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A tendency towards improved working memory among bilingual Faroese children (assessed by Odd-one out)



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Introduction

Executive functions such as attention, inhibition, working memory and control provide a promising direction for disentangling bilingualism and SLI. It is often assumed that executive functions are deficient in monolingual language-impaired children, and recent studies support this (Henry, Messer & Nash, 2011). On the other hand research shows, that working memory can be improved among typically developing bilingual children (Bialystok 2011) (Windsor et al. 2008). It is therefore important to disentangle whether the specific components of Executive Functions that have shown to be impaired in monolingual children with SLI, are improved in typically developing bilingual children, as this knowledge has important clinical implications for the diagnostics of BiSLI children. Furthermore, it is important to investigate the relationship between working memory and syntax in monolingual and bilingual children.

Aims

The aim of this study is to investigate to which extent a non-verbal Working Memory task: "Odd-One-Out", that is recommended by WG4, correlates with children's syntax abilities.

We predict:

- 1) Working memory is significantly improved among typically developing bilingual children compared to typically developing monolingual children?
- 2) Is non-verbal working memory correlated with comprehension and production of relative clauses in bilingual & monolingual children?

Method

Twenty-four typically developing mono- and bilingual (Danish & Faroese), age $M = 98.6$, $SD = 7.34$ children from the Faroese Island participated in completing two Relative Clauses tasks (comprehension & production) (Friedmann & Novogrodsky, 2004; Novogrodsky & Friedmann, 2006). and an Odd-One-Out task. Bilingual: $N = 7$. The groups did not differ in age.

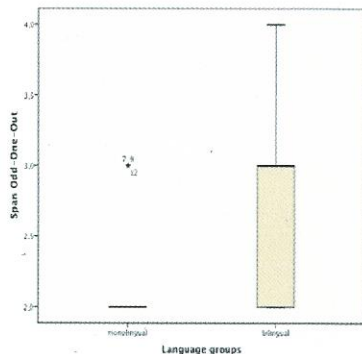
The bilingual children's level of bilingualism was assessed by means of the short version of The Beirut-Tours Questionnaire.

All tasks were assessed by native Faroese-speaker and in Faroese. Danish and Faroese differ substantially in syntax and semantic. Faroese has case marker similar to German, whereas Danish has no case marking.

The span level of the bilingual children ($M = 2.71$, $SD = .75$) is significantly higher ($t = -2.19$, $df = 21$, two-tailed $p = .039$) than that of the monolingual children ($M = 2.19$, $SD = .40$). See figure 1.

Due to unequal variance caused by one outlier in the bilingual group, the outlier was removed and the data reanalysed. When the variances were assumed equal the differences were no longer significant.

Figure 1. Box-plots for span on Odd-one-out for the two language groups.



Results

Correlations:

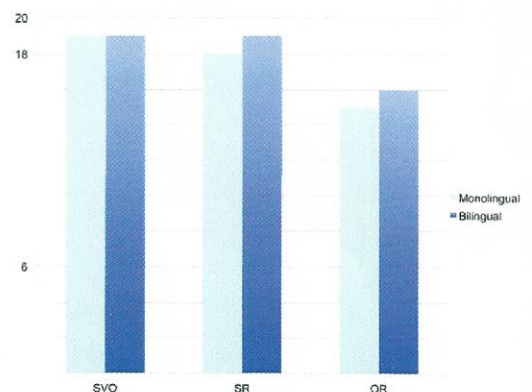
Monolinguals:

	SVO	SR	OR
SR	.78**		
OR	.16	.02	
Span Trails	.22	.06	.31

Bilinguals:

	SVO	SR	OR
SR	.88**		
OR	.17	-.13	
Span - Trails	.23	.47	-.79*

Figure 2. Comprehension of SVO, SR & OR clauses for the two language groups



Discussion

Although there was a tendency for the bilingual children to perform better on the span task, when adjusting for the large variance the difference was not significant. The monolingual and bilingual children performed equally well in their comprehension of Subject and Object relative clauses, although again there was a slight tendency for the bilingual children to perform better than the monolingual children on the object relative clauses.

There was a significant correlation between the children's comprehension on OR clauses and Memory Span for trails on the Odd-One-Out for the bilingual children, but not for the monolingual children. Although the bilingual sample was small, the data suggests that the relationship between visual working memory and comprehension of complex syntax is stronger for bilingual children than in monolingual children. This may have implications for the assessment of BiSLI children. In comparing our results with the results from the Windsor et al., 2008 study, where they did not find a significant difference between the performance of monolingual and bilingual children on the Odd-One-Out it is important to note that the children in our study are substantially younger than those in the Windsor et al. Study.

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