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Research report

Childhood pet ownership, attachment to pets, and subsequent meat avoidance. The mediating role of empathy toward animals

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ABSTRACT

Researchers studying childhood pet ownership outcomes do not typically focus on measures of adult diet, and those studying the psychology of meat consumption do not normally consider early experiences with companion animals. The present research sought to integrate these two areas by examining relationships between childhood pet ownership, pet attachment, empathy toward animals, belief in human–animal similarity, meat avoidance, and justifications for eating meat. Results from 273 individuals responding to a survey on an internet platform revealed that participants with greater childhood attachment to a pet reported greater meat avoidance as adults, an effect that disappeared when controlling for animal empathy. Greater childhood pet attachment was also related to the use of indirect, apologetic justifications for meat consumption, and this effect too, was mediated by empathy toward animals. Child pet ownership itself predicted views toward animals but not dietary behavior or meat-eating justifications. The authors propose a sequence of events by which greater childhood pet attachment leads to increased meat avoidance, focusing on the central role played by empathy toward animals.

> If we are to change the way people behave toward animals, we must first learn about the origins of that behavior in childhood.
> —Alan Bowd, 1989

Introduction

In a time when nonhuman animals (for convenience, hereafter referred to as "animals") are increasingly endangered in the minds and experiences of their human counterparts (Fawcett, 2002), it could be argued that the most frequent and meaningful action that many individuals take toward animals involves eating them. In spite of Bowd's (1989) counsel though, researchers have generally neglected the developmental aspects of meat consumption and its most antithetical form, vegetarianism. Outside of parental diet, investigators have often failed to consider how childhood experiences may influence adult meat consumption.

The present study, then, aims to address this shortcoming and in doing so seeks to integrate two distinct areas of research. The first concerns how pets or companion animals influence children's development, a topic gaining interest as some researchers have advocated a "biocentric" approach to development (see Melson, 2001, 2003). The second literature examines the psychology of eating animals, a "blossoming" field of inquiry according to a recent review (Ruby, 2012). Despite generating increasing attention and having obvious relevance for one another, these areas have largely been treated discretely by researchers who tend to concentrate exclusively on one or the other. Those studying pet ownership outcomes typically do not focus on measures of adult diet, and those studying meat consumption do not normally consider early experiences with companion animals. The present research was guided by the assumption that childhood pet ownership, especially those relationships characterized by close child–pet attachments, would result in increased future meat avoidance because of the mediating role of empathy toward animals[1]. It was also expected that those with closer childhood relationships with pets would endorse more indirect, apologetic justifications for eating meat and that this effect too would be mediated by empathy toward animals.

Because empathy toward animals was expected to unite the two literatures in question, it is useful to clarify its meaning before proceeding further with the rationale for these hypotheses. Borrowing from standard definitions of empathy (Cohen & Strayer, 1996; Eisenberg & Strayer, 1987), empathy toward animals consists of cog-

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[1] Of course there are many reasons why an individual may avoid meat including health concerns, personal disgust, etc. The mechanism proposed in the present research, empathy toward animals, is most relevant to those avoiding meat for ethical reasons involving animal welfare. There is the possibility that childhood pet ownership exerts later influence on meat avoidance via health concerns, but the present study did not test such a mechanism.

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nitive and affective components which respectively relate to recognizing and understanding an animal's emotion and sharing or having emotional responses in line with an animal's emotion. While not restricted to any particular emotion, empathy most commonly refers to emotional concern aroused by the suffering of another living being (Zahn-Waxler, Hollenbeck, & Radke-Yarrow, 1985).

Vegetarianism, reduced meat consumption, and empathy toward animals

The philosopher Lori Gruen (2004, p. 290) once noted that "when we begin to identity nonhuman animals as worthy of our moral attention because they are beings with whom we can empathize, they can no longer be seen merely as food." That is, the process of empathy transforms abstract entities into living beings whose welfare cannot easily be ignored. Empirical research has corroborated that an important difference between omnivores and vegetarians lies in the expression of empathy. Not only did vegetarians demonstrate greater human-directed empathy than omnivores (Preylo & Arikawa, 2008), they also had higher brain activation of empathy-areas of the brain while viewing negative valence animal images (Fillipi et al., 2010). For many vegetarians, higher levels of empathy toward animals make it cognitively and emotionally difficult to justify eating them, especially given that most consumed animals originate from factory farming (Foer, 2009) which is associated with cruelty and suffering.

On the opposite end of the spectrum, a lack of empathy may facilitate meat consumption. What researchers have labeled the "meat paradox" (Loughnan, Haslam, & Bastian, 2010) – our simultaneous love for animals and our love for eating them – is resolved through a number of strategies, chief among them to deny that animals have emotional and cognitive capacities. Meat consumption is greatest among those not believing that animals suffer (Rothgerber, 2012) and for those who perceive animals to be unintelligent (Ruby & Heine, 2012). Relative to vegetarians, omnivores judged animals to share less similar emotional states to humans for a variety of emotions, but especially secondary emotions (e.g., nostalgia, regret, etc.; Bilewicz, Imhoff, & Drogosz, 2011). Even more directly, experimental contexts reveal that eating animals, expecting to eat them, and even being made to think about certain animals as sources of food led to greater perceived human–animal differences (Bastian, Loughnan, Haslam, & Radke, 2012; Bratanova, Loughnan, & Bastian, 2011; Loughnan et al., 2010).

These motivated perceptions psychologically prepare the individual to consume animals and operate by requiring a lack of empathy toward animals (e.g., denying suffering, emotional capacity, etc.). Given that eating animal flesh is related to a lack of empathy toward animals, from a conceptual and practical viewpoint, it then becomes important to understand the causes and antecedents of empathy toward animals. The remainder of the introduction focuses on one of many possible causes: childhood pet ownership.

Pet ownership and empathy toward animals

The notion that childhood involvement with pets is related to more humane and favorable attitudes toward animals later in life is not a contemporary construction (Wells & Hepper, 1997). In fact, it was adopted as a chief principle of the humane education movement in the late 19th century (Finch, 1989). These ideas seem to have survived as currently, pets are more likely to be found in households with minor children than any other household (AMVA, 1997). In one study, approximately 90% of pet owners believed that pets were important for children (Horn & Meer, 1984); parents believe that pets engender more respect for all animals and higher levels of general compassion (Macdonald, 1981; Salomon, 1981).

There is little doubt that pets demand and receive emotional support, central to the experience of empathy. Across different age groups, there is evidence that children are emotionally expressive and connected to their pets. When asked who they would turn to in emotional situations or when wanting to share a secret, nearly half of a sample of 5-year-olds without prompt, mentioned a pet (Melson & Schwarz, 1994, October). An even greater percent (75%) of 10- to 14-year-olds revealed that they turned to their pets when they were upset (Covert, Whirren, Keith, & Nelson, 1985). Bryant (1985) discovered that 7- to 10-year-old pet owners reported being as likely to talk to their pets about emotional experiences as their siblings. This should not be surprising considering that this group mentioned two pets on average when asked to name the 10 most important individuals in their lives, and pet relationships were perceived by elementary school children to be more reliable than those with friends and family (Bryant, 1990; Furman, 1989). Pets, then, are trusted sources of emotional expression for children. But this relationship is not merely one sided: Because they are dependent on human care, pets provide children the opportunity to learn about and practice nurturing for others.

Rost and Hartmann (1987) found that 75% of 8- to 10-year-olds had exclusive or shared responsibility for pet care, and 92% believed this to be an important or very important part of the relationship. Consistent with these findings, 12-year-olds spent more time caring for pets than caring for their younger siblings (Melson & Fogel, 1996). The opportunity to nurture one's pet was identified by Bryant (1990) as a benefit to childhood pet ownership. Because the ability to recognize, understand, and share the feelings of others is a necessary condition for nurturance (Melson, 2003), pets facilitate the development of empathy. Zahn-Waxler et al. (1985) even noted that animals are sometimes recipients of a child's first expression of empathy.

Cuomo and Gruen (1998) and Gruen (2004) take this reasoning a step further: They identified interspecies relationships and friendships as critical for developing empathy toward not only the specified pet, but toward all animals. They reason that because animals lack the verbal ability to communicate their concerns, humans must develop skills to understand them – without empathic awareness, humans would be in no position to understand an animal's needs and desires, their moods, concerns, etc.

Because humans are largely physically separated from nonhuman animals in the wild and those used in food production, it is difficult to develop these skills and cultivate empathy outside the context of pet ownership. This distance also makes it difficult for humans to feel compelled by the pain of animals unless one can imagine the suffering that would be felt by the animals with whom they share a relationship. Relationships with pets, then, provide opportunities to develop empathy and make it more likely that such feelings will extend beyond the immediate pet and onto other animals.

Such theorizing about the role that childhood pet ownership plays in facilitating empathy toward animals has received empirical support from Paul (2000). Paul (2000) found that empathy toward animals was significantly related to the current ownership of pets and to childhood pet ownership in a sample of 514 adults in Scotland. Because empathy may signify general concerns for animals, it follows that childhood pet ownership is related to more positive attitudes toward animals (Bowd, 1984; Paul & Serpell, 1993), positive attitudes toward pets (Poresky, Hendrix, Mosier, & Samuelson, 1988), and with empathy toward pets (Vizek-Vidovic, Arambasic, Kerestes, Kuterovac-Jagodic, & Vlahovic-Stetic, 2001).

In short, empathy toward animals may be central to the experience of vegetarians and those trying to reduce meat consumption, and it may also be related to childhood pet ownership. This implied link between childhood pet ownership and reduced meat consumption has received indirect support from several sources. In

a qualitative study of 11 vegetarians, Janda and Trocchia (2001) noted that several interviewees attributed their adult vegetarianism to childhood ownership of pets. Many of the respondents expressed empathy for what they perceived as a poor quality of life for animals raised for human consumption. In another study, adult male vegetarians had significantly more positive attitudes toward pets than nonvegetarian males (Preylo & Arikawa, 2008). The attitudinal preferences of vegetarians also extend to behavior. Several studies (Rothgerber, 2013, in press) indicated that rates of pet ownership were higher among meat abstainers than the national rate of 56% estimated by the American Veterinary Medical Association (Weise, 2012).

Despite the obvious connections, there is only one study we are aware of that has directly addressed the question of whether childhood pet ownership relates to future rates of meat consumption. Paul and Serpell (1993) found among university students in the U.K. that the greater the number of pets reported as having been important to the respondent in some way during childhood, the more likely they were to report avoiding at least one animal product for ethical reasons in young adulthood. Participants who reported having more pets of their own during childhood were also more likely to currently avoid eating at least one type of animal product, although this effect only held for females.

While deserving praise for expanding the scope of outcome measures typically included in studies of childhood pet ownership, several limitations of the study leave unanswered questions. One issue is that to distinguish between meaningful and less meaningful pet relationships, Paul and Serpell (1993) counted the number of pets deemed to be important to the participant, but such a determination was made categorically (yes/no) for each pet. That is, there was no ability to discern whether pet relationships that were even more important to participants led to reduced meat consumption compared with those that were important, but relatively less so. The other measurement issue involved the division of meat abstainers into two categories: those reducing their intake of at least one animal product and those not doing so. This is not the most sensitive measure as it lumps together many individuals (e.g., semi-vegetarians, strict vegetarians, vegans, etc.) who may vary widely in their rates of meat consumption. It also does not account for omnivores who may be reducing meat consumption but have not entirely omitted one particular type of animal product from their diet. Another issue is that while the behavior of eating meat is obviously important, attitudes about doing so (i.e., justifications) also deserve attention as these attitudes may indicate future dietary intent. Finally, while extensively discussing possible explanations for the findings, there were no measures trying to account for the process by which the number of important pets was related to meat avoidance in the study.

The present research sought to address these issues and explored how childhood pet ownership and attachment to these pets would be related to empathy toward animals, perceptions of human–animal similarity, justifications for meat consumption, and finally, meat consumption itself. The chief predictions were that (1) those who had a stronger attachment to a childhood pet would avoid eating meat more than those with a weaker childhood pet attachment because of their greater empathy toward animals; and (2) when these individuals do consume meat, because of their greater empathy toward animals, they should feel guiltier than those with less close pet attachments and prefer not to think about it, thus endorsing indirect, apologetic meat-eating justification strategies, including dissociation and avoidance. Predictions concerning the effect of childhood pet ownership were less certain. On the one hand, those with childhood pets may be expected to view animals more positively, having greater empathy toward them and perceiving them as more similar to humans. Because not all pet experiences are positive though, it was not clear if this effect would be muted.

Method

Participants and procedure

To diversify the ages and backgrounds of participants beyond that found in typical university samples, the present research was conducted through an internet platform. Although web-based measures offer less control than those typical of paper-and-pencil methods, studies testing the same instrument through both techniques have shown that adequately designed web versions perform well (Buchanan & Smith, 1999), in part due to greater perceived anonymity (Davis, 1999). The present participants were recruited through Amazon Mechanical Turk (MTurk-http://www.mturk.com/mturk/), an online labor market where requesters post jobs and workers choose which jobs to do for pay. There are numerous studies that show correspondence between the behavior of workers on MTurk and behavior offline or in other online contexts (Buhrmester, Kwang, & Gosling, 2011; Paolacci, Chandler, & Ipeirotis, 2010). Buhrmester et al. (2011) noted several advantages to MTurk: participants are slightly more demographically diverse than standard internet samples and significantly more diverse than typical American university samples; realistic compensation rates do not affect data quality; and the data obtained are at least as reliable as those obtained via traditional methods, a conclusion shared by Mason and Suri (2012) in a review.

A brief recruitment notice for a study on attitudes toward animals was posted on MTurk along with a link to the survey monkey website hosting the survey. Participants were paid $.75 for their participation. Before beginning the survey, participants read an informed consent giving an overview of the study procedures including provisions for anonymity and their rights as participants. The survey was accessible from September 1 to 30, 2013.

During this period, 273 individuals responded to the survey[2]. Of the total sample, 61% were females. Eighty-three percent listed the U.S. as country of origin; 16% India, and less than 1% another country. The mean age of participants was 35.55 years (SD = 11.47).

Measures

Pet ownership

To assess pet ownership, participants were asked to indicate whether they had a pet during their childhood. Eighty-four percent of respondents answered affirmatively.

Pet attachment

Participants indicating childhood pet ownership were asked to consider the pet to which they felt closest. Attachment to this pet was measured with the Lexington Attachment to Pets Scale (LAPS; Johnson, Garrity, & Stallones, 1992). The LAPS has excellent psychometric properties and has been used in at least a dozen published studies. It consists of 23 items including "My pet means more to me than any of my friends;" and "Quite often I confide in my pet." All items were scored on a 6-point Likert scale (1 = *strongly disagree*; 6 = *strongly agree*), with higher scores indicating greater pet attachment. Reliability for the 23 items was high (alpha = .93).

Animal empathy

To assess their empathy toward animals, participants were administered the animal empathy scale developed by Paul (2000). The scale consists of 22 items ["Seeing animals in pain upsets me"; "People often make too much of the feelings and sensitivities of

[2] Degrees of freedom for subsequent analysis do not match the total sample number because some participants failed to answer certain questions. The degrees of freedom, then, reflect completed data for each measure.

Table 1
Study outcome measures as a function of childhood pet ownership.

Measure	Childhood pet ownership				*F* value	Cohen's d
	Yes		No			
	Mean	SD	Mean	SD		
Empathy toward animals	4.45	.78	3.87	.48	20.54***	.90
Human–animal similarity secondary emotions	5.51	1.27	4.78	1.07	10.60***	.62
Human–animal similarity primary emotions	3.37	1.41	2.24	1.60	13.09***	.75
Overall human–animal similarity	4.44	1.17	3.61	1.21	15.43***	.70
Meat avoidance	10.42	6.20	10.95	6.07	.24	.09
% strict vegetarians (Y/N)	5.0%		8.1%		.58	.05
Direct MEJ strategies	3.49	1.00	3.77	.77	2.25	.31
Indirect MEJ strategies	4.46	1.20	4.44	1.01	.09	.02
Total MEJ	3.80	.78	3.96	.63	1.29	.23

For percent strict vegetarians, chi square rather than *F* value is reported and phi rather than Cohen's d is reported. Cohen's d of .2 represents small effects, .5 medium effects, and .8 large effects.
***$p < .001$.

animals" (reverse scored)]. All items were measured on a 6-point Likert scale (1 = *strongly disagree*; 6 = *strongly agree*) with higher scores revealing more empathy toward animals (alpha = .90).

Human–animal similarity

To assess the extent to which participants believed animals possessed emotional states similar to humans, a scale was derived from the work of Bilewicz et al. (2011). Specifically, participants were asked to indicate human–animal similarity for eight emotions on a scale ranging from 1 (only humans have this emotion) to 7 (animals and humans have this emotion to the same degree). The eight emotions used by Bilewicz et al. (2011) were: fear; melancholy; panic; guilt; excitement; regret; happiness; and nostalgia (alpha = .84). The odd items together displayed solid reliability (alpha = .76) and were combined to form a single measure of primary emotions. The even items (alpha = .87) comprised secondary emotions.

Meat avoidance

To assess current meat avoidance, participants were asked to indicate in an average week how many of their meals (including breakfast, lunch, and dinner) were completely vegetarian, that is, contained no meat (beef, chicken, pork) or fish, and how many in the last week were completely vegetarian. In each case, they were directed to pick a number between 0 and 21. Given the fairly strong correlation between these measures, $r(245) = .64$, $p < .001$, they were combined to form a single measure of meat avoidance. Participants also indicated whether they were a strict vegetarian (yes/no).

Meat-eating justification

To assess the extent to which participants used different strategies to justify meat consumption, the 27-item meat-eating justification (MEJ) scale (Rothgerber, 2012) was administered to participants. In addition to measuring overall MEJ (alpha = .89), based on Rothgerber (2012) the MEJ was divided into two subscales, each consisting of multiple strategies. The indirect, apologetic subscale consisted of Dissociation and Avoidance (alpha = .88). The direct, unapologetic subscale consisted of Pro-Meat Attitudes, Denial, Hierarchical Justification, Dichotomization, Religious Justification, Health Justification, and Human Destiny/Fate Justification (alpha = .91). All items were scored on a 6-point Likert scale (1 = *strongly disagree*; 6 = *strongly agree*) indicating agreement with the statements. With the exception of dichotomization, the strategies tended to be significantly correlated with each other. Dissociation and avoidance tended to be negatively correlated with the other strategies.

Results

To eliminate potential order effects based on priming memories of childhood pets, the pet ownership and attachment questions were administered at the beginning of the questionnaires for half the participants, and for the other half they were administered at the end. This factor did not affect any of the results, and so the analysis collapsed across question order.

Childhood pet ownership

Table 1 presents means, standard deviations, *F* values, *p* values, and effect sizes for the dependent measures with pet ownership treated as an independent variable. As evident, those who owned a pet during childhood displayed greater empathy toward animals than those that did not have a pet during childhood, $F(1,249) = 20.54$, $p < .001$. Belief in human–animal similarity also varied with pet ownership, so that those having a childhood pet believed humans and animals were more similar for primary emotions, $F(1,246) = 10.60$, $p < .001$, secondary emotions, $F(1,246) = 13.09$, $p < .001$ and overall emotions, $F(1,246) = 15.43$, $p < .001$. None of the other variables, however, differed based on childhood pet ownership. Females scored significantly higher than males on all dependent measures except secondary emotions and direct and total MEJ[3], but gender did not interact with childhood pet ownership for any measure.

Pet attachment

Levels of reported pet attachment tended to fall on the positive side of the scale (M = 4.43, SD = .83). The range of scores (1.35–5.78) showed that a variety of pet attachments were represented; 25% of responses fell below 4.04, and the upper quartile began at 5.06. Pet attachment was significantly positively related to all outcome measures except for endorsement of direct MEJ strategies. Table 2 presents these correlations and those between all the outcome measures. Of note, empathy toward animals was significantly positively correlated with all measures except for endorsement of direct MEJ and overall MEJ, both of which were negatively associated with empathy toward animals.

[3] The effect sizes were as follows: empathy: $d = .87$; primary emotions: $d = .52$; secondary emotions: $d = .02$; overall emotions: $d = .29$; meat avoidance: $d = .69$; direct MEJ: $d = .42$ (males > females); indirect MEJ: $d = .64$; and total MEJ: $d = .15$.

Table 2
Correlations between outcome measures.

Scale	1	2	3	4	5	6	7	8	9
1. Pet attachment	–								
2. Empathy	.59***	–							
3. Human-animal similarity primary emotions	.19**	.42***	–						
4. Human-animal similarity secondary emotions	.15*	.26***	.56***	–					
5. Overall human-animal similarity	.19**	.38***	.86***	.90***	–				
6. Meat avoidance	.27***	.41***	.20**	–.04	.08	–			
7. Direct MEJ	.09	–.34***	–.29***	.05	–.12	–.32***	–		
8. Indirect MEJ	.25**	.33***	.06	.00	.03	.15*	.03	–	
9. Total MEJ	.18*	–.17*	–.23***	.06	–.08	–.22***	.91***	.42***	–

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

Mediation analysis

The mediation analyses followed the procedure recommended by Judd and Kenny (1981) and Baron and Kenny (1986). Regression analyses were conducted to assess the total effect of pet attachment on the measure of current meat avoidance, as well as the degree to which this effect was mediated by empathy toward animals. Those with a stronger attachment to a childhood pet were more likely to express empathy toward animals, b = .52, t(188) = 9.27, $p < .001$. The stronger the reported attachment to a childhood pet, the more participants reported avoiding meat, b = 1.65, t(188) = 3.25, $p < .001$. The inclusion of empathy toward animals reduced this effect to nonsignificance, b = –.17, t(187) = .30, *n.s.* Using the Baron and Kenny (1986) modification of the Sobel (1982) test, the reduction was significant, z = 4.06, $p < .001$. This model is summarized in Fig. 1.

The second analysis examined indirect MEJ strategies. The stronger the reported attachment to a childhood pet, the more strongly participants endorsed indirect MEJ strategies, b = .31, t(179) = 2.94, $p < .01$. The inclusion of empathy toward animals reduced this effect to nonsignificance, b = .08, t(178) = .66, *n.s.* This reduction was again significant, z = 3.18, $p < .001$. This model is summarized in Fig. 2.

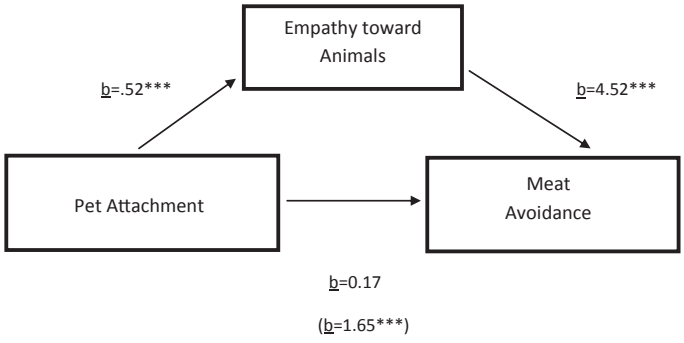

Fig. 1. Mediation model for the effect of pet attachment on meat avoidance via empathy toward animals.

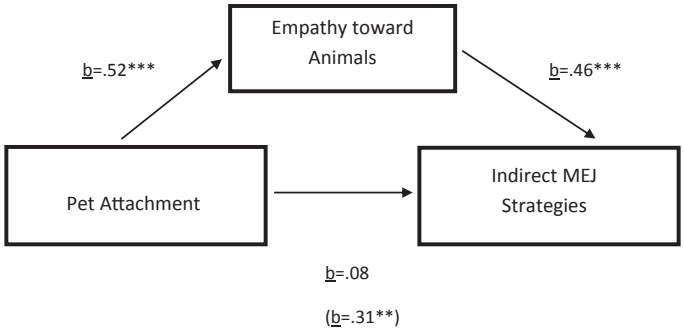

Fig. 2. Mediation model for the effect of pet attachment on indirect MEJ strategies via empathy toward animals.

Discussion

One specific question posed by the present study was whether childhood pet ownership affected views toward animals, consumption of animals, and attitudes toward such consumption. The results were decidedly mixed. On the one hand, pet ownership was associated with greater connections to living animals; those having a pet as a child expressed more empathy toward animals and perceived greater human–animal similarity for both primary and secondary emotions. At the same time, these affections for living animals did not transfer to decisions about whether to eat them. Childhood pet owners did not differ from nonowners in whether they were strict vegetarians, in the amount of vegetarian meals they consumed, or in their justifications for eating meat. To some degree, then, childhood pet owners face a quandary: They are less likely to rely on justification strategies for consuming animals (see Bilewicz et al., 2011), but still seem to consume them to the same degree as others. How this potential tension is negotiated warrants further attention.

The lack of diet effects based on childhood pet ownership alone may not be surprising given that this is such a broad category representing a variety of pet experiences[4]. Melson (1990) has noted that many empirical studies of pet ownership have suffered from lumping participants into one of two over-inclusive categories. Not all pet experiences are positive, as revealed by reports that the majority of puppies in the U.S. are surrendered by their owners within a year of acquisition (Kidd, 1986). Bryant (1990) documented a number of costs of pets to children, and it was unclear to what extent these were experienced by the respective pet owners in the current study. Some parents may use pets as scapegoats for other problems, and some may believe in or communicate less about the value of pets. It is conceivable that studies finding main effects for pet ownership have examined outcomes that may reflect initial differences between pet owners and nonowners, or they may have overrepresented those highly attached to their pets (e.g., Vizek-Vidovic et al., 2001).

For measures that are connected to childhood pet ownership in a more complex and remote way, such as future meat avoidance, the type of pet relationship proved to be more important than simple ownership status. Specifically, participants who reported having closer attachments to their childhood pet also reported currently avoiding meat more. The reason why childhood pet attachment and

[4] In addition, the lack of strict vegetarians in the sample contributed to null effects for the vegetarian status measure. The direction of means was opposite the expected pattern, but this too should be viewed as unreliable because of floor effects.

subsequent diet were related involves the empathy toward animals that these relationships cultivate. In fact, controlling for animal empathy, pet attachment and future meat avoidance were unrelated.

Greater empathy toward animals also accounted for the relationship between closer attachment to childhood pets and the endorsement of indirect, apologetic justifications for consuming meat. These indirect strategies involve dissociating the animal from the food on the plate and avoiding thinking about how the animal was treated before arriving to the plate. They minimize thinking about the animal and how it has been processed and represent a more "look-the-other-way" approach than direct justifications. Although they eat more vegetarian meals than their counterparts who have weaker attachment to a childhood pet, when those with stronger childhood pet attachments consume meat, they prefer not to think about it. This desire to avoid thinking about the origin of meat likely results from the greater discomfort such thoughts would produce in them, given their greater empathy toward animals. Taken together, the findings on meat avoidance and MEJ are consistent with Rothgerber (2012), who found that relative to the endorsement of direct MEJ strategies, indirect MEJ strategies were correlated with reduced meat consumption.

From pet attachment to increased vegetarian diet

How does having a close relationship with a childhood pet come to be associated with greater meat avoidance? What follows is a tentative sequence of events intended to highlight unresolved issues and to generate predictions more than just serve as a definitive model. There are three general conditions that need to occur in order for childhood pet ownership to affect adult meat consumption: (1) A child in a supportive home develops empathy toward his/her pet; (2) Pet empathy is generalized to other animals; and (3) For empathy to impact diet, there must be recognition of animal suffering in the food system and a lack of meat-eating justifications.

The first step requires having parents who model positive behavior toward pets, but according to Zahn-Waxler et al. (1985), this occurs in less than half of the homes they studied. Assuming a positive environment free of verbal and physical aggression toward animals, children will likely develop an emotional relationship with their pet. This relationship seems stronger for certain types of animals (Paul & Serpell, 1993) and in the absence of siblings (see Serpell, 1999). To the extent adult caregivers model helping and consoling a person or animal that is hurt or upset, the child is more likely to develop empathy (Zahn-Waxler et al., 1985). How parents respond when the child has caused their pet pain or discomfort is also significant. Zahn-Waxler et al. (1985) identified seven types of reactions from the positive perspective taking or suggesting an alternative behavior to the negative withdrawal of love or ignoring the situation.

Once empathy for their pet has been achieved, the next step likely involves a progression of developing empathy for all pets or toward other animals similar to their pet and then eventually, toward all animals. Clearly this transference of positive emotion does not always occur as there are adults who strongly identify with one type of animal (e.g., a "dog person") to the exclusion of others; in general, adults tend to keep the same kind of pets they had as children (Poresky et al., 1988). The progression may also be disrupted by any negative experiences with other pets or animals. The process of generalization may require certain cognitive abilities largely related to categorization, such as the understanding that their pet is a nonhuman animal, that there are many other nonhuman animals, and that these nonhuman animals share common characteristics and the expectation of reasonable care. It may require the ability to imagine their pet in place of animals whose suffering they confront and to perceive these animals as having the same moral standing as their pet. This is all to suggest that to have feelings of concern and understanding toward one animal may be a necessary but insufficient precondition for an individual to develop feelings of concern for all animals.

The third step involves overcoming detachment and willful ignorance, as in the case of proclaimed animal lovers who seemingly without guilt, regularly consume animal flesh. In order for animal empathy to translate to meat avoidance, the individual must recognize and attend to the suffering of animals used in the food system, be free of direct MEJ strategies (i.e., rationalizations) that have been shown to be related to greater meat consumption (Rothgerber, 2012), and overcome any structural barriers (see Ruby, 2012) to dietary change.

This proposed sequence of events generates several predictions that may stimulate future research. One prediction is that having multiple pets from different animal types (e.g., a pet dog and cat) would more likely engender empathy toward animals by expanding the range of animals to which the child feels closest. The more different the features of these animals are to each other (e.g., a dog and a lizard), the stronger the generalization process may be, although empathy is likely easier to obtain for animals that are more interactive. Unfortunately, the present study did not assess whether respondents had multiple pets that they may have felt close to or what type of animals these pets were. Another prediction is that experiencing a negative pet relationship may undermine the development of empathy toward animals in that class and subsequently, all animals. Because the present study only assessed participants' closest pet relationship, it is unclear whether those reporting close attachments to a pet experienced any negative pet relationships, thus also rendering it impossible to properly test this prediction.

In addition to the aforementioned limitations, a major unresolved issue concerns the direction of causality. Because childhood pet ownership and attachment were not randomly assigned, it is unclear whether close attachment to a childhood pet causes empathy toward animals, whether children with higher levels of preexisting empathy and empathy toward animals are more likely to end up with pets and have closer attachments because of their higher empathy, or whether there is a third variable(s) such as parental values or parental attitudes toward animals that may lead their children to have closer attachments to their pets and may lead their children to also have higher levels of empathy toward animals. Outside of a true experiment in which pet ownership is randomly assigned – along somehow with pet attachment – to disentangle these questions would require conducting a longitudinal study with multiple outcome measures over time.

The lack of a longitudinal design also introduces problems associated with the retrospective reporting of childhood pet experiences. While it is unlikely that respondents falsely recalled the existence or nonexistence of a pet, their recollection of the closeness of their relationship with a pet involves emotions and feelings and may be more vulnerable to bias. As suggested by Paul and Serpell (1993), the sort of individuals who are willing to acknowledge that they had an important relationship with a childhood pet may also be more likely to respond to questions on other animal attitude measures with empathy and sensitivity. In addition, the persons who want to lie to themselves or others about pet relationship attachment may also be more likely to lie to themselves or others about various attitudes toward animals they possess. This problem is less likely to apply to a measure of meat avoidance because it more heavily involves objective behavior with less obvious connection to pet attachment questions. Finally, the self-selected nature of the sample means that certain groups, such as those with less affinity toward animals, may have been underrepresented. The reasonably broad range found in reported empathy along with rates of reported pet ownership similar to other work (e.g., Paul & Serpell,

1993) mitigates these concerns to some extent. Nonetheless, replication of this study among a sample recruited without reference to animals would enable even firmer conclusions to be drawn.

These limitations notwithstanding, from a conceptual standpoint, the authors hope that the present results aid in better understanding of the developmental aspects of meat avoidance. They suggest that empathy toward animals plays a central role in influencing meat consumption. From a practical perspective, the results may be useful to those advocating the benefits of reduced meat consumption. Such arguments have been advanced for environmental reasons (see the United Nations, 2006; Pew Commission on Industrial Farm Animal Production, 2008 for reports); for public health reasons (see the report by the Pew Commission on Industrial Farm Animal Production, 2008); for animal welfare reasons (Foer, 2009); and for reasons of unsustainability (Roberts, 2008), among others. To date, it has been somewhat difficult to suggest interventions to reduce meat consumption or promote vegetarianism because research has focused on worldviews and values that are deeply entrenched and how they may be related to such behavior (see Ruby, 2012). One implication of the present findings is that efforts to promote healthy pet ownership (among both existing and potential households) will not only pay off in terms of outcomes purely beneficial to the individual, but through greater meat avoidance, will also lead to outcomes that may be beneficial to society as a whole.

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