Prosocial and Antisocial Behaviors in Adolescents: An Investigation into Associations with Attachment and Empathy

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ABSTRACT The normal development of empathy has been proposed to be imperative to the healthy emotional and social functioning of youths. In contrast, compromised levels of empathy have been linked to an increased propensity to engage in antisocial behaviors, including animal cruelty. Previous findings have revealed parent attachment to be intrinsically linked to the development of empathy. This association has been shown to play a role in predicting the expression of various outcome behaviors, including both those which are prosocial in nature, and those which are antisocial, and potentially aggressive. This study examines these associations in a sample of 281 12- to 18-year-old students. The aims included the investigation of the direct predictive roles played by attachment and empathy for prosocial and antisocial behaviors directed at both humans and animals. We also investigated the mediating role played by empathy in these relationships. Attachment and empathy significantly predicted prosocial and antisocial behaviors, both individually, and in combination. Furthermore, empathy was found to serve a mediating role in the associations between attachment and: human-directed prosocial behavior, the humane treatment of animals, and animal cruelty. These findings expand upon existing literature by demonstrating that it is, at least partially, through empathy that attachment to parents predicts prosocial and antisocial behaviors during adolescence. This is in contrast to the direction of relationships implied by some previous findings and proposals, which have suggested that treating animals humanely fosters the normal development of empathy, for example. Notwithstanding the promising findings revealed by the current study, we recommend that replicating this research using a larger sample will assist in addressing the limited generalizability identified in the current

study. It is further proposed that the use of a lie scale could limit the influence of social desirability responding. Future research is also needed to determine the direction of the demonstrated relationships.

Keywords: animal cruelty; antisocial behavior; attachment; empathy; humane treatment; prosocial behavior

The development of normative levels of empathy has been proposed to be imperative to the healthy emotional and social functioning of children and adolescents, largely due to the role empathy plays in altruism and prosocial behavior (Eisenberg et al. 1991). Similarly, developmentalists have reported that empathic and prosocial styles of responding to others are important antecedents of social competence. In contrast, empathy is a core deficit in antisocial and aggressive youths (Lovett and Sheffield 2007).

Empirical research (e.g., Duncan and Miller 2002) has linked impaired empathy development to not only an increased propensity to engage in callous human-directed behaviors, but also to engaging in higher levels of animal cruelty during childhood and beyond. Conversely, empathic and prosocial youths are more inclined to treat their companion animals humanely (Poresky 1990; Vidović, Štetić and Bratko 1999). In recognition of the links between human- and animal-directed behaviors, and their relationships with empathy levels, an increasing amount of attention is being dedicated to understanding the role of empathy in the expression of such behaviors.

One such study was conducted by Warden and Mackinnon (2003), who investigated the associations between empathy and social competence among 131 children ranging in age from 9 to 10 years. As predicted, prosocial children demonstrated significantly more empathic awareness than "bullies" or "victims," and were consequently less likely to be rejected by their peers. In a related study, Rydell, Hagekull and Bohlin (1997) sampled 121 7- to 10-year-old children. As expected, those children who were more popular amongst their peers yielded significantly higher prosocial orientation scores compared with those who were socially rejected by their peer group. These studies provide support for the associations between empathic and prosocial behaviors, and healthy relationships with peers. Similarly, high levels of empathy have been proposed to be associated with an increased propensity to form close bonds with companion animals (Ascione and Weber 1996; Melson, Schwarz and Beck 1997).

Providing support for the above proposal are the results of Poresky's (1990) study, which assessed the relationship between bonds with pets and empathy levels among 38 children ranging in age from three to six years. As expected, children who had a strong bond with their pet had higher empathy scores than children who did not have pets. In a related study, Vidović, Štetić and Bratko (1999) assessed pet ownership and socio-emotional development among a sample of 826 youths ranging in age from 10 to 15 years. Participants who scored higher than average on the pet attachment scale yielded significantly higher scores on both the empathy and prosocial orientation scales than those who scored lower than average on the attachment to pets scale. The researchers concluded that by taking responsibility for the well-being of a pet, children learn experientially about the importance of empathic and prosocial responding with respect to all beings—both human and nonhuman.

Research has also focused upon examining potential outcomes related to the compromised development of empathy, such as that observed in children affected by

externalizing disorders. For example, children with conduct disorder have been characterized as being callous and unemotional, lacking the ability to experience guilt (Luk et al. 1999; Hastings et al. 2000). These children tend to initiate and engage in persistent antisocial acts, including displays of aggression toward both people and animals (Ascione 1993; Miller 2001).

Empirical research (e.g., Rappaport and Thomas 2004) has confirmed that the antisocial and aggressive behavior exhibited by children with externalizing disorders leads to rejection by the mainstream group of peers, thereby increasing the likelihood of deviant group membership. Deviant peers model attitudes and motivations that support antisocial behavior, in addition to providing opportunities to engage in delinquent acts (Patterson, DeBaryshe and Ramsey 1989). Moreover, empirical work by Kimonis, Frick and Barry (2004) indicates that dysfunctional parenting may mediate the association between adolescents' externalizing disorders and deviant group affiliation.

Thus, the parent–child relationship appears to play a central role in not only the development of empathy, but also in relation to the expression of prosocial and antisocial behaviors. For example, a secure parent–child attachment has been linked to high levels of self-esteem and empathy, in addition an increased propensity to respond to others in a prosocial manner (Carlson and Sroufe 1995). Providing support for such proposals, Engels et al. (2001) sampled 412 adolescents ranging in age from 12 to 18 years, finding that secure parent–child relationships correlated with higher levels of both prosocial behavior and confidence in one's ability to relate to peers in a healthy and empathic manner.

In contrast to the positive associations described above, children with impaired attachments are at risk of compromised empathy development, which predisposes the child to not only experience difficulty relating to others in a functional and productive manner, but also to engage in antisocial and aggressive behaviors (Bowlby 1988). For example, with their sample of 125 adolescents aged between 16 and 18 years, Allen et al. (2002) found that insecure attachment predicted impaired social skills, and higher levels of delinquency and relationship problems. Similarly, based on a considerably larger sample of 1583 13- to 19-year-olds, Arbona and Power (2003) found that an avoidant attachment style was predictive of higher levels of involvement in antisocial behaviors.

Despite the growing body of literature linking attachment and empathy to social and emotional outcomes, empirical studies have tended to measure positive (e.g., healthy and socially acceptable behaviors, such as prosocial behavior) and negative (e.g., pathological and antisocial behaviors, such as animal cruelty) outcome variables separately, and have also focused on only outcomes of either human-directed aggression or animal cruelty. Further, a large proportion of studies investigating childhood antisocial behaviors have relied upon retrospective reports. As noted by Gauthier et al. (1996), it is questionable to rely on retrospective accounts of childhood experiences, particularly when the experiences are of a highly personal nature.

In response to these recognized limitations, the current research aimed to investigate both positive (i.e., prosocial behavior and the humane treatment of animals) and negative (i.e., engaging in animal cruelty) outcome variables using adolescents' self-reports about their current behaviors/experiences.

It is becoming increasingly recognized that adolescence is a high-risk period for engagement in delinquent behaviors, particularly for those who possess compromised empathy levels and/or lack a secure parental attachment relationship (Allen et al. 2002; Broidy et al. 2003). Therefore, an additional aim was to expand upon the existing literature linking attachment with prosocial and antisocial outcome behaviors, by investigating whether empathy mediates the

associations between these variables during this developmental phase. Based upon the literature reviewed above, it was predicted that:

- There would be a significant positive association between positive parental attachment relationships and empathy.

- Each of empathy and attachment would be positively associated with prosocial behavior (toward humans) and the humane treatment of animals.

- Each of empathy and attachment would be negatively associated with animal cruelty.

- Empathy would significantly mediate the relationships between attachment and each of the prosocial behavior, humane treatment of animals, and animal cruelty variables.

Methods

Participants

Parental explanatory statements and consent forms were distributed to students within 12 secondary schools across Melbourne, Australia. The schools ranged from girls' and boys' Catholic schools, located within high socioeconomic suburbs, to rural, co-educational government schools whereby families of a lower socio-economic status were represented.

The overall parent consent rate was 20%. A number of participating teachers attributed this low consent rate to students commonly failing to take the consent forms home to their parents, or to return them to school. The sample was comprised of 281 students (113 males; 168 females) ranging in age from 12 to 18 years ($M = 14.83$, $SD = 1.71$).

Measures

Inventory of Parent and Peer Attachment - Revised (IPPA-R; Gullone and Robinson 2005): Parental attachment was assessed using the parent scale of the IPPA-R, which is a youth self-report measure. This measure was designed to assess affective and cognitive dimensions of adolescents' relationships with their parents (i.e., mutual trust, quality of communication, and extent of anger and alienation). The original instrument (IPPA; Armsden and Greenberg 1987) utilizes a five-point Likert scale response format, and was validated using a sample of 16- to 20-year-olds.

The revised version of the IPPA utilizes a three-point Likert scale (i.e., "Always True," "Sometimes True," and "Never True") and simplified wording, thereby enabling use by younger adolescents. The measure consists of 28 (9 Trust, 8 Communication, and 11 Alienation) items. Total Attachment scores (derived by summing the Trust and Communication sub-scale scores, and subtracting the Alienation score) range from -22 to 34, with higher scores reflecting a more secure attachment relationship with one's parents.

Using a sample of 118 children (9- to 11-year-olds) and 163 adolescents (14- to 15-year-olds), Gullone and Robinson (2005) demonstrated adequate validity and reliability for each of the peer and parent scales of the IPPA-R. Specifically, Cronbach's alpha coefficients for the Trust, Communication, and Alienation sub-scales of the parent scale were 0.83, 0.79, and 0.76 respectively for the child group. Slightly higher coefficients were found for the adolescent sample, these respectively being 0.85, 0.79, and 0.81.

Demonstrating validity, the parent scale of the IPPA-R was found to correlate significantly with the Parental Bonding Instrument (Parker, Tupling and Brown 1979) sub-scales of Care and Overprotection, with Pearson's product-moment correlations being 0.73 ($p < 0.001$) and -0.51 ($p < 0.01$), respectively. Equally robust correlations were demonstrated between the

Self-Esteem Inventory (Coopersmith 1981) and the IPPA-R sub-scale and total scores, with coefficients ranging between 0.28 ($p < 0.01$) and 0.65 ($p < 0.001$).

With respect to the sample used in the current study, Cronbach's alpha coefficients for the Trust, Communication, and Alienation sub-scales of the parent scale were 0.89, 0.85, and 0.81, respectively. These coefficients are comparable to those obtained by Gullone and Robinson (2005) with their adolescent sample.

Index of Empathy for Children and Adolescents (IECA; Bryant 1982): The IECA was developed to assess empathy in a wide range of children and adolescents. It consists of 22 statements (e.g., "It makes me sad to see a girl who can't find anyone to play with"), each of which requires the respondent to endorse the response (i.e., "Yes" or "No") that best applies to them. Responses are scored such that higher scores reflect higher levels of empathy. Total scores range from 0 to 22.

Bryant (1982) reported this measure to have adequate internal consistency reliability, with Cronbach's alpha coefficients ranging from 0.54 for first graders, to 0.79 for seventh graders. Good test-retest reliability over a short period of time was demonstrated, with coefficients of 0.74 ($p < 0.001$) for the first graders, and 0.85 ($p < 0.001$) for the seventh graders. The convergent validity of the IECA was assessed by correlating the measure with the Feshbach and Roe (1968) empathy measure for the first graders, and the Mehrabian and Epstein (1972) empathy measure for the seventh graders. Moderate significant correlations for both the first ($r = 0.33$, $p < 0.01$) and seventh graders ($r = 0.54$, $p < 0.001$) provided evidence of the IECA's adequate convergent validity.

In the present study, a Cronbach's alpha coefficient of 0.72 was found, demonstrating adequate internal consistency.

Strengths and Difficulties Questionnaire (SDQ; Goodman 2001): Prosocial behavior was assessed using the respective sub-scale (consisting of five items) of the self-report form of the SDQ. This 25-item measure was developed as a brief screening measure of behavioral and emotional problems for use with youths aged between 11 and 17 years, and also comprises Emotional Symptoms, Conduct Problems, Hyperactivity-Inattention, and Peer Problems scales (which were not used for the purposes of the present study). Respondents are required to indicate how much the attribute applies to them on a three-point Likert scale (i.e., "Not True," "Somewhat True," or "Certainly True"). Prosocial Behavior scores range from 0 to 10, with higher scores reflecting a higher level of engagement in prosocial behaviors.

Based on the self-reports of 10,438 youths within a community sample, Goodman (2001) reported a Cronbach's alpha coefficient of 0.66 for the Prosocial Behavior scale. Also, test-retest reliability over periods ranging between four and six months (*M*: 0.62) were satisfactory.

Goodman (2001) assessed validity by determining how strongly the various SDQ scales were associated with the presence or absence of relevant psychiatric disorders. For example, attention-deficit/hyperactivity disorder was the relevant diagnosis for the Hyperactivity-Inattention scale. Because low levels of prosocial behavior may accompany many different psychiatric disorders, several diagnoses including depression and oppositional defiant disorder were assessed by Goodman (2001) to determine the validity of the Prosocial Behavior scale. SDQ scores above the 90th percentile predicted a substantially raised probability of diagnosed psychiatric disorders, providing evidence of the measure's validity.

With respect to the current sample, the Cronbach's alpha coefficient for the Prosocial Behavior scale was 0.66. This is identical to that reported by Goodman (2001).

Children's Treatment of Animals Questionnaire (CTAQ; Thompson and Gullone 2003): The humane treatment of companion animals was assessed using the CTAQ. This measure consists of 13 items (e.g., "Groom"), each of which requires the individual to indicate whether they "Often," "Sometimes," or "Never" engage in the activity specified with a companion animal. Responses are scored such that higher scores reflect higher levels of humane behavior, with total scores ranging from 0 to 26.

The CTAQ was initially validated with a sample of 25 boys and 36 girls ranging in age from 8 to 10 years ($M = 9.26$ years). Adequate internal consistency was demonstrated, with Cronbach's alpha coefficients being 0.81 for the entire sample, 0.74 for the boys, and 0.85 for the girls. Demonstrating good test-retest reliability over a five-week period, a correlation coefficient of 0.64 ($p < 0.001$) was yielded for the entire sample, while coefficients of 0.63 were yielded for each of the boy ($p < 0.01$) and girl sub-samples ($p < 0.001$).

Moderately sized significant correlations between the CTAQ and both the IECA (Bryant 1982, $r = 0.25$, $p < 0.05$) and the Empathy sub-scale of the Social Skills Rating System (Gresham and Elliott 1990, $r = 0.37$, $p < 0.01$), provided evidence of the CTAQ's convergent validity.

A Cronbach's alpha coefficient of 0.82 was obtained for the current data. This is highly comparable to that originally reported by Thompson and Gullone (2003).

Children and Animals Inventory (CAI; Dadds et al. 2004): Animal cruelty was assessed using the CAI, which is a self-report version of the Children and Animals Assessment Instrument (CAAI; Ascione, Thompson and Black 1997). Whilst the latter utilizes a semi-structured interview format, both measures assess nine theory-driven dimensions of cruelty, namely: (a) severity, (b) frequency, (c) duration, (d) recency, (e) diversity, (f) sentience, (g) covert, (h) isolate, and (i) empathy.

The CAI items are assessed on a Likert scale (with the exception of the last item, which requires a written response). An example item is "Have you ever hurt an animal on purpose?" with the individual being required to endorse either "Never," "Hardly ever," "A few times," "Several times," or "Frequently." Total scores range from 0 (no instances of animal cruelty) to 39 (severe, chronic, and recent cruelty to a range of animals with the youth showing no empathy).

A sample consisting of 36 pairs of children and their parents was used in a preliminary study to validate the CAI. Youths were aged between 6 to 13 years ($M = 11.4$ years). Excellent internal consistency was demonstrated, with a Cronbach's alpha coefficient of 0.96. Good test-retest reliability over a one-week period was also shown ($r = 0.75$, $p < 0.01$). Furthermore, the validity of the measure was demonstrated by significant, positive correlations between the child and parent reports of the child's animal cruelty in both the first ($r = 0.51$, $p < 0.05$), and second administrations ($r = 0.46$, $p < 0.05$). Dadd's et al. (2004) concluded that the CAI is a valid and reliable measure of children's cruelty to animals. However, the distribution of scores was found to be skewed in their nonclinical sample, with the majority of participants scoring 0.

Congruent with the good internal consistency reported by Dadds et al. (2004), a Cronbach's alpha coefficient of 0.93 was obtained with the present sample.

Procedure

Following approval to conduct the research by the relevant bodies (i.e., the Monash University Ethics Committee, the Victorian Department of Education and Training, and the Victorian Catholic Education Office), 65 schools were sent an information package, including permission letters and copies of the questionnaires to be used in the research.

For the 12 schools that agreed to participate in the research, parental explanatory statements and consent forms were distributed to students by their classroom teacher, and taken home to parents. Children who were given parental approval to participate were provided with a brief oral explanation of the study during school hours. They were then provided with a participant's explanatory statement and consent form. All of the students who were present during the oral explanation of the study agreed to participate, and anonymously completed the measures on a group basis during school hours. This took an average of 30 minutes. The sequence in which the measures were administered was counterbalanced across the groups to control for possible order effects.

Results

This section begins with an overview of data screening and cleaning, which aimed to ensure that the assumptions of multiple regression analyses were met. This is followed by the results of correlation analyses, which are presented to illustrate the strength of the associations between the predictor and outcome variables. A combination of standard multiple regression and hierarchical multiple regression analyses were subsequently conducted to investigate the predictive value of empathy and attachment for each of the outcome variables, in addition to determining the mediating role of empathy in these relationships.

Assumptions of Multiple Regression Analyses

Firstly, it was ensured that an adequate sample size ($n = 281$) was obtained for the purpose of conducting multiple regression analyses. With two independent variables, Tabachnick and Fidell (1996) recommend that a sample size greater than 66[1] is adequate to address the issue of generalizability.

At the conclusion of data collection, the data were screened for missing data. The data were then examined for the presence of univariate outliers, defined by Tabachnick and Fidell (1996) as cases that have a standardized residual of more than 3.30 or less than -3.30. Extreme values were identified via inspection of descriptive statistics, histograms, boxplots, and standardized residual plots. Univariate outliers were addressed by changing the scores on the variables for the outlying cases, so that the score remained deviant, but not as deviant as it had been previously. Outlying cases were assigned a raw score on the particular variable that was one unit larger (or smaller) than the next most extreme score for that variable. Such a technique is often viewed as an attractive alternative to reduce the impact of a univariate outlier, without requiring deletion of outlying cases (Tabachnick and Fidell 1996).

Similarly, the data were screened for multivariate outliers. The regression program in SPSS was used to calculate Mahalanobis Distances for each of the 281 cases. Given that the regression analyses made use of two independent variables, the critical chi-square value (at $\alpha = 0.001$) in this instance was 13.82. It was revealed that three cases had a Mahalanobis Distance in excess of this value (with values of 15.56, 16.71 and 18.88). However, given the size of the data set, it is not unusual for a few multivariate outliers to appear (Pallant 2001). Consequently, given the extremely low incidence of multivariate outliers within the data, these cases were not excluded from the analyses.

Following data cleaning, the data were assessed for normality. Distribution histograms revealed that the variables were slightly skewed. However, encouragingly, supporting the non-clinical nature of the population, the variables were skewed in the expected directions. For example, the variables measuring positive constructs (i.e., empathy, a positive attachment to

one's parents, prosocial behavior, and the humane treatment of animals) were negatively skewed, whilst the variable measuring a negative construct (namely animal cruelty) was positively skewed. Animal cruelty was significantly skewed as a result of the majority of participants scoring 0. This finding is congruent with the results reported by Dadds et al. (2004), who reported that the majority of participants report no instances of animal cruelty when nonclinical populations are sampled.

A moderate amount of variance was observed with respect to scores obtained on the humane treatment of animals' variable, whilst a high level of variance was observed across the animal cruelty and parental attachment variables. However, when working with sufficiently large sample sizes (e.g., $n \geq 30$), the violation of a normal distribution generally does not cause any major problems, as a sufficiently large sample counterbalances the impact of such violations of normality (Pallant 2001).

Finally, given the extreme sensitivity of multiple regression analyses with respect to mutlicollinearity and singularity, the relationship between the two independent variables was assessed. Whilst the correlation coefficient calculated to determine the strength of the association between empathy and attachment was significant and positive ($r = 0.17$, $p < 0.01$), as expected, this weak correlation was not suggestive of multicollinearity. Further, neither of these independent variables are a combination of other independent variables, thereby excluding the issue of singularity.

The assumptions of multiple regression analyses were re-checked via inspection of the statistical output provided by SPSS for each multiple regression analysis. In each instance, all assumptions were met. For example, perusal of normal probability plots revealed the points to lie in a reasonably straight diagonal line from bottom left to top right, thereby suggesting that there were no major deviations from normality. Providing further evidence that the assumptions were not violated were the scatterplots of the standardized residuals, as the residuals were shown to be roughly rectangularly distributed in all instances.

Correlation Coefficients between the Predictor and Outcome Variables to Investigate the Strength of Relationships

Prior to the multiple regression analyses being conducted, the results of Pearson's product-moment correlations were examined. The correlation coefficients, which illustrate the strength of the associations between the predictor and outcome variables, are shown in Table 1.

Table 1. Correlations between the predictor and outcome variables.

Outcome Variable	Empathy	Attachment
Prosocial Behavior	0.48***	0.25***
Humane Treatment	0.38***	0.12*
Animal Cruelty	-0.35***	-0.23***

Note: Correlations significant at: *$p < 0.05$, ***$p < 0.001$, two-tailed.

Table 1 shows that the predictor variables were significantly associated with the outcome variables in the expected directions. That is, empathy and (to a lesser degree) attachment were both significantly positively correlated with each of the prosocial behavior and the humane treatment variables, and significantly negatively correlated with the animal cruelty variable.

Similarly, Pearson's product-moment correlations between the outcome variables were calculated. The significant coefficients were in the expected directions. That is, prosocial

behavior and the humane treatment of animals were significantly positively correlated ($r = 0.27$, $p < 0.001$), whilst animal cruelty was significantly negatively correlated with each of prosocial behavior ($r = -0.25$, $p < 0.001$) and the humane treatment of animals ($r = -0.25$, $p < 0.001$).

Multiple Regression Analyses to Investigate the Relationships between the Predictor and Outcome Variables

To investigate whether empathy fully mediated relationships between attachment and the outcome variables, we determined that four necessary criteria were met: (a) attachment was significantly associated with empathy, (b) empathy was significantly associated with the outcome variable, (c) attachment was significantly associated with the outcome variable, and (d) attachment was not associated with the outcome variable after empathy was controlled. If only the first three criteria were fulfilled, empathy could be concluded to partly mediate the relationship between attachment and the outcome variable if attachment predicted a smaller proportion of variance once empathy was controlled. This partial mediating role of empathy could be shown to be significant at the 0.05 level, provided that the calculated z value[2] exceeded 1.96 (Baron and Kenny 1986).

Firstly, a series of standard multiple regression analyses was conducted in which attachment was entered as the predictor variable. These analyses aimed to determine whether attachment and empathy were significantly associated, and whether attachment was significantly associated with each of the outcome variables, as shown in Table 2.

Table 2. Standard multiple regression analyses between attachment (as the dependent variable) and empathy, prosocial behavior, humane treatment of animals, and animal cruelty.

Variable	R^2	Adj. R^2	F	SE	β	t	95% CI	
							Lower	Upper
Empathy	0.03	0.03	8.39**	0.02	0.17	2.90**	0.02	0.10
Prosocial Behavior	0.06	0.06	18.97***	0.01	0.25	4.36***	0.02	0.06
Humane Treatment	0.01	0.01	4.01*	0.03	0.12	2.00*	0.00	0.11
Animal Cruelty	0.05	0.05	14.90***	0.05	-0.23	-3.86***	-0.26	-0.08

Note: ANOVA and t-test outcomes noted as: *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$, two-tailed.

The findings shown in Table 2 are consistent with the results of the Pearson's product-moment correlations presented previously. Specifically, it can be seen that criterion (a) was satisfied, as attachment was significantly positively associated with empathy. Satisfying criterion (c), attachment was significantly associated with each of the outcome variables. That is, attachment was significantly positively associated with each of the prosocial behavior and humane treatment variables, and significantly negatively associated with animal cruelty.

Hierarchical multiple regression analyses were conducted to assess whether empathy was significantly associated with the outcome variables [criterion (b)], and whether attachment was no longer significantly associated (or significantly less associated) with the outcome variables, once empathy was controlled [criterion (d)]. This was achieved by entering empathy at the first step, and attachment at the second (see Table 3).

In the first analysis, the humane treatment of animals was entered as the outcome variable, and empathy (Step 1) and attachment (Step 2) as the predictor variables. The analyses indicated that empathy fully mediated the relationship between attachment and the

Table 3. Hierarchical multiple regression analyses, using attachment and empathy as predictors of prosocial behavior, humane treatment of animals, and animal cruelty.

Analyses	R^2	Adj. R^2	R^2 Change	F Change	SE	β	t	95% CI	
								Lower	Upper
Prosocial Behavior									
Step 1: Empathy	0.23	0.23	0.23	82.21***	0.03	0.45	8.52***	0.18	0.29
Step 2: Attachment	0.26	0.25	0.03	11.25**	0.01	0.18	3.35**	0.01	0.05
Humane Treatment									
Step 1: Empathy	0.14	0.14	0.14	46.94***	0.08	0.37	6.58***	0.37	0.69
Step 2: Attachment	0.15	0.14	0.00	0.99	0.03	0.06	0.99	-0.03	0.08
Animal Cruelty									
Step 1: Empathy	0.12	0.12	0.12	39.43***	0.13	-0.32	-5.76***	-0.99	-0.49
Step 2: Attachment	0.15	0.15	0.03	9.19**	0.04	-0.17	-3.03**	-0.21	-0.05

Note: Differences in R^2 and t-test outcomes noted as: **$p < 0.01$, *** $p < 0.001$, two-tailed.

humane treatment of animals. Specifically, empathy was significantly positively associated with the humane treatment of animals, explaining 14% of the variance in this outcome variable. The multiple R statistic was no longer significant when attachment was added, accounting for no (0%) unique variance in the humane treatment of animals once the effect of empathy was statistically controlled. Consistent with this latter finding, the unique contribution of attachment was non-significant (β = 0.06) when the overlapping effect of empathy was removed. Nonetheless, the combination of predictor variables predicted a total of 15% of variance in the outcome variable, an overall model that reached statistical significance ($F_{(2, 278)} = 23.96$, $p < 0.001$).

In the second analysis with prosocial behavior entered as the outcome variable, the unique contributions of each of empathy (β = 0.45) and attachment (β = 0.18) were statistically significant. Consistent with this finding, the multiple R statistic was statistically significant at both steps [thereby violating criterion (d)]. Empathy was significantly positively associated with prosocial behavior, accounting for 23% of the variance in this outcome variable. Attachment contributed a further 3% unique variance once empathy was controlled. The overall model explained 26% of the variance in prosocial behavior, and was statistically significant ($F_{(2, 278)} = 48.24$, $p < 0.001$). The calculated z score was also statistically significant ($z = 2.72$), providing evidence that empathy partially mediated the positive association between attachment and prosocial behavior.

Similarly, the unique contributions of each of empathy (β = -0.32) and attachment (β = -0.17) were statistically significant in the third regression analysis, with animal cruelty entered as the outcome variable. Consistent with these significant unique contributions, observation of the regression model revealed that the R^2 value changed significantly at the end of steps 1 and 2. Specifically, empathy was significantly negatively associated with animal cruelty, predicting 12% of the variance, while attachment contributed a further 3% unique variance once the effect of empathy was controlled. The overall model explained 15% of the variance in animal cruelty, and was statistically significant ($F_{(2, 278)} = 24.89$, $p < 0.001$). A significant z score ($z = -2.59$) confirmed that empathy partially mediated the negative association between attachment and animal cruelty.

Discussion

The current study aimed to investigate the associations between attachment and empathy, and both positive and negative human- and animal-directed outcome behaviors during adolescence. While strong support was provided in relation to the predictive power of each of the attachment and empathy variables, partial support for the hypothesized mediating role of empathy was provided by the current findings.

Our hypothesis that positive parental attachment would be significantly associated with high levels of empathy was supported by our overall results, which indicated that attachment was a significant predictor of empathy. This moderate positive association is congruent with previous research (e.g., Zahn-Waxler and Radke-Yarrow 1990; Carlson, Sampson and Sroufe 2003) which has detailed the significant role played by attachment in the development and maintenance of levels of empathy. More specifically, it has been proposed that children with a strong sense of trust and security derived from their relationship with their parents, are less pre-occupied with satisfying their own needs, and are more responsive to the feelings and needs of others, thereby promoting empathic reactions with the intention of regulating others' distress (Mussen and Eisenberg-Berg 1977; Collins and Feeney 2000; Mikulincer et al. 2001).

With respect to the hypothesized associations between the predictor and outcome variables, support was found for our prediction that there would be positive associations between empathy and positive parental attachments with each of prosocial behavior and the humane treatment of animals. We also found support for the proposal that empathy and attachment would both be negatively associated with animal cruelty.

Specifically, the regression analyses demonstrated that attachment and empathy were each significant predictors of the three outcome behaviors, explaining small to modest amounts of unique variance. Similarly, the combination of attachment and empathy explained a significant proportion of variance in prosocial behavior (26%), the humane treatment of animals (15%), and animal cruelty (15%). These findings are consistent with previous research (e.g., Mussen and Eisenberg-Berg 1977; Patterson, DeBaryshe and Ramsey 1989; Henry, Sager and Plunkett 1996; Vidović, Štetić and Bratko 1999; Finzi et al. 2001; Mikulincer et al. 2001; Duncan and Miller 2002) which has linked both attachment and empathy to the expression of both prosocial and antisocial behaviors.

In the present study, we found that the majority of variance in prosocial behavior, the humane treatment of animals, and animal cruelty was accounted for by empathy. Hence, empathy consistently served a stronger predictive role when compared with attachment. Furthermore, the findings reported by previous researchers (e.g., Bowlby 1988; Carlson and Sroufe 1995) have suggested that attachment relationships provide the foundation for the development of empathy, which in turn, affects the expression of relational behaviors. On the basis of these current and previous findings, we investigated the potential mediating role played by empathy in relationships between attachment and such behaviors.

The hypothesized mediating role of empathy was partially supported by our findings. Specifically, we found that empathy fully mediated the association between attachment and the humane treatment of animals, but only partially mediated the associations between attachment and each of prosocial behavior and animal cruelty.

Whilst no previous research has specifically investigated the associations between levels of attachment, empathy, and the humane treatment of animals, the finding that empathy fully mediated the relationship between attachment and the humane treatment of animals is somewhat congruent with those of researchers such as Vidović, Štetić and Bratko (1999). Whilst the

cause-and-effect nature of these associations was not established, the researchers found that forming a close bond with a companion animal was significantly associated with functional family relationships.

Given that the relationship between attachment and the humane treatment of animals was completely mediated by empathy in the current study, it can be suggested that the influence of parental attachment on adolescents' humane treatment of animals can be significantly attributed to the influence of attachment on empathy levels. Hence, given that secure parental attachment relationships appear to be predictive of high levels of empathy, one can argue that this increased tendency to be empathic and compassionate toward fellow beings, potentially modeled by the positive interactions such youths engage in with their parents, translates to an increased propensity to treat animals humanely.

Consistent with the abovementioned positive associations, empathy was found to partially mediate the relationship between attachment and prosocial behavior. This finding is congruent with the findings of previous empirical work (e.g., Carlson and Sroufe 1995; Finzi et al. 2001; Mikulincer et al. 2001) which has shown that the presence of a secure parental attachment is conducive to the development and maintenance of high levels of empathy and attributes, including an increased propensity to respond prosocially when another is in need. Hence, in addition to increasing levels of empathy, which in turn, translate to an increased propensity to engage in prosocial behaviors, the presence of a secure bond with one's parents appears to directly translate to an increased ability to respond to fellow humans in an altruistic manner.

On the other end of the spectrum, empathy partially mediated the relationship between attachment and animal cruelty. This finding suggests that in addition to influencing levels of empathy (which in turn, largely predicted levels of animal cruelty), attachment also directly predicted the expression of this outcome variable. This finding is congruent with proposals made by a number of researchers (e.g., Bowlby 1988; Duncan and Miller 2002; Carlson, Sampson and Sroufe 2003) who have argued that poor attachment relationships not only distort the normal development of empathy in youths, but may also increase the likelihood that aggressive externalizing behaviors such as animal cruelty will emerge.

Limitations and Suggestions for Future Research

Several substantial limitations of the current study require mention. Firstly, given the sensitive nature of the variables measured, it is highly likely that some adolescents' responses were biased by social desirability responding. Hence, the use of a lie scale could have been of considerable value.

The main limitation relates to the low level of parental consent, which is likely to have affected the representativeness of the findings. It may be that the sample was under-representative of more dysfunctional/violent families. For example, some parents may have denied their child's participation, due to an awareness of family conflict or the occurrence of animal cruelty. However, the ranges of scores reported with respect to both measures of animal-directed behaviors were comparable to those reported by the researchers who originally provided validity data for the CTAQ (Thompson and Gullone 2003) and the CAI (Dadds et al. 2004). Hence, the participants in the current sample appear to be representative of *nonclinical* youth populations. Nonetheless, replicating this study using a larger (and potentially more representative) sample is highly recommended.

Furthermore, future longitudinal studies following youths from childhood and throughout the adolescent period would not only address issues relating to limitations with respect to

predicting causality, but would further contribute to linking animal- and human-directed behaviors and interactions during this crucial phase. Data derived from such investigations will not only assist in furthering our understanding of both the development of and expression of human- and animal-directed behaviors and interactions, but will also assist researchers in developing interventions aimed at preventing the expression of antisocial (and potentially violent) outcomes.

Conclusions and Clinical Implications

Despite the abovementioned limitations, the current study has addressed important gaps in the existing literature. It is the first empirical study to concurrently investigate the associations among both positive and negative human- and animal-directed behaviors and the well-researched variables attachment and empathy. Importantly, the study findings are strengthened by the method used (i.e., concurrent self-report as opposed to retrospective and third-party reports). Moreover, given that adolescence has been identified as a high-risk period for engaging in violent antisocial behaviors including animal cruelty, the associations reported here are of significance in guiding prevention and intervention initiatives.

Overall, the current findings reinforce previous studies which have demonstrated that attachment and empathy each play significant roles in predicting the expression of both prosocial and antisocial outcome behaviors (Mussen and Eisenberg-Berg 1977; Mikulincer et al. 2001). Furthermore, the current findings have significantly contributed to existing knowledge by elucidating the role played by empathy in associations between attachment and the measured outcome behaviors. Specifically, we found that it is, at least partially, through empathy that attachment to parents predicts prosocial and antisocial behaviors during adolescence. This is in contrast to the direction of relationships implied by previous findings and proposals proposed by some researchers (e.g., Vidović, Štetić and Bratko 1999), who postulated, for example, that treating animals humanely fosters the normal development of empathy.

Notes

1. $n > 50 + 8m$, where m = the number of independent variables.
2. $z = B1 \times B2$ / square root of $(B12 \times S22 + B22 \times S12)$; where $B1$ represents the unstandardized B value associated with attachment when criteria (a) was assessed; $S1$ represents the SE associated with attachment when criteria (a) was assessed; $B2$ represents the unstandardized B value associated with empathy when criteria (b) was assessed; and $S2$ represents the SE associated with empathy when criteria (b) was assessed.

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