

**Oral and Written Morphological Knowledge among Typical  
Readers and Readers with Dyslexia**

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## **ABSTRACT**

This study deals in the morphological knowledge of readers with dyslexia, a learning disability which is characterized by a specific difficulty in the acquisition of reading and writing skills. Morphological knowledge is knowledge on the smallest units of meaning of the language and on the manner in which they are combined to create words. This knowledge makes a significant contribution to literacy abilities, and its evaluation among readers who exhibit difficulties in the fields of literacy is therefore important. Several studies found difficulties in the morphological knowledge of readers with dyslexia. The goal of the present study was to examine the morphological knowledge of readers with dyslexia and the characteristics of the difficulty in this knowledge in an analytical, systematic and comprehensive manner. Morphological knowledge was tested with reference to three levels of knowledge – implicit knowledge, explicit knowledge and meta-linguistic knowledge, and in two modalities – the auditory modality and the visual modality. The performance of the dyslexics was compared to two control groups – matched by chronological age and matched by reading age.

Implicit morphological knowledge, which is expressed in the readers' ability to break the word into its phonemes automatically and unconsciously, was tested using the short-term priming paradigm. The variables tested in this task were speed and accuracy of the response. Explicit morphological knowledge, which is expressed in the readers' ability to recognize the morphological components of the word and to use them consciously, was tested using two tasks. The first task is a morphological analogies completion task which tests knowledge at the level of the word, and without context. The second task is a sentence completion task which tests knowledge at the level of the sentence and the context, and therefore also involves syntactical and contextual knowledge. The variables tested in these tasks were speed and accuracy of the response as well as the types of errors made by the subjects. Meta-linguistic knowledge, which reflects the highest level of awareness and which is expressed in the ability of the subject to refer verbally

to morphological components and processes, was tested using retrospective questions that were presented to the subject after completion of linguistic analogies. The variable tested in this task was the type of answer given by the subjects. All of the tasks were tested among the same subjects, and in two modalities: in the auditory modality which tested knowledge on the auditory representations of the morphemes, and in the visual modality which tested knowledge on the written representations of the morphemes.

The research results indicate a dissociation between the morphological knowledge of readers with dyslexia in the auditory modality and their morphological knowledge in the visual modality. In the auditory modality, a significant priming effect was found among readers with dyslexia, similarly to the two control groups. Thus, implicit morphological knowledge in this modality is preserved, and the mental lexicon of readers with dyslexia is organized according to morphological principles. Readers with dyslexia extract the root structure in the first stages of recognizing the spoken word, similarly to typical readers. In contradistinction, absolutely no priming effect was found in the visual modality, whereas a significant priming effect was found among both control groups. The performance of the dyslexics in tasks that tested explicit knowledge in the auditory modality was lower than that of their age-matched peers, but was essentially similar to that of young reading age-matched peers. Thus, knowledge in this modality is delayed, but is compatible with their reading level. However, performance of the dyslexics in the visual modality was lower also than that of reading age-matched peers. Dyslexics thus have significant difficulty in knowledge on morphological representations in the written language and in morphological processing of the written word.

Nonetheless, analysis of the errors raised a remarkable finding that appeared in both modalities: dyslexics tended to complete an analogy or sentence with a word related associatively to the missing word to a greater extent. This finding indicates a qualitative difference in the manner in which readers with dyslexia refer to the internal structure of the word.

The meta-linguistic morphological knowledge was found to be similar to that of reading age-matched peers in both modalities. Thus, when readers with dyslexia are required to think about and analyze the words and the morphological processes, they exhibit an ability that is compatible with their reading level. Nonetheless, analysis of the types of answers given by the subjects indicated a prominent finding in both modalities. Readers with dyslexia tended to supply answers that were defined as “tautological” more often, i.e. answers that did not refer to the linguistic aspect of the word, and did not supply a relevant answer to the questions that were presented. This finding is in agreement with the finding that was found in the explicit knowledge task and reinforces the conclusion regarding a qualitative difference in the perception of the internal morphological structure of the words.

In conclusion, the research findings indicate that the difficulty attributed to readers with dyslexia in morphological knowledge has different ways of expression, according to the awareness level and the modality of the tested knowledge. In general, the difficulty in morphological knowledge is more severe in the visual than in the auditory modality. Furthermore, readers with dyslexia exhibit a qualitative difficulty in perception of the morphological structures of the word in both modalities.

The research findings make a theoretical as well as a practical contribution. Theoretically, testing morphological knowledge at different levels and in different modalities in a single study contributes to an understanding of the nature of the morphological knowledge among readers with dyslexia, and its role in their reading and writing difficulties. Practically, the research findings will contribute to the development of sensitive diagnosis tools and to assistance which is adapted to the difficulties and deficits of readers with dyslexia in the field of morphological knowledge.