

# Anxiety and Reading Difficulties in Early Elementary School: Evidence for Unidirectional- or Bi-Directional Relations?

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**Abstract** The present study examined competing models of the bi-directional influences of anxiety and reading achievement. Participants were 153 ethnically-diverse children (84 male, 69 female) from general education classes evaluated in the winter and spring of their first-grade academic year. Children completed standardized measures of reading achievement involving decoding and fluency along with an anxiety rating scale. Hierarchical linear regression analyses revealed that separation anxiety symptoms were negatively predicted by fluency performance and harm avoidance symptoms were positively predicted by decoding performance. Fluency performance was positively predicted by harm avoidance and total anxiety (for girls only) symptoms, while decoding was not predicted by any anxiety subscale.

**Keywords** Anxiety · Reading · Achievement · Learning

## Introduction

Anxiety disorders are among the most prevalent child mental health concerns [1–5], with symptoms often beginning early in childhood [6]. An additional subset of children also experience substantial subclinical anxiety and related problems—symptoms that frequently have an adverse impact on development and that may worsen over time [7]. For example, children with anxiety concerns commonly experience comorbid social (e.g., peer rejection, school avoidance, social incompetence) and emotional (e.g., low self-worth, poor self-concept, depression) difficulties [8–10].

Learning difficulties also represent a major concern among those involved with youth and the current education system. These concerns have developed, in part, from the massive increase (191%) in students identified for special education in the learning

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disability category from the mid 1970's to the 1990's in United States public schools [11]. Children with learning difficulties (broadly defined) have been found to experience a myriad of concurrent socioemotional problems, including negative emotional affect/depression [12–15], social skills deficits [16], peer rejection/neglect [14, 17–19], and poor self-concept [16, 20, 21]. Remarkably, little research has examined anxiety and academic functioning, specifically for young students with reading difficulties. Reading difficulty is a particularly salient marker for achievement in young children because it is a primary focus of early education and a principal predictor of current and later achievement [22–24]. Given the high prevalence of reading and anxiety difficulties in youth, along with the potential long-term implications of these difficulties, it is important to better understand the relations between reading achievement and anxiety. Such research is also important because it may lend to the development of more complex interventions for children with these comorbid disorders.

### Anxiety and Achievement: Competing Models

A major question concerns the direction of the influence of anxiety and poor reading achievement. The few studies that reported on anxiety and achievement in the past have often been marked by methodological and conceptual problems. Most studies in this domain have focused specifically on test anxiety and its impact on children's test performance as measured at one time point and under high-anxiety provoking conditions (e.g., a timed fluency test). While providing useful information on children's state reactions to a high-stress event, solely focusing on test anxiety precludes examination of potential differences among various anxiety concerns (e.g., general, social, separation) or children's potential responses following intervention for learning difficulties. Other studies have been limited by concurrent designs which preclude deductions regarding the causal relations for anxiety and learning difficulties, as well as the impact anxiety might have on academic interventions for children. Achievement and/or learning difficulties have also often been poorly defined in past samples, with many studies of children relying solely on teacher reported difficulties or school-based descriptions as opposed to a reliable and consistent operationalized definition. Despite these limitations, previous studies have shown an association between anxiety symptoms and achievement (e.g., [25, 26]). Based on these empirical findings, two competing models can be considered.

#### *Model 1: Anxiety Negatively Influences Achievement*

First, it may be that increased anxiety impacts students' performance on measures of achievement [25, 26]. For example, researchers have noted that anxiety can negatively impact problem-solving, self-regulation, and completion of new or difficult tasks requiring efficient information processing [27, 28]. Poorer academic performance may occur if students are distracted by their anxious thoughts (e.g., "I'm afraid I will fail") and behaviors (e.g., shaking hands). Indeed, studies have found that children who report high rates of test anxiety perform worse on classroom tests (e.g., [27, 29]). It has also been reported that negative affective states can weaken memory functioning, as well as result in inefficient processing of information [25, 30, 31]. Thus, anxious students may experience interference with their concentration, memory functioning, and/or information processing, which could lead to decreased learning of presented material and, over time, lowered achievement. Supporting this hypothesis, Normandeau and Guay [32] found a significant predictive relation for teacher-reported anxiety levels in Kindergarten children and their

first-grade achievement, as measured by school grades in math and language. Likewise, Ialongo et al. [28] examined the association between anxiety and achievement in 684 regular classroom students evaluated in the fall and spring of their first-grade year. Children identified as highly anxious in the fall, using a quartile split, were over seven times more likely to be in the lowest quartile for reading achievement in the spring.

### *Model 2: Reading Problems Lead to Anxiety*

The alternative causal model that could account for the anxiety-achievement association suggests that children with significant learning difficulties may be more likely to develop anxiety. For example, children may develop anxiety symptoms in response to repeated failure experiences within the classroom. Indeed, researchers have noted that poorly achieving students may be at increased risk for subsequent socioemotional difficulties [32, 33] and that learning difficulties predict anxiety and mood problems [13, 34]. As an illustration, children classified as poor versus good readers have been more likely to receive an anxiety disorder diagnosis in previous studies (Separation Anxiety Disorder/Generalized Anxiety Disorder, [35]; Generalized Anxiety Disorder/Social Phobia, [36]). Interestingly, Kellam and colleagues [37–39] noted that other internalizing symptoms (i.e., depression) were reduced over the course of the first-grade year when achievement was improved in low achieving students. Therefore, it may be that targeting achievement can be effective for reducing anxious symptomatology, particularly with early elementary school students. Similarly, it may be that children who respond to intervention for their reading difficulties evidence less anxiety over time than their non-responding peers.

### *Bi-Directional Influences*

Of course, it may also be that both of these hypotheses are correct and that a bi-directional relation exists between anxiety and achievement. Yasutake and Bryan [15] suggested that negative affective states (e.g., anxiety) could develop in children who experience learning difficulties; and that such emotional distress could, in turn, result in continued difficulty learning. To illustrate, anxiety may create or increase disruption in students' learning, as described above, which over time could lead to decrements in achievement. Subsequently, awareness of becoming behind in classes or experiencing school failures may heighten anxiety levels and disturb children's ability to focus, which could further increase their anxiety-related behaviors. Thus, a cycle may develop in which anxiety and learning difficulties continue to influence each other and worsen over time.

### *The Present Study*

The primary goal of the present study was to explore these competing models and determine whether the relation between anxiety symptoms and reading achievement scores appeared best explained by one or both of them. Given the dearth of information in this area, different anxiety symptoms (as well as total anxiety symptoms) were evaluated using a multidimensional scale and reading achievement was examined in both decoding and fluency domains. Two models were hypothesized, the first suggested that reading achievement scores would predict anxiety levels and the second that anxiety levels would predict reading achievement scores. Evidence for both models would suggest that a bi-directional relation best describes their association.

## Method

### Participants

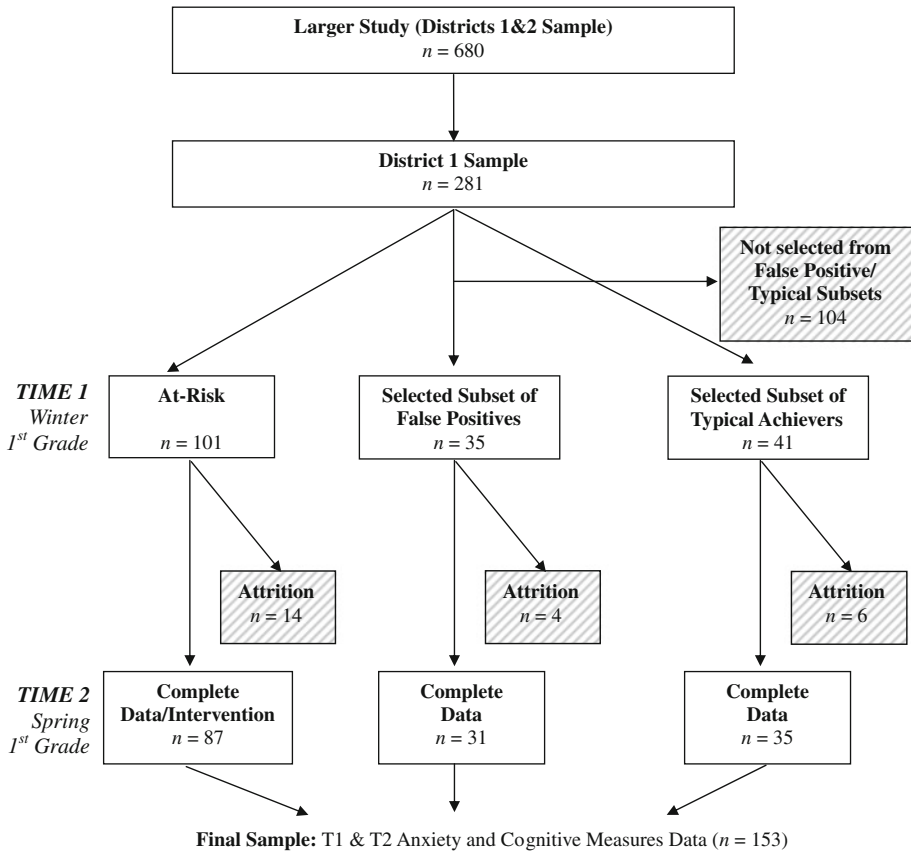
Participants for the current study were drawn from one of two school districts participating in a larger randomized clinical trial investigating a response to intervention model for reading difficulties in early elementary school children (see [40], for intervention study details<sup>1</sup>). The current study was conducted as a pilot project examining anxiety among these students. All but three students within the participating school district who completed mid- and end-year assessment batteries for the larger project completed this pilot study (see Fig. 1 for a participant flowchart).

The sample for the current study derived from 281 general education students from four schools in one district. These students were identified at the beginning of their 1st grade year as either typically achieving or at risk for reading difficulties based on their scores on a variety of screening measures [40]. At mid-year (T1), students were again evaluated with standardized achievement measures to identify those who had met benchmarks (false positives) and those who continued to struggle with reading. Students identified as at-risk at mid-year ( $n = 101$ ) were randomly assigned to receive intervention until the end of the academic year. In addition, subsets of students who met mid-year benchmarks (false positives:  $n = 35$ ) and who were identified as typically achieving ( $n = 41$ ) were randomly selected to be followed throughout the study. At the end of the 1st grade year (T2), 153 students had complete T1 and T2 achievement and anxiety data and were included in this study (87 at-risk students, 31 false positives, and 35 typical achievers; 84 male, 69 female; age  $X = 7.3$ ,  $SD = .5$ ; see Table 1 for sample descriptive information). The 24 students who were not included in this study consisted of 21 who were dropped from the intervention (18 moved and 3 withdrew) and 3 who had incomplete T1 anxiety data. Completers ( $n = 153$ ) and non-completers ( $n = 24$ ) were compared on achievement and demographic variables with no significant differences found.

### Measures

The *Multidimensional Anxiety Scale for Children (MASC)* is a 39-item self-report measure designed for use with children and adolescents [41]. For each item, children are asked to record their response on a 4-point Likert scale: “Never true about me” (0), “Rarely true about me” (1), “Sometimes true about me” (2), and “Often true about me” (3). Factor analytic strategies have revealed a primary 4-factor structure, with three of these factors comprised of two subfactors: (1) Physical Symptoms (PS; tense/restlessness, somatic/autonomic); (2) Harm Avoidance (HA; anxious coping, perfectionism); (3) Social Anxiety (SOC; humiliation/rejection, performing in public fears); and (4) Separation Anxiety/Panic (SEP). The MASC also provides a total score, as well as Anxiety Disorder and Inconsistency Indices. Satisfactory to excellent internal consistency and test–retest reliability coefficients have been reported (.64–.93; [41–43]), including with a recent sample of children diagnosed with learning disabilities (.70–.83; [44]). For the current study, scale mean scores, standard deviations, and internal consistency coefficients (Time 1  $\alpha = .58$ –.85 and Time 2  $\alpha = .56$ –.84) were found to be generally commensurate with their respective published norms. Convergent and divergent validity have also been demonstrated through

<sup>1</sup> Additional information about the larger study, its measures, and procedures can be found at: [www.texasidcenter.org/outcomes](http://www.texasidcenter.org/outcomes).



**Fig. 1** Participant flowchart

comparison of the MASC [42, 43]. Although initially normed for children 8-years and older, several recent empirical studies have used this measure with 7-year old children [45–48], and this practice has been sanctioned by the scale developer for children as young as six if items are read to the child and age 8 norms are used [45] (J. March, personal communication, May 25, 2007).

The *Woodcock-Johnson PsychoEducational Test Battery-III* [49] is a nationally standardized, individually administered battery of cognitive and achievement tests. For the current study, the Basic Reading composite score (WJBR), which is composed of the Letter-Word Identification and Word Attack subtests, was selected. Letter-Word Identification assesses the ability to read real words while Word Attack examines children's ability to read phonetically correct nonsense words. This composite score has been widely used as a norm referenced indicator in previous RTI studies (e.g., [50, 51]). The WJBR has previously been found to have excellent reliability (split-half = .91–.97) and validity [49] in young elementary school age children.

The *Continuous Monitoring of Early Reading Skills (CMERS)* [52] is a reading skills software program that provides progress monitoring assessment of a variety of reading domains. Reading samples from the CMERS were used to evaluate passage oral reading

**Table 1** Descriptive information for the sample ( $n = 153$ )

Gender	Male: 84 (55%)	Female: 69 (45%)	
Race	African-American: 89 (58%)	Hispanic/Latino/a: 41 (27%)	Caucasian: 14 (9%)
		Asian-American: 9 (6%)	
Special Ed	Yes: 74 (48%)	No: 58 (38%)	Unknown: 21 (14%)
WJBR-T1	$X = 103.9$ (SD = 17.0)		
WJBR-T2	$X = 104.3$ (SD = 16.5)		
CMERS-T1	$X = 23.0$ (SD = 24.1)		
CMERS-T2	$X = 39.9$ (SD = 29.8)		
MASCT-T1	$X = 54.9$ (SD = 16.3)		
MASCT-T2	$X = 49.0$ (SD = 16.0)		
PS-T1	$X = 14.7$ (SD = 6.6)		
PS-T2	$X = 11.5$ (SD = 5.8)		
HA-T1	$X = 16.4$ (SD = 5.3)		
HA-T2	$X = 18.4$ (SD = 6.0)		
SOC-T1	$X = 11.5$ (SD = 5.6)		
SOC-T2	$X = 8.7$ (SD = 5.3)		
SEP-T1	$X = 12.4$ (SD = 5.0)		
SEP-T2	$X = 10.3$ (SD = 4.9)		

*WJBR* Woodcock Johnson-III Basic Reading Composite Score, *CMERS* Continuous Monitoring of Early Reading Skills, *PS* MASC Physical Symptoms, *HA* MASC Harm Avoidance, *SOC* MASC Social Anxiety, *SEP* MASC Separation/Panic

fluency. Specifically, two different, 1-min, first grade level ( $\sim$  grade 1.7 readability level) passages were given with the average number of words read correctly aloud calculated to represent oral reading fluency. Adequate reliability has been demonstrated for the CMERS (.72–.93, [40]).

## Procedures

All procedures were reviewed and approved by the Universities of Houston and Texas at Austin Committees for the Protection of Human Subjects. Prior to both evaluations, children's parents received a letter of informed consent detailing all study information and procedures for both this study and the larger project. Children were read an assent statement and could choose at any time to participate or not participate. In small groups, children were read each of the items from the MASC and allowed ample time to complete each item and ask questions prior to proceeding to subsequent items. Children were instructed to look at only their own answer sheets, allowed desk shields, and monitored carefully by study personnel to ensure the confidentiality of their responses. The achievement measures were administered individually by examiners with extensive training in psycho-educational battery administration.

## Results

First, a series of independent samples t-tests were conducted to determine gender differences on the scales used in this study (MASC, CMERS, and WJBR). No significant gender

differences were found at either time point and subsequent analyses combined boys and girls. Hierarchical linear regression analyses were conducted to examine the predictive relations between anxiety and reading achievement, as well as to explore the potential moderating role of gender. Given the potential bi-directional influence of these variables, competing models were examined; one set of analyses examined the predictive role of anxiety on reading achievement and the second set examined the predictive role of achievement on anxiety. In each of these analyses, the T1 score of the dependent variable was entered first into the regression, followed by the proposed predictor, gender, and their interaction term.

### Reading Achievement Predicting Anxiety

In all cases, the T1 anxiety score (block 1) was a significant predictor of its respective score at T2; this was the only significant predictor/block with two exceptions. For Harm Avoidance (HA), the  $R^2$  obtained by regressing T2-HA on T1-HA was .07 ( $p < .01$ ) and including WJBR in Block 2 significantly increased the total  $R^2$  to .12 ( $p < .01$ ; see Table 2). For Separation Anxiety (SEP), the  $R^2$  obtained by regressing T2-SEP on T1-SEP was .04 ( $p < .05$ ) and including CMERS in Block 2 significantly increased the total  $R^2$  to .09 ( $p < .01$ ; see Table 2). In no cases did either gender or the gender \* achievement interaction significantly contribute to the model.

### Anxiety Predicting Reading Achievement

In all cases, the T1 achievement score (block 1) was a significant predictor of its respective score at T2; this was the only significant predictor with two exceptions. Harm Avoidance at T1 significantly predicted T2 CMERS with a Block 2 increase in  $R^2$  from .68 to .69 ( $R^2\Delta p < .05$ ; see Table 3). Regarding the CMERS-MASC Total (MASCT), the  $R^2$  obtained by regressing T2-CMERS on T1-CMERS was .68 ( $p < .01$ ); while the inclusion of MASCT at Block 2 and gender at Block 3 did not significantly increase  $R^2$ , the addition of the interaction term at Block 4 significantly increased  $R^2$  to .70 ( $p < .05$ ; see Table 3).

Post-hoc evaluation of this moderational effect was conducted following recommendations of Holmbeck [53]. Conditional moderators and interaction terms were computed and new regression analyses that included these variables were conducted. For boys, a non-significant

**Table 2** Summary of hierarchical linear regression analyses predicting anxiety at final significant step

	<i>B</i>	SE <i>B</i>	$\beta$	<i>t</i>
Block 2: DV = T2-Harm Avoidance				
T1-HA	.29	.09	.25	3.16**
T1-WJBR	.07	.03	.20	2.49*
Step 1 $R^2 = .07^{**}$ , Step 2 $\Delta R^2 = .05^{**}$ , Step 3 $\Delta R^2 = .00$ , Step 4 $\Delta R^2 = .00$				
Block 2: DV = T2-Separation/Panic				
T1-SEP	.19	.08	.19	2.32*
T1-CMERS	-.05	.02	-.23	-2.91**
Step 1 $R^2 = .04^*$ , Step 2 $\Delta R^2 = .05^{**}$ , Step 3 $\Delta R^2 = .01$ , Step 4 $\Delta R^2 = .00$				

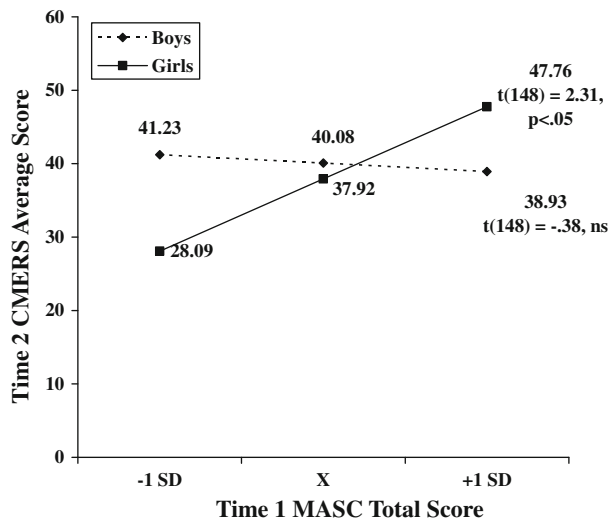
WJBR Woodcock-Johnson Basic Reading Standard Score, CMERS Continuous Monitoring of Early Reading Skills Averaged Score, HA MASC Harm Avoidance Scale, SEP MASC Separation/Panic Scale. \*  $p < .05$ ; \*\*  $p < .01$

**Table 3** Summary of hierarchical linear regression analyses predicting achievement at final significant step

	<i>B</i>	SE <i>B</i>	$\beta$	<i>T</i>
Block 2: DV = T2-CMERS				
T1-CMERS	1.01	.06	.82	17.89**
T1-HA	.61	.26	.11	2.40*
Step 1 $R^2 = .68^{**}$ , Step 2 $\Delta R^2 = .01^*$ , Step 3 $\Delta R^2 = .00$ , Step 4 $\Delta R^2 = .00$				
Block 4: DV = T2-CMERS				
T1-CMERS	1.01	.06	.82	17.93**
T1-MASCT	.02	.10	.01	.22
Gender	.71	2.77	.01	.26
MASCT * Gender	.39	.18	.13	2.20*
Step 1 $R^2 = .68^{**}$ , Step 2 $\Delta R^2 = .01^*$ , Step 3 $\Delta R^2 = .00$ , Step 4 $\Delta R^2 = .01^*$				

*CMERS* Continuous Monitoring of Early Reading Skills Averaged Score, *HA* MASC Harm Avoidance Scale, *MASCT* MASC Total Anxiety Scale. \*  $p < .05$ ; \*\*  $p < .01$

**Fig. 2** Interaction of MASC total anxiety scale by gender in the prediction of time 2 continuous monitoring of early reading skills averaged score (words read correctly in 1 min)



slope,  $t(148) = -.38, ns$ , resulted showing little change in T2-CMERS scores at low ( $-1SD$ ) and high ( $+1SD$ ) levels of T1 MASCT. For girls, the slope was significant,  $t(148) = 2.31, p < .05$ , suggesting that girls who performed better on the CMERS at T2 tended to have greater MASCT scores at T1 (see Fig. 2).

## Discussion

### Reading Achievement Predicting Anxiety

The primary aim of this study was to examine competing models of the reading difficulties-anxiety relationship in an early elementary school sample of children. The first of these models hypothesized that mid-year (T1) achievement scores would predict end-of-year



(T2) anxiety levels. This model evolved from previous research showing that poorly achieving students are at-risk for subsequent anxiety-related difficulties (e.g., [13, 34]). To further explore different aspects of anxiety, separate analyses were conducted with the four subscales of the multidimensional anxiety scale. Although smaller in magnitude than expected based on previous studies, in all cases Time 1 anxiety subscale scores served as significant predictors of their respective score at Time 2. This finding is consistent with previous studies revealing a continuing course for anxiety symptoms without intervention [54]. Remarkably, contrasting results were subsequently revealed by reading skill type (i.e., decoding vs. fluency). Specifically, decoding ability, as measured by the WJBR, was found to positively predict Harm Avoidance symptoms; whereas fluency, as measured by the CMERS predicted Separation Anxiety symptoms. In none of the analyses was gender a significant moderator.

Regarding the decoding-harm avoidance relation, it appears that children who were performing worse at the midyear decoding task tended to report lower harm avoidance symptoms at the end of the year. Although the direction of this relation was in contrast to that predicted, it may be that this reflects the nature of both the reading task and type of anxiety symptoms. Children who are generally aware of their decoding abilities may downplay the importance of those tasks. This relates to the harm avoidance items which focus on doing things “exactly right” and being generally obedient. For children who have become accustomed to doing poorly, it may be that over time they discover that they are unable to do such tasks exactly right or as asked and dissonance results. Thus, children experiencing difficulty with decoding tasks may report less concern with doing things exactly right as they struggle with these learning strategies. Further, the lack of reciprocal findings for fluency may reflect that children with fluency difficulties can be accurate but slow; thus not experiencing the inability to do things “right”. Indeed, children in this study who had only fluency difficulties demonstrated significantly more correct words per minute than those with decoding and fluency problems.

In contrast, children who evidenced greater difficulty on the fluency task at mid-year were also more likely to report greater separation-related symptoms at year end. This finding is consistent with the results of Carroll et al. [35] who indicated a significant association between literacy difficulties (single word reading and spelling) and a diagnosis of separation anxiety disorder. It may be that in response to achievement (fluency) difficulties some children develop an aversion to school, preferring instead the comfort of home, and increase their reported concerns with being away from home/family. Separation anxiety symptoms often increase or become triggered in young children experiencing transitions or coping with stressors [55]. This appeared to be the case for children in this study who had recently transitioned to the first grade of elementary school and were coping with the stress of academic failures. Items on the separation subscale are also thought to reflect panic-like symptoms which may have increased for children experiencing difficulty with timed tasks. Thus, for children with a predisposition for separation anxiety symptoms, the stress of academic failure and perhaps particularly the pressure of fluency-like tasks may have resulted in greater separation-related concerns.

### Anxiety Predicting Reading Achievement

The second set of models examined whether symptoms of anxiety reported at mid-year predicted end-of-year achievement scores. The basis for these analyses was drawn from a hypothesized interference model, wherein anxiety symptoms may interfere with children’s learning, as well as from prior studies demonstrating a predictive relation between anxiety

and reading (e.g., [28, 32]). As expected, children's T1 achievement scores were found to predict their T2 achievement scores in all instances. Although it was expected that increased anxiety might impede children's achievement performance on both areas examined, this was not confirmed. That is, decoding skills at T2 were not predicted by any of the anxiety subscales measured at T1, while a positive relation emerged between anxiety and fluency.

Interestingly, for the association between anxiety and fluency, it was the harm avoidance subscale that again emerged as significant. Children who reported greater harm avoidance symptoms (greater desire to do things exactly right and obey others) midyear tended to perform better on the fluency task. This finding is consistent with years of research showing a motivating role for moderate levels of anxiety, and indeed, students harm avoidance scores at year end corresponded with a moderate level ( $T$  scores  $\sim 50$ ). Numerous studies have supported this link since Yerkes and Dodson's seminal study [56] demonstrating how anxiety in small-moderate amounts can serve a motivating role, while excessive amounts can result in impairment. This has also been noted to be particularly true for demanding activities, such as the timed, fluency task used in this study. Also pertinent to the harm avoidance scale, children in this study who reported a high desire to do things "exactly right" and please/obey others may have been motivated to work extra hard on the fluency/timed tasks since they were individually administered by an adult who asked the child to "read as best as you can". Indeed, previous research has found better accuracy among gifted children with perfectionistic-like behaviors on timed (but not untimed) tasks [57] suggesting a motivating role for such feelings.

A significant gender by total anxiety (MASCT) interaction was also found to predict fluency performance. Examination of this interaction (Fig. 2) revealed that anxiety level did not impact males' performance on the CMERS, while girls who reported greater anxiety at T1 demonstrated significantly better fluency performance at T2. Indeed, girls who reported the lowest anxiety were well below the normative average for this scale [41] and performed more poorly on the end of year fluency task. Thus, for boys and girls, harm avoidance symptoms appeared to play a motivating role on the fluency task, whereas greater overall anxiety (as measured by the MASCT) played a motivating role for girls only.

With the above noted exception, gender differences were not found in this study when examined as moderators in the predictive models or at the individual scale level. The lack of gender differences on the MASC subscales (T1  $d_s = .15-.30$  and T2  $d_s = .11-.23$ ) was in contrast to past research with non-clinical samples which have shown greater levels of fears, worries, and anxiety symptoms in girls [58]. However, effect sizes for gender differences previously reported are also often small (e.g., [59]); for example, while significant differences were reported for the nearest age group (8–11) in the normative sample of the MASC, the effect sizes found were typically small to moderate ( $d_s = .21-.57$ ). As gender differences are typically more pronounced with age, the current sample may have been too young for these effects to be observed. Also potentially reflective of our sample age (1st graders), no predictive findings emerged in either direction for social or physical anxiety (e.g., panic-attack like) symptoms, which tend to increase more in later childhood-adolescence [60].

#### Limitations and Future Directions

Limitations of the study should be noted. Most notably, there appeared to be unexpectedly low within anxiety subscale correlations across time points (T1–T2), which could suggest unreliability of the children's reports. However, internal consistencies and test assumptions

were within acceptable ranges; thus, it may be that children of this young age are more transient in their symptoms of anxiety, thus making their reports appear inconsistent. Little research has followed the developmental trajectory of anxiety in children of such a young age and it may be that the various changes encountered across the first grade school year were reflected in their more variable reports. In addition, this study only examined child self-reported anxiety symptoms which may have impacted the findings. For example, students with reading disabilities may experience more general comprehension difficulties, so that some students may not have fully comprehended the questions being read to them from the MASC. Future studies should explore potential differences among child and other (e.g., teacher, parent) reporters of socioemotional concerns and how these might differentially predict children's response to reading intervention. In all, these limitations point to the importance of replication with additional samples to establish the strength of these findings.

## Summary

The present study represents the first known to examine the associations among diverse aspects of anxiety and markers of reading achievement, as well as to explore potential gender differences in these relations. With anxiety as the outcome, separation anxiety symptoms were negatively predicted by fluency performance and harm avoidance symptoms positively predicted by decoding performance. With achievement as the outcome, fluency performance was positively predicted by harm avoidance (for boys and girls) and total anxiety symptoms (for girls only). Decoding was not predicted by any anxiety subscales. Thus, we did not find support for any one subscale being predicted by and predicting the same reading task. However, harm avoidance was positively associated with both fluency and decoding performance. It is possible that decreased harm avoidance symptoms occur in children who are performing poorly on decoding tasks, and that these low harm avoidant symptoms then also lead to poorer fluency task performance. Longitudinal data is required to more clearly examine these potential relations. Ongoing research is clearly needed on achievement and socioemotional domains like anxiety as such studies may provide important information on characteristics of inadequate responders to reading intervention programs and/or may lead to more complex interventions that incorporate these socioemotional factors.

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