IS SELF-REPORTED OPTIMISM A UNIQUE PREDICTOR OF READING AND MATH PERFORMANCE IN LATINX ELEMENTARY SCHOOL STUDENTS?

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This study examined whether optimism is a unique predictor of fourth and fifth graders' academic performance. The few studies that have examined this relationship with students in middle childhood have ignored relevant covariates and have focused on higher socioeconomic White students. In the present study, we examined the relationship between optimism and reading and math achievement after controlling for previous achievement, socioeconomic status (SES), gender, teacher, executive functioning, positive classroom behaviors, perspective taking, and empathic concern in a sample of predominately low SES Latinx students in fourth and fifth grade. Optimism was one of the strongest unique predictors of reading achievement, but not math achievement. This study suggests that the relationship between optimism and reading achievement is not explained by the other measured variables. The findings have implications for how educators can leverage optimism to help Latinx students in their reading achievement, an area where they often struggle (Hemphill & Vanneman, 2011).

Keywords: optimism, academic achievement, Latinx students, middle childhood

Optimism has been defined as the tendency to have a positive attitude toward past and current events and to expect further positive experiences in the future (Gillham & Reivich, 2004; Peterson, 2000; Scheier & Carver, 1985, 1992; Seligman, 1991). Research has shown that this tendency can be quite beneficial. For instance, optimism is associated with better mental and physical health and more relationship satisfaction in adults (Gallagher & Lopez, 2009;

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Landa et al., 2010; Scheier & Carver, 1992; Srivistava et al., 2006).

Optimism also appears to be central to undergraduate students' academic achievement (Schulman, 1995). Undergraduate students who explain negative events in an optimistic way tend to have a higher grade point average in their first year of college. In addition, optimistic undergraduate students are less likely to drop out of college than those who are pessimistic (Schulman, 1995). Importantly, many of the studies that have examined the link between students' self-reported optimism and academic achievement have involved college samples (e.g., Brown & Marshall, 2011; Ruthig et al., 2004; Schulman, 1995; Solberg Nes et al., 2009). Fewer studies have examined this relationship in children. This is surprising given that academic achievement in childhood is arguably just as important and is associated with important outcomes, such as decreased juvenile delinquent behavior (Chavez & Oetting, 1994) and more concurrent life satisfaction (Steinmayr et al., 2015). The few studies that have examined the relationship between optimism and academic achievement in children have ignored other factors that contribute to academic achievement and that are themselves also often related to optimism, such as socioeconomic status (SES), the student's teacher, cognitive abilities, and positive classroom behaviors. It is therefore unclear how robust optimism is as a predictor of academic achievement when other relevant variables are considered. In addition, the existing studies regarding optimism and academic achievement have typically involved mostly White students from higher SES backgrounds. Our goal in the present study was to determine whether optimism would account for unique variance in primarily lower SES, Latinx fourth- and fifth-grade students' reading and math achievement when other variables were considered as covariates (e.g., previous achievement, teacher, SES, gender, executive functioning, positive classroom behaviors, perspective taking, and empathic concern). Although there are varying definitions of covariates, we define these as extraneous variables that may relate to the outcome and/or antecedent. If these variables are left unconsidered they may threaten the internal validity of results and suggest alternative explanations for any relationships observed.

THEORETICAL FOUNDATIONS FOR THE RELATIONSHIP BETWEEN OPTIMISM AND ACHIEVEMENT

Optimism has been conceptualized and studied in two major ways—both of which have implications for achievement. Scheier and Clark (1985, 1992) have studied optimism as a stable personality trait termed dispositional optimism. This view of optimism focuses on positive *expectations*, which is instrumental when individuals encounter or anticipate obstacles to goal attainment. Optimists believe that goals can be achieved despite obstacles that may arise along the way and this belief in turn encourages effort toward reaching goals. Conversely, pessimists tend to believe that obstacles to goals cannot be overcome and this leads to giving up. However, optimism is distinct from self-efficacy which is generally thought of as being situation specific and focused on positive beliefs about the self's abilities to achieve (Gillham & Reivich, 2004). Optimism involves general positive expectations. That is, the person can expect good life outcomes that are a result of their own efforts, the actions of others, and/or simple good fortune.

In the pursuit of goals, not only is optimism beneficial for endowing a person with the belief that problems can be resolved, but it also helps the person better cope with and recover from any failures that they may experience along the way. Research has shown that optimism is correlated with adults' explanatory styles (Gillham et al., 1998; Hjelle et al., 1996), which is the second major way that optimism has been conceptualized. Explanatory styles describe the ways that a person thinks about the causes of events in life

(Abramson et al., 1978). Individuals with an optimistic explanatory style tend to explain negative events as being the result of transient, isolated, and external factors (e.g., "I failed the math test, because I was hurt by what my friend said to me, so I had difficulty concentrating"). This type of explanation does not discourage future efforts toward achieving a goal, because the person can view the negative event as a special case with a particular situational cause that is unlikely to affect future goal attainment.

Conversely, pessimistic individuals tend to explain negative events as being the result of sources that are enduring, more generalized, and internal. (e.g., "I failed the math test because I am a bad test taker"). Explanations such as these discourage future effort toward goals in a variety of ways. First, if a person believes a negative event was the result of an enduring cause, rather than an unenduring cause, then he or she will likely assume that such negative events will persist and he or she may feel helpless to change things. Second, it can also be detrimental to view the source of the negative event as having generalized effects, because this may cause the person to feel that exerting efforts toward other goals is pointless. For example, in the instance of the student failing the math test, the student may assume that they will fail tests in other subjects as well. Finally, if a person believes that a negative event is due to an internal cause or their own personal weaknesses, then he or she will likely show lowered self-esteem (Nolen-Hoeksema et al., 1986).

Interestingly, the opposite pattern is observed for individuals with optimistic and pessimistic explanatory styles when they must explain positive events. That is, those with an optimistic explanatory style explain positive events as being the result of enduring, pervasive, factors internal to themselves, whereas those with a pessimistic explanatory style see positive events as transient, isolated, and due to external factors. When a positive event like passing a math test occurs it is as if they are saying, "I got lucky just this once" (Abramson et al., 1978; Gillham et al., 2001). This pessimistic pattern of thinking about negative and positive events can lead to a host of detrimental outcomes, such as cognitive impairments and inaction, as well as lowered self-esteem, assertiveness, and competitiveness (Nolen-Hoeksema et al., 1986).

The research on dispositional optimism and optimistic versus pessimistic explanatory styles suggests that optimism affects motivation and effort. However, optimism may also affect cognitive abilities. The broaden-and-build theory posits that positive emotions broaden one's attention and therefore boost innovative, varied, and investigative thoughts and actions (Frederickson, 2013). Research has indeed supported this theory. For instance, adults who are induced into positive emotional states as opposed to neutral or negative emotional states attend to a wider array of visual information as measured by eye-tracking technology (Rowe et al., 2007; Wadlinger & Isaacowitz, 2006). Additionally, in her review of the effects of positive emotions on various cognitive processes, Isen (2008) discussed empirical evidence that individuals experiencing mild positive emotions may be able to take in more information and therefore solve problems more quickly and completely than individuals experiencing neutral or negative emotions. Although this line of research has not been tested with optimism specifically, optimism is considered a positively valenced state and dispositional optimism is associated with experiencing more generalized daily positive affect (e.g., Chang et al., 1997). As such, optimism may also be instrumental for achievement because it helps bolster more wide-ranging attention and problem-solving abilities through positive affect.

PREVIOUS RESEARCH ON OPTIMISM AND ACADEMIC ACHIEVEMENT IN CHILDREN

Most studies that have examined optimism and academic achievement in children have focused on optimistic versus pessimistic

explanatory styles. For instance, in one cross-sectional study of third-, fourth-, and fifth-grade students, a positive bivariate correlation ($r = .26$, $p < .05$) was found between optimistic explanatory styles and scores on the California Achievement Test (California Testing Bureau, 1982; Nolen-Hoeksema et al., 1986). In addition, longitudinal research has demonstrated a weak, albeit a statistically significant, positive relationship between optimistic explanatory styles and academic achievement measured half a year later in fifth graders ($r = .14$, $p < .05$), though no statistically significant relationship was found for fourth graders (Nolen-Hoeksema et al., 1986). Some studies have separated optimistic and pessimistic explanatory style out into separate factors. Cross-sectional studies have shown both optimistic ($r = .20$, $p < .05$) and pessimistic explanatory style ($r = –.30$, $p < .01$) to be related specifically to math achievement (Yates et al., 1995). Longitudinal research has replicated this relationship between pessimistic explanatory style and math achievement assessed 3 years later even when controlling for previous math achievement, pessimism, grade level, and gender ($r = –.21$, $p < .05$). Curiously, optimistic explanatory style had a negative association with math achievement in this longitudinal research ($r = –.19$, $p < .05$) (Yates, 2002).

In our review of the literature on optimism and academic achievement, we found only one study involving children that conceptualized optimism in terms of positive expectations.

Pajares (2011) found a significant positive correlation ($r = .16$, $p < .01$) between student self-reported optimism and grade point average. However, this was reported as a simple bivariate correlation and no other variables were considered as covariates. In the present study, we measured self-reported optimism using a scale developed by Noam and Goldstein (1998), and revised by Song (2003). This scale assesses optimism as a disposition that is relatively stable. The scale contains primarily items that measure the extent to which someone has positive attitudes and emotions regarding the future, however there is at least one item that assesses how stable a negative event will be, which is somewhat similar to how optimism is conceptualized in research on explanatory styles. We expected that optimism, as measured by this scale, would have a significant positive bivariate correlation with both reading and math scores on standardized assessments. We also expected optimism to account for unique variance in both reading and math achievement even when controlling for a variety of other known predictors of these outcomes. It should be noted that our use of the phrase "unique" is not meant to imply that optimism is the only relevant variable for achievement. Rather, we expect it to account for a part of reading and math achievement that is not already explained by the other variables we are considering as covariates and confounds.

RATIONALE FOR COVARIATES

We statistically controlled for obvious covariates, such as previous academic achievement, and typical demographic variables such as SES and gender. All of these have been shown to have an impact on academic achievement in previous research (Çiftçi & Cin, 2017; Marcenero-Gutierrez et al., 2018). In addition, SES and gender have been found to relate to optimism, with those of higher SES and males displaying higher levels of optimism (Puskar et al., 2010). We also statistically controlled for the students' particular teacher in our study, as previous studies have shown that variation in teachers' instructional quality is associated with students' academic achievement (Nye et al., 2004). In addition, we included executive functioning, positive classroom behaviors, perspective taking, and empathy as covariates.

Executive Functioning

We considered executive functioning to be an important control variable in the present

study, because it involves three core components that are vital for academic performance. These components include inhibitory control, working memory, and cognitive flexibility (Diamond, 2013). Inhibitory control is the ability to regulate one's attention, thoughts, emotions, and actions. Working memory is essential for understanding things as they unfold in real time, as it allows us to keep in mind what has just occurred and connect it to what comes later. Cognitive flexibility is the ability to change perspectives and aids problem-solving as individuals need to think about problems from new angles if previous approaches have not worked. Higher executive functioning has consistently been shown to predict higher academic performance in children (e.g., Best et al., 2011; Bull et al., 1999; Bull et al., 2008; Bull & Scerif, 2001; McLean & Hitch, 1999; St. Clair-Thompson & Gathercole, 2006; Swanson, 1993, 1999, 2004).

Perspective Taking and Empathy

Similar to executive functioning, perspective taking and empathy are additional cognitive abilities that may help students succeed. Perspective taking is the ability to adopt another person's point of view, whereas empathy is the ability to feel compassion and concern for others (Davis, 1983). These variables may be particularly relevant for reading where students must consider the thoughts and emotions of various characters and why they acted in certain ways. Perspective taking has been shown to predict "deep reading comprehension" (LaRusso et al., 2016). Similarly, empathy has also been shown to predict reading achievement and overall grade point average in children (Bonner & Aspy, 1984; Feshbach & Feshbach, 1987).

Positive Classroom Behaviors

Along with cognitive abilities, learning and achievement require positive behaviors, such as self-control, cooperation, and assertion. For instance, self-control allows students to sustain attention and follow directions in order to complete tasks and assignments successfully and efficiently. Cooperation and assertion are largely social skills that helps students perform well in learning activities that require groups. Not surprisingly, all of these types of behaviors have been shown to positively correlate with intellectual abilities and academic achievement (Malecki & Elliott, 2002; Wentzel, 1993).

HYPOTHESES

We included all of these variables as covariates in the current study, thus making it the most robust analysis, to date, of the unique contribution of optimism to children's academic performance. In addition, we focused our study on primarily low income, Latinx students, given that previous studies have focused on primarily high income, White students. Given previous theory and research suggesting that optimism predicts effort and critical adaptive cognitive abilities (Frederickson, 2013, 2004; Isen, 2013; Nolen-Hoeksema et al., 1986), we predicted that optimism would account for unique variance in math and reading achievement even after controlling for these other factors.

METHOD

Sample

The sample included 123 fourth- and fifth-grade students from an urban elementary school located in the South Central region of the United States. Informed parental consent and verbal child assent were obtained for all students. The sample was almost exactly evenly split in terms of gender, with 50.4% of the sample being female and 49.6% being male. The age ranged from 9 to 11 years (M = 10.19, SD = .66). The sample was predominately Latinx (91.9%). A small minority were African American (5.7%), White (1.6%), or identified as being from another ethnic back-

ground (.8%). With regard to school lunch status, which served as a proxy measure of the student's SES, 68.3% received free lunch, 19.5% received reduced price lunch, and 12.2% paid in full for lunch.

Procedure

Data were collected from fourth- and fifth grade students. The students completed standardized assessments of reading and math ability toward the end of their previous academic year (i.e., when in third or fourth grade) and their current academic year (i.e., fourth and fifth grade). Toward the end of their current year, students also completed self-report measures of their optimism, perspective taking, empathic concern, as well as performance-based measures of executive functioning. Also during this time frame, the students' teachers rated them on positive classroom behaviors.

Measures

Demographic Information. SES, gender, and ethnicity/race were obtained from school records, which for gender and ethnicity/race, was based on enrollment questionnaires completed by students' parents. SES categorization was based on students' school lunch status, which included free, reduced, or paid lunch status.

Students' Positive Classroom Behaviors. The teacher form of the Social Skills Rating System, Elementary level (SSRS) was used to measure students' positive classroom behaviors. This measure was developed by Gresham and Elliott (1990) and requires teachers to rate the frequency with which students display each of 30 different classroom behaviors. Response options include 0 (never), 1 (sometimes), and 2 (very often). The measure contains three subscales, 10 items each, assessing cooperation (e.g., "follows your directions), self-control (e.g., controls temper in conflict situations with peers), and assertion (e.g., joins ongoing activity or group without being told to do so."). This scale has been well-validated (Gresham & Elliott, 1990) and widely used. The total for all 30 items was used as the score for positive classroom behaviors and this measure had good internal reliability in the current sample (.96).

Optimism. Students' optimism was measured using a subscale from the Resiliency Inventory (RI). This measure was first developed by Noam and Goldstein (1998) and later revised by Song (2003). This scale has been shown to be cross-culturally strong and has been found to correlate with theoretically related constructs in previous studies (Song, 2003; Thomson et al., 2015). The optimism subscale contains nine Likert-scale items for which students rated how well the item describes their thinking, using a scale from 1 (*not at all like me*) to 5 (*always like me*). Sample items from this scale are, "More good things than bad things will happen to me" and "When something bad happens to me, I think that it will last long." The average of the nine items was used as the optimism score in this study and this measure has good internal reliability in the current sample (.74).

Perspective Taking and Empathy. Students' perspective taking and empathy was assessed using the Interpersonal Reactivity Index that was developed by Davis (1983). A version for children in fourth through seventh grade has been used in previous studies (Schonert-Reichl et al., 2012). The perspective taking subscale measures the degree to which a person tends to take the perspective of others. This measure contains seven Likert-scale items with response options for each ranging from 1 (*not at all like me*) to 5 (*always like me*). Sample items from this subscale are, "It's easy for me to understand why other people do the things they do" and "I try to understand how other kids feel before I decide what to say to them." The average of the five items was used as the score for perspective taking in this study and the internal reliability was good in the current sample (.82).

The empathic concern subscale measures the degree to which a person tends to experi-

ence feelings of compassion and concern for others. This measure has been positively associated with theoretically relevant constructs (e.g., prosocial behavior) in previous studies (Oberle et al., 2010; Schonert-Reichl et al., 2012) with fourth and fifth graders. This measure contains seven Likert-scale items with response options ranging from 1 (*not at all like me*) to 5 (*always like me*). Sample items from this scale are, "When I see someone being picked on, I feel kind of sorry for them" and "I often feel sorry for people who don't have the things I have." The average of the seven items was used as the empathic concern score in the present study and the internal reliability was good in the current sample (.82).

Executive Functioning. The three core executive functions (inhibition, working memory, and cognitive flexibility) were assessed using the flanker task (Davidson et al., 2006; Diamond et al., 2007), which was presented to individual students on a laptop computer. Students sat approximately 20 inches from the screen and pressed one of two keys on opposite ends of the keyboard, which recorded their responses during the task. The flanker task consisted of three different subtasks. Prior to each subtask, a block of four practice trials were presented followed by a block of test trials. The four practice trials could be repeated up to 3 times to ensure that the student understood the task before moving on to the test trials. Within each subtask the student saw a row of five fish with a stimulus presentation time of 1,500 ms and an interstimulus interval of 500 ms. When the fish were blue (standard flanker subtask), the student had to press the key on the side of the keyboard that represented the direction in which the middle fish was facing, ignoring the two distractor fish on either side. When the fish were pink (reverse flanker subtask), the student had to press the key that represented the direction in which the two fish on either side of the middle fish were facing. In the third subtask, the blue and pink fish were randomly intermixed. Importantly, within each of these subtasks, four different types of trials were presented randomly: (a) congruent, (b) incongruent, (c) no distractor, and (d) neutral. The congruent trials displayed all fish facing the same direction, either left or right. The incongruent trials showed the target fish facing a different direction than the distractor fish, with some facing left and some facing right. The no distractor trial contained the target fish facing left or right and the other fish facing down. This was not considered a true distraction because the participants only have the option to press keys indicating left or right, not keys indicating down. Finally, the neutral trial showed only the target fish, with no distractor fish. The incongruent trials place the heaviest demand on all three core executive functions. Scores were calculated by taking the percentage of correct responses on the incongruent trials across all three subtasks. Responses that occurred in 200 ms or less were excluded from the scores, because this is considered too fast to adequately process the stimuli.

Reading and Math Achievement. The State of Texas Assessments of Academic Readiness in reading and math were used as the measures of academic achievement. These are standardized assessments that are administered annually in the state of Texas and align with the curriculum standards of the state. The percentage of correctly answered questions was used as the measure of academic achievement in the present study. The students' scores in fourth and fifth grade were used as the dependent measure in the analysis (current year) and their scores from the previous year when they were in third and fourth grade respectively were used as a control variable.

RESULTS

Data Screening and Analysis

Prior to conducting formal hypothesis tests, the data were screened to ensure that the variables met the assumption of normality. Empathic concern and executing functioning were both negatively skewed; therefore a squared transformation was applied to these variables and this resulted in more normal dis-

tributions. Bivariate correlations and ordinary least squares regression analysis were used to test the primary hypotheses. All the necessary assumptions were met in order to conduct these analyses. The teacher variable was recoded using four dummy variables, each of which compared a different teacher to the most veteran teacher. Lunch status were also recoded using dummy codes. For all regression models, the semipartial correlations (*sr2*) were reported to indicate the unique variance accounted for by each predictor, when controlling for the other predictors.

Results of Hypothesis Tests

First, bivariate correlations were examined between reading and math achievement and the various continuous predictors. Reading achievement was positively correlated with executive functioning, empathic concern, and optimism. Math achievement was positively correlated with executive functioning, and optimism. Table 1 displays the intercorrelations between all continuous measures collected in the study.

For the first regression model, fourth and fifth grade (current grade) reading achievement was regressed on the previous year's reading achievement, reading teacher, lunch status, gender, executive functioning, positive classroom behaviors, perspective taking, empathic concern, and optimism. Together, the nine predictors accounted for 61.39% of the variance in current reading achievement, $F(13, 117) = 12.72$, $p < .001$. However, when examining the individual predictors, only executive functioning, optimism, and the previous year's reading achievement were significant predictors of current reading achievement. These three variables each had a positive relationship with current reading achievement and an examination of the semipartial correlations indicated that they accounted for 3.00%, 2.56%, and 32.90% unique variance in reading achievement, respectively. As such, our hypothesis that optimism would account for unique variance in current reading achievement when controlling for other variables was supported. In addition, executive functioning and previous reading achievement also emerged as significant unique predictors of reading achievement. Reading teacher, lunch status, gender, positive classroom behaviors, perspective taking and empathic concern were not significant predictors of reading achievement. Table 2 displays the regression statistics for each variable in this model.

For the second regression model, the current year's math achievement was regressed on the same set of variables. The overall model was significant. Together, the nine predictors accounted for 67.44% of the variance in current math achievement, $F(13, 117) = 16.568$, $p < .001$. However, when examining the individual predictors, only executive functioning and the previous year's math achievement were significant predictors of current math achievement. These two variables each had a positive relationship with current math achievement and an examination of semipartial correlations indicated they accounted for 34.10% and 1.82% unique variance in math achievement, respectively. Math teacher, lunch status, gender, positive classroom behaviors, perspective taking, empathic concern, and optimism were not significant predictors of math achievement. As such, our hypothesis that optimism would account for unique variance in current math achievement was not supported. However, executive functioning and previous math achievement emerged as significant unique predictors of math achievement. Table 3 displays the regression statistics for each variable in the model.

DISCUSSION

Our aim in the present study was to determine if optimism would be a unique predictor of reading and math achievement, even when controlling for other robust predictors of academic performance. A review of the literature showed that optimism is linked to a host of

TABLE 1
Intercorrelations Between Continuous Variables

	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
1. Reading achievement	1.000								
2. Previous reading achievement	.743***	1.000							
3. Math achievement	.546***	.494***	1.000						
4. Previous math achievement	.547***	.659***	.762***	1.000					
5. Executive functioning	.367***	.289**	.250**	.167	1.000				
6. Positive classroom behaviors	.100	.088	.118	-.001	-.069	1.000			
7. Perspective-taking	.127	.118	.010	.016	.168	.167	1.000		
8. Empathy	.172	.201*	.053	.069	.230*	.111	1.688***	1.000	
9. Optimism	.286**	.205*	.195*	.212*	-.045	284**	.360***	.264**	1.000

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

TABLE 2
Regression Statistics for Reading Achievement

	b	*SE*	*t*	*p*	sr^2
Previous reading achievement	0.573	0.061	9.424	< .001	.329
D1 teacher	–0.024	0.034	–0.714	.477	.001
D2 teacher	0.027	0.043	0.628	.532	.001
D3 teacher	–0.049	0.039	–1.247	.215	.005
D4 teacher	–0.047	0.035	–1.345	.182	.006
D1 school lunch status	0.008	0.028	0.287	.775	.000
D2 school lunch status	–0.007	0.032	–0.216	.830	.000
D1 gender	–0.019	0.022	–0.847	.399	.002
Executive functioning	0.185	0.065	2.862	.005	.030
Positive classroom behaviors	0.000	0.001	–0.290	.772	.000
Perspective-taking	0.001	0.017	0.081	.936	.000
Empathy	–0.001	0.002	–0.321	.749	.000
Optimism	0.049	0.018	2.629	.010	.025

TABLE 3
Regression Statistics for Math Achievement

	b	*SE*	*t*	*p*	sr^2
Previous math achievement	0.644	0.062	10.431	< .001	.341
D1 teacher	0.018	0.040	0.437	.663	.000
D2 teacher	0.050	0.040	1.260	.211	.004
D3 teacher	–0.030	0.039	–0.767	.445	.001
D4 teacher	–0.100	0.028	–3.570	.001	.040
D1 school lunch status	0.017	0.029	0.584	.560	.001
D2 school lunch status	–0.008	0.033	–0.233	.816	.000
D1 gender	–0.026	0.024	–1.106	.271	.003
Executive Functioning	0.167	0.069	2.409	.020	.018
Positive classroom behaviors	0.000	0.001	0.380	.705	.000
Perspective-taking	–0.009	0.019	–0.453	.651	.000
Empathy	0.001	0.003	0.227	.821	.000
Optimism	0.016	0.020	0.831	.408	.002

motivational and cognitive advantages, so we expected optimism to account for unique variance in reading and math achievement even when other important variables were included as covariates in our analyses. This hypothesis was confirmed for reading achievement. Optimism was a positive predictor of reading achievement after controlling for previous reading achievement, lunch status, gender, reading teacher, executive functioning, positive classroom behaviors, and perspective taking and empathic concern. Interestingly, when looking at the unique variance accounted for by each predictor, optimism accounted for a comparable amount of unique variance in reading achievement (2.5%) as executive functioning (3.0%). Although this is a modest relationship, it is important to keep in mind that this is after controlling for previous academic achievement. In fact, previous academic achievement was measured using the same type of standardized test assessment as that used for students' current achievement, although each assessment was based on grade-specific knowledge and skills standards.

Executive functioning involves core cognitive processes critical for learning and numerous studies have shown it to be a positive predictor of academic performance in children (e.g., Best et al., 2011; Bull et al., 2008; Bull et al., 1999; Bull & Scerif, 2001; McLean & Hitch, 1999; St. Clair-Thompson & Gathercole, 2006; Swanson, 1993, 1999, 2004). Furthermore, research involving the same age group has shown executive functioning to have fairly large bivariate relationships (*r*'s ranging from .25 to .67) with several different skills necessary for reading achievement, such as passage comprehension, reading vocabulary and accuracy (Best et al., 2011). Thus, the fact that optimism was able to account for a comparable amount of unique variance in reading achievement as executive functioning is impressive.

It should also be noted that few previous studies have linked optimism specifically with reading achievement. Most of the studies that we reviewed focused on overall academic achievement or math achievement. As such, this study provides some initial evidence suggesting that optimism could help boost reading achievement. This finding is encouraging when we consider that our sample consisted largely of Latinx students from disadvantaged

backgrounds, with many having English as their second language. Previous research has indicated that Latinx students have had lower levels of achievement in reading than White students. For 2009, the National Center for Education Statistics reported a 25-point achievement gap between White and Latinx students on reading scores (Hemphill & Vanneman, 2011). The results from the present study suggest that optimism might be beneficial to Latinx students, particularly with regard to areas where they are at risk.

When examining math achievement, our hypothesis was not confirmed. Although there was a significant bivariate relationship between optimism and current math achievement, optimism was not a significant unique predictor of math achievement when controlling for previous math achievement, lunch status, gender, math teacher, executive functioning, positive classroom behaviors, perspective taking, and empathic concern. Our findings are inconsistent with previous studies (Yates et al., 1995) that have shown a relationship between optimism and math achievement. One possible reason that optimism did not predict math achievement could be that other variables were exerting a stronger influence on math compared to reading. In this sample, there was a significant association between teacher and current math achievement, but this association did not exist for reading. As such, it may be difficult for optimism to account for unique variance in math achievement when other variables are accounting for greater amounts of variance. Previous studies may have found a relationship between optimism and math achievement, because they did not include other covariates in their analysis, thus making it easier to detect an association with math achievement. In addition, these previous studies focused on optimistic versus pessimistic explanatory styles, which is measured and conceptualized differently than the way we measured and conceptualized optimism in this study. Recall that in the present study, we measured optimism as a stable individual difference variable that primarily involves general positive expectations about the future. The explanatory styles conceptualization and measurement examines how individuals explain positive and negative events in their lives. Clearly, more research is needed in this area to further establish which type of optimisms is and is not predictive of math achievement. These future studies should also include relevant covariates like those included in the present study. This will help rule out the possibility that the relationship between optimism and math achievement that has been found in previous studies is in fact just an effect of other variables that were not considered.

Limitations

There are limitations of the current study that are worth noting. First, several of the variables were assessed using self-report measures. Such measures may be affected by a variety of factors, such as temporary mood states or an individual's concern for presenting a favorable impression of themselves to others. However, it is encouraging to note that many of the self-report measures were also positively correlated with other theoretically relevant variables derived from other sources of measurement, such as teacher-reported positive classroom behaviors.

Although we attempted to control for several major variables, there are other variables that are conceptually similar to optimism that were not collected in this study that are also relevant for achievement. For instance, research has shown that having a growth mindset (e.g., the belief that abilities and intelligence can be grown through hard work and learning) is predictive of academic achievement. However, although optimism and growth mindset are conceptually overlapping, they may each exert unique effects on academic achievement. Optimism is distinct from growth mindset, because the individual can expect positive events that have nothing to do with his or her abilities or achievement, but that may still be instrumental to achievement. For example, a student may expect that his

next reading lesson will be enjoyable. This optimistic attitude is not specific to his or her beliefs about his intelligence or reading ability, but may nonetheless imbue the student with an attitude that is conducive to learning. Future studies should examine optimism and growth mindset together to determine each of their unique effects on reading and math achievement.

Future Directions

As we discussed at the beginning of this paper, optimism may be linked to motivational and cognitive benefits. Thus, an interesting next step might be to examine these motivational and cognitive benefits as possible mechanisms by which optimism predicts reading achievement. This would help determine which mechanism is stronger and pinpoint how optimism relates to achievement. For instance, does optimism primarily predict reading achievement by way of strengthening motivation or by way of bolstering cognitive abilities, such as expanded attention, and improved problem-solving abilities? Additionally, as we have previously discussed, future studies should seek to replicate the current findings while controlling for other relevant variables, such as growth mindset. Links between optimism and other content areas that depend on effective literacy skills, such as social studies and science, might also be examined in future studies.

Implications

The results of this study indicate that optimism is an essential value and have a variety of implications for individuals at all levels of the education system, including administrators, teachers, support staff, psychologists, counselors, social workers, and even parents. Teachers and counselors can explicitly teach optimistic thinking using socioemotional learning curricula. The Collaborative for Social, Emotional, and Academic Learning defines socioemotional learning as the "process through which children and adults acquire and effectively apply the knowledge, attitudes, and skills necessary to understand and manage emotions, set and achieve positive goals, feel and show empathy for others, establish and maintain positive relationships, and make responsible decisions" (Domitrovich et al., 2013). More and more schools have adopted practices, programs, and curricula designed to promote values, such as optimism. For instance, the MindUP Program and the Settle Your Glitter curriculum, both evidence-based socioemotional learning curricula, include lessons in which students learn what optimism is and why it is important along with activities designed to promote optimistic thinking. Similarly, this study may be of interest to those invested in character education and whole child education, who share many of the same goals associated with social emotional learning.

At an implicit level, a school's very culture and climate should reflect optimistic thinking (among other important values). For instance, optimism could be incorporated into school mission statements, and classroom expectations. School professionals should model optimism in their everyday language and interactions with other school professionals and students. School professionals should also take care to directly convey their optimistic visions of achievement through their interactions with *individual* students, particularly those who may be from disadvantaged backgrounds or those who struggle with reading. These students may need an extra dose of optimism from outside sources in order to eventually cultivate their own optimism. Many schools have also begun to implement parent coaching programs in order to effect holistic positive change for students. The findings from this study indicate that these programs would do well to educate parents about the importance of optimism in their children. The importance of optimism also underscores the need for national and state policies that better address systemic barriers (e.g., socioeconomic disparities in resources available to communi-

ties) that make it difficult for families to access high quality education, health, and social support services, all of which are critical for maintaining and strengthening optimistic attitudes.

Summary and Conclusion

In summary, we found that optimism was related to reading achievement even when we conducted rigorous tests and controlled for variables such as prior achievement, school lunch status (a proxy variable of SES), gender, teacher, executive functioning, positive classroom behaviors, perspective taking, and empathic concern. This study was one of the first to demonstrate a relationship specifically between optimism and reading achievement and the findings suggest that the relationship between optimism and reading achievement is not just an artifact of other variables. In fact, optimism accounted for almost the same amount of variance in reading achievement as executive functioning—a very core set of cognitive abilities necessary for learning (Diamond, 2013). The fact that optimism was a unique predictor even when controlling for a variety of factors and the fact that it predicted achievement for a traditionally disadvantaged sample of Latinx students underscores the importance of optimism and its relevance for achievement and educational practices. School professionals should benefit from the knowledge gained from the current study and perhaps consider implementing school initiatives designed to promote optimism.

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