Anxiety and Response to Reading Intervention among First Grade Students

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Abstract

BACKGROUND—For school-aged children with reading difficulties, an emerging and important area of investigation concerns determining predictors of intervention response. Previous studies have focused exclusively on cognitive and broadly defined behavioral variables. What has been missing, however, are studies examining anxiety, which is among the most commonly experienced difficulty for youth.

OBJECTIVE—The present study examined anxiety among children classified as typically achieving or showing inadequate/adequate response following an intervention for reading problems.

METHODS—Participants were 153 ethnically-diverse children (84 male, 69 female) evaluated in the winter and spring of their first-grade academic year. Children completed several standardized measures of reading achievement involving decoding and fluency along with a multidimensional anxiety rating scale.

RESULTS—Repeated measures ANOVA revealed significant main effects for time and scale and significant interactions for time*scale and group*scale. Logistic regression examined whether anxiety predicted response to intervention (Y/N) at the end of the school-year.

CONCLUSIONS—Results showed overall decreases in anxiety over time, with the exception of the harm avoidance area which increased and also interacted with group (children with decoding/ fluency difficulties reported less harm avoidance than typically achieving children). The harm avoidance area was most pertinent across analyses highlighting the potential importance of targeting this area; however, none of the anxiety scales predicted response group at the end of the

intervention. Ongoing research is needed in this area in order to identify characteristics of inadequate responders to reading intervention programs and/or inform interventions that incorporate these socioemotional factors.

Keywords

anxiety; reading; achievement; response-to-intervention

Anxiety disorders are among the most prevalent child mental health concerns (Cartwright-Hatton, McNicol, & Doubleday, 2006; Grills-Taquechel & Ollendick, 2012; Kessler, Berglund, Demler, Jin, & Walters, 2005), with symptoms often beginning early in childhood (Grills-Taquechel & Ollendick, 2012; LaVigne, LeBailly, Hopkins, Gouze, & Binns, 2009). 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 (Ohannessian, Lerner, Lerner, & von Eye, 1999). 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.

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 classified as having a learning disability from the mid 1970's to the 1990's (US Department of Education, 1995). Reading difficulties are the most prevalent form of learning difficulty, affecting approximately 5–18% of youth (Shaywitz, 1998; Vellutino, Fletcher, Snowling, & Scanlon, 2004). Children with learning difficulties (broadly defined) experience a myriad of concurrent socioemotional problems, including negative emotional affect/depression (Kavale & Forness, 1998; Kellam, Brown, & Fleming, 1983; Wiener & Schneider, 2002; Yasutake & Bryan, 1995) social skills deficits (Kavale & Forness, 1996), peer rejection/neglect (Haager & Vaughn, 1995; Stone & LaGreca, 1990; Vaughn, Elbaum Schumm, & Hughes, 1998; Wiener & Schneider, 2002), and poor self-concept (Elbaum & Vaughn, 2001; Kavale & Forness, 1996, Prout, Marcal, & Marcal, 1992). Remarkably, little research has been done examining anxiety and academic functioning, specifically for young students with reading difficulties. Reading difficulty is a particularly salient marker for achievement in young children as it is a primary focus of early education and an important predictor of current and later achievement (Butler, Marsh, Sheppard, & Sheppard, 1985; Scarborough, 1998; Torgesen, Wagner, & Rashotte, 1994). Given the high prevalence of reading and anxiety difficulties in youth, along with the potential long-term implications of these difficulties, it is imperative for researchers to better understand the relationship between them. Such research is also important as it may provide information on characteristics of inadequate responders to reading interventions and lead to more complex interventions that are appropriately individualized for children with anxiety and/or reading difficulties. This research is critical in educational settings because of the increasing implementation of service delivery models that focus on response to intervention (RTI), where children are explicitly identified as inadequate responders who need more explicit and tailored instructional programs. Unfortunately, there is not a large evidence base

on why some children are difficult to treat and what kinds of interventions would be most effective (Fletcher & Vaughn, 2009).

Previous studies address both predictors of intervention response for students with reading difficulties, as well as attributes of children who respond inadequately to intervention. Most of these studies focus on cognitive predictors and attributes, with some studies including assessments of behavioral adjustment, and no studies specifically reporting on anxiety. Most studies of cognitive factors that predict early reading difficulties have identified measures of phonological awareness, rapid naming, and verbal working memory as the best predictors of word reading and fluency outcomes (Schatschneider, Fletcher, Francis, Carlson, & Foorman, 2004; Vellutino, Scanlon, Small, & Fanuele, 2006), with vocabulary also emerging if comprehension is an outcome (Scarborough, 1998). Similarly, in the few studies comparing attributes of adequate and inadequate responders to early reading instruction, these same measures emerge as more severely impaired in children who are inadequate responders after one year of reading intervention (Fletcher et al, 2011; Vellutino et al., 2006). Denton et al. (2012) found that measures of phonological awareness and language processing characterized children who did not respond to two years of intervention.

Although few of these studies include an assessment of behavior, broadly reported behavioral difficulties (typically by teachers) do seem associated with inadequate reading intervention response. In a review of 23 studies of adequate and inadequate responders, Al Otaiba and Fuchs (2002) reported that problems with phonological awareness were common, but also associated with inadequate response was, in this order, difficulties with rapid naming, phonological working memory, general verbal ability, and attention and behavior problems In a meta-analysis of 30 studies, Nelson, Westhues, and MacLeod (2003) reported that difficulties with behavior were the second largest discriminator of adequate and inadequate responders, after rapid naming, and before phonological awareness, letter knowledge, memory, and IQ. None of these studies specified what type of behavior was problematic, although inattention and externalizing behaviors (e.g., hyperactivity, disruptive behaviors) represent the behavior types from the measures used in the studies (e.g., The Multigrade Inventory for Teachers).

Remarkably, none of the aforementioned studies specifically assessed anxiety, which is surprising because reading difficulties, a major problem for young elementary students, would seem to increase tension or serve as a source of stress and anxiety. A related literature, pertaining to a specific form of anxiety, text anxiety, has indeed demonstrated associations with academic domains. For example, studies have found that children who report high rates of test anxiety perform worse on achievement markers such as classroom tests and standardized test scores (e.g., Everson et al., 1994; Hill, 1984; Owens, Stevenson, Norgate, & Hadwin, 2008; Putwain, Connors, & Symes, 2010; Weems et al., 2013). In addition, positive effects of school-based test-anxiety interventions have been reported for achievement performance (e.g., Hembree, 1988; Weems, et al., 2009). Despite these promising findings for test anxiety, researchers have not explored such influences for other forms of anxiety. For instance, research has not examined various types of anxiety symptoms (e.g., social versus separation) for differences in predicting academic performance, such as achievement testing or response to interventions for learning

difficulties. Understanding the types of anxiety symptoms that most influence these academic domains seems imperative for furthering knowledge and intervention efforts aimed at improving child learning outcomes.

Therefore, the primary goal of the present study was to examine the potential influence of anxiety on children's response to intervention for reading difficulties using evidence-based definitions of reading disability risk status and achievement (Fletcher, Francis, Morris, & Lyon, 2005; Fletcher, Lyon, Fuchs, & Barnes, 2007; Fletcher & Vaughn, 2009). Specifically, we sought to compare struggling and non-struggling readers on several indices of anxiety over the course of their first grade year. In addition, we sought to examine anxiety symptoms and success in response to the first year of a multi-tiered reading intervention (Denton et al., 2011). With regard to the former goal, several main effects and interactions were hypothesized. First, main effects were expected for scale, with separation anxiety predicted to emerge as the highest area of anxiety. This was predicted because separation anxiety tends to be more common in younger aged children like those in this study (compared with social anxiety which tends to emerge closer to adolescence). For time, anxiety was expected to decrease over the school year as children acclimated to the academic environment (first grade represents the first full days of intensive instruction for youth). For group, struggling readers were hypothesized to report more anxiety than children who responded to intervention or were typically achieving. Regarding interactions, scale by group, scale by time, and scale by group by time interactions were expected, again with separation anxiety emerging, increasing over time (scale * time), and differentiating struggling and non-struggling readers (scale*group), and particularly so at the end of the year (scale*group*time). A time by group interaction was predicted as it was expected that anxiety would increase for children who continued to struggle with reading (non-responders) at the end of the school year. Finally, it was hypothesized that beginning of year (time 1) anxiety would predict end-of year (time 2) group status (controlling for T1 reading achievement) such that greater anxiety scores would be found in the inadequate response group (as compared with the responder group).

Method

Participants

Participants for the current study were drawn from a larger randomized clinical trial investigating a response to intervention (RTI) model for reading difficulties in Grade 1 elementary school children (see Denton et al., 2011, for intervention study details[b]). For the larger project, children were drawn from general education classes at nine participating public schools in two school districts. The current study was conducted with students from one of these two school districts. All but three students who completed mid- and end-year assessment batteries for the larger project completed this pilot study (see Figure 1 for a participant flowchart). The focus on Grade 1 at entry into the larger study reflected efforts to initiate the multi-tiered intervention at the first signs of risk for difficulty reading.

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[b]Additional information about the larger study, its measures, and procedures can be found at: www.texasldcenter.org/outcomes.

All students received daily reading instruction provided by their general education teacher (Tier I) that focused on phonics, word study, and reading comprehension. Students in intervention (Tier II) participated in a reading intervention focused on word-level instruction, vocabulary, oral reading fluency, and reading comprehension. The intervention was delivered daily in 30-minute sessions, in small-groups of 2–4 children with one tutor. Students were also encouraged to read with their parents each day a story or word list that had been practiced in previous lessons. Intervention tutors were trained by the research team prior to the initiation of treatment and they participated in weekly meetings and on-going school-based coaching to maintain high levels of fidelity of implementation. The present sample was derived using the pre-set response to intervention criteria of the larger project applied at the end of the year, which examined performance on the Continuous Monitoring of Early Reading Skills (oral reading fluency <20.5 words per minute; Mathes & Torgesen, 2008; see description below), Woodcock-Johnson PsychoEducational Test Battery-III-Basic Reading Scale (<25th percentile; Woodcock, McGrew, & Mather, 2001; see description below), and the Test of Word Reading Efficiency (i.e., a measure of reading accuracy, decoding, and fluency; <25th percentile; Torgesen, Wagner, & Rashotte, 1999). Using these three measures, children who received intervention were classified at the end of the academic year assessment (T2) as evidencing fluency and decoding difficulties; only fluency difficulties; or no difficulties (responders), and compared with the group of children who were previously determined to be typically achieving.

The 31 children who met benchmarks prior to intervention were dropped from this sample because they did not receive intervention. Eight additional participants (four each from the at-risk and typically achieving groups) were dropped because they were not classified into a response group for the larger project. For 7 students who had too few complete anxiety responses at T2 (i.e., >1/3 of data missing), scores were imputed using the mean score from the reading group into which they were classified. These cases were spread across reading groups with two children from the fluency, responder, and typically achieving groups and one from the decoding/fluency group. To ensure that the imputation of these data points did not alter findings, analyses were also conducted without the seven cases, with no differences revealed. The resulting 114 participants (60 male, 54 female; age $X = 7.3$, $SD = 0.5$; see Table 1 for sample descriptive information) were classified following intervention as follows: those with continued fluency and decoding difficulties ($n = 20$); those with continued fluency difficulties only ($n = 30$); those who responded to the intervention ($n = 33$); and those from the typically achieving group ($n = 31$).

Measures

The Multidimensional Anxiety Scale for Children (MASC) is a 39-item, self-report, measure designed for use with children and adolescents (March, 1997). For each item, children are asked to record their response on a 4-point Likert-type 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; e.g., feeling tense); 2) harm avoidance (HA; e.g., trying to do everything right); 3) social anxiety (SOC; fearing public performances); and 4) separation anxiety/panic (SEP; e.g., worrying about being away from

parents). The MASC also provides a total score, as well as Anxiety Disorder and Inconsistency Indices; though these were not included in the current study. Although initially normed for children 8-years and older, several recent empirical studies have used this measure with 7-year old children (e.g., Bernstein, Layne, Egan, & Tennison, 2005; Meuret, Ehrenreich, Pincus, & Ritz, 2006; Suveg, Kendall, Comer, & Robin, 2006) and this practice has been sanctioned by the scale developer for children as young as six years if items are read to the child and age 8 norms are used (J. March, personal communication, May 25, 2007). Satisfactory to excellent internal consistency and test-retest reliability coefficients have been reported (.64–.93; Grills-Taquechel, Ollendick, & Fisak, 2008; March, 1997; March, Parker, Sullivan, Stallings, & Conners, 1997), including with the children included in this study (see Grills-Taquechel, Fletcher, Vaughn, & Taylor, 2013). For the current study, scale mean scores, standard deviations, and internal consistency coefficients (Time 1/2 αs = .73/.69 for PS, .72/.75 for HA, .70/.68 for SOC, .58/.56 for SEP) were found to be generally commensurate with their respective published norms.

The Woodcock-Johnson PsychoEducational Test Battery-III (WJIII; Woodcock et al., 2001) is a nationally standardized, individually administered battery of cognitive and achievement tests. The Basic Reading composite score (WJBR) is composed of the Letter-Word Identification and Word Attack subtests. 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 of basic word reading proficiency in previous RTI studies (e.g., Fletcher et al., 2007; Torgesen, 2000). The WJBR has previously been found to have excellent reliability (split-half = .91–.97) in young elementary school age children.

The Continuous Monitoring of Early Reading Skills (CMERS; Mathes & Torgesen, 2008) 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 reading fluency. Specifically, two different, one-minute, first grade level (~ grade 1.7 readability level) passages were given, with oral reading fluency represented by the average number of words read correctly aloud..

The Test of Word Reading Efficiency (TOWRE; Torgesen et al., 1999) is a measure of word reading fluency, accuracy, and decoding. The Sum of Standard Scores represents the composite standard score of Sight Word Efficiency and Phonemic Decoding Efficiency, which ask students to read as many real words or non-words, respectively, as quickly and accurately as possible within 45 seconds. Alternate forms and test retest reliability coefficients are typically at or above .90 in this age range (Torgesen et al., 1999).

Procedures

All procedures were reviewed and approved by the Universities of Houston and Texas at Austin Committees for the Protection of Human Subjects. Data in the current study derived from two assessment points, approximately 4 months apart, in the students' first grade year (winter and spring). 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. No parents requested that their child be excluded from the study. Children

were read an assent statement and could choose at any time to participate or not participate. All children assented to participation in the study. 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 cognitive and achievement measures were administered individually by examiners with extensive training in psychoeducational battery administration.

Results

Comparisons among Struggling and Non-Struggling Readers on Anxiety Scales

A repeated measures design was used to test for significant main effects for subscale (using MASC harm avoidance, separation anxiety, social anxiety, and physical symptoms mean scores to produce equivalent scales of measurement), time, and group, as well as their interactions (2-way and 3-way). Mauchly's test indicated that the assumption of sphericity had been violated for the main effect of scale, $\chi^2 (5) = 29.97$, $p < .001$, and the scale*time interaction, $\chi^2 (5) = 18.03$, $p < .005$. Therefore, degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity ($\varepsilon s = .84$ and .89, respectively). Power to detect an effect of 7% of variance explained was observed. As shown in Table 2, the 3-way interaction was not significant; however, there were significant 2-way interactions for scale*group and scale*time, as well as significant main effects for scale and time. The main effect for time revealed an overall decrease in anxiety subscale scores from T1 (1.42) to T2 (1.27) and the significant interactive effect between subscale and time, indicated that this change differed by subscale. As shown in Figure 2, all subscales decreased from T1–T2, with the exception of harm avoidance - which increased over time. For the main effect of subscale, pairwise contrasts showed that all subscales were significantly different from one another with the exception of physical symptoms (PS) and social anxiety (SOC) (Mean scores: PS=1.1, HA= 1.9, SOC = 1.1, SEP = 1.3). As illustrated in Figure 3, the subscale*group interactive effect showed a significant difference between the decoding/fluency and typical groups on the harm avoidance subscale.

Predicting Response Groups

Logistic regression was used to predict categorical response (Y/N) in only those children who received intervention (Responders $n = 33$, Non-responders, $n = 50$). Each MASC scale was used as a predictor alone and in a set with and without T1 reading achievement as a covariate. The MASC scales were not significant in any model (see Table 3). While the relatively small sample sizes and resulting low power might explain these results, the effect sizes were also small; Pseudo R^2s calculated using McFadden's (1974) approach were 0% for PS, 1.5% for SOC, 1.7% for HA, and 2.9% for SEP.

Discussion

Following the year-end assessment, children were classified as either adequate or inadequate responders to researcher-provided reading intervention and compared with a group of

children who were typically achieving. Inadequate responders were further subdivided by difficulty domain into two groups: those with decoding and fluency problems and those with only fluency problems. Significant main effects were found for anxiety subscale and time. Regarding the former, all subscales differed from one another except physical symptoms and social anxiety, which were equivalent (and the lowest rated, followed by separation anxiety and then harm avoidance). Overall, this finding appears to reflect the age of the children included in this study and are consistent with past research on anxiety and related symptoms in non-clinical samples. For example, the higher scores on harm avoidance are consistent with past research showing that children's fears and worries are consistently related to harm coming to them; a finding that has been shown across developmental levels, genders, and cultural groups (see Grills-Taquechel & Ollendick, 2012; Ollendick, Grills, & Alexander, 2001). Likewise, separation anxiety concerns are more common among younger aged children such as those included in this study, whereas increased social anxiety concerns typically emerge closer to adolescence.

The main effect for time revealed lower year-end scores, which were more consistent with the manual mean scores reported for the normative sample of the closest age (8–11) to this study's students (March, 1997). It may be that anxiety scores decreased over the school year, perhaps as the children adjusted to the expectations of learning to read and the general elementary school atmosphere, along with normative decreases in areas such as separation anxiety. Indeed, the significant time by subscale interaction demonstrated a decrease across all subscales from T1–T2, with the exception of harm avoidance. As previously noted, harm avoidance symptoms have been commonly reported in past studies of elementary school children (e.g., Ollendick et al., 2001) and the increase in this area of anxiety may reflect both that and the specific developmental level of the children (e.g., Kohlberg's (2008) punishment/obedience orientation). Additional research examining the developmental trajectory of the MASC subscales will be important for replicating these findings.

Finally, the subscale by group interaction revealed significantly lower harm avoidance symptoms among the children in the decoding/fluency group than the typically achieving group. As the decoding/fluency group of children represented the most impaired in terms of achievement, it may be that these children were experiencing more pervasive learning difficulties, thus precluding them from either being aware of or caring about the impairment. For example, such children may not have developed the insight to recognize the severity or seriousness of their reading difficulties; whereas the typically achieving students may have evidenced more normative (higher) levels of these symptoms. Similarly, it may be that children exhibiting decoding and fluency difficulties are generally not expected to perform as well, and therefore do not experience the pressure to do so from outside sources (e.g., parents, teachers) that children from the other groups might. Alternatively, it may be that another variable was impacting the findings (i.e., shared risk factors). For example, it may be that children with both decoding and fluency problems were also more likely to have comorbid externalizing symptoms, such as impulsivity or poor behavioral inhibition, which influenced their feelings of harm avoidance as well as interfered with their task performance. In fact, previous studies have found that comorbid anxiety and oppositional defiant disorders present with a more severe presentation that includes academic difficulties (Drabick, Gadow, & Loney, 2008). Thus, it will be important for future research to include

consideration of comorbid symptoms which might influence the anxiety-achievement relationship. Finally, it may be that the items comprising the harm avoidance scale were reflective of a more motivating form of anxiety that tended to be lacking in the decoding/fluency group. For example, it may be that for children exhibiting these two forms of reading difficulties, motivation to achieve is also compromised. Given these possibilities, additional research examining different aspects of anxiety (e.g., motivational versus inhibitive, state versus trait) will be imperative for more clearly delineating these associations. Additional work is necessary to both replicate these findings with early elementary school aged children such as those in the present study, as well as to explore potential differences that may emerge at different developmental periods. For instance, it may be that harm avoidance scale items represent a form of motivating anxiety at this younger age, but that by adolescence, endorsement of these same items represents more problematic or inhibiting anxiety. With these findings in mind, interventions could then be further tailored to promote enhanced performance. For example, for children with decoding/fluency difficulties like those in the present study, it may be useful to encourage greater conscientiousness and work checking behaviors.

It is also remarkable that findings in the present study were limited to the domains of harm avoidance and separation anxiety. As previously noted, these findings likely reflect the age of the children included in this study. However, these findings are noteworthy as they suggest that globally measured anxiety may not serve as a discriminatory marker among those who do and do not respond to reading intervention at this young age. Although findings need to be replicated, it may be that other socioemotional domains are more pertinent for explaining response in this age group. However, as anxiety is known to be associated with learning difficulties, including reading, at older ages, it may be that this represents a particularly critical age for initiating anxiety/stress prevention programs. Likewise, researchers should begin to more broadly investigate the contribution of additional socioemotional domains, including anxiety, into existing intervention programs for children at-risk for reading difficulties. It may be that the inclusion of such anxiety/stress management programs provides children with additional skills that can enhance their ability to learn and/or implement learned academic material. Indeed, studies examining interventions for *test anxiety* have demonstrated efficacy (e.g., effect sizes .63–1.22; Ergene, 2003; Schoenfeld & Janney, 2008; von der Embse et al., 2013; Weems et al., 2009); however the vast majority of these studies have been conducted with adolescents. Further, previous studies have typically not explored the influence of these interventions on children's long-term learning/achievement outcomes or explored the mechanisms of action involved in program effectiveness. Thus, a number of critical gaps remain in understanding the precise associations among socioemotional domains, such as anxiety, and academic performance; and indeed, these associations may be complicated by individual variables (e.g., child, teacher) and broad ecological domains (e.g., school and community system levels). Indeed, RTI models were initially developed as multi-tiered intervention for students with behavior problems and there has been continued interest in applying RTI and related (e.g., stepped-care, prevention, and student assistance models; Prevention First, 2011; Van Der Leeden et al., 2011) approaches with socioemotional/behavioral child difficulties. However, greater integration of these models would be useful. Finally, the findings add to

the emerging database on characteristics of inadequate responders to instruction, suggesting that anxiety may be a prominent non-cognitive characteristic of some inadequate responders.

Limitations of the present 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. Additional research with this age group and with additional assessment points may help bring clarification to this issue. In addition, this study only examined child self-reported anxiety symptoms which may have impacted the findings. For example, students with reading disabilities also commonly experience comprehension difficulties, suggesting 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. With regard to the group predictive analyses, a limitation was that the two groups, responders and non-responders, were defined by cutting the distribution of scores using an informed, yet somewhat arbitrary, cutpoint. This dichotomization may result in a reduction in the relationship revealed between the variables of interest following the intervention. Finally, small partial eta's and effect sizes generally in the small range were revealed for most findings. In all, these limitations point to the importance of replication with additional samples to establish the strength of these findings.

In conclusion, the present study represents the first known to examine anxiety in children classified as adequate and inadequate responders following reading intervention. Significant main effects were found for time and scale and significant interactions occurred between subscale-time and subscale-group. The harm avoidance subscale was most pertinent across analyses highlighting the potential importance of this area with young students. Ongoing research is 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.

Acknowledgments

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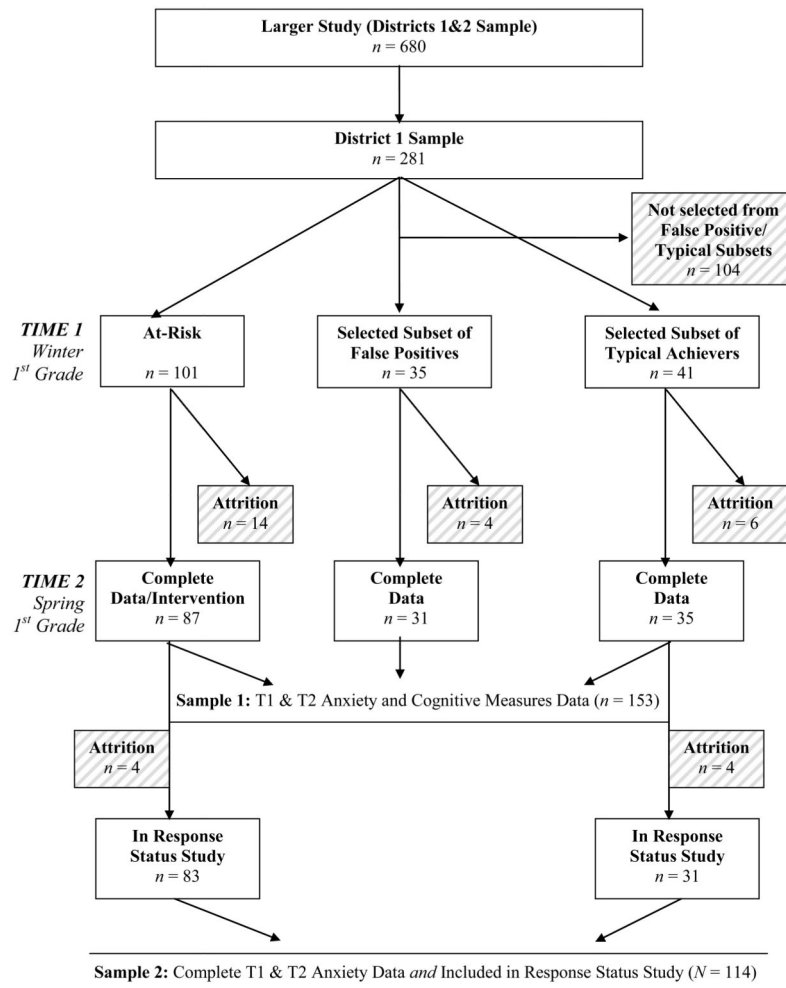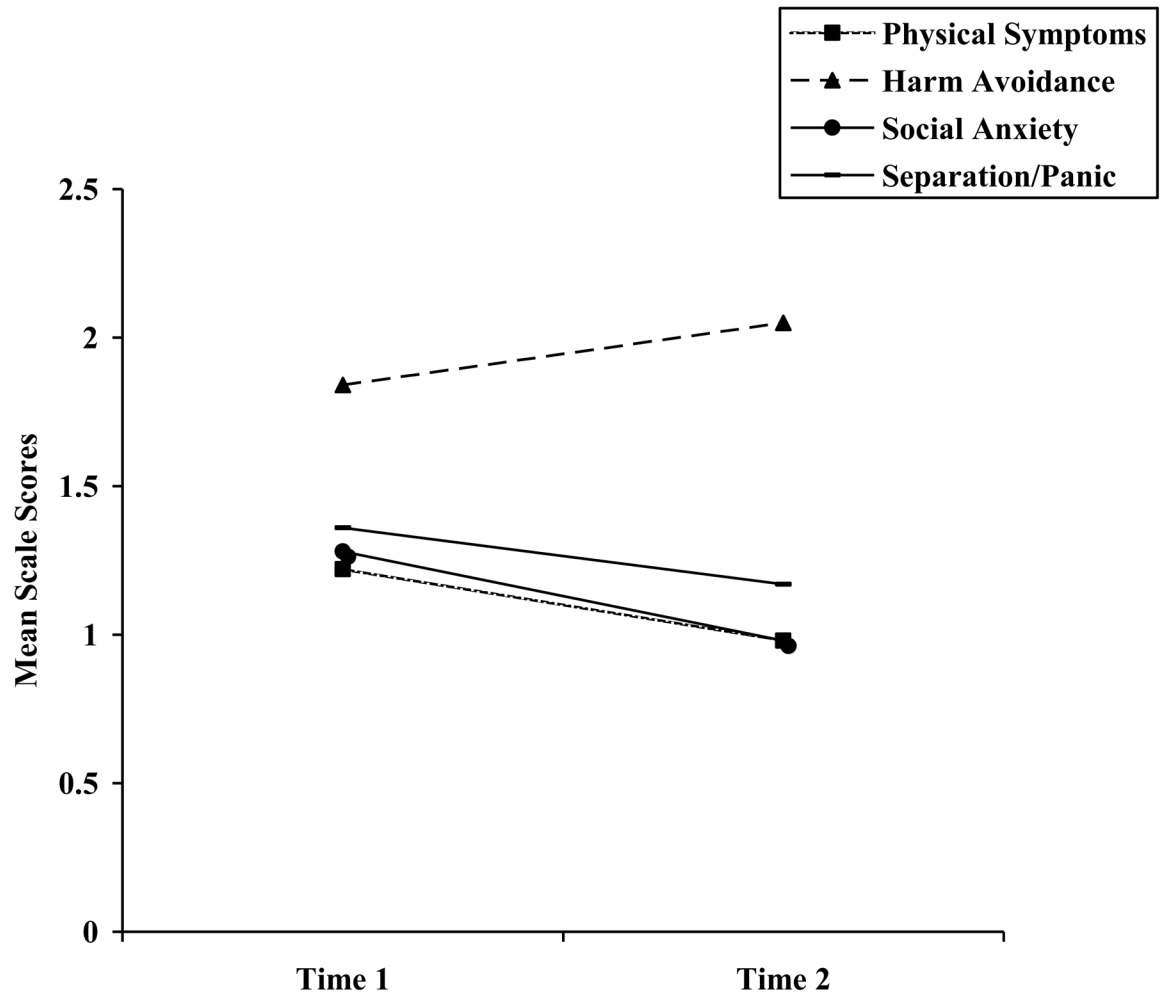
Figure 1.
Participant flowchart.

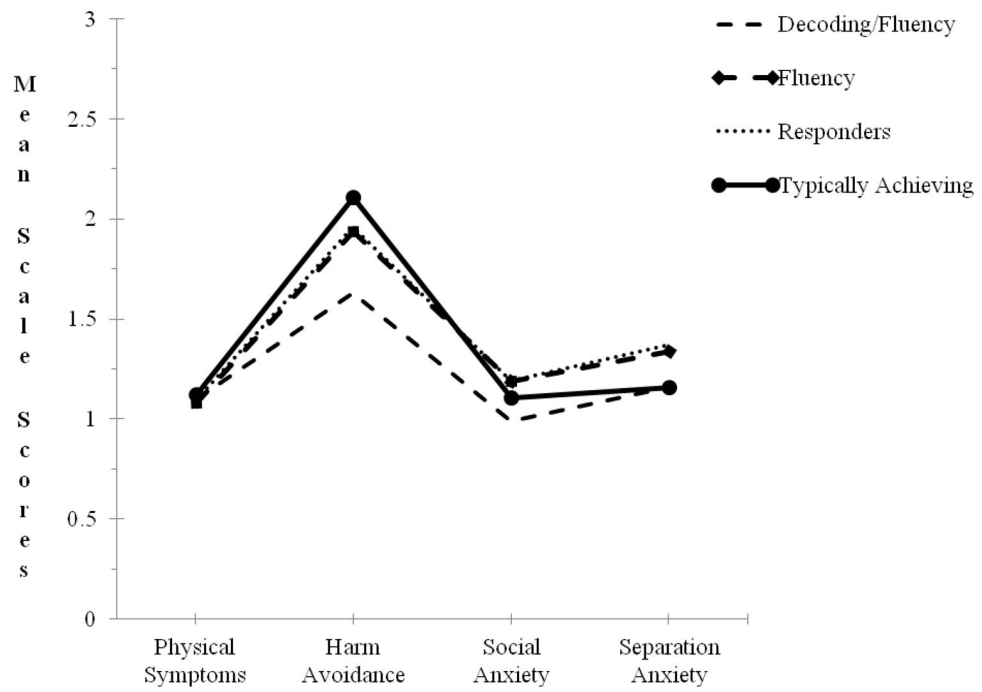**Figure 2.**
Interaction of MASC subscales by time.

Figure 3.
Interaction of MASC subscales by response to intervention group.

Table 1

Descriptive Information by Sample

	Fluency/ Decoding *n* = 20	Fluency *n* = 30	Responder *n* = 33	Typical *n* = 31
Gender				
Male	15 (75%)	13 (43%)	16 (48%)	16 (52%)
Female	5 (25%)	17 (57%)	17 (52%)	15 (48%)
Race				
African-American	13 (65%)	21 (70%)	16 (49%)	14 (45%)
Hispanic/Latino/a	6 (30%)	7 (23%)	8 (24%)	7 (23%)
Caucasian	1 (5%)	2 (7%)	6 (18%)	4 (13%)
Asian-American	0 (0%)	0 (0%)	3 (9%)	6 (19%)
Special Ed				
Yes	10 (50%)	16 (53%)	14 (42%)	15 (48%)
No	9 (45%)	9 (30%)	13 (39%)	13 (42%)
Unknown	1 (5%)	5 (17%)	6 (18%)	3 (10%)
WJBR-T1				
X (SD)	80.4 (12.6)	96.6 (9.5)	107.0 (9.3)	122.0 (10.5)
WJBR-T2				
X (SD)	77.1 (10.3)	99.4 (5.1)	109.6 (8.7)	119.2 (9.9)
CMERS-T1				
X (SD)	5.5 (7.4)	7.2 (3.7)	12.1 (6.7)	56.7 (28.8)
CMERS-T2				
X (SD)	12.6 (9.8)	16.1 (7.0)	34.5 (13.3)	80.4 (28.2)
MASCT-T1				
X (SD)	53.0 (19.5)	52.4 (14.9)	57.8 (16.3)	55.9 (16.8)
MASCT-T2				
X (SD)	41.4 (15.4)	54.0 (15.0)	49.7 (15.4)	49.7 (13.9)
PS-T1				
X (SD)	15.9 (7.0)	13.6 (6.4)	14.5 (6.8)	15.1 (6.9)
PS-T2				
X (SD)	10.6 (5.4)	12.4 (5.7)	11.7 (6.2)	11.7 (5.0)
HA-T1				
X (SD)	14.7 (4.8)	16.0 (6.1)	17.1 (4.8)	17.5 (5.1)
HA-T2				
X (SD)	14.7 (5.2)	18.9 (4.6)	18.2 (5.9)	20.5 (5.7)
SOC-T1				
X (SD)	11.4 (6.5)	10.6 (5.6)	12.6 (5.7)	11.6 (6.1)
SOC-T2				
X (SD)	6.4 (4.5)	10.9 (5.5)	8.9 (4.1)	8.4 (4.6)
SEP-T1				
X (SD)	11.1 (4.7)	12.2 (4.9)	13.7 (4.7)	11.8 (4.5)
SEP-T2				

	Fluency/ Decoding $n = 20$	Fluency $n = 30$	Responder $n = 33$	Typical $n = 31$
X (SD)	9.8 (4.6)	11.9 (4.9)	10.9 (4.1)	9.0 (4.1)

Note: 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.

Table 2

Repeated Measures Analysis of MASC Subscale, Response Group, and Time

| | **Within Subject Effects (Greenhouse-Geisser)** | | | | |
	Type III Sum of Squares	df	Mean Square	F	partial η^2
Scale	96.21	2.52	38.21	138.43**	.56
Scale*Group	5.35	7.55	0.71	2.57*	.07
Error (Scale)	76.45	276.98	0.28		
Time	4.74	1.00	4.74	8.40**	.07
Time*Group	3.39	3.00	1.13	2.01	.05
Error (Time)	62.08	110.00	0.56		
Scale*Time	8.91	2.68	3.33	20.20**	.16
Scale*Time*Group	1.64	8.04	0.20	1.25	.03
Error (Scale*Time)	48.26	294.61	0.16		

| | **Between Subject Effects** | | | | |
	Type III Sum of Squares	df	Mean Square	F	partial η^2
Group	0.48	3	0.16	1.68	.04
Error (Group)	10.48	110	0.10		

*
$p < .05$;

**
p<.01.

Table 3

Logistic Regression Analysis Predicting Group (Responder/Non-Responder) Status

	OR Estimate[a]	p	Pseudo R^2	p with WJBR
SOC	1.052	0.20	0.0149	0.06
HA	1.06	0.18	0.0167	0.20
SEP	1.089	0.08	0.0285	0.05
PS	1	0.99	0	0.81

Note: WJBR = Woodcock Johnson-III Basic Reading Composite Score; SOC = MASC Social Anxiety; HA = MASC Harm Avoidance; SEP = MASC Separation/Panic; PS = MASC Physical Symptoms.