

Abstract

Peer victimization (i.e., bullying) has been shown to negatively impact emotion regulation in youth and is associated with harmful mental health outcomes. One protective factor against the impacts of peer victimization is a strong attachment to family and positive peer relationships. Given that pets are commonly seen as family members and that youth report turning to their pet for emotional comfort, companion animals could provide an avenue of support for youth experiencing victimization. A subset of data ($n = 5,725$) from the Adolescent Brain Cognitive Development (ABCD) Study®, a study of brain development and youth health outcomes in the United States, was used to explore whether the relationship between peer victimization and emotion regulation was moderated by whether a pet lives in the home in a geographically diverse sample of adolescents in the United States. Pet status in the home did not moderate the relationship between peer victimization and emotion regulation, however mean level differences were present across types of pet groups. Participants who did not live with a companion animal showed higher levels of both maladaptive emotion regulation (emotion suppression) as well as adaptive emotion regulation (cognitive appraisal), suggesting that having a pet might lower overall ER pathways regardless of adaptive directionality. Relational victimization was a significant predictor of emotional suppression for youth with no pets, those with dogs, and those with non-dog pets,, while overt victimization was not a predictor of either kind of emotion regulation. This research demonstrates the complex nature of human-animal relationships and suggests more research is needed to understand the nuanced relationship between pets, peer victimization, and emotion regulation.

*Keywords:***companion animals** , peer victimization, emotion regulation

Companion animals and the relationship between peer victimization and emotion regulation in youth

Relationships between youth and their peers are vitally important to healthy development, particularly during adolescence. However, when peer aggression and victimization (i.e., bullying) occurs, youth can experience negative mental and emotional health outcomes including low self-esteem, social anxiety and depression (Adrian et al., 2019; La Greca & Harrison, 2005; McLaughlin et al., 2009; Storch et al., 2003; Tsaoasis, 2016). Emotion regulation, or the ability to change the perception, expression, and experience of affective responses (Gross, 1998), is vital to adolescent development and plays an important protective role in youth experiencing peer victimization. The ability to regulate emotions has been shown to provide a buffer against internalizing negative mental health symptoms (i.e., depression and anxiety) that are associated with peer victimization in adolescence (Cooley et al., 2020). However, victims of bullying are more likely to internalize symptoms (Casper & Card, 2017) and emotion regulation mediates certain kinds of bullying relationships (Garner & Hinton, 2010)

It is important to explore protective factors for youth experiencing peer victimization and understand how to further develop youth's emotion regulation skills. For example, strong attachment to family and positive peer relationships have been shown to be protective factors against the effects of peer victimization (Hemphill et al., 2015; Kochel et al., 2017). Another avenue for accessing similar social support and emotional comfort that is provided by family and peers may be youth-pet relationships. Pets are increasingly being seen as family members, and youth frequently report turning to their pets for emotional and social support when distressed (Melson & Schwarz, 1994). Companion animals have also been linked to support in the context of stress (Beetz et al., 2012), which suggests that pet relationships may provide a form of

psychological comfort. Because a positive association has been found between peer victimization and social support seeking (Andreou, 2001; Bijttebier & Vertommen, 1998), pet relationships should be investigated as a protective factor for youth experiencing victimization. This study aims to explore the relationship between peer victimization, emotion regulation and companion animals in order to understand if having a pet in the home could be a protective factor for youth experiencing bullying by moderating the effects of victimization on emotion regulation.

Peer Victimization and Emotion Regulation

Youth often experience three types of bullying: *relational victimization* (using one's relationship to harm another peer, such as being left out of a social interaction), *reputational victimization* (damaging reputation among peers, such as gossiping), and *overt victimization* (physical harm, such as hitting or pushing; De Los Reyes & Prinstein, 2004). The type of victimization relates to youth outcomes, as relational victimization predicts current and future social-psychological difficulties, particularly for girls (Crick & Bigbee, 1998; Prinstein et al., 2001). In a meta-analysis, Casper and Card (2017) found that relational victimization was strongly related to emotional internalization and lower levels of received prosocial behavior from peers. On the other hand, authors noted that overt victimization was more strongly associated with overt aggression. Additionally, victims of multiple forms of aggression are at greater risk for adjustment difficulties than victims of one or no form of aggression (Prinstein et al., 2001). Peer victimization can be associated with maladaptive forms of emotion regulation. For example, Adrian et al. (2019) noted that peer victimization causes increased anxiety through distinct aspects of emotion regulation (i.e., rumination). Authors noted that difficulties with behavioral regulation mediated the association between peer victimization and depression symptoms, whereas difficulties in cognitive regulation mediated the association between peer victimization

with anxiety symptoms. Additionally, Spence et al., (2009) found that youth were at an increased risk for future victimizations if they had poor emotion regulation during previous peer provocations. These harmful effects of youth bullying are not limited to childhood. Camodeca and Nava (2022) found that victimization during childhood was negatively associated with implicit emotion regulation in adulthood, suggesting that bullying at school is associated with difficulties in emotional wellbeing in adulthood. Because of the long-term impact of emotion regulation, it is crucial to understand the complex relationship between different kinds of victimization and forms of emotion regulation.

While there are different pathways to regulate emotions, two common strategies are expressive suppression (ES) and cognitive reappraisal (CR). ES is a form of response modulation that involves the inhibition of ongoing emotion-expressive behavior and is often measured by asking questions about showing or hiding emotion (Gullone & Taffe, 2012). Individuals who use ES modulation often experience negative psychological outcomes and are less successful at mood repair (Riley et al., 2019). Reluctancy to express negative emotions is associated with poor social functioning and reduces opportunities to engage in social interactions and develop skills needed to build youth relationships (Jacob et al., 2014; Riley et al., 2019). According to Larsen et al., (2012) expressive suppression is generally an ineffective emotion regulation strategy and peer victimized youth may not use suppression as a tool to prevent additional victimization in the future. Conversely, CR involves reinterpreting an emotion-eliciting situation to change its emotional impact (Gross & John, 2003; Lazarus & Alfert, 1964). Using CR to regulate emotions has been associated with healthier patterns of well-being and social functioning than using expressive suppression (Cutuli, 2014). Adaptive emotion regulation may be especially important for adolescents experiencing peer victimization because of the range of negative emotions that

stem from bullying including anger, sadness, fear, shame, and embarrassment (Camodeca & Goossens, 2005; Kochenderfer-Ladd, 2004; Mahady Wilton et al., 2000). Furthermore, effective regulation of sadness and worry was associated with decreased levels of anxiety and depression over time (Cooley et al., 2020), highlighting again the importance of emotion regulation and bullying. McClain (2020) also found evidence of a relationship between peer victimization and emotion regulation, suggesting that certain aspects of emotion regulation moderate the relationship between peer victimization and anxiety and depressive symptoms in elementary schoolers. Overall, the literature suggests a complex relationship between the different pathways of emotion regulation and peer victimization, however there is a need to understand the relationships between the sub-types of regulation (ES and CR) and victimization (overt, relational, reputational).

Companion Animals and Emotional and Social Support

Holt and Espelage (2007) reported that among adolescents involved in peer victimization, those with peer support indicated the lowest levels of anxiety and depression. This effect seems to persist into late adolescence, as Reid et al. (2016) found that overall social support moderated the association between childhood peer victimization and anxiety in the first year of college. Additionally, researchers noted that perceived family support was a protective factor against anxiety in previously bullied students (Reid et al., 2016). Pets are often considered to be family members, and may function as a source of social support that is similar to support received from family, friends, and significant others (Meehan et al., 2017). Through the development of emotionally supportive bonds, pet relationships can foster social skills (Carlisle, 2015), social connections (Mueller, 2014), and prosocial behaviors (Jacobson & Chang, 2018; Vidović et al., 1999), suggesting that they may be a resource and form of support for youth with pets that could

buffer the effects of peer victimization. In fact, a recent study by Hull et al. (2022) found that the relationship between peer victimization and mental health problems in youth was weaker for those living with a dog, suggesting that pets may play a role in mental health outcomes.

Pets are uniquely positioned to provide support for youth because of their non-judgmental nature, and youth may feel more comfortable expressing themselves with their pet. In fact, children have reported disclosing to their pet (Cassels et al., 2017), and it could be that because pets are not often involved in the conflict, youth are more likely to disclose to them. Given the complex nature of emotional regulation, it is helpful to understand how pets may impact both ES and CR, and how different forms of peer victimization (relational, reputational, overt) could relate to one another.

It is also important to explore how and in what contexts pet relationships may provide beneficial health outcomes because interactions with companion animals do not uniformly buffer anxiety and foster emotion regulation for all teenagers (Mueller et al., 2021). While pets play a key role in youth development, all pet relationships are not the same and vary based on individual relationships. Youth-pet relationships may be more important for youth who are experiencing stressors that reduce their social support (such as peer victimization). There may also be differential effects by species: youth with dogs often report stronger attachment as compared to other types of pets (Westgarth et al., 2013) which could strengthen the relational impact of these relationships. Research suggests there are also significant differences between species of pet in terms of the emotional attachment between them and their human family members (e.g., Westgarth et al., 2013; Zasloff, 1996). The effects of having a dog are often differentiated from the effects of other pets through activity levels, attachment, or other outcomes (e.g., Mein & Grant, 2018). Because of the prior literature suggesting the potential of

dog interactions to have differential impacts on youth outcomes, we are particularly interested in how dogs may moderate the relationship between peer victimization and youth.

While there is evidence in current human-animal interaction literature that pets provide emotional and social support to youth, there are also mixed results as to the health outcomes associated with pets. Matijczak et al. (2021) noted that companion animal support did not significantly moderate the relationship between microaggressions and anxiety, and participants with high or medium levels of emotional comfort from companion animals reported higher associations between interpersonal microaggressions and depressive symptoms. Furthermore, a longitudinal study by Barker et al. (2020) showed mixed results regarding internalizing symptoms and having a pet among college students, such that students growing up with pets had greater internalizing symptoms through the fourth year, and greater social support through the third year, than those without pets. Given the variability of findings surrounding pets and support, more research is needed that explores how pet relationships impact youth experiencing social stressors such as peer victimization.

The Current Study

Prior research on pets suggests that companion animals may provide social and emotional support that could buffer the effects of peer victimization on emotion regulation, however this relationship has been understudied in youth. Therefore, this study aimed to explore whether the relationship between peer victimization and both adaptive and maladaptive emotion regulation is moderated by pet status in a geographically diverse sample of adolescents in the United States. Additionally, because of the species differences associated with attachment and social support, we assessed if there were any variations in these relationships between individuals with dogs and those who only had non-dog pets. Therefore, we proposed a three-group model in which we

compared the relationship between peer victimization and emotion regulation in youth with no pets, those with at least one dog, and those who had pets who were not dogs. . Because pets could provide emotional support and youth may confide in their companion animals, we hypothesize that having a pet will moderate the relationship between relational peer victimization and emotion regulation, such that the relationship between peer victimization and emotion suppression as a form of emotional regulation will be less strong among those with companion animals compared to those with no animals, and youth with dogs will have the strongest effect (compared to non-dog pets). Similarly, we hypothesize that the relationship between peer victimization and cognitive reappraisal as a form of emotion regulation will be stronger for youth with pets compared to those without a companion animal, with the strongest relationship for youth with at least one dog.

Method

Participants & Procedure

This research used cross-sectional data from the Adolescent Brain Cognitive Development (ABCD) Study®, a longitudinal study of brain development and youth health outcomes in the United States. The ABCD Study is collecting annual and/or bi-annual physical, cognitive, social, emotional, environmental, behavioral, and academic assessments of youth over a ten-year period. A baseline cohort of 11,878 youth enrolled at 9-10 years of age, along with their parents/guardians; and participants are included in the study until they are 19 or 20 years old. Initial participants were recruited to participate in the ABCD Study between July 2016 and August 2018. Recruitment areas were determined by locations of 21 study sites (catchment areas), which closely matched the sociodemographic composition of the United States population. Within the catchment areas, participants were recruited through school-based probability sampling, where schools within each area were coded based on geographic location and sociodemographic characteristics using data from the National Center for Education Statistics and converted into databases that were used to generate lists for random selection (Garavan et al., 2018). The sample target uses a slight oversampling of racial/ethnic minority youth to ensure a demographically diverse sample. For more information on recruitment see <https://abcdstudy.org/scientists/> and Garavan et al. (2018). The data collection procedures are well documented as part of the larger ABCD Study, <https://abcdstudy.org/scientists/protocols/>. Due to the COVID-19 pandemic, most of the data collected for the 3-year follow-up of the initial cohort were collected remotely, via video chat, tablet, or telephone. ABCD Study researchers collected data related to physical health, mental health, substance use, neurocognition, culture and environment, mobile technology and other data sources, as well as biospecimens (for those

who were in-person). Pet status data were only collected during the 3-year follow up, therefore no longitudinal data are available for analyses.

This study analyzed a subset of cross-sectional survey data from the ABCD Annual Curated Release 4.0 (3-year follow up of original cohort; DOI: [10.15154/1523041](https://doi.org/10.15154/1523041)). The dataset originally contained 6,251 participants, however, 526 participants were excluded from this analysis because they had missing data on one or more of the independent variables needed for analysis. The final analytic sample was $n = 5,725$; there were no systematic differences on any of the demographic variables between the original and analytic sample and therefore data were assumed to be missing completely at random. The 4.0 data release followed up with about half of the participants from the original cohort, and it is important to note that this sample is less diverse than the original sample (49% of participants identified as white in the 2.0 data release, $n = 8,145$) (Adolescent Brain Cognitive Development, n.d).

Measures

Demographics

Youth participants reported their age (recorded in months, re-coded to years) and gender (male, female, trans male, trans female, gender queer, different, refuse to answer, don't know). Participants for this study were 52.6% ($n = 3,012$) male and 47.4% female ($n = 2,713$) (zero participants in the analytic sample selected any gender category other than male/female) and ranged in age from 11 to 14 years ($M = 12$ years, $SD = .68$). Participants' parents/guardians were also asked to identify their child's racial and ethnic identity. Due to sample sizes in the categories, racial/ethnic identity was combined into non-mutually exclusive analytic categories of white, Black/African American, Asian (Asian Indian, Chinese, Japanese, Vietnamese, Korean, Filipino), Indigenous (American Indian, Native American, Alaska Native), other race, and

Hispanic/Latinx. Overall, 80.8% ($n = 4,627$) participants identified as white, 18.7% ($n = 1,068$) as Hispanic/Latinx, 15.2% ($n = 870$) as Black/African American, 6.3% ($n = 359$) as Asian, 3.4% ($n = 196$) Indigenous, and 6.1% ($n = 352$) as other race. Parents were also asked to report combined parental income by selecting a category: less than \$5k (2.4%, $n = 140$), \$5,000 through \$11,999 (2.8%, $n = 159$), \$12,000 through \$15,999 (2.0%, $n = 114$), \$16,000 through \$24,999 (3.9%, $n = 221$), \$25,000 through \$34,999 (5.7%, $n = 327$), \$35,000 through \$49,999 (8.3%, $n = 478$), \$50,000 through \$74,999 (14.1%, $n = 807$), \$75,000 through \$99,999 (15.4%, $n = 881$), \$100,000 through \$199,999 (32.8%, $n = 1875$), and \$200,000 and greater (12.6%, $n = 723$).

Household Pets

Youth participants were asked if they currently had any pets, and if so, what kind of pet(s) did they have. Overall, 56.8% ($n = 3,254$) of the sample had a dog, followed by 31.7% ($n = 1,814$) with cats, 16.3% ($n = 932$) small animals (rabbit, Guinea pig, etc.), 10.8% ($n = 621$) fish, 5.8% ($n = 332$) ‘other’ species, and 0.9% ($n = 52$) horses. This variable is not mutually-exclusive, therefore it becomes difficult to parse out the effects of a multi-species household. Because of the strong theoretical relationship between dog interactions and emotion regulation, we have coded household pet status into three categories to specifically analyze the experience of having a dog compared to non-dog pets. Species of pet was coded into three categories: no pet (23%, $n = 1,311$); dogs, which includes participants who only have a dog *and* those who have both a dog and other animals (56.8%, $n = 3,254$), and all other pets (those who do not have a dog; 20.3%, $n = 1,160$).

Peer Victimization

Peer aggression and victimization was measured through an 18-item assessment of whether youth had experienced relational, reputational, or overt victimization (derived from

Revised Peer Experiences Questionnaire, R-PEQ; De Los Reyes & Prinstein, 2004; Prinstein et al., 2001). Participants were asked how often they experienced scenarios related to peer aggression/victimization: 1 = Never; 2 = Once or twice; 3 = A few times; 4 = About once a week; 5 = A few times a week. Only items related to victimization were utilized in this study. Overt victimization was assessed by three items: “a kid chased me like he or she was really trying to hurt me”, “a kid threatened to hurt or beat me up”, and “a kid hit, kicked, or pushed me in a mean way.” Relational victimization was also calculated as a latent variable with 3 items: “some kids left me out of an activity or conversation I really wanted to be included in”, “a kid did not invite me to a party or social event though they knew that I wanted to go”, and “a kid left me out of what they were doing”. Finally, reputational victimization was calculated as a latent variable using: “a kid tried to damage my social reputation by spreading rumors about me”, “another kid gossiped about me so others would not like me”, and “another kid said mean things about me so that people would think I was a loser.” A CFA model revealed no significant correlations between the three victimization sub-scales, as noted in Table 1. Internal consistencies for the subscales of the RPEQ normally range from .76 to .80, and are demonstrated in De Los Reyes & Prinstein, 2004.

Emotion Regulation

The Emotion Regulation Questionnaire, ERQ (Gullone & Taffe, 2012), was used to measure emotional regulation in participants. Youth were asked how strongly they agreed or disagreed with 6 statements (1=strongly disagree; 2=disagree; 3=half and half; 4=agree; 5=strongly agree). Three items assessed cognitive reappraisal (e.g., “When I want to feel less bad (e.g., sad, angry, worried) about something, I think about something different”) and 3 items assessed expressive suppression (e.g., “I control my feelings by not showing them”). Because we

are specifically interested in both ES and CR regulation, both scales were treated as separate latent variables.

Data Analysis

Mplus (version 8.8) and SPSS (version 27) were used to perform this analysis. First, all variables were analyzed for descriptive data, normality, and assumptions needed for structural regression models. Next, tests of measurement invariance (configural, scalar and metric) were performed in order to analyze the psychometric properties of the observed indicators, and if they were generalizable across the three pet groups (no pet, dog, other pet). The alignment method (Asparouhov & Muthén, 2014), a new method for multiple-group analysis, was used to estimate group-specific factor means and variances. Both FIXED and FREE were used to compare factor means across groups (Asparouhov & Muthén, 2014). An advantage of using the alignment method compared with a traditional CFA model is that the alignment method allows you to analyze latent factor means with-out requiring exact measurement invariance. Finally, in order to test our hypothesis, a multiple group (non-pets, dogs, other pets) structural regression analysis was performed with the observed pet grouping variable moderating the relationship between the latent variable peer victimization variables and the latent emotion regulation variables. Covariates for this model (included as independent variables regressed on the dependent variables) were age, gender, race/ethnicity, and parental income. The structural model conceptual diagram is shown in Figure 1.

Results

Invariance Testing and Factor Means for Peer Victimization and Emotion Regulation

Using Mplus CFA model and MODEL = CONFIGURAL METRIC SCALAR, the configural, scalar, and metric models for invariance testing of the five latent variables for peer

victimization and emotion regulation can be found in Table 1. We also used the ALIGNMENT FIXED followed by FREE method in Mplus to determine measurement invariance (Asparouhov & Muthén, 2014). Results suggested that measurement invariance was found across the three groups of household pet status for the latent variables of relational and reputational victimization, emotion suppression, and cognitive reappraisal. There was non-invariance for overt victimization for those in the dog group on one item: "a kid chased me like he or she was really trying to hurt me".

Factor mean comparisons across the three groups (non-pets, dogs, other pets) for latent variables can be found in Table 2. Youth that did not own pets had significantly higher emotion suppression means compared to youth with non-dog/other pets. Mean cognitive reappraisal was also significantly higher for youth with no pets compared to those with non-dog/other pets.

Peer Victimization as a Predictor of Emotion Regulation

The structural regression model fit these data well ($\chi^2 [631] = 2130.964, p < .001, CFI = 0.947, RMSEA = 0.035, SRMR = 0.036$). Relational victimization was a significant predictor of emotional suppression for all three groups. Reputational victimization was a significant predictor of emotional suppression for only youth with dogs ($\beta = 0.088, p = 0.045$), but not for the non-pet or other pet groups. Overt victimization did not predict emotional suppression for any of the groups. Relational, reputational, and overt victimization also did not predict cognitive reappraisal for any of the three groups. See Table 3 for full results. When looking at R^2 values, 11.3% ($p < .001$) of the variation in ES could be explained by the model for youth with no pets, 7.4% for those with dogs ($p < .001$) and 5.7% ($p < .001$) for youth with other pets. On the other hand, for CR, only those in the no-pet group had a small statistically significant amount of variation explained by the model (2.2%, $p = .043$). The model did not significantly explain variation in CR

for youth with dogs or other pets.

In order to test the hypothesis that having a pet would be a moderator of the relationship between peer victimization and emotion regulation, we ran a second fully constrained structural equation model with equal paths across the three groups. The fully constrained model also fit well, ($\chi^2 (679) = 2178.727, p < .001, CFI = 0.947, RMSEA = 0.034, SRMR = 0.037$). The difference in Chi-square between the two models was not significant ($\chi^2 = 47.763, df = 48, p = .483$), suggesting that there is no moderation effect of pet status.

Discussion

The purpose of this study was to explore the relationship between having a companion animal in the home, peer victimization and emotion regulation among youth in the United States. As expected from prior literature, relational peer victimization predicted higher expressive suppression across all youth, suggesting bullying that involves interpersonal conflict may put youth at risk for maladaptive emotion regulation. However, there was no relationship between peer victimization and cognitive reappraisal, suggesting that bullying may not relate as directly to adaptive emotion regulation strategies. Furthermore, contrary to our hypothesis, having a pet did not moderate the relationship between peer victimization and emotion regulation.

No significant moderation was found for youth with no pets, youth with dogs, and youth with other-pets regarding the overall relationship between peer victimization and emotion regulation. This could be because the relationship between relational peer victimization and expressive suppression is strong and effects of dogs or other-pets are not detectable. However, while this study did not find strong evidence for pets as a protective factor against peer victimization, findings do suggest some nuanced differences in experiences of both peer victimization and use of emotion regulation strategies between youth with pets and those with no

pets that require future investigation. Because relational victimization is a strong predictor of emotion suppression, the relationship quality between youth and their pet could be a mediating factor in emotional response. It could be that the strength of the youth-pet bond could play a valuable role, and as Hull et al. (2022) suggests, the perceived support from the family pet may buffer peer victimization. Future research should investigate the specific interactions within the youth-pet relationship in order to determine in what context having a companion animal may be beneficial to youth development.

Furthermore, it is possible that there are more nuanced relationships between companion animal support, victimization, and emotion regulation where the effects of pets may differ based on whether youth have other types of supports or lack emotion regulation skills. For example, the support provided by pets could be particularly important if a child is unable or unwilling to turn to friends or family due to negative interactions and/or has suppressive tendencies. In an adult population, Kurdek (2009) found participants with limited self-disclosure were more likely to rate dogs more favorably than a number of humans in their social network; as such, those individuals who may not be comfortable sharing personal information with other humans, may be comfortable sharing that information with their pet dogs. Furthermore, in a study of adult responses from romantic partners to emotional expression, Kane et al. (2019) found that interpersonal emotional expression through partner support benefits people that do not typically cope by expressing their feelings, therefore it could be that pets could play a similar supportive role in a participant's life. This type of compensatory relationship has not been well explored in the context of companion animals, though recent research did not find support for pets compensating for poor peer relationships (Kerns et al., 2023).

Additionally, for youth with dogs, reputational victimization was a significant predictor of emotion suppression, but this relationship was not significant for youth with no pets or other pets. This suggests that there could be a unique relationship between reputational victimization and having a dog, which, contrary to our hypotheses, could be problematic and not protective. However, given the lack of an overall moderation effect, this finding should be interpreted with caution and explored in future research to see if it replicates.

Overt victimization was not a significant predictor of any form of emotion regulation, which could indicate that physical bullying may have different developmental impacts than relationship and reputational damage. Our findings are contrary to Kochenderfer-Ladd (2004) which suggests that regardless of the type of victimization, youth engage in similar patterns of emotion processing. It may be that the types of peer victimization that are interpersonally-focused are tied more strongly to emotion regulation than physical conflict, or that this type of bullying is associated with more intervention by parents and teachers.

Mean Level Differences

While pets did not moderate the relationship between peer victimization and emotion regulation, there were mean-level differences across pet categories in both peer victimization and emotion regulation separately. Youth with pets (both dogs and other pets) reported experiencing significantly higher relational victimization than youth that do not own pets. While there is no theoretical or practical reason to expect having a pet would cause youth to experience victimization from peers, prior research has suggested a relationship between mental health challenges and pet status (Duvall Antonacopoulos & Pychyl, 2010; Hartwig & Signal, 2020). One possible explanation for this finding could be that pets are acquired by families as a strategy to help youth cope with complex emotions they may experience due to stressed peer relationships.

Another reason for this finding could be the perception of aggression among peers is different between youth with pets and those without pets. If youth are developing empathy as a correlate of having a companion animal (Daly & Morton, 2006; Vidović et al., 1999) that may influence the way in which they are interpreting peer interactions. Future longitudinal research is needed to disentangle the complex aspects of these relationships.

Participants that did not own a pet had significantly higher levels of both emotion suppression and cognitive reappraisal compared to other pets; however, youth with dogs were not statistically different from either group. This finding suggests that some types of pet interactions could be protective against emotion suppression; perhaps youth are finding an outlet for emotional disclosure with some of their pets. These findings are similar to prior research in which youth reported pets as a source of confidants for secrets and ranked them higher than certain kinds of human relationships (McNicholas & Collis, 2001). While much of the existing human-animal interaction literature has focused on dogs, our findings suggest that contrary to our hypothesis, cats and other small animals could play a unique role that has been under-explored. For example, perhaps youth have more individual relationships with smaller pets as compared to a family dog who interacts with multiple family members. It could also be the case that youth turn to dogs for more comfort-seeking support as compared to emotional disclosure. The nuances that emerged in these relationships provide a fruitful direction for future research, as non-dog pets, especially cats, have been historically understudied in human-animal interaction research.

Interestingly, youth without a pet showed higher levels of both maladaptive emotion regulation (emotion suppression) as well as adaptive emotion regulation (cognitive appraisal), suggesting that having a companion animal might lower overall ER pathways regardless of

adaptive directionality. Because pet relationships are more directly conducive to social and emotional support, comfort-seeking, and distraction as adaptive coping strategies, they may be less clearly linked to cognitive reappraisal. It could be the case that youth with a pet are using these other, more emotional/social support strategies as compared to cognitive reappraisal. This finding warrants further exploration, particularly with longitudinal studies that measure multiple types of emotion regulation and adaptive coping strategies.

Results of this study also suggest that the type of peer victimization youth experience is an important factor in how they regulate their emotions. As previously noted, relational victimization is an excellent predictor of ES regardless of whether a youth has a pet. This could indicate that relational victimization (e.g., some kids left me out of an activity or conversation I really wanted to be included in) is an important indicator of mental/emotional health for youth. This finding is similar to Casper and Card (2017) in which researchers found that relational victimization was associated with internalization of emotion. Including internalized symptoms of mental health (i.e depression, anxiety), in a future longitudinal study would be instrumental in understanding if an interaction between companion animals and emotion regulation can protect against internalizing symptoms for youth experiencing peer victimization.

Finally, the rate of companion animals pet ownership for households with adolescents was about 77%, suggesting that homes with children are more likely to have pets than the national average in the United States (57% to 70% of US households; American Pet Products Manufacturers Association, 2021; American Veterinary Medical Association, 2018). This finding is similar to a UK study in which households with children were more likely to have pets (Westgarth et al., 2010). The sheer number of pets living and interacting with children in the United States indicates a need for research highlighting the role of the human-animal bond in

youth development.

Limitations and Future Directions

This study has a large sample size of youth from across the United States, however there are still limitations to this dataset. This sample is lacking racial and ethnic diversity, therefore future studies should develop a broader sampling frame to highlight the developmental experiences of all youth. Next, because this was a retrospective study on pre-existing data, we only have one pet item available to analyze regarding companion animals in the home. It was also challenging to categorize participants based on species of companion animals, as many youth had multiple animals living in the home. Additionally, these data were cross-sectional in nature therefore no causal inferences can be made about the relationships with these variables. Longitudinal data that contains information on youth personality, relationship quality, pet acquisition, and length of time the pet has lived in the home could be an important next step in understanding the complexities in how companion animals interact with emotion regulation in youth experiencing peer victimization. There is also evidence that dysregulation of emotion is related to future peer victimization (Shields & Cicchetti, 2001; Spence et al., 2009) therefore, future longitudinal data should explore the long term relationship between these two constructs.

Furthermore, the measures used to ask participants about emotional suppression did not specify if the participant was hiding/not showing emotions specifically to humans, pets, or both. Future research should investigate what emotions youth may suppress and not show to other humans, but express to their pets, in light of prior work showing that youth may be more likely to disclose to pets. Moreover, the constructs of peer victimization can often be related to one another. For instance, reputational victimization could also be damaging to one's relationships. Clearly articulating the differences in victimization constructs and how they are measured is an

important consideration of future research that includes differential hypotheses for each type of victimization. Finally, these data were collected during the COVID-19 pandemic, which could have limited peer interactions and potentially peer victimization. As longitudinal data for the ABCD study are released, it will be important to study peer victimization and emotion regulation over time to better understand confounding factors of COVID-19.

Conclusion

This research demonstrates the complex nature of human- animal relationships and the need for more research in youth development. Our findings suggest that relational victimization is a strong predictor of emotion suppression, while overt victimization is not a predictor of emotion regulation in youth. While pet status did not moderate the relationship between peer victimization and emotion regulation, mean level differences were present across pet type groups. Pets could be protective for maladaptive emotion regulation, demonstrated by youth with no pets having higher levels of maladaptive emotional suppression. Youth with dogs seem to be differentially impacted by reputational victimization since there is a relationship between reputational victimization and emotion suppression for youth with dogs only. This study further supports the need for more longitudinal research on youth with pets in order to understand the nuanced relationship between child development and the human-animal bond.

References

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Table 1*CFA Invariance Model Testing for Peer Victimization and Emotion Regulation Latent Variables*

	Number of Parameters	<i>df</i>	χ^2	<i>p</i> -value
Configural	165	240	1048.83	<.001
Metric	145	260	1097.98	<.001
Scalar	125	280	1126.29	<.001
Models Compared				
Configural vs Metric	-	20	49.15	<.001
Configural vs Scalar	-	40	77.47	<.001
Metric vs Scalar	-	20	28.31	.10
Sub-Scale Correlations		Estimate	S.E.	<i>p</i> -value
Reputational with Relational	-	.670	.011	<.001
Overt with Reputational	-	.517	.014	<.001
Overt with Relational	-	.695	.011	<.001
Reappraisal with Suppression	-	.304	.016	<.001

Table 2*Latent Variable Means as Estimated by Alignment Method*

	Relational	Reputational	Overt	Suppression	Reappraisal
Dogs ^a	0.400* ^c	0.359* ^c	0.611	0.166	-0.861
Other pets ^b	0.368* ^c	0.350	0.572	0.109* ^c	-0.935* ^c
No pet ^c	0.216	0.274	0.563	0.242	-0.797

* Denotes a statistically significant difference at the $p < .05$ significance level with the corresponding group denoted by that letter.

Table 3*Standardized Coefficients: Emotion Regulation Regressed on Peer Victimization*

	No Pets			Dogs			Other Pets		
	β	SE	p	β	SE	p	β	SE	P
Suppression									
Relational	0.114	0.054	0.034	0.112	0.033	0.001	0.173	0.060	0.004
Reputational	0.117	0.073	0.107	0.088	0.044	0.045	0.021	0.067	0.757
Overt	-0.047	0.067	0.487	0.052	0.039	0.174	0.030	0.057	0.602
Reappraisal									
Relational	0.084	0.056	0.132	0.046	0.034	0.182	0.038	0.061	0.528
Reputational	0.081	0.075	0.277	0.017	0.045	0.704	<0.001	0.068	1.000
Overt	-0.094	0.069	0.169	-0.019	0.039	0.637	-0.026	0.058	0.659

Figure 1*Emotion Regulation Regressed on Peer Victimization: Structural Equation Model Diagram*