

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 DDL D 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 DDL D group relative to the TD group.
- The *Degraded Phonological Representations Hypothesis* predicts that the DDL D 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 DDL D group relative to the TD group.

METHODS

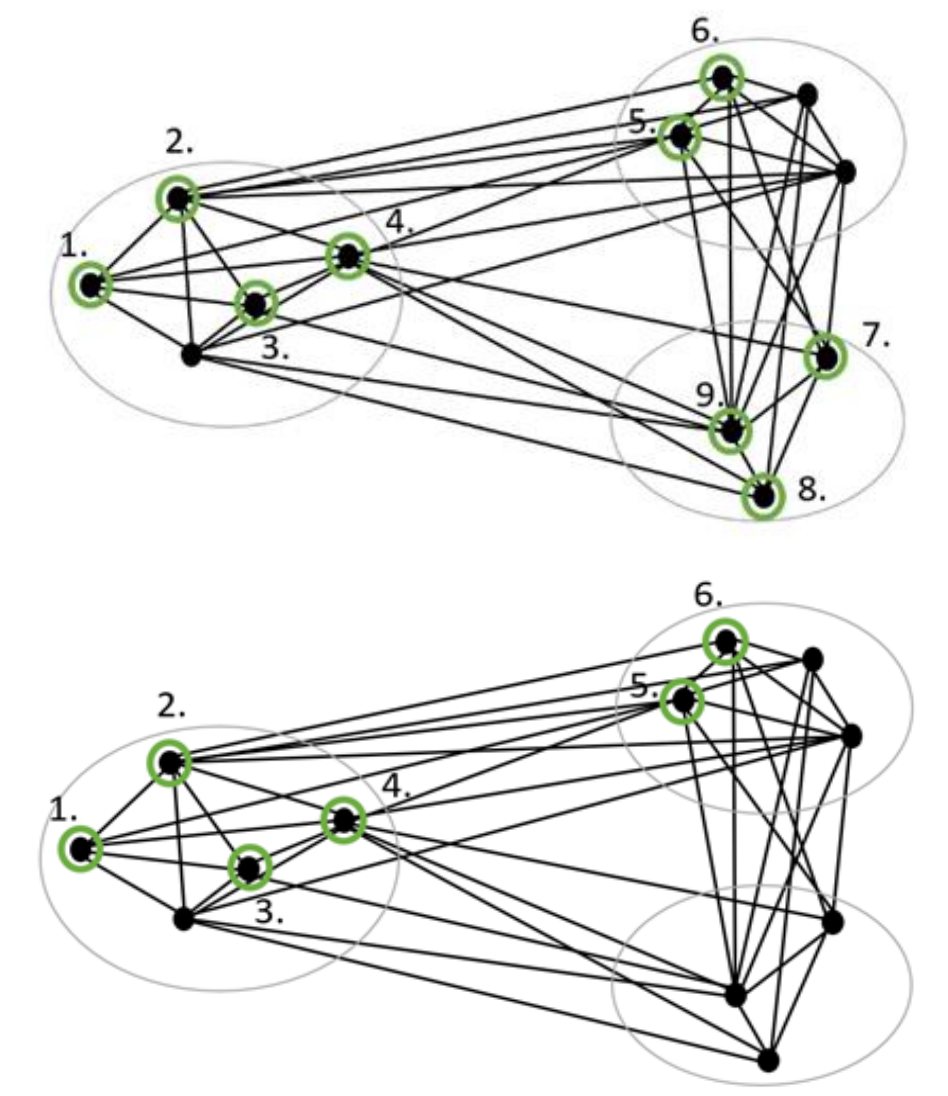
- **Participants:** N = 66 Greek-speaking children with dyslexia and/or DLD, hereafter DDL D (aged 7-12), and N = 83 TD children (aged 6-12).
- **Fluency Tasks:** **Semantic fluency** used the categories ‘animals’, ‘foods’, and ‘objects’. **Phonological fluency** used the letters ‘chi’, ‘sigma’, and ‘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

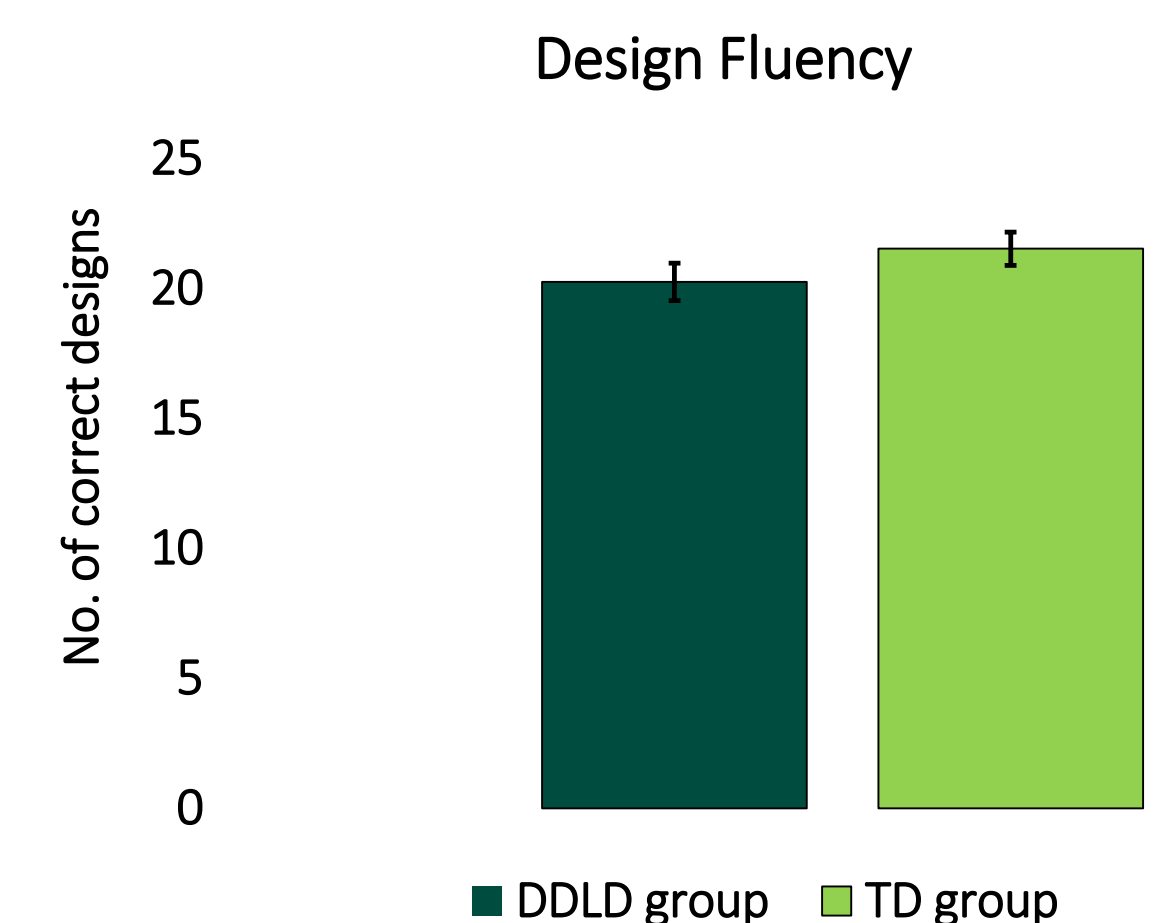
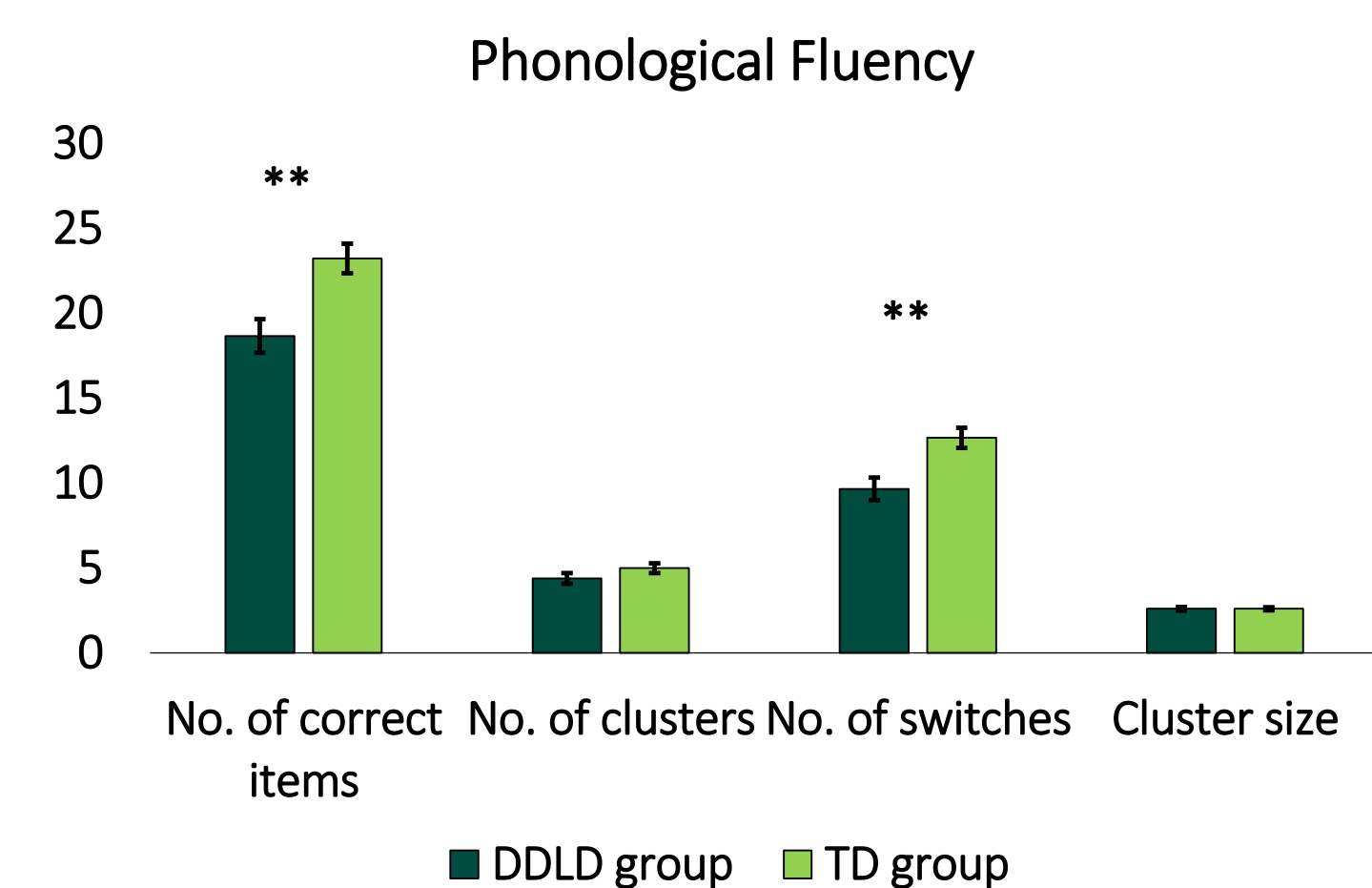
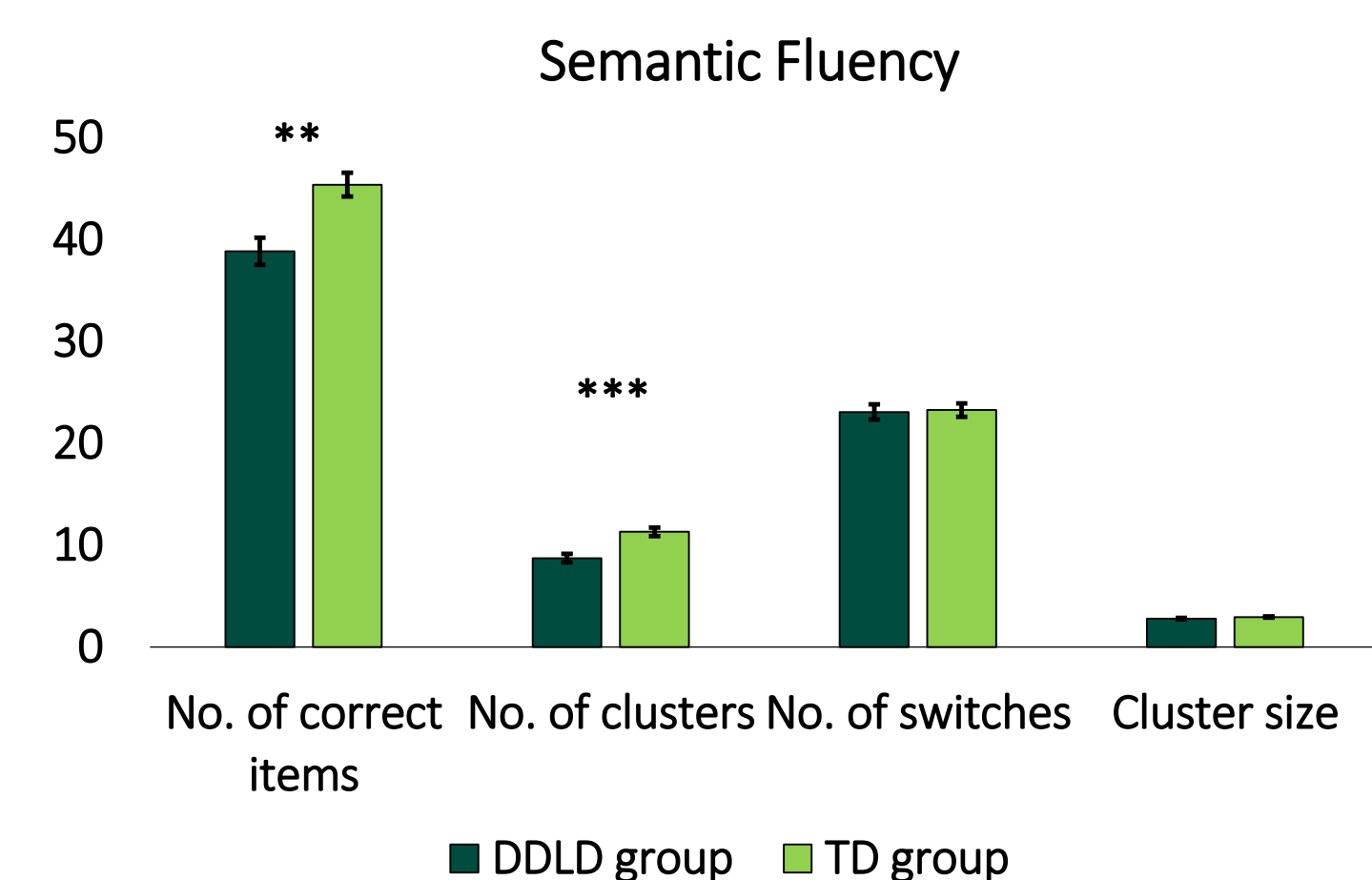
- Children with DDL D produced **fewer items in semantic and phonological fluency tasks** than TD children, but a **similar semantic and phonological cluster size** was found in the two groups.
- 9.4 and 15.6%, respectively, of the variance in semantic and phonological fluency performance was predicted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

DISCUSSION

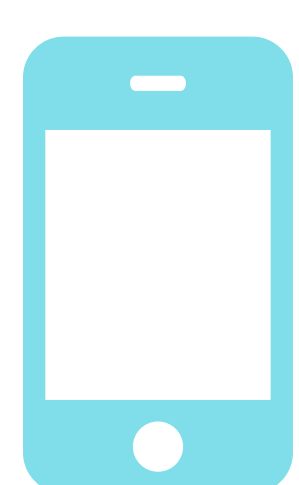
- Slower retrieval processes originating from deficient access to intact semantic and phonological representations, and also inferior language, literacy, and phonological skills explain poorer verbal fluency performance in children with dyslexia and/or DLD.



Hypothesized semantic networks and lexical retrieval during the semantic fluency task in typical development (top), and in children with DDL D according to the Slow-Retrieval Model (bottom).



The fluency deficit is specific to the verbal aspects of language in dyslexia and DLD.



Take a picture to download the full paper on phonological fluency data

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