



Published in final edited form as:

*Child Psychiatry Hum Dev.* 2023 August ; 54(4): 1064–1074. doi:10.1007/s10578-022-01315-w.

## Internalizing Symptoms and Reading Difficulties Among Early Elementary School Students

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### Abstract

While the field of learning disabilities has grown substantially over the past several decades (Grigorenko et al. in *Am Psychol* 75:37, 2020) little work has explored the role of internalizing symptoms among struggling students. The present study compared struggling and typical readers on several child reported internalizing measures at both the beginning and end of a school year during which time they received either classroom-as-usual or research-team provided intensive intervention. Struggling readers who did and did not meet reading benchmarks were also compared at year-end. While minimal differences were present at the beginning of the year, numerous differences were observed at the end, with students exhibiting persistent reading struggles reporting significantly greater distress. Bi-directional associations emerged with beginning of year group status predicting internalizing symptoms and beginning of year internalizing symptoms predicting end of year intervention response group status. Findings are discussed in terms of future directions for enhancing intervention studies of struggling readers.

### Keywords

Reading; Learning disabilities; Anxiety; Self-concept; Internalizing symptoms

Understanding of academic difficulties has grown substantially over the past several decades, with significant gains in knowledge ranging from assessment to intervention. While several correlates of academic difficulties have been considered in these efforts (e.g., attention, working memory, knowledge and inference making), comparatively, the relationship between academic difficulties and internalizing difficulties has only begun to be explored. The present study sought to bridge this gap by examining concurrent and longitudinal associations among internalizing symptoms (i.e., anxiety, depression, self-concept) and reading difficulties among early elementary school aged children.

Internalizing difficulties are typically conceived of as inwardly directed and affecting the individual (e.g., anxiety, depression), whereas externalizing difficulties are more outward behaviors that can be directed at others (e.g., ADHD, conduct issues). Epidemiological studies have found that internalizing disorders are particularly common among youth, for example prevalence rates of 7–32% have been reported for the experience of an anxiety or depressive disorder in youth with the wide range attributable to different survey designs and reporting mechanisms (e.g., [1-3]). A recent study found that across developmental stages, first incidence of an anxiety disorder was most likely to occur during childhood compared to adolescence [4], and having an anxiety disorder in childhood has been associated with deleterious outcomes in young adult functioning (for a review see [5]). Further, an even larger proportion of children experience subclinical levels of internalizing difficulties, which have also been correlated with a host of adverse outcomes [6, 7] and may worsen over time if unaddressed [8, 9].

A growing body of research has explored the relations among child internalizing difficulties and academic/achievement performance. Examined with broad samples of schoolchildren, this work has shown associations between academic difficulties and anxiety (e.g., [10-17]), depression (e.g., [17-22]), and domain-specific self-concept (e.g., reading self-concept, [23-28]).

Explaining these associations, some have suggested that internalizing symptoms may develop in children experiencing persistent academic difficulties. For example, learning difficulties have been found to predict greater anxiety and depression, as well as poorer self-concept (e.g., [11, 20, 22, 29-31]). Others have suggested that there is an increased risk for academic difficulties among children experiencing internalizing symptoms. For example, Voltas et al. [17] reported that the presence of depression and anxiety in elementary school predicted lower academic achievement 2 years later. Additional evidence has supported bidirectional associations among these variables with studies reporting that internalizing symptoms predict achievement and vice versa (e.g., [11, 32-34]). Studies focused on domain specific areas, such as math [32, 34] or reading [33], have found a bidirectional association, but with the relationship between achievement at the beginning of the year and anxiety at the end of the year significantly stronger than the relationship between anxiety at the beginning of the year and achievement at the end of the year. Thus, students who had lower achievement at the beginning of the year were more likely to have higher reading anxiety at the end of the year.

Studies of youth at-risk for or diagnosed with learning disabilities have yielded similar findings. For instance, two studies compared at-risk children classified as poor or not poor readers and found a significantly greater likelihood of an anxiety disorder diagnosis among the poor readers [18, 35]. Indeed, there appears to be the potential for a cycle to develop wherein academic and internalizing difficulties perpetuate through the influence of one another [11]. It is also conceivable that this cycle may be more likely and potentially stronger for students already identified as struggling academically. Few studies examined how experiencing internalizing or behavioral difficulties influence academically struggling students who are receiving targeted academic interventions (e.g., intensive reading intervention). Grills et al. [47] reported preliminary support for levels of

anxiety predicting response to reading intervention; such that the presence of internalizing symptoms negatively influenced academic gains. Alternatively, children with high levels of internalizing distress who receive and respond to intensive academic intervention may then show decrements in distress. This latter notion was supported by Kellam et al. [31], who found that depressive symptoms decreased from fall to spring of the first-grade year among low achieving students who showed academic improvement during that time. Taken together, these findings suggest that the relationships between achievement and internalizing symptoms may be particularly noteworthy among academically struggling students.

In summary, research has demonstrated bidirectional links between internalizing and learning difficulties, both in general populations, as well as among subsets of students demonstrating significant domain-specific achievement difficulties. More recent research also suggests that these associations may be particularly important to understand for students participating in intensive academic interventions. The present study addresses this need to better understand variations in students' response to academic interventions by examining internalizing symptoms among typical and struggling elementary school readers.

The three primary aims of the present study were to: (1) determine whether struggling and typical readers differed on internalizing symptom reports at the beginning of the school year (prior to intervention); (2) examine whether internalizing symptoms at the end of the school year were predicted by struggling or typical reading status at the beginning of the year; and (3) identify differences on internalizing symptoms between struggling students who did and did not meet achievement benchmarks after receiving a year of reading intervention. We hypothesized that struggling readers would report more internalizing symptoms (e.g., greater anxiety) than typical readers, and that this Time 1 group status would predict internalizing symptoms at Time 2. In addition, students who continued to be classified as inadequate readers at year end were expected to report significantly greater internalizing distress (i.e., greater anxiety/depression, lower self-concept), as compared with those children who met adequate reading benchmarks. In addition, we hypothesized that greater beginning of year internalizing symptom distress would predict end of year group membership (did or did not meet benchmarks). Finally, we predicted differential patterns of change for the distress levels of children classified who did or did not meet reading benchmarks at the end of the year, such that children who showed persistent reading difficulties throughout the year were expected to demonstrate an increasing pattern of distress.

## Method

### Participants

For the present study, participants were drawn from a larger randomized clinical trial investigating a response to intervention model for students with or at-risk for reading disabilities (see [36] for intervention study details). The larger study screened 1942 students at the end of their first grade year for reading difficulties, identifying ~ 11% for inclusion in an intervention study based on the criteria described below. A total of 251 children who had advanced to the second grade were selected (50% male; see Fig. 1) for inclusion in the current study. These students were selected from general education classrooms in two Texas school districts; one consisted of 5 urban schools from a large metropolitan city and

the other included 4 schools from suburban/rural areas outside of a smaller city. Across participants from both districts, a substantial portion of families qualified for free or reduced lunch (see Denton et al.). The children were of diverse racial/ethnic backgrounds: 50% African–American, 30% Latino/a, 6% Caucasian, 1% Asian, and 13% missing/other.

The 251 children included in this study were identified as struggling ( $n = 152$ ) or typical ( $n = 99$ ) readers based on their performance on two standardized reading measures. Struggling readers were those students who scored below a standard score of 93 (< 30th percentile) on either the Wood-cock-Johnson Basic Reading Composite (WJBR) or Test of Word Reading Efficiency (TOWRE) measures (with confirmation of reading difficulty from school personnel). These benchmarks are in line with prior research with struggling readers (see [37-39]). Typical readers included only those students who scored at or above a standard score of 93 on *both* of these Time 1 achievement measures. The typical readers (TYP) were all drawn from the same second grade classrooms and did not differ significantly from struggling readers on gender, race/ethnicity, limited English proficiency, or special education placement ( $ps > 0.05$ ).

As part of the larger study, struggling readers were randomized to either intensive reading intervention ( $n = 103$ ) or classroom business as usual ( $n = 49$ ) at a 2:1 ratio. All students in the study received regular classroom reading instruction, and some received additional school-provided supplemental instruction in small groups (~ 41% of TX students and 34% of BAU students) with no difference in the overall amount of time provided across groups (See [36] for intervention details). Students assigned to TX received either additional instruction in guided reading or explicit instruction, provided by study hired and training intervention teachers in small groups (2–4 students) for an average of 45 min per day for 4 days each week (23–25 weeks total). Across group comparisons revealed no significant differences among children assigned to TX or BAU on gender, grade, race/ethnicity, limited English proficiency, or special education placement ( $ps > 0.05$ ). Students completed several internalizing symptom measures at the beginning of the school year.

Twenty-four children who had completed the pretest battery (i.e., Time 1) were lost to attrition because they moved during the study. Children who attrited from the study did not differ from those completing the study on demographic (i.e., gender, race, age, free lunch status) or treatment variables (i.e., treatment assignment, Time 1 reading scores; see [36]). At the end of the year (Time 2), children completed a second assessment battery that included the internalizing and reading achievement measures. Accounting for attrition, there were 227 children at Time 2: 131 children from the struggling readers group, and 96 children from the typical readers group. Using the achievement measure performance at this second assessment, children were coded as meeting benchmarks if *both* of their Time 2 WJBR and TOWRE standard scores were > 90 (> 25th percentile). Using these procedures, 28 of the students identified as struggling readers were classified as meeting benchmarks at the end of the school year (75% of whom were from the intensive reading intervention group); see Fig. 1.

## Measures

The *Multidimensional Anxiety Scale for Children (MASC)*; [40] is a 39-item, self-report measure. Each item of the MASC was read aloud and children were asked to rate the item using a 4-point Likert scale from “Never true about me” (0) to “Often true about me” (3). The MASC is comprised of four subscales [i.e., physical symptoms (PS), harm avoidance (HA), social anxiety (SOC), and separation anxiety/panic (SEP)], with higher scores reflecting greater symptoms in that domain. The MASC has shown adequate to excellent psychometric properties [40-42]. Acceptable internal consistency coefficients (Time 1  $\alpha$ s = 0.61–0.89 and Time 2  $\alpha$ s = 0.64–0.88) were found in the present study.

The *Beck Inventories for Youth (BYI)*; [43] include the *Beck Anxiety Inventory for Youth (BAIY)*, *Beck Depression Inventory for Youth (BDIY)*, and the *Beck Self-Concept Inventory for Youth (BSCIY)*. Each of these scales consists of 20-items that are rated according to the following Likert scale: Never (0), Sometimes (1), Often (2), or Always (3). Items are summed for each scale (range 0–60) and converted to *T*-scores corresponding to an appropriate norm group (i.e., boys/girls and 7–10/11–14). Higher *T*-scores on the BAIY and BDIY reflect greater distress, whereas higher *T*-scores on the BSCIY reflect more positive feelings about the self. Excellent internal consistency coefficients, test–retest reliability, and convergent validity have been reported for all three of these scales [43]. In the present study, internal consistency was excellent across all three scales and both time points ( $\alpha$ s = 0.86–0.92).

The *Woodcock-Johnson PsychoEducational Test Battery-III* [44] is a nationally standardized, individually administered battery of cognitive and achievement tests. The Basic Reading composite score (WJBR) was used in the present study. The WJBR is comprised of the Letter-Word Identification subtest, which assesses the ability to read real words, and the Word Attack subtest, which examines children’s ability to read phonetically correct nonsense words. The WJBR composite has been widely used as a norm referenced indicator in previous response to intervention studies (e.g., [39, 45]) and has been found to have excellent reliability (split-half = 0.91–0.97) in young elementary school age children.

The *Test of Word Reading Efficiency (TOWRE)*; [46] is a test of speeded single word reading (i.e., Sight Word Reading Efficiency) and nonword reading (i.e., Phonemic Decoding Efficiency) that is commonly used as an outcome in reading intervention studies. The number of words or nonwords read correctly within 45 s is recorded. The Sum of Standard Scores represents the composite standard score of the Sight Word Efficiency and Phonemic Decoding Efficiency subtests. Alternate forms and test retest reliability coefficients are typically at or above 0.90 in this age range [46].

## Procedures

All procedures were reviewed and approved by the universities committees for the protection of human subjects. Prior to the study, children’s parents received a letter of informed consent detailing all study information and procedures for both this study and the larger reading intervention project. 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. Examiners who were provided with extensive training in psychoeducational testing administered the achievement measures (WJBR and TOWRE). At both assessments, children were read each of the items from the internalizing measures (i.e., MASC and BYI) in small groups. Children were monitored carefully by study personnel to ensure the confidentiality of their responses and were allowed ample time to complete each item and to ask questions.

## Results

To determine whether children identified as struggling readers differed from typical readers on the internalizing measures at Time 1, a multivariate analysis of variance (MANOVA) was conducted using Wilks' Lambda and child subscales from the BYI and MASC included as dependent variables. The resulting omnibus effect was significant: Wilks'  $\Lambda$ ,  $F(7, 240) = 5.61$ ,  $p < 0.001$ . Significant findings emerged for the BSCIY, HA, and SEP scales. Means and standard deviations for the two groups (i.e., struggling and typical readers), as well as the results of univariate comparisons and effect sizes (Hedges'  $g$ ) are presented in Table 1.

To examine whether Time 2 internalizing symptoms were predicted by identification as a struggling or typical reader at T1, a one-way analysis of covariance was conducted for each outcome measure. In each analysis, the T2 (posttest) score served as the dependent variable and the T1 (pretest) served as the covariate, with identification group as the independent variable. A significant difference was found on the HA scale. Means and standard deviations for the two groups (i.e., struggling and typical readers), as well as the results of univariate comparisons and effect sizes (Hedges'  $g$ ) are presented in Table 2.

Next, a series of analyses were conducted comparing struggling readers who met adequate year-end reading thresholds and those who did not. A MANOVA was conducted comparing these two groups with students identified as typical readers on T2 internalizing measures (BYI and MASC). Subsequent univariate tests, Games–Howell pairwise comparisons, and effect sizes (Hedges'  $g$ ) were calculated. The resulting omnibus effect was significant: Wilks'  $\Lambda$ ,  $F(14, 432) = 2.76$ ,  $p < 0.001$ . Significant univariate effects were found on the BAIY, BDIY, PS, HA, and SEP scales, with those who met benchmarks reporting fewer difficulties (see Table 3).

Beginning of year internalizing symptoms were then examined as predictors of end of year identification based on whether or not students met benchmarks ( $n = 27$ ) or not ( $n = 103$ ). A logistic regression was conducted with T1 reading scores controlled for with entry in the first block and followed by T1 internalizing scale scores as predictors in the second block. At step 1, T1 TOWRE was significant (Odds Ratio = 1.14, 95% CI = 1.03–1.26), with those reporting lower T1 scores more likely to be identified as having persistent reading difficulties at year end. Inclusion of the internalizing scales in block 2 was statistically significant,  $\chi^2(7) = 19.75$ ,  $p = 0.006$ , and explained an additional 18% (Nagelkerke  $R^2$ ) of the variance in response status (overall model  $R^2 = 43\%$ ). The model correctly classified 85% of cases. The SEP (Odds Ratio = 0.79, 95% CI = 0.67–0.93) and HA (Odds Ratio = 1.18, 95% CI = 1.05–1.32) subscales were significant predictors of response status (see Table 4). Children who reported lower T1 harm avoidance, as well as those who reported



higher separation anxiety, were more likely to be identified as having persistent reading difficulties at the end of the year.

Finally, patterns of change in internalizing symptom distress were compared for struggling readers who met benchmarks at year-end and those who continued to struggle with reading. Using T scores > 65 to indicate high levels of distress, children's scores on the MASC and BYI were examined at T1 and T2. Fisher's exact tests were used to examine within group cases where T1 scores were low and remained low at T2 versus cases where scores were low at T1 but high at T2 (increasing pattern of distress). Children who were classified as continuing to struggle with reading (not meeting benchmarks) were significantly more likely to evidence this pattern of change for the PS and SEP scales (see Table 4). Similarly, Fisher's exact tests were used to examine cases where T1 scores were high and remained high at T2 versus cases where scores were high at T1 but low at T2 (decreasing pattern of distress); however, this pattern was only significant for the BSCY, with findings indicating that students who continued to struggle with reading were significantly more likely to have decreased self-concept at year end (see Table 5).

## Discussion

The present study sought to examine internalizing symptoms in struggling and typically reading early elementary school aged children. At the beginning of the school year (i.e., Time 1), struggling readers were compared with typical readers on several self-reported internalizing symptom indices. At the end of the school year (i.e., Time 2), struggling readers were classified as either: (a) meeting benchmarks on standardized reading achievement measures or (b) not meeting benchmarks/continuing to struggle with reading. Using the same internalizing measures, comparisons were then made among these groups with children who had met benchmarks all year (typical readers).

In contrast to what was predicted, struggling and typical readers indicated generally similar levels of *anxiety* symptoms at the beginning of the school year. Indeed, the only statistically significant finding revealed lower separation anxiety symptoms reported by struggling students. The lack of differences may reflect that, early in the school year, inadequate readers have not yet (or recently) had many reading struggles or failure experiences. Thus, struggling students may not have been feeling stressed or overwhelmed by their reading difficulties at the start of the school year.

Significant differences between struggling and typical readers were found on two additional *non-anxiety* specific scales (i.e., self-concept, harm avoidance) at the beginning of the year. Specifically, struggling readers had significantly lower self-concept scores, suggesting that they generally described themselves as doing things less well (e.g., "I feel proud of the things I do"). These findings are in line with previous research that has demonstrated significant associations with depression, domain specific self-concept, and academic difficulties in young students (e.g., [18, 23, 19, 24, 20, 25-27, 21, 17, 28, 22]). Of note, our findings regarding self-concept extend previous work focused on domain-specific self-concept by suggesting that children's broader views of themselves may be influenced by their academic struggles.

Struggling readers in the present study also reported significantly lower harm avoidance scores at the beginning of the school year, a finding consistent with previous work comparing struggling/typical readers [47]. The harm avoidance scale contains items that can be interpreted as assessing motivation or conscientiousness (e.g., “I try to do everything exactly right”, “I try hard to obey my parents and teachers”). The medium-large effects for the difference in harm avoidance scores suggest that struggling readers in the present study did not perceive themselves as evidencing these behaviors as much as typical readers. Harm avoidance also emerged as the only internalizing scale predicted by group status at time 1, with struggling readers reporting significantly lower harm avoidance than typical readers. Furthermore, in contrast to the findings across other scales (described below), scores on this measure remained similar among children classified as meeting or not meeting benchmarks at year-end. Interestingly, while the harm avoidance scale was originally described as tapping perfectionistic and avoidant behaviors that have been negatively associated with child adjustment and achievement measures (e.g., [48, 49]), our work has consistently shown inverse results among the early elementary school aged children in our studies [12, 47]. We have postulated that for the younger aged children in our samples, the scale items are viewed as indicative of conscientious behaviors and positive perfectionism (i.e., striving for perfection). In this regard, our findings are in line with previous studies which have shown that positive perfectionism can be associated with higher achievement and motivation (e.g., [50, 51]).

In addition to the between-group differences found at each time point for struggling/typical readers, an interesting finding also emerged for harm avoidance within the struggling reader group. That is, beginning of year harm avoidance scores were found to significantly predict group status (meeting/not meeting benchmarks) at the end of the year, adjusting for beginning of year achievement scores. Thus, struggling readers who began the year with higher harm avoidance scores were found to have increased odds of meeting the adequate reading benchmarks at the end of year.

Taken together, these findings suggest that it may be critical to better understand the components of the harm avoidance scale in order to potentially build such skills into intervention programs. For example, conscientiousness and academic motivation have been well linked with school performance (e.g., [52-55]), as well as academic self-concept (e.g., reading, [25, 56, 57]), and also appear to be captured by this scale. Although a number of school, peer, and home practices have been proposed to account for these findings (see [52] for review), limited research has been conducted on intervention programs targeting these domains in early childhood. Thus, future research should draw from these empirical findings and investigate the potential additive benefit of incorporating components like conscientiousness and motivation building (e.g., motivational interviewing strategies, [58]) into existing interventions for struggling learners.

Interestingly, greater separation anxiety symptoms at the beginning of the year also predicted end of year classification in the continuing to struggle with reading group (failure to meet benchmarks); a finding in line with our earlier work in this area [47]. Therefore, it may be that increased separation anxiety symptoms serve an inhibiting influence on children’s ability to attend to instruction. The items that comprise this scale reflect



fearfulness (e.g., “I get scared riding in the car or bus”) and avoidance (e.g., “I avoid going to places without my family”) which may be particularly likely to interfere with attention or cognitive engagement during this early developmental period. For example, a child who is concerned with being apart from their parent may be preoccupied by thoughts that something has happened to their parents, ultimately missing out on instruction or learning practice opportunities, even in smaller group settings. Over time, this disruption may result in failure to adequately respond to intervention and suggests that there may be additive value in addressing these specific concerns among early elementary school students who are struggling to learn how to read.

Finally, beginning of year reading scores also predicted end of year classification in terms of meeting or not meeting reading benchmarks. Students who began the year with lower reading scores on the TOWRE were more likely to be identified as having persistent reading difficulties at year end. Interestingly, the same finding did not emerge for the WJBR. These distinctions may reflect the different test formats (timed versus untimed) or differences in change across groups. Post-hoc analyses supported the latter suggestion, such that students who eventually met benchmarks had significantly higher scores on the TOWRE and WJBR at the beginning of the year; but only the TOWRE showed an interaction with time showing greater gains among those who met benchmarks (83.4–93.9) versus those who did not (74.6–78.4).

While struggling and typical readers differed little at the beginning of the school year, at the end of the school year differences emerged on nearly all measures. Further, a consistent pattern emerged across every measure of distress (with the above noted exception of the harm avoidance scale, as well as self-concept): Children who did not meet benchmarks at the end of the school year reported the greatest level of distress (e.g., highest anxiety, depression), followed by children in the typical group, and finally children in the met benchmarks group (who reported the lowest levels of distress). Comparisons generally showed that the group who did not meet benchmarks were significantly different from the group who did meet benchmarks (i.e., medium effects observed), and frequently also differed significantly from the typical reader group (i.e., small effects observed). Further, the scores of those meeting benchmarks were similar to those in the typical reading groups (non-significantly different) on all of these measures with one exception (separation anxiety), in which case the meeting benchmarks group had significantly *lower* scores than even the typical reading group.

In all, these findings suggest that, at the end of the school year, children who continued to struggle with reading were experiencing greater internalizing distress than their peers who had reached reading benchmarks. It may be that the achievement of benchmarks corresponds with decreasing levels of distress for children who had previously struggled with reading. Conversely, children who continue to struggle with reading may develop increasing levels of distress throughout the school year. Indeed, in the current study, further examination of the struggling readers whose distress levels changed during the year supported the latter suggestion. That is, students categorized as not meeting benchmarks disproportionately comprised the increasing distress change pattern group (Note: for self-concept, the high to low change reflects greater distress over time), whereas the proportions

in the decreasing distress change groups did not significantly differ. Thus, it seems that as children's academic struggles continued, their stress and self-views tended to worsen such that they were significantly more likely to begin the year reporting typical levels of internalizing symptoms but end the year reporting clinically elevated levels. These findings are especially noteworthy as self-concept plays a particularly salient role in the development or inhibition of various childhood difficulties (e.g., [59, 60], and may be compounded by the increasing anxiety also being reported by students. An alternative possibility is that children who had lower initial levels of distress were better able to reach achievement benchmarks over time. For example, it may be that children who report greater internalizing distress at the beginning of the year are doubly disadvantaged by their academic and internalizing symptom difficulties, which then hinders their ability to make reading gains. The results of the present study provided some support for this hypothesis as well. Specifically, as previously noted, results from the logistic regression revealed decreasing odds of being classified in the responder group at year-end for students who began the year with higher separation anxiety symptoms. While additional longitudinal research is necessary to clarify these complex relationships, collectively, these findings clearly highlight the need for researchers and practitioners to attend to the internalizing distress associated with struggling to learn among young children.

Collectively, the present findings suggest that for children experiencing reading difficulties, a range of different internalizing symptoms may be beneficial to target with interventions that can supplement existing academic interventions. In particular, the present findings provide further support for teaching children strategies that can boost their self-worth, motivation, and conscientiousness, as well as those to help students manage feelings of anxiety and depression. It appears that beginning such supplemental interventions early is also of importance. For example, findings from the present study add to the literature suggesting that a negative or compounding anxiety cycle is possible for struggling readers. That is, children who began the year struggling and experiencing separation anxiety were less likely to reach benchmarks over the course of a school year and reading status at the beginning of the year (struggling versus typically achieving) was found to predict greater social anxiety at the end of the year. Moreover, children who failed to reach benchmarks at the end of the year were found to disproportionately comprise the subgroup of children whose anxiety rose from normative to clinical levels. Thus, addressing students' stress/ anxiety alongside their academic difficulties appears especially warranted. Indeed, findings from our own work investigating a combined reading and anxiety management intervention supports the feasibility and efficacy of such an approach (see [61, 62]).

Finally, it is valuable to note limitations of the present study as well as some future directions for research. First, findings from the present study are limited in their generalizability to other samples (e.g., regional, developmental, socioeconomic) and may primarily represent relations for younger aged children or those at risk for reading difficulties. It will be important for future research to replicate the associations among these variables in a broader array of geographic settings. Further, future research should consider more diverse age groups, as well as include socioeconomic variables that may directly address whether these factors influence struggling readers' reports of internalizing behaviors. For example, past research has found that academic motivation (e.g., [55], as

well as harm avoidance [63], decrease during later childhood (e.g., middle school) and it may be that the relations among these variables change considerably at that time. In addition, future research should be conducted with children experiencing other academic struggles (e.g., math, writing) to determine whether the present findings are replicable across academic domains. Second, the present study relied upon the use of self-report measures, and it may be useful for future research to include observational or behavioral experiment methods to compare with these findings. Such findings may help shed light on the relative importance of including multiple informants' reports when evaluating difficulties such as these among young children (e.g., [64]). Third, the present findings are limited by the lack of definitive classification for students with academic struggles. In the present study, students were classified as adequate or inadequate intervention responders using an informed (< 25th percentile) standard score cut-point. Additional research might examine whether the associations found herein differ at even greater extremes of academic difficulty; in the present study sample size precluded such examinations. However, the present approach allowed for investigation of cases more likely to be representative of that seen in typical general education classrooms, with children coded as inadequate readers displaying a full range of scores on the reading measures. In all, replication of this work will be critical to establishing the strength of these findings. Moreover, future studies should utilize a longer time-point longitudinal design in order to further explicate the relationships between these internalizing and reading variables over time.

## Summary

There has been growing recognition of the need to better understand social, emotional, and behavioral correlates with academic outcomes and interventions. Consistent with previous findings, the present study revealed bi-directional associations between internalizing symptoms of distress and reading difficulties. Further, while there were few differences on internalizing measures among struggling readings at the beginning of the school year, numerous differences were observed at the end of the year, with students exhibiting persistent reading struggles reporting significantly greater distress. The present study represents a critical advancement in our understanding of the relationships among reading and internalizing difficulties. These findings also extend our previous work exploring anxiety in children classified as adequate and inadequate readers following intensive reading intervention and continue to highlight the need to provide social, emotional, and behavioral interventions as well as academic interventions for such students. Combined intervention approaches represent an important next step in addressing the complex concerns experienced by children who struggle with learning.

## Acknowledgements

This research was supported in part by Award Numbers K08HD058020 (PI, Grills) and P50HD052117 (PI, Fletcher) from the Eunice Kennedy Shriver National Institute of Child Health & Human Development. The content is solely the responsibility of the authors and does not necessarily represent the official views of the Eunice Kennedy Shriver National Institute of Child Health & Human Development or the National Institutes of Health.

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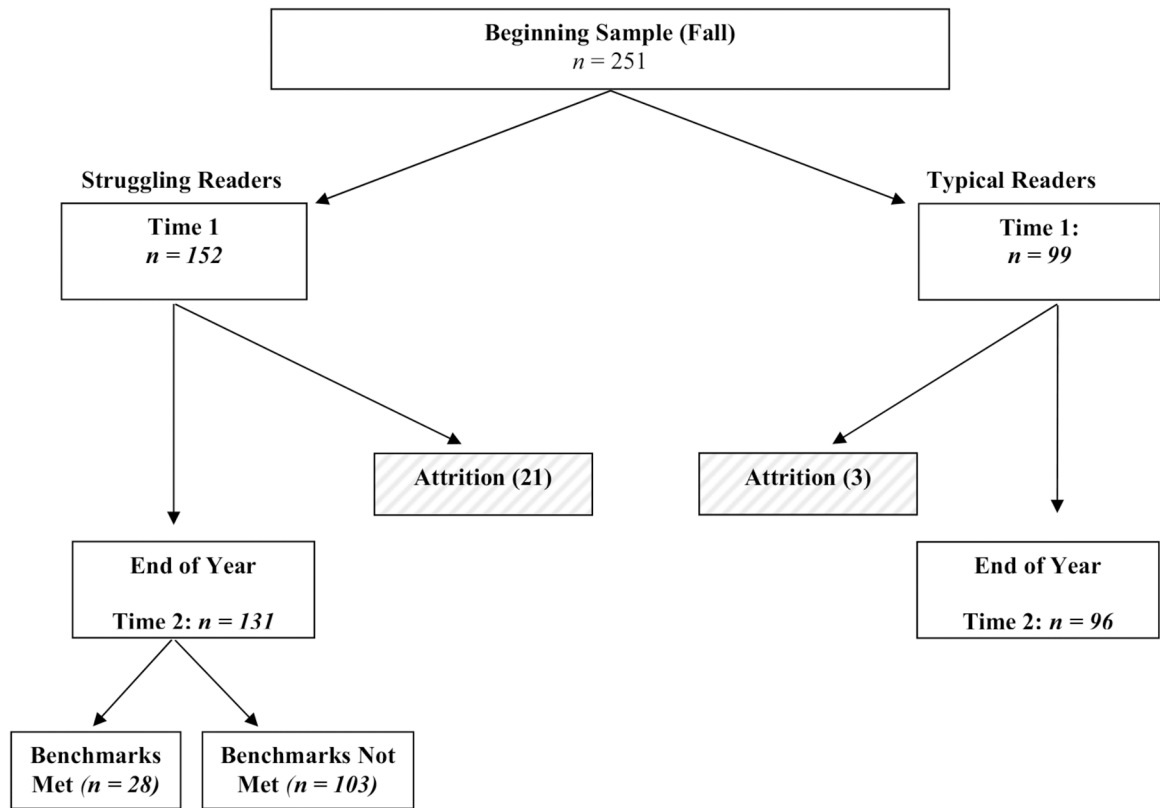
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**Fig. 1.**  
Participant flowchart from randomization to study completion

Internalizing symptom reports for struggling (n = 150) versus typical (n = 98) readers at the beginning of the school year

**Table 1**

Scale/subscale	Group	Results of univariate analyses			
		Typical readers (m/sd)	Struggling readers (m/sd)	F p-value Hedge's g	
BYI—BAIY	53.1 (14.0)	54.4 (13.6)	0.52	0.471	0.10
BYI—BDIY	51.0 (13.3)	54.2 (13.2)	3.39	0.067	0.24
BYI—BSCIY	52.7 (8.1)	49.4 (10.3)	6.90*	0.009	-0.35
MASC—PS	15.4 (7.5)	15.4 (6.7)	0.01	0.995	0.00
MASC—HA	20.0 (5.1)	15.9 (5.8)	32.88*	< 0.001	-0.74
MASC—SOC	10.9 (6.3)	10.3 (6.2)	0.52	0.470	-0.10
MASC—SEP	12.6 (5.4)	11.1 (5.2)	4.88*	0.028	-0.28

BYI/Beck youth inventory T-scores, BAIY/Beck anxiety inventory for youth, BDIY/Beck depression inventory for youth, BSCIY/Beck self concept inventory for youth, MASC/multidimensional anxiety scale for children raw scores, PS/physical symptoms, HA/harm avoidance, SOC/social anxiety, SEP/separation-panic

\*  $p < .05$

ANCOVA predicting anxiety at end of year from reading status (struggling: n = 131 or typical: n = 95) at the beginning of the year

**Table 2**

Scale/subscale	Group	Results of Univariate Analyses			
		Typical readers (m/sd)	Struggling readers (m/sd)	F	p-value
BYI—BAIY	49.2 (11.8)	51.3 (13.3)	1.01	0.315	0.17
BYI—BDIY	49.0 (11.9)	52.1 (13.4)	1.29	0.258	0.24
BYI—BSCIY	51.1 (10.9)	48.6 (9.9)	0.32	0.571	-0.24
MASC—PS	12.5 (6.8)	14.3 (7.5)	3.39	0.067	0.25
MASC—HA	20.2 (4.8)	17.1 (5.2)	11.56*	< 0.001	-0.62
MASC—SOC	8.5 (6.7)	9.6 (6.5)	2.93	0.088	0.17
MASC—SEP	10.3 (5.3)	9.9 (5.2)	0.32	0.573	-0.08

BYI/Beck youth inventory T-scores, BAIY/Beck anxiety inventory for youth, BDIY/Beck depression inventory for youth, BSCIY/Beck self concept inventory for youth, MASC/multidimensional anxiety scale for children raw scores, PS/physical symptoms, HA/harm avoidance, SOC/social anxiety, SEP/separation-panic

\* p < .05

Internalizing symptom reports for children based on reading classification status at the end of the school year

**Table 3**

Scale/subscale	Group ( <i>m</i> / <i>sd</i> )	Results of univariate analyses					
		Benchmarks not met <i>n</i> = 103	Benchmarks met <i>n</i> = 27	Typical <i>n</i> = 95	<i>F</i>	<i>p</i> -value	<i>hedge's g</i> -values
BYI—BAIY	52.9 (13.9) <sup>ab</sup>	46.1 (10.4) <sup>a</sup>	49.2 (11.9) <sup>b</sup>	3.95*	0.021	0.51 <sup>a</sup>	0.29 <sup>b</sup>
BYI—BDIY	53.8 (14.2) <sup>ab</sup>	46.1 (8.5) <sup>a</sup>	49.0 (11.9) <sup>b</sup>	5.62*	0.004	0.58 <sup>a</sup>	0.37 <sup>b</sup>
BYI—BSCIY	48.2 (10.3)	50.7 (8.6)	51.1 (10.9)	2.15	0.119		
MASC—PS	15.1 (7.3) <sup>ab</sup>	11.6 (7.7) <sup>a</sup>	12.5 (6.8) <sup>b</sup>	4.29*	0.015	0.37 <sup>a</sup>	0.37 <sup>b</sup>
MASC—HA	17.1 (5.2) <sup>a</sup>	17.1 (5.8) <sup>c</sup>	20.2 (4.8) <sup>d</sup>	9.96*	< 0.001	− 0.62 <sup>a</sup>	− 0.62 <sup>c</sup>
MASC—SOC	10.2 (6.4)	7.3 (6.7)	8.5 (6.7)	2.76	0.066		
MASC—SEP	10.6 (5.2) <sup>a</sup>	7.8 (4.7) <sup>d</sup>	10.3 (5.3) <sup>c</sup>	3.25*	0.041	0.55 <sup>a</sup>	0.48 <sup>c</sup>

*BYI*Beck youth inventory T-scores, *BAIY*beck anxiety inventory for youth, *BDIY*beck depression inventory for youth, *BSCIY*beck self concept inventory for youth, *MASC*multidimensional anxiety scale for children raw scores, *PS* physical symptoms, *HA* harm avoidance, *SOC* social anxiety, *SEP* separation-panic, <sup>a/b</sup> Matching subscripts indicate significant differences ( $p < .05$ ) based on Fisher's least significant difference pairwise comparison

\*  $p < .05$

Logistic regression predicting T2 group status (benchmarks met/benchmarks not met) from T1 internalizing symptoms

Table 4

	Block 1		Block 2	
	$\beta$ (SE)	OR Estimate	$\beta$ (SE)	OR Estimate
Constant	- 12.56 (3.19) *	0.00	- 14.36 (4.40) *	.000
TOWRE	.13 (.05) *	1.14	.15 (.06) *	1.17
WJBR	.01 (.04)	1.00	.01 (.05)	1.00
BYI—BAIY			.01 (.03)	1.01
BYI—BDIY			.02 (.03)	1.02
BYI—BSCIY			-. 01 (.03)	1.00
MASC—PS			-. 07 (.06)	0.93
MASC—HA			.16 (.06) *	1.18
MASC—SA			.02 (.07)	1.03
MASC—SEP			-. 23 (.08) *	0.79
Model $\chi^2$	$\chi^2(2) = 22.45, p < .001$		$\chi^2(9) = 42.19, p < .001$	
Hosmer & Lemeshow test	$\chi^2(8) = 7.09, p = .527$		$\chi^2(8) = 7.44, p = .490$	
Nagelkerke $R^2$	.25		.43	

*BYI*/beck youth inventory T-scores, *BAIY*/beck anxiety inventory for youth, *BDIY*/beck depression inventory for youth, *BSCIY*/beck self-concept inventory for youth, *MASC*/multidimensional anxiety scale for children raw scores, *PS* Physical Symptoms, *HA* harm avoidance, *SOC* social anxiety, *SEP* separation-panic, *TOWRE* test of word reading efficiency, *WJBR* Woodcock-Johnson basic reading composite score

\*  $p < .05$



Table 5

Patterns of change for internalizing distress ratings among children classified as meeting/not meeting benchmarks at year-end

		Start low/end high	Start high/end low
BYI—BAYI	Benchmarks Not Met	17%	67%
	Benchmarks Met	4% $p = .11$	67% $p = .75$
BYI—BDYI	Benchmarks Not Met	16%	77%
	Benchmarks Met	4% $p = .09$	100% $p = .62$
BYI—BYSCI	Benchmarks Not Met	45%	16%
	Benchmarks Met	40% $p = .62$	0% $p = .03$
MASC—PS	Benchmarks Not Met	24%	85%
	Benchmarks Met	7% $p = .05$	100% $p = .74$
MASC—HA	Benchmarks Not Met	4%	100%
	Benchmarks Met	7% $p = .35$	100% $n/a$
MASC—SOC	Benchmarks Not Met	7%	80%
	Benchmarks Met	7% $p = .58$	100% $p = .82$
MASC—SEP	Benchmarks Not Met	20%	69%
	Benchmarks Met	4% $p = .05$	75% $p = .64$

*BYI*beck youth inventory T-scores, *BAYI*beck anxiety inventory for youth, *BDYI*beck depression inventory for youth, *BSCYI*beck self-concept inventory for youth, *MASC* multidimensional anxiety scale for children raw scores, *PS* physical symptoms, *HA* harm avoidance, *SOC* social anxiety, *SEP* separation-panic