Slower retrieval processes explain verbal fluency difficulties in dyslexia and DLD.

**Verbal Fluency Difficulties in Dyslexia and DLD**

**Poor Representations or Slower Retrieval Processes?**

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**INTRO**

- The *semantic fluency task* requires the production of as many words as possible which belong to certain categories, such as “animals”. It is used to investigate lexical organization by analyzing clustering behavior (e.g., “pets”).
- This study investigated whether semantic fluency difficulties in dyslexia and DLD are better explained by impoverished semantic structure, or by slower retrieval processes of items from the lexicon while the semantic structure is intact.
- Another type of fluency task is the *phonological fluency task* requiring the production of as many words as possible beginning with certain letters. It is used to investigate the quality of phonological representations by analyzing clustering behavior (e.g., *flag-flower*).
- This study investigated the locus of the phonological deficit. That is, whether phonological fluency difficulties in dyslexia and DLD are better explained by degraded phonological representations, or by deficient explicit access to phonological representations while implicit access to them is intact.

**PREDICTIONS**

- The *Poor Lexical-Semantic Structure Model* predicts that the DDLD group will produce a significantly smaller cluster size than the TD group. In contrast, the Slow-Retrieval Model predicts that the two groups will not differ on cluster size. Both models predict fewer items and fewer clusters in the DDLD group relative to the TD group.
- The Degraded Phonological Representations Hypothesis predicts that the DDLD group will produce a significantly smaller cluster size than the TD group. In contrast, the Deficient Phonological Access Hypothesis predicts that the two groups will not differ on cluster size. Both hypotheses predict fewer items in the DDLD group relative to the TD group.

**METHODS**

- Participants: N = 66 Greek-speaking children with dyslexia and/or DLD, hereafter DDLD (aged 7-12), and N = 83 TD children (aged 6-12).
- Fluency Tasks: Semantic fluency used the categories ‘animals’, ‘foods’, and ‘objects’. Phonological fluency used the letters ‘chi’, ‘sigma’, and ‘alpha’. Nonverbal fluency used a design fluency task.
- Participants also completed a range of tasks assessing language, literacy, and phonological skills.
- Analyses: We tested for significant group differences in the number of correct items produced in verbal fluency categories, and the number of clusters, switches, and cluster size (i.e., the number of items within a cluster). We also tested the contribution of language, literacy, and phonological skills on semantic and phonological fluency performance.

**RESULTS**

- Children with DDLD produced fewer items in semantic and phonological fluency tasks than TD children, but a similar semantic and phonological cluster size was found in the two groups.
- 9.4 and 15.6%, respectively, of the variance in semantic and phonological fluency performance was predicted by language, literacy, and phonological skills.

**DISCUSSION**

- Slower retrieval processes originating from deficient access to intact semantic and phonological representations, and also inferior language, literacy, and phonological skills explain poorer verbal fluency performance in children with dyslexia and/or DLD.

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