Computerized Assessment of Verbal Skill

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This paper describes a computerized diagnostic test for the assessment of basic literacy skills in Dutch. Central in this test is a skill labeled word image, referring to the subject's implicit knowledge of orthographic structure. Test norms were obtained in a group of reference subjects. The most notable trend found in the standardization study was that the development of word image performance showed a nonlinear, U-shaped trend. Two case studies are reported. A supplementary validation study, based on test data collected from standard reference groups of normal and poor readers, demonstrated that word image performance is significantly related to between-group differences.

INTRODUCTION

Dutch orthography is characterized by its close relationship with syntax. Unlike related languages, such as English and German, Dutch orthography contains syntactic information which is not represented in oral language. Linguistically, it is a highly expressive orthography (Klima, 1972). An orthography is more expressive of the language if it distinguishes between lexical items which, while identical at the sound level, are distinct at the lexical level. For example, compare meat (for flesh) and meet (for encounter) in English.

Dutch orthography is particularly expressive in its verb spelling. The existing orthographic rule system expresses grammatical functions which are absent in the spoken language, such as in: wij wachten/wacht-ten (for we wait/waited). A negative aspect of this informative written

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code, however, is its complexity for the novice learner. Educationalists disagree on the question of what age is most suitable to begin formal instruction of the complex grammatical rules involved. To gain more insight in this issue and in order to track the developmental relationship between syntactic and orthographic skills (Bowey 1986a; 1986b; Turner, Nesdale, & Wright, 1987), we designed a computerized test. This test will be described next. Subsequently, the results of two empirical validation studies are presented.

AN OUTLINE OF THE DIAGNOSTIC TEST

The test sentences used are skeletons, in which the two basic types of orthographic problems in Dutch can be inserted. The most difficult type of problem involves homophones, which are orthographic distinctions expressing syntactic information which is not present in the oral language. A correct choice must be based on grammatical knowledge. The second type involves nonhomophones, which express a simple sound-spelling correspondence. In the latter instance word-specific memory may be used to make the correct choice.

In addition to both types of orthographic skill, there are two test indices to be discussed here. The first one is syntactic skill, the ability to select syntactically legal options, regardless of correct spelling. The final index will be designated word-image here. This refers to a skill which may be described as the implicit knowledge of orthographic structure. It is the ability to detect and reject 'system-illegal' orthographic options, independent of context. It must be emphasized here that word-image skill should be clearly distinguished from spelling ability. Incorrect spellings are not necessarily violations of existing spelling options in a language. Word-image mistakes only refer to system-illegal letter combinations, options that could never occur in writing, regardless of context. Thus, word image refers to a specific type of spelling error, violating graphotactic constraints. To illustrate, in English orthography the option bcat for boat is system-illegal, whereas boap is not. Skilled readers are able to discriminate any input letter string from thousands of other letter patterns by making use of the characteristics of redundancy in the written language (Seidenberg & McClelland, 1989). This skill of utilizing constraints on the forms of written words enables the subjects in our test to detect system-illegal alternatives.

Subjects who perform very poorly on orthography tests are not necessarily dyslexic. There are several possible causes for their poor per-