Can SLI and Reading Disorders be represented by the Quadrant Model1?

Introduction

- **Specific Language Impairment (SLI):** impairment in expressive and/or receptive language in the context of otherwise normal development2. There are usually several distinct difficulties with language domains2,3.

Reading disorders can be classified as:
- **Classic Dyslexia:** significant difficulty learning to read accurately and fluently, despite intelligence within normal limits and adequate opportunity to learn1. Usually good oral language skills but specific phonological deficits1.
- **Poor comprehenders (PCs):** can decode well but have difficulty understanding what they are reading. They have poor nonphonological language (semantics and syntax)4.

Issue

For many years there appeared to be a consensus that dyslexia and SLI were distinct disorders, however gradually researchers began to question this divide.

It became apparent that phonological processing problems were present in children with SLI as well as dyslexia2. However, this is not true of PCs5. The Quadrant Model was developed in order to classify SLI, Dyslexia and PCs depending on whether the reading impairment is with phonological skills, nonphonological skills or both2 (Figure 1). The Quadrant Model depicts dyslexia and SLI not on a single continuum, but rather as occupying different areas of a two dimensional space2.

![Quadrant Model of Reading Disability and SLI](image)

**Is the quadrant model adequate to represent SLI & RD?**

The Evidence Base

**In Support of the Quadrant Model**

- It is not sufficient to place RD and SLI on a continuum of severity, as there are differing underlying cognitive impairments within the range of profiles2,5. Children with classic dyslexia have a core cognitive deficit in phonological processing but PCs show normal sensitivity to phonological manipulations (length and legality) in word reading: meaning they have normal phonological skills6. **Critique:** This study had a clear inclusion criteria but used a small amount of experimental words5.

- There needs to be at least two dimensions of impairment to characterise the range of clinical profiles observed in the field7. The quadrant model accounts for the poor phonological skills in Dyslexia and SLI, and also the poor nonphonological skills shown in PCs and SLI2,4,7.

- Dyslexia and SLI are not manifestations of the same disorder, as there are differences in the developmental trajectories8. The quadrant model acknowledges that RD and SLI should still be kept as distinct disorders. **Critique:** This is a follow up study of children with SLI and has a thorough methodology. However, the evidence is not fully reliable as it is not clear if the same assessments were re-administered for comparison.

**Against the Quadrant Model**

- The opposing view from the quadrant model is that there is a developmental continuum between early language disorders and reading disorders, with age being the factor that distinguishes between them2,3.

- Studies have shown that language impairment is present in children with dyslexia before they learn to read2, and some children with SLI develop literacy difficulties6. However, children can present with only SLI or dyslexia so some distinction should be retained6. **Critique:** The variation between how SLI and dyslexia are diagnosed impacts on the reliability of these studies6.

- Children’s profiles will change with development; therefore they may not remain static within one ‘box’ of the model1. Diagnosis depends on the child’s age, the severity of the impairment and the professional discipline giving the diagnosis2.

- SLI and RD are not manifestations of the same disorder, due to different underlying impairments and developmental trajectories; but there is a high degree of co-morbidity1,2,4. The Quadrant Model does not indicate any co-morbidity between the disorders.

- The Quadrant Model does not adequately represent the disorders as complex heterogeneous disorders1.

Conclusions

When looking at SLI and classic dyslexia, they seem to present with the same core deficit in phonological processing, however the same cannot be said for PCs1,2 & 5.

In order to account for the fact that PCs show this core difference in their profile it may be useful to adopt a two dimensional model such as the quadrant model2, rather than a continuum. However, this model does not truly represent the co-morbidity between the disorders, or that a child may present with both SLI and a reading disorder such as classic dyslexia or poor comprehension1.

To explain the co-morbidity between the different disorders we may require a model in which multiple cognitive deficits interact and separate liabilities for the different disorders exist, but at least one of the liabilities can lead to a co-morbid form1.

**More research is required on the developmental trajectories of children who have RD and SLI in order to establish a valid and reliable model of the relationship between them.**

Implications & Impact

The evidence base has shown that more research is still required to establish the relationship between reading disorders, such as dyslexia and SLI. The Quadrant Model does not truly represent the relationship but is a good starting point for future research2.

For future research, a clear diagnostic criteria for RD and SLI should be established to ensure reliability of the evidence base1. Clinically, SLT’s should be aware of the co-morbidity between SLI and RD, and take account of this during therapy tasks1. As both disorders are heterogeneous it is important to consider the child in terms of their impairments and not the label.

References