Bidirectional associations between affective empathy and proactive and reactive aggression

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Abstract
Preliminary evidence indicates that affective empathy is differentially related to proactive and reactive functions of aggression. However, additional longitudinal research is needed to understand the potential reciprocal nature of these links. The current study examined the bidirectional associations between affective empathy and proactive and reactive aggression over a 6-month period during middle childhood, with attention to potential gender differences. Data were collected from 294 elementary school children (52% girls; M = 9.25 years; SD = 0.944 years) and their homeroom teachers. Affective empathy was assessed using self-reports, and teachers provided ratings of children's functions of aggression. Data were collected during the fall and spring of one academic year. Overall, results suggest some evidence that affective empathy and functions of aggression are reciprocally linked over time. As predicted, Time 1 empathy was inversely associated with Time 2 proactive aggression and Time 1 reactive aggression was inversely associated with Time 2 empathy. Contrary to expectations, Time 1 proactive aggression was marginally positively associated with Time 2 empathy, and Time 1 empathy was not significantly associated with Time 2 reactive aggression. These prospective links did not differ according to gender. Implications and directions for future research are discussed.

KEYWORDS
affective empathy, middle childhood, proactive aggression, reactive aggression

A robust amount of research has demonstrated that empathy and aggression are closely related constructs (e.g., Eisenberg, Eggum, & Di Giunta, 2010). However, previous studies have used overly broad and inconsistent conceptualizations of both aggression and empathy (e.g., Konrath, O’Brien, & Hsing, 2011; Lovett & Sheffield, 2007), and few longitudinal studies have evaluated whether aggression and empathy are bidirectionally linked. Aggression is a complex construct, composed of distinct functions (i.e., proactive and reactive), which differ in their underlying motivations, behavioral manifestations, and emotional reactivity (Bandura, 1973; Berkowitz, 1993; Dodge & Coie, 1987). Preliminary evidence suggests that empathy may be differentially associated with each function of aggression (e.g., Euler, Steinlin, & Stadler, 2017; Stavrinides, Georgiou, & Theofanous, 2010).

Thus, the current study examines possible bidirectional links between affective empathy and proactive and reactive aggression during middle childhood, with attention to potential gender differences.

1 | EMPATHY AND AGGRESSION

While several definitions of empathy have been proposed (Eisenberg et al., 2010; Konrath et al., 2011; Lovett & Sheffield, 2007), the current study defines empathy as understanding or experiencing an emotional state that is very similar to what another person may be feeling or expected to feel given the context (Eisenberg, Fabes, Schaller, Carlo, & Miller, 1991; Hosking & Walsh, 2005). Two forms of
empathy include cognitive empathy and affective empathy (Decety & Jackson, 2004; Eisenberg & Eggum, 2009). Cognitive empathy is the ability to comprehend how someone would be expected to feel (Jolliffe & Farrington, 2006) and includes understanding the perspective of someone else (Davis, 1980). Research on associations between cognitive empathy and aggression are mixed (i.e., null, positive, and negative; e.g., Eisenberg et al., 2010). Researchers have suggested that when positive associations between cognitive empathy and aggression are found it may be due to aggressive individuals “faking good” on empathy assessments or to callous–unemotional (CU) traits of aggressive individuals, which enable them to conceptually understand, but not care about, how another person is feeling (Eisenberg et al., 2010). Affective empathy refers to feeling the emotions that one would be expected to experience in a situation (Jolliffe & Farrington, 2006) and inverse associations between affective empathy and aggression have been found in individuals two through 18 years of age (e.g., Euler et al., 2017; Ostrov, Murray-Close, Godleski, & Hart, 2013).

Aggression and empathy may be negatively related due to the inhibitory effects of affective empathy (Eisenberg et al., 2010; Hosking & Walsh, 2005; Lovett & Sheffield, 2007). That is, experiencing another’s emotions impacts one’s behavior towards them (Eisenberg et al., 2010). When people who typically aggress receive feedback on their victims’ negative emotions, these cues produce inhibition of further aggression (Feshbach & Feshbach, 1969; Mehrabian & Epstein, 1972). In contrast, individuals who experience low levels of affective empathy tend to be more aggressive. For example, Hosking and Walsh (2005) found that a key trait in physical aggressors (i.e., rapists, murderers, wife batters) was a lack of affective empathy. In addition, in Spanish adolescents (mean age 12.28 years), affective empathy predicted lower levels of physical and verbal aggression 1 year later (Carlo, Mestre, Samper, Tur, & Armenta, 2010).

Although substantially less studied, aggression may also precede the development of empathy (e.g., Stavrinides et al., 2010). While empathy is posited to be a learned response which is typically first modeled to children through their caregivers’ response to their distress (Hosking & Walsh, 2005), research in early childhood suggests that several individual characteristics associated with aggression (e.g., cognitive and language development and fearful or negative temperament) also predict empathy levels (van der Mark, van Uzendoorn, & Bakermans-Kranenburg, 2002; Moreno, Klute, & Robinson, 2008). Taken together, it is likely that aggression and the individual characteristics associated with it (e.g., negative temperament) make it more difficult for children to elicit empathy responses from their parents (e.g., Kiang, Moreno, & Robinson, 2004; Lorber, Del Vecchio, & Slep, 2015). Given that empathy and aggression both begin to emerge around age 2 (Eisenberg et al., 2010; Piquero, Carriaga, Diamond, Kazemian, & Farrington, 2012) and that caregivers can experience difficulty forming a positive bond with a child who exhibits high levels of aggression (Lorber et al., 2015), it may be that aggressive children have difficulty eliciting empathy from their parents, and, therefore, have fewer opportunities by which to learn how to respond empathetically.

Moreover, children who either had fewer opportunities to develop empathy or were less receptive to empathy modeling may be more likely to learn that aggressive behavior is adaptive and rewarding due to their behavioral inhibition system (BIS) and behavioral activation system (BAS; Gray, 1972; Beaver, Lawrence, Passamonti, & Calder, 2008). The BIS/BAS model of behavior (Gray, 1972) posits that individuals vary on their responsiveness to punishment and frustrated nonreward (i.e., BIS) and their responsiveness to reward and novelty (i.e., BAS). Therefore, children who are highly sensitive to reward and novelty (i.e., BAS) and low on responsiveness to punishment (i.e., BIS) may find the positive results of their aggression particularly rewarding and negative consequences of aggression (e.g., affective empathy with victims) easy to endure (e.g., Beaver et al., 2008; Harmon-Jones & Peterson, 2008; Smits & Kuppens, 2005). Furthermore, aggressive individuals may be motivated to continue to reduce feelings of empathy over time. Alternatively, aggression in children may develop as a learned response to perpetually perceiving their environment as hostile and threatening via maladaptive social information processing (SIP; Crick & Dodge, 1996; Dodge, 2006). This framework suggests that aggressive children are more likely to develop negative biases towards others (Crick & Dodge, 1996), which eventually leads to reduced affective empathy. Notably, traits like high reactivity, poor regulation skills, and CU traits may differentially increase the likelihood that children learn to use aggression as a way to achieve desired outcomes (i.e., proactive aggression via BIS/BAS) or to adopt aggression as a defensive response (i.e., reactive aggression via maladaptive SIP; Degnan, Calkins, Keane, & Hill-Soderlund, 2008; Frick & White, 2008).

2 | THE IMPORTANCE OF MIDDLE CHILDHOOD

The relationship between affective empathy and aggression is different during distinct developmental periods, potentially due to differences in perspective-taking and emotional maturity (Eisenberg et al., 2010; Lovett & Sheffield, 2007). Lovett and Sheffield (2007) found that associations between general aggression and affective empathy were unstable in early childhood (i.e., ages 3–7 years), with consistent negative associations emerging in middle childhood (i.e., ages 8–12 years) which then remained stable through adolescence (i.e., ages 12–18 years). Most of the research on these constructs have examined early childhood and adolescent samples (Lovett & Sheffield, 2007); however, middle childhood is an important period to examine because it is a critical time for the development of affective empathy and aggression (Eisenberg et al., 2010; Piquero et al., 2012).

While affective empathy is characterized by its emotional component, it requires emotional maturity and advanced cognitive skills which may not be developed until middle childhood (Eisenberg et al., 2010; Hughes, Tingle, & Sawin, 1981; Strayer, 1993). In addition, children’s ability to experience affective congruence with others (and to experience this in a nonegocentric manner) significantly increases from early to middle childhood (i.e., age 5 to ages 7–8; Strayer, 1993). Moreover, at the onset of middle childhood youth become aware of the factors that are involved in others’ emotional
experiences (e.g., perspectives; Hughes et al., 1981). Therefore, affective empathy may first become a truly examinable construct in middle childhood.

In their review of the developmental trajectories of aggression, Piquero et al. (2012) found that most children steadily decline in aggression during early childhood. However, in middle childhood aggression trajectories demonstrate significant variability: approximately one-third exhibit stable, high levels of aggression, one-third exhibit stable, low levels of aggression, and other children exhibit changing levels of aggression (Piquero et al., 2012). Notably, individual and environmental risk factors (e.g., inattentiveness, impulsivity, and problematic homelife) play a large role in aggression levels during this time period (Piquero et al., 2012). Therefore, understanding risk and protective factors that exacerbate or mitigate aggression in middle childhood, such as empathy, may be particularly important.

3 | BIDIRECTIONAL ASSOCIATIONS BETWEEN AFFECTIVE EMPATHY AND PROACTIVE AGGRESSION

Proactive aggression is the controlled use of aggression to attain a goal (Dodge & Coie, 1987) and can be explained by the social-cognitive learning theory, which suggests that aggression is adopted by those who find it adaptive (Bandura, 1973). Previous research and theory suggest that affective empathy is negatively associated with subsequent proactive aggression (Eisenberg et al., 2010; Mehrabian & Epstein, 1972; Stavrinides et al., 2010). The controlled, planful nature of proactive aggression suggests that potential aggressors have time to reflect on the positive and negative outcomes of their potential actions (e.g., attaining a goal vs. harming a victim) before they aggress (Bandura, 1973). Thus, high levels of affective empathy may discourage children from engaging in proactive aggression because they can reflect on (and may wish to avoid) the negative experience of affective congruence with potential victims (e.g., negative emotions; Decety & Ickes, 2009; Decety & Moriguchi, 2007). Similarly, low levels of affective empathy may precede high levels of proactive aggression, as an individual who experiences low levels of affective empathy (perhaps due to global deficits in affective congruence) is unlikely to experience affective congruence with their victims but would experience the rewards of proactive aggression (i.e., goal attainment). Therefore, a lack of affective empathy may serve to exacerbate proactive aggression in children. Indeed, previous cross-sectional research in youth aged 11-18 consistently demonstrates that affective empathy and proactive aggression are negatively associated (e.g., Espelage, Mebane, & Adams, 2004; Euler et al., 2017). Furthermore, longitudinal studies have shown that low levels of affective empathy predict higher levels of proactive aggression in children aged 2-11 years (Deschamps, Verhulp, de Castro, & Matthys, 2018; Ostrov et al., 2013; Stavrinides et al., 2010).

Alternatively, high levels of proactive aggression may be associated with affective empathy through aggressive children learning to repress empathic responses. Following the BIS/BAS model of behavior (see above; Gray, 1972), children who are highly receptive to the rewards of their aggressive behavior may work to reduce the “punishing” feelings that may accompany experiencing affective empathy with victims (e.g., guilt; Harmon-Jones & Peterson, 2008; Smits & Kuppens, 2005). Thus, the salience of the reinforcement of aggression may motivate proactively aggressive children to repress feelings of affective empathy over time. Unfortunately, the potential influence of proactive aggression on affective empathy has been understudied. One cross-sectional study found that proactive aggression was associated with fewer empathy responses in fourth and sixth graders (Katsuma & Yamasaki, 2008). Similarly, a longitudinal investigation in sixth graders demonstrated that proactive aggression was negatively associated with affective empathy (Stavrinides et al., 2010). Finally, retrospective studies have found that proactive aggressors do not feel empathy for their victims in school-age children as well as adult samples (Fernandez & Marshall, 2003; Olweus, 1993); however, it is important to note that the aggressors only lacked feelings of empathy for their specific victims. Therefore, they may have learned to repress empathy specifically when it was adaptive to them.

4 | BIDIRECTIONAL ASSOCIATIONS BETWEEN AFFECTIVE EMPATHY AND REACTIVE AGGRESSION

Reactive aggression is the impulsive use of aggression in response to a perceived threat (Dodge & Coie, 1987) and can be explained by the frustration-aggression theory, which states that a barrier or threat to expected goal attainment instigates impulsive, emotional aggression (Berkowitz, 1993). Reactive aggression may be learned via maladaptive SIP (see above; Crick & Dodge, 1996; Dodge, 2006), which contributes to reactive aggression through the development of hostile schemas that make aggressive responses easily available (Dodge, 2006). Reactive aggression is characterized by emotional overarousal (Dodge & Coie, 1987) and negative valence increases the likelihood of reactive aggression (Berkowitz, 1993; Dodge, 2006).

High levels of affective empathy may precede increases in reactive aggression. Children can experience affective empathy in a way that is personally distressing and accompanied by excessive negative emotions (Eisenberg et al., 2010). Therefore, experiencing high levels of affective empathy may contribute to emotional overarousal and negative valence, which results in a greater likelihood that youth will engage in reactive aggression (likely towards another third party). Research on associations between affective empathy and reactive aggression is mixed and may vary based on the age and characteristics (e.g., emotion regulation skills) of the sample (Deschamps et al., 2018; Euler et al., 2017; Pouw, Rieffe, Oosterveld, Huskens, & Stockmann, 2013). Euler et al. (2017) found that affective empathy was not associated with reactive aggression in a sample of highly aggressive adolescents (mean age 15.6 years). Conversely, Pouw et al. (2013) found a negative association between affective
empathy and reactive aggression in typically developing youth, but a positive association between reactive aggression and affective empathy in youth with autism spectrum disorder (mean age 11.6 years). In contrast, a longitudinal study of 6- to 7-year-old children found a null relationship between affective empathy and reactive aggression (Deschamps et al., 2018).

On the other hand, the manner in which reactive aggression is learned and employed muddles whether reactive aggression is linked to affective empathy over time. Unlike proactive aggression, which is adopted because it is rewarding, reactive aggression develops due to maladaptive SIP (Dodge, 2006). It is possible that as reactive aggression becomes embedded in one’s cognitive schema and increasingly available as a response (Dodge, 2006), individuals may develop universal negative perceptions of peers and gradually decline in their level of affective empathy. Unfortunately, research on the influence of reactive aggression on empathy is limited, with the majority of studies only examining how empathy predicts reactive aggression. Only one cross-sectional study was identified, which found significant associations between proactive, but not reactive, aggression and empathy in fourth and sixth graders (Katsuma & Yamasaki, 2008).

5 | GENDER AS A POTENTIAL MODERATOR

The need to consider potential gender differences in the association between affective empathy and aggression has recently been highlighted (Deschamps et al., 2018; Euler et al., 2017). Previous studies have shown girls exhibit higher levels of affective empathy than boys (ages 4–16 years; Dadds et al., 2006; Euler et al., 2017; Jolliffe & Farrington, 2006; Stavrinides et al., 2010), and boys exhibit higher levels of proactive and reactive aggression than girls (ages 9–14 years; Mayberry & Espelage, 2007; Rieffe et al., 2016; Salmivalli & Nieminen, 2002). Boys may be more likely to exhibit inverse bidirectional associations between affective empathy and proactive aggression because of their increased aggression and lower empathy levels (see above). In contrast, girls may be more likely to experience their higher levels of affective empathy aversively during the interpersonal conflict with peers, thereby priming them to engage in increased reactive aggression. It is also possible that boys who exhibit higher levels of reactive aggression are more likely to develop universal negative perceptions of peers and show decreases in affective empathy over time. However, gender differences in the links between empathy and specific functions of aggression have been understudied to date due to sample size and power limitations (Deschamps et al., 2018; Ostrov et al., 2013). While one cross-sectional study was identified, it found that the gender distribution did not differ between clusters of adolescents with elevated reactive and/or proactive aggression (mean age 15.6 years; Euler et al., 2017). Similarly, other investigations, which examined aggression and empathy more broadly, found associations are not moderated by gender in youth aged 11–15 years (Carlo et al., 2010; Jolliffe & Farrington, 2004; Stavrinides et al., 2010). Thus, additional work is needed to evaluate whether gender impacts potential bidirectional associations between the constructs.

6 | THE CURRENT STUDY

The current study examined bidirectional associations between empathy and proactive and reactive aggression, and potential gender differences, over a 6-month period in middle childhood. Examining bidirectional associations during middle childhood is important, as few prospective studies have been conducted during this developmental period and it marks a critical time in aggression and empathy development (Eisenberg et al., 2010; Lovett & Sheffield, 2007; Piquero et al., 2012). Previous work has demonstrated negative associations between affective empathy and proactive aggression (e.g., Espelage et al., 2004; Euler et al., 2017). Thus, in the current study, we expected that low levels of Time 1 affective empathy would be associated with high levels of Time 2 proactive aggression, and high levels of Time 1 proactive aggression would be associated with low levels of Time 2 affective empathy, especially among boys. Previous research on reactive aggression and affective empathy is limited and the existing research is mixed (e.g., Euler et al., 2017; Pouw et al., 2013). However, in the current study, we expected that high levels of Time 1 affective empathy would predict high levels of Time 2 reactive aggression, especially among girls, and that high levels of Time 1 reactive aggression would predict low levels of Time 2 affective empathy, especially among boys.

7 | METHOD

Participants included 294 elementary school children (52% girls) in Grades 3 through 5 (M = 9.25 years, SD = 0.944 years) and their teachers (n = 17). The same teachers reported on the same children’s aggression at both time points. Data were collected at a rural elementary school in the Midwestern United States. Students were eligible to participate in the study if they were in third to fifth grade and were not receiving special education services that precluded them from participating in the mainstream classroom. Approximately 76% of eligible students participated in the study. School records data indicated that approximately 40% of students received free or reduced-price lunch and approximately 90.9% of students identified as Caucasian. The school was located in a community with an average per capita income of $25,369, with 5% of individuals living below the federal poverty line, and the primary language spoken at home was English (U. S. Census Bureau, 2010).

7.1 | Measures

7.1.1 | Affective empathy

Children completed six items assessing affective empathy (e.g., “When I see someone being picked on, I feel kind of sorry for them”) using a 3-point Likert scale (1 = Not Like You to 3 = Really Like You; Spinrad et al., 1999). The measure is a version of the Empathic Concern subscale from the interpersonal reactivity index.
(Davis, 1980), which was adapted for children (Eisenberg et al., 1991; Spinrad et al., 1999). This scale has demonstrated good psychometric properties in previous samples (e.g., Eisenberg et al., 1991). Current internal consistencies were acceptable at both time points ($\alpha = .73$ and $.78$).

### 7.1.2 Proactive and reactive aggression

Teachers completed the Proactive/Reactive Aggression Scale (Dodge & Coie, 1987) using a 5-point Likert scale (1 = Never to 5 = Almost Always). Three items on the scale assess proactive aggression (e.g., “Gets other kids to gang up on somebody that he/she does not like”) and three assess reactive aggression (e.g., “When teased or threatened, gets angry easily and strikes back”). The measure has previously demonstrated good psychometric properties (Dodge & Coie, 1987; Fite, Evans, Pederson, & Tampke, 2017). Internal consistencies for both functions were acceptable at both time points ($\alpha = .78$ and $.85$ and $\alpha = .93$ and $.95$, respectively).

### 7.2 Procedure

The researchers’ institutional review board and the elementary school’s administrators approved all study procedures. Parents provided consent for their children’s participation in back-to-school packets. Teachers provided written consent for their participation. Student and teacher data were collected in November 2014 (Time 1) and April 2015 (Time 2). Time 1 data were collected 2 months after the start of the school year, so teachers were familiar with students.

Student data collection occurred in classrooms during 30-min sessions. A child verbal assent was obtained before each data collection session. Teachers, children who lacked consent, and children who denied assent were not present in the classrooms while data were collected to facilitate accurate responding. A research assistant read items aloud while other research assistants walked around the classroom to answer questions and manage behavior. Children received pencils for participating. Data from teachers were collected via online surveys within 2 weeks of student data collection. Teachers reported on 17–24 students and were paid $50 for completing all student measures and $25 for completing a portion of student measures.

### 7.3 Data analysis

Data were analyzed utilizing a panel design with autoregressive and cross-lagged paths via Mplus software (Muthén & Muthén, 2001). Grade and gender were included as covariates in the models, as demographic differences in aggression and empathy have previously been found (e.g., Dadds et al., 2008; Rieffe et al., 2016). All variables were standardized before analyses to aid in the interpretation of effects. Skewness and kurtosis of variables at Time 2 (see Table 1) fell within the range recommended by Kline (2011). Models were estimated using full information maximum likelihood estimation, which accommodated the minimal amount of missing data at Time 2 (i.e., 1%). Note that this approach has been found to be more efficient and less biased than other missing data techniques (Arbuckle, 1996; Kline, 2011).

A main effects path model was initially estimated to examine the cross-lagged associations between empathy and functions of aggression. This model was fully saturated, with no degrees of freedom; therefore, goodness-of-fit indices are not reported. To test for gender differences, an unconstrained multiple group model was estimated. Next, each of the paths (i.e., Time 1 empathy to Time 2 proactive aggression) were sequentially constrained to be equal across gender, and nested model comparisons were conducted to determine whether adding each constraint resulted in a significant decrement in model fit.

### 8 RESULTS

#### 8.1 Descriptive statistics

Descriptive statistics and bivariate correlations between study variables are presented in Table 1. Gender was correlated negatively with both functions of aggression and positively with empathy at both time points, such that boys demonstrated higher levels of aggression and girls demonstrated higher levels of empathy. Grade was positively correlated with Time 1 empathy, with older children demonstrating higher levels of empathy. Both forms of aggression were positively correlated within and across all time points. At Time 2, empathy was positively correlated with proactive aggression. Dependent sample t-tests indicated mean levels increased from Time 1 to Time 2 for proactive aggression ($t_{292} = 3.346; p = .005$), reactive aggression ($t_{292} = 2.824; p = .001$), and empathy ($t_{289} = 15.679; p < .001$).

#### 8.2 Cross-lagged path models

A main effect path model was estimated to examine the associations between proactive aggression, reactive aggression, and empathy over time (see Figure 1). Neither control variable (i.e., gender nor grade) predicted Time 2 proactive aggression ($\beta =-.05; SE = 0.05; p = .33$ and $\beta = .07; SE = 0.05; p = .14$) nor reactive aggression ($\beta = -.06; SE = 0.04; p = .12$ and $\beta = -.01; SE = 0.04; p = .09$). However, gender significantly predicted empathy at Time 2 ($\beta = .13; SE = 0.05; p = .009$), such that girls were more empathetic than boys, but grade did not ($\beta = -.07; SE = 0.05; p = .17$). Proactive aggression, reactive aggression, and empathy all demonstrated stability across time. Whereas Time 1 reactive aggression was marginally positively associated with Time 2 proactive aggression, Time 1 proactive aggression was not linked to Time 2 reactive aggression. As predicted, Time 1 empathy was negatively associated with Time 2 proactive aggression. In contrast to expectations, Time 1 proactive aggression was marginally positively associated with Time 2 empathy ($p = .057$). Time 1 empathy did not
TABLE 1  Correlations and descriptive statistics

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<tr>
<td>1. T1 reactive aggression</td>
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<td>2. T1 proactive aggression</td>
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<td>3. T1 empathy</td>
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<td>-</td>
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<td>-</td>
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<td>4. T2 reactive aggression</td>
<td>0.74**</td>
<td>0.51**</td>
<td>-0.04</td>
<td>-</td>
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<td>7. Gender</td>
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<td>0.10</td>
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<td>-0.14**</td>
<td>0.21**</td>
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<td>8. Grade level</td>
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<td>0.04</td>
<td>0.17**</td>
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<td>0.08</td>
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<td>M (SD)</td>
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<td>1.18 (0.44)</td>
<td>2.57 (0.44)</td>
<td>1.53 (0.92)</td>
<td>1.26 (0.58)</td>
<td>2.96 (0.39)</td>
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Abbreviations: T1, Time 1; T2, Time 2.
*p < .05, two-tailed.
**p < .001, two-tailed.

significantly predict Time 2 reactive aggression, but Time 1 reactive aggression was negatively associated with Time 2 empathy. Next, gender was evaluated as a moderator of these effects using a multiple-group modeling approach. Results indicated that sequentially constraining effects to be equal across boys and girls did not result in a significant decrement in model fit (χ²(2) = 2.28–4.74; ps = .09–.32).¹

9 | DISCUSSION

The current study examined prospective associations between affective empathy and proactive and reactive aggression. This study significantly advances previous work by examining the unique functions of aggression, evaluating bidirectional effects, and potential gender differences over a 6-month period, and utilizing a middle childhood sample.

Consistent with previous research utilizing teacher reports, mean levels of aggression significantly increased from fall to spring (Schaeffer, Petras, Ialongo, Poduska, & Kellam, 2003). In addition, as expected, empathy predicted lower levels of proactive aggression, and empathy and proactive aggression were negatively correlated at Time 2. These findings support our theorizing that high levels of affective empathy would result in children inhibiting proactive aggression and that children with low levels of affective empathy (perhaps due to emotional deficits) may develop increased levels of proactive aggression (Bandura, 1973; Deschamps et al., 2018; Ostrov et al., 2013; Stavrinides et al., 2010). It is also consistent with previous research demonstrating negative associations between affective empathy and proactive aggression in individuals aged 6–16 years (Deschamps et al., 2018; Espelage et al., 2004; Euler et al., 2017).

Unexpectedly, proactive aggression marginally predicted higher levels of empathy at Time 2 and concurrent associations indicated empathy and proactive aggression were not associated at Time 1. Our findings contradict previous research (Katsuma & Yamasaki, 2008; Olweus, 1993; Stavrinides et al., 2010) and theorizing that the rewards of aggression would result in empathy inhibition (Gray, 1972; Harmon-Jones & Peterson, 2008; Smits & Kuppens, 2005). However, evidence suggests some aggressors lack empathy only for their victims but do not demonstrate global empathy deficits (Brown, Walker, Gannon, & Keown, 2013; Fernandez & Marshall, 2003). Therefore, proactively aggressive children may have been able to effectively repress affective empathy only for their specific victims without decreasing their general empathy (Hawley, 2003; Sutton, Smith, & Swettenham, 1999), perhaps because of their increased emotional intelligence (Björkqvist, Österman, & Kaukiainen, 2000; Ostrov et al., 2013). Notably, further research examining empathy towards specific targets would be needed to substantiate this claim and this does not explain why global affective empathy would increase for proactively aggressive youth. Of potential significance, the year of data

¹A series of multilevel models were estimated using SAS (University Edition; SAS Institute Inc., 2014) to further evaluate the robustness of effects and aggregate the variance in each outcome that was due to mean differences between children (i.e., random intercept variance) between classrooms (i.e., random intercept variance), and within persons over time (i.e., residual variance). The direction of all results remained unchanged. However, the magnitude of the relationship between Time 1 empathy and Time 2 proactive aggression became marginally statistically significant (b = −0.11, p = .08), while the relationship between Time 1 proactive aggression and Time 2 empathy became statistically significant (b = 0.17; p = .04). Given that results did not meaningfully change and that three or more waves of data would be needed to simultaneously distinguish true change from measurement error and describe individual trajectories of change (Hoffman, 2015), the original cross-lagged panel models were retained.
collection coincided with the elementary school’s first year of a social-emotional curriculum (i.e., lessons focused on positive peer relations, managing emotions, and bullying) and, perhaps as a result of this intervention, mean levels of self-reported empathy increased in our sample. Alternatively, empathy may have increased because of better-established classroom relationships and peer dynamics. Given that proactive aggression is associated with increased social and emotional intelligence (Björkqvist et al., 2000; Ostrov et al., 2013) and cognitive empathy (Sutton et al., 1999), it could be those proactively aggressive children were particularly receptive to the intervention, which resulted in increased empathy levels at Time 2 via increased emotional intelligence. However, the current study did not examine emotional intelligence or other outcomes of this school-based intervention, and this explanation is speculative.

Consistent with our conceptualization that reactively aggressive children may adopt universally negative perceptions of their peers (Dodge, 2006) and experience subsequent declines in affective empathy, reactive aggression was associated with lower levels of affective empathy over time. Notably, concurrent associations indicated reactive aggression was not associated with empathy at either time point, which is consistent with other null findings in fourth through sixth-grade children (Katsuma & Yamasaki, 2008); however, our concurrent findings did not control for proactive aggression, grade, or gender. Therefore, our longitudinal results, which assessed the unique associations between reactive aggression, represent an important contribution to the limited literature on these constructs.

Contrary to predictions, affective empathy was not associated with reactive aggression. Negative valence increases the likelihood of reactively aggressive (Berkowitz, 1993), thus we proposed that experiencing affective empathy aversively (e.g., via personal distress) would lead individuals to reactively aggress (likely towards another third party) because the youth’s increased negative valence increases the probability they will react negatively to triggers. This theory was not supported, which may be because other temperament/personality traits (e.g., anger or frustration) contribute more strongly to negative valence than empathy. While research on affective empathy and reactive aggression is mixed (Euler et al., 2017; Lovett & Sheffield, 2007; Pouw et al., 2013), our null findings align with Euler et al. (2017) finding that affective empathy was not associated with reactive aggression in highly aggressive adolescents.

We found some gender differences in our data, with boys demonstrating higher levels of both functions of aggression and girls demonstrating higher levels of empathy. However, we expected that boys would be more likely to exhibit inverse bidirectional associations between affective empathy and proactive aggression and an inverse relation between Time 1 reactive aggression and Time 2 empathy. We expected that girls would be more likely to exhibit a positive association between Time 1 affective empathy and Time 2 reactive aggression (e.g., Dadds et al., 2008; Mayberry & Espelage, 2007). We did not find any differences in these associations, which is consistent with previous research in youth 11–16 years old (Carlo et al., 2010; Euler et al., 2017; Jolliffe & Farrington, 2004; Stavrinides et al., 2010).

The current study’s limitations provide directions for future research. Beyond self-reports of empathy, future investigations would benefit from utilizing multiple sources of data (e.g., behavioral observations) and measuring empathy towards specific victims, as this would allow for a more refined conceptualization of the associations between constructs (e.g., Deschamps et al., 2018). Future research may benefit from also examining forms of aggression (i.e., physical and relational), as empathy may be differentially related to them (Björkqvist et al., 2000). In addition, the current sample came from a rural Midwestern community in the United States that lacked ethnic/racial diversity, which may limit the generalizability of results. Furthermore, the sample size only had the power to detect medium to large, not small, effects (Aiken & West, 1991). Future studies with larger, diverse samples with the power to detect small effects are needed to further evaluate bidirectional associations. To reduce error, future studies could use latent variables, rather than mean scores, for analyses. Also, future work may benefit from examining patterns in longer time intervals (e.g., 1 year) or examining a
suggest that empathy training in middle childhood may still be effective in increasing empathy, but empathy predicted decreases in proactive aggression. This suggests that middle childhood may be able to effectively engage in the theory of mind and perspective taking (Eisenberg et al., 2010). Conversely, high proactive aggression marginally predicting increases in empathy does not align with the BAS/BIS model of behavior, in which we expected rewarding aggressive behavior to motivate inhibition of potentially punishing feelings of affective empathy over time (Gray, 1972; Harmon-Jones & Peterson, 2008). This may suggest that affective empathy is not a punishing experience for youth in middle childhood already engaging in proactive aggression; however, further research examining empathy towards specific targets of aggression is needed. High levels of reactive aggression predicting low levels of empathy provide support for the maladaptive SIP (Dodge, 2006) model of reactive aggression and may suggest that reactively aggressive youth in middle childhood develop negative perceptions of peers, resulting in decreased affective empathy. Conversely, affective empathy not predicting subsequent reactive aggression may indicate reactively aggressive children do not consider affective congruence with victims before aggressing (Dodge & Coie, 1987) and suggests that empathy does not contribute to broader negative affect in youth in middle childhood. Alternatively, our null results could be due to heterogeneity in children, with some who experience low levels of affective empathy more likely to engage in reactive aggression and others who experience high levels of emotional distress more likely to engage in reactive aggression. Thus, more research evaluating this is needed.

Clinically, our findings indicate that the function of aggression and developmental timing for empathy training are important to consider. While empathy and aggression were stable in our current sample, the bidirectional associations between constructs differed (e.g., proactive aggression predicted increases in empathy, but empathy predicted decreases in proactive aggression). This suggests that middle childhood may still be an important time for empathy and aggression interventions because associations between the constructs are susceptible to change over time. Our findings indicate that empathy training to prevent the development of proactive aggression may be more effective before the onset of middle childhood; however, the effectiveness of these interventions in early childhood may be limited, given that affective empathy may not be fully developed (Hughes et al., 1981; Strayer, 1993). Our results also suggest that empathy training in middle childhood may still be effective in preventing aggression for youth not yet engaging in proactive aggression. In contrast, empathy training may not be a helpful intervention strategy for already proactively aggressive youth (unless perhaps empathy training focused on increasing empathy for their specific victims; e.g., Day, Casey, & Gerace, 2010). Similarly, findings indicate increasing empathy may not be a salient construct to target for the prevention of reactively aggressive behavior in middle childhood (Dodge, 2006). However, interventions focused on increasing empathy in youth demonstrating high levels of reactive aggression in middle childhood may be helpful. Alternatively, these findings suggest that efforts to reduce reactive aggression may also help increase affective empathy in middle childhood.

In sum, we found that associations between empathy and aggression in middle childhood differed based on the function of aggression and the initial levels of aggression and empathy. Given the complex associations between affective empathy and aggressive behavior, some researchers have proposed that compassion (i.e., caring about others without requiring affective congruence) may be a better construct to target for interventions (Bloom, 2017), especially during middle childhood. Future research on empathy training for functions of aggression may benefit from examining the role of developmental timing and type of intervention.

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CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

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