Associations Among Cruelty to Animals, Family Conflict, and Psychopathic Traits in Childhood

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Previous research has produced mixed findings on the role of child and family factors in the genesis of childhood cruelty. The authors examined the relationships of cruelty to animals to a range of child and family factors. First, the authors test the idea that cruelty is a callous aggression that will be more strongly associated with psychopathic (callous or unemotional, CU) traits than general externalizing problems. Second, the authors operationalize family problems as open conflict rather than parenting problems as used earlier. Results indicated that for both genders, CU traits were associated strongly with cruelty. For boys, externalizing problems also added prediction in regression analyses. Family conflict was not associated with cruelty for either. These results suggest that cruelty to animals may be an early manifestation of the subgroup of children developing conduct problems associated with traits of low empathy and callous disregard rather than the more common pathway of externalizing problems and parenting problems.

Keywords: *child; aggression; cruelty; animals; psychopathy; family; violence*

Few single childhood behaviors carry with them the ominous and pernicious associations that childhood cruelty to animals (CCA) has acquired in popular psychology. The relationship of CCA to violent behavior in adult-

hood has been the focus of a significant body of forensic literature, and recent editions of the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM*; American Psychiatric Association, 1994, 2000) have recognized CCA in the criteria for conduct disorder. However, despite much interest in CCA as a risk factor for later violence, little research into its early manifestations has been undertaken, and little is known about the relationship of CCA to the various antisocial pathways articulated in recent developmental literature.

A wealth of research within forensic settings has demonstrated disproportionately high rates of CCA in the histories of violent adult offenders (see Dadds, Turner, & McAloon, 2002, for a review). On the positive side, CCA is typically measured in forensic research via intensive qualitative interviews, and interpersonal outcomes are usually at the severe end, such as murder, interpersonal violence, and sexual offending. Here the wealth of evidence suggests that CCA is an early marker of a propensity for violence (see Arluke, Levin, Luke, & Ascione, 1999; Dadds et al., 2002; Felthous & Kellert, 1987; C. Miller, 2001). On the negative side, most of these studies are cross-sectional or retrospective, and longitudinal studies that show CCA is a unique antecedent to violence have not been conducted.

In contrast, the scant research into CCA in the mental health sciences typically relies on a one-item measure of CCA from a behavior checklist, or as a one-off symptom derived from a diagnostic interview, and examines it against criteria of diagnostic outcomes. For example, Loeber, Keenan, Lahey, Green, and Thomas (1993) found that a variety of early symptoms discriminated severity and chronicity of conduct problems. CCA discriminated between milder and more severe forms of conduct problems but was not unique in this regard. As exemplified by Loeber et al. (1993), clinical research has been careful to evaluate CCA against the backdrop of a range of behavior problems that the person may exhibit. This approach has not supported the idea that CCA has unique predictive power. On the negative side, the measures used clinically may not operationalize CCA according to its most pernicious features (e.g., intentionality, motives, secrecy). Furthermore, *DSM* diagnostic criteria may be too blunt a tool to allow the potential power of CCA to be detected. That is, the forensic literature indicates CCA may be associated with severe acts of predatory violence; *DSM* diagnoses such as conduct disorder are far broader than this and cover a range of antisocial behavior of which severe violence is only a small part.

Despite this, there is some clinical research that hints at the importance of CCA. Frick et al.'s (1993) meta-analysis of 60 studies, albeit using the Child Behavior Checklist one item, found that cruelty to animals was one of a small number of symptoms useful in discriminating between children with severe

conduct problems (destructive subtype) and mild conduct problems (non-destructive subtype). Luk, Staiger, Wong, and Mathai (1999) used the one item of the Child Behavior Checklist (Achenbach, 1991) to measure CCA and found that, in a sample of clinic-referred conduct problem children, those described as cruel to animals by their parents differed from those not so described on a number of variables. The CCA children showed a more severe pattern of conduct problems and had higher self-esteem than did those in the non-CCA group. They did not differ on impulsivity, internalizing symptoms, or family problems. Luk et al. (1999) concluded that CCA may be associated with a psychopathic subtype of conduct disorder marked by more severe behavior problems but high self-esteem and callous disregard for others.

Notwithstanding these suggestive findings, it is clear that research may benefit from measures that capture the complex and often secretive nature of cruelty. Very recently, researchers have built on Ascione, Thompson, and Black's (1997) dimensional model of CCA (including frequency, recency, type of animals, context, regret), and a theoretically driven measure that is brief and reliable using either child or parent report has recently appeared (the Cruelty to Animals Inventory; Dadds, Whiting, Bunn, Fraser, & Charlson, 2004; Guymer, Mellor, Luk, & Pearse, 2001). Dadds et al. (2004) showed that the Cruelty to Animals Inventory has excellent reliability and validity, including convergence with independent observations of children's cruel versus nurturant behavior when in free play with companion animals. The development of this measure has potential for more precisely testing the relationship of CCA to broader aspects of developmental psychopathology, in particular the idea that there may be different and measurable pathways to violent behavior. In this study, we conduct the first test of CCA associations with two putative pathways to violent behavior: the common pathway associated with general externalizing behavior problems and coercive parenting and the trait or psychopathy pathway held to be driven by aspects of the child's temperament that are problematic for the development of empathy and conscience, the putative temperamental aspect of psychopathy.

A common model of chronic antisocial behavior emphasizes early escalating externalizing behavior in the context of disrupted, conflicted family relationships and poor parenting. In terms of externalizing behavior, there is no doubt that rates of CCA are higher in clinic-referred externalizing children; however, the concordance is only moderate. For example, 28% of conduct disordered children showed CCA compared to approximately 3% in a comparison group (Luk et al., 1999). Similar or higher percentages are found in adjudicated forensic samples (e.g., Felthous & Kellert, 1987; K. S. Miller & Knutson, 1997). Clearly, CCA does not characterize the histories of all people with aggressive, antisocial behavior.

Similarly, evidence for a relationship between CCA and parenting and family problems is mixed and grows substantially weaker as improved designs are used. Correlations can be found between self-reported CCA and a history of severe parental punishment in college students (Flynn, 1999). Descriptive studies consistently document that domestic violence and physical abuse are frequent among participants with animal cruelty histories (e.g., Gelles & Straus, 1988; Kellert & Felthous, 1985). Severe cruelty to animals is consistently found in families receiving services for domestic violence (Boat, 1995; Deviney, Dickert, & Lockwood, 1983). However, K. S. Miller and Knutson's (1997) study of a large sample of adjudicated adult offenders found no relationship between CCA and adverse family experiences, although their study is unusual in combining both observed and perpetrated CCA. Similarly, the small number of studies using more experimental designs and community or child clinical samples have not supported this relationship. The Luk et al. (1999) study using parent reports failed to find convincing differences on family functioning between CCA and non-CCA conduct problem children. Dadds et al. (2004) assessed child behavioral disturbance and parenting style in a sample of 1,333 children aged 3 to 9 years. The hypothesis that parenting style would be predictive of child cruelty was not supported, with the relationship between positive and negative parenting and CCA disappearing once the level of behavioral disturbance in the child was controlled. Thus, the relationship of parenting and family conflict to CCA in children remains unclear.

An alternative to the externalizing behavior or poor parenting pathway to antisocial behavior emphasizes temperamental factors in the child associated with disruptions to development of empathy and conscience. Children who possess highly emotional or arousable temperaments are thought to be more susceptible to the emotions of others and discomfort triggered by transgressions from behavioral standards. Therefore, these children respond to lower levels of punishment and learn to avoid particular behaviors quickly, including negative emotions in others (Dadds & Salmon, 2003; Hare & Schalling, 1978). However, for children possessing a temperament that is less sensitive to others' emotions and punishment and more prone to impulsive thrill seeking and anger, discipline-related socialization may be less effective (Kochanska, 1993), and the child may fail to learn appropriate inhibitory control and concern for others.

The paired notions of lack of inhibitory control (impulsivity) and lack of empathic or emotional arousal (callous or unemotional traits, CU) are synonymous with the traditional two-factor conceptualization of psychopathy in adults (e.g., Hare, Hart, & Harpur, 1991) and more recently in children and adolescents (Frick & Ellis, 1999). As shown in adult data, high scores on the

CU factor are associated with more severe and proactive aggression, less responsiveness to cues of punishment, disrupted processing of emotional cues, a reward-dominant style, and less anxiety. These factors are thought to impede the development of conscience (Barry et al., 2000; Blair, Colledge, Murray, & Mitchell, 2001; Christian, Frick, Hill, Tyler, & Frazer, 1997; Lynam, 1997; O'Brien & Frick, 1996). Further, there is tentative evidence to suggest that conduct problems in high CU children are less likely to have been directly influenced by a family background characterized by poor parenting practices and low socioeconomic status (SES; Christian et al., 1997).

In summary, a number of authors have suggested that there may be multiple developmental pathways to violent and antisocial behavior. In this article, we test the idea that CCA may be a marker of early manifestation of the early psychopathy pathway described above. We aimed to investigate the relationship between cruelty and CU personality traits. It has been shown that children are more likely to develop both conduct problems and cruelty to animals in abusive or high conflict family environments. However, a divergent etiology in the development of conduct problems, whereby some children develop conduct disorder primarily because of high CU traits, regardless of the family environment, is possible (Christian et al., 1997; Frick, O'Brien, Wootton, & McBurnett, 1994; Lynam, 1997; Wootton, Frick, Shelton, & Silverthorn, 1997). This suggests there may be divergent or interacting pathways in the development of abusive behavior toward animals whereby children are differentially influenced by conflictive or abusive family systems, on the one hand, and temperamental CU traits on the other. This investigation aimed to explore CCA by investigating competing correlates of children's cruelty to animals: the family environment, children's externalizing behavior, and CU traits. The externalizing behavior or poor family stress or parenting model would predict that high levels of family conflict and the child's externalizing behavior would contribute to the child's cruelty to animals regardless of the child's temperament. On the contrary, the early psychopathy model would predict that relationships of externalizing and family or parenting to CCA would reduce to zero once measures of the CU traits in the child were entered into the equation.

Method

Participants

Participants were 131 children aged 6 to 13 years and their parents, recruited from five independent schools within southeast Queensland, Australia. The participant pool included 67 males and 64 females (age males *M* =

10.0, $SD = 2.2$; age females $M = 10.1$, $SD = 1.1$). The five schools were from several different locations including rural, coastal, and suburban areas (approximately 33% each). All schools were located in or around Brisbane, a city with a population of 1.3 million that contains a mix of European, Asian, and Indigenous cultural backgrounds but is predominantly Caucasian. Of the child participants in this study, 44.8% had one sibling, and 27.6% had two siblings (number of siblings $M = 1.51$). A total of 81.8% of the parents were married or de facto, and 15.1% were single parents. The average number of pets owned by the families was 2.02, with 73.6% of families owning four or fewer pets. Not all families had a pet currently in the home, but all had some contact with companion animals. Of the fathers, 31.8% had completed tertiary study, 24.5% had completed college or obtained a trade certificate, 15.2% had completed high school, and 26.4% had completed grade 10. For the mothers, 34.2% had completed tertiary study, 24.2% had attended college or trade school, 15.2% had finished high school, and 26.1% had completed grade 10. Therefore, parents in this study were generally educated, middle class, and Caucasian and had above average SES.

Measures

The test battery comprised an information and consent sheet, the experimental measures, a return envelope, and a raffle ticket to enter a drawing for a prize. The completed questionnaires were returned in the postage-paid envelope, with return rates ranging from 30.5% to 79.2% across schools. The return rate was not associated with level of CCA, childhood adjustment problems, or family conflict reported across schools.

The Children and Animals Inventory (CAI; Dadds et al., 2004) includes parent and child self-report forms based on the Children and Animals Assessment Instrument (CAAI; Ascione et al., 1997), a semistructured interview for children. Nine theory-driven dimensions of cruelty are assessed as follows: severity (based on degree of intentional pain and injury caused to an animal), frequency (the number of separate acts of cruelty), duration (period of time during which the cruel acts occurred), recency (the most recent acts), diversity across and within categories (number of animals abused from different categories and the number of animals harmed from any one category), sentience (level of concern for the abused animal),[1] covertness (child's attempts to conceal the behavior), isolation (whether the cruelty occurred alone or with other children or adults), and empathy (the degree of the child's remorse for the cruel acts). Items are worded to exclude accidental cruelty by using words such as *on purpose* or *deliberate*. Each item offers a negative response, such as, "I have never hurt an animal," to allow a total score of 0 for

children who reported never having displayed intentional cruelty to animals. In addition to the nine Likert-type items (two items assessed frequency), a free-response question (item 10) asks the reporter to describe an incident or pattern of cruelty that can be used qualitatively. Responses to this item are scored from 0 to 3 according to a specified coding system to obtain a score for severity. Total possible scores for the CAI range from 0 (no instances of animal cruelty) to 39 (severe, chronic, and recent cruelty to a range of animals with the child showing no empathy). It should be noted however that the distribution of CAI scores is inherently skewed in nonclinic samples, with the majority of participants scoring 0.

Internal consistency of the CAI is greater than .9 for both child and parent versions, and test-retest is in the range of $r = .75$ to .80. Convergence for parent and child reports has been in the range of .3 to .6, with greater agreement for females and younger children. Finally, the CAI reliably predicts actual independent observed levels of nurturing versus cruel behavior in boys playing with a companion animal (Dadds et al., 2004).

Children's externalizing behavior was measured using the Child Behavior Checklist–Revised–Parent Form (Achenbach, 1991). Only the 33-item externalizing scale was used. Each item in this checklist is composed of a statement regarding the child and a range of answers of 0 (*not true*), 1 (*somewhat or sometimes true*), or 2 (*very true*). The Child Behavior Checklist–Revised is widely used and has reliability, validity, and extensive normative data for both normal and clinical populations (Achenbach, 1991).

The Antisocial Process Screening Device (APSD; Frick & Hare, 2001) was used to assess for the presence of CU traits. This is a 20-item behavior rating scale that was completed by the child's primary caregiver. Each item is scored either 0 (*not al all true*), 1 (*sometimes true*), or 2 (*definitely true*). Frick et al. (1994) found that the APSD contained two factors: a 6-item CU factor and a 10-item impulsivity or conduct problems factor. Recent findings have cast some doubt on the stability of the impulsivity or conduct problems when used in community samples (Frick, Bodin, & Barry, 2000). However, in both clinic and community samples, the CU factor remains separate from the impulsivity or conduct problems and narcissism factors, is only weakly associated with conduct problems in general, and represents the unique characteristic of psychopathy. This structure has recently been confirmed in a large Australian sample (Dadds, Frost, Fraser, & Hawes, 2005). Thus, only the 6-item CU factor was used for this study to identify children with a CU personality style. Both internal consistency and stability of this subscale are adequate in this age group. Alpha reliability coefficient for the CU scale in this sample was .70.

Table 1
Distribution of Children and Animals Inventory (CAI) Scores
for Parent and Child Reports

CAI Score	Parent Report		Child Report	
	Males %	Females %	Males %	Females %
0	70.1	75.0	47.8	62.5
1-10	15.0	9.4	22.5	20.4
11-20	15.0	15.6	19.5	17.3
21-30	—	—	9.0	—
31-35	—	—	1.5	—

The conflict subscale of the Family Environment Scale (Moos & Moos, 1981) was used to measure family conflict. This nine-item subscale measures the amount of openly expressed anger, aggression, and conflict among family members. Items are answered *true* or *false*, and the score is added. The conflict subscale has strong internal consistency (Cronbach's $\alpha = .75$), 2-month test-retest reliability (.85), and 12-month test-retest reliability (.76; Moos & Moos, 1981).

Results

The distribution of CAI scores on both the parent and child report forms of the CAI are presented for each gender in Table 1. It can be seen that children self-reported higher levels of cruelty than indicated by the reports of their parents, and as expected, males had higher rates of cruelty than did females, and the majority of participants scored 0 on both the parent and child forms of the measure. Both these findings are consistent with our use of the CAI in larger normative samples (Dadds et al., 2004). For each gender, two regressions were conducted. In the first, the dependent variable was the parent reports of cruelty to animals (CAI parent total score), and in the second, child report was used. Although a composite of the two scores would be advantageous in reducing the total number of analyses conducted, we chose to use them separately. Combining scores assigns the unique variance contained in each measure to error (Keiley, Lofthouse, Bates, Dodge, & Petit, 2003). Unique variance may be especially important for a low-rate secretive behavior such as cruelty, and previous studies have shown that parent reports may underestimate secretive cruelty (Dadds et al., 2004). Predictors were added in the following order: block 1—number of pets and child age; block 2—family variables including father's education, mother's education, and

conflict; block 3—externalizing behavior and CU traits; block 4—CU Traits × Externalizing Behavior. It is important to note that cruelty occurs at a low rate in community samples, with only 30.6% of participants scoring greater than 0 on the CAI (i.e., reporting any cruel behavior). Such a skewed distribution presents a number of options for analysis, each with advantages and limitations. Although a linear regression is capable of explaining the full range of CAI scores observed, such an analysis assumes normality of distribution and may therefore be biased in this application. An alternative would be to reduce the continuous scores on the CAI to a categorical variable and conduct a logistic regression. For a logistic regression, participants would be coded as cruel (scoring 1 or greater) or not cruel (scoring 0), with the analysis used to determine the predictive effects of the independent variables on children falling into either of these categories. However, although this method would be more statistically sound, it would limit prediction to the same kind of data produced by single-item measures of cruelty (e.g., the respective item on the Child Behavior Checklist). It was decided that the inclusion of both analyses would therefore provide the best representation of the data.

Results from the linear regression in which CAI scores were treated as a continuous variable are presented in Table 2. For parent report of males on the CAI, neither block 1 (age or number or pets) nor block 2 (parent education, family conflict) resulted in a significant increase in prediction of cruelty. The addition of block 3 led to a significant increase in prediction to 25.3% of variance in CAI scores, whereas the interaction in block 4 explained no additional variance. In the final equation, 25.3% of the variance had therefore been explained, $F(8, 58) = 2.45, p < .05$. Significant predictors, once all had been entered, were mother's education and externalizing behavior, such that boys exhibiting higher levels of externalizing behavior, and whose mothers had lower levels of education, were more likely to be reported as cruel by their parents.

For the females, using parent reports, block 1 resulted in no significant prediction of cruelty. The addition of blocks 2 and 3 however, resulted in significant increases in prediction to 18.6% and 38.6% of the variance, respectively. Block 4 failed to add any significant prediction, with a total of 38.9% of the variance explained in the final equation, $F(8, 55) = 4.38, p < .01$. Significant predictors, once all had been entered, were age, father's education, and CU traits, such that girls exhibiting higher levels of CU traits, whose fathers had lower levels of education, were more likely to be reported as cruel by their parents.

Using child scores on the CAI for males, the addition of each of the 4 blocks added significantly to the prediction of cruelty. Block 1 explained 16.1% of the variance, followed by an increase to 26.4% with the addition of

Table 2
Linear Regression Analysis Summary for
Prediction of Child Cruelty as Reported by Parents and Children

|	CAI Child Report			CAI Parent Report		
	R^2	r	β	R^2	r	β
Males						
Age	.16**	.32	.24*	.04	−.20	−.18
No. of pets		.28	.27*		−.02	−.01
Father education	.26*	.15	—	.14	−.08	.04
Mother education		−.34	−.33**		−.29	−.30*
Family conflict		.16	−.04		−.02	−.06
Externalizing behavior (EB)	.37*	.30	−.06	.25*	.34	.37*
Callous or unemotional (CU) traits		.12	—		−.05	−.12
CU Traits × EB	.47**	.41	.54**	.25	.16	−.03
Females						
Age	—	−.06	−.15	.04	−.14	−.28*
No. of pets		—	−.04		−.13	−.14
Father education	.06	.08	.14	.18*	.19	.27*
Mother education		.01	.09		−.15	−.10
Family conflict		.20	.09		.18	−.00
EB	.17	.17	.04	.38**	.36	.17
CU traits		.33	.50**		.43	.51**
CU Traits × EB	.18	.15	−.19	.38	.33	−.08

Note: CAI is the Children and Animals Inventory. Beta weights shown are those once all variables have been entered.
*$p < .05$. **$p < .01$.

block 2 and increases to 37.1% and 47.4% for blocks 3 and 4, respectively. In the final equation, 47.5% of the total variance for cruelty had therefore been explained, $F(8, 58) = 6.53$, $p < .01$. Significant predictors, once all had been entered, were mother's education and the interaction between CU traits and externalizing behavior, with lower levels of maternal education and an escalating CU-externalizing interaction associated with higher levels of CCA. This interaction is presented in Figure 1. Female child reports of cruelty were not predicted by either block 1 or 2; however, block 3 was significant in predicting an extra 11.2% of variance in cruelty. Block 4 failed to add any significant prediction. The only significant predictor shown, once all predictors had been entered, was CU traits, with girls exhibiting higher levels of CU traits more likely to report cruelty.

Results of the logistic regressions conducted using the same sets of variables are presented in Table 3. For the males, using parent scores on the CAI, block 1 resulted in no significant prediction for age or number of pets. The

Figure 1
Interaction Between Callous or Unemotional Traits and Externalizing
Scores on the Cruelty to Animals Inventory for Male Self-Report
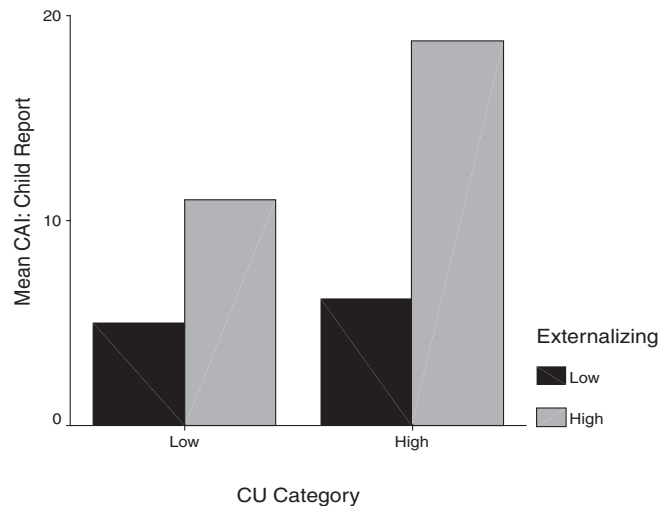
addition of block 2 variables resulted in no improvement in prediction, but mother's education level ($p < .01$) was individually significant in predicting whether a male child was cruel or not cruel. The addition of block 3 variables resulted in a significant equation, $\chi^2(3) = 14.51$, $p < .001$, with 89.4% and 60.0% of participants classified correctly into *not cruel* and *cruel* groups, respectively. Individual variables that were significant in predicting cruelty were age ($p < .05$), mother's education ($p < .05$), externalizing behavior ($p < .01$), and CU traits ($p < .05$). Thus, using parent reports of cruelty, older males with low-educated mothers, high externalizing behavior, and high CU traits were more likely to be cruel to animals. The interaction term in block 4 added no improvement in prediction of cruelty. For the females, using parent reports, both blocks 1 and 2 resulted in no significant prediction of cruelty, although age ($p < .05$) and mother's education ($p < .05$) were significant predictors. Block 3 was significant, $\chi^2(2) = 21.16$, $p < .001$, accurately categorizing 89.8% of children as not cruel and 73.3% as cruel. Significant individual variables were age ($p < .01$), number of pets ($p < .01$), and CU traits ($p < .01$). Based on parent reports, these results suggest that older females with low-educated mothers, high numbers of pets, and high CU traits are more likely to be cruel. No improvement in prediction was seen following the addition of block 4.

Table 3
Logistic Regression Analysis Summary for Prediction of Child
Cruelty as Reported by Parents and Children

	CAI Child Report			CAI Parent Report		
	% Correct	% Correct		% Correct	% Correct	
	Not Cruel	Cruel	Wald (z)*	Not Cruel	Cruel	Wald (z)*
Males						
Age	40.6	65.7	0.11	100.0	—	4.55*
No. of pets			2.94			2.81
Father education	62.5	51.4	0.07	87.2	30.0	0.82
Mother education			0.81			5.62*
Family conflict			0.13			0.02
Externalizing behavior (EB)	65.6	74.3	2.20	89.4	60.0	8.06*
Callous or unemotional (CU) traits			5.57*			3.79
CU Traits × EB	68.8	74.3	—	91.5	55.0	—
Females						
Age	100.0	—	2.09	95.8	18.8	7.69*
No. of pets			0.36			5.28*
Father education	92.5	16.7	0.25	89.6	12.5	0.06
Mother education			0.66			1.11
Family conflict			0.32			1.01
EB	92.5	54.2	0.20	93.8	68.8	1.78
CU traits			8.85*			8.61*
CU Traits × EB	90	62.5	—	93.8	68.8	—

Note: CAI is the Children and Animals Inventory. Wald (z) weights shown are those once all variables have been entered at the last significant block.
*$p < .05$. **$p < .01$.

Using child scores on the CAI for males, neither block 1 nor block 2 provided significant prediction of children's cruelty. However, block 3 produced a significant equation, $\chi^2(2) = 9.97, p < .01$, accurately categorizing 65.6% of males as not cruel and 74.3% as cruel. The only significant predictive variable was CU traits ($p < .05$), indicating that, using child reports of cruelty, males with high CU traits were more likely to be cruel than were those males low on CU traits. Block 4 added no improvement in the prediction of cruelty. Female child reports of cruelty were not predicted by either block 1 or block 2, but block 3 was significant in predicting cruelty, $\chi^2(2) = 16.48, p < .001$, accurately classifying 90% of children who were not cruel and 56.5% of children who were cruel. The only significant variable was CU traits ($p < .05$), indicating that CU traits are significant in designating cruel from not cruel

females when using child reports. Finally, the interaction term in block 4 added no improvement in prediction of cruelty.

There is a possibility that the relationships found between CU traits and cruelty to animals in the above regressions are inflated because of the CAI containing items measuring concern and level of empathy for mistreated animals. To check that CU traits were indeed associated with cruel behavior and not just empathic feelings, CAI scores for both parents and children were recalculated with the sentience and empathy items omitted, and the regressions were run again. No differences in results were found; in fact, there was a tendency for the associations between CU and cruelty to strengthen.

Discussion

This study examined CCA as a correlate of alternative developmental pathways to antisocial behavior. The first of these describes antisocial behavior resulting from a combination of externalizing problems in the child and abusive or high conflict family environments. The second, early psychopathy pathway, implicates CU personality traits as a key etiological factor in the development of antisocial behavior. The results of the current study clearly show that cruelty to animals is a consistent correlate of the latter model, in which the temperamental characteristics of a child are associated with their cruel behavior. Evidence that family problems are associated with cruelty was not found to be impressive. Generally, these results support a model of cruelty associated with child characteristics placing the child at risk for failing to learn adequate empathic, conscience-driven behavior. Consistent with previous attempts to delineate specific pathways by gender, the associations were different for males and females. General externalizing problems were associated with cruelty for males only.

Moderate support was found for a relationship between parent education (examined as an indicator of SES) and cruelty. Low education in parents was significantly associated with cruelty to animals in both males and females when the full range of variance was examined in a linear regression. By contrast, family conflict did not appear to contribute to the cruelty reported for males or females. This is surprising given the extensive literature on the relationship of family dysfunction and violence and cruelty to animals in children. However, it is consistent with previous studies specifically designed to address this relationship (Dadds et al., 2004; Luk et al., 1999; K. S. Miller & Knutson, 1997).

There may be important reasons for this inconsistency. First, previous studies finding a positive relationship are limited to clinical samples where

extremes of child disturbance and/or family violence are the rule. In community samples such as these, population variance in both the predictor variables and cruelty levels are greater. If a significant relationship between family dysfunction and cruelty exists only at extremes, it may not be picked up in a community sample. Although their use of a measure of CCA that combined perpetrated and observed CCA is unusual, it should be noted that K. S. Miller and Knutson (1997) used an incarcerated violent sample and also failed to find a relationship. Second, the conflict subscale of the Family Environment Scale may not measure the critical aspects of family dysfunction that predict cruelty. Further research may benefit from expanding measurement of family variables, especially to include measures that tap more extremes of violence. However, it should be noted that the negative findings found here for family conflict support the results of earlier research by Dadds et al. (2004). This study found that measures of parenting behaviors that have previously been shown to predict aggressive behavior (monitoring, positive parenting, inconsistent and extreme punishment; Dadds, 1995) also failed to show unique associations with CCA.

Notwithstanding the methodological issues, it appears that family conflict (and parenting problems) are associated with general behavior problems but have no unique relationship to specific acts of cruelty. The research reviewed earlier showing relationships between family problems and cruelty typically utilized clinical and forensic samples in which the predominant problems were antisocial and aggressive behavior. It is possible that the relationship between family conflict and cruelty is really just a side effect of the (well-established) relationship of family conflict to general antisocial and aggressive behavior in these samples. Cruelty, although overlapping with antisocial and aggressive behavior problems, may have distinct developmental pathways. This is supported by the significant results obtained for the child variables as predictors.

Analyses of how cruelty is associated with different patterns of child and family functioning showed important differences according to the source of information and the gender of the child. For males, parent reports showed that cruelty was consistently associated with high externalizing problems and low parental education. However, for child reports, CU traits featured as the main correlate, as a main effect according to the logistic regression and in interaction with externalizing problems for the linear analysis. This is consistent with the early psychopathy model where CU traits and externalizing behavior are believed to interact and magnify each other in the development of antisocial behavior (e.g., Frick & Ellis, 1999). These differences between findings resulting from child and parent reports reinforce the importance of

considering informants separately. It is likely that the self-reports of children contain unique information about any secretive activities, which will by definition be missing from parent reports. The performing of aggressive acts in a manner that allows for concealment indicates a strong degree of behavioral control, unlike that associated with the impulsive and/or emotional outbursts characterizing typical externalizing behavior. Such secretive aggression toward animals can be seen as consistent with the construct of CU traits that emphasize a cold, dispassionate style with behavior driven by purposeful sensation seeking.

For females, CU traits were associated with cruelty according to both parent and child reports and were operated as a main effect. That is, in contrast to males, externalizing problems did not feature in the cruelty. This may have important implications for developmental models of antisocial behavior in females. Recent research has shown that antisocial behavior in females may not typically emerge until the adolescent years (Silverthorn & Frick, 1999). Its emergence at this time shows a clear relationship to factors such as family conflict and adversity; however, it is difficult to find relationships of family environment factors to conduct problems earlier in the developmental trajectory for females. Alternatively, the relationship of cruelty to CU traits may mark a pattern of problems that are prognostic in females. This is the third study to report that CU traits are more likely to operate as a main effect in characterizing the development of problems in young females (see also Dadds et al., 2005; Frick et al., 2003). That is, they do not operate in interaction with general levels of externalizing problems to predict outcomes early in female trajectories. Such findings are contrasted with the preliminary evidence for the early psychopathy model in which CU traits are associated with the growth of antisocial behavior only in boys with concurrent externalizing behavior (Dadds et al., 2005; Frick et al., 2003). Problems of autonomy and control that emerge for the first time in females in adolescence may occur more strongly for high CU females who are less influenced by parental control and discipline. These may become manifest as both antisocial behavior and family conflict in the teenage years. Notwithstanding these speculations, it is clear that CU traits appear to be solid bases for early cruelty in females.

It should be noted that this study relied on self- and parent-report data. Previous work has shown that the CAI does converge with independent observations of child cruelty and nurturance; however, an improved methodology would incorporate some behavioral validation of the constructs under scrutiny and the collection of collateral data such as teacher report of child externalizing behavior and CU traits. In addition, the middle-class nature of the sample should be noted in terms of generalizability of the results. The

findings would benefit by some replication in a larger and more diverse sample of children and their parents. Further, our measure of family conflict may not have adequately measured the construct of dysfunction and violence as hypothesized, and further research may benefit from improving the specificity and coverage of this measurement. Finally, because of the skewed distribution observed in CAI scores, two alternative forms of regression analyses were conducted. The decision was made to perform both in an attempt to best address the theoretical or statistical limitations associated with each respective method. Although both analyses produced consistent results, little is known about the relationship between specific levels of cruelty and various developmental outcomes such as later antisocial behavior. The continuation of such research using larger samples could therefore allow for the identification of cutoff points that are meaningful in relation to such outcomes.

The associations between CU personality traits and cruelty to animals and other aggressive behaviors warrant further research attention. Psychopathy is a putative construct consisting of both behavioral and trait factors. The trait component is difficult to measure objectively. Cruelty to animals may be an important behavioral manifestation of this trait, thus allowing for more accurate identification of early signs of risk for psychopathy in children. Cruelty can also be studied more experimentally through laboratory work and intervention studies that focus on reducing it. Future research could expand on the humane education program run in schools by Ascione and Weber (1996) that has shown generalized improvements in children's empathy as a result of training in animal relationships. The potential of these programs for children with generalized behavior problems is unknown but warrants attention.

In summary, the current study has shown that cruelty to animals in children shows different patterns of association with child adjustment according to the developmental model of antisocial behavior adopted, the gender of the child, and the specific informant used to collect the information. Further, the pattern of these differences is meaningful and theoretically important. That is, cruelty in boys was associated with an early psychopathy pathway characterized by an interaction of externalizing behavior and CU. The latter traits featured more prominently in child reports, possibly because of their association with the likelihood of secretive, purposeful cruelty. Consistent with contemporary models of gender differences in pathways to antisocial behavior, we found that externalizing behavior did not feature in females' cruelty but was associated with CU traits independently from the children's general adjustment and family problems. Cruelty to animals may have potential as an early indicator of trait factors placing children at risk for the development of ongoing problems.

Note

1. Ascione, Thompson, and Black (1997) use *sentience* to refer to the animal's level of sentience; the Children and Animals Inventory uses the term to refer to the child's empathic concern for the animal.

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