

Original Article

Responding to parental concern about children's reading

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ABSTRACT

Objectives: This study explored if parents are accurate in their reading concerns, with implications for paediatric practice.

Methods: Parents of school-aged children in 34 schools in Ontario, Canada responded to a questionnaire about their children's academic development (27% response), and their children participated in standardized, norm-referenced tests of word reading and an oral sentence recall task. Parental concern status was retrospectively cross-referenced with reading difficulty status (<25th percentile on the word reading tests) for grade 2 children with complete data (n = 294); diagnostic accuracy was evaluated. Demographic and reading-related characteristics of children whose parents' concern did not match their reading difficulty status were explored.

Results: Approximately 22% of parents endorsed concern, while 18.5% of children had word reading difficulty. Parental concern status accurately corresponded with reading difficulty status in 81% of cases (95% CI: 76% to 85%). Specificity was 85% (95% CI: 80% to 90%), while sensitivity was 59% (95% CI: 44% to 73%). Children of unconcerned parents rarely had word reading problems (NPV 91%; 95% CI: 88% to 94%), while children with concerned parents had word reading difficulty in 45% of cases (PPV; 95% CI: 36% to 54%). Apparent inaccuracy (i.e., mismatch between parental concern and reading difficulty status) was related to children's word reading, oral sentence recall skills, and English language learner (ELL) status, but not child age, sex, or parent education.

Conclusions: Many parents of grade 2 children endorse reading concerns. Parental concern is an overall accurate screener for word reading difficulty, although some children will be missed. Evidence-informed recommendations for responding to parental concern are provided.

Keywords: Developmental dyslexia; Parenting; Reading; Screening.

BACKGROUND

Reading difficulties are extremely common among school-aged children, with over a quarter of students in many Canadian provinces failing to meet provincial standards for reading proficiency (1–5). While reading development is complex (6,7), almost all children with reading difficulty have underlying deficits in word reading or oral language comprehension (8).

Parents frequently discuss reading with paediatric providers (9), and reading difficulties commonly co-occur with other health and mental health conditions that present in paediatric practice (10,11). Early identification and intervention for reading difficulties is crucial because reading difficulties are highly stable (12) and can result in emotional and behavioural consequences (13). Early intervention can substantially reduce the prevalence of persistent reading difficulty for many children (14). Therefore, providers need efficient and empirically supported approaches

for identifying and appropriately referring children at risk of reading and other academic difficulties (15). Unfortunately, few options exist (16; cf. 17, 18) and many children with reading difficulties are not identified or treated (19,20).

Eliciting parental concern is an accurate and efficient way of identifying many developmental challenges (21), however, parental concern about reading has not been studied. Parents might accurately identify reading problems in their children (22), but could also be biased due to their own characteristics [e.g., educational attainment (23)], or irrelevant characteristics of their children [e.g., gender or younger age relative to peers (24,25)]. Parents may also lack full understanding of reading development, as teachers do (26).

Therefore, the value of parental concern in identifying reading difficulties must be empirically explored. This can be done by treating parental concern as a screening test for reading

difficulty and computing diagnostic accuracy parameters. These parameters include overall accuracy (percentage of individuals correctly classified) as well as sensitivity and specificity (percentage of individuals who do/do not have a condition who are identified correctly). Sensitivity/specificity values over 70% are considered acceptable (27), although 75% to 80% or higher is preferred for educational screens (28).

While sensitivity and specificity evaluate the properties of a screening test, positive predictive value (PPV) and negative predictive value (NPV) establish implications of test results for individuals (29). Positive predictive value is the probability that someone with a positive screen has the condition of interest; whereas NPV is the probability that an individual who screens negative does not have the condition. Positive and NPVs must be calculated in an epidemiological sample, and they cannot be used to determine the accuracy of a screener as they are highly affected by base rates (30).

CURRENT STUDY

The purpose of the current study was to determine the prevalence of parental concern about reading and evaluate its accuracy in identifying reading difficulty. This study focused on grade 2 children, as consistent reading trajectories are established at this age [e.g., (12,31)] and behavioural and emotional impacts of reading difficulty are evident [e.g., (32)].

There can be no 'gold-standard' measure of reading difficulty, as reading skill is multi-faceted and exists on a continuum (33). Acknowledging this, children's word reading performance <25th percentile on a standardized word reading test was selected as the reference standard for this study. Word reading is important to comprehension at this age (34), while a cut-off value of the 25th percentile is consistent with previous literature [e.g., (35)], and is associated with poor educational outcomes (36).

With respect to study hypotheses, it was expected that, as in other domains, parental concern about reading would correspond with actual developmental difficulty and would not be biased by characteristics of child age, gender, or parent education [see (23)]. In contrast, it was expected that children's status as a native English speaker versus English language learner (ELL) may influence parental concern, as ELLs tend to lag native English-speaking peers with respect to oral language development and comprehension (37).

METHODS

Data for this study were obtained retrospectively from a dataset considering early predictors of educational success in school-age children [see (38)]. The Nonmedical Research Ethics Board at the University of Western Ontario and the local school board approved the procedures. In the wider study, all parents of children from kindergarten to grade 4 from 34 suburban/rural schools in Southwestern Ontario were invited via a letter home in October 2009 to consent to and complete a questionnaire about their children's academic development and to consent to their children completing a battery of academic tests (~5,967 letters distributed, with 1,605 returned and 1,120 participants with complete data). Of

the 323 grade 2 children whose parents consented, 294 had complete data from parents and children. Sample characteristics are presented in Table 1.

The questionnaire included demographic information (including child's gender, age, and parental education) as well as ELL status. Parents were also asked "Have you ever been concerned about this child's ability to learn to read?" (response options: Yes/No). An affirmative response was considered parental concern about reading.

Children completed standardized, norm-referenced, timed tests of word recognition and decoding [Test of Word Reading Efficiency (39)]. Children also completed an oral sentence recall task that has been shown to accurately differentiate children with language difficulties from typically developing children (40). Trained research assistants, blind to parental concern status, individually administered these tasks in a quiet environment from November 2009 to February 2010.

Descriptive statistics were calculated for all variables. Several variables violated assumptions of normality, so bootstrapping was used for parametric t-tests. Standard scores ($M = 100$, $SD = 15$) were used to provide clear implications for practice. Standard scores for the word reading tests were calculated using the test manual, whereas for the oral sentence recall test they were calculated based on the original study sample (38).

Cross-tabulations were completed, and classification accuracy, sensitivity, specificity, PPV, and NPV were calculated [see (29)]. Planned contrasts were used to compare children with apparently 'accurate' versus 'inaccurate' parents (true positives versus false negatives and true negatives versus false positives) on demographic variables, word reading skills, and oral sentence recall skills. For categorical data, chi-square analyses were used; for continuous data, t-tests were used. Statistics were calculated using IBM SPSS Statistics version 24, except screening parameters, which were calculated using the MedCalc diagnostic test evaluation calculator (41).

Table 1. Demographic characteristics of sample ($n = 264$)

Child characteristics	
Age in months, mean (SD)	89.66 (3.64)
Youngest in class, %	33.3
Female gender, %	47.6
English language learner (ELL) status, %	9.5
Parents' education level	
Highschool or less—mothers, %	17.0
Highschool or less—fathers, %	31.0
Parental concern—yes, %	22.1
Reading and language standard scores	
Word recognition, mean (SD)	106.24 (13.67)
Decoding, mean (SD)	105.03 (13.22)
Overall word reading, mean (SD)	106.72 (15.70)
Oral sentence recall, mean (SD)	100.78 (14.82)
Reading difficulty status (<25th percentile), %	
Word recognition	14.0
Decoding	12.5
Any word reading difficulty	18.5

RESULTS

Overall, 22% of parents reported having ever been concerned about their children's ability to learn to read. This rate was higher for parents of ELLs, $X^2(1) = 5.30$, $P = 0.021$, with 39% endorsing concern.

See Table 2 for diagnostic accuracy parameters. Parental concern status accurately classified children with/without word reading difficulties in most cases (81%, 95% CI: 76% to 85%). Specificity was also high (>80%). Parental concern identified 59% of the children with any word reading difficulty (95% CI: 44% to 73%), with better sensitivity in identifying word recognition difficulties (70%, 95% CI: 53% to 84%) than decoding difficulties (61%, 95% CI: 42% to 77%). Children whose parents were not concerned about their reading rarely had word reading difficulties (NPV >90%). Children with concerned parents performed poorly on at least one index of word reading difficulty 45% of the time (i.e., PPV, 95% CI: 36% to 54%).

With respect to apparent inaccuracy, children whose parents were concerned in the absence of word reading difficulty had worse oral sentence recall skills as a group ($M = 95.14$, $SD = 15.87$) than children of accurately unconcerned parents ($M = 103.86$, $SD = 12.61$), $t(243) = -3.68$, $P < 0.001$, $d = 0.61$. While still performing within the average range, these children also had worse word reading skills ($M = 103.03$, $SD = 9.33$) than children of accurately unconcerned parents ($M = 112.96$, $SD = 12.09$), $t(243) = -4.69$, $P < 0.001$, $d = 0.92$. There were no demographic differences with respect to child gender [$X^2(1) = 2.18$, $P = 0.140$], child's age placing them among the youngest in their class [$X^2(1) = 3.56$, $P = 0.059$], mother's education level [$X^2(1) = 0.79$, $P = 0.374$], or father's education level [$X^2(1) = 1.46$, $P = 0.226$]. However, parents were more likely to be concerned in the absence of word reading difficulty when their children were ELLs versus native English speakers [$X^2(1) = 4.69$, $P = 0.030$].

A reverse pattern was obtained for children whose parents were *not* concerned despite their poor word reading ability. While still below the 25th percentile, these children had better word recognition skills that closely approached the cut-off score [$M = 89.70$, $SD = 5.55$] than children of concerned parents [$M = 82.76$, $SD = 7.72$], $t(47) = -3.45$, $P = 0.006$, $d = 1.03$, while their decoding skills did not differ significantly, $P = 0.070$. The children whose parents were unconcerned despite their poor word reading had better oral sentence recall skills as a group ($M = 99.25$, $SD = 13.25$) than children of accurately concerned parents ($M = 86.62$, $SD = 19.04$), $t(47) = -2.57$, $P = 0.015$, $d = 0.77$. There were no demographic differences between the 2 groups with respect to child gender, $X^2(1) = 0.50$, $P = 0.480$, child's age placing them among the youngest in their class, $X^2(1)$

$= 3.25$, $P = 0.072$, mother's education level, $X^2(1) = 0.75$, $P = 0.388$, father's education level, $X^2(1) = 3.64$, $P = 0.056$, or child's ELL status, $X^2(1) = 0.75$, $P = 0.387$.

DISCUSSION

The results of this study suggest that parental concern about children's reading is common (endorsed by 22% of parents in this epidemiological sample). A single question of parental concern is a brief, cost-effective, and simple screening strategy for paediatric providers who wish to identify (word) reading difficulties in grade 2 children. Parental concern displayed adequate accuracy and specificity (>80%) but modest sensitivity in identifying word reading difficulties with a cut-off of the <25th percentile. However, further analysis suggested that parents may be more likely to identify more severe reading deficits and those that affect word recognition.

Child age, child gender, and parent education status were unrelated to parental accuracy in this study. However, parents of ELLs were more likely to be concerned in the absence of word reading difficulties than parents of native English-speaking children. This is sensible, because while ELLs as a group display word reading skills on par with their native English-speaking peers, they display relative reading comprehension deficits (37). Parents' response to questions about concern may also differ cross-linguistically/cross-culturally [e.g., (42)].

When a parent is concerned about their child's reading, their child may demonstrate poor word reading in about half of cases. However, results suggest that children of concerned parents whose word reading is not significantly affected may still have milder reading difficulties and/or language difficulties. More than 10% of children may have adequate word reading skills but struggle with fluency (43) or comprehension only (44). Therefore, parents are not necessarily incorrect in their concern; rather, their concern may signify difficulties affecting reading beyond basic word reading skills.

Paediatric providers can use the results of this study, in tandem with the literature reviewed in this paper, to inform a response to parental concern about reading (see Box 1). First, it is recommended that providers acknowledge parental concern, seeing it as a likely indicator of reading difficulties. Although using parental concern as screening strategy may result in modest over-referral, this is preferable to under-referral (45). As children with reading difficulties may not be uniformly identified and provided with effective intervention (46–48), providers should be explicit in recommending further evidence-based assessment and (as needed) intervention.

Table 2. Utility of parental concern in identifying reading difficulty (n = 294)

Type of reading difficulty	Accuracy, % (95% CI)	Sensitivity, % (95% CI)	Specificity, % (95% CI)	PPV, % (95% CI)	NPV, % (95% CI)
Word recognition	82.99 (78.20–87.11)	70.27 (53.02–84.13)	84.82 (79.84–88.98)	40.00 (31.81–48.79)	95.20 (92.33–97.02)
Decoding	80.27 (75.26–84.67)	60.61 (42.14–77.09)	82.76 (77.62–87.14)	30.77 (23.26–39.45)	94.32 (91.56–96.22)
Any reading difficulty*	80.95 (75.99–85.28)	59.18 (44.21–73.00)	85.31 (80.24–89.49)	44.62 (35.50–54.11)	91.27 (88.14–93.63)

PPV, Positive Predictive Value; NPV, Negative Predictive Value.

*Any reading difficult was defined as performance <25th percentile on the test of word recognition, decoding, or a combined index of the two (the "Total Word Reading Efficiency Index").

Box 1. Responding to parental concern about children's reading.

Step 1. Acknowledge parents' concern.

Step 2. Review common profiles of reading difficulty—that is, approximately 15% of students may struggle with word reading and an additional 10% may have comprehension problems when word reading is adequate.

Step 2b. Review context of reading development for English language learners (ELLs) as needed—namely that ELL children can typically read words as accurately as peers but may lag in language understanding; however, signs of word reading difficulty and/or language problems in the first language can be signs of a reading/learning disorder.

Step 3. Recommend further reading assessment—at minimum of word recognition, fluency, listening comprehension, and reading comprehension using norm-referenced, standardized tests with adequate psychometric properties (e.g., WIAT, TOWRE).

Step 4. Review overall elements of effective reading intervention— including that it should be early, intensive, and explicit.

Step 5. Review components of effective intervention for word reading difficulties—including explicit teaching of phonics, 'sight words', and word-solving strategies, coupled with extensive strategically focused reading of appropriately levelled text.

Step 6. Review components of effective intervention for comprehension difficulties—including teaching comprehension strategies and potentially teaching oral language skills (such as vocabulary).

Step 7. Review that emotional/behavioural issues can affect struggling readers (e.g., negative feelings about reading, low motivation, avoidance)—counsel parents to create a positive climate around reading and to ensure that reading material is not too difficult (should be read with at least 95% accuracy).

Step 8. Discuss with parents any other concerns and screen for commonly co-occurring conditions—such as other learning difficulties, language disorder, ADHD, behavioural/mental health concerns, and coordination difficulties.

Evidence-based reading assessment should assess multiple reading-related constructs (e.g., word reading, fluency, and language/reading comprehension) using well-validated tools (e.g., standardized, norm-referenced achievement tests such as the Test of Word Reading Efficiency (TOWRE, 39) or the Weschler Individual Achievement Test [WIAT (49)]. Evidence-based intervention should be provided as early as possible (50) and should be explicit (51), intensive (52), and matched to children's difficulties [e.g., in word reading and/or language comprehension; 19 (53)]. Evidence-based interventions for word reading difficulties include instruction in letter patterns/meaning units (such as phonics sounds, 'word families', and prefixes/suffixes) and high frequency words ('sight words'), teaching word-solving strategies (e.g., sounding out, finding familiar parts), and extensive practice strategically reading appropriately levelled text [e.g., (54,55)]. Instruction for comprehension difficulties may include direct teaching of reading comprehension strategies and language content (37). Similar reading interventions are effective for ELLs and should not be delayed due to limited English proficiency (56). Providers may also address the emotional and behavioural consequences of reading difficulty, counselling parents to create an encouraging environment (57). Providers may make parents aware that to optimize learning (and perhaps limit emotional distress), children should read material with at least 95% accuracy (58).

With respect to limitations and future directions, parental concern as a screening strategy for reading difficulties should be formally explored further in relevant paediatric settings. Such exploration could improve upon the current study by ensuring a representative sample (versus the sampling method in this study, which may have, for example, under-represented those with low literacy or whose first language was not English). Future work could also evaluate the accuracy of parental concern at younger and older ages, consider the reliability of the question of parental concern, and explore the ideal format used to elicit parental concern (e.g., orally versus in writing). Further, additional relevant

demographic variables [e.g., parents' reading characteristics (59)] and reading measures (e.g., fluency and comprehension) could be incorporated. Future work may also further consider how concern arises, for parents of both ELLs and native English speakers.

In conclusion, methods for recognizing and responding to potential reading difficulties are an important element of paediatric care providers' knowledge base. The present work offers empirical insights into how parental concern about reading corresponds with reading difficulties in early elementary school. The findings highlight the wisdom of honouring parents' concerns and placing them at the centre of children's care, as well as a need for continued exploration of early identification methods for reading difficulties appropriate to paediatric settings.

FUNDING

Natural Sciences and Engineering Council of Canada Discovery Grant (received by third author).

POTENTIAL CONFLICTS OF INTEREST

MFJ received a Natural Sciences and Engineering Council of Canada Discovery Grant for research, not related to this study. As noted in the funding section above, LMDA received a Natural Sciences and Engineering Council of Canada Discovery Grant to fund the study that formed basis of this work. There are no other disclosures. The authors have no conflicts of interest relevant to this article to disclose.

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