

LINGUISTIC KNOWLEDGE, METACOGNITIVE KNOWLEDGE AND RETRIEVAL SPEED IN L1, L2 AND EFL WRITING

A structural equation modelling approach

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Abstract. This chapter presents an analysis of the Dutch and English writing proficiency of students who learned Dutch as a second language, compared to students for whom Dutch is the first language. Participants are 13/14 year-old secondary school students. The point of departure in the analyses is a regression model in which writing proficiency is decomposed into three types of constituent subskills: linguistic knowledge (vocabulary, grammar, and orthographic knowledge), speed or fluency of processing linguistic knowledge (word retrieval and sentence building), and metacognitive knowledge of both text characteristics and reading and writing strategies. This study investigates whether there are structural differences in both the Dutch writing and the English writing of the non-native speakers of Dutch compared to their native Dutch-speaking peers. Our hypothesis is that the two groups will differ in their Dutch writing, but not so much in their English writing. Using structural equation modelling, we firstly test whether the writing model for the native Dutch writers, with respect to the explanatory value of the constituent skills, holds for the non-native Dutch writers as well. Secondly, we test whether the English writing 'decomposition' is the same across the two student groups. Despite the differences in writing proficiency, no essential differences between the two groups were found in the pattern of weights of either Dutch or English writing proficiency on the three types of predictor variables (language knowledge, retrieval speed, and metacognitive knowledge).

Keywords: L1 writing ability, L2 /FL writing ability, language abilities, structural equation modelling

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1 INTRODUCTION

Almost everywhere in the world, school education at elementary and secondary level is provided in the designated official language of the country or region. For large numbers of students, this is their native, or first, language – the language with which they grew up at home before they went to school. For a considerable number of students, however, the language of schooling is not their first language. In the Netherlands, as in most countries of the European Union, the school population consists of a majority of students for whom the national language is their native language, plus a considerable minority of students who are non-native speakers of the national language. Many of these students either migrated with their parents to the Netherlands at an early age, or were born in the Netherlands, but come from migrant families. In the remainder of this chapter, we will refer to the former group of students with the term ‘native speakers of Dutch’ or ‘native Dutch speaking’ (NS), and to the latter group with the term ‘non-native speakers of Dutch’ or ‘non-native Dutch speaking’ (NNS).¹ Obviously, exposure to oral, colloquial Dutch differs between the two groups, whereas exposure to written Dutch may differ far less. In the case of writing, differences in writing experience between NS and NNS students may be smaller, as young people tend to write, when they write at all, mainly in the context of school assignments and relatively little in other contexts. However, as writing also calls upon language knowledge acquired orally (see below), the aforementioned differences in oral language proficiency may also show up in writing.

Research in the Netherlands and many similar European countries has shown that NNS students lag behind their NS peers in school success (Vallen & Stijnen, 1991). One of the main causes for this difference in educational performance probably is a poorer command of Dutch, especially in the breadth and depth of their vocabulary knowledge (Appel & Vermeer, 1998; Verhallen & Schoonen, 1993, respectively). Little is known, however, whether and, if so, to what extent NNS students fall behind their NS peers in their Dutch writing ability. A recent report of a national assessment at the end of primary education showed mixed results. Of the sixteen assignments that were administered, two showed large differences between NS and NNS writers. Five assignments showed differences of medium effect size, six showed small effects and three showed no differences (Sijtsma, 1997).

In learning a foreign language, the NS students probably experience the same difficulties as the NNS students, because the foreign language is ‘new’ to both groups. By foreign languages we mean languages that are taught in the educational system as true non-indigenous, foreign languages. For example, English, French and German are the three compulsory foreign languages in Dutch secondary schools. There is indeed some evidence that suggests that NNS and NS students may not differ in their performance in foreign languages (Sanders & Meijers, 1995).

1 We use these not entirely adequate terms for want of better ones. We will not refer to these students as majority or minority students for two reasons. First, these latter terms refer to numbers rather than to linguistic background. Second, in many urban schools, the majority of the students consists of non-native speakers of Dutch.

The present study compares the writing performance in Dutch and English of 13-/14-year old NS and NNS students in terms of a number of types of knowledge and skills. The aim of the study is to investigate the relative weights of these knowledge and skill components in the following three constellations: (1) in Dutch writing when Dutch is a native, and hence relatively strong language, (2) in Dutch writing when Dutch is a non-native, and hence potentially weaker language, and (3) in English, the language to which both NS and NNS students have been exposed during the same relatively short period in their school careers. The knowledge and skill components in our investigation fall into three categories: (1) knowledge of language (vocabulary, grammar, and orthographic knowledge), (2) the speed with which language knowledge can be retrieved (word retrieval and sentence building), and (3) metacognitive knowledge of text characteristics and reading and writing strategies (in Dutch and English as a foreign language). In the following subsections, we will address the componential nature of writing abilities in general and of writing skills in L1 and L2 in particular. We will round off the introduction with our research questions.

1.1 The componential nature of writing ability in general

Writing calls upon several language skills, as well as upon more general (meta) cognitive skills. To our knowledge, a generally accepted model for writing 'subskills' does not exist (see, however, Abbott & Berninger (1993) and Grabe & Kaplan (1996) for an attempt to arrive at such a model). Most writing models are process models (Flower & Hayes, 1980; 1983; Hayes, 1996; Kellogg, 1996) or developmental models (Bereiter & Scardamalia, 1987). But which components might make up the construct of writing ability?

First of all, writers need to have some degree of vocabulary knowledge of the language in which they are writing (*cf.* Grabe & Kaplan, 1996). Lexical knowledge or vocabulary size may well influence the quality of the text to be written. Measures of lexical richness of texts correlate substantially with holistic ratings by readers of the text (Engber, 1995). In a study by Laufer and Nation (1995) it was shown that vocabulary size, use of words of different frequency bands (Lexical Frequency Profile) and composition rating are highly intercorrelated.

The writer's ideas are not just expressed in single words, but need to be cast in grammatical structures. Therefore, the writer needs to have some grammatical knowledge available (*cf.* Grabe & Kaplan, 1996). Furthermore, writing, compared to speaking, also requires knowledge of the orthography of the language, *i.e.*, spelling (Abbott & Berninger, 1993). We will refer to knowledge of vocabulary, grammar and orthography as language or linguistic knowledge.

Writing is a laborious, demanding task as writers must be familiar with the organization of texts, the intended readers, and the way texts function in a community (Torrance & Jeffery, 1999). Furthermore, writers must find ways to deal with all these constraints simultaneously ('juggling with constraints', *cf.* Flower & Hayes (1980)). Schoonen and De Glopper (1996) showed that proficient (L1)writers have more (declarative) knowledge about writing than poorer writers, and that they have a

different perception of what is important for a text to be adequate; the proficient writers focused more on text organization compared to the poor writers who focused on mechanics and layout. Victori (1999) showed that successful and unsuccessful EFL-writers could be distinguished by their metacognitive knowledge in each of three domains: knowledge one holds about oneself as cognitive processor, task knowledge and strategy knowledge. Thus, it also seems to be important to have sufficient (metacognitive) knowledge about texts and about strategies to deal adequately with texts. We will use 'metacognitive knowledge' to refer to knowledge about text characteristics and (reading and) writing processes and strategies.

However, having this metacognitive and linguistic knowledge does not guarantee proficient writing. Writers must also be able to access and activate these knowledge resources more or less simultaneously, which will overburden their short-term working memory. Therefore, to reach a certain level of proficiency, writers must find ways to deal with these multiple sources of knowledge within their cognitive constraints (*cf.* McCutchen, 2000). In recent years, writing research has included research into the role of cognitive capacity and working memory (*cf.* Benton, Kraft, Glover & Plake, 1984; Fayol 1999; Kellogg, 1999; Lea & Levy, 1999; Levy & Marek, 1999; McCutchen, Covill, Hoyne, & Mildes, 1994; McCutchen, 1996 and Ransdell & Levy, 1999), and from this research it can be inferred that it is not enough to have language knowledge available while writing; the writer must also be able to apply this knowledge fluently (see for an extensive discussion McCutchen, 1996). Measures of working memory capacity and resource accessibility are related to writing fluency and writing quality, and there is plenty of evidence that constraining working memory capacity during writing by requiring writers to carry out a simultaneous secondary task affects writing fluency and (to a lesser extent) writing quality. This cognitive psychological research with experimental tasks, *e.g.* reading and writing span measures, has been confined to small-scale experimental studies. In (large scale) correlational research such measurements have been largely ignored (for understandable reasons). However, fluent access to words and phrases or grammatical structures in memory² may lower the cognitive processing load for a writer and may thus enhance the writing process and possibly the quality of the written text (*cf.* Cumming, 2001; Grabe & Kaplan, 1996; McCutchen, 1996; Pennin-groth & Rosenberg, 1995). So, one may assume that fluent lexical retrieval and sentence structuring are also constituent subskills of writing.

The 'model' of writing proficiency which we present here is a simplification of a very complex construct (see for more extensive analyses of writing and theories about writing, Grabe & Kaplan, 1996; Grabe, 2001), but it addresses three different components of knowledge and skills which we think are relevant for writing proficiency: linguistic knowledge (vocabulary, grammar, and orthographic knowledge), metacognitive knowledge (of text characteristics and reading and writing strategies), and the speed with which linguistic knowledge can be retrieved (word retrieval and sentence building).

2 How this reduction of cognitive load exactly is achieved remains to be investigated. See McCutchen (2000) for a discussion about the roles of short-term working memory and long-term working memory (*cf.* Kintsch 1998) in writing.

1.2 The differential influences of components for NS and NNS writers

For L1 writers, the availability of words and grammatical structures may be fairly highly automatized and therefore less discriminative between good and poor writers (see Stanovich (1991) for similar findings with word recognition in reading). Thus, for the NS students in our study, we expect a less substantial weight of the fluency measures (lexical retrieval and sentence building) than for language knowledge components in their Dutch L1 writing. It is not well known whether the NNS writers have had less exposure to written Dutch and less experience in writing Dutch during their school careers, but they have had less exposure to (oral) Dutch than their NS peers. Thus, when writing in Dutch, our NNS students may have greater problems than their NS peers in retrieving lexical and grammatical information from memory, which may cause 'cognitive overload' during writing at the expense of the quality of the text. This may be reflected in a larger contribution of the fluency measures to the quality of their writing.

In contrast, writing in English is writing in a foreign language for both the NS and the NNS writers. Therefore, one might expect few differences between the two groups, *i.e.* English writing is expected to appeal to the components of knowledge and fluency in a similar pattern for both groups. Both groups are expected to suffer from similar problems and shortcomings with respect to their linguistic EFL knowledge (vocabulary, grammar and orthography) and fluency or accessibility of this linguistic knowledge (word retrieval and sentence building). Individual differences in these subskills should relate to individual differences in English writing proficiency. For all students in our study we expect that they are more involved in the 'lower level' problems of quick retrieval of lexical, grammatical and orthographic knowledge when writing in their weaker language English than when writing in their stronger language Dutch. When engaged too much in knowledge retrieval processes, they may not have sufficient cognitive resources left to deal with 'higher level' aspects of writing. To describe similar phenomena in L2 reading, a linguistic threshold hypothesis was formulated by Alderson (1984) among others:

'Poor foreign language reading is due to reading strategies in the first language not being employed in the foreign language, due to inadequate knowledge of the foreign language. Good first-language readers will read well in the foreign language once they have passed a threshold of foreign language ability' (Alderson, 1984: 4).

Our expectation is that a similar kind of threshold may apply to writing. Some empirical evidence for this expectation was provided by Jones and Tetroe (1987), who studied the interaction between composition skills and (second) language competence in what they call a 'natural experiment': writing in a second language. The study focused on planning strategies of six native Spanish adult ESL writers. Participants wrote essays in Spanish L1 and English L2 while thinking aloud. In addition, they performed (thinking aloud) a more constrained paragraph writing task in which the final sentence was given. This more constrained writing task was intended to affect a writer's planning behaviour. The study's basic finding was that the normal planning processes in Spanish L1 and English L2 were generally speaking the same. In the more constrained experimental task there was an increase in the amount of planning behaviour in comparison to the more natural composition task. The au-

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