COGNITIVE ADVANTAGE IN SIGN-SPOKEN BILINGUALS

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BACKGROUND

- The context of languages use might be important for the cognitive consequence of bilingualism (Anderson, Mak, Keyvani Chahi, & Bialystok, 2018).
- In the '**adaptive control hypothesis**' (Green & Abutalebi, 2013), the bilingual effect on the cognition depends on contexts in which the languages are used: the contexts differ in demands to monitor, select and switch between languages.
- To date, the lack of cognitive advantage in sign-spoken bilinguals was explained by the sign-spoken bilingual context that did not require the high level of monitoring, switching, inhibition and selection of languages (Emmorey, Luk, Pyers, & Bialystok, 2008; Olulade et al., 2016).

QUESTION:

Does the sign-spoken bilingualism enhance cognitive control compared to spoken bilingualism and monolingualism

HYPOTHESIS

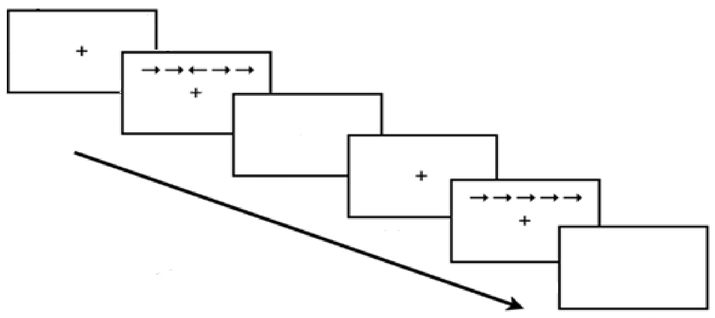
Sign-spoken bilinguals are supposed to have enhanced cognitive control in comparison with monolinguals because sign-spoken bilinguals experienced different languages use contexts, when they are supposed to control, monitor, inhibit and switch between languages with different interlocutors.

METHOD & HYPOTHESIS

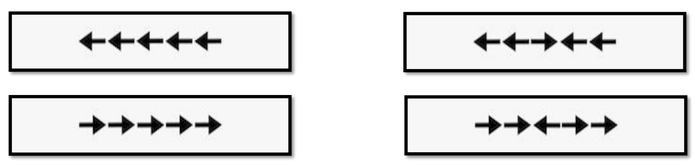
PARTICIPANTS

- 30 bimodal bilinguals – **CODA**
  age: M= 32, SD=8;7, ♂=5 ,♀=25
- 30 unimodal bilinguals – **UB**
  age: M=31; SD=8;6, ♂=5 ,♀=25
- 30 monolinguals – **M**
  age: M=32; SD=8;6, ♂=5 ,♀=25

- modified version of **Eriksen flanker task:**



Flanker congruency



flankers congruent with the target

flankers incongruent with the target

RESULTS & DISCUSSION

Error rate in the flanker task: In the flanker task, the mix ANOVA revealed the between group differences in error rate (F (2,83) = 16.690, p < .0001 $\eta 2$ = .287). Sign-spoken bilinguals had lower error rate than spoken bilinguals (F (1,57) = 9,492887, p = .003 $\eta 2$ = .143) and lower than monolinguals (F (1,54) = 31,769709 , p < .0001 $\eta 2$ = .370). Spoken bilingual individuals were still better than monolinguals (F (1,55) = 8,777203 , p = .004 $\eta 2$ = .138).

Reaction times in flanker task: When we analyzed the RT, the mix ANOVA showed that the groups differed (F (2,83) = 5,070, p = .008 $\eta 2$ = .109). Sign-spoken bilinguals did not differ on RT from spoken bilinguals (F (1,57) = 2,918499 , p > .05 $\eta 2$ = .049). Sign-spoken bilinguals were better than monolinguals F (1,54) = 8,983191 , p = .004 $\eta 2$ = .143). Spoken Bilinguals were as fast as the monolinguals F (1,55) = 2,733346; p > .05 $\eta 2$ = .047).

The present outcomes showed that sign-spoken bilingualism has cognitive consequences on attentional and inhibition processes in hearing native signers. Hearing native signers outperformed monolingual individuals and, surprisingly, they had better scores than spoken bilinguals. The findings are in accordance with the 'adaptive control hypothesis' (Green & Abutalebi, 2013): spoken bilinguals were restrained to bilingualism in single context: all participants used English at work and Polish in private life and this kind of bilingualism is supposed to be less cognitive control demanding. Whereas, sign-spoken bilinguals were reported to have large experience with dual language use when they were supposed to control, inhibit and switch between languages.

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