INHIBITION AND LANGUAGE PROCESSING DEFICITS IN DIFFERENT TYPES OF APHASIA

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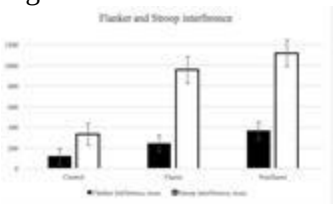
INTRODUCTION: The relation between executive control and language processing deficits in aphasia need further investigation (Murray, 2012; McNeil & Hula , 2008). It has been shown that language comprehension difficulties are associated with impaired inhibition (Martin & Allen, 2008). The current study had three main objectives: (1) to measure inhibition deficit in adults with fluent and nonfluent aphasia as well as in the healthy controls; (2) to investigate the relationship between inhibition and language comprehension in different types of aphasia; (3) to address individual differences through the comparison of results from the group and single subject analyses. PARTICIPANTS: Nineteen participants with nonfluent and 17 with fluent aphasia were recruited from the Moscow Center for Speech Pathology. Twenty-one adults without aphasia were recruited into the control group. One–way ANOVA found no significant difference in age or in education between the three groups. MATERIALS AND PROCEDURES: All of the participants from the clinical groups were assessed with the Quantitative Assessment of Speech in Aphasia (Tsvetkova et al., 1981) including ten subtests measuring various aspects of language production and comprehension in Russian. All of the participants were presented with the Flanker and Stroop tasks. RESULTS: The clinical groups did not differ in severity of comprehension deficits as well as the Flanker and Stroop interference scores among each other. Both groups had significantly higher Stroop interference scores compared to the control group (fluent: $t(47) = –3.64$, $p < .001$; nonfluent: $t(47) = 4.77$, $p < .001$). The fluent group did not differ from the control in the Flanker interference, whereas the nonfluent group was significantly slower in resolving interference, $t(51) = 2.05$, $p = .046$. Flanker and Stroop interference scores significantly correlated in the nonfluent group only, $r(14) = .69$, $p = .01$. Language comprehension and Flanker interference scores were significantly related in both clinical groups

(fluent: r(13) = .14 , p = .61; nonfluent: r(15) = -.42, p = .11). In contrast to the results from the group analysis, the single subject analysis revealed that 18% participants with fluent and 11% with nonfluent aphasia did not have inhibition deficits in both Stroop and Flanker tasks.

DISCUSSION: Inhibition deficits are present in both types of aphasia being more prominent in its nonfluent type. Since there was no significant difference between the fluent and control groups in the interference in the Flanker task, inhibition deficits in fluent aphasia seem to appear in a task with a high verbal loading. An absence of the association between the Flanker and Stroop interference scores in the fluent and control groups and its presence in the nonfluent group reflect the difference in the nature of executive control deficits in different types of aphasia. The role of inhibition in language comprehension has been supported by the significant associations between the magnitude of the Flanker interference and comprehension scores in both types of aphasia. An absence of inhibition deficits revealed in some participants with aphasia in the single-case analysis shows that language processing deficits are not simply consequences of impaired underlying cognitive processes.

Figure 1



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