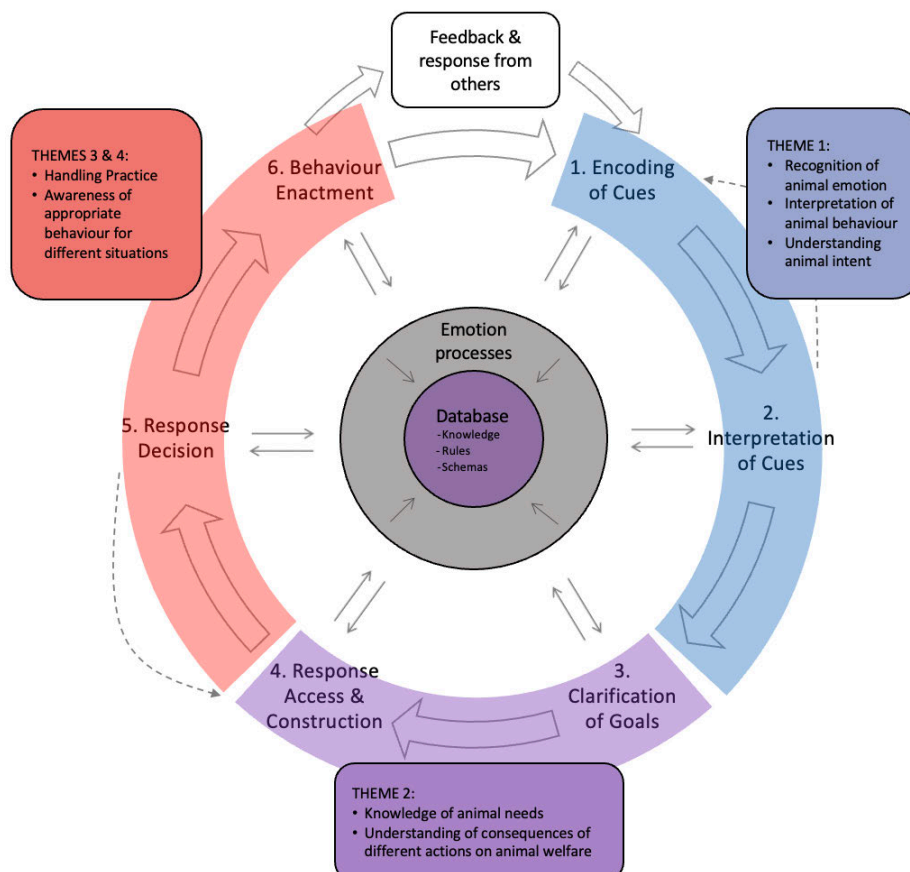
Combined with existing research, this iterative design process helped refine intervention content, explore change mechanisms, and streamline outcome measurement. These factors can be summarised with a logic model, which is an important part of evidence-based practice (Wolpert et al., 2016) including for the development and evaluation of AWE programmes (Muldoon & Williams, 2021b). Figure 6.2 shows the logic model produced for the evaluation of AG (based on the template in Wolpert et al., 2016). This process helped clarify how mechanism of change and outcomes could be split into two categories. *Primary outcomes* for AG are the taught aspects directly targeted by the intervention, including knowledge of animal emotions and needs, belief in animal sentience, and behaviours around animals. *Secondary outcomes* for AG are the latent psychological risk factors which the intervention tackles indirectly, including human-directed and animal-directed empathy as well as self-regulation and executive functioning (EF) skills, especially inhibitory control.

Figure 6.2: Logic model for the Animal Guardians programme as delivered for the current evaluation



The primary outcomes are addressed by sequentially teaching children about four key themes: (1) understanding animal sentience and recognizing animal emotions, (2) learning about animal welfare needs, (3) responsible ownership and care, and (4) practicing appropriate handling and behaviour around animals. These themes are pedagogically informed to build on each other and recapitulate the processes involved in Social Information Processing (SIP; Lemerise & Arsenio, 2000), as shown in Figure 6.3. Along with emotional regulation processes (Parfitt & Alleyne, 2018), SIP has been theorised to be a useful tool to understand cases of animal harm (Henry, 2018), in educational psychology (Cooke, 2017), and a good framework for understanding the development of moral decision making. Activities are structured to ensure that children first cover each theme separately and then have an opportunity to bring all the components together at the end.

Figure 6.3: Themes Covered in Animal Guardians and Social Information Processing Theory.



Note. Diagram highlighting how themes covered in Animal Guardians are associated with the Social Information Processing model as conceptualised by Lemerise and Arsenio (2000).

Table 6.1: Overview of a typical set of sessions for the Animal Guardians Program with main themes and example games for each session.

Session	Objective	Activities and Equipment
1	Introduction to the program	Activity Pack
2	Emotion Recognition Human and animal	Snow Globe: labelling own emotion and self-regulation (repeated at start of each session) Emotion Boards: matching emotions to pictures
3	Emotion Recognition Nuances	Hexagon game: emotions are interlinked +handling
4	Welfare Needs Basic	Hello! five domains and Velcro onto each +handling
5	Welfare Needs Basic	Triangles: need to match good and bad things for cows, hedgehogs, and cats.
6	Welfare Needs Advanced	What do I need? Six animals – play an animal and then around you need to put everything it needs +handling + Lucky Max part 1
7	Responsibilities Introduction	Dominos game: responsibilities around both pets and wildlife +handling + Lucky Max part 2
8	Responsibilities Bringing everything together	Decisions game: Bringing everything together using pictures so that there is an emotional and situational recognition element which ties into the behaviour. Includes much trickier emotions to recognize. +handling + Lucky Max part 3
Extra Games	Brief interactive/ kinetic games which can be added throughout	- Dice game: recap on human and animal emotions - Emotion pictures: Go match animal’s emotion to the emoji around the room- allows children to run around. - Match it! game which works on visual attention where children have to find two matching symbols
9	Wrapping up	Activity Pack

Empathy and self-regulation are indirectly targeted through activities’ content, characteristics, and structure. The AG programme covers children’s own emotions, emotion recognition in humans and animals, and animal-related perspective taking, all of which are common elements in school-based empathy interventions (Berliner & Masterson, 2015). Furthermore, the YEOs adopt an empathetic stance with children and model empathetic behaviour, which is also an important component to promoting empathy in school-settings (Feschbach & Feschbach, 2009). With regards to self-regulation, most activities are designed

as turn-taking “board games” or kinetic activities, both of which have been shown to increase Executive Functions in normally developing children, especially inhibitory control (Gashaj et al., 2021). Children also play a visual matching game which works on attention, working memory, and cognitive flexibility (e.g., the OT Toolbox). Table 1 shows the structure for a typical AG programme; more details on the equipment and structure of each activity can be found in Supplementary Table 6.1. Number of sessions can vary, but children who complete the program will typically receive 6-10 sessions.

6.2.3.3 A Note on the Impact of COVID-19 on Delivery and Evaluation

Unfortunately, COVID-19 has a range of impacts on the way the AG was delivered and could be evaluated. During the height of the pandemic, programme delivery (and evaluation) had to be entirely stopped, since children were not going to school. Once schools had reopened, YEOs were quickly allowed back into most schools to deliver the school-based portion of the AG programme. In the intervention’s original design, there was also an option for the child to visit one of the Scottish SPCA’s rescue-and-rehoming centres at the end of the school-based sessions. Unfortunately, this part of the programme had to be suspended and did not occur in the iteration of AG under evaluation but is planned to resume from September 2022. Evaluation procedures also had to be adapted, as researchers were not allowed back into schools, which meant that there could be no one-to-one task-based components in the evaluation. The activity pack was designed to be completed with pencil and paper, as easily as possible with minimal assistance from an adult. Although most constructs of interest could still be evaluated in this way, it was not possible to measure EFs.

6.2.4 The Current Study

The main aim of this study was to evaluate the effectiveness of the AG programme by determining whether it improved primary targets of the intervention, including children’s belief in animal sentience, knowledge of welfare needs, and responsible behaviour. Given the link between animal harm and lower empathy, a second aim of the study was to evaluate whether the program increased children’s empathy towards other children and animals. Finally, we sought to understand whether the programme would be equally effective for all referred children, or if certain factors might impact effectiveness. To explore these aims, we used pre- and post- questionnaires with a set of referred children who

participated in the AG program, and group of matched control children who did not receive any intervention. We had three main hypotheses:

1. The AG programme will have a significant positive effect on referred children's attachment to pets, belief in animal minds, welfare knowledge, and behaviour towards animals, compared to control children.
2. The AG programme will have a significant positive effect on referred children's empathy towards other children and animals, compared to control children.
3. The effectiveness of the programme will not be different when comparing referred children based on gender, age, and severity of harm.

6.3 Methods

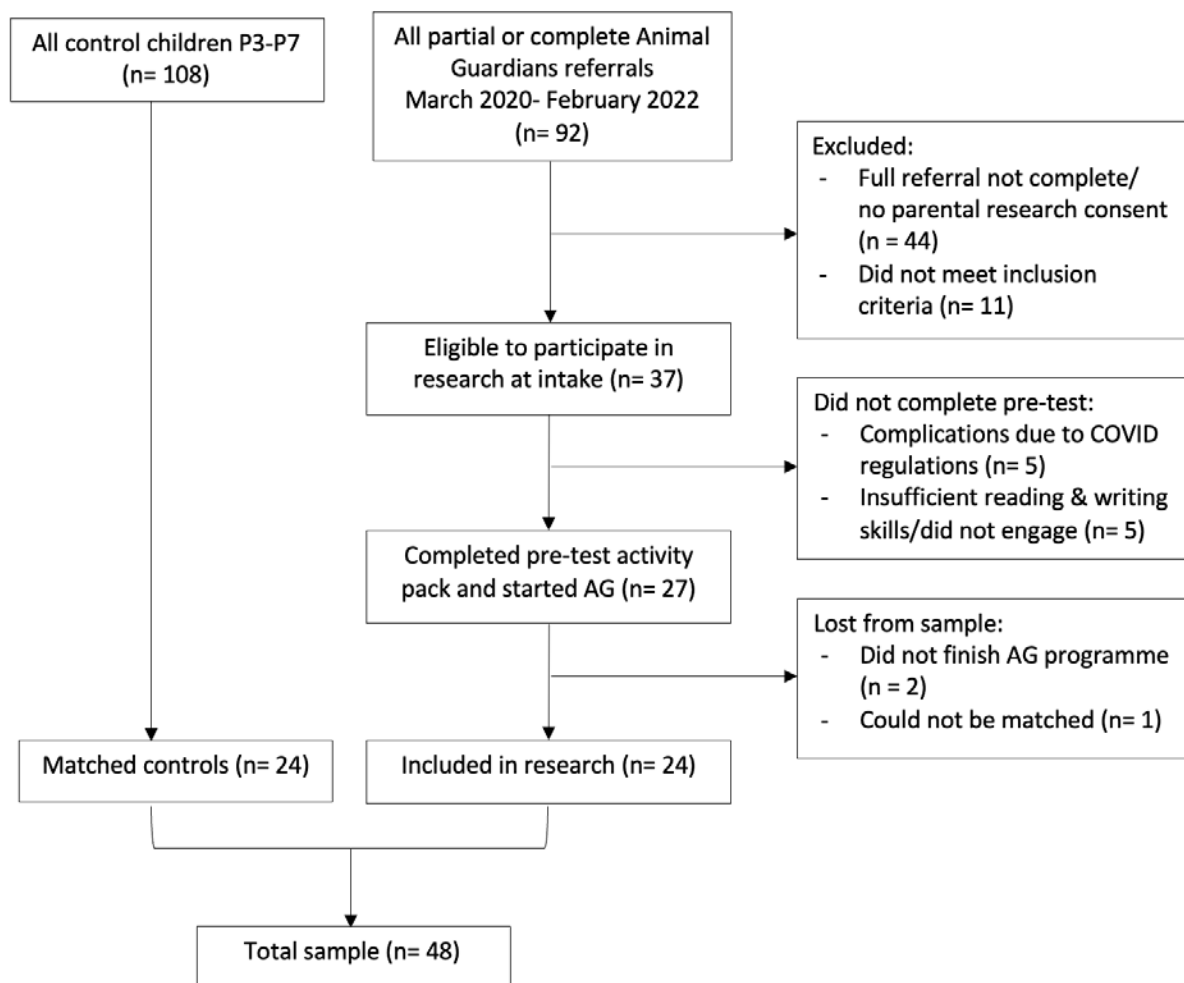
Ethical approval for this research was granted by the Clinical and Health Psychology Ethics Committee, University of Edinburgh [CLPS009]. The study also gained ethical approval from the City of Edinburgh council for research with schools. Research was carried out following the British Psychological Society (BPS) Code of Human Research Ethics (Oates et al., 2021).

6.3.1 Participants

Participants were 24 children referred to the Animal Guardians (AG) programme (11 girls and 13 boys, mean age = 7.9, SD = 2.1) who were on the programme between November 2020 and June 2022, and 24 matched controls (11 girls and 13 boys, mean age = 7.9, SD = 1.8). Referrals to the programme came from various sources, including teachers, parents, social work, and Scottish SPCA inspectors, either where animal harm had already occurred or where a referring adult was concerned it might. Control children did not receive an intervention but completed the activity pack twice, 8 weeks apart. They were recruited from a school in the Edinburgh City area, with one class from each year group from P3-P7 completing the pre- and post- test questionnaire for a total of 108 complete responses. Each referred child was then matched to one control child on sex and pet ownership, and as closely as possible on age and school class (three five-year-old children were matched to six-year-old children, and one 13-year-old child was matched to an eleven-year-old). The majority of referred children lived with pets ($n = 21$), with the same number in the matched control group. We also matched children as closely as possible on type of pet owned. Although this was not always perfect (especially in cases where children lived with several

pets) Fisher’s exact tests showed there were no significant differences between referred and control groups for frequency of ownership on any of the pet types. In the referred group, most children lived with dogs (n= 16), followed by cats (n= 12), small mammals (n= 4), and birds or reptiles (n= 4). In the control group children lived with dogs (n= 11), cats (n= 10), small mammals (n= 5), and reptiles or birds (n= 4). Figure 6.4 presents a flow diagram showing where referred and matched-control children came from, and which children were included in the research.

Figure 6.4: Participant Flow Diagram



6.3.2 Measures

The full Activity Pack shows all the measures described here and is provided in Appendix X. Measures are described below in the order in which they appear in the pack.

6.3.2.1 Family Composition and Hierarchical Mapping Drawing Task

The first task asked children to draw themselves in the middle and “anyone important like family, friends, or pets” around them, on a sheet with concentric circles. This “bull’s eye” hierarchical mapping task was used in Chapters 3 and 5. Children could draw as many or as few people as they chose for their picture and were asked to label each person with their relationship (e.g., sister, friend) rather than their name. Control children completed this independently, while referred children completed this with help from the Scottish SPCA Youth Engagement Officer, who could label and/or draw if needed. Family composition was assessed *after* this measure (so as not to prompt children to include certain people/pets for the drawing), and asked children “Who do you live with at home?”, and “Do you have any pets at home?” (yes/no) and then “What types of pets do you have at home?”.

For analysis, the distance between the centre of the child and the centre of each figure was measured in centimetres to produce a “closeness” score. Children’s relationships were divided into categories and where more than one character appeared, the closest figure was used. The categories were: mother, father, pet(s), sibling(s), extended family, and other. Children’s “score” for each category was calculated using the reciprocal of the distance (i.e., $1 / [\text{distance measured in cm}]$) so that low scores corresponded to a larger distance to the self. For mother and father categories, if no corresponding figure was drawn, a score of zero was given (since all children have two parents). For siblings and pets, if the child indicated that they did *not* live with siblings or pets and did *not* draw them, this was left as missing data. If they *had* indicated they lived with sibling(s) and/or a pet(s) and did not draw at least one corresponding figure, they were given a score of zero. A few children who did not live with pets included a pet in their drawing (e.g., their grandmother’s pet); in this case, the child received a closeness score using that pet.

6.3.2.2 Short Attachment to Pets Scale

The Short Attachment to Pets Scale (SAPS; Marsa-Sambola et al., 2016) is a brief nine item self-report measure of attachment to pets designed for use with children. It uses a five-point Likert scale for each item, from “Strongly Agree” to “Strongly Disagree” and has one item which needs to be reverse-coded. An overall average across the nine items was taken for each child, so that a higher score corresponded to higher attachment to pets. The scale

has excellent internal reliability with a sample of children aged 7-12 ($\alpha = 0.85$; Hawkins & Williams, 2017). As in previous versions, items also had the text “or would if I had one”, so that children who did not have pets could also answer the questions ($\alpha = 0.79$).

6.3.2.3 Child Belief in Animal Minds

Children’s understanding of animal sentience was measured using the Child’s Belief in Animal Minds (Child-BAM; Hawkins & Williams, 2016), which asks children whether they think a range of animals are: (1) clever, and can feel (2) pain, (3) happiness, (4) sadness, and (5) fear. The original measure was developed for children 6-13 years and had good reliability using a set of seven animals ($\alpha = 0.92$). For this study, we adapted the measure to make it shorter, given the number of questions already in the activity pack. The scale started with children’s views on human sentience followed by dogs and cats. Scores for the human and animal items were kept separate, and the dog and cat items retained good internal reliability ($\alpha = 0.79$). Each item was scored on a five-point Likert scale, and the child’s overall BAM score was calculated by averaging scores for cats and dogs, with a higher score corresponding to higher belief in animal sentience.

6.3.2.4 Welfare Knowledge

Welfare knowledge was measured using a free-response task very similar to the one used in Chapter 4. Children had to fill in welfare needs for dogs and cats by listing “everything good for a [dog/cat]” on one side, and “everything bad for a [dog/cat]” on the other. Children were provided with six spaces on each side but told they could fill in as much or as little as they wanted. If needed, children were provided help with reading and writing but were not given feedback. Answers were scored by giving one point for each of the Five Provisions (environment, diet, physical health, expression of natural behaviour, and companionship; see Mellor, 2016) correctly identified on the positive side, and each of the Five Freedoms correctly identified on the negative side (freedom from hunger/thirst, discomfort, pain, distress, and to express natural behaviour). There was an additional point available for stating that absence of companionship could be negative, and a total of 11 points were available for each animal. Four coders coded 20% of a larger sample (all referred and control children, $n = 136$) at pre- and post- test and reliability was calculated for each dimension using Cohen’s Kappa. Overall reliability for was moderate ($\kappa = 0.69$; McHugh, 2012).

6.3.2.5 Positive and Negative Behaviour Toward Animals

Children's behaviour towards animals was measured using a novel 27-item scale which mixed positive and negative behaviours. This was done to reduce response style bias and ensure that children did not feel stigmatised while completing items on harmful behaviour. Since there is not an existing measure of both positive and negative behaviour, this scale was created by combining items from existing scales exploring each separately, as well as adding items based on previous research, to ensure we were capturing a complete spectrum of behaviours. Items for this scale came from two main sources: 11 items from the Children's Treatment of Animal Questionnaire (CTAQ; Thompson & Gullone, 2003) and 10 items from the Childhood Animal Harm Behaviour (CAHB; Connor et al., 2018). The CAHB is an 11-item scale which had good reliability with an adolescent sample ($\alpha = 0.79$; Connor et al., 2018), and a version measuring attitudes towards the same harmful behaviours has been used with primary school children ($\alpha = 0.70$; Hawkins et al., 2020a). We used all items from the CAHB but collapsed "Forgot to give food" and "Forgot to give water" into a single item. The CTAQ was developed using a sample of 8–10-year-old children to explore both positive and negative behaviours towards animals. The original scale had 19-items, but the authors shortened this to a 13-item version retaining only positive behaviours. We selected a mixture of 10 positive and negative items from the original 19-item scale to complement the items in the CAHB; we excluded items which were animal-specific and could not apply to all pet types (e.g., "take for a walk" would only usually apply to dogs) or which were positive for the child but not necessarily the animal (e.g., "play dress-up with", "tell my secrets to").

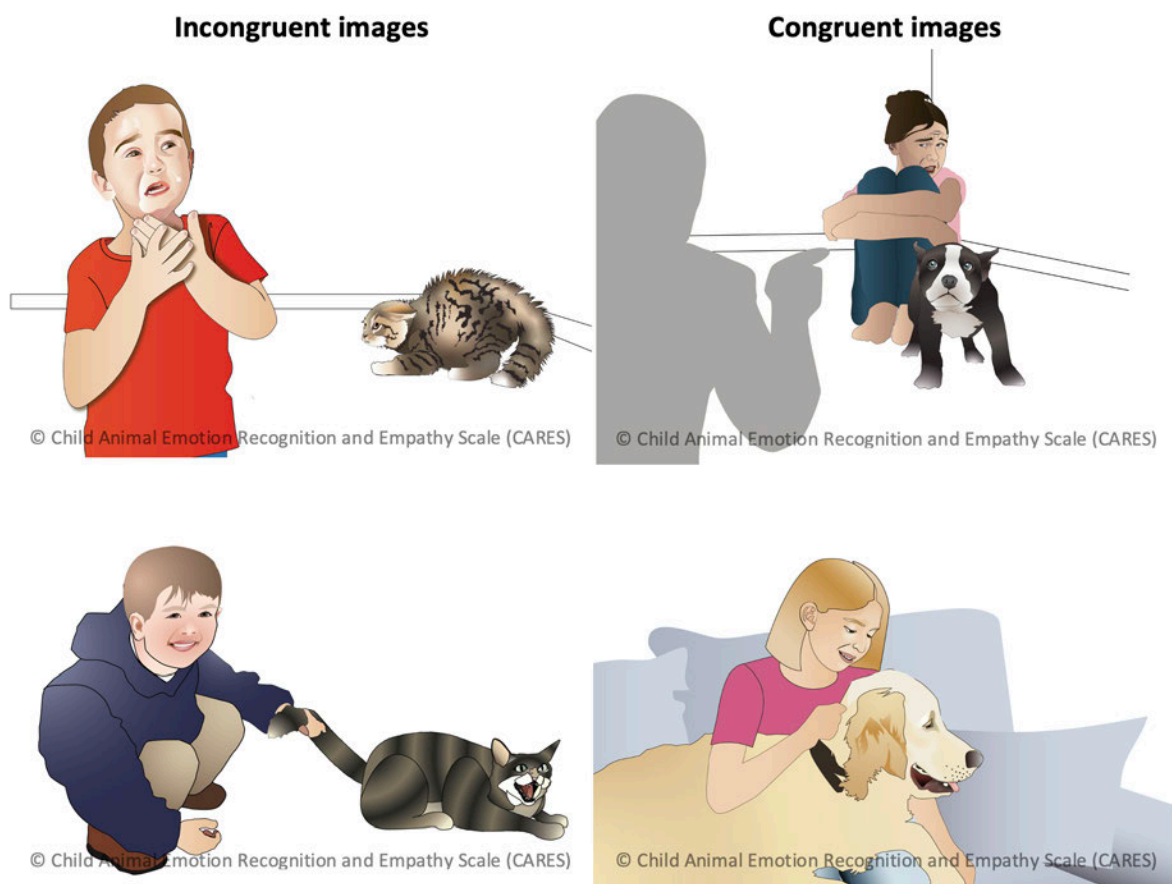
The 21 items from these two scales were supplemented with six novel items: four novel positive items and two novel negative items, arising from discussions with the Scottish SPCA and existing research (Wauthier et al., 2020). Children were asked "How often have you done these things in the last month?" and had three options for each item: "Never", "1-2 times", and "More than 2 times". Scales were scored so that higher scores were positive. Thus, for negative behaviours, "Never" received three points, "1-2 times" received two points, and "More than 2 times" received one points, with the reverse for the positive items, and average scores were calculated separately for positive ($\alpha = 0.81$) and negative ($\alpha = 0.87$) behaviours. Supplementary Table 2 gives the full list of items, their origin, and the means and standard deviations for the referred and control children.

6.3.2.6 Empathy Towards Humans and Animals

Empathy towards humans and animals was measured using the Child Animal Emotion-Recognition and Empathy Scale (CARES) a novel picture-based measure using drawings of children interacting with animals. The CARES takes inspiration from the Kids Empathy Development Scale (KEDS; Reid et al., 2013), a picture-based measure which uses line drawings to probe cognitive, affective, and behaviour empathy. In previous research, we used an adapted version of the KEDS with primary school children adding four pictures of interactions with animals (Wauthier et al., 2022). However, there were a variety of issues which we wished to address in the creation of the CARES: (1) the images in the KEDS are simplified and not realistic (e.g., faces are not drawn for focal figures), (2) questions do not target the theoretically intended dimension of empathy very well (e.g. affective empathy was probed using the question “How do you think the child is feeling?”), and (3) there are currently no measures of empathy towards animals available for young children.

Thus, the CARES is a set of 10 images designed to be realistic depictions of interactions between children and animals, showing the expression of five basic affective states (happy, sad, scared, angry, neutral) while balancing the number of girls, boys, cats, and dogs, and using a mixture of images where emotions are congruent (child and animal are feeling the same emotion) and incongruent (child is feeling one emotion, animal another). Definitions provided by Overgaauw et al. (2017) form the theoretical basis for the questions in the CARES, although theoretically expanded to include *both* children and animals, and *both* positive and negative emotions. Overgaauw et al. (2017) define: (1) cognitive empathy as “the extent to which a child understands why another person is in distress”, (2) affective empathy as “the extent to which a child feels for the emotional state of the suffering person”, and (3) behavioural empathy (which they call *intention to comfort*) as “the extent to which a child is inclined to actually help or support the suffering person”. Thus, in the CARES, each image has a set of six questions: two multiple-choice questions probing emotion recognition, and three free response questions, one for each of the three empathy dimensions. To keep the measure short, a subset of four images was selected for the current study with two images each for congruent and incongruent emotion between child and animal, girls and boys, and finally cats and dogs (see Figure 6.5).

Figure 6.5: *The Four CARES Images Used in the Current Study*



Note. Images showing human emotions (clockwise from top left: sad, scared, happy, and happy), and animal emotions (clockwise from top left: scared, scared, relaxed, angry).

Cognitive empathy was measured by taking an average of the emotion recognition multiple choice question and the cognitive free response question. The multiple-choice question asked, “How do you think the [BOY/GIRL] is feeling?” with five options (Happy, Sad, Angry, Scared, Relaxed/Neutral, I don’t know) repeated once for the child and once for the animal. The free-response question asked, “What do you think is happening in this scene?” and answers were scored on two three-point scales (0 to 2), once for an understanding of the situation from the child’s perspective and once for an understanding of the situation from the animal’s perspective. Affective empathy was measured using the question “How does seeing this make YOU feel?” and answers were scored twice on a four-point scale (0 to 3), once for how much the answer reflected the child’s emotion in the scene, and once for how much the answer reflected the animal’s emotion. Finally, behavioural empathy was

measured using the question “What would YOU do if you saw this happening?”, which was scored twice on a five-point scales (-1 to 3) once for the compassion and helpfulness towards the child in the image, and once for the compassion and helpfulness towards the animal in the image (negative scores were rare and corresponded to aggressive behaviours such as “punch the child”). Four coders coded 20% of a larger sample (all referred and control children, n= 130) at pre- and post- test, and reliability for the free-response questions was calculated using Cohen’s weighted Kappa. Overall, inter-rater reliability was moderate ($\kappa = 0.71$; McHugh, 2012), with $\kappa = 0.59$ for cognitive empathy, $\kappa = 0.72$ for affective empathy, and $\kappa = 0.82$ for behavioural empathy. Supplementary Table 3 gives the coding scheme used for the first image as an example.

6.3.3 Procedure

Data collection for this study occurred at two time points (pre-test and post-test) and there were distinct procedures for referred and control children. Parental consent for children referred to AG was obtained through an opt-in consent form within the referral process, and parents could refuse for their child to participate in the research without affecting their child’s eligibility for the program. For control children, parental consent was obtained through an opt-out consent form handed out in class one week before the pre-test. On the day of the pre-test, both referred and control children provided informed assent, by going through an information sheet which clearly stated they could withdraw at any time, and a separate tick-box consent form. Children were then provided with an “Activity Pack”, which had all the measures together with brief instructions. Referred children completed the Activity Pack one-to-one with a YEO on the first day of their AG programme. The YEO helped them with reading and writing but had clear instructions to not provide any feedback on answers. Control children completed the pack individually within a class setting, with the class teacher helping children as needed with reading and writing but again without providing any feedback. Class teachers also provided consent to participate in the research and were provided with a range of resources giving detailed instructions on how to complete each measure, which they could refer to as needed. Referred children then went through the AG programme, which lasted 8.5 sessions on average, and on the day of their last session, completed the Activity Pack once again. Control children did not receive any intervention but were given the activity pack to complete a second time, eight weeks after

the completion of the first pack. After completing each pack, children could choose a piece of Scottish SPCA stationary (pencil, ruler, eraser, keychain, etc.) as a “thank you” for their help. Activity packs were collected from the Scottish SPCA and from the primary school once all packs were completed, and children’s packs were numbered to anonymise data entry.

6.3.4 Data Handling and Analyses

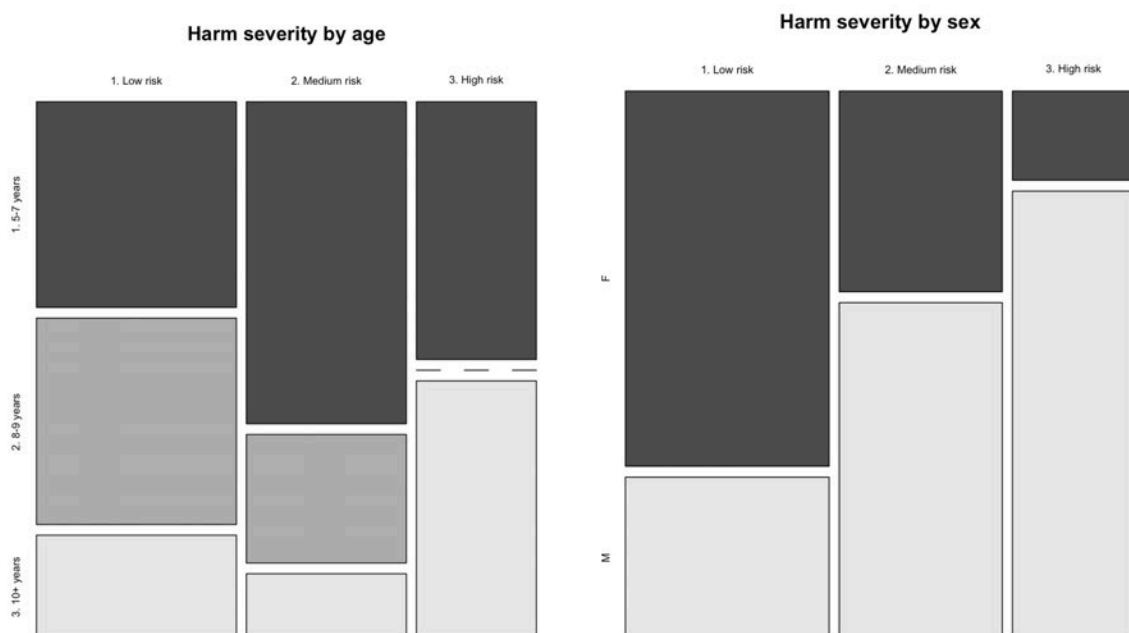
Data from activity packs were entered into Excel for preliminary handling, including data cleaning, reverse coding items, and calculating scores across scales. All variables were calculated so that a higher score was positive (for the negative behaviour measure, a higher score correspondence to an absence of harmful behaviours). The finalised dataset was imported into RStudio for analyses. Each variable was inspected for significant violations of parametric assumptions, including skew, kurtosis, normality, and inspection of histograms and q-q plots. Several variables violated assumptions, so analyses were carried out using robust tests (Field & Wilcox, 2017). To test the first and second hypotheses on the effectiveness of the intervention, a series of robust mixed (2x2) Analysis of Variance (ANOVA) were carried out using 10% trimmed means with `bwtrim()` function of the `WRS2` package in R (Mair & Wilcox, 2020). Explanatory measures of effect size (ξ) for the main effects were obtained through the `yuen()` function for the difference in scores between the referred and control group, and the `yuend()` function for changes between the pre- and post- test (Mair & Wilcox, 2020). The `WRS2` package does not provide a calculation of the interaction term’s effect size, so data were subset for referred and control groups and effect sizes across time are provided separately for each group. Results were plotted with the `ggplot2` package in R, displaying boxplots, mean, and bootstrapped confidence intervals. To test the third hypothesis on whether the intervention was equally effective across age, sex, and severity of harm, we analysed only the referred children. Because our sample size was too small to perform a MANOVA, we calculated a change in score from pre-test to post-test for each variable, transformed these into z-scores, and then calculated an overall average. Using this overall change score, we performed three robust one-way between-subject ANOVAs using the `t1way()` function, comparing sex (males and females), age binned into three groups (5-7, 8-9, and 10-11), and harm severity binned into three groups (low-risk, $n=10$; medium risk, $n=8$; high-risk, $n=6$). We followed up any significant results by carrying out robust one-way ANOVAs for each variable.

6.4 Results

6.4.1 Description of Animal Harm Incidents

To understand the nature of the animal harm incidents leading to children's referral to Animal Guardians, we carried out some descriptive analysis using details collected by the Scottish SPCA. Animal harm incidents were primarily towards dogs (n= 11), followed by cats (n= 3), hedgehogs (n= 3), birds or reptiles (n= 2), and fish (n= 1); some children had been referred for harmful behaviour towards multiple animal species (n= 4). Type and severity of animal harm could be binned into three risk categories. Low risk referrals (n=10) included witnessed animal cruelty (n= 2), identified as at-risk but no harm had occurred (n=4), and minor physical harm such as rough handling (n= 4). Medium risk was comprised entirely of moderate physical harm (n= 8) since there were no cases of emotional tormenting. High-risk was reserved for cases which resulted in the death of the animal (n=6). None of the animal death incidents involved dogs; one involved a kitten, one involved a reptile, one a domestic bird, one a fish, and two involved hedgehogs. We explored whether there were differences in severity of harm by age or sex. Although mosaic plots (Figure 6.6) suggested males may have been involved in more serious harm cases than females, harm severity did not vary significantly by either age ($p = 0.405$) or sex ($p = 0.148$) when using Fisher's exact test.

Figure 6.6: Mosaic plots showing harm severity by age and gender within the sample of referred children



6.4.2 Family composition, child relationships, and risk of animal harm

To replicate results in Chapter 4 and 5, we also wanted to determine whether family composition and apparent “attachment” assessed through the hierarchical drawing task was related to children’s risk of animal harm. This also seemed important to explore, since it was not something we could control for. Using children’s self-report of family composition, Fisher’s exact test showed that referred children were as likely as control children to live with their mother and sibling(s) but were much less likely to live with their fathers (see Table 6.2). We also wanted to use the drawing task to explore whether there were differences between referred and control children’s closeness to different family members. Using Mann-Whitney U tests, there were no difference in closeness for mother, sibling(s), and pet(s), but there was a significant difference for fathers ($p= 0.002$). However, there may have been a serious confounding factor here: referred children completed the drawing task one-on-one with the Youth Engagement Officers, who could offer to draw for them, while control children completed the drawing independently. This may make the distances difficult to compare, since having to draw attachment figures oneself is much more activating of attachment representations than having someone else draw them and simply indicating where to place them. To address this, we also explored *whether* children included certain figures in their drawings (binary outcome). Doing this, referred children were less likely to include their mothers *and* their father than control children, but there was no difference in the inclusion of siblings (for those who had siblings) or pets (for those who had pets; see Table 6.2).

Table 6.2: Frequencies and p-values for Fisher’s exact test of different family members in children’s family composition and drawings.

		Referred		Control		p- value
		Present	Absent	Present	Absent	
Mum	Family composition	19	5	22	2	0.416
	Drawing	14	10	21	2	0.017*
Dad	Family composition	6	18	20	4	<0.001***
	Drawing	8	16	20	3	<0.001***
Sibling	Family composition	16	8	18	6	0.752
	Drawing	10	4	13	4	0.999
Pet	Family composition	21	3	21	3	-
	Drawing	16	6	19	2	0.135

6.4.3 Effectiveness of Animal Guardians on Primary Outcome Measures

To investigate the effect of the AG programme on five primary outcome measures (attachment to pets, belief in animal minds, welfare knowledge, positive and negative behaviour towards animals) we carried out robust mixed ANOVAs. Descriptive statistics of means and standard deviations at pre- and post- test for each of the primary outcome variables are given in Table 3. Although robust statistics with 10% trimmed means are used for the main analyses, this table gives the raw (non-trimmed) means and standard deviations for each variable. Variables which show a significant change between pre- and post- test (as shown in Table 6.3) are bolded here.

Table 6.3: Means and standard deviations at pre- and post- test for both referred and control children across primary outcome variables.

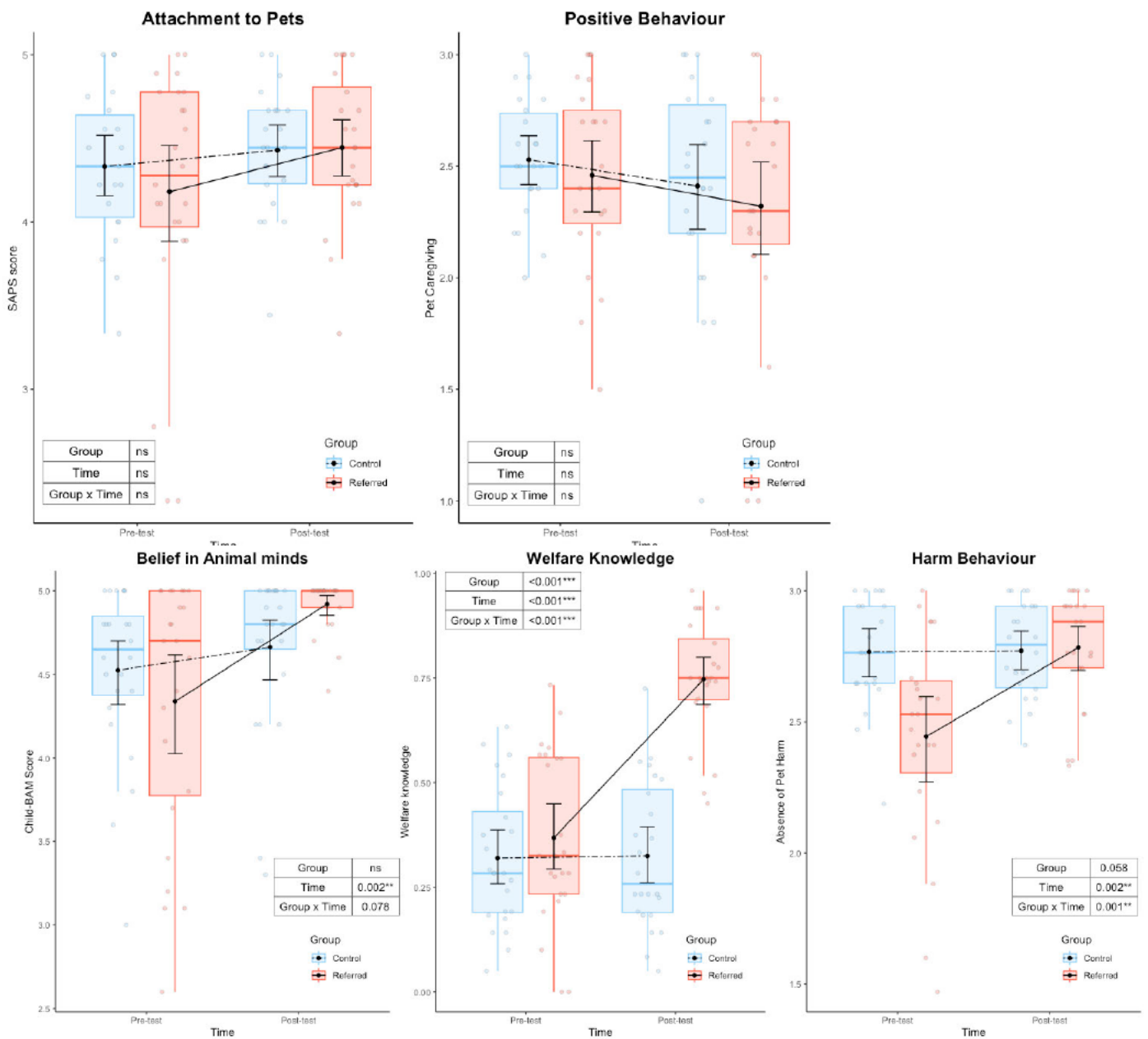
	Referred		Control	
	Pre-test	Post-test	Pre-test	Post-test
Attachment to Pets	4.14 (0.76)	4.45 (0.44)	4.33 (0.45)	4.43 (0.37)
Belief in Animal Minds	4.34 (0.77)	4.92 (0.16)	4.53 (0.51)	4.66 (0.48)
Welfare Knowledge	0.37 (0.21)	0.75 (0.14)	0.32 (0.17)	0.32 (0.18)
Positive Behaviour	2.46 (0.41)	2.32 (0.54)	2.53 (0.27)	2.41 (0.49)
Negative Behaviour	2.44 (0.40)	2.78 (0.22)	2.77 (0.21)	2.77 (0.18)

Robust mixed ANOVAs and follow-up tests (Table 6.4) showed that the AG intervention had a significant positive impact by increasing referred children’s belief in animal sentience, increasing welfare knowledge, and reducing negative behaviour. There was no effect of the intervention on children’s attachment to pets or on their self-reported positive behaviour towards pets. Although the interaction term for belief in animal minds was not significant, we can see in the robust t-tests by group that only referred children had a significant increase in child-BAM score. In fact, control children did not have a significant increase in score for any of the primary outcome variables. Figure 6.7 displays boxplots for the change in each of these variables, along with means and bootstrapped confidence intervals.

Table 6.4: Results of robust mixed ANOVAs across primary outcome variables with follow up robust t-tests showing change by sub-group (referred or control) across time.

	Effect		<i>F</i> or <i>t</i>	<i>df</i>	p-value		ξ -hat
Attachment to pets	Group		0.015	1, 29.58	0.903		0.02
	Time		2.577	1, 31.91	0.118		0.19
	Time*Group		0.310	1, 31.91	0.581		
	<i>By sub-group</i>	Ref.	-1.475	15	0.161		0.18
		Con.	-1.026	13	0.324		0.17
Belief in Animal minds	Group		0.004	1, 33.78	0.948		0.10
	Time		11.363	1, 34.17	0.002	**	0.47
	Time*Group		3.308	1, 34.17	0.078		
	<i>By sub-group</i>	Ref.	-2.496	15	0.024	*	0.86
		Con.	1.253	15	0.229		0.24
Welfare knowledge	Group		28.183	1, 36.94	<0.001	***	0.67
	Time		55.866	1, 28.25	<0.001	***	0.53
	Time*Group		53.499	1, 28.25	<0.001	***	
	<i>By sub-group</i>	Ref.	-8.437	15	<0.001	***	0.92
		Con.	-0.252	15	0.804		0.02
Positive Behaviour	Group		0.283	1, 31.75	0.598		0.11
	Time		1.723	1, 31.39	0.199		0.16
	Time*Group		0.026	1, 31.39	0.873		
	<i>By sub-group</i>	Ref.	1.122	14	0.281		0.14
		Con.	0.664	13	0.518		0.14
Negative Behaviour	Group		3.868	1, 31.04	0.058		0.32
	Time		12.187	1, 22.48	0.002	**	0.39
	Time*Group		13.736	1, 22.48	0.001	**	
	<i>By sub-group</i>	Ref.	-3.758	14	0.002	**	0.66
		Con.	0.255	13	0.803		0.03

Figure 6.7: Boxplots Showing Children’s Change in Score Across Primary Outcome Measures



6.4.4 Effectiveness of Animal Guardians on Human- and Animal-Directed Empathy

To gain an in-depth understanding of the effects of the AG programme on human- and animal-directed empathy, we analysed the change across the three sub-dimensions: cognitive, affective, and behavioural empathy. Descriptive statistics of means and standard deviations at pre- and post- test for these three sub-variables across human and animal directed empathy are given in Table 6.5. As before, variables which show a significant change between pre- and post- test for each sub-group (as shown in Table 6.6) are bolded.

Table 6.5: Means and standard deviations at pre- and post- test for both referred and control children across human- and animal-directed empathy.

		Referred		Control	
		Pre-test	Post-test	Pre-test	Post-test
Animal	Cognitive	1.09 (0.34)	1.52 (0.35)	1.03 (0.41)	1.09 (0.25)
	Affective	0.89 (0.44)	1.23 (0.42)	0.91 (0.46)	1.15 (0.55)
	Behavioural	0.78 (0.58)	1.11 (0.45)	0.75 (0.54)	0.82 (0.51)
Human	Cognitive	1.18 (0.30)	1.43 (0.30)	1.18 (0.37)	1.19 (0.36)
	Affective	1.00 (0.43)	1.05 (0.36)	1.00 (0.45)	1.14 (0.57)
	Behavioural	0.45 (0.80)	0.81 (0.64)	0.53 (0.50)	0.79 (0.63)

Robust mixed ANOVAs (Table 6.6) showed that referred children significantly improved across all dimensions of animal-directed empathy. This was strongest for cognitive empathy and was accompanied by a significant interaction effect. For affective and behavioural empathy, while there was a significant improvement for referred children, the interaction terms were not significant. For affective empathy, this may have been because control children had a lesser but still significant increase in score, which would reduce the power of the test to detect a significant interaction term. One possible explanation for control children's improvement may be that there was a moderate practice effect associated with completing the empathy measure twice. For behavioural empathy, only referred children had a significant improvement, with control children showing no change. We can see that referred children's change and associated effect size ($\xi = 0.47$) was smaller than for the other dimensions (e.g., $\xi = 0.74$ for cognitive empathy), suggesting the study may be underpowered to detect a significant interaction effect for this dimension.

For human-directed empathy, there was a different pattern, and the effects of the intervention are less marked. Referred children had a significant improvement only for cognitive empathy, while control children did not show a significant increase for any of the dimensions of empathy. Behavioural empathy did significantly increase over time, but neither referred nor control children showed a significant improvement when analysed separately; this may again suggest a small effect the study was underpowered to detect. Based on an *a priori* power analysis conducted using G*Power3 (Faul et al., 2007), a sample of 34 participants is required to detect a medium effect size ($d = .50$) in a paired sample t-test with an alpha of .05 and a power of 0.8. The sample sizes for each group were

significantly below this (especially using robust methods which remove 20% of the sample), so we complemented these parametric tests with non-parametric test (Wilcoxon sign-rank) for each sub-group to check how robust the results were.

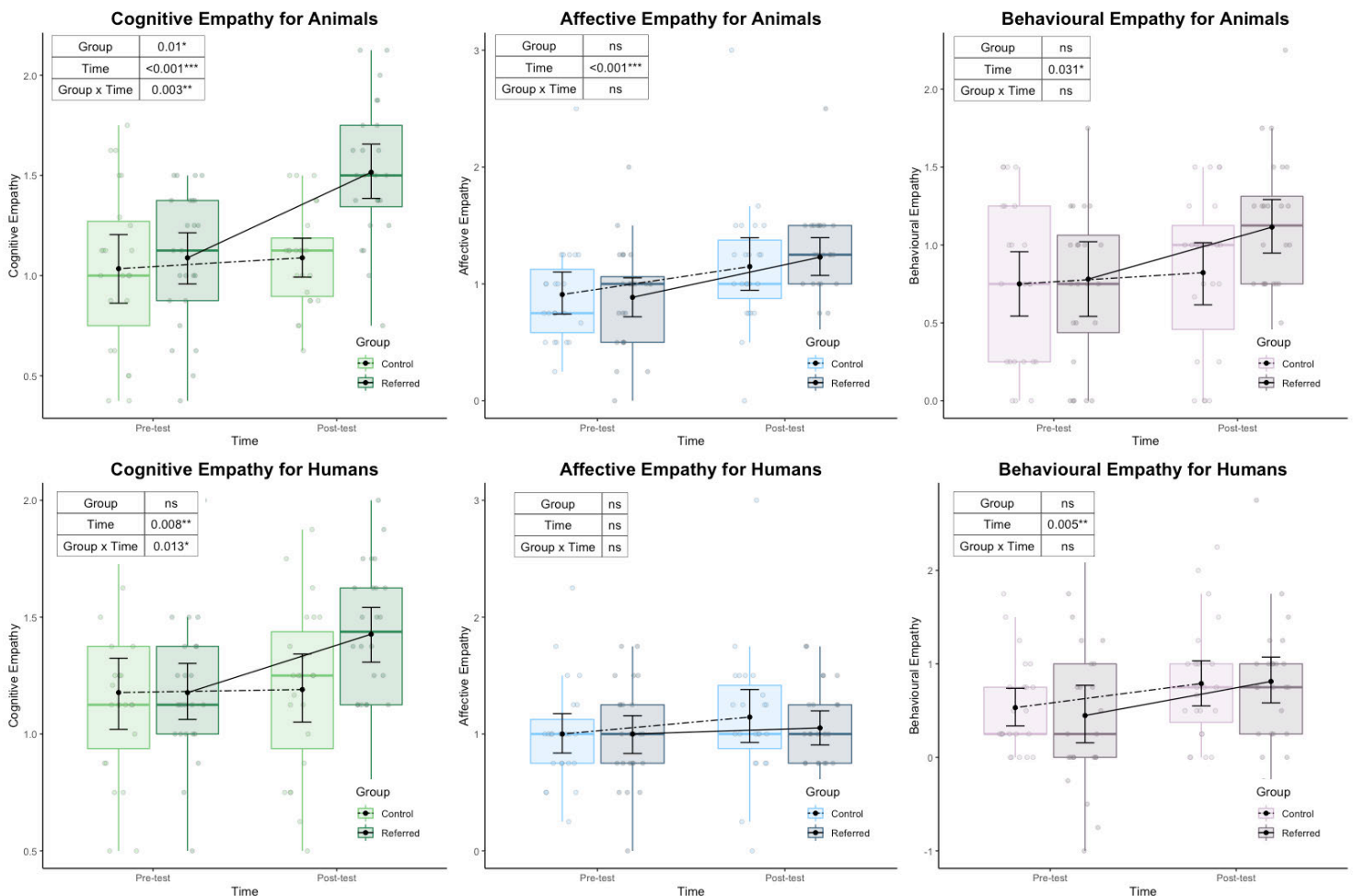
Table 6.6: Results of robust mixed ANOVAs across measures of human- and animal- directed empathy with robust t-tests showing change by sub-group (referred or control) across time.

		Effect	<i>F</i> or <i>t</i>	<i>df</i>	p-value		ξ -hat
Animal	Cognitive	Group	7.381	1, 35.60	0.010	*	0.43
		Time	17.053	1, 35.96	<0.001	***	0.40
		Time*Group	10.127	1, 35.96	0.003	**	
		<i>By sub-group</i>	Ref. -4.498	15	<0.001	***	0.74
			Con. -0.454	14	0.656		0.10
	Affective	Group	0.503	1, 35.95	0.482		0.13
		Time	19.733	1, 35.85	<0.001	***	0.50
		Time*Group	0.493	1, 35.85	0.486		
		<i>By sub-group</i>	Ref. -3.614	15	0.003	**	0.57
			Con. -2.151	14	0.049	*	0.53
	Behavioural	Group	0.843	1, 34.59	0.364		0.17
		Time	5.110	1, 31.94	0.030	*	0.29
Time*Group		1.903	1, 31.94	0.177			
<i>By sub-group</i>		Ref. -2.192	15	0.044	*	0.47	
		Con. -0.742	14	0.470		0.14	
Human	Cognitive	Group	1.731	1, 31.83	0.197		0.21
		Time	7.949	1, 33.75	0.008	**	0.28
		Time*Group	6.907	1, 33.75	0.012	*	
		<i>By sub-group</i>	Ref. -3.793	15	0.002	**	0.57
			Con. -0.358	14	0.725		0.05
	Affective	Group	0.068	1, 35.99	0.795		0.04
		Time	1.992	1, 35.98	0.166		0.17
		Time*Group	0.777	1, 35.98	0.383		
		<i>By sub-group</i>	Ref. -0.138	15	0.891		0.02
			Con. -1.667	14	0.117		0.27
	Behavioural	Group	0.003	1, 35.36	0.955		0.02
		Time	8.997	1, 35.94	0.005	**	0.31
Time*Group		0.156	1, 35.94	0.694			
<i>By sub-group</i>		Ref. -2.098	15	0.053	~	0.33	
		Con. -1.957	14	0.070		0.37	

Results are presented in Supplementary Table 4. These tests showed that referred children showed significant improvements in most dimensions, including human-directed behavioural empathy (the only measures *without* significant improvement were SAPS score, positive behaviour towards animals, and human affective empathy). There were also some

slightly different patterns for the control children, who showed significant improvement in human behavioural empathy but not animal affective empathy. Figure 6.8 displays boxplots with means and confidence intervals for the change for the three sub-dimensions of empathy, with animal-directed empathy in the top row, and human-directed empathy in the bottom row.

Figure 6.8: Boxplots Showing the Changes in Animal- and Human-Directed Empathy Across Cognitive, Affective, and Behavioural Dimensions.



We also briefly explored how primary outcome variables and empathy dimensions were related to each other. Supplementary Figure S1 shows a correlogram for the 48 children with scores at pre-test, with variables grouped using hierarchical clustering. From this, a few general trends emerged: human and animal empathy correlated strongly with each other within sub-dimensions, welfare knowledge grouped strongly with cognitive empathy, harmful behaviour did not group with any other variables, and positive behaviour grouped loosely with attachment to pets and belief in animal minds.

4.4.5 Effectiveness of the intervention across age, sex, and severity of harm

Given the improvement across most of the outcome measures for children referred to the AG program, we sought to explore whether all children showed similar improvements following the intervention. Using robust one-way between-subject ANOVAs, we investigated the effects of age, gender, and harm severity on an average of improvement across variables. The effectiveness of the intervention did not vary between males and females $F(1, 15.85) = 0.157$, $p = 0.697$ nor did it vary between low, medium, and high-risk harm categories, $F(2, 10.82) = 0.266$, $p = 0.771$. However, age did seem to have a marginal effect on the effectiveness of the intervention $F(2, 9.51) = 4.217$, $p = 0.049$, with post-hoc tests showing that there was a significant difference between the youngest age group (5-7 years old), which improved more than the oldest age group (10+ years, $p = 0.046$). Follow-up tests suggest that this was driven by differences in improvement on welfare knowledge $F(2, 9.22) = 4.18$, $p = 0.051$, with younger children improving marginally more than the older children ($p = 0.055$). This reflected the fact that the younger children had significantly worst welfare knowledge at pre-test $F(2, 7.3) = 5.03$, $p = 0.042$, but by post-test all age-groups scored similarly $F(2, 10.1) = 0.24$, $p = 0.789$. None of the other variables had significant differences in improvement between age-groups.

6.5 Discussion

The aim of this research was to evaluate the effectiveness of the AG programme by comparing changes in key outcomes in a group of referred children and a group of matched controls. Our results show that AG was especially effective at improving cognitive factors associated with animal harm: welfare knowledge, belief in animal minds, and cognitive empathy towards both humans and animals. There were also moderate improvements in self-reported animal harm behaviour, and though behavioural empathy towards animals did not have a significant interaction term (possibly due to tests being underpowered for smaller effect sizes), there was still a significant improvement observed in the group of referred children. However, the intervention did not significantly shift more affective dimensions related to animal harm, including attachment to pets, affective empathy, or caregiving behaviours towards animals. Results are discussed across cognitive, affective, and behavioural dimension in relation to existing research in child AWE, risk and protective factors for CAH, and broader child development psychology.

Before exploring the effectiveness of the programme, we analysed whether referred and control children had similar family compositions and drawings. We found that referred children were much less likely to live with their fathers, and less likely to include fathers and mothers in their drawings, but the difference was not significant for the inclusion of pets or siblings. The absence of fathers in referred children's lives is particularly notable: children of disengaged fathers are known to be more likely to develop externalising behaviours (Ramchandani et al., 2013). This provides tentative confirmation for the role of attachment and family stability, although it is important to note that inclusion of parents in drawings should not be taken as a direct proxy for attachment security.

6.5.1 Effectiveness of the Animal Guardians Programme

6.5.1.1 Cognitive Factors

Referred children had the largest improvements for welfare knowledge, belief in animal minds, and animal-directed cognitive empathy following AG. The large effects for these cognitive factors echo the results of existing AWE programs, especially those delivered over several sessions (Williams et al., 2022 large effect sizes), as compared to single-session interventions (Hawkins et al., 2017a medium effect sizes). Comparisons with control children at pre-test show that referred children did not start with lower levels of these cognitive factors, but that AG was improving these from a common baseline. This suggests that programmes for CAH can be effective not only by filling gaps in knowledge or cognitive empathy, but by improving dimensions that can act as protective factors and have can improve child resiliency (Masten & Barnes, 2018). As a result of the intervention being especially effective at shifting cognitive and knowledge-based risk factors, it achieved marginally greater improvements in younger children, since older children started with higher baselines. Interestingly, similar results were found in the Scottish SPCA's "Rabbit Rescuers" programme, where younger children (5-6 years old) also had larger increases in belief in rabbit sentience and in attitudes to cruelty than older children (6-7 years old; Williams et al., 2022). This highlights the importance of taking a developmentally informed approach to intervention, since different dimensions will have different timing for optimal improvement (see Malti et al., 2016 for a discussion of developmentally tailored interventions for empathy). Extrapolating this pattern further, it seems likely that

interventions for adolescent animal harm might benefit from going beyond knowledge-based aspects, and address age-appropriate constructs such as peer-group influences and discussion of broader societal consequence, and possibly adopt certain elements from adult interventions, such as accountability, responsibility, and legal consequences (e.g., RSPCA's "Breaking the Chain" and ASI's BARK programme).

6.5.1.2 Affective Factors

The AG programme was not as able to improve most affective dimensions related to animal harm, including attachment to pets, affective empathy, or caregiving behaviours towards animals. There are a range of reasons this might be the case. The intervention focused on preventing harm and emphasised the importance of children avoiding negative behaviours, which might explain the absence of change in caregiving behaviours. This might be further compounded by the fact that children do not typically have the main caregiving responsibilities towards pets, and this is typically viewed as parents' responsibility (Muldoon et al., 2015). Furthermore, there are few activities within AG on how to build a bond with a pet, which might be necessary to see shifts affective dimensions like attachment (Wanser et al., 2020). Furthermore, interventions targeting changes in child attachment security tend to require parental involvement (Cornell & Hamrin, 2008) which is not a core part of AG. Whether targeting affective constructs and attachment would be a useful intervention target, capable of further reducing risk of harm *while* being delivered safely in terms of animal welfare, is a question for future research. One possible benefit may be that targeting affective dimensions, improving attachment to pets, and encouraging positive caretaking behaviours would shift harm prevention to an intrinsically motivated goal, which might support deeper learning and sustained improvements in the long-term (Carlton & Winsler, 1998).

6.5.1.3 Behavioural Factors

Referred children had a large significant decrease in self-reported animal harm, moderate improvements in behavioural empathy towards animals, and nearly significant improvements in human-directed behavioural empathy. These results are promising, as this is one of the first studies to directly measure reduction in harmful behaviour following AWE or human education, since most studies measure changes in attitudes to harm (Hawkins et

al., 2017a; Lakestani et al., 2015) or changes in positive behaviours (Tardif-Williams & Bosacki, 2015). Self-reported animal harm behaviour was the only dimensions where referred children started significantly lower than control children, and the intervention brought them back to normative levels. Although we were not able to perform analyses that could tease apart the mechanisms of change, this suggests that improvement in targeted areas can act as protective factors against further acts of animal harm. More research needs to be done to tease apart the effects of AG on accidental compared to intentional harm behaviours. Self-reported behaviour and behavioural empathy did not correlate at pre-test, which suggests that these are measuring separate constructs, and highlights the importance of having other sources of information on the child's behaviour to validate results. Parent report may be a valuable and feasible addition, although existing studies show that parent and child report on animal harm behaviours can have quite low levels of correlation (Walters, 2018). Aside from issues with validity, one reason that self-reported behaviour and behavioural empathy may not have correlated is because they target slightly different behaviours: while the self-report assessed the child's own behaviours towards pets, behavioural empathy assessed children's ability to react appropriately to situations in which another child and/or animal was in distress. There are very few studies which directly relate empathy to observed behaviour, and self-reported empathy correlates notoriously poorly with empathetic behaviour as rated by an external observer (see e.g., Ogle et al., 2013).

6.5.1.4 Animal Welfare Education and Empathy

This study also provides an opportunity to consider how well humane education programmes improve human-directed empathy as is often claimed (Jalongo, 2014; Faver, 2010) but has only been demonstrated in a few under-powered pilot studies (Arbour et al., 2009; Ascione, 1992). Our results showed that while referred children had greater improvements for animal-directed empathy than for humans (as evidenced by greater effect sizes), there were still significant improvements in human-directed empathy dimensions. Because the AG programme covers human emotions alongside animal emotions, it is difficult to say if the improvements in human-directed empathy were entrained by improvements in animal-directed empathy or are a direct result of the human intervention exercises. Where AWE programmes cover emotion recognition and empathy in *both* human

and animals and draw parallels between these, they may be able to increase both animal and human directed empathy.

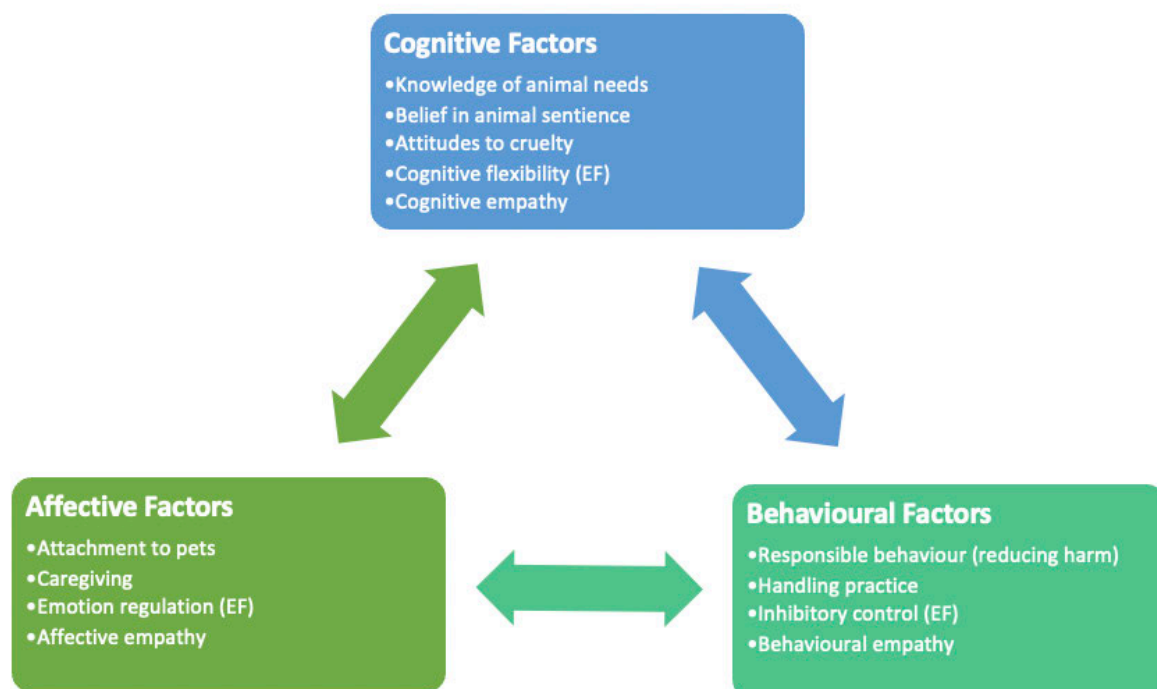
This study also allows a deeper investigation into how empathy dimensions relate to each other and change through intervention. Firstly, correlations at pre-test showed stronger associations *within dimensions* of empathy (cognitive vs. affective vs. behavioural) rather than *within species* (human vs. animal). This ties into research with adults, which found a correlation between human- and animal-directed empathy (Paul, 2000), and a similar pattern was found with children in Wauthier et al. (2022). This suggests that the psychological mechanisms for one type of empathy carry over across species (at least within mammals, see Miralles et al., 2019 for a discussion of empathy across phylogeny). One implication is that increasing empathy towards a target (e.g., animals) is likely to be more straightforward if it can build on existing empathy. This also highlights the importance of taking a dimensional approach to empathy both for intervention and for measurement.

It is interesting to reflect on these findings in light of current research on the development of empathy. Research has started to show that affective empathy changes little with age, while cognitive empathy shows fairly big improvements during childhood (Bensalah et al., 2016). Affective empathy seems to be more of a stable trait which develops in very early childhood in relations to temperament and attachment security, while cognitive empathy is much more influenced by conscious learning (Decety & Holvoet, 2021). A pathological lack of affective empathy is closely linked to CU traits, which *have* received a lot of attention in the animal cruelty literature, appear early and seem quite stable (Frick & Kemp, 2021). While, we know less about the development of behavioural empathy, there is some research on the development of prosocial behaviour, a closely linked concept. Prosocial behaviour seems to rely on many abilities coming together, including cognitive and affective empathy, but also self-regulation, mimicry of parental behaviour, and concepts of fairness and morality (Decety & Holvoet, 2021). Thus, in terms of educational interventions like AG, we might therefore expect large increases in cognitive empathy due to the emphasis on learning, mixed or uncertain results on behavioural empathy which also relies on constructs not addressed by the intervention, and no change in affective empathy, which is a broadly established character trait by childhood.

6.5.2. The ABCs of Animal Harm Prevention

These results have a range of implications for our understanding and treatment of childhood animal harm. Firstly, the effectiveness of the AG programme across harm severity at referral acts as a proof of concept for the ability of “intermediate” level interventions to fill the gap across a spectrum of harm between mainstream education and psychotherapeutic intervention. Furthermore, the greater improvement in younger children, which has been found in several other AWE approaches (Tardif-Williams & Bosacki, 2015; Williams et al., 2022), and in interventions for conduct disorder (Frick & Kemp, 2021), underlines the importance of early intervention from both prevention and effectiveness perspectives. Finally, the fact AG had consistently large effectiveness across cognitive dimensions, moderate effectiveness across behavioural dimensions, and low effectiveness for affective dimensions suggests that considering these three dimensions as separate targets might be a useful approach to intervention design (see Figure 6.9).

Figure 6.9: Possible Topics in an Affective, Behavioural, Cognitive (ABC) Model for the Treatment of Childhood Animal Harm.



This would also have the benefit providing tie-ins with psychotherapeutic techniques such as cognitive behavioural therapy (CBT), which also uses this three-dimensional approach (thoughts, feelings, and behaviours; Beck & Beck, 2011) although there is often an added a

dimension for physical sensations (referred to as the “hot cross bun” model; Greenberger & Padesky, 1995), which could be an interesting avenue for further research from a harm-prevention perspective.

However, there are unanswered questions. Firstly, are there different “aetiologies” of children who harm animals and who would benefit from different intervention approaches? Although the sample in the current study was too small to tease apart typologies, referred children had much greater variability in their scores at pre-test than their matched control counterparts. This suggests that there may be subgroups within the referred population, either who are at-risk on a subset of factors, or who represent a higher risk across the board. Existing research on externalising disorders and conduct disorder suggests there may be children with low self-regulation, low empathy, or both (roughly corresponding to externalising disorder only, CU traits only, or both; Fairchild et al., 2019). This may tie in to reactive and proactive subtypes of aggression, which are often discussed in relation to animal cruelty in adulthood (Henry, 2018). One advantage of adopting an “affective, behavioural, cognitive” (ABC) approach is that this might allow for comprehensive but flexible intervention delivery, which could be tailored to the child’s needs. This leads to a deeper psychological question: how much do improvements in one dimension help with improvement in other dimensions? Since the focus of AG is primarily improving cognitive risk factors, it is unclear the degree to which changes in the cognitive dimension entrained changes in behavioural factors, or if the moderate changes in behavioural empathy were a result of the aspects of the intervention directly targeting behaviour. Research suggests that even within more restricted abilities, such as EFs, improvements do not tend to generalise across sub-dimensions (Diamond & Lee, 2011). If mechanisms of change do not carry well across dimensions, interventions should consider how they are targeting all three dimensions to get maximal long-term effects.

6.5.3 Limitations and Future Research

This research had several sampling limitations which might impact generalisability. The small sample meant that certain analyses were underpowered, especially when using robust tests. As a result, lack of significance may not mean complete absence of an effect, especially where results approached significance, as was the case for certain interaction

effects or human-directed behavioural empathy. The small sample also meant that analyses to detect typologies across children (such as low vs. high empathy) or to tease apart mechanisms of action (mediation) or interactions between variables (moderation) were not possible. However, the rigorous case-control matching meant we did not need to control for certain variables (age, gender, or pet ownership), which would otherwise have further reduced power. Another possible source of bias to be cautious of is the number of children who did not participate in the research. For example, if non-participation due to lack of parental consent was non-random and associated with reduced engagement, this would make AG appear more effective. Finally, we do not have data on the sample's diversity (e.g., nationality, ethnicity, SES status), so it is difficult to know how generalisable results would be to other populations. All children were in Scottish primary education, so the AG programme may need to be adapted if it were delivered in countries and cultural settings.

There were a range of limitations with regards to measurement. Firstly, many of the measures used in this study were new or adapted in some way, to accommodate survey length (e.g., child-BAM), completeness (positive and negative behaviours), and lack of existing tools (empathy). While these measures all have good face-validity and are based in existing research, we must be careful in the interpretation of results in case the adaptations or novelty introduces sources of bias or artifacts that would otherwise be avoided by only using highly established and refined measures. One of the particularly complex limitations was around the assessment of behaviour. Changes in behaviour towards animals could not be measured observationally, so was assessed via self-report and through the behavioural element of the empathy measure. Unfortunately, there can be quite low correspondence between self-reported behaviour, task-based measures, and actual behaviours (Dang et al., 2020; Murphy and Lilienfeld, 2019); in fact, in the current sample self-reported behaviour towards animals did not correlate to behavioural empathy. Although observations of animal harm in naturalistic settings are likely never going to be possible for ethical reasons, there are several options future research could explore. One option would be to develop a behavioural assessment using a toy or robotic animal and instructing the child to interact with it either in free play or through series of prompts designed to elicit a range of responses. The child's behaviour could be video-recorded and coded for the frequency of different types of positive and negative behaviours. Although interactions with a toy or

robotic animal may not translate directly to interactions with live animals, previous research has demonstrated that a majority of children conceptualise and interact with a robot dog like a real dog (Melson et al., 2009) and spend a similar amount of time in social touch with a robotic and real dog (Barber et al., 2020). Other options include integrating additional sources of information such as parent or teacher report or adding measures of EF to detect changes in inhibitory control. Measuring EFs would also be important given that low self-regulation has been repeatedly implicated in cases of CAH.

There are a range of questions for further research on intervention delivery. Firstly, it will be important to do follow-up research on children who have completed the AG programme, to verify that improvements are maintained over time, and whether there are long-term positive impacts on the child's relationships to animals. Furthermore, as visits to Animal Rescue and Rehoming Centres (ARRCs) are re-introduced, it would be interesting to tease apart the effect of the school-based intervention from the session at the ARRC, to see if hands-on experiences with animals brings about further improvements. Over longer-term periods, it will also be important to consider how programmes like AG integrate with psychotherapeutic interventions. Once the programme is fully available throughout Scotland, it might be interesting to set up epidemiological studies comparing changing rates of animal harm: we might be able to explore whether there is an overall decrease in rates of animal cruelty once children have transitioned into adulthood, and this would be a convincing way of demonstrating the long-term *societal* effects of interventions like AG.

6.6 Conclusions

This study demonstrates the effectiveness of the Animal Guardians programme at reducing cognitive and behavioural risk factors for childhood animal harm. Results suggest that there was no difference in the intervention's effectiveness based on child sex or levels of harm severity at referral, while early intervention is likely to be especially effective with young children making marginally greater gains in knowledge than older children. Further research is required to determine whether improvements are retained over time and whether self-regulation and behaviours as reported by parents or teachers are also improved. Future developments may wish to consider adding exercises targeting affective dimensions and the impacts of adding interactions with animals.

Chapter 7: Discussion

Implications for Theory and Practice

7.1 Chapter Overview

This thesis forms the research basis for the development of the Scottish SPCA's Animal Guardians programme and had three main aims: 1) adopting a child-centred approach to understanding childhood animal harm (Chapter 2 and 3), 2) investigating risk and protective factors for children referred to Animal Guardians (Chapters 4 and 5), and 3) evaluating the effectiveness of the Animal Guardians programme (Chapter 6). In Chapter 2, the systematic review explored how the lack of studies carried out with children and issues with measurement reliability had resulted in definitions and theories of childhood animal harm which were not developmentally informed. In Chapter 3, interviews with children referred to Animal Guardians highlighted the high incidence of exposure to human violence and animal aggression, the importance of attachment, self-regulation, and mentalising processes, and the wide variety of motivations for animal harm ranging from accidents to acts of intentional aggression. Chapter 4 used self-report and task-based measures to quantitatively compare children referred to Animal Guardians with classmate controls on psychological risk factors, finding differences in attachment and executive function and mixed results for the role of empathy. Chapter 5 then dove deeper into how a child's overall attachment strategy impacts their attachment to pets, their ability to mentalise about pets, and the role of pets as sources of comfort, even in cases of animal harm. Chapter 6 described the design of the Animal Guardians programme and found it effectively improved children's welfare knowledge, animal-directed empathy, and belief in animal minds, while reducing self-reported harm behaviour. The intervention was found to be equally effective across sex and harm severity at referral and was slightly more effective for younger children.

This chapter discusses the implications of these findings for the treatment of childhood animal harm within the broader context of child development. First, theoretical implications are discussed around key risk factors which are brought together to create an overarching model. Second, implications and recommendations for expanding practice are discussed. Third, future development of the novel measurement approaches designed in this thesis are considered. The chapter concludes with a discussion of limitations and suggestions for future research.

7.2 Theoretical Implications

Factors such as attachment, self-regulation, empathy, and welfare knowledge were repeatedly implicated as risk factors for childhood animal harm. Three samples of children were used across studies: a sample of 10 children referred to Animal Guardians who were qualitatively interviewed (Chapter 3), a sample of 9 referred children and 18 classmate controls who carried out a range of psychological measures before referred children started Animal Guardians (Chapters 4 and 5), and a sample of 24 referred children and 24 closely matched controls who completed and pre- and post- test activity pack (Chapter 6). Because the effects of these factors were replicated across multiple research methodologies and samples of children, this helps increase confidence that effects are genuine. This section summarises these results, discusses how they fit within the existing literature, and where gaps remain, or further replication may be required.

7.2.1 Attachment

Attachment processes underpin socio-emotional development and are relevant for many of aspects of human-animal interaction. Despite this, the role of attachment in childhood animal harm has been persistently under-researched (see Chapters 1 and 2). This thesis used a wide range of methods to explore the relevance of attachment processes; findings consistently suggest direct and indirect roles both for the effects of overall attachment strategy and the effect of attachment to pets.

7.2.1.1 Attachment strategy

Secure attachment is a protective factor through development and is associated with a positive view of self and other (Clark & Symons, 2009), while insecure attachment strategies are associated with negative views of self and/or others, and in severe cases can be a risk factor in the development of various psychopathologies (Mikulincer & Shaver, 2012). Although different typologies of attachment have been proposed, such as the ABCD model (Main & Solomon, 1990) and the Dynamic Maturational Model (DMM; Crittenden, 2006), both models agree that there are secure, insecure, and pathological (or disorganised) strategies (see Figure 5.1). Chapter 3 provided an initial glimpse into the internal working

models (IWMs) of children referred to Animal Guardians and suggested that negative views of self and other link directly to animal harm. Children used very negative terminology to describe themselves especially around cases of animal harm, and the theme *signs of poor/insecure attachment* brought together instances where children used conflicting or avoidant language around caregivers. In some cases, this was directly linked to animal harm when it involved “retaliating” against family members. Content analysis on the “animals at risk” Thematic Apperception Test (TAT) further demonstrates negative view of others since children interpreted the human intentions and outcomes in the scenes predominately negatively. This is the first research to explicitly explore the effects of IWMs on instances of animal harm and links to work which uses Social Information Processing (SIP) theory to explore animal harm behaviour (Henry, 2018).

Following on from these results, Chapter 4 rigorously investigated the role of children’s attachment strategies using a validated story-stem measure of attachment, the Child Attachment Play Assessment (CAPA; Farnfield, 2016). We found that insecure attachment strategies were much more common in children referred to Animal Guardians, and that this effect was even stronger when comparing non-pathological to pathological attachment patterns (A+ or C+ in the DMM; see Crittenden, 2006). Although the sample was too small for mediation analyses, we also found evidence for an indirect role, since insecure attachment patterns were associated with worse scores on a range of risk factors including empathy and executive functioning (discussed more below). This is the first study to confirm that insecure attachment patterns are both direct and indirect risk factors for animal harm in childhood. It supports theoretical accounts such as those in AniCare child (Shapiro et al., 2013) and is in line with findings from Thompson and Gullone (2008) which found that empathy partially mediated the association between less secure attachment and animal cruelty in a sample of adolescents (12-18 years old).

7.2.1.2 Attachment to pets

This thesis also explored the role of attachment to pets on risk of animal harm, although results here are complex. Hawkins et al. (2020) found that higher attachment to pets was associated with lower *acceptance* of animal harm and more positive *attitudes* to animals. However, children referred to the Animal Guardians programme were quite strongly

attached to their pets (Chapter 3), and no differences were found between referred and control children on self-reported pet attachment (Chapters 5 and 6). How do we reconcile these findings? There are several possible explanations: 1) different samples (normative vs. high-risk) may have different patterns of relationships between pet attachment and animal harm, 2) the current research may be under-powered (Hawkins et al.'s large sample was able to detect small effects), 3) links between attitudes to cruelty and actual harm behaviours might be weak, and/or 4) there may be sub-types of childhood animal harm, some with low-attachment to pets with high-acceptance of harm and others with high attachment to pets and low-acceptance of harm. In fact, sub-groups might have been present in the current sample: referred children had greater variance on attachment to pets than control children, which might suggest a heterogeneous population. Using Levene's test, referred children had significantly greater variance on attachment to pets in Chapter 4 ($p=0.045$), with a similar pattern for the referred children in Chapter 6, although it did not reach significance ($p=0.12$). Hawkins et al. 2020 found that low attachment to pets only predicted higher acceptance of *intentional* animal cruelty and animal neglect but did not relate to acceptance of *unintentional* (accidental) acts of animal harm, which might hint at how typologies of harm link differentially to pet attachment.

Perhaps even more intriguingly, many of the referred children seemed to be more securely attached to their pets than other family members and perceived animals as less threatening than humans. Results from Chapter 5 provide preliminary confirmation that attachment to pets is separate from child's overall attachment strategy and found that insecurely attached children could still use pets as sources of comfort. This had been theorised (Julius et al., 2012) but only sparsely tested with children: one study found that insecurely attached children used an unfamiliar dog as a source of comfort over a human assistant (Beetz et al., 2012) and an unpublished study found that generalised attachment to humans and the quality of attachment to pets were independent from each other (Julius et al., 2010). An extension of this is that attachment to pets may be indirectly protective against animal harm, by mitigating the effects of other risk factors such as trauma or insecure attachment. The protective value of attachment to pets has started to receive support from studies of children in violent households (Murphy et al., 2022) and in the context of fostered or looked after children (Carr & Rocket, 2017). Results from this thesis are therefore encouraging,

since they suggest that interactions with animals still have the potential to have positive effects for the child even in cases of animal harm.

7.2.2 Self-Regulation

A group of closely linked concepts relate to a child's ability to control their behaviour, including arousal regulation, self-regulation, inhibitory control, and executive function (see Chapters 1 and 4). The development of these regulation skills is closely tied to a child's attachment (Pallini et al., 2018), hindered by stressful and traumatic events (Gruhn et al., 2020), and issues with these processes have been implicated in externalising behaviours and aggression (Dvir et al., 2014). Despite the known link between regulation issues and Conduct Disorder (CD), and several theoretical accounts suggesting that these processes are likely to be important in cases of animal harm (Parfitt & Alleyne, 2018), this topic has not received any direct research in childhood. Results in this thesis confirm the importance of these mechanisms using a range of methods in two samples. In Chapter 3, the theme *Issues with behavioural control* highlighted atypical behaviours of four children during the interviews, including difficulty concentrating and hitting some of the toys. Building on this, Chapter 4 provides quantitative evidence of these issues: referred children scored significantly worse on a task of executive functioning and were scored significantly higher on Strengths and Difficulties Questionnaire as rated by teachers (which measures behavioural difficulties across a range of dimensions; Goodman, 2007). Chapter 4 found that these deficits were also linked to insecure attachment, which is in line with existing research. Attachment is closely linked with the development of regulation systems: in secure attachment relationships, caregivers help infants co-regulate arousal, which gives way to increasingly independent strategies for self-regulation through childhood (Brumariu, 2015). Capacity for arousal regulation then lays the foundation for greater executive functioning skills, and studies have found that attachment security predicts both EF task performance and teacher-reported capacities at school entry (Bernier et al., 2015). Unfortunately, it was not possible to measure self-regulation constructs again in the final study (Chapter 6), so future research may wish to replicate these results further. Carrying out further research on the links between childhood animal harm and executive function might be especially useful: not only is there an extensive literature on interventions to improve executive function in school settings (Blair et al., 2018), but interactions with animals may improve executive functions

(Ling et al., 2016), which has been tentatively demonstrated in 6–8-year-old children interacting with dogs in school-based interventions (Tepper et al., 2021).

7.2.3 Empathy

Empathy is a broad umbrella term, which can rely on all or some of the following processes (Overgaauw et al., 2017): 1) emotion recognition, 2) the ability to understand why someone feels a certain way, or *cognitive empathy* (also sometimes referred to as mentalising or theory of mind), 3) the degree to which one is affected by another’s emotions or distress, or *affective empathy* (also referred to as emotional contagion), and 4) the desire to act to help people in distress, or *behavioural empathy* (also referred to as compassion). Research has established low empathy as a risk factor for animal harm including through associations with Callous Unemotional (CU) traits (Hartman et al., 2019), and low compassion (Hawkins et al., 2020). However, few studies directly with *children* have related animal harm to empathy (e.g., Hartman et al., 2019 uses parent report, and Connor et al., 2021 uses an adolescent sample) or related empathy to actual animal harm *behaviour* (e.g., Hawkins et al., 2020, look at links with attitudes to harm). There is no research on empathy to *animals* in childhood and only a handful of studies in adolescents/adults, which find they are only weakly correlated (Paul, 2000; Gaspar & Esteves, 2022). In any case, the associations between empathy and childhood animal harm are not always consistent; depending on how it is measured and what is accounted for, certain studies find animal harm is associated with lower affective empathy (Plant et al., 2019) while others find it is associated with lower cognitive empathy (Hartman et al., 2019). This all points to the complexity of empathy as a construct and the difficulty of accurately measuring it, especially in children.

7.2.3.1 Discrepancies in Empathy’s Role as a Risk Factor

Results across the chapters in this thesis paint a similarly complicated picture. Chapter 3 provided initial insights into relevant processes and indicated that human- and animal-directed empathy were likely not interchangeable. In the “animals at risk” TAT some children interpreted human intentions and emotions in an unrealistically negative way⁷, a

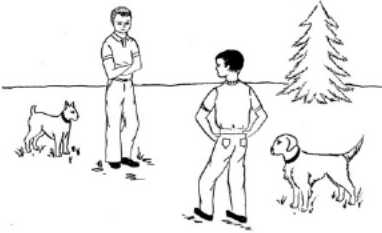





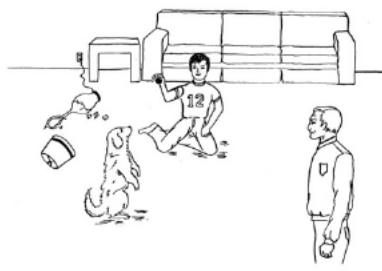





⁷ This might translate to lower cognitive empathy, were it to be measured quantitatively. This bias is likely to come, at least in part, from negative life-experiences and home environments.

bias which did not seem present for the animals. Furthermore, children seemed remorseful for any harm they had done, had a positive view of animals, and knew that animals would feel distress in instances of harm, suggesting that the animal harm had not come from callous disregard or sadistic intent. Building on this, Chapter 4 used four measures related to empathy: a human and animal emotion recognition task, a self-report measure (Bryant's empathy index, BEI; Bryant, 1982), a teacher-reported measure (the Inventory of CU Traits; Frick, 2004), and an adaptation of a picture-based measure (Kid's Empathy Development Scale, KEDS; Reid et al., 2013) with added images of child-animal interaction. No differences were found between referred and control children on the BEI or on the emotion recognition task, referred children scored lower on cognitive empathy but not affective or behavioural empathy on the KEDS, and there was a large difference in CU traits as reported by teachers. Using a novel measure, Chapter 6 brought a more systematic approach to the measurement of cognitive, affective, and behavioural empathy towards *both* humans and animals using a novel picture-based task (Child Animal emotion Recognition and Empathy Scale, CARES). Although empathy improved following Animal Guardians, there were no significant differences between referred and control children at pre-test on any of the dimensions.

What might explain these seemingly inconsistent findings? The literature shows that measurement modality has a big impact on results, so differences between the self-report, teacher-report, and task-based measures may not be entirely surprising, since these are likely measuring different constructs (Murphy & Lilienfeld, 2019). However, the discrepancy across the picture-based measures is intriguing: measures used in Chapters 3 and 4 suggest issues in referred children's interpretations of intentions and behaviour, but this was not replicated with the measure in Chapter 6. Looking across a sample of the images used (Figure 7.1) we can see that the measures have different characteristics, especially with regards to the *ambiguity* of emotions displayed. Specifically, the TAT and the KEDS are designed so that the child must interpret emotions based on clues from the scene, while the CARES is designed to have realistic emotions clearly depicted. What we might (speculatively) infer from this is that children referred to Animal Guardians for animal harm especially struggle with empathy in *ambiguous* situations. In fact, interpretation of ambiguous facial expressions as aggressive is an established bias in antisocial violent offenders (Schonenberg

& Jusyte, 2013), and aggressive boys were found to endorse more aggressive outcomes to ambiguous provocation than controls (de Castro et al., 2012). Furthermore, a recent study

Figure 7.1: Comparison of images used to assess empathy and related social cognition constructs across studies

"Animals-at-Risk" Thematic Apperception Test (4 of 5 images used)	Kid's Empathy Development Scale (KEDS) (4 of 10 images used)	Child Animal Emotion Recognition and Empathy Scale (CARES) (4 of 4 images used)
	 <p>© Project KIDS 2012</p>	
	 <p>© Project KIDS 2012</p>	
		
		

Note. Images are copyrighted by their respective owners. For the four images on the left: © Randall Lockwood, Ph.D., see also Shapiro et al., 2013, reproduced with permission. For the

two top images in the middle column: © Project KIDS, see also Reid et al., 2013, reproduced under Fair Use. All other images are copyright of the author.

by Giller et al. (2022) used an emotional Stroop task with 8–12-year-old children classified either as typically developing or as having affect dysregulation. They found that children with affect dysregulation could not efficiently “modulate controlled response selection given emotionally ambiguous information” (p. 66). One of their findings was that the children with affect dysregulation were unable to recruit additional cognitive resources to deal with incongruent emotional information, which they suggest partially underlies their issues in behaving in a situation-appropriate way. Intriguingly, the area of the brain most recruited by the typically developing children (and not the children with affect dysregulation) was the orbitofrontal cortex, which is a region also implicated with the modulation of attachment behaviour (Schoore, 2000).

7.2.3.2 Links Between Attachment and Empathy

Chapters 4 and 5 also investigated the links between attachment, empathy, and childhood animal harm. Chapter 4 found that insecurely attached children scored significantly worse on all the measures related to empathy except for emotion recognition. When splitting KEDS into child and animal dimensions (rather than affective, cognitive, and behavioural) there was no significant differences between secure and insecure children on empathy towards *animals*, but there was on empathy towards *children*. In Chapter 5, a new measure was developed, the “Pets in Children’s Attachment Stories” (PICAS), to explore how attachment impacted children’s internal representations of their relationships with their pets, as elicited by story-stems. Although insecure children could use pets as sources of comfort just as frequently as secure children, they scored lower on mentalising about pets (related to cognitive empathy; Quesque & Rossetti, 2020), on caregiving towards pets (related to behavioural empathy), and on how they used parent characters to help resolve conflicts with the pet. However, there were no significant differences in any of these variables when splitting children based on whether they were referred or controls, nor did any of the dimensions correlate with attitudes to animal harm or self-reported harm behaviour. Parental help in resolving conflict significantly correlated with cognitive, affective, and behavioural empathy as measured through the KEDS, suggesting that children

whose parents modelled positive resolution to conflict developed greater empathetic skills. Furthermore, empathy towards animals but *not* empathy towards humans significantly related to mentalising and caregiving towards pets as measured by the PICAS. Taken together, these results suggest: 1) attachment security is important for the development of empathetic processes, 2) internal working models of *pets* may not directly relate to risk of animal harm, 3) human and pet internal working models are distinct, as are these models' relationships with human and animal-directed empathy.

7.2.4 Declarative factors: Knowledge, Attitudes, Beliefs

So far, results have shown that implicit processes such as attachment, self-regulation, and empathy are involved in risk of animal harm, but these can be hard to shift through educational interventions. Declarative processes, such as knowledge of animal welfare needs, attitudes to animals, and beliefs about animals, are prime targets for such interventions, and so are important to understand as risk factors. Existing research suggests that low belief in animal minds and higher acceptance of animal cruelty are linked with intentional and unintentional animal harm (Hawkins et al., 2020). Less is known about whether low knowledge about animal welfare needs also predicts animal harm behaviour, but children tend to have low knowledge of animal needs (Muldoon et al., 2016), and this seems likely to be implicated in accidental cases of animal harm. Animal welfare education interventions have been shown to significantly increase belief in animal minds and knowledge of welfare needs, although attitudes towards animal cruelty may be harder to shift (Hawkins et al., 2017), and may require interventions over several sessions (Williams et al., 2022). Results across chapters in this thesis did not find that these declarative factors acted as large risk factors for children referred to Animal Guardians. Children's responses in the qualitative study in Chapter 3 suggested children saw animals as sentient, scores in Chapter 4 on Child Belief in Animal Minds (Child-BAM), welfare knowledge, and Child Acceptance of Animal Cruelty (CAAC) were not significantly different between referred children and classmate controls, and in Chapter 6 Child-BAM and animal welfare knowledge was not different between referred children and matched controls at pre-test, although both significantly improved after the Animal Guardian's intervention, while self-reported animal harm behaviour decreased.

7.2.5 Multiple Routes Into Animal Harm

One reason for some of the discrepancies between previous research on risk factors and these findings might be that there are distinct routes into animal harm, including a low BAM, low attachment to pets, high acceptance of cruelty route linked to intentional cruelty and detected through self-report (e.g. Hawkins et al., 2020), and a route through other processes, such as low self-regulation associated with more unintentional acts, and corresponding with the majority of children referred to the Animal Guardians programme. One reason this dual route explanation is plausible is that the tendency to “fake good” on questionnaires is lower in people with psychopathic traits (Verschuere et al., 2014), and so children with these characteristics are more likely to admit to negative attitudes or instances of harm since they are less influenced by a “social desirability bias” (Camerini & Schulz, 2018). The consequence is that questionnaire-based self-report research will be good at detecting risk factors for animal harm linked with psychopathy, such as low-empathy, low-BAM, high acceptance of cruelty. In fact, *self-reported* animal cruelty in a sample of 6–13-year-old children was more related to CU traits than *parent-reported* animal cruelty, most likely because self-reported animal cruelty included secretive acts hidden from parents (Dadds et al. 2006). However, since referral into Animal Guardians is based on caregiver or health professional referral, it is poorly placed to detect secretive instances of animal harm compared to accidental or reactive acts which stem from other factors such as lack of knowledge or poor regulation. Even if Animal Guardians *is* receiving referrals associated with an emerging psychopathy route, psychopathy is quite rare (less than 1% in the general UK adult population; Coid et al., 2009), so this route is unlikely to make up most children referred to the programme, given that in comparison externalising disorders (e.g., ADHD and CD) have a prevalence of about 7-10% (see e.g., Samek & Hicks, 2014). This “averaging out” of different typologies is one of the pitfalls of quantitative research, and why it is important to consider variance between groups. In fact, in Chapters 6, we see greater spread of scores in referred children compared to control children on attachment to pets, belief in animal minds, positive and negative behaviour towards animals, and human behavioural empathy (although tests of difference in variance did not reach statistical significance).

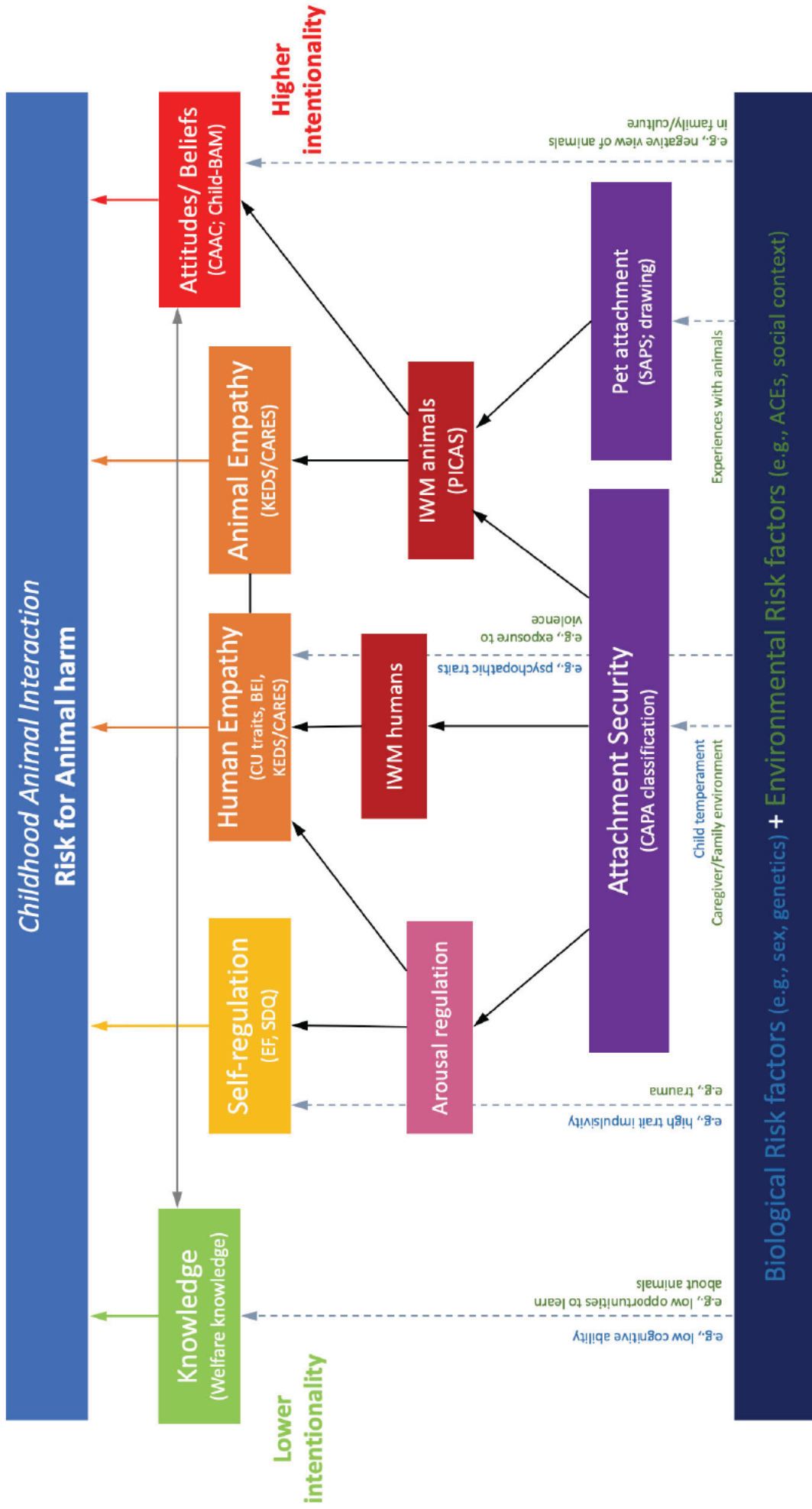
7.2.6 Proposing a Model of Risk Factors Beyond Motivation

Considered alongside existing research, findings across this thesis point to a complex interaction between a multitude of risk factors, the importance of considering measurement methodology, and the possibility of different “typologies” of animal harm. The model in Figure 7.3 brings together findings on risk expands significantly on the model proposed by Shapiro et al., 2013 by:

- 1) More precisely portraying how psychological processes are linked to each other,
- 2) Separating out appropriate human- and animal-directed constructs, such as empathy and attachment, and
- 3) Highlighting that there are different “routes” into animal harm, where different risk factors can act alone or in combination.

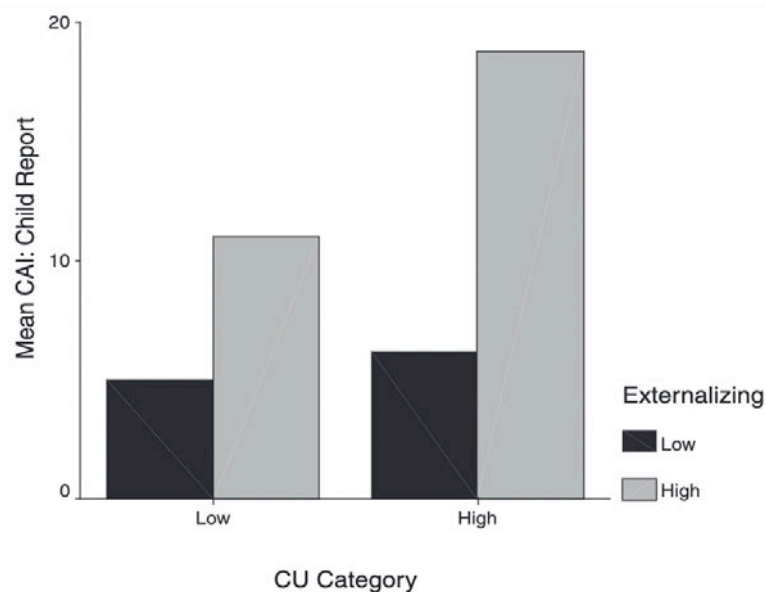
These different routes have important implications for practice. In the AniCare Child treatment approach, Shapiro et al. (2013) suggest that practitioners identify where their clients lie in a 2x2 matrix of low-high self-regulation and/or low-high empathy to guide the choice of exercises in therapy. Furthermore, research suggests that combinations of risk factors have a compounding effect and can lead to more serious harm: Dadds et al., (2006) found that children with high CU-traits (i.e., low empathy) AND higher externalising problems (i.e., low self-regulation) scored especially high on self-reported animal cruelty (see Figure 7.3). Figure 7.2 adds the roles of attitudes/beliefs and low-knowledge, and it seems likely that the more of these risk factors a child has, the higher their risk for more serious animal harm.

Figure 7.2: Overall model showing interactions of psychological risk factors leading to childhood animal harm



Note. Model based on findings described in this thesis (with associated measures in brackets) and the broader literature. At the base, biological (blue) and environmental (green) factors impact psychological processes and risk of harm both directly and indirectly. Working up, attachment is basal to many other psychological processes. Although low knowledge and the influence of attitudes and beliefs are presented at opposite ends due to their differing relationships with intentionality, these processes are correlated to each other psychologically (grey arrow). Risk factors can act separately or in conjunction with each other (they are not mutually exclusive). Please note that this model is not intended to represent all possible risk factors or their relationships to one another.

Figure 7.3: Interaction between callous unemotional traits and externalising score on cruelty to animal inventory for boys' self-report



Note. From “Associations Among Cruelty to Animals, Family Conflict, and Psychopathic Traits in Childhood” by Dadds et al., 2006, *Journal of Interpersonal Violence*, 21(3), p. 421. Copyright 2006 Sage Publications. Reprinted with permission.

This model’s multiple streams propose an alternative to existing psychological typologies of childhood animal cruelty, which have tended to focus on motivations (Ascione, 2001) and age (Ascione, 2005) to identify pathological and non-pathological animal abuse. However, typologies based on motivations have not been found to be predictive of future interpersonal violence (Hensley & Tallichet), and motivations can be difficult to assess (Lee-Kelland & Finlay, 2018) especially in children who are still developing metacognitive abilities, and there can be multiple motivations involved in a single act of animal harm (Hensley & Tallichet, 2005). Another issue with using motivation-based typologies of animal harm is that they do not capture the full range of unintentional harm, which can be a consequence of low knowledge or emotional and behavioural regulation issues. This does not mean that motivations are irrelevant. For example, Newberry (2018) found that different motivations for animal cruelty in adults (e.g., retaliation/control vs. amusement) linked to different facets of impulsivity (negative urgency vs. total impulsivity, respectively), which suggests that motivations can tell us something about underlying psychological issues. Still, having typologies based on underlying risk factors is more useful for interventions, which can then identify the combination of issues which need to be addressed.

7.3 Recommendations for Practice

Our understanding of how to intervene in cases of childhood animal harm is still in its infancy, so these findings on psychological risk factors and the effectiveness of the Animal Guardians intervention have implications across a range of practice settings. This section reviews the impact of Animal Guardians, discusses continuing development, and then considers how prevention approaches might be coordinated across organisations and integrated into mainstream psychological practice.

7.3.1 Referrals to Animal Guardians 2018-2022

Overall trends in the referrals made to the Animal Guardians programme can give a sense of the scale of the programme and the impact it is already having across Scotland. Since its start, Animal Guardians has received 318 unique referrals, and of these, 177 children (56%) have started the programme. Figure 7.4 shows the number of new sessions started year on year, and although there was a slight slow-down due to the COVID pandemic, we can see the programme is successfully expanding. Of the 177 children who have started the programme, 129 children (73%) have completed 6 or more sessions. This shows good engagement, because this drop-out rate includes interruptions due to outside circumstances (e.g., moving school, COVID, etc.), which are not that uncommon given that the programme will often run over more than one school term. The map in Figure 7.5 shows referrals by location in Scotland; although we see the greatest number of referrals in Edinburgh the programme now covers a large area.

Figure 7.4: *New sessions started for each time period since the launch of Animal Guardians*

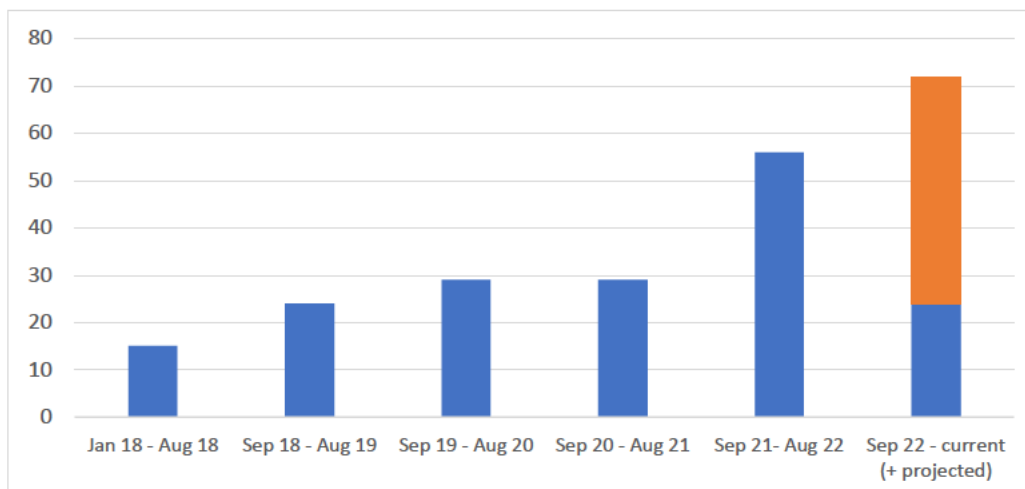
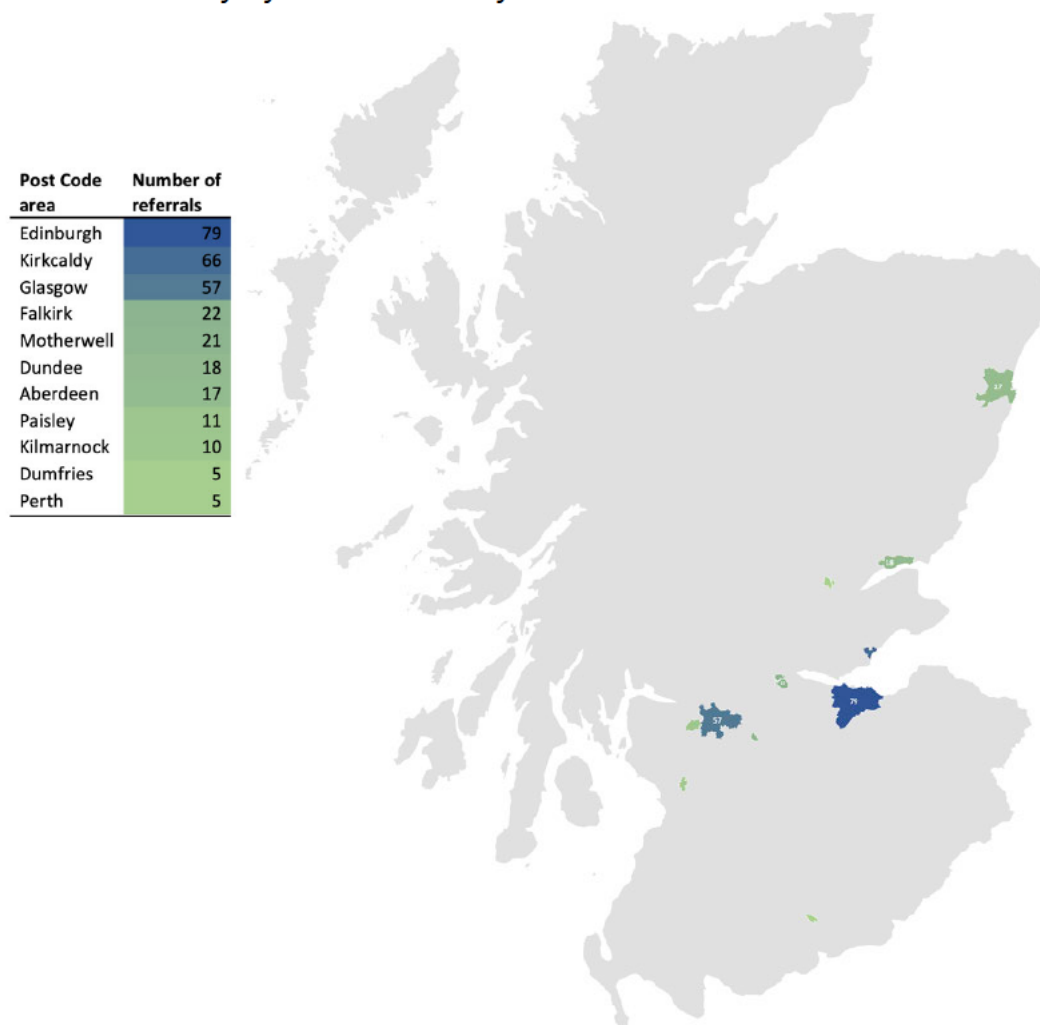


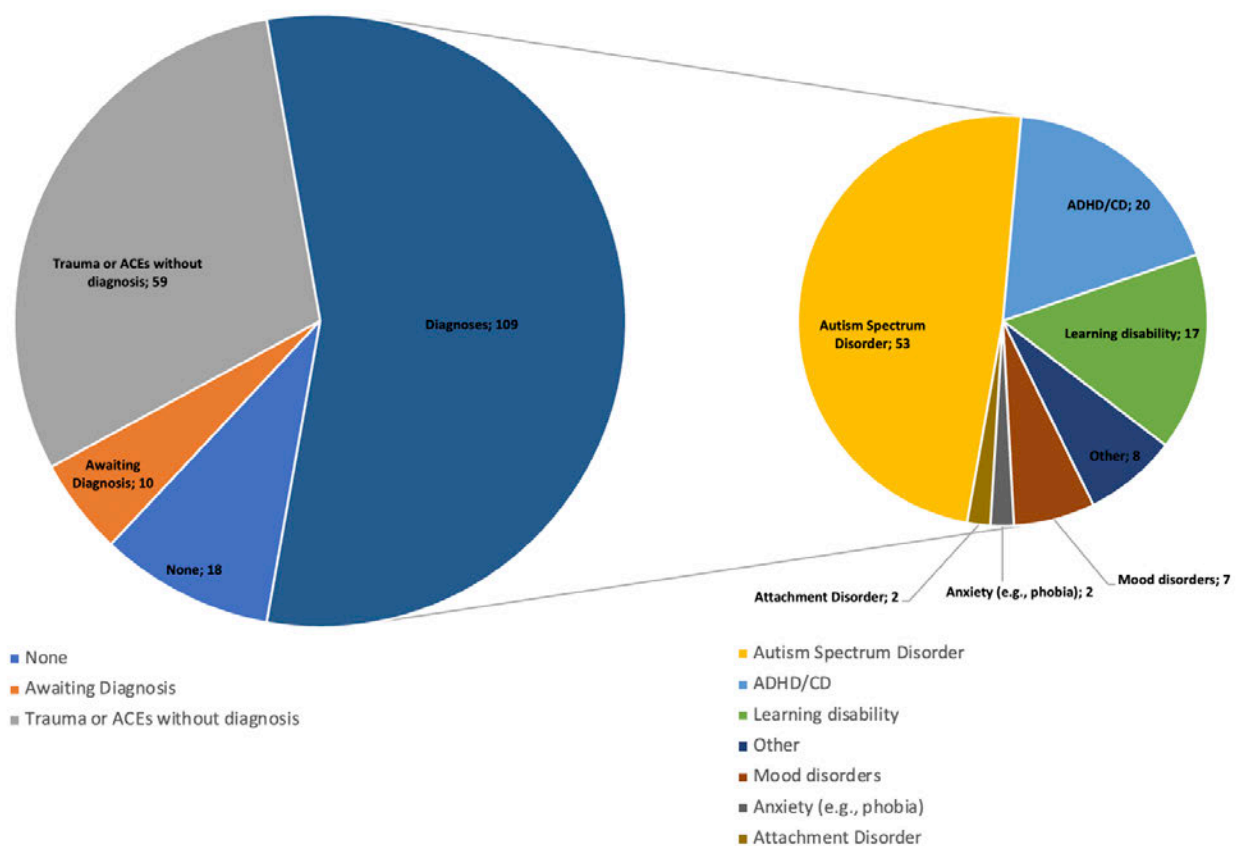
Figure 7.5: Map of post-code areas in Scotland where Animal Guardians has been offered and the number of referrals received since launch in 2018



Some of the most interesting statistics collected by the Scottish SPCA is on the diagnoses and rates of trauma in children referred to Animal Guardians (Figure 7.6). Although data on this dimension is optionally provided by the referring adult and not verified, it still provides an informative approximation of the rates of different issues within referred children. We can see that most children have either experienced some trauma or ACEs or have a formal developmental, behavioural, or mental health diagnosis. By far the most common diagnosis is autism spectrum disorder, followed by externalising disorders and learning disabilities. This is surprising, given that there is very little literature on animal harm prevalence in children with ASD, and may be concerning given that many parents consider it important to get pets for children diagnosed with autism (Nieforth et al., 2021). This pattern also highlights that many referred children are likely to have been involved in accidental harm, either due to difficulties in emotion recognition and theory of mind (ASD; see e.g.,

Fitzpatrick et al., 2018), lack of knowledge of animal needs or appropriate behaviours (learning difficulties), and issues with emotional-behavioural regulation (ADHD/CD; Ryckaert et al., 2018). This may also point to a “bias” in the referral mechanisms, where children who are already identified as having additional support needs are more likely to be referred to the programme. Issues around diagnoses will require further research, especially to determine whether it has an impact on the effectiveness of the programme.

Figure 7.6: Diagnoses of the 177 children starting Animal Guardians between January 2018 and August 2022



7.3.2 Generating Impact Through Collaboration

As we can see, collaborating with the Scottish SPCA allowed this research to work with a very difficult-to-reach sample of children and have a much more immediate research impact. This route into practice and impact may be a relatively untapped way of developing a greater understanding of childhood animal harm, especially in a time where standard health services such as Child and Adolescent Mental Health Services are at capacity and not

a position to design and deliver new interventions. There are a range of child welfare, animal welfare, and support charities in the UK and beyond which might be well placed to deliver similar psycho-educational interventions. This type of research collaboration is also beneficial to the charity, which gets independent evaluation of their programmes and expert advice on further development. In other words, if appropriate provisions are made at the start, these collaborations can benefit both parties. Based on experiences from this research process, some of the issues to carefully address in research-charity collaboration include: 1) establishing who owns intellectual property and having suitable memorandums of understanding, 2) coordinating time-scales for research and delivery components and establishing how research will inform practice, 3) having well planned procedures for data-sharing in line with General Data Protection Regulations (GDPR), and 4) balancing programme consistency for rigorous evaluation with flexible delivery to meet each individual child's needs.

7.3.3 Continuing Development of Animal Guardians

As part of the ongoing collaboration with the Scottish SPCA, results from this research are being fed forward to inform the continue development of the Animal Guardians programme. This includes how the current programme for primary school children (ages 5-12) can be improved, and how Animal Guardians can be expanded to include younger nursery and P1 children (ages 3-6) and adolescents in secondary school (ages 12-16).

7.3.3.1 Continuing Development of Primary School Programme

As discussed in Chapter 6, the Animal Guardians programme was very effective at improving cognitive factors (animal welfare knowledge, belief in animal minds, and cognitive empathy to animals and humans), moderately effective at improving behavioural factors (reducing self-reported animal harm behaviour and improving animal-directed behavioural empathy) but not as effective at improving affective factors (there was no change on attachment to pets, affective empathy, or caregiving towards pets), nor was there an opportunity to assess changes in self-regulation/executive functioning. The following recommendations were made for the continuing improvements of Animal Guardians:

1. ***Maintain cognitive elements*** covering animal sentience, welfare needs, and responsibilities towards pets. These are working well to improve their respective

constructs, and the fact there are improvements in cognitive empathy suggest that this is successfully generalising to how children reason about situations.

2. ***Increase parent involvement and add focus on improving positive behaviours.***

Increasing pet caregiving skills can help foster positive attachment to pets (Hall et al., 2016) and may be an important way of preventing animal harm (Hawkins et al., 2017). There are two main ways Animal Guardians could do this: providing additional opportunities for hands-on practice with real or robotic animals during sessions (see also point 4 below), and/or working with parents to provide opportunities for children to practice caregiving at home (where this is feasible/appropriate). Parents often take on exclusive responsibility for pet care (Muldoon et al., 2015) and this may explain why we did not see changes in children's caregiving behaviours. Supporting parents to engage children with pet care will help bring learning into the home environment, encourage parents to explicitly model positive behaviours, and will frame pet care as a positive family bonding experience⁸. Increasing parent involvement may also provide valuable opportunities for parent report at pre- and post- test to help triangulate results on changes in behaviour. However, there are some logistical challenges to involving parents, who may not always be willing or able to take part; as a result, the recommendation is that this element be *offered*, but that parents can opt-out.

3. ***Increase activities improving self-regulation.*** Adding elements which more explicitly cover self-regulation and EF dimensions will allow Animal Guardians to be more comprehensive and may improve long-term effectiveness. EFs can be improved through exercises in school settings, and through activities which promote mindfulness, physical activity, and reduce stress (Diamond & Lee, 2011). Authors have also theorised that interaction with animals and taking care of animals (as in point 2 above) can improve EFs (Ling et al., 2016). Finally, EFs have been shown to improve through game-based turn-taking approaches (Gashaj et al., 2021) which is already used in Animal Guardians, and by structured pretend play (e.g., Tools of the Mind; Blair et al., 2018). For younger children, one recommendation is to add a pretend-play element around animal care, as in Rabbit Rescuers (Williams et al., 2022). For older children, we recommend discussing

⁸ There is already a minor provision for parental involvement, using a sheet the child can bring home detailing behaviours to encourage and behaviours to avoid; the recommendation here is to have a more in-depth and structured approach to encouraging positive behaviours through an in-person session with the parent(s).

self-regulation and adding games specifically targeting EFs, such as adapted versions of “red light green light”, Head-Shoulders-Knees-and-Toes, and a “stop and think” exercise to practice problem solving. Evaluating changes in EFs could be built in to the pre- and post- test procedures using a task such as the Dimensional Change Card Sort (DCCS)⁹ and overall self-regulation could be assessed with teacher report using the Strengths and Difficulties Questionnaire.

4. ***Hands-on experiences with animals and ARRC visits.*** Visits to Scottish SPCA Animal Rescue and Rehoming Centres (ARRCs) were unfortunately suspended due to COVID for the evaluation in Chapter 6, but (where feasible) Animal Guardians is designed to finish with a visit to the nearest ARRC. This provides an opportunity for the child to have some hands-on experiences with animals, learn more about how the Scottish SPCA operates, and see the realities of animal rehoming when welfare needs are not met. The hope is that this not only provides some direct benefits, but ties into opportunities for building self-regulation and improving affective dimensions of attachment and empathy to animals. If parents are involved, this also provides a positive opportunity to wrap up the programme with them. This part of Animal Guardians went live again in September 2022, and there will be opportunities to trial different types of activities and evaluate whether this increases benefits compared to the school-only programme.

It is hoped these additions will allow Animal Guardians to address the full range of risk factors, increasing the programme’s effectiveness and allowing it to fulfil its role as a universal secondary prevention approach to childhood animal harm in Scotland. However, Animal Guardians is not necessarily sufficient for all cases of childhood animal harm; for example, it should not address risk factors such as trauma or attachment issues and it is important that it sticks to its remit as an educational intervention. The Activity Pack will continue to be integrated long-term evaluation of the programme, although some minor modifications have been made (see Appendix X for current version). Ideally, there would also be follow-up evaluations 3-6 months after the programme ends, possibly using a shortened version of the Activity Pack supplemented with parent- and teacher- reports.

⁹ It is not possible to include a measure of EFs as part of the paper-and-pencil activity pack, but EFs can easily be measured using electronic (tablet) versions of activities such as the DCCS and a go-no-go tasks.

7.3.3.2 Expanding Animal Guardians to Reach Younger and Older Children

The Scottish SPCA want to provide preventative intervention for all children in Scotland and have received referrals for children as young as 3 and as old as 16. Given the different developmental capacities across these ages, adapted versions of Animal Guardians are being developed and trialled for nursery children (3-6) and secondary school children (12-16). Activities in the nursery programme will focus less on learning detailed information on welfare needs (although basics will still be covered) and more on emotional and behavioural regulation and practice (e.g., see the mindfulness-based “Kindness Curriculum”; Flook et al., 2015). Planned activities include 1) basic emotion recognition games, 2) reading simple stories together, 3) pretend play with soft toy animals (a simplified version of Rabbit Rescuers), and a 4) consistent and repeated opportunity to practice correct handling and “soft hands” with toys. Another possible use for some of these activities would be as an alternative for primary children with more serious additional support needs who struggle to engage with the main primary programme. More research will be required to understand whether children with additional support needs benefit from the programme as much as peers, or whether a tailored set of activities is required.

For the adolescents, more work is needed to determine whether similar risk factors are at play, or if there needs to be a different focus. For example, risk factors are less likely to include low welfare knowledge, and even in the current sample there were signs of diminishing effectiveness of the current programme for the older children. Instead, risk factors for adolescents may include peer group pressure, emerging patterns of delinquency, and/or effects of social media “trends” (Arluke 2012; RSPCA, 2018). A recent meta-analysis found that interventions that included “behavioural practice”, “problem solving”, and “information about social and emotional consequences” were effective at reducing adolescent aggression (Castillo-Eito et al., 2020). The adolescent programme might therefore include: developing pro-social problem solving skills, discussions on personal responsibility and the legal aspects of animal harm, and a chance to practice positive behaviours with dogs, as seen in interventions like Paws for Progress (Leonardi, 2016). There may also be scope to draw inspiration from elements covered in adult programmes for animal cruelty or adolescent programmes for delinquency.

7.3.4 Coordinated Approach to Animal Harm Prevention

As we have seen, childhood animal harm can be an early sign of a variety of serious developmental issues, including trauma, attachment insecurity, difficulty understanding emotions, and self-regulation issues. Despite this, mainstream developmental and developmental psychopathology research has not taken much interest in children's interactions with animals (Chapter 1). This research shows that a relatively low-intensity educational intervention is effective at engaging children, preventing animal harm, and improving associated risk factors. However, it is neither possible nor appropriate for animal welfare charities to intervene for all cases. Child charities and mainstream psychological practice should be able to identify high-risk cases and provide support, especially to complement educational interventions (e.g., addressing issues such as trauma, attachment issues, or problems with family dynamics). There especially seems to be untapped potential for child welfare charities (such as Barnardo's and the NSPCC) to explore child-animal interaction not only to prevent harm but also to promote healthy development through positive interactions with animals. This leads to the question: how should prevention and intervention approaches be coordinated across organisations?

7.3.4.1 Primary, Secondary, and Tertiary Prevention for Childhood Animal Harm

The public health model of primary, secondary, and tertiary prevention can be used to coordinated approaches to reduce cases of animal cruelty (see Chapter 1). Animal Guardians is a "proof of concept" that targeted secondary prevention can be effective, fitting between general welfare education as primary prevention, and therapeutic approaches such as AniCare Child as tertiary prevention. One requirement for coordinated approaches to prevention and intervention of animal harm is to have accepted thresholds and definitions for when children require different types of intervention. I present a short measure to quickly determine the risk and associated level of intervention recommended for a child. Each of the questions corresponds to a dimension important in determining the significance of the animal harm and the required intensity of intervention: 1) presence of underlying risk factors, 2) types of harm, 3) frequency of the harm behaviour, 4) intentionality of the harm behaviour, and 5) severity of the harm.

While adopting a coordinated, universal approach to animal harm prevention would enable a range of childhood issues to be identified and tackled early, there are several points of caution to bear in mind. Firstly, terminology around the issue must be carefully chosen; we have already explored issues of stigma around using terms like “childhood animal cruelty” (see Chapters 1 and 2), but there are additional nuances here. For example, *labelling theory*, which was formulated within a criminological framework but can be applied to educational settings (Rist, 2017), states that negative labels increase rather than decrease deviant behaviour (Bernburg, 2019). This is because identification with the label and negative reactions from others to the label feed a negative “self-fulfilling” cycle of behaviour. Given the stigma associated with animal harm, health professionals must be careful not to unduly label children in ways which might impact them negatively (e.g., a record of animal cruelty can have very negative consequences in a fostering context), and programmes should adopt positive language where possible. For example, rather than a programme “addressing childhood animal harm”, an alternative could be, “helping children nurture empathy and compassionate behaviour towards animals”. Careful use of terminology will also help parents and other caregivers have more positive attitudes towards their child completing the programme.

Another point of caution is that approaches to prevention and intervention need to be tailored to local areas, countries, and cultures. For example, research shows that adolescents in cultures more accepting of animal harm self-report engaging in more animal harm behaviours (Plant et al., 2016). Thus, while this research identifies relevant risk factors for Scottish children and shows the Animal Guardians is effective, this may not extend to cultures with very different attitudes, where animal harm may stem less from psychological issues and more from cultural factors. Even within Scotland, animal harm in communities which take part in activities such as dogfighting, badger-baiting, or other organised animal cruelty may need a different approach to prevention (see e.g., Scottish SPCA, n.d.).

Assessing Risk of Animal Harm in Children and Adolescents

Risk factors for animal harm: Please answer the following question about difficulties the child or young person is experiencing that might increase their risk of harming an animal.

1. Which of the following statements apply to the child or younger person? [1 point each]
- Has witnessed animal harm/abuse
 - Has been exposed to human violence/abuse
 - Shows signs of trauma and/or has three or more ACEs
 - Has difficulty regulating their emotions/behaviours
 - Struggles to understand other people's (or animal's) emotions and behaviours
 - Struggles to respect boundaries or follow directions

Behaviour towards animals: Please answer the following questions about any harm or distress the child or young person has caused animals. Answer only for vertebrates (e.g., fish, reptiles, birds, mammals) do not include behaviour towards invertebrates (e.g., insects, worms, molluscs).

2. What type(s) of harm or distress has the child/young person caused animal(s)?
(Circle all that apply)
- Child/young person has never caused an animal distress (skip remaining questions) [0 points]
 - Child/young person has caused an animal physical distress (e.g., rough handling, hitting) [1 point]
 - Child/young person has caused an animal emotional distress (e.g., teasing, yelling at) [1 point]
 - Child/young person has neglected an animal (e.g., forgetting food or water, tying up for very long periods) [1 point]
3. How many times has the child/young person caused an animal harm or distress in the last six months?
- Not in the last six months [0 points]
 - 1-2 times [1 point]
 - 3-5 times [2 points]
 - 6 or more times [3 points]

If there is more than one instance you can think of, answer the remaining questions for what you consider to be the most serious case

4. Do you think the child/young person caused the animal's harm or distress on purpose?
- No, it was an accident [0 points]
 - Not really, the young person didn't realise what they were doing in the moment (e.g., they reacted impulsively) [1 point]
 - Yes, but the young person's primary goal was not to cause the animal distress (e.g., they wanted to "correct" bad behaviour) [2 points]
 - Yes, the young person did it specifically because they wanted to cause the animal harm or distress [3 points]
5. How much harm or distress did the child/young person cause the animal?
- Mild: e.g., animal was uncomfortable, but it did not last long [1 point]
 - Moderate: e.g., animal had lasting pain and/or fear [2 points]
 - Severe: the animal needed to go to the vet and/or died [3 points]

Score	Associated Risk	Prevention level	Main Intervention	Example
0-2	Very low risk	Primary	General prevention	Scottish SPCA's "Animal Wise"
3-5	Low risk	Secondary	Targeted animal welfare education	Animal Guardians
6-8	Moderate risk	Secondary/ Tertiary	Targeted animal welfare education + assess for further intervention	Animal Guardians [+ AniCare]
9+	High risk	Tertiary	Psychotherapy	AniCare Child

7.3.4.2 The Psychology of Child-Animal Interaction

Exploring child-animal interactions remains an untapped resource child clinical psychology both in assessment and intervention. As we have seen, exploring child-animal relationships can help identify psychological issues early (when things go wrong) and recognise protective factors or the child's strength (when things go right). Furthermore, interventions with animals or around animal themes are engaging and can help to nurture the healthy development of many psychological processes. Tapping into these benefits would be relatively straightforward. For example, psychologists could simply ask children and parents "what is [your]/[your child's] relationship with pets and animals like?" to screen for any potential positive or negative aspects. Unfortunately, child clinical psychology as a discipline seems far away from adopting this approach. As an example, Chapters 4 and 5 were both originally submitted to child/human psychology journals and were rejected as "outwith the scope of the journal".

7.4 Future Research on Measurement

Lack of suitable measurement approaches has constrained research on childhood animal harm. As we have already explored, over-reliance on self-report is likely to have introduced certain biases, and task-based approaches are rarely used. Having good measures is a key step to better understanding animal harm behaviours and evaluating interventions. However, designing measures is difficult to do for childhood research: measures need to be developmentally tailored across ages and it is very difficult to eliminate influences of confounding factors. This section reflects briefly on the strengths and limitations of the

novel measures designed for this research, how they might be further developed, and some of the measurement issues for research and practice going forward.

7.4.1 Reflections on novel measures' strengths and limitations

Following the qualitative interviews carried out in Chapter 3, it quickly became apparent that existing self-report methodologies would not adequately capture the complexity of factors involved in children's animal harm. A range of novel measures were designed to assess a range of constructs; design considerations included minimising effects of confounding factors, using non-stigmatising language, demonstrating conceptual and cross-measure validity, and ensuring measures could be used across ages, which meant young children could still perform the task, but that older children would not be at ceiling.

7.4.1.1 Hierarchical Drawing Task

The use of drawings to measure and classify children's attachment has a long history (see e.g., the Family Drawing Task, Kaplan & Main, 1986) and several approaches have been validated against story-stem classifications of attachment (Pace et al., 2021). The 'hierarchical' drawing task used in this thesis used a very simplified approach, and simply looked at the inclusion of different people and pets on a piece of A4 paper with a "bull's eye" of concentric circles, and children's distance from each figure was measured. Kidd and Kidd (1995) also used a drawing task to explore children's attachment to pets relative to other family members and found that children drew pets closer to themselves than other family members, a finding which was replicated with this measure. Although closeness between the child and figures in the drawings related to attachment style (Chapter 5), closeness did not differentiate between referred and control children in Chapter 6. However, *whether* the child included their mother and/or their father *did* differentiate between referred and control children. As mentioned in Chapter 5, one of the issues with using closeness to family members is that insecure children may have a bimodal pattern: 1) omitting caregivers/drawing them very far away *or* 2) drawing them extremely close to themselves. This means that closeness alone is not useful as a measure of attachment security, and (in its current form) this measure is unlikely to be able to assess attachment strategy. However, it has a variety of other strengths: it is quick and easy to use in interview

and self-report settings, it can help build rapport with the child while getting to understand their family dynamic¹⁰, and can be used for both quantitative and qualitative research.

The measure's properties suggest it could be useful to gain deeper insights into pet attachments. Closeness to pets did *not* correlate to closeness to other family members (mum, dad, and sibling, which did correlate to each other), in line with other findings showing that attachment to pets operates mostly independently from human attachments (Julius et al., 2013). Furthermore, closeness to pets was positively correlated to Short Attachment to Pets Scale (SAPS) score and negatively correlated to animal harm behaviour (Chapter 6). As such, this may be a promising measure to use as a supplement to the SAPS, especially to remove confounds around verbal reasoning (Chambers & Johnston, 2002). There is a lot of scope for future research to continue developing and validating this measure. For example, could it help gain deeper insights into the role of pet relationships within broader attachment strategies (A/B/C/D)? What other elements would need to be included to achieve this (e.g., perhaps bringing it more in line with the Family Drawing Task)?

7.4.1.2 Pets in Children's Attachment Stories (PICAS)

Story-stems provide a wealth of information about children's internal representation of relationships. A variety of coding systems have been developed to go beyond attachment classification and provide insights on dimensions such as children's positive and negative representations of themselves and parents (Hawkins & Hasket, 2014). Story stems have also been tweaked to investigate attachment security in different relationships, such as Vu's (2015) study finding that children's representations of mothers and teachers were quite strongly related, but that children's representations of friends followed a different pattern. The PICAS is the first attempt to investigate children's internal working models of pets, using newly created stories of tension in relationship with pets and applying a novel coding scheme. Although the measure showed certain expected patterns of association (e.g., parental help correlated to closeness to parents in the drawing task; links with child- and

¹⁰ The Scottish SPCA Youth Engagement Officers reported enjoying the measure to get to know the child in the context of delivering the intervention, and this procedure might therefore have uses in practice setting as well.

animal- empathy measure) it would benefit from further validation, possibly using an observation of child-pet interaction. There may also be opportunities to develop more coding categories to look at other dimensions; for example, Schermerhorn et al. (2008) used story stems to code family dynamics and children's responses to marital conflicts. Another avenue for development would be to use a tweaked coding systems for other relationships, such as parents, siblings, and friends, to gain a deeper understanding of how attachment patterns generalise, and how pets fit within this. However, one of the main issues with this measure (and broader story-stem techniques) is that it is logistically difficult to carry out: it is time-consuming, requires one-to-one interviews, specialised training, and video recording. This may therefore not be a viable method for larger scale studies.

7.4.1.3 Child Animal emotion Recognition and Empathy Scale (CARES)

There are currently no validated measures of children's empathy towards animals, and existing measures of general empathy suffer from validity issues due to self-report and confounds around verbal reasoning (see e.g., Chambers & Johnston, 2002). The single existing measure of animal-directed empathy, the Animal Empathy Scale (AES; Paul, 2000), has only been used in adolescents and adults (Gaspair and Esteves, 2022) and does not differentiate between dimensions of empathy (e.g., cognitive, affective, behavioural), which are increasingly being recognised as important to distinguish (Sesso et al., 2021). As a results, we developed the CARES to assess empathy using specially designed images of child-animal interactions. This measure built on the picture-based approach of the Kids Empathy Development Scale (KEDS; Reid et al., 2013) and on a study using vignettes to compare human and animal empathy in adults (Agantyr et al., 2011). The measure worked well with the children, was sensitive to improvements through intervention, and shed some tentative insights on how dimensions of empathy across humans and animals correlated (Chapter 6). However, much more work is needed to fully validate this measure. The plan is to carry out a developmental study using the whole sample of control children (n=120) and a separate sample of adults (n= 800) who completed the measure using 10-point Likert scale format. In the future, there may be free-response *and* scale versions of the measure available: while scale response allows online questionnaire approaches with large samples, free response is closer to a task-based approach and allows more fine-grained insights depending on coding. A larger number of images was developed (13 images) than was possible to use with the

children in this study, so future work may also determine which images are best at eliciting different emotional responses and differentiating those with high- and low- empathy.

7.4.1.4 Child Animal Harm Behaviour

The final measurement issue we had to address was developing a comprehensive child-report measure of behaviour towards animals. Although several measures have been validated with children, notably the Children and Animals Inventory (CAI; Dadds et al., 2004), the Children's Treatment of Animals Questionnaire (CTAQ; Thompson & Gullone, 2003), and the Children's Attitudes to Animal Cruelty (CAAC; Hawkins, 2016), they each have specific limitations. When used in interviews, it quickly became apparent that the CAI used stigmatising and confusing language, the CTAQ has only been validated with regards to positive behaviours, and the CAAC measures attitudes rather than behaviours. For this study, we designed a novel measure combining items from existing measures mixing positive *and* negative behaviour towards animals (this helps children feel more comfortable answering the measure and avoids response biases). The measure was designed: 1) using prompts for specific behaviours and their frequency, 2) to use non-stigmatising, easy to understand language, and 3) address common issues for referral to the Animal Guardians programme. Although the measure seemed to work relatively well and could differentiate referred from non-referred children, feedback from the Youth Engagement Officers and the class teachers was that it was too long for the younger children (it had 27 items). As a result, a revised and shortened version of the measure (18 items) is being developed and will be trialled with the updated activity, collapsing together items which indicate "accidental" and "on purpose" behaviour, which is instead indicated in the responses.

7.4.2 Challenges and future directions for measurement

Researching and designing new measures to assess child-animal interaction highlighted some of the challenges being faced by this area. One of the most evident tensions is between quality and quantity of data collected. In depth measures using coding schemes based on children's free responses (e.g., PICAS, CARES) provide idiographic, detailed, and flexible data, but it is difficult to generalise or achieve large enough sample sizes for more nuanced statistical analyses. On the other hand, while questionnaire-based measures allow for large samples, they are prone to a range of biases and are difficult for younger children

to complete, especially those which rely on self-reflection. A related difficulty is how young animal harm behaviour can start, with children as young as three referred to Animal Guardians. Adopting a truly developmental lens requires having measures which are sufficiently flexible to accommodate a very wide range of ages. This is challenging for questionnaire approaches due to more limited verbal reasoning/ reading ability in young children affecting validity (Woolley et al., 2004) and for task-based approaches because the youngest children must not be at floor (i.e., not scoring any points) while the older children need to not be at ceiling (i.e., scoring the maximum number of possible points). Another challenge for task-based approaches (e.g., CAPA, DCCS) is that they are resource intensive, require training for videorecording and coding¹¹, and require direct access to children for interview. This was not possible for the final study due to COVID and would also be difficult in large-scale settings. However, alternatives using computer or tablet-based approaches (e.g., Minnesota Executive Functioning Scale, see White & Carlson, 2016) are increasingly becoming available and may provide useful complements to paper-pencil approaches, which have their own advantages (especially for drawing tasks).

Based on these experiences, there are a few recommendations for research and the continuing development of new measures:

1. *Use multiple informants, where possible*: child-report, parent-report, and teacher-report give different insights into the child's behaviour and any issues. Parent and teacher report are especially important for certain constructs (such as CU traits) for which there are no child-report measures.
2. *Use multiple methods*: as we have seen, self-report and task-based measures provide insights into different processes. While self-report is valuable (e.g., a child's own perception of their abilities is important), it cannot be assumed to stand in for more objective measurement approaches. One area for research which may be particularly beneficial is exploring how task-based approaches can be adapted for tablets (as is already the case for the Dimensional Change Card Sort; see e.g., White

¹¹ Data is only as good as the coding scheme is reliable and accurately taps into the intended constructs. While detailed coding schemes with finely graded categories can be tempting, this makes it very difficult to achieve sufficient levels of inter-rater reliability. For this thesis, three- or four-point scales were generally found to strike a good compromise between detail and reliability.

& Carlson, 2015) to allow for studies using larger sample sizes than is possible through one-to-one interview.

3. *Simplify measures*: it is important to limit the number of items and simplify the number of options in childhood research, but even young children (4-5 years old) are able to complete appropriately designed measures as long as they receive appropriate support for reading and/or writing.
4. *Develop measures which can be used for research and practice*: given the small amount of research on interventions, it is important to develop measures which can detect changes to evaluate practice. With enough validation and standardisation, certain measures might even be developed to help screen which children might need additional support before harm occurs.

7.5 Limitations and Future Directions

Across studies, this thesis has limitations around measurement, sample selection, and research design which impact generalisability and suggest avenues for future research. With regards to measurement, there are two main areas which might be sources of concern. As discussed above, all the novel and adapted methods would benefit from further cross-validation to confirm their accuracy, reliability, and construct validity. Secondly, lack of parent or other third-party report limits confidence in data collected on children's behaviours around animals, especially since younger children's self-reports are known to have lower validity (Conjin et al., 2020). Continuing research will hopefully be in a position to address these issues.

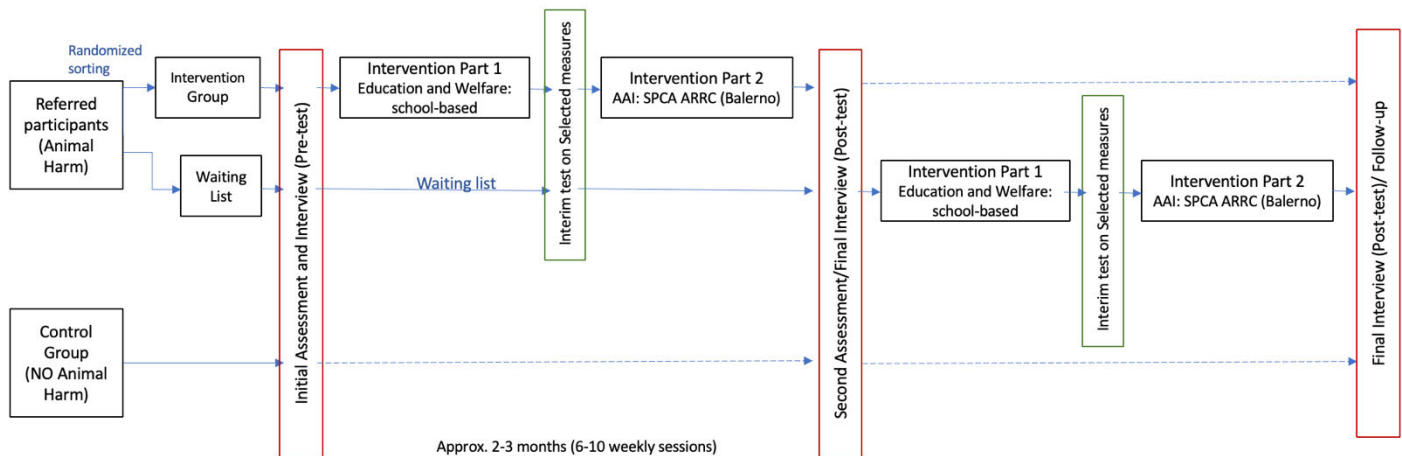
With regards to sampling, there are two factors which consistently limit generalisability. Firstly, small samples have a range of impacts on statistical results: results are more easily affected by outliers, estimates of effect size are likely to be inflated or inaccurate, and it was not possible to explore results by sub-group or to test more complex interactions such as mediation and moderation, which could impact the apparent effect variables have on each other. Second, referral and screening processes may have introduced multiple sources of bias. Children were primarily referred by professionals (rather than parents) and had high rates of behavioural and mental health diagnosis. This suggests that children who were already "flagged" as having issues might have been more likely to be referred to the

programme, rather than children who might hide the behaviour or otherwise appear “normal” to staff and where the behaviour is only occurring at home. This selection procedure may mean there is a “blind spot” in results for risk factors and intervention effectiveness in cases of more intentional harm. Another limitation was the screening processes for referrals. Due to the rapid expansion of staff on the Animal Guardians programme, almost all referrals to the programme were accepted, because it would not have been financially appropriate to turn down legitimate referrals if youth engagement officers still had capacity. This meant children with only very minor or “at-risk” behaviour (which was at the discretion of the referring adult) were included in studies. This creates wide variation in the level of concern of the behaviour and can “muddy the waters” when we consider risk factors. If youth engagement officers were at capacity, a more stringent screening processes to include only confirmed cases would ensure risk factors identified were directly associated with animal harm behaviour.

These sampling issues also had an impact on design. This research originally intended to use a randomised control trial design, comparing a group of referrals with a group of wait-list-control referrals and a group of matched-controls (see Figure 7.7). However, there were insufficient referrals to justify a waitlist control group, and this design had to be dropped. This waiting list approach would also have incorporated a follow-up time point to determine whether the intervention had lasting effects, which we did not have the time or capacity to include in the current research. Although this design was possibly too ambitious for Animal Guardians as a novel programme in the process of being piloted and launched, it may now be feasible since the programme is more well-established.

Thus, several unanswered questions remain for future research, including: 1) Are there different psychological typologies of animal harm and do these require different types of intervention? 2) Can children’s improvements from intervention be maintained into the medium- to long-term?, and 3) Can educational interventions be effectively generalised to other populations and countries?

Figure 7.7: Originally proposed design for the evaluation of Animal Guardians.



7.6 Conclusions

This thesis has provided insights into the risk factors of childhood animal harm and showed that Animal Guardians, a targeted education intervention, worked to improve several key risk-factors. One of the unique strengths of this research is the in-depth data-collection using a range of measures and carried out with multiple samples of referred children, replicating several key findings across studies. This has helped demonstrate that childhood animal harm is part of a broad spectrum of child-animal interaction and can act as a marker for the development of a variety of psychological issues. Findings have a range of implications for practice. Results might inform the continuing development of targeted educational interventions, the way organisations create coordinated responses to animal harm, or the weight given to child-animal interaction in psychological practice. This thesis was also an opportunity to design and explore new measurement approaches beyond self-report. These measures have highlighted the importance of differentiating human- and animal-related constructs and may have continuing applications in research and practice, although they will require further validation. In summary, this thesis has proposed a theoretical framework of childhood animal harm, created a set of measures needed to further this under-research topic, and shown that educational interventions for childhood animal harm can be effective.

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Note: some references in the published chapters cite publications in their online pre-print form, with an earlier date. Where there are two dates for a reference, these are both indicated and separated by a slash.

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Appendix A:
Supplementary Materials for Chapter 3

*A Qualitative Study of Children's Accounts
of Cruelty to Animals*

Supplementary Materials (SM)

Due to space constraints, it was not possible to display child specific answers throughout the paper, so tables tracking children’s individual answers to certain sections of the interview are summarized here. Given that IPA is an ideographic approach which underlines the processes specific to the individual, we thought it was important to provide this deeper level of detail to do justice to the children’s complex backgrounds. Three tables are presented here, summarizing: (1) the basic characteristics of each child, (2) each child’s answer to the Hierarchical mapping task, and (3) each child’s answer to the ‘Animals at risk’ TAT. Note: participant names have been changed, and match names in paper.

SM Table 1: List of participants with basic demographics, cruelty incident, and notes on main interview themes

	Age	Gender	Cruelty Severity/Risk	Notes on Interview themes
Alex	5	Male	Severe (Animals killed)	Struggled admitting to cruelty. Signs of trauma around cruelty incident. Witnessed rough handling from siblings.
Ben	7	Male	Severe (Animal killed)	Struggled admitting cruelty, expressing fear around being told-off. Struggled to concentrate, some violent play.
Frank	11	Male	Moderate (Rough handling, violence at school)	Refused to be recorded. Residential school- signs of trauma around father. Admitted cruelty but said he had changed.
George	11	Male	Moderate (Minor rough handling, expelled from school)	Had witnessed several incidents of animal cruelty. Was very attached to his dog.
Harry	8	Male	Moderate (Regular hitting of pets)	Trauma around mother nearly dying. Used pets to interact and carry out frustration against her. Attached to his cat.
Ian	8	Male	Moderate (Unsuitable behaviour in animal activity)	Tense relationship with siblings, especially sister. Denied any cruelty.
Katie	11	Female	At-risk (Aggression to other children)	Was very attached to her pets, discussing them more than her family.
Charlie	10	Male	At-risk (Violent outbursts at school, possible ASD)	Struggled to interpret TAT pictures. Didn’t want to associate with cruelty. Described police incident.
Daniel	10	Male	At-risk (Witnessed cruelty)	Quiet during interview. Discussed incidents of cruelty in his household which made him angry.
Eddie	7	Male	At-risk (Witnessed animal death, violent home)	Refused to be recorded. Did not include any attachment figures. Discussed incident of cruelty from his brother.

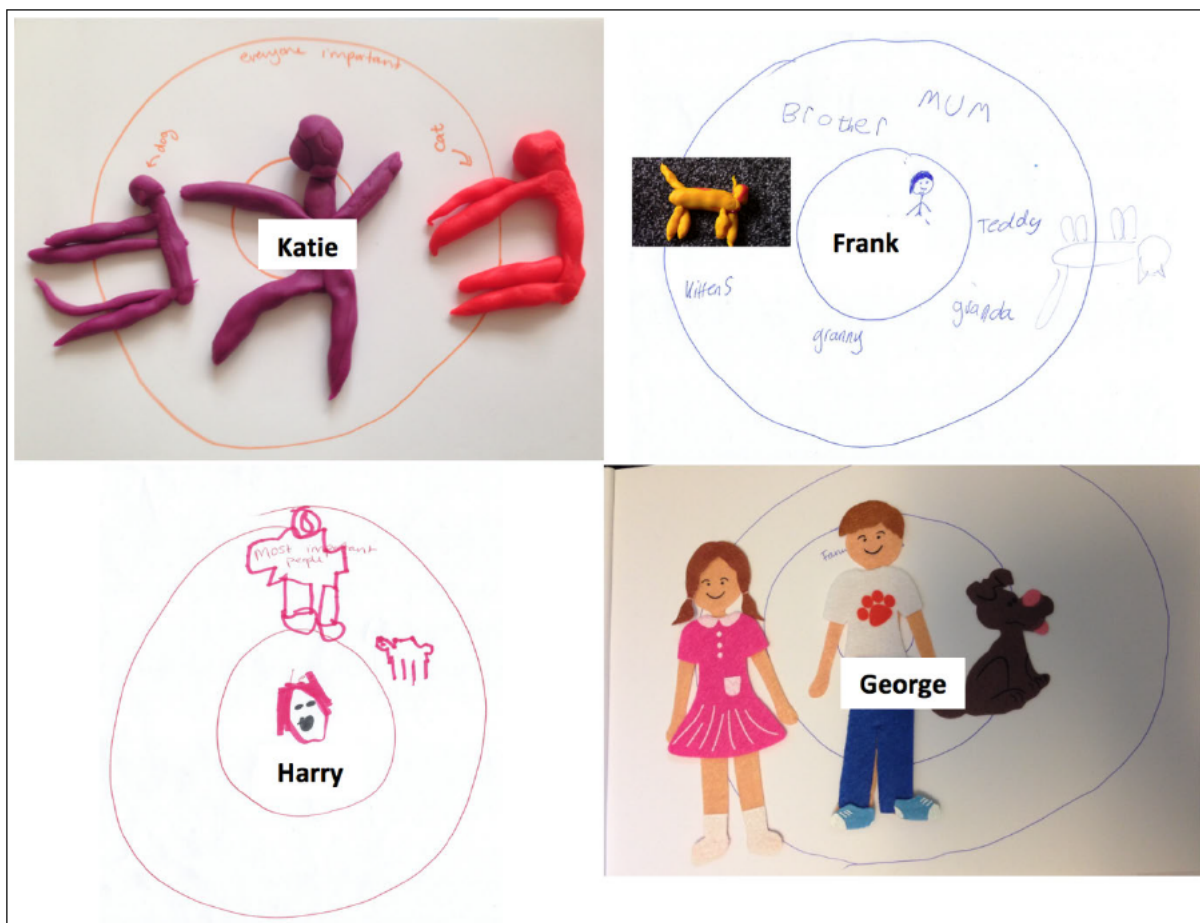
SM Table 2: Hierarchical mapping Creative Arts Attachment (CAA) task, showing which categories of people (mum, dad, sibling...) children included in the attachment circles compared to who they reported living with. Note that the 'living with' column reports numbers (e.g. 5 siblings) but the totals are calculated only based on whether or not someone in that category was included.

Child	Mum		Dad		Siblings		Pets		Grand-parent		Total C.A.A.	Total live with
	C.A.A.	live with	C.A.A.	live with	C.A.A.	live with	C.A.A.	live with	C.A.A.	live with		
Alex	✓	1		1	✓	5	✓	1		0	3	4
Ben	✓	1	✓	0		0		1	✓	0	3	2
Frank	✓	0		0	✓	0	✓	0	✓	0	4	0
George		1		0		0	✓	1		0	1	2
Harry	✓	1		0		0	✓	4		0	2	2
Ian	✓	1	✓	1		2		2		0	2	4
Katie		1		0		0	✓	5		0	1	2
Charlie	✓	1		0	✓	3		0		0	2	4
Daniel	✓	1		0		7		9		0	1	3
Eddie		1		0		3		1		0	0	3
Total	7	9	2	2	3	5	5	8	2	0	\bar{X}:1.9	\bar{X}:2.6


SM Table 3: Children’s answers to the ‘Animals-at-risk’ TAT image interpretations tasks. Responses patterns are highlighted: red for predominantly negative attributions, blue for predominantly ‘no answer/don’t know’ responses, and green for predominately positive. The bold line differentiates between Severe/Moderate cruelty (first 6 children) and the at-risk group (bottom 4 children). T-tests comparing these two groups showed no significant differences in the interpretations of scenes for either total negative (p=0.68) or total positive (p=0.91) interpretations.


Name	Outcomes				Human Emotion				Animal Emotion			
	+ve	-ve	Neut./ mix.	No ans.	+ve	-ve	Neut./ mix.	No ans.	+ve	-ve	Neut./ mix.	No ans.
Alex	0	5	0	0	0	3	2	0	0	3	0	2
Ben	1	1	0	3	1	0	1	3	1	0	0	4
Frank	0	4	1	0	1	2	2	0	3	1	0	1
George	1	2	2	0	1	2	2	0	4	0	0	1
Harry	1	4	0	0	1	4	0	0	0	5	0	0
Ian	0	3	2	0	0	4	1	0	2	3	0	0
Katie	1	4	0	0	1	3	1	0	2	2	1	0
Charlie	0	2	0	3	0	1	0	4	0	1	0	4
Daniel	1	3	1	0	2	2	1	0	1	3	0	1
Eddie	1	2	2	0	1	4	0	0	2	0	0	3
% of total	12%	60%	16%	12%	16%	50%	20%	14%	30%	36%	2%	32%

SM Figure 1: Images generated by children during the creative attachment mapping task where pets were included in the child's attachment circles.



Ethical Approval and Amendment Approval

ER46 CONCLUSION TO ETHICAL REVIEW (if required)
<p>The applicant's response to our request for further clarification or amendments has now satisfied the requirements for ethical practice and the application has therefore been approved.</p>
Signature: 
Position: Lecturer in Clinical Psychology, Ethics Tutor
Date: 13/06/18

ER48 CONCLUSION TO ETHICAL REVIEW OF AMENDMENT
<p>I can confirm that the above amendment has been independently reviewed. It is the opinion that:</p> <p>a. Ethical issues have been satisfactorily addressed and no further response from the applicant is necessary,</p>
Signature: 
Position: Lecturer in Clinical Psychology, Ethics Tutor
Date: 22/06/18

Research for Animal Guardians: Exploring children's relationship with animals and their understanding of animal cruelty

Parent Information Sheet

Dear Parent/Guardian,

Thank you in your interest in our research. Please read the following information about the study carefully:

About the Study

The University of Edinburgh are running a research project in collaboration with the Scottish Society for the Prevention of Cruelty to Animals (SPCA) to understand how primary school aged children (between 5-13 years old) interact with animals. This research is part of an MSc by Research project, and part of broader research investigating the effectiveness of education programs run by the Scottish SPCA.

Specifically, this research investigates how children referred to the Animal Guardians program talk about animals and describe the animal cruelty incident/ at-risk behaviour which led to their referral. This study aims to understand how children who have engaged in animal cruelty or at-risk behaviour understand the event and how they experienced it. This research will focus on the child's perspective of the event, what may have led to it, whether they intended to cause harm, and if they understand why they are taking part in the Animal Guardian's intervention. This information will help fine-tune the intervention as well as provide some insight into why such behaviours have occurred.

What will be involved?

This research will be based in your child's school. The research session will occur over one session of about 30-45 minutes. The main researcher (Laura Wauthier) will carry out a series of activities and a semi-structured interview with your child in a quiet one-on-one setting in the child's school on an appropriate day. Your child will be asked a short series of open-ended child-friendly questions which will allow them to express what they feel is important within the context of the broader research questions.

The interview carried out with the child will be recorded on audio tape so that it can be transcribed. The transcriptions will then be analysed to see if there are common factors or themes in children's description of animal cruelty. Once the transcriptions have been made, the audio recordings will be safely disposed of. The interview will also be recorded on video tape, in case the child finds it difficult to talk about the subject. Similarly, the video recordings will be transcribed into relevant behaviours and then safely disposed of. This procedure will be explained to children before they begin the study and they will be asked if they consent. Children will be free to withdraw from the study at any time they

wish, and will be provided with support if they should become distressed at any time during the research process.

Will the information you collect be confidential?

Yes. All information collected will be anonymous and kept in a safe location and treated confidentially. It will not be possible to identify the responses from any child at any stage in the project (including the writing of reports/articles).

Contact Information

Please don't hesitate to contact Ms. Laura Wauthier at the University of Edinburgh for more information.

Ms Laura Wauthier

Email:

Telephone: 07867213460

Clinical and Health Psychology Doorway 6, Teviot Place, Medical School, The University of Edinburgh

Alternatively, contact **Dr Joanne Williams** (Senior Lecturer) who is supervising the project:

Email:

Telephone: 0131 650 9962

Clinical and Health Psychology Doorway 6, Teviot Place, Medical School, The University of Edinburgh

If you have complaints at any point in this research, please fill out the form at the link (<http://www.ed.ac.uk/files/imports/fileManager/WEB%20Complaint%20Form.pdf>) and send it to the head of the School:

Professor Charlotte Clarke (Head of School of Health in Social Science)

Email:

Telephone: 0131 650 4327

Thank you for your support!



THE UNIVERSITY
of EDINBURGH

SCOTTISH SPCA
Scotland's Animal Welfare Charity



Parent Consent Form

Please tick each of the statements below to show that you agree with them, and then sign the form at the bottom of the page to give consent for your child to participate.

1. You have read and understood the information provided
2. You are happy for your child to participate and take part in this research study voluntarily
3. You understand that you or your child can stop and withdraw from the study at any time without consequence
4. Understand that all data will be anonymised
5. Understand that your child will be recorded (audio and video) during the interview and that these recordings will be transcribed and then disposed of
6. Understand that fully anonymised data may be shared in public research repositories as well as being used in research papers and conferences.

Caregiver's Name (Printed)

Child's Name (Printed)

Caregiver's Signature

Today's Date

Child Consent Form

About me and my relationship with animals

This form is to tell us that you would like to take part in this project and understand what the project is about



Please read the 6 points below and tick the box if you agree

- I am happy to take part in this project
- I understand what the project is about
- I understand that the answers I give will be kept private
- I understand that I can stop or leave this project any time
- I understand that a report will be written on how children interact with animals and understand animal cruelty
- I am happy to be recorded, and understand that these recordings will be private and only used for the project

If you have any questions, please ask!

NAME:

SCHOOL:

CLASS:

DATE:

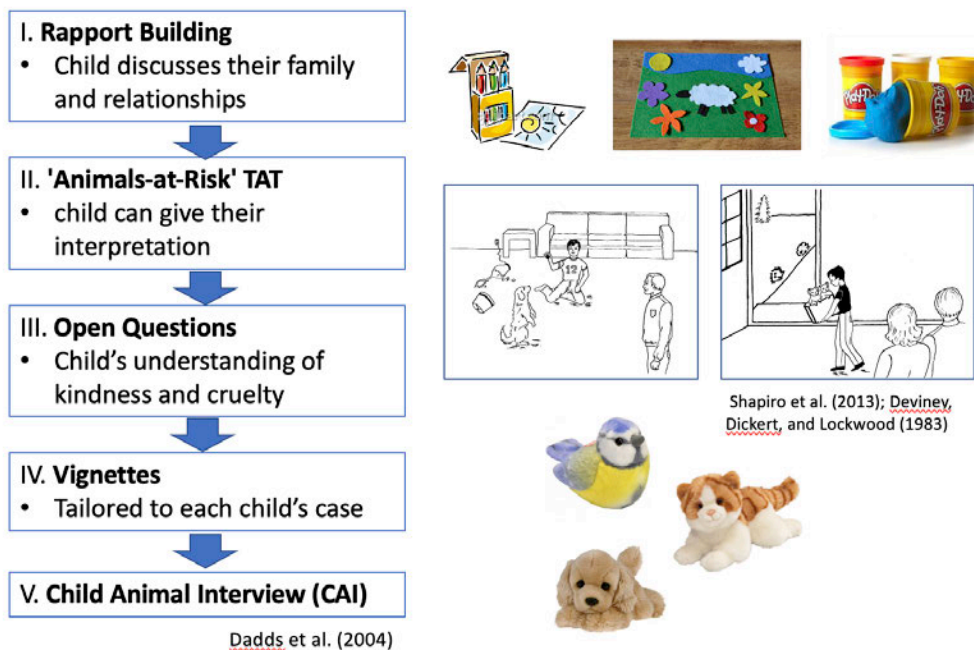


Interview Resources and Structure

Image of the resources used for the qualitative interviews, and snapshot of the overall interview structure. The following pages provide the full interview schedule.



Interview Structure and Procedure



I. Rapport Building

Introductions

What is your name? _____

How old are you? _____

What year are you in school? P1 P2 P3 P4 P5 P6 P7

Are you a boy or a girl? Boy Girl

Who do you live with at home? _____

Do you have brothers and sisters? _____

 If yes, how many? _____

Do you have any pets at home? _____

 If yes, what pets do you have? _____

How do you feel about coming to school?



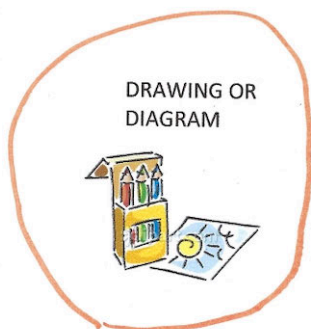
What is your favourite subject? _____

Do you have any favourite activities? _____

Rapport building (continued)

Creative arts task (choice of materials before starting the task):

Circle which you like best:



II. 'Animals-at-Risk' TAT

Tell me what you think is happening in the Picture

1. Who are these people?
2. What is going on? / What has happened?
3. What will happen next?
4. How do you think each person and animal is feeling?

[Repeat 5 times, once for each image]

III. Open Questions

1. What does it mean for a person to be hurt?
2. What does it mean for an animal to be hurt?
3. Can you tell me about a time an animal was hurt by someone?
(Can use toy or image props)
4. How did you feel when this happened?
5. What do you think makes people want to hurt animals?
6. What do you think about animals?
7. How would you be kind to an animal?
(Can use toy or image props)

IV. Animal Harm Vignette

A boy is playing by himself one afternoon. A cat is lying down asleep nearby, and the boy walks up to the cat. The boy starts stroking the cat, and sometimes strokes it roughly and hits it. The cat starts to walk away and the boy pulls it back by its tail. The animal cries out in pain.

- a. What do you think about what happened?
- b. Have you ever found yourself in a similar situation? If yes, can you tell me about what happened?
- c. How do you think the boy felt when it happened? After?
- d. Why do you think the boy did this?
- e. Can you tell me about what the animal was doing?
- f. How do you think the animal felt?

V. Cruelty to Animals Interview (Dadds et al., 2004)

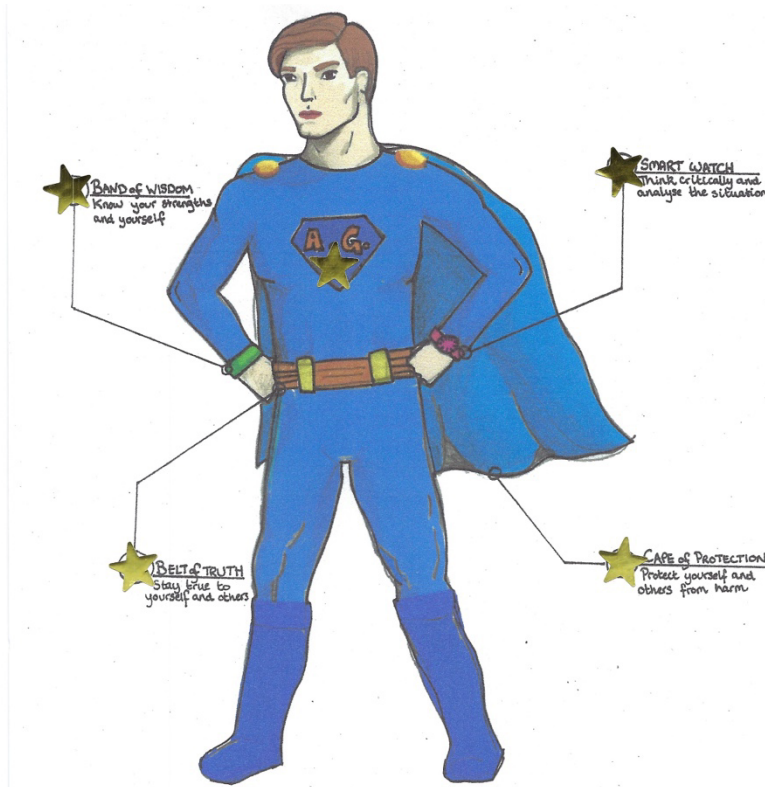
1. Have you ever hurt an animal on purpose? (tick):
 - a. Never
 - b. Hardly ever
 - c. A few times
 - d. Several times
 - e. Frequently
2. How many times have you hurt an animal on purpose? (tick):
 - a. Never
 - b. Once or twice
 - c. Three to six times
 - d. More than six times
3. What types of animals have you hurt in the past (tick as many boxes as needed):
 - a. None
 - b. Wild animals How many?
 - c. Stray animals How many?
 - d. Farm animals How many?
 - e. Pet animals How many?
4. Which of these animals have you been cruel to? (tick):
 - a. None
 - b. Worms or insects
 - c. Fish, lizards, frogs etc.
 - d. Birds or mammals
5. How long did you do this for (on and off)? (tick):
 - a. Never
 - b. For about 1 month
 - c. For about 6 months
 - d. Longer than 6 months
6. When was the last time you hurt an animal on purpose? (tick):
 - a. I have never hurt an animal
 - b. More than a year ago
 - c. Less than 1 year ago but more than 6 months ago
 - d. In the last 6 months (half a year)
7. 6. Do you treat animals cruelly in front of others or by yourself? (tick):
 - a. I have never hurt an animal
 - b. In front of others
 - c. Alone
8. If you hurt an animal with others, are they adults or friends? (tick):
 - a. I have never hurt an animal
 - b. Adults who were also hurting the animal
 - c. Friends who join in
 - d. With friends who don't join in
9. If you hurt an animal by yourself, do you try to hide what you have done?
 - a. I have never hurt an animal
 - b. No, I don't try to hide it
 - c. Sometimes I try to hide it, not always
 - d. Yes, I do try to hide it

10. If you purposely hurt an animal, do you feel very sorry for it and feel sad that you hurt it?
- I have never been cruel to an animal
 - Yes, I feel very sad for the animal
 - Sometimes I feel bad, not always
 - No, I do not feel bad for the animal
11. How do you feel about people hurting animals?
- Very sad and upset
 - Don't know
 - They deserve it
 - It is fun

ANSWER THIS LAST QUESTION IF YOU HAVE HURT AN ANIMAL ON PURPOSE.

12. Can you tell us what happened when you hurt an animal on purpose or what you usually do if you hurt animals often?

VI. Thank you and Debrief: Children got a star on the image below for each activity completed (they could choose to keep this if they wanted), got to pick a small reward (e.g., animal figurine), and were fully debriefed.



Appendix B:
Supplementary Materials for Chapter 4

*Psychological Risk Factors for Childhood
Animal Cruelty*

Supplementary Tables and Figures

Supplementary Table 1

Demographic details for each child showing sex, age, pet ownership, and CAPA classifications.

Child #	Referred/ Control	Sex	Age	Pet owner?¹	Pet type(s)	CAPA class.
1	R	M	9	Family pet	Cat	A+
2	R	F	11	Own pet	Dog	A+ (Tr)
3	R	M	4	Own pet	Small mammal	C1
4	R	M	10	Family pet	Dog, cat, small mammal	A+
5	R	F	9	Own pet	Cat	B
6	R	F	7	Own pet	Dog	A+ Dp
7	R	M	10	Own pet	Dog	C+
8	R	M	10	Own pet	Dog, cat	C+
9	R	M	9	No		C+
10	C	M	7	Own pet	Dog	Missing
11	C	F	11	No		B
12	C	M	9	No		B
13	C	F	10	Family pet		Missing
14	C	F	7	No		B
15	C	F	9	Own pet	Small mammal	A1
16	C	M	10	Own pet	Cat	B
17	C	M	10	No		A2
18	C	F	11	No		B
19	C	M	9	Family pet	Small mammal	B
20	C	F	8	Family pet	Dog	B
21	C	F	4	Family pet	Cat, fish/reptile	Missing
22	C	F	11	No		B
23	C	M	10	Family pet	Rabbit	A+ (Tr)
24	C	F	4	Own pet	Dog	B
25	C	F	4	Own pet	Cat	C2
26	C	F	11	Own pet	Dog, cat, small mammal	A1
27	C	M	10	No		B

¹ Pet ownership was measured on a three-point scale: 1= child has a pet and considers it their own pet, 2= pet in the family but child does not consider it their own, 3= no pet in the family.

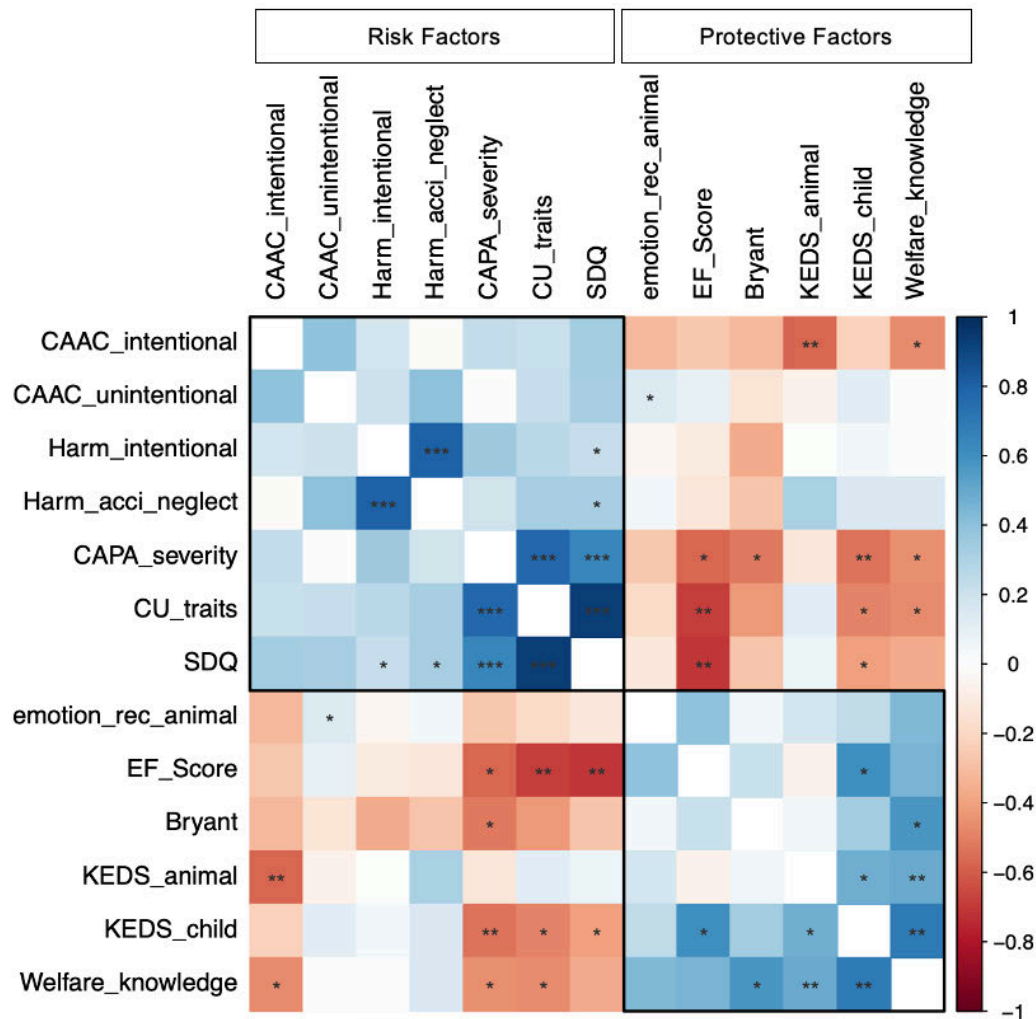
Supplementary Table 2

Results of Mann-Whitney U test comparing male and female children across psychological risk and protective factors.

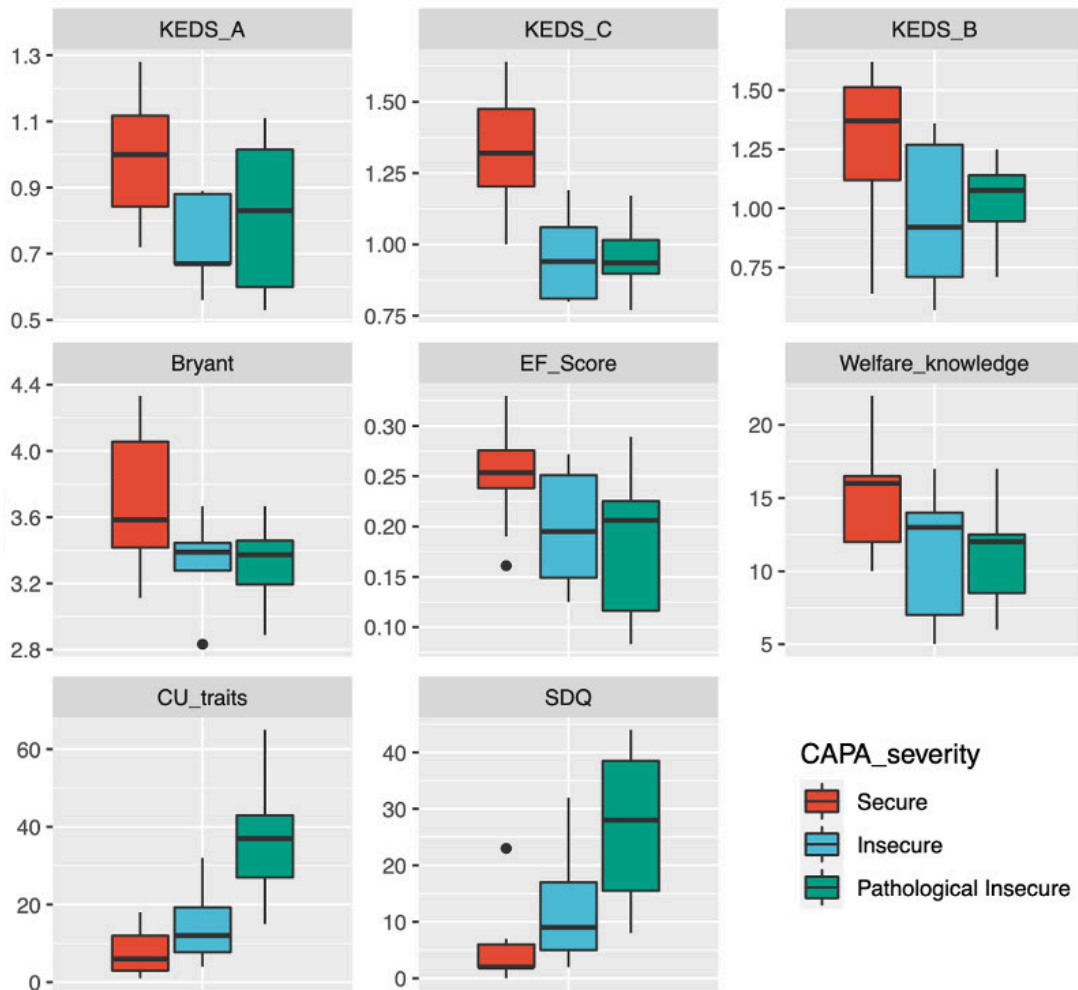
	Males (mean rank)	Females (mean rank)	Test statistic	p-value
Higher score is protective	KEDS – A	11.46	14.42	U(25)= 59.5 .320
	KEDS – C	10.67	15.15	U(25)= 50.0 .137
	KEDS – B	8.96	16.73	U(25)= 29.5 .007**
	Emotion rec.- human	12.17	14.64	U(26)= 68.0 .432
	Emotion rec.- animal	12.08	14.71	U(26)= 67.0 .403
	BEI	13.19	14.71	U(26)= 80.5 .840
	Welfare Knowledge	14.00	14.00	U(27)= 91.0 1.00
	Executive Function	13.62	13.38	U(26)= 83.0 .960
	Child-BAM	13.79	13.25	U(26)= 80.5 .860
	Referred (mean rank)	Control (mean rank)	Test statistic	
Higher score is a risk	CU traits	14.04	12.04	U(25)= 65.5 .503
	SDQ score	12.64	12.38	U(24)= 70.0 .955
	CAAC (intentional)	13.29	13.68	U(26)= 81.5 .899
	CAAC (accidental/neglect)	15.21	12.04	U(26)= 63.5 .297
	CAHB (intentional)	14.54	12.46	U(26)= 71.0 .511
	CAHB (accidental/neglect)	14.62	12.38	U(26)= 70.0 .479

Note: Where there is a difference in mean rank great than 2, the higher value is bolded.
 *p<0.05; **p<0.01; ***p<0.001

Supplementary Figure 1: Correlogram showing associations between risk and protective factors which had at least one significant correlation. Stars show significance levels (*p<0.05, **p<0.01, ***p<0.001)



Supplementary Figure 2: Boxplots showing children’s scores across the three attachment categorizations (Secure, Insecure ‘normal’, and ‘Pathological insecure’) for measures where there was a significant difference between securely and insecurely attached children.



University of Edinburgh Ethical Approval



SCHOOL of HEALTH IN SOCIAL SCIENCE
CLINICAL AND HEALTH PSYCHOLOGY

The University of Edinburgh
Medical School
Doorway 6, Teviot Place
Edinburgh EH8 9AG

Telephone 0131 651 3969
Fax 0131 650 3891
Email submitting.ethics@ed.ac.uk

Laura Wauthier
PhD Student
Department of Clinical and Health Psychology
School of Health in Social Science
University of Edinburgh

24 June 2019

Dear Laura,

Application for Level 2 Approval

Reference: CLIN629

Project Title: A longitudinal evaluation of Animal Guardians, a human education intervention for children who have been cruel to animals

Academic Supervisor: Jo Williams

Thank you for submitting the above research project for review by the Department of Clinical and Health Psychology Ethics Research Panel. I can confirm that the submission has been independently reviewed and was approved on the 17th May 2019.

Should there be any change to the research protocol it is important that you alert us to this as this may necessitate further review.

Yours sincerely,

Kirsty Gardner
Administrative Secretary
Clinical Psychology

Local Authority Approvals to do research in schools



Educational Psychology Service

West Lothian Civic Centre
Howden South Road
Livingston
West Lothian
EH54 6FF

Principal Educational Psychologist
Jennyfer McNiven

Contact:
Tel: 01506 283130
www.westlothian.gov.uk/
EducationPsychologyService

Laura Wauthier
9 Duncan Street
Edinburgh
EH8 1SZ

Date 30/07/19

Your ref

Our Ref MG/AF

22/08/2019

Dear Laura,

I am writing in response to your application requesting permission to undertake research in schools in The City of Edinburgh.

Your request has been considered, and I am pleased to inform you that you have been given permission in principle to undertake your research. I must stress that it is the policy of this Authority to leave the final decision about participation in research projects of this kind to Head Teachers and their staff, so that approval in principle does not oblige any particular establishment to take part.

I request that you forward a copy of your completed findings to me when they become available. In this case an electronic summary of your thesis would be preferred. Your work may be of interest to a number of staff in the Communities and Families Department.

I would like to thank you for contacting the Communities and Families Department about your work, and wish you every success in the completion of your project.

Yours sincerely

Marlin Gammell
Principal Psychologist

To whom it may concern,

The Educational Psychology research committee at West Lothian Council grants ethical approval for the research of Laura Wauthier titled "A Longitudinal Evaluation of Animal Guardians, a Human Education Intervention for Children Who Have Been Cruel to Animals". It is our understanding that the research will be conducted by Laura between September 2019 and December 2021 as part of their PhD project at the University of Edinburgh.

Yours faithfully,

Jennyfer McNiven
(Principal Educational Psychologist)

Psychological Services, Communities and Families
Level 1.3 Waverley Court, 4 East Market Street, Edinburgh EH8 8BG

Tel 0131 499 2803 E-mail anne.flzpatrick@ea.edn.sch.uk



Working to improve the wellbeing and educational outcomes of children and young people in West Lothian through the practical application of psychology.

Data Label OFFICIAL Sensitive

westlothian.gov.uk

Delayed Office Opening for Employee Training
This office will be closed from 8.45am - 11.00am on the first Thursday of each month.



Research and Performance
Paul Davison Corporate Research and Information Manager

2 High Street, PER H, PH 5PH
tel 0 738 476200 Fax 0 738 4762 0

Contact Chris Hunter
Direct Dial (0 738) 476349
Email www.prc.gov.uk

Our ref PD/CH

Your ref

Date 03 February 2020

Laura Wauthier
University of Edinburgh



Laura Wauthier <

RE general - Research in Fife Schools for the evaluation of a Scottish SPCA intervention

Vivienne Sutherland < >
To Laura Wauthier >
Cc: WAUTHIER Laura < >
Wed, Oct 23, 2019 at 1 21 PM

Dear Laura

Having reviewed your materials I am please to say that we have recommended to the Head of Service that your project is approved.

You will receive an official letter in due course, but there may be a delay due to the high number of requests that we are currently dealing with. Please accept this email in the meantime as approval to accept and act on any referrals from Fife.

I wish you all the best with this interesting area of work.

Best wishes

Viv

Vivienne Sutherland
Principal Psychologist
Fife Council Educational Psychology Service
Rothsay House
Glenrothes
KY7 5PQ

Tel. 01592 583340

Voip 442083

Dear Laura

A longitudinal evaluation of Animal Guardians, a human education intervention for children who have been cruel to animals

Thank you for your request to undertake research in Perth and Kinross.

I am pleased to confirm that your research has been approved in principle by Education and Children's Services Senior Management, subject to the conditions enclosed.

The final decision to permit the research in their establishment lies with the Headteacher/Head of Establishment and you will be required to provide a copy of this letter.

We look forward to receiving a copy of the findings of your research.

Yours sincerely

Paul Davison
Corporate Research and Information Manager

Enc

Copy to: Sharon Johnston, Interim Head of Education
All Primary School Headteachers

Education & Children's Services
Executive Director (Education & Children's Services) Sheena Devlin

Exploring children's relationship with animals

Parent Information Sheet

Dear Parent/Guardian,

The University of Edinburgh is working in collaboration with the Scottish Society for the Prevention of Cruelty to Animals (SPCA) to investigate how children interact with animals. We would be grateful if you could read the information below detailing the nature of the research, then if you consent for your child to participate, signing the form on page 3.



Thank you for your time and for supporting our research!

About the Study

This research is part of the evaluation for a new programme run by the Scottish SPCA called Animal Guardians. Animal Guardians is a targeted educational intervention to help children nurture empathy for animals and understand their needs. It is aimed at primary school aged children (between 4-12 years old). As part of this research, we need non-referred children to take part in the study so we can have a comparison group. Your child would be part of this comparison control group, and would not receive the intervention, but would still have the same questions asked before and after. This research is part of a PhD project, and part of broader research investigating the effectiveness of education programs run by the Scottish SPCA.

What will be involved?

This research will be based in your child's school. The research consists of two interview blocks, about eight weeks apart. Each interview block will be broken up into 20 minute sections to be carried out over two or three days. The main researcher (Laura Wauthier) will carry out a series of activities with your child in a quiet one-on-one setting at school. Questions will cover various topics, including understanding of animal welfare, relationship to animals, emotion recognition, and pets in the context of the family.

This procedure will be explained to children before they begin the study and they will be asked if they consent. Children will be free to withdraw from the study at any time they wish, and will be provided with support throughout.

Parts of the interviews will be audio and video recorded so they can be transcribed, anonymised and analysed. Once the transcriptions have been made, the recordings will be safely disposed of. We will also ask your child's classroom teacher to fill out a brief questionnaire about your child's behaviour in the classroom. Below is a detailed list of all the activities that your child will complete as part of the research with example questions/ explanations:

1. Animal ownership questionnaire (e.g. What type of pets do you own?)
2. Attachment to pet scale (e.g. Do you feel like your pet is your friend?)
3. Cruelty acceptance scale (e.g. Do you think it is OK to annoy an animal on purpose?)
4. Animal welfare knowledge (e.g. Can you list some good and bad things for dogs?)

5. Human and animal emotion recognition (using pictures)
6. Child Attachment and Play Assessment (child tells stories using figurines as a way to get an idea of how they relate to people and pets)
7. Card sorting task (child sorts cards according to shape or colour, as a measure of how well they can remember and switch rules)
8. Kids Empathy Development Scale (pictures with scenarios where child explains how they think people are feeling and what they would do in that situation)
9. Bryant empathy measure (standardised empathy questionnaire for children)

Will the information you collect be confidential?

Yes. All information collected will be anonymised, kept in a safe location, and treated confidentially. All GDPR regulation will be strictly adhered to, along with the University's Information Security policy. The main researcher (Laura Wauthier) has received child protection training and is fully PVG checked. This research has gone through a rigorous ethical review process at the University of Edinburgh, and consent has been received from your Local Authority.

Contact Information

Please don't hesitate to contact the research team at the University of Edinburgh for more information:

Main researcher: **Ms Laura Wauthier**

Supervisor: **Prof. Joanne Williams**

Email:

Email:

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Clinical and Health Psychology Doorway 6, Old Medical School, The University of Edinburgh

If you would like more information about Animal Guardians, or any other programme run by the Scottish SPCA, please visit their website at: <https://www.scottishspca.org/education/>

If you have complaints at any point regarding this research, please fill out the form at the link <http://www.ed.ac.uk/files/imports/fileManager/WEB%20Complaint%20Form.pdf> and send it to the head of the School:

Professor Matthias Schwannauer (Head of School of Health in Social Science)

Email:

Telephone: +44 (0)131 651 3954

Thank you for your support!



THE UNIVERSITY
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SCOTTISH SPCA
Scotland's Animal Welfare Charity



centre for applied
developmental
psychology



caar

Parent Consent Form

Please tick each of the statements below to show that you agree with them, and then sign the form at the bottom of the page to give consent for your child to participate.

7. You have read and understood the information provided
8. You are happy for your child to participate and take part in this research study voluntarily
9. You understand that you or your child can stop and withdraw from the study at any time without consequence
10. Understand that all data will be anonymised
11. Understand that your child will be recorded (audio and video) during the interview and that these recordings will be transcribed and then disposed of
12. Understand that fully anonymised data may be shared in public research repositories as well as being used in research papers and conferences.

Caregiver's Name (Printed)

Child's Name (Printed)

Caregiver's Signature

Today's Date

Note on completing this form:

There are several ways you can complete and return this form:

- **Physically print and sign** the form. You can then either scan and send back to your school's admin email or main researcher (), or bring the physical copy into the school.
- **Sign the form electronically:** You can sign this form electronically using standard programs provided on Mac (Preview) or PC (Adobe Reader). These programs allow you to easily create an e-signature.
 - **On Mac:** open this PDF in Preview, and click on 'Markup' which should appear in the tool bar. This will allow you to tick the boxes, enter text, and add an e-signature. Then simply save the file and send back.
 - **On a PC:** open this PDF in Adobe Reader (free to download if you don't have it) and click on 'Fill and Sign' which appears on the right-hand column. This will allow you to tick, enter text, and insert an e-signature.

Child Information Sheet

About me and my relationship with animals

I am interested in how children think and feel about animals. I am going to be asking you lots of different kinds of questions and we will also be playing some games. Don't worry- there are no right or wrong answers. Everything that you say is private, so I will not tell your teacher or your parents anything you don't want me to, unless I think your safety might be at risk.

We are going to do the interview over three days for about 20 minutes each time. I will also come back in a couple of months, and we will do some of the activities again. If at any point you don't want to do the interviews anymore, all you have to do is tell me and we will stop (don't worry you won't get in any trouble!). After you complete each part, you will get a small present. Some of the parts of the interview will need to be recorded on the camera. Also, I will give your teacher a small questionnaire to fill out as well so that I can get to know a bit more about you.

Let's go over some of the things we will be doing, and you can tell me if you are OK to do the interview with me.



Stories



iPad Questions



Card game

Child Consent Form



This form is to tell me that you would like to take part in this project and understand what the project is about

Please read the 6 points below and tick the box if you agree

- I am happy to take part in this project
- I understand what the project is about
- I understand that the answers I give will be kept private
- I understand that I can stop or leave this project any time
- I understand that a report will be written on relationships between children and animals
- I am happy to be recorded, and understand that these recordings will be private and only used for the project

If you have any questions please ask!

NAME:

SCHOOL:

CLASS:

DATE:

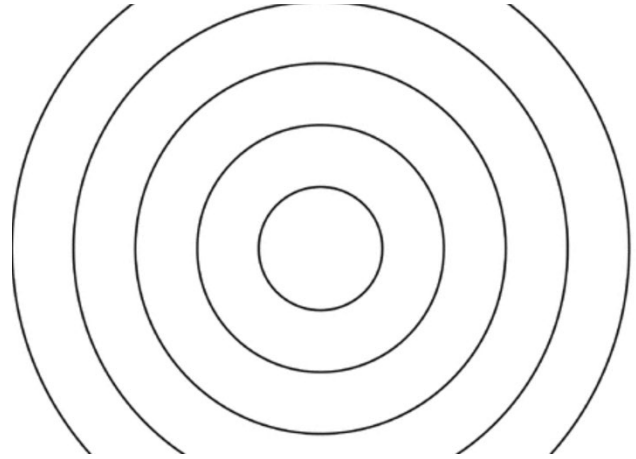
Interview Schedule

Day 1: Relationship to Animals

Attachment circles:

Children are asked to 'draw anyone who is important to them, like family, friends or pets'.

I take a record of (1) the ORDER they draw these people in, and (2) the DISTANCE they draw the people from themselves. I offer the child the choice of whether they want to draw or want me to draw for them. The image below is what the paper looks like when we start the task (with concentric circles). The point of this activity is to see whether children are including pets in their circles, and how they are doing so, and also whether more general information about their attachment style might be gleaned from who they are including.



Animal Ownership questionnaire:

Short set of 5 questions asking children whether they own pets now, what pets they own, and also if they have owned pets in the past, and what these pets were.

Short Attachment to Pets Scale:

Short set of 11 items asking children how attached they are to their pets:

	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
I don't really like animals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I spend time every day playing with my pet (or would if I had one)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have sometimes talked to my pet and understood what it was trying to tell me (or would if I had one)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I love pets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I talk to my pet quite a lot (or would if I had one)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My pet makes me feel happy (or would if I had one)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I consider my pet to be my friend (or would if I had one)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My pet knows when I am upset and tries to comfort me (or would if I had one)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are times I'd be lonely without my pet (or would if I had one)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Belief in Animal Minds:

Set of questions regarding belief that animals can have feelings and feel pain. The animals covered are dogs, cats, birds, and rabbits.

Do you think dogs are/can feel...?




	Yes	Maybe	Not sure	Not really	Not at all
Clever	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Happiness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sadness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fear	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Animal Welfare needs

Children’s self-generated answers on the welfare needs of animals using the sheet shown below. Children are asked what each kind of animal needs/likes and things that are bad for them in a free-response format. Animal covered are dogs, cats, rabbits, and hedgehogs (we don’t always have time to do the hedgehogs). Their answers will be coded to see if they are capturing all the welfare needs, and whether their knowledge of different kinds of harm also increases.

What Does a DOG need?

Good things for dogs	Bad things for dogs
_____ _____ _____ _____ _____	_____ _____ _____ _____ _____



Animal Cruelty Acceptance Scale:

Short set of 11 questions asking whether the child thinks certain behaviours towards animals are acceptable (not whether they have done these things)

Do you think it is OK to...?

Only answer for mammals, birds, and reptiles (not for fish or insects)

	Very bad	Bad	Not sure	Good	Very good
Annoy an animal on purpose	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Frighten an animal on purpose	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hurt an animal on purpose	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Leave a pet alone for a few days with enough food and water	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kick an animal on purpose	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tease an animal on purpose	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kick an animal by accident	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Forget to feed a pet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Forget to give a pet water	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hurt an animal by accident	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kill an animal (not for food)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Emotion Recognition:

Human and animal emotion recognition images, where children have to say whether they are happy, sad, angry, afraid, or neutral. Animals covered are cats, dogs, and rabbits.

Day 2: Stories

CAPA stories procedure (9 stories):

Children are given a story prompts (below) and are asked to finish the story however they would like (“Tell me and show me what happens next”). Younger children are given a slightly different set of main stories (1-6) than older children (3-8). This is then followed by three animal-related stories. This procedure is filmed and the content of the child’s stories, their body language and engagement are then all coded to give an indication of the child’s attachment style. The idea is that the stories present the children with challenging situations, and we are interested in how they resolve the tension in the story (sometimes children cannot do this very well, and that can be a sign of poor attachment).



Story 1: Animal story. A little pig gets lost when taking a walk and can’t find his way back home. (animals are other farm animals and also some ‘dangerous’ animals like lions and tigers.)

Story 2: Animal Story. A big elephant comes stomping through the group of animals and none of them like the scary stomping.

The child is asked to pick out a family including children, parents, and pets.

Story 3: Good picture. The main child has just been at school and drawn a really good picture, and the child comes home from school.

Story 4: Spilled juice. The children are sitting at the table getting their favorite juice. The mum/dad says to be careful as they have just gotten new carpets. The child spills the juice everywhere.

Story 5: noise in the night. The children are getting ready for bed, while the parents stay downstairs quietly in the living room. One of the children hears a noise in the night and it wakes him/her up. The noise happens again, and the child wonders whether there is a burglar in the house.

Story 6: Burnt hand. The children are waiting for their dinner on Sunday (child's favorite food). Child is hungry and goes to the kitchen asking if it's ready yet. The food is not yet ready, and the parent says to wait. The child wants to peek at the food while parent's back is turned, but spills all the hot food on their hand.

Story 7: Mum's headache. Child is at home with mum watching TV. Mum says she has a headache and wants to lie down, could the child do something else quietly. The child does, but then a friend knocks on the door and says that there's a really good programme on TV that they can watch and asks if they can come in to watch it together.

Story 8: Lost keys. Mum and dad are going on a trip, and are looking for their keys. Mum blames dad for losing them, and the parents get into a fight over who lost the keys.

Animal Story 1: Cuddling a pet. Child comes home from school and has had a hard day and was teased. Child wants to play with favorite pet (child chooses this), but pet is tired and does not want to interact.

Animal Story 2: punishing a pet. Child and pet are playing together with child's new favorite doll. They start to play too roughly and pet rips the toy while they play.

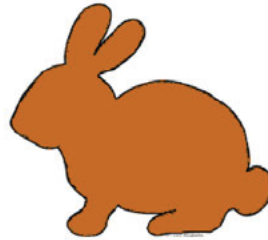
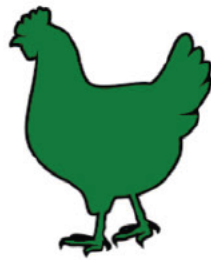
Animal Story 3: lashing out against pet. Child goes up to a pet, and starts to play or cuddle it, then the animal bites/scratches them.

Depending on how much detail the child gives for each story, this takes between 20 minutes and 30 minutes. Occasionally stories are cut short if time is tight, but I will always try to do at least 5 core stories and 2 animal stories.

Day 3: Empathy and Executive functioning

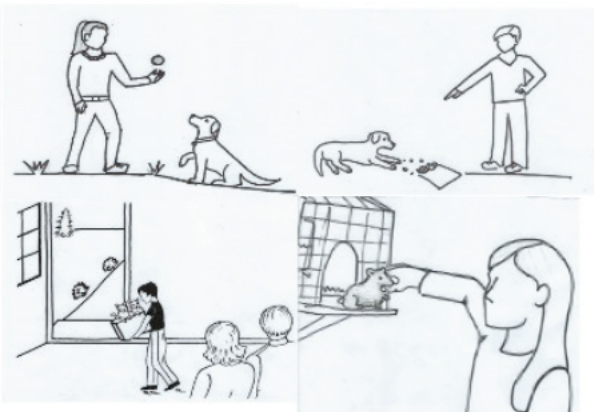
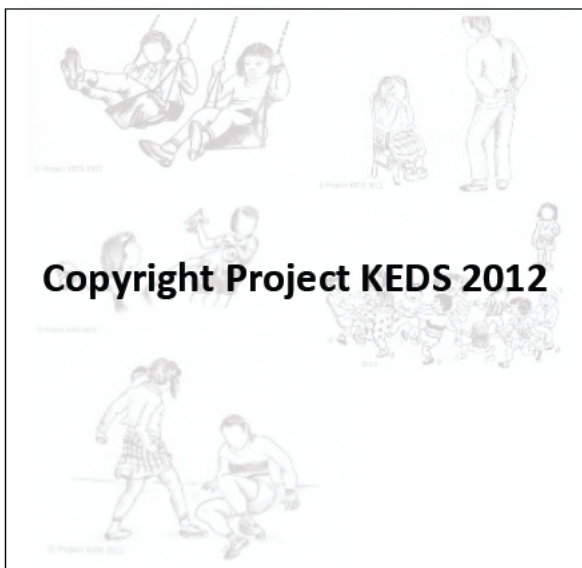
MEFS-inspired Executive Functioning Task:

In this task, children have to sort card according to two dimensions: shape or colour. There are 3 levels to this game, and if the child gets the majority correct on one level, they pass to the next level. In this case, they are sorting green/orange rabbits/chickens. Full task takes approx. 5 minutes. Children are sorting physical cards into boxes- this is filmed and later an error rate/timing can be calculated for each child.



KEDS empathy Measure

This is an empathy measure where children look line drawn scenes and are asked three questions for each relevant character: (1) what are they feeling? (affective empathy) (2) why are they feeling like that (cognitive empathy) and (3) what would you do if you were in that situation? (behavioural empathy). The original set of KEDS images is 12 images long. For this study, I have selected 6 images the original measure, and four have been added to probe animal-directed empathy (for a total of 10 images). Several of the images I have removed from the original measure are not relevant because they measure surprise (2), boredom/neutral (2).



Bryant Empathy measure

A set of about 20 items which explores empathy in children. Below are 5 example items from the scale:

	Not at all	Not really	Neutral	A bit	A lot
It makes me sad to see a kid who can't find anyone to play with	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People who kiss and hug in public are silly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Children who cry because they are happy are silly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I really like to watch people open presents even when I don't get a present myself	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Seeing someone who is crying makes me feel like crying	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Animal cruelty and compassion questionnaire

Set of 18 questions investigating children's behaviour towards animals. Compassionate behaviour and acts of harm are mixed into each other (it's two sets of questions combined). Below are some example items:

How often have you do the following?

Only answer for mammals, birds, and reptiles (not for fish or insects)

	Never	Sometimes	Often	Very often	I don't have a pet
Annoy an animal	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cuddle a pet animal	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Frighten an animal on purpose	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Left a pet alone for a few days with enough food and water	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kick an animal on purpose	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Groom a pet animal	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kicked an animal by accident	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Clean up after a pet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Forgotten to feed a pet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix C:
Supplementary Materials for Chapter 5

*The Role of Attachment in Children's
Relationships with Pets*

Please see Appendix B for ethical approvals, consent forms, and interview schedule (the sample of children for Chapters 4 and 5 was the same)

Supplementary Table 1: Intra- and Inter- rater reliability scores across the PICAS items

	Intra-rater reliability (Weighted Kappa)	Inter-rater reliability (Weighted Kappa)
Pet thoughts	0.71	0.59
Pet feelings	0.78	0.60
Caregiving	0.78	0.70
Comfort	0.81	0.63
Parental help	0.81	0.78
Average	0.78	0.66

Supplementary Table 2: Demographic details for each child showing sex, age, pet ownership, and CAPA classifications for human and pet stems.

Child #	Sex	Age	Pet owner?¹	Referred/ Control	CAPA class. (Human stems)	CAPA class. (Pet stems)²
1	M	7	1	C	Missing	Missing
2	M	9	2	R	A+	A+
3	F	11	1	R	A+ (Tr)	A+
4	M	4	1	R	C1	C1
5	F	11	3	C	B	B
6	M	9	3	C	B	B
7	M	10	2	R	A+	A+ (Tr)
8	F	9	1	R	B	B
9	F	10	2	C	Missing	Missing
10	F	7	3	C	B	CC (A/C)
11	F	9	1	C	A1	A1
12	M	10	1	C	B	B
13	M	10	3	C	A2	A2
14	F	7	1	R	A+ Dp	A+
15	F	11	3	C	B	B
16	M	9	2	C	B	B
17	F	8	2	C	B	B
18	F	4	2	C	Missing	Missing
19	M	10	1	R	C+	C+
20	F	11	3	C	B	B
21	M	10	1	R	C+	C+
22	M	10	2	C	A+ (Tr)	C+
23	M	9	2	R	C+	C+
24	F	4	1	C	B	B
25	F	4	1	C	C2	C2
26	F	11	1	C	A1	A1
27	M	10	3	C	B	B

¹ Pet ownership is on a three-point scale: 1= child has a pet and considers it their own pet, 2= pet in the family but child does not consider it their own, 3= no pet in the family.

² CAPA classification based on the pet stems was carried out to confirm that children broadly displayed the same attachment patterns when carrying out the pet stories- pet stem classification matched the main (human stem) classification in all instances but two, child 10 and child 22.

Supplementary Table 3: Correlation Matrix for Whole Sample on Measures of Interest

		Distance Mum	Distance Dad	Distance Sibling	Distance Pet	MENTALISING	CAREGIVE	COMFORT	PARENTAL	Average BAM	SAPS	CAAC score	Negative behaviours
Distance Mum	Spearman's rho	—											
	p-value	—											
	N	—											
Distance Dad	Spearman's rho	0.824 ***	—										
	p-value	< .001	—										
	N	27	—										
Distance Sibling	Spearman's rho	0.569 **	0.457 *	—									
	p-value	0.002	0.016	—									
	N	27	27	—									
Distance Pet	Spearman's rho	0.170	-0.036	0.276	—								
	p-value	0.398	0.860	0.163	—								
	N	27	27	27	—								
MENTALISING	Spearman's rho	0.188	0.137	0.252	-0.127	—							
	p-value	0.378	0.523	0.234	0.555	—							
	N	24	24	24	24	—							
CAREGIVE	Spearman's rho	0.191	0.147	0.457 *	0.104	0.717 ***	—						
	p-value	0.371	0.492	0.025	0.630	< .001	—						
	N	24	24	24	24	24	—						
COMFORT	Spearman's rho	0.158	-0.313	0.217	0.176	0.067	0.214	—					
	p-value	0.461	0.137	0.309	0.411	0.755	0.315	—					
	N	24	24	24	24	24	24	—					

Supplementary Table 3: Correlation Matrix for Whole Sample on Measures of Interest (Continued)

	N	24	24	24	24	24	24	—					
PARENTAL	Spearman's rho	0.421 *	0.415 *	0.616 **	-0.118	0.461 *	0.665 ***	0.008	—				
	p-value	0.040	0.044	0.001	0.583	0.023	< .001	0.969	—				
	N	24	24	24	24	24	24	24	—				
Average BAM	Spearman's rho	0.199	0.248	0.050	0.427 *	-0.108	0.186	-0.274	-0.262	—			
	p-value	0.330	0.222	0.810	0.030	0.624	0.394	0.206	0.227	—			
	N	26	26	26	26	23	23	23	23	—			
SAPS	Spearman's rho	0.059	-0.129	0.085	0.373	-0.214	0.082	-0.083	0.045	0.387	—		
	p-value	0.775	0.531	0.680	0.061	0.327	0.710	0.707	0.840	0.051	—		
	N	26	26	26	26	23	23	23	23	26	—		
CAAC score	Spearman's rho	0.474 *	-0.244	0.330	-0.261	-0.124	0.169	-0.229	-0.049	-0.108	0.028	—	
	p-value	0.014	0.229	0.100	0.197	0.573	0.441	0.294	0.824	0.598	0.892	—	
	N	26	26	26	26	23	23	23	23	26	26	—	
Negative behaviours	Spearman's rho	0.104	-0.262	0.065	0.434 *	0.102	0.139	-0.060	-0.106	0.335	0.185	0.110	—
	p-value	0.612	0.196	0.752	0.027	0.644	0.527	0.786	0.630	0.102	0.376	0.601	—
	N	26	26	26	26	23	23	23	23	25	25	25	—

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

Supplementary Table 4: Correlation Matrix for *Securely Attached* Children on Measures of Interest

		Distance Mum	Distance Dad	Distance Sibling	Distance Pet	MENTALISING	CAREGIVE	COMFORT	PARENTAL	Average BAM	SAPS	CAAC score	Negative behaviours
Distance Mum	Spearman's rho	—											
	p-value	—											
	N	—											
Distance Dad	Spearman's rho	0.439	—										
	p-value	0.177	—										
	N	11	—										
Distance Sibling	Spearman's rho	0.610 *	0.184	—									
	p-value	0.046	0.587	—									
	N	11	11	—									
Distance Pet	Spearman's rho	0.286	-0.212	0.474	—								
	p-value	0.394	0.532	0.141	—								
	N	11	11	11	—								
MENTALISING	Spearman's rho	-0.164	-0.329	0.060	0.028	—							
	p-value	0.629	0.324	0.860	0.936	—							
	N	11	11	11	11	—							
CAREGIVE	Spearman's rho	0.145	-0.065	0.455	0.534	0.677 *	—						
	p-value	0.670	0.850	0.159	0.091	0.022	—						
	N	11	11	11	11	11	—						
COMFORT	Spearman's rho	0.138	-0.215	0.448	0.408	0.283	0.438	—					
	p-value	0.685	0.526	0.167	0.213	0.399	0.178	—					

Supplementary Table 4: Correlation Matrix for *Securely Attached* Children on Measures of Interest (Continued)

PARENTAL	N	11	11	11	11	11	11	—					
	Spearman's rho	-0.110	-0.134	0.380	0.150	0.651 *	0.581	0.198	—				
	p-value	0.749	0.694	0.249	0.660	0.030	0.061	0.560	—				
Average BAM	N	11	11	11	11	11	11	11	—				
	Spearman's rho	0.066	0.208	-0.163	0.444	-0.505	-0.054	-0.086	-0.399	—			
	p-value	0.848	0.539	0.632	0.172	0.113	0.874	0.802	0.225	—			
SAPS	N	11	11	11	11	11	11	11	11	—			
	Spearman's rho	0.320	-0.304	0.229	0.349	-0.438	-0.120	0.275	-0.315	0.370	—		
	p-value	0.337	0.364	0.498	0.292	0.178	0.726	0.413	0.346	0.262	—		
CAAC score	N	11	11	11	11	11	11	11	11	11	—		
	Spearman's rho	-0.175	0.463	-0.129	0.279	0.007	0.023	-0.726 *	0.211	-0.132	0.593	—	
	p-value	0.607	0.152	0.705	0.406	0.984	0.945	0.011	0.534	0.700	0.054	—	
Negative behaviours	N	11	11	11	11	11	11	11	11	11	11	—	
	Spearman's rho	0.112	-0.346	0.355	0.792 **	0.418	0.671 *	0.279	0.283	0.358	0.032	-0.243	—
	p-value	0.758	0.327	0.315	0.006	0.229	0.034	0.434	0.428	0.310	0.931	0.499	—
	N	10	10	10	10	10	10	10	10	10	10	10	—

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

Supplementary Table 5: Correlation Matrix for *Insecurely Attached* Children on Measures of Interest

		Distance Mum	Distance Dad	Distance Sibling	Distance Pet	MENTALISING	CAREGIVE	COMFORT	PARENTAL	Average BAM	SAPS	CAAC score	Negative behaviours
Distance Mum	Spearman's rho	—											
	p-value	—											
	N	—											
Distance Dad	Spearman's rho	0.972 ***	—										
	p-value	<.001	—										
	N	13	—										
Distance Sibling	Spearman's rho	0.538	0.581 *	—									
	p-value	0.058	0.037	—									
	N	13	13	—									
Distance Pet	Spearman's rho	0.408	0.416	0.495	—								
	p-value	0.167	0.157	0.085	—								
	N	13	13	13	—								
MENTALISING	Spearman's rho	0.182	0.157	0.060	-0.087	—							
	p-value	0.551	0.608	0.846	0.777	—							
	N	13	13	13	13	—							
CAREGIVE	Spearman's rho	0.050	0.141	0.267	0.210	0.432	—						
	p-value	0.872	0.646	0.379	0.491	0.140	—						
	N	13	13	13	13	13	—						
COMFORT	Spearman's rho	-0.292	-0.293	0.097	-0.179	-0.136	0.085	—					
	p-value	0.333	0.332	0.754	0.558	0.658	0.783	—					

Supplementary Table 5: Correlation Matrix for *Insecurely Attached* Children on Measures of Interest (Continued)

	N	13	13	13	13	13	13	—					
PARENTAL	Spearman's rho	0.462	0.574 *	0.525	0.213	-0.331	0.266	0.036	—				
	p-value	0.112	0.040	0.065	0.485	0.269	0.381	0.908	—				
	N	13	13	13	13	13	13	13	—				
Average BAM	Spearman's rho	0.387	0.432	0.229	0.681 *	0.238	-0.036	-0.530	-0.073	—			
	p-value	0.213	0.161	0.474	0.015	0.455	0.911	0.076	0.822	—			
	N	12	12	12	12	12	12	12	12	—			
SAPS	Spearman's rho	0.059	0.106	0.095	0.625 *	-0.206	-0.062	-0.315	0.085	0.496	—		
	p-value	0.855	0.742	0.770	0.030	0.521	0.849	0.318	0.793	0.101	—		
	N	12	12	12	12	12	12	12	12	12	—		
CAAC score	Spearman's rho	-0.544	-0.579 *	-0.379	-0.319	-0.345	-0.623 *	0.249	-0.398	-0.150	0.016	—	
	p-value	0.068	0.049	0.225	0.313	0.272	0.031	0.435	0.200	0.643	0.960	—	
	N	12	12	12	12	12	12	12	12	12	12	—	
Negative behaviours	Spearman's rho	-0.077	-0.170	0.102	0.192	0.022	-0.078	-0.336	-0.275	0.287	0.336	-0.025	—
	p-value	0.802	0.579	0.741	0.529	0.942	0.801	0.261	0.364	0.366	0.285	0.938	—
	N	13	13	13	13	13	13	13	13	12	12	12	—

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

Appendix D:
Supplementary Materials for Chapter 6

The Animal Guardians Programme

Supplementary Table 1: An overview of the exercises and games used in the AG intervention, organised by the four themes.

Part 1: Emotion Recognition

Snow Globe

At the start of every session, children are prompted to label their own current emotion. They can then place a smiley of their emotion in the snow globe (pictured). If children become frustrated or seem too high in energy, they are prompted to shake the snow globe and count how long it takes for all the flakes to settle. This serves as an emotional labelling and a simple self-regulation exercise.



Emotion Boards

Starting with a board of human images, children must label which of 6 emotions correspond to each picture using smileys. Emotions are happy, sad, angry, scared, neutral, and hurt. Following human emotion recognition board, children move on to dogs, then mixed pets (cats and rabbits), wildlife (swan and fox), and farm (cow, pig, sheep). These are done in increasing level of difficulty for children, who tend to be less familiar the wildlife and farm species.



Hexagon Game

Using a set of five hexagons with an emotion drawn on them (happy, sad, angry, scared, and hurt), children must match the emotions of animals to each emotion- this time animal and human tiles are mixed into each other. Once children have completed this, the pattern of hexagons can be brought together into one overall grid, and the AG officer can discuss how we can sometimes we feel multiple emotions at once- for example both sad and hurt, or both scared and angry.



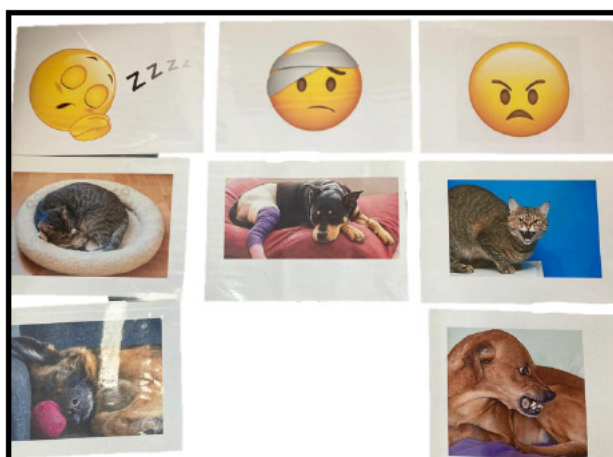
Additional Game: Dice

As a quick interlude, which can be used to engage children in a short activity at any point in the program, a pair of large foam dice are used. The red dice has six emotions (as above) and the green dice has six species. Once the dice are rolled, the child must give a quick example of why that animal might feel that emotion. Pictured on the right for example, they would give an example of how a dog might get injured or feel pain.



Additional Game: Run to pictures

Designed for children who might struggle to sit down or engage in more difficult verbal tasks, here the AG officer will set out eight different emotion cards (happy, sad, angry, scared, neutral sleepy, hurt, and “please don’t touch me”) around the room. Then the child will be handed images one at a time, and must place them near the right emotion, or between two emotions if they think the animal might be feeling to adjacent feelings (e.g. angry and “please don’t touch me”).



Part 2: Animal Welfare Needs

Hello! My name is...

This game acts as a quick introduction to various animal's welfare needs. Children must attach velcro items to five categories which correspond to the five domains: "In my home I need...", "I like to eat...", "I need a visit to the vet when...", "These things make me sad or frightened...", and "I am happy when...". This also allows for a discussion of needs as opposed to wants (what makes them happy), and of the fact that animals rely on humans to provide these things for them.



Triangles

For this task, children must match a range of items to either a cat, a hedgehog, and a cow and place them either with "good things" or "bad things". This task is a bit more challenging than the previous task, since all the animals and all their needs are mixed into one box, and children must be able to understand that while something might be good for one animal (e.g. hay for a cow) it is not good for other animals (e.g. a cat).



What do I need?

For this final game, five or six cards are split between the AG officer and the child, and children must complete all the welfare needs for each of six animals. If they do not have a card they can place around an animal, they must draw from the pile. As before, children need to differentiate what is good for one animal compared to other animals, and this also allows a discussion of what is common for all animals (e.g. vet check ups).



Part 3: Responsibilities

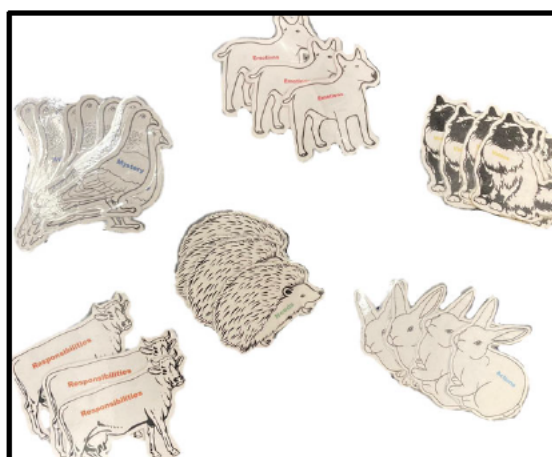
Lucky Max

This is a short three-chapter picture book about a boy who gets a puppy to take care of. The stories give examples of things the boy does with the dogs and how to handle various behaviours- for example, potty training with positive reinforcement. Children will usually read one chapter per session over three sessions, tying over the welfare needs sessions with the responsibilities sessions. Children can keep the book if they want to, and can read it with parents at home.



Dominos

Children place dominos with colours instead of numbers (not pictured). When they line up two colours, they must answer a card (left) with the appropriate coloured theme, these are: Emotions, Needs, Actions, Responsibilities, Mystery, and Video. Some of these cards start to recap topics covered in previous games, and other cards add new topics, such as actions and responsibilities. For the "Videos" cards, they watch a video and need to answer questions about what is going on and what they might do in that situation. Covers responsibilities towards both pets and wildlife.



Decisions: Snakes and Ladders

Bringing everything together, children complete a board game where they must roll a dice and answer a question card corresponding to the colour of the tile they land on. The themes emotions, needs, actions, and videos. Because children are required to answer questions based on images and videos, they need to bring together all their skills, including emotion recognition, understanding situations, and knowing what needs to be done.



Part 4: Behaviour around animals

Handling exercises

At the beginning of the program children are given a soft toy of either a cat or a dog that **they can keep**. AG officers also have larger versions of these toys to demonstrate correct handling, including where children are allowed to pet and where they should not touch, and how to be gentle. These animal toys also have microchips in them, which can be scanned for an extra interactive element and when discussing visits to the vet. If children struggle to engage with the soft toys, there are also robotic touch sensitive toys which can be used, although generally these are not necessary.



Executive Functioning game: Match it!

As a fun game to wrap up sessions, children play on a set of circular cards and must find the matching symbol occurring on any pair of cards, which can be either an animal or a letter. If it is an animal, children must name the baby of that animal (e.g., puppy, kitten, kit, chick) and if it a letter, they must find an emotion that starts with that letter. This helps children work on executive functioning skills such as inhibitory control and working memory. **Children keep a pack of cards to take home.**

Home Support


It is very important the children get consistent message about how they should behave around animals, so parents are provided with a short information sheet going over the content of AG on one side, and giving examples of behaviours that children can get rewarded for. At the end of each week of good behaviour, they get to pick a bit of Scottish SPCA stationary (pencil, ruler, bookmark, etc.) to fill out a new pencil case (these are provided by Scottish SPCA for the parent to hand out). The effectiveness of this element is dependent on parental engagement.



Supplementary Table 2: Items in the positive and negative behaviour scales, with a note on the source of the item; items with an Asterix are slightly modified from the original version. Referred and control children's mean and standard deviation are given for each item at pre-test. A higher score indicates less negative behaviour and more positive behaviour.

	Interactions with Animals	Where is it from?	Positive or negative?	Referred Mean (SD)	Control Mean (SD)
3	Hurt an animal on purpose	CAAC	Negative	2.57 (0.79)	2.88 (0.49)
4	Annoy an animal	CAAC	Negative	2.24 (0.83)	2.75 (0.58)
5	Play rough with an animal	CTAQ*	Negative	2.43 (0.79)	2.44 (0.73)
6	Frighten an animal by accident	CAAC	Negative	2.05 (0.84)	2.29 (0.77)
7	Shout at an animal	CTAQ	Negative	2.35 (0.83)	2.65 (0.70)
8	Tease an animal	CTAQ*	Negative	2.26 (0.86)	2.81 (0.40)
9	Forget to give food or water to an animal	CAAC*	Negative	2.87 (0.34)	2.82 (0.39)
13	Hurt an animal by accident	CAAC	Negative	2.32 (0.72)	2.47 (0.64)
14	Kick an animal on purpose	CAAC	Negative	2.55 (0.80)	3.00 (0.00)
16	Frighten an animal on purpose	CAAC	Negative	2.65 (0.65)	3.00 (0.00)
17	Kick an animal by accident	CAAC	Negative	2.32 (0.84)	2.81 (0.40)
18	Kill an animal	CAAC	Negative	2.83 (0.49)	2.94 (0.24)
19	Lash out against an animal when I am angry	CTAQ*	Negative	2.65 (0.71)	2.88 (0.33)
20	Lock-up or tie-up an animal	CTAQ*	Negative	2.68 (0.57)	3.00 (0.00)
21	Hit an animal	CAAC	Negative	2.45 (0.80)	3.00 (0.00)
24	Punish an animal if they misbehave	Novel	Negative	2.39 (0.78)	2.88 (0.34)
27	Wake up a pet while it's sleeping	Novel	Negative	1.91 (0.87)	2.47 (0.80)
1	Pat or stroke an animal	CTAQ	Positive	2.78 (0.60)	2.73 (0.59)
2	Give food or water to an animal	CTAQ	Positive	2.57 (0.79)	2.33 (0.72)
10	Cuddle an animal	CTAQ	Positive	2.61 (0.72)	2.76 (0.66)
11	Play with an animal	CTAQ	Positive	2.64 (0.73)	2.76 (0.44)
12	Spend time with an animal	CTAQ	Positive	2.81 (0.51)	2.76 (0.56)
15	Brush, clean, or groom an animal	CTAQ	Positive	2.13 (0.87)	2.38 (0.81)
22	Comfort an animal if they are sad or scared	Novel	Positive	2.78 (0.52)	2.71 (0.59)
23	Give treats to an animal	Novel	Positive	2.61 (0.58)	2.59 (0.62)
25	Clean up after an animal	Novel	Positive	1.91 (0.90)	2.24 (0.90)
26	Train an animal	Novel	Positive	1.77 (0.87)	1.94 (1.03)

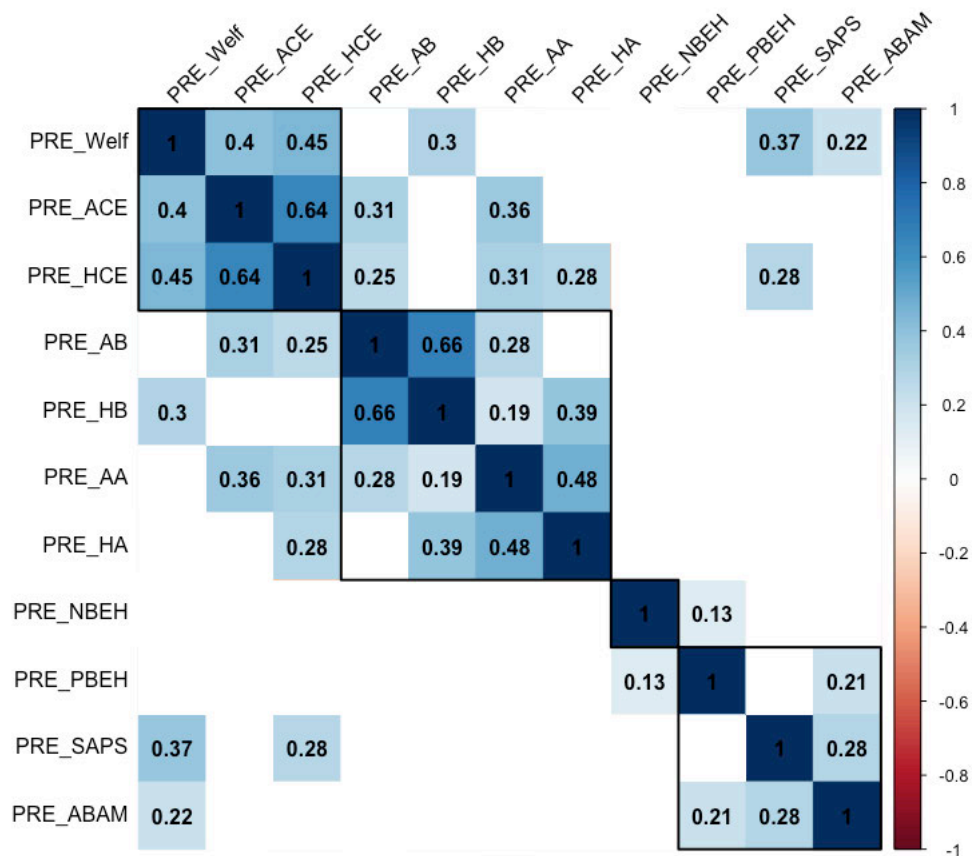
Supplementary Table 3: Coding scheme used for the first image of the empathy measure.

	
<p>1. How do you think the BOY is feeling?</p> <ul style="list-style-type: none"> a. Happy – 0 points b. Sad – 2 points c. Angry – 0 points d. Scared – 1 point e. Relaxed/Neutral – 0 points f. I don't know – 0 points 	<p>2. How do you think the CAT is feeling?</p> <ul style="list-style-type: none"> a. Happy – 0 points b. Sad – 0 points c. Angry – 1 point d. Scared – 2 points e. Relaxed/Neutral – 0 points f. I don't know – 0 points
<p>3. What do YOU think is happening in this scene?</p>	
<p>Human Cognitive 0- No answer/incorrect/ simply repeat emotion <i>e.g. Boy is choking</i> 1- simple correct/partial correct <i>Cat scratched the boy</i> 2- Full correct and matching above emotion <i>+boy is hurt/upset</i></p>	<p>Animal cognitive 0- No answer/incorrect/repeat emotion <i>e.g. cat scratched boy</i> 1- simple correct/partial correct <i>Cat is scared of the boy</i> 2- Full correct and matching above emotion <i>e.g. Boy [annoyed] the cat and now cat is scared and scratched him</i></p>
<p>4. How does seeing this make YOU feel? (in a few words)</p>	
<p>Human Affective 0- Don't know/no answer 1- Sad/ It is sad (situation) 2- Sad + matching/ [scared] for boy 3- Very sad/additional explanation</p>	<p>Animal Affective 0- Don't know/ no answer 1- Sad/Angry/annoyed 2- Scared + matching/ [sad] for cat 3- Very scared/additional explanation</p>
<p>5. What would YOU do if you saw this happening? (in a few words)</p>	
<p>Human behavioural/compassion -1- Aggressive response <i>e.g. Yell at the boy</i> 0- Don't know/no response 1- Get help (vague)/ Get adult (vague) 2- Help the boy / more specific help <i>e.g. "Try to find the boy's mum"</i> 3- comfort the boy/specific help <i>for boy</i> <i>e.g. "Make sure the boy is alright and calm him down"</i></p>	<p>Animal behavioural/compassion -1- Aggressive response <i>e.g. Hit the cat</i> 0- Don't know/no response 1- Get help (vague)/Get adult 2- Help the cat / more specific help <i>"e.g. make sure cat is OK"</i> 4- comfort the cat/ specific help <i>for cat</i> <i>e.g. "Make sure the cat is alright and comfort it"</i></p>

Supplementary Table 4: Results of non-parametric Wilcoxon signed rank tests comparing pre- and post- test scores for referred and control children across main outcome measures and empathy measures.

Referred Children		N	Z	p-value	
SAPS		24	-1.794	0.073	
Child-BAM		24	-3.312	0.001	**
Welfare knowledge		24	-4.129	<0.001	***
Negative behaviour		23	-3.393	0.001	**
Positive behaviour		23	-1.028	0.304	
Animal Empathy	Cognitive	24	-3.827	<0.001	***
	Affective	24	-2.577	0.010	*
	Behavioural	24	-2.669	0.008	**
Human Empathy	Cognitive	24	-2.957	0.003	**
	Affective	24	-0.268	0.788	
	Behavioural	24	-2.534	0.011	*
Control Children					
SAPS		22	-0.104	0.917	
Child-BAM		24	-1.209	0.227	
Welfare knowledge		24	-0.104	0.917	
Negative behaviour		22	-0.262	0.793	
Positive behaviour		22	-0.836	0.403	
Animal Empathy	Cognitive	23	-1.648	0.517	
	Affective	23	-1.741	0.082	
	Behavioural	23	-0.630	0.529	
Human Empathy	Cognitive	23	-0.105	0.916	
	Affective	23	-1.036	0.300	
	Behavioural	23	-2.283	0.022	*

Supplementary Figure S1: Correlogram showing spearman’s correlation coefficient between variables as measured at pre-test. Variables with correlation p-values greater than 0.1 are suppressed from the correlogram.



Abbreviations: Welf= Welfare knowledge; ACE= Animal Cognitive empathy; HCE= Human cognitive empathy; AB= Animal behavioural empathy; HB= Human behavioural empathy; AA= Animal affective empathy; HA= Human affective empathy; NBEH= Negative behaviour towards animals; PBEH= Positive behaviour towards animals; SAPS= Short attachment to pets scale; ABAM= Belief in animal minds.

University of Edinburgh Amendment to Ethical Approval

Due to interruptions of the previous studies due to COVID, ethical approval for this study was obtained as an amendment to the ethical approval for the approval appearing in Appendix B. This shows the final approval, following an amendment request to have control children's parental consent forms appear as opt-out. The following pages show first the control children's parental information sheet and consent form, followed by those for referred children's parents, which appear as part of the Animal Guardians referral booklet.

ER27 AMENDMENT/S: REQUEST FOR APPROVAL	
<p><i>Subsequent to receipt of ethical approval I the applicant would like to request the following amendment/s to my original proposal.</i></p> <p>We have been in contact in with <u>Gilmerton</u> primary school, who have agreed to participate in the data-collection for matched control children in P3-P7. The Head Teacher at <u>Gilmerton</u> Primary school has requested that parental consents are rephrased as opt-out, rather than opt-in, and she explains this is preferred in cases of class-wide data collection.</p> <p>We are therefore requesting an amendment to the control children's parental consent form and have attached the revised opt out parental consent form for control children (all other documents remain the same).</p>	
Signature	:
Date: 03/09/2021	
Reviewer Comments	
This amendment has favourable opinion from Clinical Psychology Ethics Committee on condition that the parents are given enough time to consider the research project and opt out (typically a week is recommended).	
Signature:	
Position: Lecturer in Applied Psychology/Ethics and Integrity Lead	
Date: 9.09.21	

For Control Children's Parents

Exploring children's relationship with animals

Parent Information Sheet

Dear Parent/Guardian,

The University of Edinburgh is working in collaboration with the Scottish Society for the Prevention of Cruelty to Animals (SPCA) to investigate how children interact with animals. We would be grateful if you could read the information below detailing the nature of the research and then signing and returning the form on page 3 if you do NOT consent for your child to participate.



Thank you for your time and for supporting our research!

About the Study

This research is part of the evaluation for Animal Guardians, a programme run by the Scottish SPCA. Animal Guardians is an educational intervention to help primary-school aged children nurture empathy for animals and understand their needs. As part of this research, we need non-referred children to take part in the study so we can have a comparison group. Your child would be part of this comparison control group, and would not receive the intervention, but would still have the same questions asked. This research is part of a PhD project, and part of broader research investigating the effectiveness of education programs run by the Scottish SPCA.

What will be involved?

This research will be based in your child's school. The research consists of a printed questionnaire ('Activity Pack') which should take 30-40 minutes to complete and will be carried out as a class activity. Children will complete the same set of questions twice, eight weeks apart. Due to COVID regulations, it will not be possible for the main researcher to come into class, so your child's class teacher will help your child complete the pack. Activities in the questionnaire include drawing, multiple choice questions, and image interpretation, and cover various topics, including understanding of animal welfare, relationship to animals, emotion recognition, and pets in the context of the family. The purpose of the research will be explained to children before they begin the study, and they will be asked if they consent. Children will be free to withdraw from the study at any time they wish and will be provided with support throughout.

Will the information you collect be confidential?

Yes. All information collected will be anonymised, kept in a safe location, and treated confidentially. Any research data generated will be fully anonymized before being shared in any public research repositories or any publications. All GDPR regulation will be strictly adhered to, along with the University's Information Security policy. The main researcher (Laura Wauthier) has received child protection training and is fully PVG checked. This

research has gone through a rigorous ethical review process at the University of Edinburgh, and consent has been received from the City of Edinburgh Council.

What will happen if I want to withdraw from the study?

You or your child can withdraw from the study at any point, without having to give a reason and without consequence. If you decide to withdraw, any non-anonymised data (activity packs) will be removed from the study and safely destroyed, but any data which is already anonymised cannot be removed.

COVID guidelines and risks

In order to minimise risks due to COVID, the researcher will not be able to complete the questionnaires with the children in-person. Instead, the printed packs will be dropped off at the school by the researcher and quarantined for at least 72 hrs, both before and after completion. In all cases, to minimise the risk of exposure to COVID-19, the researcher will be adhering to the most up to date Scottish Government [guidance](#). These measures include: maintaining 2 metres social distancing; using face coverings; avoiding crowded places; cleaning hands and surfaces regularly. Furthermore, the research will only come into schools to drop off the packs if they have experienced no COVID-19 symptoms nor had any known contact with COVID-19 positive individuals for the 14 days prior.

Contact Information

Please don't hesitate to contact the research team at the University of Edinburgh for more information:

Main researcher: **Ms Laura Wauthier**

Email:

Telephone: 07867 213 460

Supervisor: **Prof. Joanne Williams**

Email:

Telephone: 0131 650 9962

Advice: If you would like independent advice about your participation in this research, including for your rights as a participant, please contact the following independent member of staff:

Dr. Emily Newman | Email:

| Telephone: 0131 651 3945

Complaints: If you have complaints at any point regarding this research, please fill out the form below and send it to the head of school:

<http://www.ed.ac.uk/files/imports/fileManager/WEB%20Complaint%20Form.pdf>:

Prof. Matthias Schwannauer | Email: headofschool.health@ed.ac.uk | Telephone: 0131 651 3954

Please keep this form for your records

Thank you for your support!



THE UNIVERSITY
of EDINBURGH

SCOTTISH SPCA
Scotland's Animal Welfare Charity

Opt-out Parent Consent Form

Please tick the box, sign, and return this form to the school if you do NOT want your child to participate in the research. If you are happy for your child to participate, then you do not need to do anything.

I am NOT happy for my child to participate in this research study

Caregiver's Name (Printed)

Child's Name (Printed)

Caregiver's Signature

Today's Date

Please return this form to the school

Animal Guardians Referral pack

Including parental information sheet and consent forms for research and intervention (for referred children), and child consent forms for participating in the intervention.

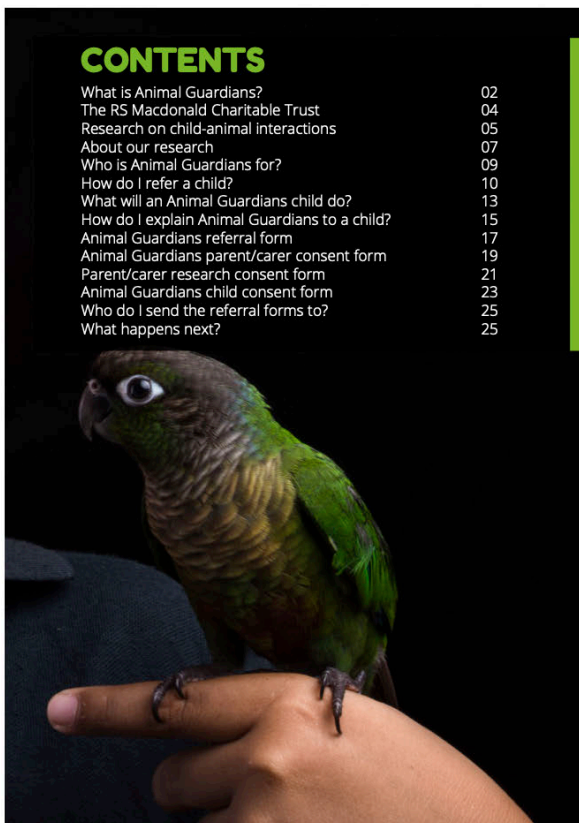


03000 999 999
scottishspca.org



AS SCOTLAND'S ANIMAL WELFARE CHARITY WE ARE PROUD TO OFFER ANIMAL GUARDIANS AS AN EDUCATIONAL RESOURCE. THE PROGRAMME:

- works with children to nurture empathy and compassionate behaviour towards animals
- provides **FREE** bespoke one-to-one sessions
- covers animal emotions, needs and responsibilities
- is offered to primary school aged children
- is in collaboration with the University of Edinburgh
- offers a visit to one of our animal rescue and rehoming centres



WHAT IS ANIMAL GUARDIANS?

Animal Guardians is a free education programme offered to primary school children by the Scottish SPCA. It is part of the Scottish SPCA's 'Prevention through Education' programme, which reaches around 245,000 children annually.

Animal Guardians is suitable for children who are showing negative behaviours towards animals, including being rough with pets or injuring animals. It is designed for children whose actions towards animals are a cause for concern to adults around them. These children can be referred to Animal Guardians to receive additional support to build empathy and compassion and develop positive behaviours towards animals.

Animal Guardians is an education programme where a child meets with a Scottish SPCA youth engagement officer during school time. The child will participate in games and activities to help them learn:

- about animal emotions
- what animals need to keep them healthy and happy
- how to be responsible when around animals



“ My daughter has a much greater understanding of how to better interact with her cat, to help her play and be more understanding of how to make it more enjoyable for the both of them. She now understands the feelings and nature of cats. ”

Parent of child who has participated in the programme

“ The work that the Scottish SPCA has done has been unbelievable. My child has decided to try and have some kind of career in working with animals after having the sessions. To turn round a young person's life is a great achievement to the centre and staff. ”

Parent of child who has participated in the programme

Professor Jo Williams and her research team from the University of Edinburgh will be evaluating the Animal Guardians programme. We need your help with this research. By helping us to evaluate Animal Guardians we can make sure it is helping children to develop more positive behaviours towards animals. It can also help us improve the programme so that it becomes even more beneficial in the future.



THE RS MACDONALD CHARITABLE TRUST

We would like to thank the RS Macdonald Charitable Trust for funding and supporting the development, implementation, and evaluation of Animal Guardians.

“ We recognise the importance of this programme in its ability to educate and establish positive child-animal interactions. Vulnerable children and young people are supported to promote animal welfare and reduce animal cruelty. ”

Rachel Campbell, Trust Director

Animal Guardians has a fantastic advisory group which includes: The City of Edinburgh Council, Edinburgh Women's Aid, Police Scotland, Barnardo's, Scottish Fire and Rescue Service, Links Group, Paws for Progress, The University of Edinburgh Centre for Applied Developmental Psychology, CAAR and Seamab.



RESEARCH ON CHILD-ANIMAL INTERACTIONS

Our research shows 70% of UK children live with their pets¹. Children form strong emotional attachments to their animals² and often think of pets as important members of their family.

However, children can also harm animals and we are working to prevent this. Research on cruelty towards animals suggests it can start as young as six years of age³ and includes both unintentional and deliberate cruelty. Sadly, Animal Guardians is already receiving referrals for children younger than six years-old.

The collaborative research between the Scottish SPCA and the University of Edinburgh shows children who think cruelty to animals is acceptable tend to:

- have lower levels of attachment to pets
- have lower levels of compassion to animals
- are less likely to believe animals have thoughts and feelings
- show less humane and caring behaviours towards animals

Nurturing positive child-animal relationships and teaching children about animals can be powerful tools in increasing empathy and positive behaviour towards animals in childhood⁴.

Adverse Childhood Experiences (ACEs) such as abuse, neglect and bullying can play an important role in children's behaviour towards animals because children who have witnessed cruelty and violence are more likely to be cruel towards animals themselves. Research has shown links between intentional animal cruelty and human violence in which both are predicted by low levels of empathy and conduct disorder⁵. Education programmes for vulnerable children that teach them appropriate behaviour towards animals might change their behaviour and reduce the risk that they will engage in animal cruelty in the future⁶.

Animal Guardians has been developed based on current child developmental theories and expertise in animal welfare education to promote empathy and compassion to children, and in turn encourage positive behaviour towards animals. Learning to handle animals appropriately and responding to their emotional and physical needs can help a child to act safely around animals and avoid situations where a child or an animal could become frightened or injured.

1. Marsa-Sambola, F., Williams, J., Muldoon, J., Lawrence, A., Connor, M., Roberts, C. & Currie, C. (2016). Sociodemographics of pet ownership among adolescents in Great Britain: Findings from the HBSC Study in England, Scotland, and Wales. *Anthropozoos*, 29(4), 559-590.
 2. Hawkins, R.D., Williams, J.M. & Scottish SPCA (2017). Childhood attachment to pets: Associations between pet attachment attitudes to animals, compassion and humane behaviour. *International Journal of Environmental Research and Public Health*, 2017, 14(5), 490. DOI:10.3390/ijerph14050490
 3. Hawkins, R.D., Hawkins, E. & Williams, J.M. (2017). Psychological Risk Factors for Childhood Animal Cruelty: A Systematic Review. *Society and Animals*, DOI: 10.1163/15685306-12341448
 4. Thompson K.L. & Gullone, E. (2003). Promotion of empathy and prosocial behaviour in children through humane education. *Australian Psychologist*, 38:3, 175-182. DOI: 10.1080/00050060310001707187
 5. McPhedran, S. (2009). A review of the evidence for associations between empathy, violence and animal cruelty. *Aggression and Violent Behaviour* 14, 1 - 4.
 6. Scottish SPCA First Strike Campaign (1997)

ABOUT OUR RESEARCH

The University of Edinburgh is researching the effectiveness of Animal Guardians to answer the following questions:

- Does Animal Guardians improve children's knowledge of animal emotions and welfare needs?
- Does Animal Guardians improve children's attitudes and intentions towards animal welfare and animal cruelty?
- Does Animal Guardians help improve factors associated with harmful behaviour towards animals (e.g. empathy)?

How can my child participate in the research?

When a child has been referred to Animal Guardians, parents/carers will be asked if they give permission for their child to participate in the research. A parent/carer will be asked to complete the form on page 21 indicating whether they are happy for their child to participate (please note this form **MUST** be completed, even if they do not wish their child to participate). If consent is given, the child will be asked to give their consent to being part of the research at the beginning of their research session. Please note that children can still be part of Animal Guardians without participating in the research.

What does the research entail?

If consent for research is given, the researcher will meet with the child one week before the start of Animal Guardians and one week after the end of the programme. Interviews with the child will be carried out in a quiet one-to-one setting at school.

The child will be asked to answer a series of standardised child-friendly questions relating to their relationships with animals and how they relate to other people. These questions will be read out by the researcher and the child will be asked to choose the answer that most corresponds to how they feel. Interviews will be recorded so that answers can be transcribed, and then recordings will be safely destroyed, and data will be anonymised. This procedure will be explained to the child before they begin the research session and they will be asked if they are happy to take part. The child will be free to withdraw from the research at any time they wish. A short questionnaire will also be given to the child's main teacher.



Will the information collected be confidential?

Yes. All information collected will be anonymous and kept in a secure location and treated confidentially.

Please note the following key points:

- the research project has been given ethical approval by the University of Edinburgh
- the researchers have received training to work with children and are active members of the PVG scheme
- all data will be anonymised, and data collected will be stored securely according to ethical and GDPR guidance

Contact Information

If you have any questions about the research, including the questions asked in the interview, please do not hesitate to contact a member of the research team. Details can be found below:

Clinical and Health Psychology Department
Doorway 6, Teviot Place, Medical School, The University of Edinburgh

Main researcher Ms Laura Wauthier Email: Telephone: 07867 213 460	Supervisor Professor Jo Williams Email: Telephone: 0131 650 996
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If you have complaints at any point regarding this research, please fill out the form at <http://www.ed.ac.uk/files/imports/fileManager/WEB%20Complaint%20Form.pdf>

and send it to:

Head of School of Health in Social Science
Professor Matthias Schwannauer
Email:
Telephone: 0131 651 3954



THE UNIVERSITY
of EDINBURGH



WHO IS ANIMAL GUARDIANS FOR?

Animal Guardians is an educational programme for children who require additional support to build empathy and compassion towards animals.

Children can be referred to Animal Guardians for a range of reasons including:

- repeatedly teasing or frightening an animal
- rough handling of an animal, including squeezing or picking up pets inappropriately, stroking too hard, pushing and shoving an animal
- cutting whiskers or hair off an animal
- neglecting an animal if this is meant to be the child's responsibility (e.g. forgetting to provide food or water or cleaning out a cage on numerous occasions)
- kicking, punching, or harming an animal (including wildlife)
- killing an animal either by accident or on purpose

Animal Guardians is currently suitable for primary aged children (5-12 years old). If the referred child is not within this age range, but you would like them to be part of the programme, please complete the referral form (page 17) and the Scottish SPCA will do their best to help.

If you are not sure whether your child would benefit from the programme or you have any concerns about your child's behaviour towards animals, please phone **03000 999 999, option 5** for further assistance.



HOW DO I REFER A CHILD?

Who can refer?

A child can be referred by anyone who is in a position of care for that child. This includes:

- Parents or other relatives/carers
- Teachers
- Childcare and health professionals (e.g. Social Work, Child and Adolescent Mental Health Services (CAMHS))
- Charitable organisations working with a child (e.g. Barnardo's, Paws for Progress)



How do you refer?

Complete and submit the referral form on page 17 and also ask both the child and the parent/carer to complete the consent forms which can be found in this booklet. One of the Scottish SPCA's youth engagement officers will then be in touch to discuss the referral in more detail.

Referral process

1. Complete and submit the referral form to the Scottish SPCA (see page 25 for contact details)
2. Initial conversation with the Scottish SPCA's youth engagement officer to confirm the Animal Guardians programme is suitable for the child.
3. If Animal Guardians is an appropriate programme for the child, the referring adult must ensure the parent/carer and child consent forms are completed and sent to the youth engagement officer prior to the child starting the programme
4. Research meeting with the University of Edinburgh research student (if applicable)
5. Child starts the Animal Guardians programme

Please note the following:

Any details received via the referral forms and subsequent information will be stored securely, and in strict compliance with GDPR. Information about our privacy policy can be viewed at scottishspca.org.

All youth engagement officers are suitably trained in child protection and are active members of the PVG Scheme.

Any discussions during the child's participation in Animal Guardians will be kept private unless the youth engagement officer feels that the child's safety may be at risk. In this case, the information will be passed on to the person who made the initial referral or a relevant child protection professional.



WHAT WILL AN ANIMAL GUARDIANS CHILD DO?

1. Initial referral (from parent, teacher, child care and health professionals)
2. First research session (if parent/carer consent has been provided)
3. Animal Guardians workshops commence and will encompass the following:
 - recognising animal emotions and understanding animals have feelings
 - understanding animal welfare needs
 - developing compassionate and responsible behaviour towards animals
 - visit to one of the Scottish SPCA's animal rescue and rehoming centres (if appropriate for the child)
4. Second research session (if parent/carer consent has been provided)
5. Review of child's progress (completion certificate awarded and written feedback is given to the referring adult)

Animal Guardians is flexible and will be adapted to the individual needs of each child. The number and frequency of workshops a child attends will vary but in general most children will attend one workshop each week and usually participate in 6-10 workshops in total.



HOW DO I EXPLAIN ANIMAL GUARDIANS TO A CHILD?

Please find information below to help a child understand what Animal Guardians is about.

- You will work with the Scottish SPCA youth engagement officer each week
- There will be lots of games to play, which will help you learn about:
 - different types of animals
 - what animals need
 - how animals can feel different emotions, just like us
 - how you can help animals by being a responsible animal citizen
- You will also get a chance to read about 'Lucky Max' and may meet some of the animals that are staying at one of the Scottish SPCA's animal rescue and rehoming centres
- Each time you attend an Animal Guardians session it will be just you, the youth engagement officer and a teacher/carer. It will most likely take place in your school or somewhere that you often visit and is familiar to you that is not your home
- The sessions will be short but if you do want to stay longer that is okay too
- Every time you meet with the youth engagement officer, you will talk about what you did last time and build on what you have already learned
- You will get the chance to meet new people at Scottish SPCA Animal Guardians 'stay connected' events that run during school holidays



ANIMAL GUARDIANS REFERRAL FORM

Please read the points below and tick the box if you agree:

- I confirm that the child lives in:
(Please name local authority)
- I can confirm that both the parent/carer consent form and the child consent form have been completed and these will be passed to the youth engagement officer when referral is discussed

First name Surname
 Organisation Job title
 Telephone Telephone (m)
 Email

Information of referred child

First name Surname
 Age Sex

Give as much detail as possible for the reason for referral

Please indicate if the child has any additional support needs

Other organisations involved (Social Work, CAMHS)

Signature Date (dd/mm/yyyy)

Scottish SPCA reference number
(to be completed by Scottish SPCA on receipt of consent form)

Kingsseat Road, Halbeath, Dunfermline KY11 8RY
 Scottish Charity No. SC 006467



ANIMAL GUARDIANS PARENT / CARER CONSENT FORM

Please read the points below and tick the box if you agree:

- I am happy for my child to participate in the Animal Guardians programme
- I would like to bring my child to the Animal Guardians 'stay connected' events which will be held throughout the year during the school holidays

First name Surname

Relationship to child

Information of referred child

First name Surname

Age Sex

Name of local authority child resides in

Give as much detail as possible for the reason for referral

Please indicate if your child has any additional support

Other organisations involved (Social Work, CAMHS)

Signature

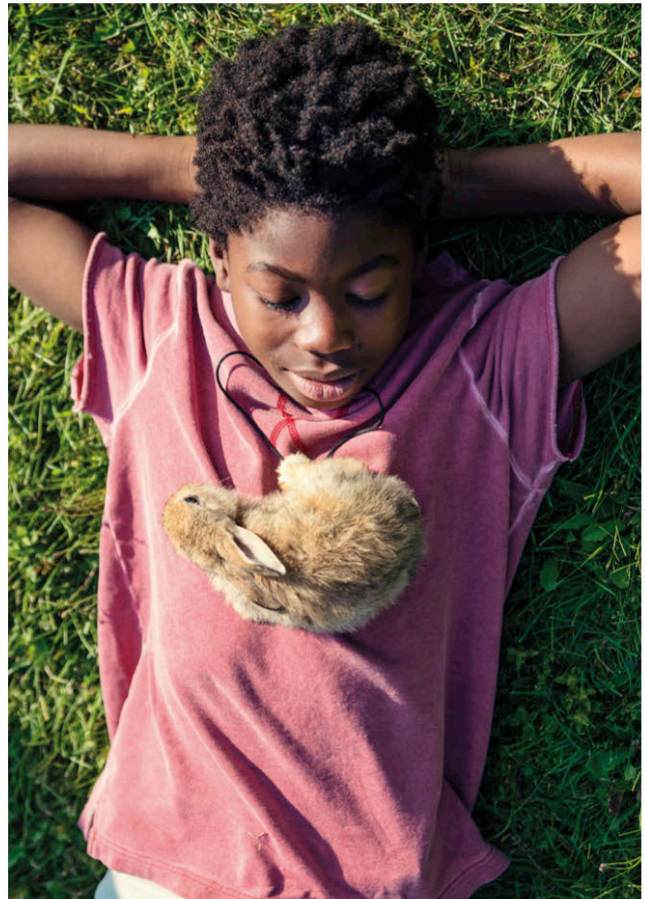
Date (dd/mm/yyyy)

Scissors icon

Scottish SPCA reference number
(to be completed by Scottish SPCA on receipt of consent form)

Kingseat Road, Halbeath, Dunfermline KY11 8RY
Scottish Charity No. SC 006467

Scottish SPCA
Animal Guardians



PARENT/CARER RESEARCH CONSENT FORM

Please tick one:

- I **AM** happy for my child to take part in the research
- I am **NOT** happy for my child to take part in the research

If you are happy for your child to take part, please read the following statements and tick to show you agree. Then sign the form at the bottom of the page to give consent for your child to participate.

- I have read and understood the information provided in this booklet
- I understand that myself or my child can stop and withdraw from the study at any time without consequence
- I understand that all data will be anonymised
- I understand that my child will be recorded (audio and video) during the interview and that these recordings will be transcribed and then disposed of
- I understand that the data will be fully anonymised in any subsequent research reports

Parent/carer's full name

Child's full name

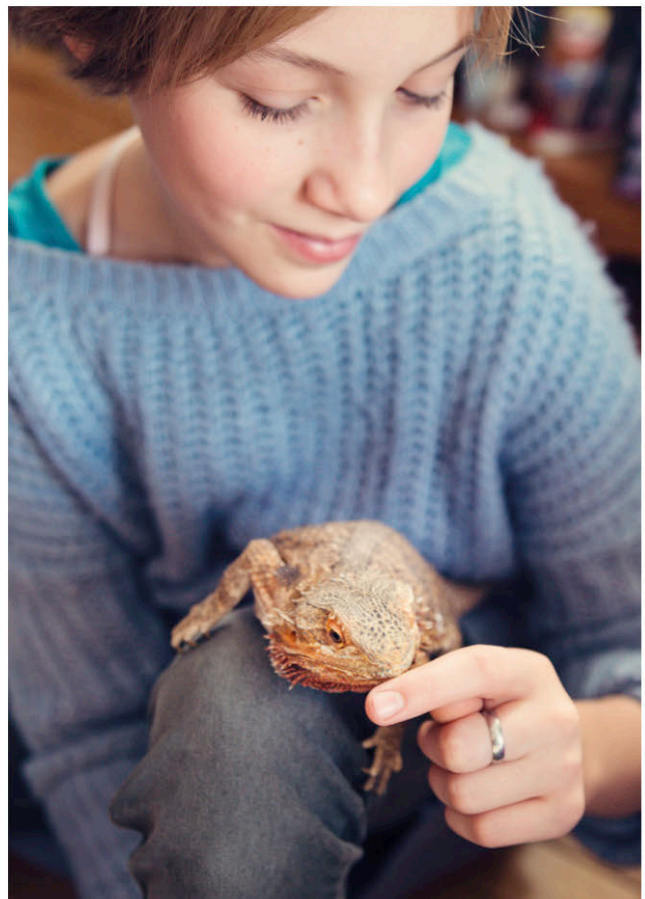
Parent/carer's signature

Date (dd/mm/yyyy)

Scissors icon

Kingseat Road, Halbeath, Dunfermline KY11 8RY
Scottish Charity No. SC 006467

Scottish SPCA
Animal Guardians



ANIMAL GUARDIANS CHILD CONSENT FORM

Please complete this form on your own or with the help of a parent or carer. Read the points below and tick if you agree:

- I am happy to take part in the Animal Guardians programme
- I understand what the Animal Guardians programme is about
- I understand that when I am doing Animal Guardians, what I say will be kept private unless my safety is at risk. If my safety is at risk, the Animal Guardians youth engagement officer has to tell someone else like my teacher or my support worker to make sure I stay safe

How happy are you to take part in Animal Guardians?



First name Surname

Age Sex

Scottish SPCA reference number
(to be completed by Scottish SPCA on receipt of consent form)

Kingseat Road, Halbeath, Dunfermline KY11 8RY
Scottish Charity No. SC 006467



Scottish SPCA
Animal Guardians



WHO DO I SEND THE REFERRAL FORMS TO?

Please send the completed referral forms to
animalguardians@scottishspca.org

or to

Animal Guardians
Youth Engagement Officer
Scottish SPCA HQ
Kingseat Road
Halbeath
Dunfermline
KY11 8RY

WHAT HAPPENS NEXT?

Once the Scottish SPCA has received your referral form, a youth engagement officer will contact you. It will be important to know if there are any other organisations working with the referred child, to make sure that there is no conflict for a child participating in the Animal Guardians programme.

If you have any queries, please contact the education team either through the above email or via **03000 999 999, option 5**.



03000 999 999
scottishspca.org

Scottish Society for the Prevention of Cruelty to
Animals | Scottish Charity No. SC 006467

 **SCOTTISH SPCA**
Scotland's Animal Welfare Charity

Scottish SPCA
Animal Guardians





Child consent form
(for both referred and control children)



Would you like to be part of the project?



Please read the 5 points below and tick the box if you agree:

- I am happy to take part in this project
- I understand the project is about me and my relationship with animals
- I understand that my answers will be kept private
- I understand that I can leave this project any time
- I understand that a report will be written on relationships between children and animals

If you have any questions, please ask!

NAME:

SCHOOL:.....

DATE:



Instructions for Teachers: Completing the Animal Guardians Questionnaire

Dear Teacher,

Thank you very much for your help with our research, especially in the difficult circumstances surrounding the COVID pandemic. This pre- and post- test questionnaire should take around 30-40 minutes and has a series of questions for children to complete regarding their relationship with animals. The purpose of this research is to compare the responses of control children (such as the children in your class) to the responses of children referred to the Animal Guardians programme.

Animal Guardians is a novel educational intervention run by the Scottish SPCA for primary school children who are at-risk of harming animals. The children referred to Animal Guardians complete the Activity Pack with a Youth Engagement Officer (YEO) before and after the intervention programme (approximately 8 weeks apart). Control children, like those in your class, will also complete the activity pack twice about 8 weeks apart, but will not receive an intervention.

Please note: Before handing out the Activity Pack for children to complete, it is important that parental consent for research has been given. We cannot accept activity packs for any children whose parents have opted out.

Step-by-Step Instructions

The pack has 7 activities for children to complete and requires children have sufficient levels of reading and writing comprehension that they can write out a few words in response to simple questions. You can provide as much help as necessary (or as you are able) for anything regarding reading comprehension or writing, but it is very important to not give children an indication of a 'right' or 'wrong' answer. The following is a proposed step-by-step guide for the whole procedure:

- 1. Information about the research and child consent (5 minutes)** Introduce the activity pack to the class- You can read out the front page of the activity pack, which acts as a child information sheet. Ask children if they have any questions about the pack or the research, and then explain that children can choose to participate, and that they must fill out the child consent form by ticking each box and writing their name and date.
- 2. Activity Pack (30-40 minutes)** The activity pack has 7 activities for children to complete- some activities, such as those with multiple choice, should be very quick, but some, especially those requiring free-response, will probably take a bit longer. There are instructions within the pack for each activity, which can be read out to the whole class when moving from one activity to the next. Older children might be able to complete the whole pack without stopping to go over instructions for each activity, and consequently will probably be quicker. Ask children to complete the pack independently from each other. Times below are guidelines- feel free to go faster or slower, as necessary.

- a. **Drawing Task (6 minutes)** Children should place themselves (perhaps with a stick figure drawing) in the middle, and label the people, friends and pets **most important to them** around them, however they like. They can include as few or as many people/friends/pets as they want (if they don't want to put anyone, that is fine too). In practical terms, imposing a maximum limit of 8 can be useful, as some children will just keep adding! It is important that children are remember to **label each relationship** (e.g. sister) rather than the name (e.g. Kate).
- b. **Relationship with pets (2 minutes)** This is a brief multiple-choice task where children must indicate how much they agree with each statement. For children who don't have pets, they can imagine what they think the relationship would be like if they had one.
- c. **'About Me' (2 minutes)** This is a task asking basic information about the child
- d. **Belief in animal minds (2 minutes)** Another brief multiple-choice task, asking children whether they think humans, dogs, and cats are clever and have feelings.
- e. **What do pets need? (8 minutes)** A free response task around children's knowledge of the welfare needs of dogs and cats. Children can write down what they think is good for them/what they need on the green side, and what is bad for them/what they shouldn't have on the red side. Children can leave as many spaces blank as they want.
- f. **Interactions with animals (6 minutes)** Multiple choice questions in two parts, asking children which behaviours they have carried out in the last month (left side) and what they would do if they could do whatever they wanted (right side)- for example, if they want a pet of their own but don't currently have one, or if they knew they would not get in trouble.
- g. **Picture Stories (15 minutes- approx. 4 minutes per scene)** Picture-based measure investigating children's interpretation of 4 scenes between children and animals. Each picture has 5 questions, asking them to interpret the emotions of the children and animal in the scene and asking them to interpret what is happening, as well as what they would do in that situation.

3. **Debrief (5 minutes):** After completing the pack, thank children and ask if they have any questions or concerns. In the unlikely event that a child might be distressed after completing the pack, you can signpost them to the relevant organizations below. Please then collect their answers and return the answers in the envelope provided.

If they are distressed:



If they are worried about an animal:



Please sign below to confirm that you are happy to help with this research and that you understand what is involved:

Signed: _____

Date: _____

Thank you for your help! Please return this form, along with the answers from children

(Scottish SPCA use)

CODE: _____

Animal Guardians Activity Pack

Hello,

This is a short pack to get to know you and what you think about animals. Some parts have multiple choice questions, and some part have activities. There are no right or wrong answers, so just put what you think.

You can complete this pack alone or ask for some help from an adult, for example with reading and writing. Everything you put in this pack will be kept private.

If you agree, your answers can also be part of a project to understand what children think about animals. All your answers will still be private. Please complete the sheet to let us know if you would like to be part of the project!



Feel free to use coloured pencils!

NAME: _____ DATE: _____

SCHOOL: _____ CLASS: _____

Activity 1: Most important people and animals

For this activity, please draw yourself in the middle, and add anyone who is really important to you, like friends, family, or pets. You can include as many or as few people or animals as you like! Make sure you label each person with their relationship to you (e.g. 'mum', 'sister', etc.)



2

Activity 2: My relationship with pets

For this activity, read the statements and say whether or not you agree by ticking one of the boxes.

Please tell us how you feel about your favorite pet animal. If you don't have a pet, try to imagine what your relationship with a pet would be like if you had one.

	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
I spend time every day playing with my pet (or would if I had one)					
I have sometimes talked to my pet and understood what it was trying to tell me (or would if I had one)					
I love pets					
I talk to my pet quite a lot (or would if I had one)					
My pet makes me feel happy (or would if I had one)					
I consider my pet to be my friend (or would if I had one)					
My pet knows when I am upset and tries to comfort me (or would if I had one)					
There are times I'd be lonely without my pet (or would if I had one)					
I don't really like animals					

3

Activity 3: About Me

These are some short questions about you and who you live with at home.

How old are you? : _____

What year are you in school? (circle) P1 P2 P3 P4 P5 P6 P7

What sex are you? (circle) Boy Girl Other Prefer not to say

Who do you live with at home? (for example: mum, dad, sister, brother)

Do you have any pets at home? Yes No

What types of pets do you have at home?

Is there a pet you consider your own? If yes, which one(s)?

How do you feel about being able to do Animal Guardians?



4

Activity 4: What I think about animals...

For this activity, read each statement and say whether you think these different animals are clever and feel certain emotions by filling in one of the circles.

Do you think humans...



	Yes	Maybe	Not sure	Not really	Not at all
are clever?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
can feel pain?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
can feel happiness?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
can feel sadness?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
can feel fear?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Do you think dogs...



	Yes	Maybe	Not sure	Not really	Not at all
are clever?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
can feel pain?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
can feel happiness?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
can feel sadness?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
can feel fear?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Do you think cats ...



	Yes	Maybe	Not sure	Not really	Not at all
are clever?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
can feel pain?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
can feel happiness?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
can feel sadness?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
can feel fear?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5

Activity 5: What do pets need?

For this activity, try to think what a dog and a cat might need. Try to put good and bad things for each and go to the next sheet when you can't think of anymore. You can ask for help writing things down if you like.

What is good for dogs?

What is bad for dogs?

What Does a DOG need?

6

Good things for cats

Bad things for cats

What Does a CAT need?

7

Activity 6: What you do with animals

These questions are about what you do with animals. Simply put a tick in each column for each statement- try to put what is most true for you.

How often have you done these things in the last month?	INTERACTIONS WITH ANIMALS			If you could do whatever you wanted, how often would you do these things?		
	Never	1-2 times	More than 2 times		Never	1-2 times
Pat or stroke an animal						
Give food or water to an animal						
Hurt an animal on purpose						
Annoy an animal						
Play rough with an animal						
Frighten an animal by accident						
Shout at an animal						
Tease an animal						
Forget to give food or water to an animal						
Cuddle an animal						
Play with an animal						
Spend time with an animal						
Hurt an animal by accident						
Kick an animal on purpose						
Brush, clean, or groom an animal						
Frighten an animal on purpose						
Kick an animal by accident						

8

How often have you done these things in the last month?			INTERACTIONS WITH ANIMALS	If you could do whatever you wanted, how often would you do these things?		
Never	1-2 times	More than 2 times		Never	1-2 times	More than 2 times
			Kill an animal			
			Lash out against an animal when I am angry			
			Lock-up or tie-up an animal			
			Hit an animal			
			Comfort an animal if they are sad or scared			
			Give treats to an animal			
			Punish an animal if they misbehave			
			Clean up after an animal			
			Train an animal			
			Wake up a pet while it's sleeping			

Activity 7: Picture stories

There are four pictures below showing different scenes of children and animals. For each picture, try to answer the questions about what is happening, how the children and animals are feeling, and what you might do in that situation (your answers can be short!). Remember, you can guess if you don't know, and you can ask for help reading and writing!

9



1. How do you think the BOY is feeling? a. Happy b. Sad c. Angry d. Scared e. Relaxed/Neutral f. I don't know	2. How do you think the CAT is feeling? a. Happy b. Sad c. Angry d. Scared e. Relaxed/Neutral f. I don't know
3. What do you think is happening in this scene?	
4. How does seeing this make YOU feel? (in a few words)	
5. What would YOU do if you saw this happening? (in a few words)	

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10



1. How do you think the GIRL is feeling? a. Happy b. Sad c. Angry d. Scared e. Relaxed/Neutral f. I don't know	2. How do you think the DOG is feeling? a. Happy b. Sad c. Angry d. Scared e. Relaxed/Neutral f. I don't know
3. What do you think is happening in this scene?	
4. How does seeing this make YOU feel? (in a few words)	
5. What would YOU do if you saw this happening? (in a few words)	

12



<p>1. How do you think the BOY is feeling?</p> <p>a. Happy b. Sad c. Angry d. Scared e. Relaxed/Neutral f. I don't know</p>	<p>2. How do you think the CAT is feeling?</p> <p>a. Happy b. Sad c. Angry d. Scared e. Relaxed/Neutral f. I don't know</p>
<p>3. What do you think is happening in this scene?</p>	
<p>4. How does seeing this make YOU feel? (in a few words)</p>	
<p>5. What would YOU do if you saw this happening? (in a few words)</p>	

13



<p>1. How do you think the GIRL is feeling?</p> <p>a. Happy b. Sad c. Angry d. Scared e. Relaxed/Neutral f. I don't know</p>	<p>2. How do you think the DOG is feeling?</p> <p>a. Happy b. Sad c. Angry d. Scared e. Relaxed/Neutral f. I don't know</p>
<p>3. What do you think is happening in this scene?</p>	
<p>4. How does seeing this make YOU feel? (in a few words)</p>	
<p>5. What would YOU do if you saw this happening? (in a few words)</p>	

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Thank you!



Well done for finishing all the questions! You have been a great help in helping us understand more about children's relationships with animals.

Do you have any questions about what we did today?

If you have any questions after we are gone, please ask your teacher and they will be able to help you or get in touch with us.

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Excerpts from New Animal Guardians Referral Pack

Following the research from this thesis, and as Animal Guardians continues to evolve, the Referral Booklet has been updated to reflect findings and the current goals of the programme. You can find the full Referral Booklet in its present form here:

[https://www.scottishspca.org/sites/default/files/2022-](https://www.scottishspca.org/sites/default/files/2022-11/Animal%20Guardians%20Booklet.pdf)

[11/Animal%20Guardians%20Booklet.pdf](https://www.scottishspca.org/sites/default/files/2022-11/Animal%20Guardians%20Booklet.pdf). The following pages are extracts from the new booklet's text on the research background. There are also changes to the details collected about the child's harm to the animal in the parent and referring adult forms, which now also have tick box options (not shown here).

Research on child-animal interactions

Animals are an important part of many children's lives, and around 70% of children in the UK live with pets¹. Research shows that children can form strong emotional attachment to their animals², often think of pets as important members of their family, and positive relationships with pets can have a range of benefits³.

However, children can also harm animals and we are working to prevent this. Research on childhood animal harm suggests it is linked with a range of risk factors, can start as young as four⁴, and includes both accidental and intentional harm. Research has also shown links between intentional animal cruelty and human violence in which both are predicted by low levels of empathy and conduct disorder⁵. Fortunately, early intervention can help, and the earlier the intervention the greater the positive impacts⁶.



Why do children harm animals?

There are a wide range of reasons a child might harm an animal, ranging from an accident where the child does not know what they are doing is harmful, to lashing out or intentional cruelty⁷. Collaborative research between the Scottish SPCA and the University of Edinburgh show there are a range of psychological risk factors associated with childhood animal harm, including⁸:

- Insecure patterns of attachment.
- Difficulties regulating behaviours and/or emotions.
- Lower levels of empathy and compassion to animals.
- Being more accepting of cruelty to animals.
- Being less likely to believe animals have thoughts and feelings.

There are also a variety of environmental risk factors associated with childhood animal harm. These include Adverse Childhood Experiences (ACEs) such as abuse, neglect, and bullying, because children who have experienced or witnessed cruelty and violence are more likely to harm animals themselves^{9,10}. Other environmental risk factors include not being appropriately supervised around animals and interacting with animals who are likely to show aggressive behaviours.

While a child who has harmed animals may not necessarily have any of these risk factors, it is important to be aware of increased risks so that appropriate levels of support can be provided. Education programmes for vulnerable children that teach them appropriate behaviour towards animals can change their behaviour and reduce the risk that they will engage in animal harm in the future. Furthermore, nurturing positive child-animal relationships can be a powerful tool in increasing empathy and compassion¹¹.



Does Animal Guardians work?

Animal Guardians has been developed based on current child developmental theories and expertise in animal welfare education to promote empathy and compassion and in turn encourage positive behaviour towards animals. Learning to handle animals appropriately and responding to their emotional and physical needs can help a child to act safely around animals and avoid situations where a child or an animal could become frightened or injured.

Animal Guardians has already received an initial evaluation through the collaboration with the University of Edinburgh⁹. Children who completed Animal Guardians had significant improvements in:

- Their knowledge of animal welfare needs.
- Their belief that animals have thoughts and feelings.
- Recognition and understanding of human and animal emotions.
- Empathetic responses to animals.

Children also had a significant reduction in self-reported animal harm behaviours towards animals. This suggests that the programme is working well to reduce many of the psychological risk factors for animal harm. We continue to strive to improve and expand the programme. By doing this we hope to be able to improve additional risk factors including increasing attachment to pets, helping children learn strategies for self-regulation, and practice taking care of animals.

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9



About our study

It is important the Animal Guardians programme continues to be evaluated, to ensure it remains effective and that any new activities improve intended outcomes. The University of Edinburgh is carrying out the ongoing evaluation, aiming to answer the following questions:

- Does Animal Guardians continue to be effective and improving children's knowledge of needs, understanding of animal emotions, and empathy towards animals?
- Does Animal Guardians continue to reduce animal harm behaviours as reported both by the child AND a parent or referring adult?
- Can Animal Guardians also improve self-regulation and increase caregiving behaviours towards animals?

What does the study entail?

The study for Animal Guardians is integrated within the programme. For the study, routinely collected information will be used by the University of Edinburgh team for full evaluation. This routinely collected information is made up of information collected during the referral process and an activity pack completed during the first and last sessions.

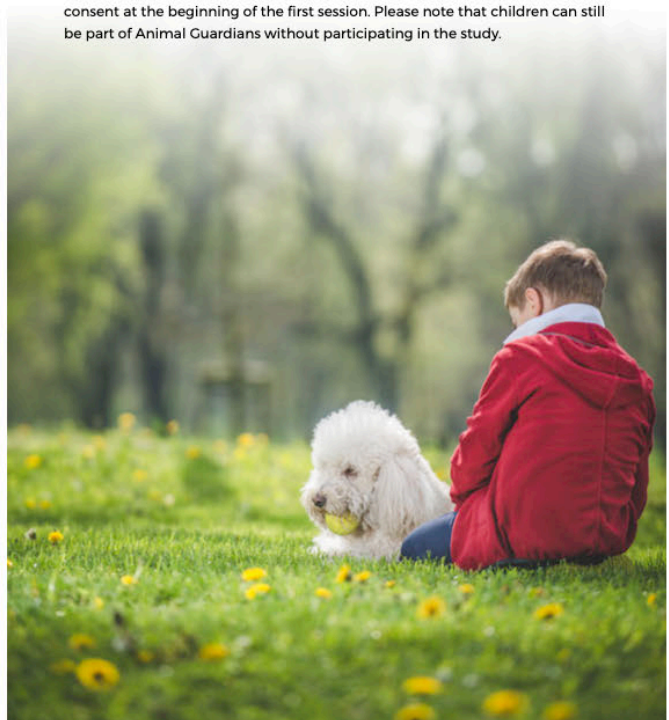
The youth engagement officer will complete the activity pack with your child by asking a set of standardised child-friendly questions on their relationship to animals, their understanding of animal emotions and needs, their empathy, and their self-regulation. This will also allow the youth engagement officer to tailor the programme to your child's needs and level of understanding.

The referral information and children's answers to the activity pack can be used for our study if both parent/guardian and child consent is given. All information will be anonymised and stored separately from the rest of the Animal Guardians programme. Answers will be stored on secure university servers and accessed by the University of Edinburgh research team for evaluation. If consent is not given, the referring adult and child will still carry out the same questions, but the answers will not be passed on to the research team at the University of Edinburgh or used for the study.

11

How can my child participate in the study?

When a child has been referred to Animal Guardians, parents/carers can decide if they consent for their child's answers to the activity pack, in the first and last session, to be used for study. A parent/carer MUST complete the form on page 26 indicating whether they are happy for their child to participate. If parent/guardians' consent is given, the child will also be asked to give their consent at the beginning of the first session. Please note that children can still be part of Animal Guardians without participating in the study.



Appendix E:
Certifications and Conference
Presentations



THE CHILD ATTACHMENT & PLAY ASSESSMENT

RELIABILITY CERTIFICATE *Level 2 Reliable Coder*

This is to certify **Laura Wauthier** has passed the reliability test for CAPA analysis of pre-school and school aged narrative stems on attachment strategies and markers for complex trauma in children. The certificate is valid for 2 years from the date of issue.

Dr Steve Farnfield
Formerly convenor of the MSc in Attachment
Studies at the University of Roehampton

March 1st 2021

Conditions of maintaining reliability are given
over leaf.



Laura Wauthier
9 Duncan street
Edinburgh, Scotland EH9 1SZ
lwauthie@ed.ac.uk

Certificate of Completion

Be it known that:

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**Assessment and Treatment of Animal Abuse - Pts 1 & 2
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Conference Presentations and Poster

Please find below a list of conferences at which work in this thesis was presented, and a copy of the poster on the next page.

Wauthier, L., Scottish SPCA, & Williams, J. M. (2019). A Qualitative Study of Childhood Animal Cruelty. *International Society of Anthrozoology*, 2nd of July, Orlando, Florida, USA.

Wauthier, L., Mendes-Ferreira, G., & Williams, J. M. (2020). A Qualitative study of children's cruelty to animals: Uncovering the roles of trauma, exposure to violence, and attachment. *OneKind: Children and Animals, Compassion and Cruelty*. 2nd of July 2020. Virtual Event.

https://www.youtube.com/watch?v=uHjHyxA8lIM&ab_channel=OneKindCharity

Wauthier, L., Mendes-Ferreira, G., Farnfield, F., & Williams, J. M. (2020). Novel and Adapted Methodologies: Children's Attachment to Pets. Poster presented at *Human Animal Interactions Section of Division 17 of the American Psychological Association Convention*. August 6-8, Virtual Conference.

Wauthier, L., Mendes-Ferreira, G., Farnfield, F., , & Williams, J. M. (2021). Risk Factors for Childhood Animal Harm: The Roles of Attachment, Empathy, Executive Functions, and Callous-Unemotional Traits. *International Society of Anthrozoology*, 24th of June, Virtual Conference.

Wauthier, L., Farnfield, F., , & Williams, J. M. (2021). What kind of bond? Measuring children's attachment to pets and understanding its role in cases of childhood animal harm. *One Welfare Conference*. 15th of September. Virtual Conference.

Other forms of public engagement have included presenting at workshops and events run by the Scottish SPCA and the Child Animals and Adolescent Research (CAAR) group.

Novel and Adapted Methodologies: Children's Attachment to Pets

Laura Wauthier¹, Prof. Jo Williams¹, Gilly Mendes-Ferreira², Dr. Steve Farnfield³
¹University of Edinburgh, ²Scottish SPCA, ³University of Roehampton



Measures of Human and Animal Related Attachment in Children

Methods

27 children with a range of behaviours towards animals, including referrals to the AG programme and matched controls

In-depth interview in 3 sessions covering:

- Belief in Animal Minds
- Welfare Knowledge
- Executive Functioning
- Emotion Recognition
- Attachment
- Empathy

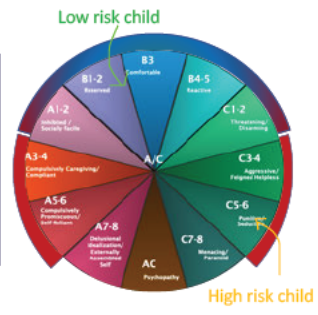
Analysis of results is currently ongoing

Existing Measure

	Strongly agree	Agree	Not sure	Disagree
I like animals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I enjoy playing with my pet (if I have one)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have talked to my pet and that it was trying to tell me (if I have one)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would like to have a pet (if I had one)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Novel and Adapted Measures

- Short Attachment to Pets Scale (SAPS)**
- Hierarchical Mapping Task (Attachment Drawing)**
- Child Attachment Play Assessment (CAPA)**
- Story-Stem Procedure**



Measures of Human and Animal Related Empathy in Children

Short Questionnaire

- State-of-the-art measure of empathy for children
- Self-report and easy to administer
- Conflates with verbal reasoning
- No animal-specific measures
- Not up to date with current conceptualization of empathy

Picture-Based Procedure

- Does not rely on verbal reasoning
- Appropriate for all ages
- No animal-specific measures
- May not correctly assess all dimensions of empathy

Animal-related Empathy

- Addition to the KEDS procedure
- 4 images looking at child-animal interaction: happy, sad, angry (human), and angry (animal)
- Need for a fully developed measure which allows comparison of human-related and animal-related empathy across dimensions

Conclusions

- We must not assume that children who harm animals have no empathy or attachment to animals
- Understanding the spectrum of Child-Animal Interaction requires appropriate measures
- We must not assume that human-related measures are directly applicable to animals
- We must use tools that are developmentally appropriate

Results of the study coming soon- stay tuned for more!
 Contact: _____

References

Bryant, B. K. (1982). An index of empathy for children and adolescents. *Child development*, 413-425.

Farnfield, S. (2016). The Child Attachment and Play Assessment (CAPA) Validation of a new approach to coding narrative stems with children ages 3-11 years. *International Journal of play therapy*, 25(4), 217.

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Associations Among Cruelty to Animals, Family Conflict, and Psychopathic Traits in Childhood

Author: Mark R. Dadds, Clare Whiting, David J. Hawes

Publication:

Journal of Interpersonal Violence: Concerned with the Study and Treatment of Victims and Perpetrators of Physical and Sexual Violence

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BACK

CLOSE WINDOW

Re: Permission to use the AniCare Child conceptual framework diagram in a research paper under review at Anthrozoos

kenneth shapiro <ken.shapiro@animalsandsociety.org>

Fri 24/06/2022 14:11

To: WAUTHIER Laura <lwauthie@exseed.ed.ac.uk>

Cc: WILLIAMS Joanne <Jo.Williams@ed.ac.uk>

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You should only click on links or attachments if you are certain that the email is genuine and the content is safe.

Dear Laura,

As the first author of *The Assessment and Treatment of Children who Abuse Animals* (Springer, 2014), permission is granted to use the figure on p. 8 of the handbook as revised.

Great study. The article will be helpful for us as we undertake a validation study of the AniCare Approach. If for some reason Anthrozoos rejects the paper, I encourage you to submit it to *Society and Animals*.

On 6/24/2022 8:09 AM, WAUTHIER Laura wrote:

Dear Dr. Shapiro,

We have submitted a research article to Anthrozoos on the psychological risk factors of animal cruelty in childhood, and would like to ask permission to use an adapted version of the figure that appears on Page 8 of the manual? (Sincere apologies if you are not the right person to email about permission for use of the figure- if not, would you know who we should email?)

About the study: Having read the AniCare Child approach (and attended your excellent online seminar on the topic!) we wanted to explore its theoretical framework. We used its premises to inform the psychological factors we compared between children referred to a programme for animal harm and control children. Our results support the dimensions suggested in the framework, and we have interesting results on the effects of attachment, self-regulation, and empathy. The reviewers were asking for a bit more detail on the framework, and we felt one of the best ways to provide this was to add an adaptation of the figure which appears in the manual.

I have attached a copy of the manuscript- the diagram (Figure 1) appears at the end of the document after the references. Please let us know if we would have permission to use the figure and/or if you feel we need to make changes to the diagram or the caption. Please don't hesitate if there is anything else you need before making a decision.

Thank you very much for your help!
All the best,
Laura

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Laura Wauthier <laura.wauthier@gmail.com>

RE: 'Animals at Risk' Thematic Apperception Test and research on childhood animal cruelty

Randall Lockwood < > Fri, Jun 5, 2020 at 1:43 PM
To: Laura Wauthier < >

Dear Laura,

You are free to use the images. You can either cite the papers in which they appeared or cite as source: "Randall Lockwood, Ph.D., used with permission" or whatever format the journal prefers. I would appreciate getting a draft of the manuscript and a preprint when the final is ready.

I am glad the material was helpful to you and wish you the best in future research endeavors.

Randall Lockwood, Ph.D.
ASPCA Consultant, Policy, Response and Engagement
2214 Tulip Drive
[Falls Church, VA 22046](#)

email: randall.lockwood@aspca.org
Phone: 347 668-4302
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From: Laura Wauthier < >
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