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Editorial

Understanding Dyslexia and Developmental Language Disorders: From Cognitive Mechanisms to Functional Outcomes and Intervention

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1. Introduction

Dyslexia and developmental language disorder (DLD) are often discussed in separate clinical and research studies. This distinction is useful, but it is not complete. Dyslexia is most clearly expressed in persistent difficulties with accurate and/or fluent word reading and spelling, whereas DLD involves difficulties in the acquisition and use of oral language, including vocabulary, morphosyntax, discourse, and comprehension (Bishop et al., 2017). Research has nevertheless long pointed to an overlap between the two conditions, particularly in phonological and broader language-related vulnerabilities, and dyslexia and DLD often co-occur (Adlof & Hogan, 2018; Bishop & Snowling, 2004; Snowling et al., 2020). Their effects can also extend beyond test performance to literacy, academic achievement, and everyday functioning.

This overlap makes simple, single-deficit explanations difficult to sustain. Multiple-deficit accounts instead allow different combinations of risk and protective factors to produce partly overlapping developmental outcomes (Bishop & Snowling, 2004; Pennington, 2006). For dyslexia and DLD, the important questions are therefore not only whether the disorders overlap, but where that overlap lies, which mechanisms remain distinct, and why individuals with similar test scores may arrive there through different developmental routes. Those questions become even more important when we consider how the expression of a difficulty changes with age and with the demands placed on the child or adult.

The Special Issue of Understanding Dyslexia and Developmental Language Disorders was organized with these questions in mind. Its eight contributions range from preschool children to adults and include German-, French-, and Turkish-speaking participants, as well as deaf signers. The methods are equally varied: behavioral assessment, detailed error analysis, eye tracking, eye–voice coordination, regression modeling, and evidence synthesis. Four papers concern dyslexia or reading and spelling processes closely related to dyslexia, two focus directly on DLD, and two bring in comparative evidence from Down syndrome and autism spectrum disorder. The papers do not offer a single account of dyslexia or DLD, nor should they be expected to. Their value lies in showing, from different angles, how much can be missed when we rely only on diagnostic labels or endpoint accuracy scores.

2. Reading and Spelling: Persistence, Processing, and Orthographic Learning

The dyslexia and literacy papers make one point especially clearly: persistent difficulty does not imply a uniform profile. Eckert et al. (Contribution 1) examined cognitive–

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linguistic profiles in German-speaking adults with dyslexia and found marked heterogeneity, even within a relatively transparent orthography. Spelling, word reading, and phonological awareness were among the strongest predictors of group status, while rapid automatized naming was the most widespread area of weakness. Cognitive differences were more limited, with slight weaknesses in verbal working memory and no comparable visuospatial impairment. The study therefore shows both persistence and variability: literacy-related vulnerabilities can remain evident in adulthood, but they do not take the same form in every individual.

Rossier-Bisaillon et al. (Contribution 2) move from profile to process. By synchronizing eye movements with spoken reading of a standardized French text, they found slower and less accurate reading, persistent word-length effects, reduced lexical-frequency effects, and a diminished and unstable eye–voice span in adults with dyslexia. The pattern was consistent with continued reliance on serial, sublexical processing during reading aloud. This is a useful reminder that reading speed and accuracy tell only part of the story. Two readers may eventually produce the same word, while the coordination between visual identification and articulation reveals quite different routes to that response.

Robidoux et al. (Contribution 3) make a related point from the perspective of orthographic learning. French-speaking good and poor spellers both learned inconsistent nonwords and showed broadly similar improvement during the learning session. Their eye movements, however, differed: poor spellers allocated proportionally more attention to inconsistent syllables and less to consistent parts of the novel words. Differences were also clearer on longer-term retention, including delayed recognition. In other words, similar short-term learning curves did not necessarily reflect the same encoding or consolidation processes. Because the groups were defined by spelling ability rather than by a diagnosis of dyslexia, the findings should not be read as evidence for a dyslexia-specific mechanism. They do, however, show why online measures and delayed retention can add information that immediate performance alone may miss.

Friedmann et al. (Contribution 4) put forward a more specific mechanistic claim to a cross-modal test. In deaf signers with letter position dyslexia, closely similar error patterns appeared when words were presented in writing and through fingerspelling. Transpositions mainly affected internal letters, doubled-letter errors occurred, and errors were concentrated in migratable words. Because fingerspelled letters unfold sequentially, the correspondence across modalities is difficult to explain solely in terms of simultaneous visual presentation. The findings instead support a more abstract account of letter-position encoding.

Viewed together, these studies move across several levels of explanation: broad cognitive–linguistic profiles, moment-to-moment reading behavior, orthographic learning and retention, and a highly specific representational impairment. What links them is not one common deficit. Rather, each shows, in a different way, that the final behavioral score can conceal important differences in how reading or spelling is achieved.

3. Developmental Language Disorder: Persistent Linguistic Vulnerabilities and Everyday Functioning

The two DLD papers address a related problem from the language side: where does a linguistic difficulty persist, and how does it matter beyond the test itself? Pourquié et al. (Contribution 5) examined lexical and inflectional verb processing in French-speaking adolescents with DLD. The adolescents with DLD performed comparably to controls in action naming, but subject–verb agreement remained vulnerable in both production and comprehension. Verb argument structure did not account for the group differences. The pattern is therefore more consistent with a persistent difficulty in inflectional processing than with a generalized lexical verb deficit. It is also clinically relevant that these differences

were still detectable in adolescence, when language difficulties may be less obvious than they are in younger children.

Dionne and Rezzonico (Contribution 6) turned to preschool social functioning. Their results do not support a broad deficit across every aspect of social competence. Children at risk of DLD showed greater dependence on adults, and language and pragmatic abilities, including aspects of personal narrative, were related to dimensions of social adjustment. This more selective pattern matters. Language is used in play, negotiation, storytelling, repair of misunderstandings, and the gradual development of independence. A language difficulty can therefore have consequences that are not captured well by a standardized language score alone.

These two papers capture different points along that continuum. One isolates a grammatical vulnerability that remains measurable in adolescence; the other links early language and pragmatic abilities with aspects of social adaptation. Together, they suggest that a useful account of DLD must say both what is difficult linguistically and how that difficulty changes in significance as communicative and social demands change.

4. Comparative Neurodevelopmental Perspectives

The final two contributions sit somewhat outside the central dyslexia–DLD comparison, but they provide useful comparative perspectives on language and communication in other neurodevelopmental conditions.

Sarıyer Temelli and Güven (Contribution 7) examined morphosyntax and short-term memory in Turkish-speaking children and adolescents with Down syndrome. Participants showed substantial difficulties in syntactic comprehension, syntactic production, and morphology, together with marked individual variability. In this relatively small sample, auditory digit span predicted sentence comprehension, whereas nonword repetition predicted morphological production. These associations should be interpreted cautiously and replicated in larger samples. Even so, they raise useful questions about whether different components of verbal memory relate differently to language outcomes. Turkish is also a valuable test case because its rich, productive morphology differs substantially from the languages on which many accounts of developmental language difficulty have been built.

Papadopoulos et al. (Contribution 8) bring an intervention perspective through their scoping review of theater-based techniques for individuals with autism spectrum disorder. Across 11 studies, theater- and drama-based approaches were associated with encouraging changes in social cognition, reciprocal behavior, interaction, psychosocial functioning, language-related abilities, and anxiety. The evidence base, however, was heterogeneous in design, intervention format, and outcome measurement; therefore, strong conclusions about efficacy would be premature. The review is relevant here because it shifts attention from impairment-level measures toward outcomes such as interaction, participation, and generalization, which matter across developmental communication disorders.

The comparative value of these two papers lies in what they add without collapsing diagnostic differences. Looking across neurodevelopmental conditions can help identify relationships that may be relatively condition-specific and others that cut across diagnostic boundaries, while still preserving the distinct developmental profiles of each group.

5. Looking Across the Collection

What stands out across the collection is not a single shared mechanism, but a recurring gap between what a broad label or summary score tells us and what closer measurement reveals. Adults with dyslexia differed in the configuration of their cognitive–linguistic weaknesses, and children with similar spelling performance differed in how they distributed visual attention during learning. Diagnostic categories remain useful, but they are only

one level of description. More detailed profiles can help explain why two people who look similar on an overall score may have different underlying difficulties and, potentially, different support needs.

This is where process-sensitive measures earn their place. Eye movements, eye–voice coordination, error patterns, learning and retention measures, and targeted contrasts within lexical or grammatical processing can expose differences that overall accuracy scores blur. They should not replace clinically meaningful outcome measures. Their value is explanatory: they can help show how a given outcome was reached.

The papers also cover a broad developmental range, from preschool social functioning and school-age orthographic learning to adolescent morphosyntax and adult reading. They do not provide a longitudinal account, but the spread across ages is still informative. Neurodevelopmental difficulties do not simply appear early and remain unchanged; their expression is shaped by schooling, experience, compensation, and changing environmental demands. Longitudinal work is needed to determine which early vulnerabilities persist, which are compensated for, and which become more consequential later on.

Language and modality provide another useful source of variation. German and French differ in orthographic consistency, Turkish places heavy grammatical demands on morphology, and fingerspelling allows letter-position processing to be tested with sequential input. These differences are more than background characteristics of the samples. Cross-linguistic and cross-modal studies can test whether a proposed mechanism generalizes, and they can show where the structure of a language, writing system, or modality changes its behavioral expression.

One gap is especially noticeable: the Special Issue was motivated in part by the relationship between dyslexia and DLD, yet the final collection contains little direct evidence from individuals with well-characterized co-occurring profiles. Dyslexia and DLD can occur separately, but they also co-occur at substantial rates (Adlof & Hogan, 2018; Bishop & Snowling, 2004; Snowling et al., 2020). Most of the papers here instead represent parallel lines of work on literacy-related or language-related difficulties. This separation mirrors a wider problem in the literature. Describing each disorder with increasing precision will not, on its own, explain why their developmental pathways overlap in some individuals and diverge in others.

A direct comparison of dyslexia-only, DLD-only, co-occurring dyslexia and DLD, and typically developing groups using the same measures would be a useful next step. Longitudinal studies beginning before formal literacy instruction would be even more informative because they could separate early precursors from later consequences. Just as importantly, greater mechanistic precision should remain connected to outcomes that matter beyond the laboratory, including participation at school, social functioning, autonomy, and response to intervention.

6. Conclusions

The papers in this Special Issue show how difficult it is to reduce developmental language and literacy disorders to a single deficit or a single level of explanation. Dyslexia can persist into adulthood while presenting in different cognitive–linguistic configurations. Similar literacy outcomes can arise from different learning and reading processes. DLD can involve selective linguistic vulnerabilities whose importance changes as children grow and face new communicative demands. Evidence from different languages and modalities also shows why theories need to be tested beyond the populations and writing systems in which they were first developed.

If there is one thread that runs through the collection, it is that identifying whether a person has difficulty is only the beginning. We also need to understand how that difficulty

is produced, how it changes over development, and when it begins to affect everyday functioning. Bringing the dyslexia and DLD studies into closer contact, especially through studies of children and adults with co-occurring profiles, is an important part of that next step. I hope this Special Issue helps move that conversation forward and encourages work that is both mechanistically informative and clinically meaningful.

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