



Bilingualism and Cognition: The Acquisition of Frisian and Dutch
Mw. E. Bosma

English summary

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of Frisian and Dutch**

This dissertation is the result of a project in which we examined the interplay between bilingualism and cognition. This was done by means of a longitudinal study with three consecutive annual measurements, in which we followed the linguistic and cognitive development of a group of 120 Frisian-Dutch bilingual children, who were 5 or 6 years old at the first time of testing. Frisian is a regional minority language that is spoken in the Dutch province of Fryslân, where it has official status next to the national majority language Dutch. Historically, Frisian is most closely related to English, but over time Frisian and English have diverged, while Frisian and Dutch have converged (Gooskens & Heeringa, 2004). As a result of this convergence, the Frisian and Dutch language that are spoken nowadays share a large part of their vocabularies and morphosyntactic structures. In this dissertation, we used the extensive overlap between the Frisian and Dutch linguistic system to investigate how cross-language similarity interacts with variables such as exposure, age of onset and cognitive functioning, and to examine whether growing up with two closely related languages has an effect on children's cognitive capacities.

The measures that were used to assess Dutch language development include the PPVT-III-NL (Dunn & Dunn, 1997; Schlichting, 2005) for receptive vocabulary, the TAK (Verhoeven & Vermeer, 2002) for inflectional morphology and the MAIN (Blom & De Jong, 2013; Gagarina et al., 2012) for the comprehension and production of narratives. Frisian receptive vocabulary and Frisian inflectional morphology were measured with tasks developed for the purpose of this project and the comprehension and production of Frisian narratives were measured with a translation of the MAIN. In the Frisian receptive vocabulary task, cross-language similarity was systematically manipulated through four cognate categories. The measures that were used to assess cognitive development include the Sky Search task (Manly et al., 1998) for selective attention, the Flanker task (Engel de Abreu et al., 2012; Rueda et al., 2004) for interference suppression, the Digit Span task (Alloway, 2012) for verbal memory and the Dot Matrix task (Alloway, 2012) for visuospatial memory.

Individual topics that were examined concern the influence of age of onset on the acquisition of Dutch vocabulary and grammar (chapter 2), the role of cognates in receptive vocabulary acquisition (chapter 3), the role of verbal working memory in the acquisition of cross-linguistic phonological regularities (chapter 4), and, finally, the effect of language balance (chapter 5 and 6) and minority language exposure (chapter 6) on cognitive functioning. These individual studies will be summarized below.

In the first study of this dissertation, described in **chapter 2**, we investigated the influence of age of onset on the acquisition of Dutch receptive vocabulary and inflectional morphology. The results showed that for inflectional morphology, it does not really matter whether children start learning Dutch at age 0 or at age 4, while for vocabulary, it may be better to start a bit later. Furthermore, for both vocabulary and inflectional morphology, intensity of exposure to Dutch turned out to be a significant predictor. In addition, proficiency at using Frisian inflection significantly predicted proficiency at using Dutch inflection. As the children were more accurate with overlapping items than with non-overlapping items, this was probably due to lexical overlap between Frisian and Dutch.

In **chapter 3** of this dissertation, we investigated to what extent the acquisition of cognates among bilingual children depends on degree of cross-language similarity and intensity of exposure to the tested language, and whether children's sensitivity to cognates with different degrees of cross-language similarity changes over time. In order to answer these questions, we analysed children's performance on the four cognate categories of the Frisian receptive vocabulary task. The results showed a gradual cognate facilitation effect for children with a low intensity of exposure to Frisian: the higher the degree of cross-language similarity, the better their performance. Furthermore, as they grew older, these children improved the most on non-identical cognates with a simple cross-linguistic phonological regularity between Frisian and Dutch. An example of such a regularity is Frisian *-âld* [ɔ:t] and Dutch *-oud* [aut], as in the cognate pairs *kâld* [kɔ:t] - *koud* [kaut] 'cold' and *wâld* [wɔ:t] - *woud* [waut] 'forest'. This finding suggests that over time, children become better at recognizing regularities between the Frisian and Dutch phonological systems.

In the third study of this dissertation, reported on in **chapter 4**, we followed up on this last result by examining whether there is a relationship between the acquisition of cross-linguistic phonological regularities and verbal working memory. The results showed that this is indeed the case: verbal working memory had a significantly stronger effect on the acquisition of cognates with a cross-linguistic regularity than on other types of cognates and non-cognates. In line with previous studies that have shown that verbal working memory is related to the acquisition of grammar, but not vocabulary (e.g. Engel de Abreu & Gathercole, 2012; Verhagen & Leseman, 2016), this suggests that verbal working memory plays a role in the acquisition of linguistic regularities.

In **chapter 5** of this dissertation, we investigated the cognitive effects of bilingualism and the role of language balance in this domain, comparing the cognitive performance of balanced bilingual children and Dutch-dominant bilingual children. The results showed that

the balanced bilingual children outperformed the Dutch-dominant bilingual children on selective attention and verbal working memory, but not on interference suppression and visuospatial working memory. In line with previous research (e.g. Prior et al., in press; Thomas-Sunesson et al., 2016), this suggests that bilingual cognitive effects are influenced by language balance, although the differences between the two groups were moderate and inconsistent.

In the fifth and last study of this dissertation, described in **chapter 6**, we conducted a longitudinal study that followed up on the cross-sectional study described in chapter 5. First, we investigated whether language balance, based on vocabulary and morphology scores in both languages, influenced cognitive performance and whether this effect was sustained over a three-year period. Second, we investigated whether intensity of exposure to Frisian at home predicted language balance and whether there was a relationship between intensity of exposure to Frisian at home and cognitive performance. The results showed that intensity of exposure to Frisian at home, mediated by language balance, had an impact on selective attention, but not on interference suppression, verbal working memory and visuospatial working memory. However, the effect on selective attention was only visible at time 1. These results show that substantial minority language exposure at home indirectly affects bilingual children's cognitive development, but at the same time support previous scepticism about the robustness of the bilingual advantage (Ross & Melinger, 2016).

Taken together, the results from this dissertation deepen our understanding of the relationship between the linguistic and cognitive development of bilingual children growing up with two closely related languages. Due to extensive overlap between the Frisian and Dutch linguistic system, there is much co-activation between the two languages and thus many opportunities for cross-linguistic transfer. The results from this dissertation show how bilingual children can benefit from these cross-linguistic similarities and regularities and the ways in which cognition supports bilingual language acquisition. With regard to the debate about the cognitive effects of bilingualism, this dissertation provides a nuanced perspective.