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A bilingual threshold for enhanced executive functioning: Cognitive advantages in Frisian-Dutch bilingual children

Bosma, E.; Blom, E.; Versloot, A.

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KEYNOTE SPEAKERS
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University of Limerick
Juana M. Liceras
University of Ottawa
Luis Enrique López
*Programa de Apoyo a
la Calidad Educativa*
Jeff MacSwan
University of Maryland
Lee Osterhout
University of Washington

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ABSTRACTS

A bilingual threshold for enhanced executive functioning: Cognitive advantages in Frisian-Dutch bilingual children

Evelyn Bosma, Elma Blom and Arjen Versloot Poster 21-May

"Previous research has shown that bilingual children outperform monolingual children on executive function (EF) tasks that test interference inhibition (Martin-Rhee & Bialystok, 2008; Engel de Abreu et al., 2012), selective attention (Engel de Abreu et al., 2012) and working memory (Blom et al., 2014; Morales et al., 2013). Recent studies have challenged bilingual children's EF advantages (Duñabeitia et al., 2014; Paap & Green, 2013), pointing to the confounding effect of demographic differences between bilinguals and monolinguals. The current study investigates a new population of bilinguals: speakers of the national majority language Dutch and the regional minority language Frisian. While other studies comparing bilinguals in a similar setting investigated two very different languages, e.g., Welsh-English (Gathercole et al., 2010) and Basque-Spanish (Duñabeitia et al., 2014), Frisian and Dutch are closely related. All children are selected from the same population of bilingual Frisian-Dutch children, which minimizes the risk of confounding variables. At the same time, the bilingual Frisian-Dutch children vary substantially in their degree of bilingualism, which allows investigating whether enhanced EFs require a bilingual threshold (Blom et al. 2014; Carlson & Meltzoff, 2008; Poarch & Van Hell, 2012).

In order to examine if (i) bilingual Frisian-Dutch children have enhanced EFs, and (ii) EF enhancement is related to the degree of bilingualism, we tested 25 Frisian-Dutch balanced bilinguals and 25 Dutch-dominant children on interference inhibition, selective attention and verbal and visuospatial working memory. The two groups were matched on age (5-6 year olds), nonverbal IQ (WNV; Wechsler & Naglieri, 2006), socioeconomic status, Dutch expressive

morphology (Taaltoets Alle Kinderen, Verhoeven & Vermeer, 2002) and receptive vocabulary (Peabody Picture Vocabulary Test-III-NL, Dunn & Schlichting, 2005). Frisian expressive morphology and receptive vocabulary were assessed with tasks modelled after the Dutch tasks. The balanced bilinguals scored similarly on Dutch and Frisian morphology, $t(24)=-1.24$, $p=.23$, and vocabulary, $t(24)=-0.56$, $p=.58$, while the Dutch-dominant bilinguals scored better on the Dutch than on the Frisian versions of these two tasks, $t(24)=-16.56$, $p<.001$ for morphology, $t(24)=-5.15$, $p<.001$ for vocabulary.

A one-way multivariate analysis of variance (MANOVA) revealed a statistically significant difference in EF performance between the balanced bilinguals and the Dutch-dominant bilinguals, $F(4,45)=2.59$, $p<.05$, $\eta^2=.19$. Subsequent ANOVAs (see Table 1) showed that the balanced bilinguals outperformed the Dutch-dominant bilinguals on selective attention. The balanced bilinguals also performed better than the Dutch-dominant bilinguals on verbal working memory and interference inhibition, but these differences did not reach statistical significance. There was no difference between the two groups on visuospatial working memory.

In this study, two bilingual Frisian-Dutch groups were compared that are demographically very similar but different in how bilingual they are. First, the results of this highly constrained study confirm that bilingualism enhances children's EF development, although some variation was observed between the different EF tasks. Second, the findings demonstrate that a specific threshold in bilingual proficiency needs to be reached before the bilingual EF advantage takes full effect."