

# The Demise of the Discrepancy Definition of Dyslexia: Commentary on Snowling, Hulme, and Nation

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## Abstract

In this article, we review the proposal of Snowling, Hulme, and Nation (2020) to reinstate the discrepancy definition of dyslexia. Presenting logical reasons and empirical evidence that this definition is not valid, we suggest that there is no need to distinguish between individuals with dyslexia as identified through an IQ-achievement discrepancy framework and nondiscrepant poor readers.

*Keywords:* Dyslexia, IQ, assessment, dyslexia definition, discrepancy definition

The difficulty in acquiring reading skills continues to be a serious challenge for some. Much is known regarding how to teach the mechanics of reading so that children can become competent readers. In addition, the scientific literature has effectively shown that children who struggle to learn to read can be provided with interventions to help improve their reading skills. The earlier the at-risk child can be identified, the more likely reading failure can be prevented, but for the latter to occur, it is essential that highly predictive and accurate tools be used to identify these children.

The core deficits of dyslexia consist of problems with accuracy and fluency of word recognition and decoding. Specifically, individuals with dyslexia experience difficulties manipulating the sounds of language, mapping sounds onto their representative letters, and using these skills to decode and synthesize words, which, in turn, produces barriers to fluent reading, spelling, comprehension, and writing. Moreover, dyslexia refers to deficiencies in reading skills that are genetically based (Carrion Castillo et al., 2015; Eden et al., 2015; Shao et al., 2016), neurobiologically expressed (Norton et al., 2015), and typically are manifested in phonological processing deficiencies (Vellutino et al., 2004) and poor fluency (Cassar et al., 2005; Lefly & Pennington, 1991; Lyon et al., 2003; Sumner et al., 2014), and lasts a lifetime (Bruck, 1990).

In a recent article, Snowling, Hulme, and Nation (2020) argue that it is challenging to identify children who have dyslexia, and further suggest that it is important to differentiate between children experiencing reading disabilities into (a) those who have dyslexia and (b) those who are nondiscrepant poor readers. That is, according to these authors, it is important to distinguish between poor readers whose reading is significantly lower than their IQ scores (and thus deserve to be identified as having dyslexia) and poor readers who do not show this discrepancy (and who cannot be labeled as having dyslexia). To make this distinction, Snowling et al. argue that the discrepancy definition of dyslexia should be the definition that is used. This requires that to be labeled with dyslexia, a child must demonstrate a discrepancy between their reading abilities and their intellectual functioning as measured by an IQ score. Children with dyslexia, the authors suggest, stand in contrast to children who are poor readers but do not demonstrate discrepancies between their reading skills and intellectual functioning. The latter would be considered “nondiscrepant poor readers” rather than struggling to read due to dyslexia. Nondiscrepant poor readers are those whose reading and IQ scores are similar.

Operationalizing the degree of discrepancy has typically resulted in a difference in which standardized

reading scores must be at least one standard deviation below the standardized intelligence score (Farris et al., 2020; Fletcher et al., 2018).

In support of their argument for employing a discrepancy approach to the identification of dyslexia, Snowling and colleagues outline several consequences that followed the removal of the ability-achievement discrepancy criterion from the definition of dyslexia (Snowling et al., 2020). However, eliminating the discrepancy requirement from the definition occurred due to overwhelming evidence that intelligence did not appropriately or accurately differentiate between types of poor readers (described ahead).

The logic of the canonical model of IQ and IQ discrepancy is built on the assumption that IQ measures denote an individual's inherent potential. However, research has made it clear that measures on an IQ test are just as apt to provide a metric of educational opportunities (Ritchie & Tucker-Drob, 2018). As such, the motivation and justification for adopting the canonical model of IQ-achievement discrepancy is based on a flawed assumption. Moreover, educational opportunities are not equally distributed across the population, and reverting to an IQ-discrepancy approach to identifying dyslexia would serve to disadvantage and further disenfranchise certain members of society (Odegard et al., 2022). These include individuals who are not privileged with quality educational opportunities or financial resources to overcome inferior reading instruction by obtaining additional educational services outside of a public-school setting.

Eloranta et al. (2019) provided data germane to conversations surrounding the ability of IQ to provide a stable measure of inherent potential, especially for individuals with reading disabilities. These researchers reported findings from a longitudinal study of Finnish individuals identified with a reading-fluency-based reading disability in childhood. They noted that the verbal IQ scores of the individuals who had been identified with a reading disability had dropped more than 10 standard score points when they were retested as adults. As a result of this drop in scores, individuals with IQ scores in the average to above-average range in childhood had IQ scores in the low-average to below-average range as adults. The same declines were not observed in typically developing individuals sampled from the general population.

To make their argument, Snowling et al. assumed that children with dyslexia are different from nondiscrepant poor readers. Their premise stands on the notion of etiology. That is, they appear to be arguing that children with dyslexia, compared to those with nondiscrepant reading difficulties, have a different set of causes

that give rise to their characteristic behavioral deficits in reading and spelling. However, evidence indicates that there is no meaningful distinction between individuals identified with dyslexia using an IQ-achievement discrepancy approach and nondiscrepant poor readers. As a result, there is no utility in differentiating etiology into distinct classes based on intelligence as those classifications will not inform treatment or prognosis. When contextualized in this manner, the assertion that there is utility in differentiating children with dyslexia as defined by discrepancy from those who present with the same behavioral manifestations of reading and spelling deficits who are nondiscrepant is not supported.

Snowling et al. wrote, "While defensible on statistical grounds, to regard dyslexia 'just' as poor reading (and spelling) fails to capture the fact that it has an early onset (in preschool) and is persistent over time" (p. 502). They appear to be arguing that only individuals classified with dyslexia based on an IQ-discrepancy approach exhibit difficulties in preschool and that nondiscrepant poor readers do not. Again, there is no evidence to show that this is the case. Their argument also implicitly suggests that difficulties in preschool are a prerequisite for being identified with reading difficulties that result from dyslexia. As most preschool children are not assessed on skills that are relevant to the acquisition of reading skills, such as phonological awareness, the authors appear to be advocating that unless they demonstrate language-related difficulties in the preschool period, most children who have reading difficulties, even the discrepant ones, cannot be considered to have dyslexia. The literature suggests that poor phonological processing abilities can be recognized during preschool. However, until universal screening occurs in preschool, they cannot be considered a fundamental component of the definition of dyslexia, as evidence of poor preschool phonological processing skills would not be available for a diagnosis of dyslexia for the great majority of children.

Studies that have examined good readers, nondiscrepant poor readers, and children with dyslexia have discovered that both the nondiscrepant poor readers and children with dyslexia performed similarly on reading-related measures and were significantly different from good readers. The two poor reading groups, children with dyslexia and nondiscrepant poor readers, were differentiated based on their intelligence test scores. In studies comparing children with dyslexia and nondiscrepant poor readers, both groups of children performed similarly and very poorly and significantly worse than nondisabled readers (e.g., Hurford, Johnston et al., 1994; Hurford, Schauf et al., 1994; Siegel, 1992; Stanovich, 2005; Vellutino et al., 2000). Further, these studies found no differences between children

with dyslexia and nondiscrepant poor readers in skills related to reading, such as word recognition, regular and exception word reading, pseudoword reading, word and pseudoword spelling, and the recognition of the visual form of sounds.

It should be noted in the Siegel (1992) study that the individuals with dyslexia had significantly higher scores than the nondiscrepant poor readers on full-scale intelligence as well as the verbal and performance composite scores and every subtest of the IQ test. The scores on the language-oriented subtests, Vocabulary, Similarities, and Comprehension, for the group with dyslexia were significantly higher than those of the nondiscrepant poor readers but similar to those of nondisabled readers. These age-appropriate language skills of the group with dyslexia were not sufficient to assist them in performing well on decoding and reading comprehension tasks. In fact, there were no significant differences between individuals with dyslexia and nondiscrepant poor readers in reading comprehension scores; both groups had low word recognition and decoding scores. So, the enhanced language skills of the individuals with dyslexia, as determined by the subtests from IQ tests, did not enable them to overcome their decoding difficulties.

With regard to language skills, Siegel (1992) compared individuals with dyslexia and nondiscrepant poor readers on a variety of language and memory tasks. The group with dyslexia had significantly higher scores than the nondiscrepant poor readers on the simpler syntactic awareness tasks, but the two groups did not differ significantly on the more difficult syntactic tasks. Both groups of children with reading difficulties had significantly lower scores than the nondisabled readers. The individuals with dyslexia had significantly higher scores on short-term and working-memory tasks than the nondiscrepant poor readers. Thus, despite some better scores on language and memory tasks, the children with dyslexia did not perform at a higher level on reading comprehension tasks than the nondiscrepant poor readers. It is clear, therefore, that the core difficulty, located in the word-reading module for both groups, limits text comprehension for both groups.

Even though individuals with dyslexia had better language skills than the nondiscrepant poor readers, there was no indication that it helped their reading performance, nor was their reading performance any different from that of the nondiscrepant poor readers. In addition, there is ample evidence to suggest that there are no significant differences between individuals with dyslexia and nondiscrepant poor readers in the ability to benefit from remediation (e.g., Hurford, Johnston et al., 1994; Stage et al., 2003; Weber et al., 2002).

Snowling et al. write, "An inevitable consequence of removing the discrepancy definition is that more children with poor reading in the context of broader and more serious language difficulties will be labeled 'dyslexic'" (p. 505). They appear to be arguing that children identified with dyslexia, when based on a discrepancy definition, are less likely to have serious language difficulties. There is no evidence for this assertion. Language functioning should be evaluated for all people with reading difficulties, and when deficiencies are found, interventions should be provided. However, the absence or presence of language difficulties is irrelevant for the definition of dyslexia. Snowling et al. noted,

Since reading for meaning draws on language skills, it follows that many non-discrepant poor readers also have poor reading comprehension skills. Thus, whereas in classic discrepancy-defined dyslexia, reading comprehension is only an issue insofar as poor decoding presents a bottleneck to the construction of meaning, this is not the case for children with dyslexia who have co-occurring language problems; these children have poor reading comprehension too. (Bishop & Snowling, 2004, p. 505)

And, "None of these comorbidities should be viewed as 'core' features of dyslexia, but they can complicate its presentation and response to intervention" (Rose, 2009, p. 506).

The authors appear to be arguing that if individuals with dyslexia have reading comprehension problems, it is a result of decoding difficulties, but if nondiscrepant poor readers have reading comprehension problems, it is a result of decoding and language difficulties. This argument holds no merit and appears circular. That is, if someone has reading comprehension problems and has been discrepancy-defined as having dyslexia, their comprehension problems result from decoding issues, but if it is a nondiscrepant poor reader, then the reading comprehension problems are a result of language problems and possibly decoding. Although Snowling et al. argue that "... following relaxation of the discrepancy definition and hence the IQ cut-off, the number of 'symptoms' co-occurring with dyslexia has increased" (p. 506), there is no evidence to support this claim.

How is dyslexia to be differentiated from poor reading? This is the central question, and Snowling et al. do not provide a clear answer. Snowling et al. wrote, "Although intellectual disability precludes a diagnosis of specific learning disorder, once the practice of restricting the diagnosis of dyslexia to those principally with above average IQ is abandoned, the kinds of learning difficulties to which the label

'dyslexia' applies wider and now include children with a broader range of learning problems. Such children have a range of problems with reading which are not best characterized as affecting only accuracy and fluency. (p. 503)

Again, it is important to note that the individuals with dyslexia and the nondiscrepant poor readers did not differ significantly on various reading and spelling tasks at the word level and did not differ on reading comprehension (Siegel, 1992).

Snowling et al. further state, "An inevitable consequence of removing the discrepancy definition is that more children with poor reading in the context of broader and more serious language difficulties will be labeled 'dyslexic'" (p. 505). Language difficulties and reading difficulties are not necessarily orthogonal dimensions. They may overlap, but each issue may require different types of evaluation and remediation. The presence of other difficulties is irrelevant to the definition of dyslexia, although, of course, these other difficulties, when they exist, should be recognized and treated.

Snowling et al. appear to be arguing that if an individual has difficulties with mathematics, attention, or has social-emotional difficulties, they should not be labeled as having dyslexia. Furthermore, they appear to be arguing that children with dyslexia, vs. nondiscrepant poor readers, have no other presenting difficulties. It is not clear why the authors would suggest that if you have attention and/or language problems, you should not be considered as having dyslexia. The available evidence is that whatever the IQ score, individuals who are poor readers may have other difficulties, and these difficulties should be evaluated and remediated along with the reading difficulty (Catts & Petscher, 2021; Fletcher et al., 2018; Odegard et al., 2022).

These authors further state: "In summary, we argue that cases of 'specific dyslexia' exist, and they are most apparent when a strict discrepancy definition (reading poorer than expected for a child's age and IQ) is adopted. However, when it is dropped, a wider range of difficulties are observed among children with reading disorders" (p. 506). What Snowling and colleagues seem to ignore is that many children with reading difficulties have language, attention, and mathematical difficulties, for example, without regard to their IQ score. The important point is that these difficulties should not be ignored and should be assessed. Rather than an IQ test, specific assessments of language, mathematical skills, and attention will be more useful.

Snowling et al. propose that "the term dyslexia should not be used as a shorthand for 'reading disorder' but should be used to refer to a difficulty with decoding and spelling fluency which is evident from the early

school years and persistent over time" (p. 507). We agree but do not think that IQ scores have any place in this conceptualization. However, early efforts to remediate identified deficits may mask the reading problems in some children with dyslexia until the complexity of the word structure overwhelms basic skills acquired in the early grades through remediation. These children would present with late-emerging reading deficits (e.g., Catts et al., 2002; Scarborough, 1990). This is one reason why risk models can be advantageous. Students who are at risk for reading failure could be identified. This would then be noted as a preexisting factor upon later identification if reading deficits should emerge. Efforts should not be delayed with regard to providing remediation to help support children who are at risk for reading failure. In their paper, Snowling et al. note,

Another issue that has concerned those who do not support the use of the term 'dyslexia' is the fact that the types of intervention that are known to be helpful do not differ from the interventions that are useful for other non-discrepant poor readers. This is, however, a simplistic view. Dyslexia does equate with poor decoding and word reading, and therefore to say it requires similar treatment to poor reading is a tautology. (p. 507)

That is exactly our point; poor word reading is the defining feature of dyslexia regardless of a measured IQ score. We conceptualize dyslexia as difficulty with the accuracy and/or fluency of word recognition.

We are not arguing against the term *dyslexia*. The available evidence indicates that when poor readers have been differentiated into "dyslexia" and "nondiscrepant poor reader" groups, not only do they appear very similar in their reading skills, but they also benefit equally from the same interventions. Although future work should continue to examine the potential of other measures beyond reading to benefit the identification of children at risk for reading failure and to determine their neurological characteristics, the state of the field presently does not support the contention made by Snowling et al. – that the discrepancy definition should be affirmed. In fact, use of the discrepancy definition leads to inherent harm and unintended consequences. Specifically, when the discrepancy formula has been applied, access to special education and related services for children who are nondiscrepant poor readers has been denied (Miciak et al., 2016; Odegard et al., 2022).

At a time when a large percentage of children who are learning to read English have not been exposed to science-based curricula that help them to master such an opaque writing system, a more inclusive definition is more appropriate. Denying struggling readers an appropriate research-based curriculum and then pre-

venting them access to special education and related services to assist them in becoming competent readers is cruel and increases the likelihood that these children will face anxiety and depression (Alexander-Passe, 2015a), poor self-esteem (Terras et al., 2009), parental abuse (Fuller-Thomson & Hooper, 2014), suicidal ideation (Alexander-Passe, 2015b; Dahle et al., 2011), suicide attempts (Fuller-Thomson et al., 2018; Livingston et al., 2018; McBride & Siegel, 1997), school drop-out (Cortiella & Horowitz, 2014), and poor economic earning potential (Cortiella & Horowitz, 2014). Although science is obligated to determine the nature of reading failure, practitioners should be utilizing the fruits of science to assist all poor readers, regardless of their intellectual functioning, in becoming competent read-

ers. There is ample evidence that reading interventions are successful for all struggling readers. Children with reading levels commensurate with their intellectual functioning should not be excluded from interventions that can assist them in becoming competent readers.

If we agree that all children who are struggling readers should be provided with appropriate interventions to help them become competent readers, then we must seriously consider the ramifications of the discrepancy definition and abandon the strategy of differentiating children who will receive interventions based on their IQ score. In summary, both empirically and practically, the use of discrepancy criteria for dyslexia identification is not supported.

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