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Exposure to intimate partner violence and internalizing symptoms

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1   **Abstract**

2   **Background:** It is estimated that more than half of children living in households where intimate

3   partner violence (IPV) occurs are also exposed to animal cruelty (AC). Although prior research links

4   bonds with pets with higher levels of socioemotional competence among school-age children, exposure

5   to AC may negate the protective effects of pet ownership and/or exacerbate the potentially deleterious

6   effect of IPV on children's mental health.

7   **Objective:** The current study evaluates whether and to what extent the associations between exposure

8   to IPV and several indicators of children's mental health vary as a function of children's positive

9   engagement with pets and exposure to AC.

10   **Participants and Setting:** Participants included 204 children (aged 7-12 years; 47% female; 57%

11   Latinx) and their maternal caregiver who were recruited from domestic violence agencies in a western

12   U.S. state.

13   **Method:** Multiple moderation analysis evaluated whether the association between children's exposure

14   to IPV and internalizing and posttraumatic stress symptoms vary as a function of children's positive

15   engagement with pets and exposure to AC.

16   **Results:** Analyses revealed several moderation effects for positive engagement with pets (e.g.,

17   internalizing problems: [b= -.15, $t(195)$ = -2.66, p = .008]; posttraumatic stress symptoms: [b= -

18   .13, $t(195)$ = -2.24, p = .026]), whereas exposure to AC only moderated the association between IPV

19   and anxious/depressed symptoms (b= .32, $t(195)$ = -2.41, p = .017).

20   **Conclusions:** These findings highlight the potential protective effects of positive engagement with pets

21   and importance of screening for exposure to AC when engaging in trauma-informed work with children

22   exposed to IPV.

23   *Keywords*: domestic violence, animal abuse, childhood adversity, trauma, child psychopathology

24

Introduction

Intimate partner violence (IPV) is a worldwide public health problem that contributes to a myriad of long-lasting negative consequences for children who are exposed to such abuse. In the United States, nearly 8 million children are exposed to IPV each year, and this type of violence exposure has received increased recognition as a form of victimization and adverse childhood experience (ACE) (Dube et al., 2002; Hamby, Finkelhor, Turner & Ormrod, 2011; NATSCEV I, 2014). Approximately 81% of children who live in homes where IPV occurs are directly exposed to physical and psychological violence (Douglas & Hines, 2016; Fantuzzo & Fusco, 2007; Vatnar & Bjørkly, 2011). Among the potential short- and long-term effects of exposure to IPV on child outcomes, increased risk of internalizing (e.g. depression and anxiety), externalizing (e.g. aggression, conduct disorder), and post-traumatic stress problems have been extensively documented (Evans, Davies & DiLillo, 2008; Moylan et al., 2010; McTavish, MacGregor, Wathen & MacMillan, 2016; Vu, Jouriles, McDonald & Rosenfield, 2016). Indeed, rates of clinical levels of internalizing and externalizing problems are estimated to be as high as 40-60% among youth exposed to IPV (Grych, Jouriles, Swank, McDonald & Norwood, 2000).

A large body of research indicates that child adjustment following exposure to IPV involves a complex interplay between risk and protective factors (McDonald et al., 2016). Childhood adversities frequently co-occur, and for a majority of U.S. children, childhood victimization involves multiple rather than single experiences (Bynum et al., 2010). Children exposed to IPV are at greater risk for exposure to co-occurring forms of family violence, such as physical abuse (Finklehor, Ormond & Turner, 2007; Moylan et al., 2010), maltreatment of a sibling (Renner & Boel-Studt, 2017), and animal cruelty (AC), than their non-exposed counterparts, which may increase their risk for maladjustment (McDonald et al., 2017). At the same time, not all children experience poor outcomes following IPV exposure (Holt, Buckley & Whelan, 2008). Some children may develop healthy coping mechanisms and/or external sources of social support that help attenuate or prevent the negative consequences of

50 early exposure to violence (Haj-Yahia, Sokar, Hassan-Abbas & Malka, 2019; Howell, Graham-

51 Bermann, Czyz & Lilly, 2010; Nicolotti, El-Sheikh & Whitsonet, 2003). Other factors associated with

52 resilience in children exposed to IPV include: self-regulation and positive self-perception (Yule,

53 Houston & Grych, 2019); maternal sensitivity, mental health, and social support (Barbarin, Richter &

54 DeWet, 2001; Howell, Graham-Bermann, Czyz, Lilly, 2010; Fogerty, Wood, Giallo, Kaufman, &

55 Hanson, 2019); and positive parenting practices (Grogan- Kaylor, Galano, Hines, Howell, Miller-Graff

56 & Graham-Bermann, 2019; Manning, Davies & Cicchetti, 2014; Yule et al., 2019).

57   Although research on resilience among children exposed to IPV has identified a long list of

58 risk and protective factors, an often-overlooked relationship that may confer both risk and protection in

59 the context of IPV concerns a child's relationship with their family pet(s). In this paper we address this

60 gap and examine the extent to which positive engagement with pets and exposure to AC influence

61 children's adjustment in the context of IPV.

62 **Protective Effects of Relationships with Pets**

63   Household pets are important aspects of the social and environmental ecologies of children

64 (Carr & Rockett, 2017). When examining family relationships and social support, it is important to

65 consider broad modern networks of relationships and the subsequent impact on development, which

66 include pet animals (Cassels, White, Gee & Hughes, 2017; Melson, 2003). It is estimated that up to

67 75% of U.S. households with children above the age of 6 years are characterized by cohabitation of

68 human and non-human animals (American Veterinary Medical Association, 2007), and a majority of

69 people who reside with pet animals consider them to be a member of the family (American Veterinary

70 Medical Association, 2007; Burns, 2019). Children can form strong, emotional bonds with their pets;

71 such bonds meet the prerequisites for an attachment relationship (proximity seeking, safe-haven, secure

72 base and separation distress) and share many features with human parent-child attachment (Hawkins,

73 Williams & Scottish SPCA, 2017; Rockett & Carr, 2014; Sable, 2013; Zilcha-Mano, Mikulincer &

Shaver, 2011, 2012). Although arguably different from the quality of relationship with humans, pets can offer children a secure attachment figure (Beck & Madresh, 2008).

Children often value their relationships with their pets over and above relationships with other family members including siblings (Cassels, White, Gee & Hughes, 2017), and turn to their pets in times of difficulty for support and comfort (Melson, Schwartz & Beck, 1997; Russell et al., 2017). For example, children may become more attached to their pets when facing adversity such as parental divorce (Strand, 2004), and pets can serve as important attachment figures and a source of emotional support, companionship and friendship within adverse family settings (Cassels, White, Gee & Hughes, 2017; McDonald et al., 2015; Newberry, 2017). Additionally, caring for pets may contribute to a child's global sense of competence and positive self-regard, which may be particularly beneficial to promoting child resiliency in households where there is family conflict and/or parents struggle to demonstrate healthy parenting practices (McDonald et al., 2016). Furthermore, prior research suggests that animals can offer children a path towards re-establishing attachment security with others and can help facilitate human-human attachments (Carr & Rockett, 2017; Cassels, White & Hughes, 2017; Messent, 1983; Parish-Plass, 2008).

A plethora of studies demonstrate that positive relationships with pets are associated with physical, social, psychological, and emotional benefits in both normative and vulnerable populations (Gadomski et al., 2015; Purewal et al., 2017; Rhoades, Winetrobe & Rice, 2015). Research into the impact of animals on human health and wellbeing has shown that interactions with animals are associated with reductions in stress, mental health problems, loneliness, aggression, and increases in quality of life, positive wellbeing, happiness, sociality and prosocial behavioral outcomes (Beetz, Uvnäs-Moberg, Julius & Kotrschal, 2012; Charnetski, Riggers & Brennan, 2004; Handlin et al., 2011; Kotrschal & Ortbauer, 2003; Marsa-Sambola et al., 2016; McNicholas & Collis, 2000; Purewal et al., 2017). Prior research also indicates that pets can mitigate against adverse effects of life trauma and stress, acting as a 'protective' factor against the development of psychological problems following

99   potentially traumatic events, such as losing a spouse (Akiyama, Holtzman & Britz, 1986) and growing

100   up within the foster care system (Carr & Rockett, 2017). However, there is a paucity of research on the

101   links between pet ownership, pet attachment, and mental health in childhood, and no research to date

102   has examined whether and to what extent relationships with family pets help children cope with

103   childhood adversity due to family violence. It is important to consider that the potential benefits

104   associated with pets may only be present for children who demonstrate a positive relationship with

105   their pet and/or may not be the case for children who have been exposed to AC in their home.

106   **Childhood Animal Cruelty Exposure**

107   Pets that child and adult IPV survivors are closely bonded with, or attached to, can often

108   become a target for abuse by perpetrators of IPV (Ascione et al., 2007; Volant et al., 2008). Thus, AC

109   often functions as a tactic of coercive control in households where IPV occurs (DeGue, 2011; Hardesty

110   et al., 2013; Hawkins, Hawkins, & Williams, 2017; McDonald et al., 2017). Prior studies report that

111   IPV perpetrators who engage in AC are more likely to display extreme forms of violence including

112   sexual abuse, stalking, harsh physical punishment, and physical injury when compared to IPV

113   perpetrators without histories of AC (Ascione et al., 2007; Carlise-Frank et al., 2004; Walton-Moss,

114   Manganello, Frye & Campbell, 2005). However, there is some evidence of ethnic differences in these

115   relations, particularly among U.S. Hispanic perpetrators, who are less likely than non-Hispanic

116   perpetrators of IPV, to utilize AC as a coercive control tactic (Hartman, Hageman, Williams &

117   Ascione, 2018). Although the rate of AC in the context of IPV has varied across samples (Collins et al.,

118   2018), some studies have found rates of exposure to AC in childhood to be as high as 61.5% in homes

119   where family violence is present (Ascione et al., 2007). Often in such cases, children are directly

120   exposed to AC, which can be traumatic for the child and lead to negative impacts on the child's

121   emotional and behavioral health. Moreover, children who witness AC may be at increased risk for

122   intervening in incidents of violence toward pets, which may increase their risk of injury by a caregiver

123   (McDonald et al., 2015).

124   Research on the consequences of exposure to AC among IPV survivors and children is scarce.

125   However, recent studies suggest that exposure to AC in childhood is associated with increased risk of

126   psychopathology (McDonald et al., 2017), behavioral problems such as delinquency and violence

127   (Longobardi & Badenes-Ribera, 2018), and childhood cruelty to animals (Hawkins, Hawkins &

128   Williams, 2017); most of the research in this area has focused on *externalizing* outcomes and failed to

129   attend to internalizing behavior and posttraumatic stress symptoms. However, adults who witness AC

130   in their childhood report 'still being bothered' by such acts in adulthood (Flynn, 2000; Henry, 2004). It

131   has been argued that witnessing violence toward, or the death of, a family pet, can be equally traumatic

132   for a child as witnessing violence directed at other family members (Girardi & Pozzulo, 2015). Animal

133   cruelty can therefore be viewed as a distinct manifestation of family violence that may complicate the

134   adverse impacts of IPV on posttraumatic stress and internalizing symptoms (McDonald et al., 2015).

135   An emerging body of research suggests that AC exposure in childhood may account for more

136   variance in internalizing psychopathology than other co-occurring adversities (e.g., IPV and emotional

137   abuse; Girardi & Pozullo, 2015; McDonald et al., 2016, 2017). Internalizing consequences of exposure

138   to AC, such as emotional distress, may be more pronounced in cases where the abuse is frequent and

139   severe, and in cases where the child is highly attached to their pets (Girardi & Pozzulo, 2015;

140   McDonald et al., 2016). A retrospective study by Girardi and Pozullo (2015) found a significant

141   interaction between participants' level of bonds with pets and AC exposure in childhood, controlling

142   for co-occurring emotional abuse. Those who reported medium-level bonds with pets who were

143   exposed to AC in childhood, displayed significantly higher depression and anxiety scores in adulthood

144   than those who were not exposed to AC. Participants who reported medium-level bonds with pets and

145   had not been exposed to AC in childhood, displayed lower depression and anxiety scores adulthood

146   than those with low-level bonds.

147   **Current Study**

148   To our knowledge, no prior studies have examined associations and interactions between

149   positive engagement with pets, exposure to AC and IPV, and internalizing and post-traumatic stress

150   symptoms among children. The aim of the current study was to evaluate whether and to what extent the

151   associations between exposure to IPV and several indicators of mental health (i.e., internalizing

152   behavior symptoms and posttraumatic stress) vary as a function of children's positive engagement with

153   pets and exposure to AC. Given prior evidence that cats and dogs have greater impacts on

154   psychological support than other species (see Purewal et al., 2017), the current study specifically

155   focused on children living in households where dogs and/or cats were present. We hypothesized the

156   following: 1) Higher levels of exposure to IPV will be associated with higher levels of internalizing and

157   posttraumatic stress symptoms, and the magnitude of the effect of IPV will be greater among children

158   who are also exposed to AC, 2) Positive engagement with a pet will serve as a protective factor against

159   the impact of exposure to IPV on children's internalizing and posttraumatic stress symptoms when

160   adjusting for the effect of AC exposure, and 3) Children exposed to IPV will exhibit greater

161   internalizing problems when they display higher levels of positive engagement with pets and have been

162   exposed to AC in the home (see Figure 1). Due to the inconsistent methodological and measurement

163   approaches employed across studies examining the impact of human-animal interaction on child health

164   and wellbeing, the current study examines multiple domains of internalizing symptoms in addition to

165   posttraumatic stress symptoms to clarify how AC and positive engagement with pets are related to

166   specific clusters of symptomatology.

167   [Figure 1 here]

168   **Methods**

169   **Participants and Procedure**

170   Child participants for the present cross-sectional study were drawn from a larger dataset of

171   mother-child dyads recruited from 22 domestic violence agencies in the western United States between

172   2010 and 2016. Women were eligible to participate if they were over the age of 21 and had: (1)

173   experienced IPV in the last year, (2) at least one child between the ages of 7 to 12 in the home, and (3)

174   lived with at least one companion animal (dog or cat) within the past year. Consistent with IRB

175   approved protocol, designated staff members (including Spanish-English bilingual staff) from each

176   agency were trained to recruit participants, obtain consent and assent, and administer standardized

177   surveys to eligible mother-child pairs. If women had more than one child who was in the eligible age

178   range, they were asked to select one child to participate in the study (no criteria for this decision).

179   Surveys were conducted with mothers and children separately.

180   The present study restricted analyses to those individuals who owned at least one dog or cat

181   within the past year (N=237). Thirty-three participants were excluded from analysis due to missing

182   data, yielding a total sample of 204 children. We conducted independent samples t-tests to determine

183   whether the youth with missing data (n = 33) differed from those included in the final sample (n = 204)

184   and found that there were no significant differences in the children's race/ethnicity, gender, nativity,

185   income, or internalizing symptoms (ps > .05). However, on average, individuals with missing data were

186   younger (M = 8.4, SD = 6.4) than those included in this study's sample (M = 9.1, SD = 1.6), t(235) = -

187   2.25, p = .025.

188   The sample consisted of 108 (52.9%) male and 96 (47.1%) female children, ranging in age from

189   7 to 12 years old (mean 9.11 years, SD = 1.63). Most participants identified as Latinx/Hispanic

190   (57.4%), followed by White/Non-Hispanic (22.5%), Multi-racial (16.2%), Black/African American

191   (2.9%), Asian (.5%) and American Indian/Alaska Native (.5%). Approximately 37.5% of the mothers

192   had not completed high school, 38.9% had obtained a high school degree, 14.8% had completed some

193   college, and 8.9% had completed a bachelor's degree or higher. Nearly 19% of the sample had at least

194   one dog *and* one cat at home; 21% had at least one cat, but no dogs; and 60% had at least one dog, but

195   no cats. A majority (72%) of families' income fell below the 2016 poverty threshold for their family

196   composition. Thirty-six percent of the surveys were completed in Spanish; existing Spanish language

197   versions of the measures were used when available. When Spanish language versions were not

198 available, a professional translator with expertise in research with Latinx populations translated English

199 language versions of the scale using the translation-back-translation procedure (van de Vijver &

200 Hambleton, 1996). This process included input from Bilingual (Spanish/English) domestic violence

201 advocates at partnering agencies, who reviewed Spanish language versions of our measures (both

202 existing and those created for our study) to confirm the appropriateness of the items for the dialects and

203 experiences of their Latinx clients.

204 **Measures**

205 **Exposure to IPV.** Children's exposure to IPV was measured using the Child Exposure to

206 Domestic Violence Scale (CEDV, Spanish and English language versions; Edleson, Shin &

207 Armendaris, 2008). The CEDV is a 42-item scale that is separated into 6 subscales. For the purposes of

208 the present study, participants only completed the "Home Exposure" subscale, which asks children

209 about different types of domestic violence they may have been exposed to in the home. Participants

210 completed a revised 9-item version of this subscale; one item referring to exposure to harm of animals

211 by the mother's partners was removed from the original 10-item CEDV Home Exposure subscale due

212 to its overlap with the Pet Treatment Survey. Prior studies have supported use of the revised 9-item

213 version as a unidimensional measure of children's IPV exposure (e.g., McDonald et al., 2016).

214 Responses on the revised CEDV scale were measured on a Likert scale, with scores ranging from 0

215 'Never' to 3 'Almost Always'. All of the responses were averaged together to compute one total CEDV

216 score for each participant ($\alpha = .78$).

217 **Exposure to AC.** The Pet Treatment Survey (PTS; McDonald, Vidacovich, Williams, Ascione

218 & Green, 2015) measured children's exposure to AC as reported by maternal caregivers. This survey

219 was designed to measure the treatment of animals in homes experiencing IPV as reported by women

220 receiving residential and non-residential domestic violence services. The PTS has been used in prior

221 studies of children's exposure to AC (McDonald et al., 2016; McDonald et al., 2017), and contains two

222 main items focusing on AC: one item asks whether a woman's partner has ever *threatened* to hurt or

223   kill a family pet, and another asks whether the partner has ever *actually hurt or killed* a family pet. If

224   the mother answers yes to either of these items, she is then asked a series of follow-up questions which

225   includes whether her child has ever seen or heard a pet hurt or killed in the home. Thus, the PTS yields

226   a dichotomous parent-report measure of children's exposure to AC in the home (0 = not exposed, 1 =

227   exposed). This measure was translated to Spanish for the current study.

228   **Positive engagement with pets.** Children's self-reported positive engagement with their pet(s)

229   was measured using the Children's Treatment of Animals Questionnaire (CTAQ; Thompson &

230   Gullone, 2003). The CTAQ contains 13 items asking children how often they engage in behaviors

231   relating to companion animals (e.g., "play with", "cuddle", "groom", etc.). Choices range from 'Never'

232   to 'Often' and were scored on a Likert scale from 1 to 3, respectively. A total CTAQ score for each

233   participant was computed as a mean of responses on all items, excluding the item "yell at", which is the

234   only item that does not reflect positive engagement with pets, and has been identified as problematic in

235   prior research using English and Spanish versions of the measure (McDonald, Vidacovish, Williams,

236   Ascione & Green, 2015). The CTAQ demonstrates good internal consistency and test-retest reliability,

237   as well as sufficient convergent validity (Thompson & Gullone, 2003). Internal consistency in the

238   current sample was good (α =.85).

239   **Internalizing problems and posttraumatic stress.** Internalizing problems were measured

240   using six total scores from the Child Behavior Checklist (CBCL 6/18, Spanish and English language

241   versions; Achenbach & Rescorla, 2001). This is a widely used measure that utilizes caregiver reporting

242   to evaluate children's behavior problems reflecting multiple domains of socioemotional functioning.

243   For the present study, items from the internalizing scale (INT) and its component syndrome-based

244   subscales (Anxious/Depressed, AD [α=.91]; Withdrawn/Depressed, WD [α=.90]; and Somatic

245   Complaints, SC [α=.89]) were examined, as well as the DSM-oriented Anxiety Problems scale (AP;

246   α=.88) and Posttraumatic Stress Problems scale (PTS; α=.91). For the INT scale and subscales, scores

247   ranging from 60 to 63 are considered to be in the "borderline" clinical range, while scores greater than

248   or equal to 64 are considered to be clinically significant levels of symptoms. All analyses were

249   conducted using raw total scale/subscale scores.

250   **Demographic survey.** Child age, gender, ethnicity, household income, family size, and pet

251   ownership information were obtained using a parental demographic survey that has been used in prior

252   human-animal interaction research with victimized children and adults. Socioeconomic status was

253   measured using a log transformation of an income-to-needs ratio based on family income, household

254   size, and federal poverty threshold data.

255   **Data analysis**

256   All analyses were conducted using SPSS 25 (IBM Corp., 2017). A multiple moderation analysis

257   using PROCESS (Hayes, 2017) evaluated whether the association between exposure to IPV and parent-

258   reported internalizing (i.e., INT, AD, WD, SC, AP) and posttraumatic stress symptoms vary as a

259   function of children's positive engagement with pets and exposure to AC (see Figure 1). Each outcome

260   (INT, AD, WD, SC, AP, PTS) was examined in a separate model. Before running the moderation

261   analyses, the association between the independent and dependent variables and possible covariates

262   were examined (i.e., child age, gender, ethnicity, and socioeconomic wellbeing). Child age, gender, and

263   Hispanic ethnicity were retained as covariates in each model as they were significantly associated with

264   engagement with pets, behavior problems, and/or exposure to IPV in our sample. Prior to analysis, all

265   variables were standardized to reduce multicollinearity (Baron & Kenny, 1986). Moderation effects

266   were probed. A post hoc power analysis was conducted using G*Power software (Faul, Erdfelder,

267   Buchner & Lang, 2009) to determine whether the current sample size of 204 was sufficient to detect a

268   hypothesized incremental effect size of .05 (a small effect) and an alpha level of $\alpha = .05$. Results

269   indicated the current sample size was sufficient to achieve power of .99, with a critical F value of 3.89.

270   Assumptions of normality, linearity, and homoscedasticity were all satisfied. The assumption of

271   singularity was met, as the independent variables were not a combination of other independent

272   variables.

273   [Figure 1 here]

274   **Results**

275   Intercorrelations of all variables included in the analyses are displayed in Table 1. Correlations

276   among the outcome variables were significant at $p < .001$. Exposure to IPV was significantly correlated

277   with positive engagement with pets ($r = .22$, $p = .001$). However, the effect is not strong enough to

278   violate the assumption of multicollinearity. Approximately 26% of mothers reported that their children

279   had been exposed to AC. We did not find evidence of a significant association between exposure to

280   IPV and exposure to AC ($r = -.04$, $p = .594$) or exposure to AC and positive engagement with pets ($r =$

281    $.10$, $p = .170$). Tolerance and VIF were all within accepted limits, which indicate that the assumption of

282   multicollinearity was met (Hair, Black, Babin & Anderson, 2010). We examined Mahalanobis distance

283   scores, which did not identify any multivariate outliers.

284   [Table 1 here]

285   **Internalizing Behavior Problems**

286   Results indicate that children's positive engagement with pets functions as a moderator of the

287   effect of exposure to IPV on overall internalizing behavior problems (INT), $b = -.15$, $t(195) = -2.66$, $p =$

288    $.008$. The interaction between exposure to IPV and exposure to AC did not significantly predict

289   internalizing problems, $b = .26$, $t(195) = 1.96$, $p = .051$. These results indicate that the effect of

290   exposure to IPV on internalizing outcomes changes across different levels of children's positive

291   engagement with pets when AC exposure is held constant. Specifically, the moderation of the effect of

292   exposure to IPV by children's level of positive engagement with pets uniquely accounts for 2.74% of

293   the variance, $F(1, 195) = 7.09$, $p = .008$, whereas the moderation by exposure to AC uniquely accounts

294   for 1.49% of the variance, $F(1, 195) = 3.86$, $p = .051$. Table 2 displays the conditional effects of

295   exposure to IPV at different levels of the moderator variables.

296   [Table 2 here]

297   As shown in Figure 2A, the magnitude of the effect of exposure to IPV on internalizing

298 problems is strongest for children who have been exposed to AC and report low or moderate levels of

299 positive engagement with pets. The association between exposure to IPV and internalizing behavior is

300 not significant for children exposed to AC that have a high level of positive engagement with pets.

301 Thus, high levels of positive engagement with pets may function as a protective factor against

302 internalizing outcomes for children exposed to IPV and AC.

303   [Figure 2 here]

304 **Anxious/Depressed (AD) Symptoms**

305   The effect of exposure to IPV on comorbid AD problems was moderated by both children's

306 positive engagement with pets, $b = -.16$, $t(195) = -2.95$, $p = .004$, and exposure to AC, $b = .32$, $t(195) =$

307 -2.41, $p = .017$. The effect of the interaction between exposure to IPV and children's level of positive

308 engagement with pets uniquely accounts for 3.23% of the variance in AD, $F(1, 195) = 8.70$, $p = .004$.

309 The moderated effect of exposure to IPV by exposure to AC uniquely accounts for 2.16% of the

310 variance, $F(1, 195) = 5.82$, $p = .017$. Figure 2B displays the conditional effect of exposure to IPV on

311 AD as a function of children's positive engagement with pets and exposure to AC. The effect of

312 exposure to IPV on AD is statistically significant at low and moderate levels of children's positive

313 engagement with pets, but only for children exposed to AC. Similar to the results of the model

314 predicting internalizing problems, these results indicate that exposure to AC amplifies the relationship

315 between exposure to IPV and AD unless children also have high levels of positive engagement with

316 their pets.

317 **Withdrawn/Depressed Symptoms (WD) and Somatic Complaints (SC)**

318   We did not find evidence of a moderated effect of exposure to IPV by children's positive

319 engagement with pets on WD [$\Delta R^2 = .017$, $F(1, 195) = 3.76$, $b = -.12$, $t(195) = -1.94$, $p = .054$], SC

320 [$\Delta R^2 = .011$, $F(1, 195) = 2.81$, $b = -.09$, $t(195) = -1.68$, $p = .095$], or SC, $\Delta R^2 = .005$, $F(1, 195) = 1.24$,

321 $b = -.07$, $t(195) = -1.11$, $p = .267$. Similarly, we did not find evidence that exposure to AC moderated

322   the effect of exposure to IPV on WD [$\Delta R^2 = .006$, $F(1, 195) = 1.30$, $b = .17$, $t(195) = 1.14$, $p = .256$],

323   SC [$\Delta R^2 = .005$, $F(1, 195) = 1.39$, $b = .16$, $t(195) = 1.18$, $p = .239$], or SP, $\Delta R^2 = .003$, $F(1, 195) = .75$,

324   $b = .12$, $t(195) = .86$, $p = .389$.

325   **DSM-Oriented Anxiety Problems (AP)**

326   Children's positive engagement with pets moderated the effect of exposure to IPV on AP, $b = -$

327   $.14$, $t(195) = -2.54$, $p = .012$. See Figure 2C. We did not find evidence that exposure to AC moderated

328   the effect of exposure to IPV on AP, $b = .18$, $t(195) = 1.39$, $p = .167$. The effect of the interaction

329   between exposure to IPV and children's level of positive engagement with pets uniquely accounts for

330   2.39% of the variance in AP, $F(1, 195) = 6.47$, $p = .012$. In contrast, the effect of exposure to IPV by

331   exposure to AC uniquely accounts for only .71% of the variance in AP, $F(1, 195) = 1.92$, $p = .167$. As

332   shown in Table 2, the effect of exposure to IPV is statistically significant among children with low

333   levels of positive engagement with pets who have been exposed to AC. However, the effect is not

334   significant when children exposed to AC have moderate or high levels of positive engagement with

335   pets.

336   **Post-traumatic Stress Problems (PTS)**

337   Results indicate that the effect of exposure to IPV on PTS is significantly moderated by

338   children's positive engagement with pets [$b = -.13$, $t(195) = -2.24$, $p = .026$], but not by AC exposure, b

339   $= .21$, $t(195) = 1.59$, $p = .114$. Whereas exposure to AC uniquely accounts for .95% of the variance in

340   PTS, children's positive engagement with pets uniquely accounts for 1.89% of the variance. As seen in

341   Figure 3, we found that the effect of exposure to IPV on PTS was significant at low and moderate

342   levels of children's positive engagement with pets, but only for those who had been exposed to AC.

343   The effect of exposure to IPV was not significantly different from zero among children who had been

344   exposed to AC and had high levels of positive engagement with pets. We also did not find evidence of

345   a significant effect among children who had not been exposed to AC, regardless of their degree of

346   positive engagement with pets.

347   [Figure 3 here]

348   **Discussion**

349   To our knowledge, this study is the first to evaluate whether and to what extent the associations

350   between exposure to IPV and several indicators of children's mental health vary as a function of

351   children's positive engagement with pets and exposure to AC. Generally, we found support for two of

352   our three hypotheses: 1) children who had been exposed to higher levels of IPV exhibited more

353   internalizing and posttraumatic stress symptoms if they had also been exposed to AC, and 2) positive

354   engagement with pets buffered the impact of exposure to IPV on children's internalizing and

355   posttraumatic stress symptoms when adjusting for the effects of AC exposure. Although we

356   hypothesized that children exposed to IPV would exhibit increased internalizing problems when they

357   had higher levels of positive engagement with pets *and* had been exposed to AC in the home, we found

358   that for children exposed to AC, high levels of positive engagement with pets had a protective effect

359   against the adverse consequences of exposure to IPV, where this was not the case for children reporting

360   low-to-moderate levels of engagement with pets in the context of AC. Collectively, these findings

361   demonstrate the powerful role that pets can play in the lives of children, especially in the context of

362   exposure to IPV. Multiple scholars focusing on preventive interventions for children experiencing early

363   life adversity (e.g., Luthar & Cicchetti, 2000) argue that it is more practical for preventive interventions

364   serving victimized children to promote the development of adaptive functioning by bolstering

365   children's assets and resources at multiple levels within children's social ecologies rather than aim to

366   reduce negative behavioral symptoms. Our findings suggest that relationships with pet animals are an

367   asset and resource in children's lives that warrant increased attention alongside the welfare of pets in

368   families experiencing IPV.

369   Specifically, our findings suggest that high levels of children's positive engagement with a

370   family pet functions as a moderator of the effect of exposure to IPV on generalized internalizing

371   symptoms as well as three symptom clusters including: anxious/depressed symptoms, DSM-oriented

372   anxiety problems, and PTS symptoms. Although our study is unable to examine potential mechanisms

373   through which engagement with pets operates as a protective factor among children exposed to IPV

374   and AC, it is possible that engaging with pets fosters social regulation of emotion, enhances cognitive

375   control, and/or increases a child's sense of social support (Freund, McCune, Esposito, Gee &

376   McCardle, 2016) which are well-documented factors that discriminate between resilience and

377   psychopathology among children exposed to violence (Yule et al., 2019). Further, prior studies link

378   multiple forms of competence (social, academic, and extracurricular) to positive psychosocial

379   adjustment among children experiencing adversity across developmental stages (Ostrov et al., 2009;

380   Yule et al., 2019). Positive engagement with pets, particularly care-taking behaviors (which are

381   reflected among the CTAQ items), may help children develop a positive sense of self and prosocial

382   competence by helping the child engage in externally oriented activities, which can protect against

383   negative affect. Further research is needed to tease apart whether and to what extent distinct domains of

384   engagement with pets (e.g., caretaking, play, affectionate behavior) have protective effects on the

385   relation between IPV and specific domains of psychopathology, as well as the dynamic processes (e.g.,

386   competence, self-regulation) through which child-pet interactions influence these relations. For

387   example, behaviors such as dog-walking may help to mitigate the effects of IPV exposure by increasing

388   children's sense of community and social support, whereas affectionate behaviors may support stress

389   reduction by reducing cardiovascular reactivity (Allen, Blascovich & Mendes, 2002).

390   Relatedly, we did not find evidence that positive engagement with pets buffers the impact of

391   IPV on somatic complaints or withdrawn/depressed symptoms. It is possible that specific aspects of

392   child-pet interactions (e.g., stress reduction, social support) may be more relevant to mitigating the

393   impact of IPV on these symptom clusters, rather than the more generalized construct of positive

394   engagement measured in the current study. Alternatively, symptoms such as somatic complaints and

395   being withdrawn may go unnoticed in high conflict households where parenting is compromised

396   (Maddoux et al., 2016). For this reason, it is possible that caregiver reports of these symptom clusters

397   do not accurately capture variability among children in our sample. Future research in this area should

398   incorporate self-report assessments of children's mental health symptoms and a greater breadth of

399   measures to capture multiple features of the child-pet relationship. In addition, longitudinal research

400   should test the relationship between pet engagement and these symptom clusters over time, in order to

401   shed light on potential reciprocal relations between human-animal interaction and internalizing

402   psychopathology in this population.

403   As shown in Table 2, the conditional effects models indicate that IPV is not significantly

404   associated with posttraumatic stress or any of the internalizing behavior scores among children in our

405   sample who were not exposed to AC (across all levels of positive engagement with pets). This finding

406   conflicts with the wide body of research documenting deleterious impacts of IPV on child mental

407   health (Evans, Davies & DiLillo, 2008; Fong, Hawes & Allen, 2019; Grip, Almqvist & Broberg, 2012);

408   although, we are unaware of any study that has adjusted for the presence of pets in the household.

409   Given that all families in our sample lived with pets in the past year, even children with low levels of

410   positive engagement with pets may have benefited from other protective aspects of pet-ownership, such

411   bonds or attachments to pets and associated stress-reduction, which may have buffered the impact of

412   IPV on children (McDonald et al., 2015; Melson, Schwartz & Beck, 1997). Other explanations for the

413   null associations between the child-reported IPV and child adjustment include: reduced variability in

414   scores due to our sampling procedures or that children were reluctant to report exposure to specific IPV

415   behaviors due to the repercussions of reporting on their family environment.

416   As expected, we found a significant effect of IPV exposure on multiple domains of internalizing

417   behavior and PTS among children exposed to AC. Across all models, the magnitude of the effect of

418   IPV on these child outcomes was strongest for those who had been exposed to AC and reported low

419   levels of positive engagement with pets. For children exposed to AC, IPV exposure was not

420   significantly associated with increases in internalizing behavior or PTS problems among children with

421   high levels of positive engagement with pets. Thus, exposure to AC can put children at a greater risk of

422   developing internalizing problems when they lack high levels of positive engagement with their pets.

423   This finding is not surprising given that a previous study found that children exposed to AC were over

424   5 times more likely to display severe maladjustment (characterized by clinical levels of 5 behavioral

425   problems, including internalizing problems) than children not exposed to AC (McDonald et al., 2016),

426   adjusting for the effects of severity of child IPV exposure and other household risk factors.

427   Although our study indicates that exposure to AC exacerbates the negative impact of IPV on

428   anxious/depressed symptoms, particularly for children with low to moderate levels of positive

429   engagement with pets, we did not find evidence of moderation by AC for any of the other mental health

430   variables. Quantitative research in this area is limited, and therefore we cannot directly compare our

431   results with similar studies of children exposed to IPV. However, when reflecting on the items that

432   comprise the AD subscale, our findings mirror and complement prior qualitative work on children's

433   experiences of AC. The AD subscale primarily reflects items capturing negative cognitions (e.g., fear,

434   worry, worthless, guilty) and emotion regulation (cries). Prior qualitative studies document that

435   children's exposure to AC is multifaceted, and that children often become involved in preventing and

436   intervening in IPV incidents involving AC (Collins et al., 2018; McDonald et al., 2015). Thus, it is

437   understandable that exposure to AC may be uniquely related to this symptom cluster, given that

438   children's accounts of their involvement in AC incidents often centers on the interplay between

439   negative emotions (i.e., fear) and emotion regulation (e.g., crying, becoming involved in an IPV

440   incident involving pets), as well as subsequent negative cognitions such as guilt and negative self-

441   image.

442   Although our findings mirror Girardi and Pozullo's (2015), in that we found AC was associated

443   with increased risk for anxiety and depressive symptoms, their retrospective study suggested that the

444   impact of AC exposure on internalizing symptoms was greatest for those with close bonds with pets.

445   Our study examined children's positive *engagement* with their pets, rather than the child's bond with

446   the pet. Therefore, it may be important for future research to consider multiple domains of children's

447   relationships with pets in order to disentangle relations between child victimization, AC, and mental

448   health outcomes. Furthermore, it is possible that children's level of positive engagement with pets

449   reflects enhanced parent-child interactions in the home. Several of the CTAQ items reflect pet-keeping

450   activities such as feeding, grooming, and walking the pet, which are behaviors often encouraged by

451   adult caregivers (Muldoon, Williams & Lawrence, 2015). Moreover, it is possible that pets help to

452   buffer the impact of IPV on adult survivors' mental health, thereby having an influence on the indirect

453   effect of IPV on child outcomes via maternal mental health. Future studies would do well to control for

454   the quality of the child-caregiver relationships and maternal health and parenting to more rigorously

455   evaluate the impact of relationships with pets on child outcomes in the context of family adversity.

456   These findings add important contributions to knowledge of the role of pets as a protective

457   factor in the context of family violence. Taken as a whole, this study supports prior assertions that

458   children in adverse family environments experience both potential benefits and risks associated with

459   pets in the household (Collins et al., 2018; McDonald et al., 2015; McDonald et al., 2017). Many

460   children exposed to IPV display high levels of positive engagement with pets (McDonald et al., 2015).

461   Although replication is needed, our results suggest that pets may serve as a protective factor for

462   children if there is high engagement, whether or not they have been exposed to AC. These findings

463   have significant implications for promoting positive adjustment in violence-exposed children, although

464   we cannot draw causal inferences due to the cross-sectional nature of our study.

465   **Limitations**

466   Although this study has many strengths, we note several limitations that should be considered

467   when interpreting our results. First, all families enrolled in this study were connected with community-

468   based IPV services. Thus, our convenience sample may not be representative of the full population of

469   women and children experiencing IPV. Relatedly, our results might only be generalizable to families

470   experiencing violence towards mothers. Additionally, mothers decided which one of their eligible

471   children would participate in the study. Our project was advertised as the "Pets in Families Study";

472   therefore, mothers may have been more likely to choose children with strong bonds or negative

473   relations with their pets. Another significant limitation is our use of listwise deletion. Although we

474   found only a minor age difference between individuals excluded and those included in the present

475   study, other methods have been found to be more robust in addressing missing data (e.g., full

476   information maximum likelihood). This study is also limited by our reliance on a dichotomous measure

477   of child exposure to AC that included both animal harm and death. This prevented us from testing and

478   accounting for differences in frequency, severity and proximity of children's exposure to AC, which

479   are important aspects of violence exposure to consider in relation to child wellbeing. Although prior

480   research indicates that children display the strongest attachment to dogs and cats (Hawkins, Williams &

481   Scottish SPCA, 2017; Muldoon, Williams & Currie, 2019), another limitation of this study is that other

482   types of pets (e.g., lizards, lagomorphs, fish) were not considered. Finally, we relied on mothers'

483   reports of children's behavioral symptoms. Future studies would do well to include child assessments

484   of internalizing behavior and trauma symptoms.

485   **Implications for Research and Practice**

486   Exposure to IPV and AC in childhood places children at-risk for internalizing problems and

487   posttraumatic stress. Results of this study suggest that positive engagement with family pets, via

488   normal day-to-day activities such as play, grooming, and caretaking, may help mitigate the adverse

489   impact of exposure to family violence on child health and wellbeing. Results of this study also

490   demonstrate the powerful role that dogs and cats can play in the lives of children when children have

491   high levels of engagement with their pet, especially in the context of exposure to IPV. Our findings

492   should not be interpreted as support for the notion that pet ownership alone is protective against the

493   impacts of IPV exposure. These findings underscore the need for further research to consider how

494   exposure to AC and positive aspects of child-animal interactions, interact and influence children's

495   development, particularly in the context of other ACEs.

496   Future studies should also test whether positive engagement with pets is a protective factor

497   against the impact of other ACEs. As mentioned previously, it is well documented that ACEs

498   exposures often occur as multiple, rather than single events (Shin, McDonald & Conley, 2018). The

499   current study was unable to account for co-occurring ACEs, such as child maltreatment. It is possible

500   that associations between AC exposure and children's psychological wellbeing may be explained by

501   confounding factors such as the co-occurrence of child physical abuse or other forms of adversity (e.g.,

502   emotional abuse and sexual abuse) that our and prior studies have failed to test. Longitudinal research

503   is needed to tease apart the unique impact of AC exposure on child development while adjusting for the

504   effects of other ACEs. Finally, qualitative and mixed-methods studies with children would enable a

505   more in-depth understanding of children's views surrounding how their relationship with their pet(s)

506   helps them cope with IPV. Such information would provide valuable insight into how to incorporate

507   pets into intervention and prevention efforts for this population.

508   Our findings, when considered alongside previous work in this area, demonstrate that children

509   who have been referred to professional and community services due to exposure to IPV, should also be

510   screened for exposure to AC and relationships with family pets, to ensure that appropriate, efficient

511   support and resources can be provided. There is strong empirical evidence of children's attachment to

512   pets in the context of IPV, and so appropriate safety planning and intervention efforts are needed for

513   IPV survivors with pets. There may be important psychological and safety consequences for the

514   removal of an animal within families where IPV and AC are present, or a delay in seeking shelter due

515   to children and adults' concern for pets left behind (Barrett et al., 2018; Collins et al., 2018). Our

516   findings highlight the importance of residential co-shelter IPV services that allow families and pets to

517   stay together. There is also a need for evidence-based interventions to be developed that address

518   children's exposure to AC, support trauma and grief associated with AC, and consider both the benefits

519   and adverse consequences of children's positive relationship with their pet in the context of family

520   violence.

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Table 1.

Intercorrelations among exposure to intimate partner violence, moderator variables, and internalizing scales (N = 204).

	1	2	3	4	5	6	7	8	9
1. Exposure to IPV	-								
2. Exposure to AC	-.04	-							
3. Positive engagement with pets	.22**	.10	-						
4. Internalizing Problems	.02	.41***	.03	-					
5. Anxious/Depressed	.07	.43***	.11	.93***	-				
6. Anxiety Problems	.02	.47***	.10	.84***	.89***	-			
7. Withdrawn/Depressed	.06	.23**	-.10	.86***	.70***	.63***	-		
8. PTS Problems	.00	.43***	-.04	.90***	.85***	.81***	.78***	-	
9. Somatic Problems	-.12	.29***	-.01	.72***	.54***	.51***	.50***	.61***	-
10. Somatic Complaints	-.11	.37***	.01	.82***	.65***	.61***	.58***	.72***	.93***

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

Table 2.

Conditional effects of exposure to intimate partner violence on internalizing scales at different levels of positive engagement with pets (N = 204).

		Positive engagement with pets	b	SE	t	p	LL	UL
							95% CI	
Internalizing problems	Not exposed to AC	Low [a]	.16	.10	1.55	.124	-.04	.36
		Moderate	.00	.08	.06	.952	-.15	.16
		High [b]	-.15	.09	-1.62	.106	-.33	.03
	Exposed to AC	Low [a]	**.42**	**.13**	**3.14**	**.002**	**.16**	**.68**
		Moderate	**.27**	**.11**	**2.37**	**.019**	**.04**	**.49**
		High [b]	.12	.12	.98	.331	-.12	.35
Anxious/Depressed	Not exposed to AC	Low [a]	.19	.10	1.87	.063	-.01	.38
		Moderate	.02	.08	.28	.783	-.13	.17
		High [b]	-.14	.09	-1.62	.106	-.32	.03
	Exposed to AC	Low [a]	**.50**	**.13**	**3.83**	**.000**	**.24**	**.76**
		Moderate	**.34**	**.11**	**3.04**	**.003**	**.12**	**.56**
		High [b]	.17	.12	1.48	.140	-.06	.40
Anxiety Problems	Not exposed to AC	Low [a]	.15	.10	1.47	.143	-.05	.34
		Moderate	.00	.08	.05	.960	-.15	.15
		High [b]	-.14	.09	-1.56	.121	-.31	.04
	Exposed to AC	Low [a]	**.33**	**.13**	**2.50**	**.013**	**.07**	**.59**
		Moderate	.19	.11	1.68	.095	-.03	.40
		High [b]	.04	.12	.38	.707	-.19	.27
Post-Traumatic Stress Problems	Not exposed to AC	Low [a]	.13	.10	1.29	.200	-.07	.33
		Moderate	.00	.08	.03	.976	-.15	.15
		High [b]	-.12	.09	-1.39	.167	-.30	.05
	Exposed to AC	Low [a]	**.34**	**.13**	**2.56**	**.011**	**.08**	**.60**
		Moderate	.21	.11	1.90	.059	-.01	.43
		High [b]	.09	.12	.73	.465	-.15	.32

LL = Lower level; *UL* = Upper level; [a] Indicates scores less than or equal to one standard deviation below the centered mean (-1.01); [b] Indicates scores greater than or equal to one standard deviation above the centered mean (1.01).
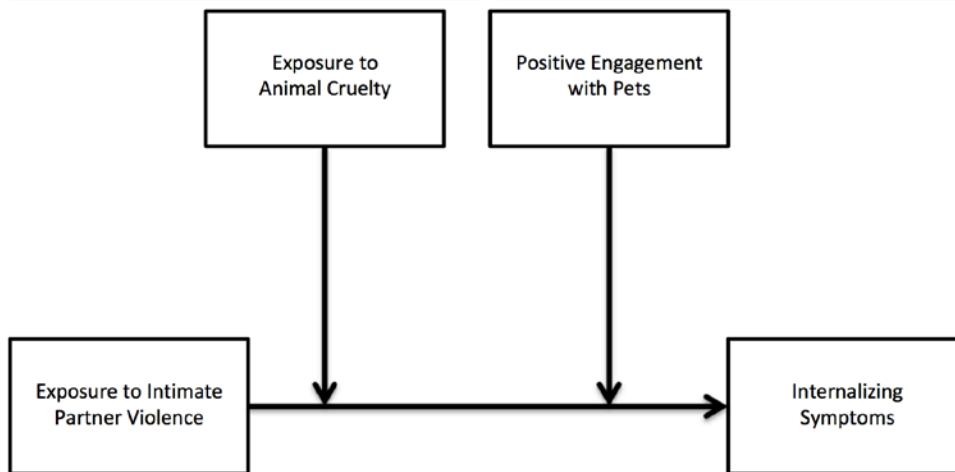
Figure 1. Theoretical model of the collective moderating effects of positive engagement with pets and AC exposure on the relationship between children's exposure to intimate partner violence exposure and internalizing behavior symptoms. Effects of covariates (e.g., age, gender, and Hispanic ethnicity) are not included in the figure to reduce complexity.
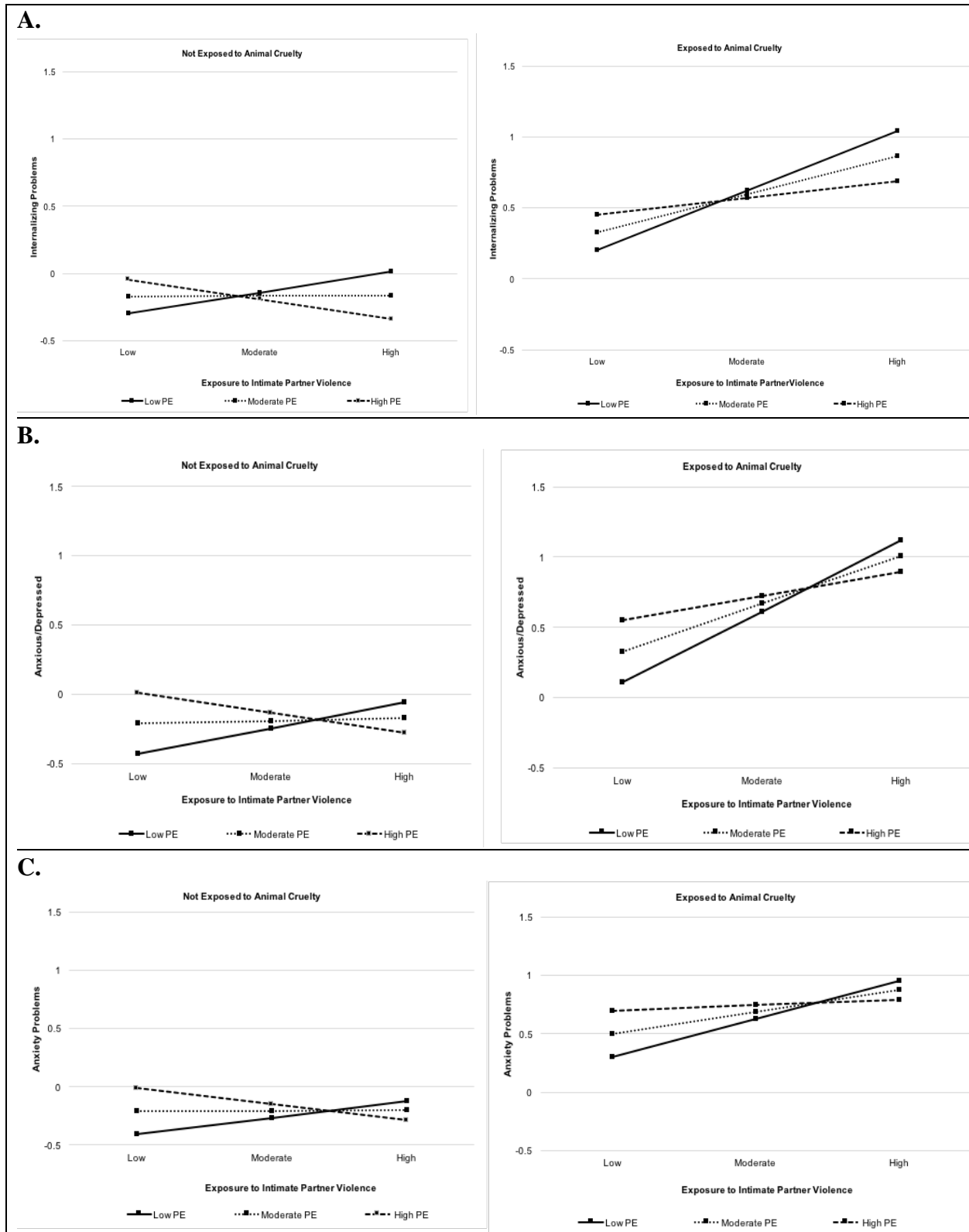
Figure 2. Conditional effect of exposure to intimate partner violence on internalizing symptoms as a function of children's positive engagement (PE) with pets and exposure to animal cruelty (*N* = 204).
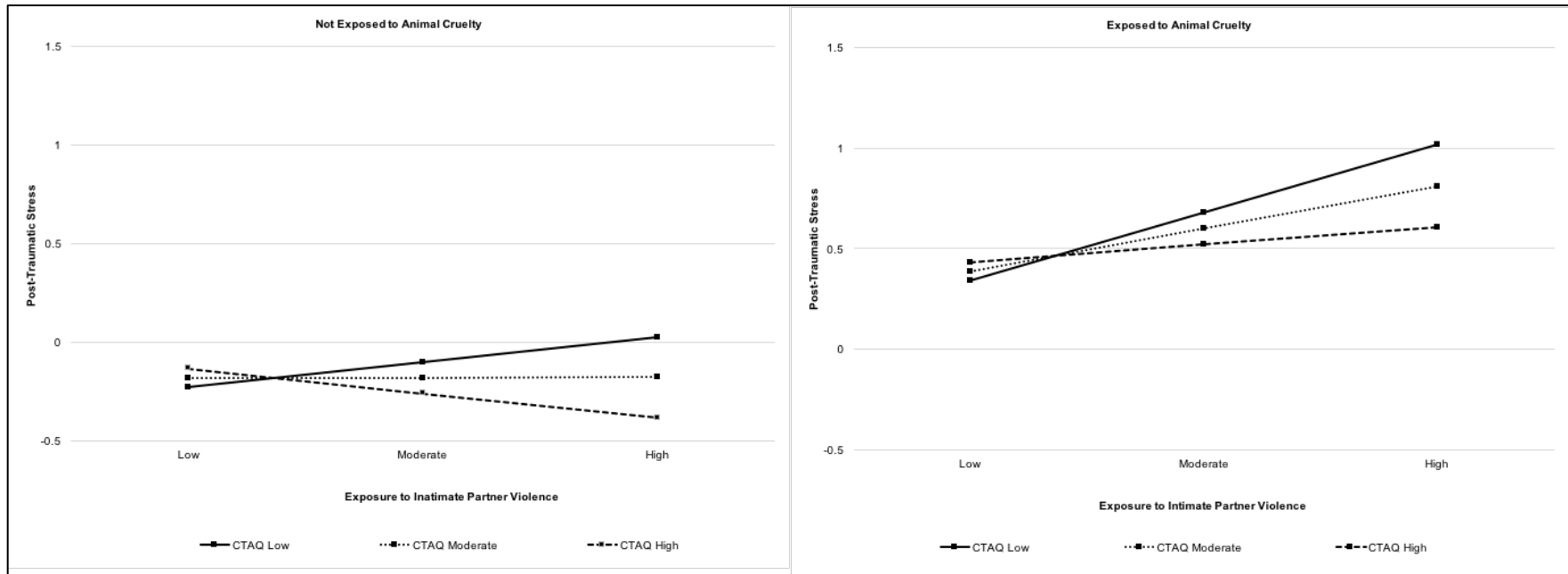
Figure 3. Conditional effect of exposure to intimate partner violence on posttraumatic stress symptoms as a function of children's positive engagement (PE) with pets and exposure to animal cruelty (*N* = 204).