

# The moderating role of emotional engagement on the relation of anger regulation with later achievement in elementary school

School Psychology International  
2023, Vol. 44(1) 23–47  
© The Author(s) 2022  
Article reuse guidelines:  
sagepub.com/journals-permissions  
DOI: 10.1177/01430343221116297  
journals.sagepub.com/home/spi



Colleen R. O’Neal 

Kristin Meyering

Leyla Babaturk

Nicole Gosnell

Hayley Weinberg

University of Maryland, USA

## Abstract

The objective of this study was to understand if and for whom anger regulation relates to later reading and math achievement. The sample included 267 upper elementary school students from two schools (5% Asian, 10% Black, 6% Latinx, 17% Multiethnic/Other, and 62% White; 36% dual language learner; 60% female; average age = 9.7 years). Self-reported anger regulation and self- and teacher-reported emotional engagement were assessed. Then, reading and math standardized achievement were tested by the schools approximately three months later. Latent variable path analyzes suggested that withdrawal when experiencing anger (“anger withdraw”) had a significant, positive relation with later reading and math achievement outcomes, when controlling for other anger regulation strategies and demographics. Latent student- and teacher-reported emotional engagement moderated the relation of anger withdraw with later reading

---

## Corresponding author:

Colleen R. O’Neal, University of Maryland, 3212 Benjamin Bldg., College Park, MD 20815, USA.  
Email: [onealc01@umd.edu](mailto:onealc01@umd.edu)

achievement. Discussion centers on anger regulation, moderation, and implications of anger regulation for school psychologists.

### **Keywords**

anger regulation, emotional engagement, achievement, elementary school

Emotion regulation influences a range of outcomes including academic functioning, behavior management, and successful peer and adult relationships (e.g., Cole et al., 1996; Skibbe et al., 2019). Emotion theorists have argued that emotion regulation is best assessed through an emotion-specific lens, meaning that anger regulation should be conceptualized as a process distinct from the regulation of other emotions (Izard, 1977; Tomkins, 1963). Anger is a particularly important emotion to assess, given its unique positive and negative outcomes, as well as challenges associated with its regulation. Anger can be a difficult “extrapunitive” emotion to socialize and regulate (Zahn-Waxler et al., 1998). Anger is also a discrete and complex emotion that can be a source of motivation and focus, or, in contrast, overwhelming and difficult to accept (e.g., Tomkins, 1963). Maladaptive anger regulation has been associated with externalizing problems in children as young as preschool age, with lasting effects later in their schooling (e.g., Cole et al., 1996). The unique outcomes of anger have largely gotten lost in the typical “global” assessments of emotion regulation. Despite emotion theorists suggesting an emotion-specific approach, anger regulation is typically captured via emotion regulation summary scores, an average of emotion regulation across many different emotions (Tomkins, 1963, 1991). The present study focuses on anger-specific effects as well as behavioral strategies that children use to regulate their anger, in addition to how anger regulation interacts with engagement in predicting achievement.

Given that anger, and other emotions, play a critical role in academic learning (e.g., Raver, 2002), there is a need for research on anger regulation and achievement. To our knowledge, however, only two studies have tested anger regulation as a predictor of achievement; both studies used GPA as the achievement indicator (Boekaerts, 1994; Totura et al., 2014). The current short-term study contributes to the literature by examining the predictive strength of anger regulation (Child Anger Regulation Measure [CARM]; O’Neal et al., under review) with later standardized achievement, in addition to how that relation is dependent on emotional engagement.

### ***Emotion theories and emotion regulation***

Although there are many different operationalizations of emotion regulation (e.g., Cicchetti et al., 1995), the construct generally refers to the management of emotions with consequences for socioemotional functioning (e.g., Rydell et al., 2003). A functional perspective of emotion regulation argues that one’s goals for managing emotions are guided by one’s social adaptations (Campos et al., 2004); others have operationalized

emotion regulation as psychological processes related to emotions and changes to emotions (Cole et al., 2004; Gross, 1998, 2001). Studies have historically focused on the regulation of negative emotions, like anger, though there is a small body of research in adults centered on the management of positive emotions (e.g., Farmer & Kashdan, 2012; Kashdan et al., 2015).

Emotion theories that focus on discrete strategies and emotions underlie our anger regulation measure, which is operationalized as behavioral strategies in response to anger. Similarly, Gross' (1998, 2001) process model of emotion regulation emphasizes an individual's use of specific strategies to regulate the components of an emotional response (e.g., experiential, behavioral, physiological). In Gross' model (1998, 2001), strategies were viewed as either antecedent- or response-focused and as differential in their impact on all emotions. The behavioral strategies in the present study (e.g., deep breaths) can be viewed as response-focused with the goal of managing the emotional response after its onset.

Gross' (1998, 2001) process model addresses the general emotion regulation process. In contrast, emotion theories like Affect Theory and Differential Emotions Theory (DET) frameworks of emotion regulation conceptualize emotion regulation in terms of discrete emotions (Izard, 1977; Tomkins, 1963). Each emotion is viewed as having unique qualities and motivational elements. Emotion theories that focus on discrete emotions underlie our anger regulation measure. Notably, anger is one of the fundamental emotions in DET (Izard et al., 1993; Tomkins, 1963) that is experienced across individuals, regardless of culture or social learning. Anger-specific effects warrant investigation in children because anger is viewed as having distinct qualities in DET (Izard, 1977; Tomkins, 1963).

Though DET (Izard, 1977; Tomkins, 1963) names anger as a discrete emotion, Pekrun's (2006) control-value theory is also applicable to the present study in that it explains the unique role of anger in the process of learning. In Pekrun's (2006) control-value theory, anger is conceptualized as a discrete emotion that can be activated during learning. Its activation depends on students' beliefs about their personal agency in learning and the subjective importance of achievement activities, such as studying. Anger is assumed to be activated by a high level of perceived self-efficacy combined with negative value beliefs about the learning task (Camacho-Morles et al., 2021; Pekrun et al., 2017). Theorists posit that the activation of negative emotions, including anger, diminishes cognitive resources by giving rise to tangential thinking and by impeding intrinsic motivation; anger, however, can also trigger motivation to increase effort to avoid failure (Camacho-Morles et al., 2021; Pekrun et al., 2017). Thus, anger has the potential to be a positive regulatory force, if viewed from a non-pathological perspective. Anger regulation and psychopathology studies, however, have largely examined and reported that maladaptive anger regulation can be a strong predictor of psychopathology (e.g., Cole et al., 1996).

*Anger regulation operationalization and measurement.* Anger-specific regulation has typically been assessed by one trait-based measure for use with adults, the State-Trait Anger Expression Inventory (STAXI; Spielberger et al., 1985), and two child/adolescent STAXI

adaptations (e.g., STAXI2-C/A; del Barrio et al., 2004). Trait-based approaches to anger regulation assessment originate from a personality framework that views responses to anger as chronic, long-standing personality characteristics. State-based approaches to anger regulation, on the other hand, conceptualize anger regulation as temporary reactions to and management of anger, as conceptualized by the CARM. The CARM is a state-based anger measure that was developed based on discrete emotion theories (O'Neal et al., under review). Unlike other anger regulation measures, which are guided by psychopathology and personality frameworks, the CARM does not take a value-laden, maladaptive approach to the conceptualization of anger regulation. Rather, anger regulatory strategies are regarded as neutral, but could also be adaptive, depending on the context. For example, the item "When I was angry, I would go off by myself" may refer to an adaptive strategy, depending on what the child does after going off by themselves (e.g., deep breathing). CARM items are phrased to capture recent strategy use and stand in contrast to existing anger regulation measures that phrase items to tap into trait-like, personality patterns (e.g., "I am hotheaded"; Brunner & Spielberger, 2010).

The CARM's largely neutral approach helps to capture a range of strategies beyond dichotomous adaptive/maladaptive behavior and creates opportunities to examine the relation between anger regulation and positive outcomes. The measure is also unique in including a pause anger scale which captures "mindful" responses to anger, along with expressive scales that clearly distinguish with whom the child shares their anger. Moreover, the CARM is relevant to the school context, given that one of the anger express subscales addresses students' communication with a teacher when angry.

### *Anger regulation and achievement*

Anger regulation may influence children's academic achievement through cognitive, interpersonal, and motivational mechanisms (e.g., Dougherty, 2006). Harley et al. (2019) have argued that emotion-specific regulation, including the downregulation and expression of anger, must be examined in the achievement context. According to their perspective, more research is needed to identify different emotion regulation strategies used to attain academic success. Indeed, they speculate that the anger regulation strategy of situational modification (i.e., changing academic tasks) may work well when individuals are angry in the achievement context. Emotion regulation literature has found elementary-aged children's emotion regulation to be related to achievement. For instance, parent-reported emotion regulation was related to teacher-reported academic performance in kindergartners (Graziano et al., 2007). One study reported a weak, indirect effect between emotion regulation and elementary-school achievement (Shah et al., 2018).

Despite some established links between children's emotion regulation and academic success (e.g., Raver, 2002), only one study has assessed anger regulation with elementary-aged achievement (Boekaerts, 1994). Boekaerts (1994) adapted the STAXI for 11-year-old Dutch students and found that anger-in (i.e., anger suppression) was positively associated with GPA, with a small effect size. It was important to note that there

were no significant relations of the three other STAXI anger regulation predictors with GPA. There have been a few studies that examined the relation of anger regulation with adolescent academic-related outcomes (e.g., Totura et al., 2014). These studies typically cite a low magnitude of relations, along with non-significant relations of certain anger regulation strategies with academic-related outcomes. The lack of studies across children and youth do not lead to a clear hypothesis of which of our anger regulation strategies may be more related to achievement than others; however, Boekaerts' (1994) findings suggested that an inhibitory anger regulation strategy ("anger-in") may be more related to achievement than "maladaptive" outward expressions of anger's ("anger-out"; e.g., verbal aggression) relation to achievement.

### *Emotional engagement as a moderator or mediator*

Emotional engagement is operationalized as one's positive emotional involvement, interest, and enjoyment in learning activities (Skinner & Belmont, 1993). Achievement is dependent on emotional engagement (e.g., Park et al., 2012). Positive emotions toward academics, like those included in emotional engagement (e.g., pride, curiosity, enjoyment), have been positively associated with academic achievement. In contrast, negative emotions (e.g., anger, anxiety) have been negatively associated with achievement (Pekrun et al., 2017; Putwain et al., 2019). Given these associations and their influence on achievement, it is possible that positive and negative emotions interact to impact achievement (Pekrun et al., 2017; Putwain et al., 2019). Similarly, since anger regulation involves a negative emotion and emotional engagement involves positive emotions, AR's effect on achievement may depend on how emotionally engaged students are in learning. Therefore, it would be valuable to explore how the positive emotional experience of emotional engagement influences the effects of AR because anger is a negative emotion. Surprisingly, there are no existing studies, to our knowledge, that test emotional engagement, or any other type of engagement, as a moderator of anger regulation effects.

It is also possible that emotional engagement could act as a mediator of anger regulation effects on academic-related outcomes. An argument can be made equally for emotional engagement as a moderator or mediator. There is little literature or theory to support emotional engagement as a moderator, and there is equally little research to support emotional engagement as a mediator. The scant literature that hints that emotional engagement might act as a moderator could equally support emotional engagement as a mediator of anger regulation effects. For instance, the literature identified above may also support a tentative mediation hypothesis—that emotional engagement has been positively associated with academic achievement, while negative emotions (e.g., anger, anxiety) have been negatively associated with academic engagement and achievement (Pekrun et al., 2017; Putwain et al., 2019). Therefore, it is possible that a mediation process could occur with anger regulation leading to positive emotions, like emotional engagement, which could lead to achievement. One study by Zhou et al. (2010), however, found that children with maladaptive emotion regulation emotionally disengage from school which, in turn, lessens their academic achievement, which suggests a potential mediating role of emotional engagement between emotion regulation and

achievement. Given the limited evidence for either moderation or mediation, this study will explore, rather than hypothesize, the question of whether or not emotional engagement acts as a moderator or mediator.

In sum, the theory and literature reviewed lay the groundwork for our hypotheses. Emotion theories (i.e., Affect Theory, DET) support the need for research on emotion-specific regulatory strategies, like anger regulation, rather than a “global” emotion regulation construct (Izard, 1977; Tomkins, 1963). Moreover, emotions theory and the literature point to the importance of examining the relation between anger regulation and positive outcomes, rather than a sole focus on the negative consequences of maladaptive anger regulation on outcomes such as psychopathology. A limited number of studies have largely found emotion regulation to be related to achievement (e.g., Graziano et al., 2007). Only one study has examined achievement as an outcome of anger regulation among elementary-aged students (Boekaerts, 1994), supporting the need to test the assumption that adaptive anger regulation may lead to positive learning and elementary-aged achievement outcomes. Finally, the engagement literature has supported emotional engagement as potentially playing a protective role via moderation (e.g., Zhou et al., 2010). It is not yet clear, though, if emotional engagement acts as a mediator to explain the relations between anger regulation and achievement outcomes.

## *Hypotheses*

1. Anger regulation strategies will have a positive relation with later achievement test scores. We explore which of the anger regulation strategies explain the most variation in later achievement, when controlling for other anger regulation strategies.
2. We also explore if anger regulation’s relation with later achievement depends on the moderator of emotional engagement or if emotional engagement acts as a mediator.

## **Method**

### *Participants*

The participants consisted of 251 participants from two schools in the U.S. Of the total sample, 60% were female and 36% were dual language learners (i.e., speak a language other than English with at least one parent). Participants’ race categories were 5% Asian, 10% Black, 6% Latinx, 17% Multiethnic/Other, and 62% White. Twenty-one percent of the sample were in the gifted program at one of the two schools. The participants’ ages ranged from 8 to 11 years (Table 1). All of the students lived in the U.S.; we did not collect data on the country of origin of the participants. Participating students’ racial demographics were proportional to that of both schools’ total student bodies; about 14% of students across both schools were classified as Free and Reduced Meal Status (FARMS). Note that the school district did not

**Table 1.** Demographics.

	N	%
Child sex		
Female	151	60
Age		
8 years	23	9
9 years	83	33
10 years	93	37
11 years	52	21
Ethnicity		
Asian	13	5
Black	25	10
Latina/o	14	6
White	155	62
Multiracial	29	17
Dual language learner	91	36
Highly gifted center	52	21
Schools		
School 1	122	49
School 2	129	51
Administration format		
Group	46	18
Individual	205	82

Note: Total n = 251.

permit researchers to ask students or parents about their socioeconomic or immigrant generational status.

### Procedures

All procedures were approved by the school district and university institutional research committees. The procedures included verbal student assent and written parent and teacher consent. Students were recruited from all 27 upper elementary classrooms across the two schools. Thirty-six percent of students agreed to participate. The recruitment rate ranged from 12% to 67% per class. Analyzes controlled for potential class cluster effects. The two schools were selected due to the principals' and teachers' interest in this study; when we met with the parent-teacher associations at both schools, the parent representatives were also interested. The schools were in a mid-Atlantic, U.S. location, with catchment areas that ranged in wealth from low-income to high-income. We did not conduct a priori power analyzes before data collection. The sample was a convenience sample, as was the sample size of 251. This sample size was dependent on the number of students who chose to participate across the two schools.

As a part of a larger study, students completed questionnaires at three time points (March; April to May; June 2015). This multimethod study used the first of those time

points (March 2015; Time 1 [T1]) for student-reported anger regulation, student- and teacher-reported emotional engagement, and control variables. The achievement outcome (Measure of Academic Performance [MAP] task) was collected in a separate testing process conducted by the school district from April to June 2015, between one and three months after T1 measures were collected (T2).

Researchers read the anger regulation questionnaire out loud in English to each student, in one-on-one sessions during the school day, to ensure that all students understood the questions, given that 36% were dual language learners. Participants could read along with hard copies of the questionnaire. Eighteen percent of students' questionnaire data were collected in a small group setting due to time constraints; therefore, questionnaire format (i.e., individual or group) was a control variable in model testing.

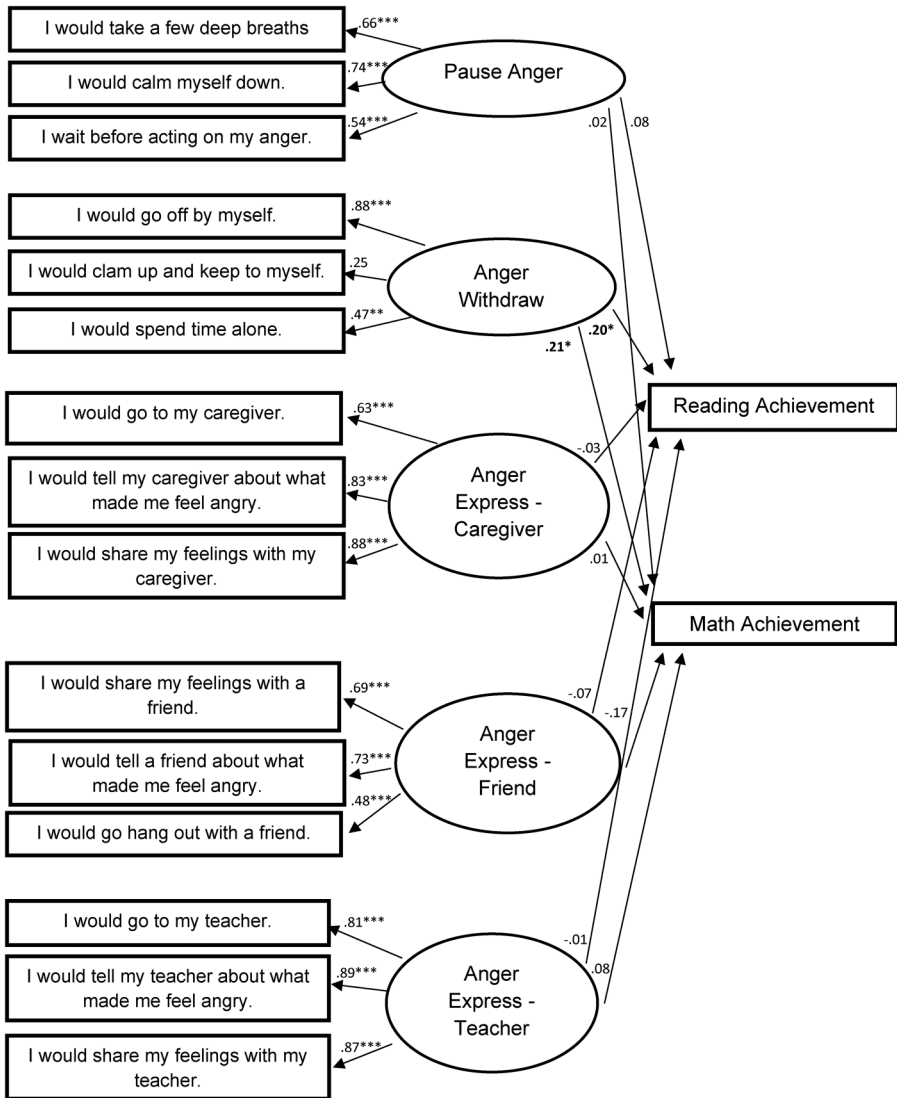
All of the teachers at the two schools participated in the study, and they completed an online T1 emotional engagement questionnaire on each student. Teacher participants included 27 third, fourth, and fifth-grade teachers (26% male; 11% Asian, 7% Black, 3% Latinx, 79% White).

## Measures

**Anger regulation.** Anger regulation was assessed using the CARM. The CARM was adapted from the Emotions as a Child—Emotion Regulation Strategies' (EAC-ER) anger regulation scale, which was an adult emotion regulation scale that asked adults to recall how they regulated their emotions as a child. The EAC-ER had sadness, fear, and shame emotion regulation scales (O'Neal & Magai, 1997). The EAC-ER was co-developed by the first author, and then the CARM was adapted by the first author from the EAC-ER. The CARM was adapted by selecting the anger regulation scale of the EAC-ER, and the wording of some of the items was changed to be more age-appropriate for elementary school students. Additionally, two child-relevant subscales on anger expression with teachers and anger expression with peers were added to mimic and supplement the existing adult EAC anger expression with caregiver subscale. A pause anger subscale was added to enhance the positive ways to manage anger, like calming oneself down and waiting before acting on one's anger. To ensure content validity with the original adult EAC, the wording and some of the content were similar to the adult EAC factors.

The CARM assesses students' self-rated frequency of anger regulation strategy use. For the 15 anger regulation items, students were asked to think about times they felt angry or frustrated over the past month. Then they were asked to rate how often (1 = *Never*, 5 = *Very often*) they would pause their anger, for instance (e.g., "wait before acting on my anger") (see items in Figure 1). Anger regulation scales include pause anger, anger withdraw, anger express-caregiver, anger express-friend, and anger express-teacher. The EAC-ER had adequate internal consistency and predictive validity of externalizing problems among Black and Brown urban adolescents (O'Neal, 2000). In a paper under review with the current study's sample, a CFA was done for the entire anger regulation measure (including all 15 anger regulation items) with a first-order correlated theoretical model including all five anger regulation scales as the five correlated factors in





**Figure 1.** Latent anger regulation relations with later observed achievement.

Note: Estimates for each path/indicator are standardized; significance is indicated by \* $<.05$ , \*\* $<.01$ , \*\*\* $<.001$ . Bolded path estimates indicate the significant paths from anger withdraw to reading and math achievement. The figure does not depict the controls—anger frequency, age, gender, ethnicity, dual language status, questionnaire format, school, and gifted status.

the model, and the fit of the data to the model was adequate. We found that the CARM subscales' internal reliabilities were adequate, except for the anger withdraw scale which had an alpha of .56 (Table 2). Note that the use of structural equation modeling has a

Table 2. Bivariate correlations and descriptives.

Measures	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Mean	SD	$\alpha$	n
1. Pause Anger	—																3.58	.84	.67	248
2. Anger Withdraw	-.10	—															3.24	.84	.56	247
3. Express Anger-Caregiver	.24***	.02	—														3.32	1.00	.82	249
4. Express Anger-Friend	.39***	-.11	.34***	—													2.74	.98	.71	250
5. Express Anger-Teacher	.23***	-.06	.40***	.37***	—												2.25	1.01	.89	250
6. MAP-R	.04	.14	-.05	.04	-.07	—											223.95	14.47	—	236
7. MAP-M	.00	.12	-.05	-.03	-.07	.83***	—										228.86	17.46	—	235
8. Age	.00	.07	-.01	.09	-.22***	.46***	.51***	—									9.69	.90	—	251
9. Gender (Female)	.04	-.07	.04	.13*	.00	.10	.01	.08	—								—	—	—	243
10. Ethnicity (White)	-.10	-.03	.15*	-.03	.07	.21**	.19**	.07	.03	—							—	—	—	251
11. DLL	-.02	.06	-.12	.00	-.04	-.23***	-.25***	-.07	.02	-.50***	—						—	—	—	251
12. Gifted status	.02	.09	-.02	.01	.00	.64***	.63***	.24***	.06	.06	-.12	—					—	—	—	247
13. School	.00	.04	.05	-.03	-.03	.29***	.28***	.03	.08	.06	-.08	.50***	—				—	—	—	251
14. Questionnaire Format (Group Admin)	.01	-.01	-.02	.01	-.08	-.18**	-.17**	-.01	-.07	-.05	.05	-.25***	-.49***	—			—	—	—	251
15. Anger freq	-.29***	.28***	.02	-.15*	-.06	.04	-.06	-.04	.11	.07	.03	.10	-.03	.06	—		3.08	.90	—	249
16. SR-EE	.34***	-.13*	.16*	.20**	.19**	.12	.08	.04	.18	-.10	-.03	.09	.10	-.17**	-.21	—	4.09	.65	.80	248
17. TR-EE	.15*	.02	.01	.05	.06	.14*	.12	-.18**	.27***	.13*	-.13*	-.01	.12	-.08	-.08	.34***	4.13	.88	.95	246

\*p < .05; \*\*p < .01; \*\*\*p < .001.

methodological advantage of using latent rather than observed variables. The use of a factor as a latent rather than an observed factor reduces the impact of the observed subscale's low reliability, given that "latent variable models can control measurement error better than observed-variable models" (Kline, 2015, p. 15). For instance, the use of an anger withdraw latent factor in this study, rather than an observed anger withdraw subscale, may reduce the impact of measurement error associated with anger withdraw's low internal reliability. Using the same sample, test-retest correlations for each of the observed anger regulation strategies were moderate-strong, and all the CARM subscales were associated with concurrent emotional engagement (O'Neal et al., under review). Anger frequency was assessed as the first item in the CARM via one item asking students to rate how often they felt angry or frustrated over the past month (1 = *Never*, 5 = *Very often*). This anger frequency item is typically used as a control in CARM studies. Anger frequency is important as a control variable when the CARM is used because it is likely that emotion regulation strategy use is dependent on the individual's frequency of experiencing the emotion.

**Emotional engagement.** Emotional engagement is conceptualized as a student's positive emotional involvement, enjoyment, and enthusiasm in school. Emotional engagement was assessed via the student self-reported emotional engagement subscale of the Engagement versus Disaffection with Learning Scale, in addition to the teacher-reported version (EvsD; Skinner et al., 2008). This scale was designed to capture students' emotional participation in learning activities on a five-point scale (1 = *Not at all*, 5 = *Very Much*). The measure consists of five items all indicating a student's level of interest and enthusiasm for school (e.g., student-reported: "I enjoy learning new things in class"; teacher-reported: "The student enjoys learning new things in class."). The teacher-reported emotional engagement scale has the same items as the student-reported emotional engagement scale, with the substitute of "the student" on the teacher-report version rather than "I" used in the student-reported version. The teacher-reported emotional engagement scale was completed at Time 1 by the teacher on Qualtrics.

The self- and teacher-reported measures have demonstrated adequate internal consistency and test-retest reliability in elementary-age samples (Skinner et al., 2008). In a previous study with the same sample, a separate CFA was done for the emotional engagement measurement model including a second-order emotional engagement factor with two first-order factors including student- and teacher-reported emotional engagement; the data had an adequate fit with the measurement model (see CFA fit in the analysis section below) (O'Neal et al., under review). In this study, the student-reported emotional engagement scale had an alpha of .80, and the teacher-reported emotional engagement scale had an alpha of .95 (Table 2).

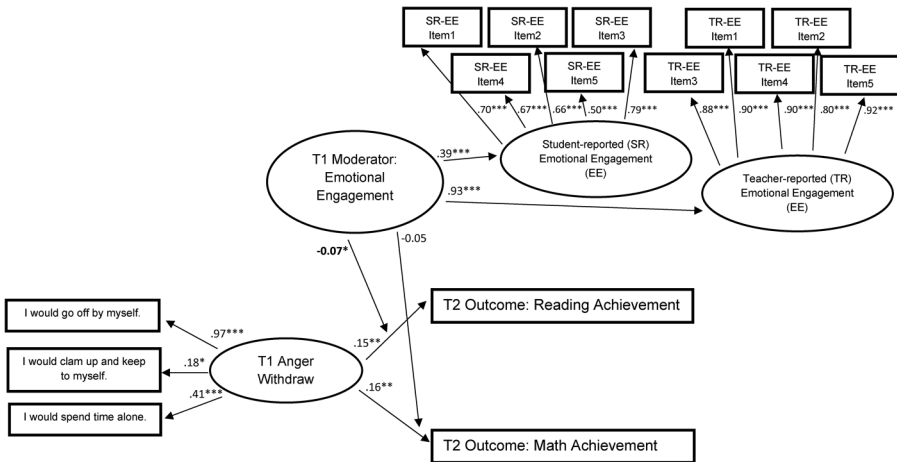
**Reading and math achievement.** The school district provided the authors with students' scores on a standardized achievement test in reading and math (Measures of Academic Progress-Reading, MAP-R; Measures of Academic Progress-Math, MAP-M; Northwest Evaluation Association, 2009). The MAP is a 42-item assessment that takes 20 min to 1 h as an untimed, individual, nationally normed computerized, and

skill-adaptive test used by the school district for benchmarking, academic growth tracking, and accountability. Average standardized scores in this study ranged from 198.6 to 211.8; the total possible range is 120–250. MAP has been used for children in second grade through high school, and the internal and test-retest reliabilities are high (Northwest Evaluation Association, 2009).

**Analyzes**

*Mplus* version 8.2 (Muthén & Muthén, 1998–2017) was used for latent variable path analysis (LVPA). LVPA included anger regulation latent subscales predicting observed reading and math achievement. Moderation analyzes tested the interaction of latent emotional engagement (observed student- and teacher-reported emotional engagement items loaded onto respective first-order student- and teacher-reported emotional engagement latent factors, which loaded onto a second-order emotional engagement latent factor) with any significant latent anger regulation factors on the relation with later observed MAP-M and MAP-R (Figure 2).

A CFA for latent anger regulation was conducted, and a separate CFA was conducted for latent emotional engagement prior to this path analysis. The anger regulation first-order, five-factor measurement model fit was adequate (RMSEA = .038; CFI = .97;



**Figure 2.** Latent anger withdraw relations with later observed achievement moderated by latent emotional engagement.

Note: Estimates for each path/indicator are standardized; significance is indicated by \* $<.05$ , \*\* $<.01$ , \*\*\* $<.001$ . The bolded estimate is the significant moderation path from the moderator of emotional engagement onto the path between anger withdraw and reading achievement. The figure does not depict controls which were included in the model—anger frequency, age, gender, ethnicity, dual language status, questionnaire format, school, and gifted status. EE item 1: When I’m in class, I feel good; EE item 2: When we work on something in class, I feel interested; EE item 3: Class is fun; EE item 4: I enjoy learning new things in class; EE item 5: When we work on something in class, I get involved.

SRMR = .056); the standardized loadings ranged from .34 to .95. All of the loadings were significant, except for an item loading onto the anger withdraw factor: "When I was angry, I would spend time alone." The second-order emotional engagement measurement model fit was adequate for the SRMR and CFI indices and approaching adequate for the RMSEA (RMSEA = .077; CFI = .967; SRMR = .051). All of the emotional engagement loadings were significant; the standardized loadings ranged from .50 to .92. The details on the factor loadings of the items onto the AR and engagement factors are supplementary analyzes.

We controlled for student-reported anger frequency, age, gender, ethnicity, dual language status, questionnaire format, school, and gifted status. We adjusted for possible teacher cluster effects in *Mplus* via the `type = complex` procedure. MAP scores from fifteen participants were missing by the time the MAP outcome was assessed between one and three months later. A restricted maximum likelihood robust standard error estimation approach was used (i.e., MLR), which can handle non-normal data and accommodate missingness and small samples (Muthén & Muthén, 1998–2017). Regarding model fit, the recommended RMSEA cutoff is less than .06, CFI cutoff is more than .95, and SRMR cutoff is less than .08 (Hu & Bentler, 1999).

## Results

### *Descriptives, reliability, and correlations*

Anger regulation scales all had means close to three, on a scale from one to five; pause anger was highest and express teacher was lowest (Table 2). Mean percentiles of achievement outcomes were the 82nd percentile for MAP-R and 78th percentile for MAP-M; mean standardized scores were 224 for MAP-R and 229 for MAP-M.

The internal reliabilities of the anger regulation scales were adequate, except for the anger withdraw scale which had an alpha of .56 (Table 2); however, as addressed above, internal reliability is not a major concern given that we use latent modeling (Hancock & Mueller, 2013). Anger regulation variables were correlated with each other, except for anger withdraw. The correlation of anger frequency was significant and negative with pause anger, express teacher, and express friend but positive with anger withdraw. Surprisingly, bivariate correlations between anger regulation and achievement were not significant. Student-reported emotional engagement demonstrated a significant association with all the anger regulation strategies, but it had a negative association with anger withdraw; like anger regulation, student-reported emotional engagement was not associated with achievement. Teacher-reported emotional engagement was associated with pause anger, and it was associated with MAP-R.

### *Relation of anger regulation with later achievement*

When all of the latent anger regulation variables were in a model with later observed reading and math achievement as the outcomes, anger withdraw had a positive, significant relation with both MAP-R and MAP-M (see results in Figure 1 and Table 3).

**Table 3.** The relation of latent anger regulation factors with later standardized achievement.

	MAP-reading				MAP-math			
	Unstand. estimate (SE)	Standardized estimate (SE)	Unstand. estimate (SE) <i>p</i> -value	Unstand. estimate CI	Unstand. estimate (SE)	Standardized estimate (SE)	Unstand. estimate (SE) <i>p</i> -value	Unstand. estimate CI
Pause anger	1.56(1.36)	.08(.07)	.25	(-1.12, 4.22)	.48(1.64)	.02(.07)	.77	(-2.73, 3.70)
Anger withdraw	<b>2.52(1.05)</b>	<b>.19(.06)</b>	<b>.02</b>	<b>(.46, 4.59)</b>	<b>3.26(1.40)</b>	<b>.21(.07)</b>	<b>.02</b>	<b>(.52, 6.00)</b>
AE-caregiver	-.52(1.63)	-.03(.09)	.75	(-2.36, 2.14)	.29(1.65)	.01(.097)	.86	(-2.95, 3.53)
AE-teacher	-.11(1.15)	-.01(.07)	.92	(-4.37, 2.18)	1.47(1.45)	.08(.08)	.31	(-1.38, 4.31)
AE-friend	-1.09(1.67)	-.07(.10)	.51	(-8.36, 2.54)	-3.43(2.17)	-.17(.11)	.11	(-7.68, .82)
Anger frequency	-.73(.72)	-.05(.05)	.77	(-2.13, .68)	<b>-2.99(1.09)</b>	<b>-.16(.06)</b>	<b>.01</b>	<b>(-5.13, -.85)</b>
Gifted status	<b>18.12(2.16)</b>	<b>.52 (.10)</b>	<b>.000</b>	<b>(13.88, 22.36)</b>	<b>21.48(2.08)</b>	<b>.51(.09)</b>	<b>.000</b>	<b>(17.41, 25.56)</b>
Ethnicity (White)	<b>4.57(1.50)</b>	<b>.16 (.05)</b>	<b>.002</b>	<b>(1.63, 7.50)</b>	3.44(1.80)	.10(.05)	.06	(-.09, 6.97)
DLL	-2.76(1.53)	-.09(.05)	.07	(-5.75, .24)	<b>-4.21(1.51)</b>	<b>-.12(.04)</b>	<b>.01</b>	<b>(-7.17, -1.25)</b>
Questionnaire format (Group admin.)	-2.03(2.12)	-.06(.06)	.34	(-6.18, 2.11)	-1.94(3.00)	-.04(.07)	.52	(-7.83, 3.95)
School	-1.26(2.11)	-.04(.07)	.55	(-5.40, 2.88)	-1.53(2.27)	-.04(.07)	.50	(-5.97, 2.91)

(continued)

**Table 3.** Continued

	MAP-reading			MAP-math		
	Unstand. estimate (SE)	Standardized estimate (SE)	Unstand. estimate (SE) <i>p</i> -value	Unstand. estimate (SE)	Standardized estimate (SE)	Unstand. estimate (SE) <i>p</i> -value
Age	<b>4.42(.85)</b>	<b>.28(.06)</b>	<b>.000</b>	<b>6.93(1.09)</b>	<b>.36(.06)</b>	<b>.000</b>
Gender (Female)	2.07(1.25)	.07(.04)	.10	.29 (1.35)	.01(.04)	.83
				<b>(2.75, 6.09)</b>		<b>(4.80, 9.07)</b>
				<b>(-37, 4.52)</b>		<b>(-2.35, 2.93)</b>

Note: Bolded rows are significant; AE stands for Anger Express; Unstand. stands for Unstandardized; DLL stands for Dual Language Learning status. The controls included anger frequency, gifted status, DLL, questionnaire format (group or individual), school, age, and gender.

Therefore, higher anger withdraw led to better achievement outcomes than lower anger withdraw. Unlike anger withdraw, express and pause anger did not have significant relations with MAP outcomes when controlling for other anger regulation latent variables. With or without the other anger regulation factors in the model, anger withdraw had a significant relation with later achievement outcomes. The model fit was adequate, RMSEA = .03; CFI = .98; SRMR = .05.

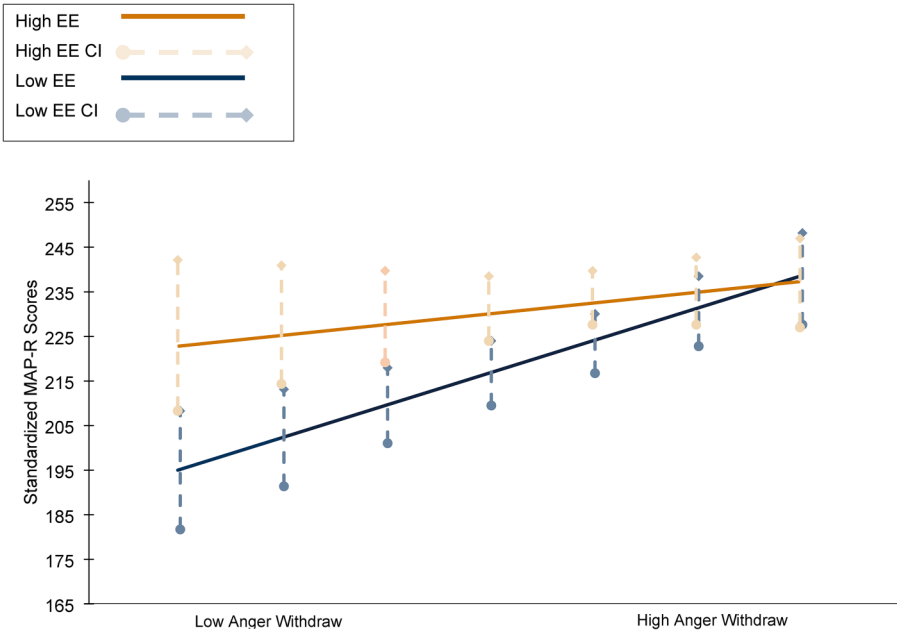
### *Moderation by emotional engagement*

We tested the moderating effect of latent second-order student- and teacher-reported emotional engagement on the prediction of later achievement by latent anger withdraw, given that anger withdraw demonstrated the only significant relation of the five anger regulation factors with later achievement. Emotional engagement was a significant moderator of the effect of anger withdraw on reading achievement (Unstandardized Estimate [SE] =  $-1.09[.55]$ ,  $p < .05$ , CI [ $-2.17, -.01$ ]; Standardized Estimate =  $-.07[.04]$ ), but it did not moderate the effect of anger withdraw on math achievement. None of the other anger regulation-achievement relations were moderated by EE. Note that no fit indices exist for latent moderation models because they are mixture models. If the same model without the moderator/interaction fits well, as it did in this study, then the addition of an interaction term to the model can only explain more, rather than less, of the data. Therefore, the fit of our moderation model is likely as strong as the adequate model fit that was reported above for this model without the interaction term.

The results of the moderation model with latent emotional engagement moderating the relation of anger withdraw with later achievement is shown in Figure 3, including loadings onto the latent factors of emotional engagement and anger withdraw. Figure 3 depicts the emotional engagement moderation effect and illustrates how the low emotional engagement group ( $-1$  SD below the emotional engagement mean) was equally high as the high emotional engagement group ( $+1$  SD above the emotional engagement mean) in reading achievement at higher levels of anger withdraw. The low emotional engagement group, however, had lower reading achievement if they reported low anger withdraw. Indeed, emotional engagement could be interpreted as having a protective effect on the negative relation of low anger withdraw with later reading achievement. There were two positive main effects of engagement and anger withdraw and a negative interaction coefficient of the two. Our understanding is that when the two main effects like our predictor, anger withdraw, and our moderator, engagement, have positive coefficients with reading achievement as the outcome, and there is a negative interaction coefficient of anger withdraw with engagement, then that means that the association of anger withdraw with reading at high engagement is weaker (or, as can be seen in Figure 2, high engagement is the flat line depicting the association between anger withdraw and reading) than the positive association of anger withdraw with reading at low engagement.

When we tested emotional engagement as a mediator, we found that there was a convergence issue. There was lack of convergence because the mediation analysis had a non-positive-definite Hessian matrix problem which cannot be reversed during the estimation.





**Figure 3.** Latent emotional engagement moderation of the relation of latent anger withdraw with later reading achievement. Note: Low Emotional Engagement (EE) is 1 SD below the mean. High Emotional Engagement is 1 SD above the mean.

### Discussion

The main goal of this short-term study was to examine if, and for whom, anger regulation predicts later achievement. Indeed, the contribution of this study was elucidating the roles of anger-specific regulation and emotional engagement in achievement, with implications for socioemotional learning and resilience in school. Latent anger withdraw had significant, positive relations with both reading and math achievement when controlling other anger regulation factors. Moreover, the relation of latent anger withdraw with later reading achievement was dependent on latent student- and teacher-reported emotional engagement in school, with results suggesting that high emotional engagement may have a protective effect. This discussion addresses related theory, literature, limitations, and implications of the findings.

#### *Anger regulation and achievement*

Latent anger withdraw had a significant, positive relation with later reading and math achievement in our LVPA that included all five latent anger regulation factors, with reading and math achievement as later outcomes. Boekaerts (1994) found a positive

association between directing anger inward (i.e., anger-in) and GPA in elementary school. Boekaerts' (1994) and our similar anger withdraw results contribute an important question to the field—can anger withdraw have a positive effect on later achievement? Perhaps anger regulation research needs to reconsider the positive versus negative effects of withdrawal in response to emotions. Such anger withdraw effects may depend on how anger withdraw is operationalized. “Withdraw” may not even be an appropriate label for us to use to characterize taking a break by oneself when angry, given that withdrawal holds negative connotations. Indeed, the present study suggests that choosing to be alone after one feels angry does contribute to success in later achievement.

Most of the anger regulation research conceptualizes withdrawal from anger as maladaptive “anger suppression” (e.g., Bartlett et al., 2018; Ng & Khor, 2018; Spielberger et al., 1985). One might speculate that anger withdraw would have a negative relation with achievement due to other literature suggesting that anger suppression has negative effects on psychopathology-related outcomes (e.g., Brunner & Spielberger, 2010). The CARM, however, conceptualizes and assesses withdraw as a neutral or potentially positive anger regulation strategy, rather than a maladaptive strategy, as anger suppression is often conceptualized (O’Neal et al., under review). The phrasing of the CARM anger withdraw items makes it possible that individuals may withdraw to cool down or avoid worsening their anger, among other reasons for spending time alone when angry.

Perhaps the anger withdraw process is similar to exercising self-control in the face of impulses or temptations that act as obstacles to learning (e.g., Duckworth & Gross, 2014). Although executive functioning and its sub-construct of self-control have had a large body of research supporting their relations with achievement (e.g., Moffitt et al., 2011), there has been relatively little research on how anger regulation impacts achievement. Anger withdraw may demonstrate a form of self-control in which individuals compartmentalize or put aside angry reactions and focus on calming down or schoolwork. Rather than indicating the suppression of anger, anger withdraw may indicate an ability to prioritize where one’s energy needs to go and an ability to wait to process emotions until one has relaxed. Given that researchers have consistently found negative associations between anger and academic achievement (e.g., Camacho-Morles et al., 2021), it may follow that the ability to manage anger via withdraw processes would assist with academic achievement.

*Emotional engagement as a moderator, not a mediator.* We explored whether or not emotional engagement played a moderating or mediating role in anger withdraw’s prediction of achievement. Results suggested moderating effects of emotional engagement on the relation between anger withdraw and later reading achievement, rather than mediating effects of emotional engagement. Therefore, results indicated that emotional engagement in school may protect students’ achievement from the negative outcomes of low anger withdraw. The moderation finding could be interpreted as suggesting that enthusiasm and enjoyment in school mitigates the negative impact of low anger withdraw on academic reading performance. In other words, a student who struggles to withdraw from their anger may also struggle with learning to read and reading achievement. However,

if the student struggling with withdrawing from anger is emotionally engaged in school, then they are more likely to learn and achieve effectively in reading. Perhaps, the benefits of positive emotions that are typically associated with emotional engagement, such as pride and enjoyment, may mitigate the negative consequences of low anger withdraw for later reading achievement. It is difficult to speculate why emotional engagement has a protective effect on anger withdraw's prediction of reading, but not math, achievement; there are not any similar moderation studies with either emotion regulation or anger regulation predicting math versus reading achievement, to our knowledge. A study that used anger, not anger regulation, as a predictor of kindergarten reading and math achievement found that parent-reported child anger was correlated with reading but not math achievement, but teacher-reported child anger was related to both reading and math achievement (Valiente et al., 2010). In the study, effortful control was a moderator of the relation between teacher-reported anger and math achievement, but not of the relation with reading achievement, and, opposite of expectations, high effortful control only acted as a protective factor of anger's relation with math achievement at low, rather than, high child anger (Valiente et al., 2010).

We were somewhat surprised that the mediation result was not significant; however, it should be noted that a future study with a different sample may not encounter the problems we experienced with running the mediation analyzes due to a non-positive definite matrix. There is potential for future studies to find emotional engagement to play a mediating role given that, for example, a study of preschoolers found self-regulation to be associated with greater vocabulary (receptive and expressive), phonological awareness, and print knowledge, and engagement partially mediated the relation between self-regulation and changes in expressive vocabulary (Bohlmann & Downer, 2016). Therefore, future research may benefit from not only replicating the mediation model in this study with a similar sample but also using a wide variety of indicators of reading and literacy performance, in addition to math performance. Overall, our significant moderation results suggest the unique protective role of positive emotions (i.e., emotional engagement) and anger withdraw with later reading achievement.

### *Limitations*

Research assistants read the anger regulation items out loud to each participant, rather than participants reading the items silently on their own. Therefore, it is possible that participant responses might vary by method of silent or verbal questionnaire delivery. Also, the results might differ by individual or group administration; however, we did control for group administration. Despite using anger withdraw as a latent variable (which eliminated measurement error; Hancock & Mueller, 2013), the low internal consistency of observed anger withdraw deserves further investigation. This study was limited by its low overall recruitment across both schools, with 36% of students agreeing to participate. Also, there was not enough power to detect unique patterns within ethnic groups or differences across ethnic groups. Finally, another limitation was the correlational nature of this study and its reliance on a convenience sample from two schools.

## **Conclusions, implications, and future directions**

The present study contributes to the limited literature examining anger regulation and achievement in elementary school (Boekaerts, 1994) by establishing a link between the emotion-specific regulatory strategy of anger withdraw and achievement. The results of this investigation suggest the importance of anger withdraw for achievement, indicating that students who withdraw from anger have better achievement outcomes, with implications for school psychologists' emotional support for students' anger regulation. If future research continues to confirm the importance of anger withdraw for achievement, the results may hold implications for social-emotional learning interventions in schools. For example, teachers could offer an opportunity for students to withdraw when they are angry (e.g., a cool-down space) to promote the use of anger withdraw in a positive and preventive way. A cool-down space is a trauma-informed and evidence-based classroom practice that serves to help students regulate difficult emotions, such as anger (Lantieri, 2008). These spaces are often decorated with developmentally appropriate materials (e.g., noise canceling headphones, molding clay, etc.) to support students to withdraw from anger-inducing situations. In turn, students' anger responses may not escalate into aggressive speech or behaviors, and then they can return to academic tasks. Similarly, clinicians have begun to implement Dialectical Behavior Therapy (DBT) in schools to teach students skills to regulate emotions (Mazza et al., 2016). School psychologists could push-in to classrooms to teach distress tolerance skills consistent with DBT (e.g., "Wise Mind ACCEPTS") to children and youth (Linehan, 2014). These skills are focused on distraction from challenging emotions, like anger, as a way for students to resist the urge to act on them, and as a means to return to a learning mindset (Mazza et al., 2016). In sum, our findings tentatively suggest that evidence-based practices, such as cool-down spaces and DBT skills groups, could be potentially beneficial interventions to teach children to withdraw from their anger, with potential consequences for academic outcomes.

The present study also suggested that emotional engagement was a protective factor for students low in anger withdraw. These results hold implications for school psychologists' promotion of a school climate that facilitates the potential protective factor of positive emotions like curiosity, joy, and interest in school (i.e., emotional engagement), with implications for students who struggle to withdraw from anger. Indeed, our moderation results suggest that cultivating students' interest and engagement in school may help prevent negative reading achievement outcomes for students who find it difficult to disengage from their anger. One way to increase participation and engagement in school, for example, is to allow students a choice of classroom activities and interventions (Kosky & Curtis, 2008). Future research should also investigate whether behavioral, social, and cognitive engagement, along with other social-emotional variables besides emotional engagement, could help students when they struggle with anger regulation.

This short-term study contributed to our knowledge of if, and for whom, anger-specific regulation predicts later achievement. Another contribution of this study was its design, including student- and teacher-report in addition to standardized test performance. An exploration of different dimensions and operationalizations of emotion

regulation strategies would be a contribution, like the re-operationalization of the strategy of anger withdraw as mindful anger management. The next steps could also be to test if anger withdraw continues to predict later achievement in other samples, and how anger-specific regulation affects achievement, with further testing of emotional engagement as a possible mediator in addition to consideration of other potential mediators like student-teacher interactions, peer interactions, or self-control in academics. Future research could also seek to understand the competing and complementary roles of behavioral, cognitive, social, and emotional engagement in similar models. Furthermore, there is a great need in anger regulation research to identify and explore cross-cultural and cross-national variations in anger management and achievement, and potential moderators and mediators, given cultural differences in emotion management (e.g., Shaver et al., 1992). In sum, anger withdraw may hold implications for reading achievement, especially in the context of emotional engagement.

### Acknowledgements

The authors would like to acknowledge the student and teacher participants contributions to this article. We also appreciate the doctoral students who collected this data as part of our Emotions, Education, and Equity lab. Finally, Dr. William Strein offered invaluable feedback on this paper.


### Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

### Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

### ORCID iD

Colleen O'Neal  <https://orcid.org/0000-0003-3461-218X>

### References

- Bartlett, M. L., Abrams, M., Byrd, M., Treankler, A. S., & Houston-Norton, R. (2018). Advancing the assessment of anger in sports: Gender differences and STAXI-2 normative data for college athletes. *Journal of Clinical Sport Psychology, 12*(2), 114–128. <https://doi.org/10.1123/jcsp.2016-0026>
- Boekaerts, M. (1994). Anger in relation to school learning. *Learning and Instruction, 3*(4), 269–280. [https://doi.org/10.1016/0959-4752\(93\)90019-v](https://doi.org/10.1016/0959-4752(93)90019-v)
- Bohlmann, N. L., & Downer, J. T. (2016). Self-regulation and task engagement as predictors of emergent language and literacy skills. *Early Education and Development, 27*(1), 18–37. <https://doi.org/10.1080/10409289.2015.1046784>

- Brunner, T. M., & Spielberger, C. D. (2010). *The state trait anger expression inventory for children and adolescents (STAXI-C/A)*. Psychological Assessment Resources. <https://doi.org/10.1002/9780470479216.corpsy0942>.
- Camacho-Morles, J., Slemp, G. R., Pekrun, R., Loderer, K., Hou, H., & Oades, L. G. (2021). Activity achievement emotions and academic performance: A meta-analysis. *Educational Psychology Review*, 33(3), 1051–1095. <https://doi.org/10.1007/s10648-020-09585-3>
- Campos, J. J., Frankel, C. B., & Camras, L. (2004). On the nature of emotion regulation. *Child Development*, 75(2), 377–394. <https://doi.org/10.1111/j.1467-8624.2004.00681.x>
- Cicchetti, D., Ackerman, B. P., & Izard, C. E. (1995). Emotions and emotion regulation in developmental psychopathology. *Development and Psychopathology*, 7(1), 1–10. <https://doi.org/10.1017/S0954579400006301>
- Cole, P. M., Martin, S. E., & Dennis, T. A. (2004). Emotion regulation as a scientific construct: Methodological challenges and directions for child development research. *Child Development*, 75(2), 317–333. <https://doi.org/10.1111/j.1467-8624.2004.00673.x>
- Cole, P. M., Zahn-Waxler, C., Fox, N. A., Usher, B. A., & Welsh, J. D. (1996). Individual differences in emotion regulation and behavior problems in preschool children. *Journal of Abnormal Psychology*, 105, 518–529. <https://doi.org/10.1037/0021-843X.105.4.518>
- del Barrio, V., Aluja, A., & Spielberger, C. (2004). Anger assessment with the STAXI-C/A: Psychometric properties of a new instrument for children and adolescents. *Personality and Individual Differences*, 37(2), 227–244. <https://doi.org/10.1016/j.paid.2003.08.014>
- Dougherty, L. R. (2006). Children's emotionality and social status: A meta-analytic review. *Review of Social Development*, 15(3), 394–417. <https://doi.org/10.1111/j.1467-9507.2006.00348.x>
- Duckworth, A., & Gross, J. J. (2014). Self-control and grit: Related but separable determinants of success. *Current Directions in Psychological Science*, 23(5), 319–325. <https://doi.org/10.1177/0963721414541462>
- Farmer, A. S., & Kashdan, T. B. (2012). Social anxiety and emotion regulation in daily life: Spillover effects on positive and negative social events. *Cognitive Behavioral Therapy*, 41(2), 152–162. <https://doi.org/10.1080/16506073.2012.666561>
- Graziano, P. A., Reavis, R. D., Keane, S. P., & Calkins, S. D. (2007). The role of emotion regulation in children's early academic success. *Journal of School Psychology*, 45(1), 3–19. <https://doi.org/10.1016/j.jsp.2006.09.002>
- Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology*, 2(3), 271–299. <https://doi.org/10.1037/1089-2680.2.3.271>
- Gross, J. J. (2001). Emotion regulation in adulthood: Timing is everything. *Current Directions in Psychological Science*, 10(6), 214–219. <https://doi.org/10.1111/1467-8721.00152>
- Hancock, G. R., & Mueller, R. O. (Eds.). (2013). *Structural equation modeling: A second course* (2nd ed.). Information Age Publishing, Inc.
- Harley, J. M., Pekrun, R., Taxer, J. L., & Gross, J. J. (2019). Emotion regulation in achievement situations: An integrated model. *Educational Psychologist*, 54(2), 106–126. <https://doi.org/10.1080/00461520.2019.1587297>
- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1–55. <https://doi.org/10.1080/10705519909540118>
- Izard, C. (1977). *Human emotions (Emotions, personality, and psychotherapy)*. Plenum Press.
- Izard, C. E., Libero, D. Z., Putnam, P., & Haynes, O. M. (1993). Stability of emotion experiences and their relations to traits of personality. *Journal of Personality and Social Psychology*, 64(5), 847–860. <https://doi.org/10.1037//0022-3514.64>

- Kashdan, T. B., Young, K. C., & Machell, K. A. (2015). Positive emotion regulation: Addressing two myths. *Current Opinion in Psychology*, 3, 117–121. <https://doi.org/10.1016/j.copsyc.2014.12.012>
- Kline, R. B. (2015). *Principles and practice of structural equation modeling* (4th ed.). Guilford Press.
- Kosky, C., & Curtis, R. (2008). An action research exploration integrating student choice and arts activities in a sixth-grade social studies classroom. *Journal of Social Studies Research*, 32(1), 22–27.
- Lantieri, L. (2008). Building inner resilience. *Reclaiming Children and Youth*, 17(2), 43–46.
- Linehan, M. M. (2014). *DBT training manual*. The Guilford Press.
- Mazza, J. J., Dexter-Mazza, E. T., Miller, A. L., Rathus, J. H., Murphy, H. E., & Linehan, M. M. (2016). *DBT Skills in schools: Skills training for emotional problem solving for adolescents (DBT STEPS-A)*. Guilford Press.
- Moffitt, T. E., Arseneault, L., Belsky, D., Dickson, N., Hancox, R. J., Harrington, H., Houts, R., Poulton, R., Roberts, B. W., Ross, S., Sears, M. R., Thomson, W. M., & Caspi, A. (2011). A gradient of childhood self-control predicts health, wealth, and public safety. *Proceedings of the National Academy of Sciences*, 108(7), 2693–2698. <https://doi.org/10.1073/pnas.1010076108>
- Muthén, L. K., & Muthén, B. O. (1998–2017). *Mplus user's guide* (8th ed.). Muthén & Muthén.
- Ng, L. V., & Khor, K. L. (2018). Anger experience and expression among adolescents: A test of the STAXI-2 C/A. *Advances in Social Science, Education and Humanities Research*, 3, 109–112. <https://doi.org/10.2991/acpch-17.2018.55>
- Northwest Evaluation Association (2009). *Technical manual for measures of academic progress™ and measures of academic progress for primary grades™*. Northwest Evaluation Association.
- O'Neal, C. R. (2000). *Paths of resilience: A contextual-moderator analysis of exposure to community violence and behavioral functioning among inner city youth* (Publication no. 9978688) [Doctoral dissertation, Long Island University, Brooklyn]. ProQuest Dissertations Publishing.
- O'Neal, C. R., & Magai, C. (1997). Emotions as a Child. Unpublished measure.
- O'Neal, C. R., Meyering, K., Babaturk, L., & Gosnell, N. (under review). Child Anger Regulation Measure (CARM): Psychometric properties and prediction of emotional engagement.
- Park, S., Holloway, S., Arendtsz, A., Bempechat, J., & Li, J. (2012). What makes students engaged in learning? A time-use study of within- and between-individual predictors of emotional engagement in low-performing high schools. *Journal of Youth and Adolescence: A Multidisciplinary Research Publication*, 41(3), 390–401. <https://doi.org/10.1007/s10964-011-9738-3>
- Pekrun, R. (2006). The control-value theory of achievement emotions: Assumptions, corollaries, and implications for educational research and practice. *Educational Psychology Review*, 18(4), 315–341. <https://doi.org/10.1007/s10648-006-9029-9>
- Pekrun, R., Lichtenfeld, S., Marsh, H. W., Murayama, K., & Goetz, T. (2017). Achievement emotions and academic performance: Longitudinal models of reciprocal effects. *Child Development*, 88(5), 1653–1670. <https://doi.org/10.1111/cdev.12704>
- Putwain, D. W., Nicholson, L. J., Pekrun, R., Becker, S., & Symes, W. (2019). Expectancy of success, attainment value, engagement, and achievement: A moderated mediation analysis. *Learning and Instruction*, 60, 117–125. <https://doi.org/10.1016/j.learninstruc.2018.11.005>
- Raver, C. C. (2002). Emotions matter: Making the case for the role of young children's emotional development for early school readiness. *Social Policy Report*, 16(3). Ann Arbor, MI: Society for Research in Child Development. <https://doi.org/10.1002/j.2379-3988.2002.tb00041.x>
- Rydell, A. M., Berlin, L., & Bohlin, G. (2003). Emotionality, emotion regulation, and adaptation among 5 to 8-year-old children. *Emotion (Washington, D.C.)*, 3(1), 30. <https://doi.org/10.1037/1528-3542.3.1.30>

- Shah, P. E., Weeks, H. M., Richards, B., & Kaciroti, N. (2018). Early childhood curiosity and kindergarten reading and math academic achievement. *Pediatric Research*, *84*(3), 380–386. <https://doi.org/10.1038/s41390-018-0039-3>
- Shaver, P. R., Wu, S., & Schwartz, J. C. (1992). Cross-cultural similarities and differences in emotion and its representation. In M. S. Clark (Ed.), *Emotion* (pp. 175–212). Sage Publications.
- Skibbe, L., Montroy, J., Bowles, R., & Morrison, F. (2019). Self-regulation and the development of literacy and language achievement from preschool through second grade. *Early Childhood Research Quarterly*, *46*, 240–251. <https://doi.org/10.1016/j.ecresq.2018.02.005>
- Skinner, E. A., & Belmont, M. J. (1993). Motivation in the classroom: Reciprocal effects of teacher behavior and student engagement across the school year. *Journal of Educational Psychology*, *85*(4), 571–581. <https://doi.org/10.1037/0022-0663.85.4.571>
- Skinner, E., Furrer, C., Marchand, G., & Kindermann, T. (2008). Engagement and disaffection in the classroom: Part of a larger motivational dynamic? *Journal of Educational Psychology*, *100*(4), 765–781. <https://doi.org/10.1037/a0012840>
- Spielberger, C. D., Johnson, E. H., Russell, S. F., Crane, R. J., Jacobs, G. A., & Worden, T. J. (1985). The experience and expression of anger: Construction and validation of the anger expression scale. In M. A. Chesney, & R. H. Rosenman (Eds.), *Anger and hostility in cardiovascular and behavioral disorders* (pp. 5–30). Hemisphere.
- Tomkins, S. (1963). *Affect imagery consciousness: Volume II: The negative affects* (Vol. 2). Springer Publishing Company.
- Tomkins, S. S. (1991). *Affect, imagery, consciousness, Vol. 3. The negative affects: Anger and fear*. Springer Publishing Co.
- Totura, C. M. W., Karver, M. S., & Gesten, E. L. (2014). Psychological distress and student engagement as mediators of the relationship between peer victimization and achievement in middle school youth. *Journal of Youth and Adolescence*, *43*(1), 40–52. <https://doi.org/10.1007/s10964-013-9918-4>
- Valiente, C., Lemery-Chalfant, K., & Swanson, J. (2010). Prediction of kindergartners' academic achievement from their effortful control and emotionality: Evidence for direct and moderated relations. *Journal of Educational Psychology*, *102*(3), 550–560. <https://doi.org/10.1037/a0018992>
- Zahn-Waxler, C., Klimes-Dougan, B., & Kendziora, K. T. (1998). The study of emotion socialization: Conceptual, methodological, and developmental considerations. *Psychological Inquiry*, *9*, 313–316. [https://doi.org/10.1207/s15327965pli0904\\_16](https://doi.org/10.1207/s15327965pli0904_16)
- Zhou, Q., Main, A., & Wang, Y. (2010). The relations of temperamental effortful control and anger/frustration to Chinese children's academic achievement and social adjustment: A longitudinal study. *Journal of Educational Psychology*, *102*(1), 180–196. <https://doi.org/10.1037/a0015908>

### Author biographies

**Colleen R. O'Neal**, Ph.D. is an associate professor of School Psychology in the College of Education at the University of Maryland, College Park (Department of Counseling, Higher Education, and Special Education). Her primary research goals are to identify emotion-focused risk and resilience processes among immigrant and minoritized students with a focus on prevention.

**Kristin Meyering**, M.A. is a School Psychology doctoral candidate in the College of Education at the University of Maryland, College Park (Department of Counseling,



---

Higher Education, and Special Education). Her primary research interest is socioemotional learning and literacy achievement.

**Leyla Babaturk**, M.A. is a School Psychology doctoral candidate in the College of Education at the University of Maryland, College Park (Department of Counseling, Higher Education, and Special Education). Her primary research interest is stress and literacy achievement.

**Nicole Gosnell**, Ph.D. is a school psychologist in the Howard County Public School System. Her primary research interest is refugee mental health and teachers.

**Hayley Weinberg**, M.A. is a School Psychology doctoral student in the College of Education at the University of Maryland, College Park (Department of Counseling, Higher Education, and Special Education). Her primary research interest is emotion regulation and literacy achievement.