INTRODUCTION

Bilinguals routinely manage (i.e., control) two languages, but how this skill effects cognitive control is under debate:
• an association between language control (LC) and cognitive control (CC) vs. a dissociation between these control mechanisms (e.g., Calabria et al., 2011; Prior & Gollan, 2011).

Current study:
• Bilingual adults with aphasia (BAA) offer a unique opportunity to explore the relationship between LC and CC because they are often reported to present with LC deficits. Few studies have investigated LC and CC mechanisms in this population (Dash & Kar, 2014; Gray & Kiran, in press; Green et al., 2010; Verreyt et al., 2013).

OBJECTIVES

1. Determine whether deficits in language inhibition are specific to the language domain or are indicative of a more general cognitive deficit.

<table>
<thead>
<tr>
<th>Bilingual Language Processing</th>
<th>Resilience to Distractor Interference (type of cognitive control)</th>
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<tbody>
<tr>
<td>Both languages active. To access the target language, the non-target language must be inhibited.</td>
<td>Presented with the target stimulus.</td>
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2. Determine if there is an effect of task complexity.

PARTICIPANTS

• 20 Spanish-English neurologically healthy bilingual adults (NHBA), age: M = 51; SD = 13.
• 13 Spanish-English bilingual adults with aphasia (BAA), age: M = 48; SD = 12.

*NHBA and BAA were matched on age and education and all filled out the Language Use Questionnaire (Kiran et al., 2010).

METHODS

1. Non-linguistic Flanker: decide which way the target arrow is pointing.

2. Linguistic Flanker: decide if the target word is English or Spanish.

3. Non-linguistic Triad: select the response that matches the target by shape or color.

4. Linguistic Triad: select the word that is semantically related to the target.

HYPOTHESES

<table>
<thead>
<tr>
<th>Task</th>
<th>Potential Outcomes</th>
<th>Domain General Cognitive Control</th>
<th>Domain Specific Language Control</th>
<th>Effects of Task Complexity</th>
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</thead>
<tbody>
<tr>
<td>Non-linguistic Flanker</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Non-linguistic Triad</td>
<td>X</td>
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These outcomes should be identified in accuracy and/or latency for NHBA and BAA.

CONCLUSIONS

1. NHBA (and BAAHigh) → Domain General Cognitive Control
2. BAALow → Domain Specific Cognitive Control
3. BAAHigh vs BAALow: separable patient groups

Analyses:
1. Congruency effect: indicates that control mechanisms are functioning in that domain.

Non-linguistic tasks: two-way ANOVAs were performed to evaluate the effect of condition (congruent and incongruent) x target (color and shape) for percent accuracy and RT for NHBA and BAA.

LINGUISTIC TASKS

• Non-linguistic tasks: two-way ANOVAs were performed to evaluate the effect of condition (congruent and incongruent) x target (English and Spanish) for percent accuracy and RT for NHBA and BAA and a measure of language experience was the covariate.

RESULTS

- Significant main effects of congruency:
  - NHBA: F(1, 38) = 33.15, p < .001
  - BAAHigh: F(1, 23) = 41.74, p < .001
  - BAALow: F(1, 7) = 33.62, p < .001

- Significant main effects of condition:
  - NHBA: F(1, 38) = 34.82, p < .001
  - BAAHigh: F(1, 23) = 3.54, p < .001
  - BAALow: F(1, 7) = 3.05, p < .001

- Significant main effects of target:
  - NHBA: F(1, 38) = 1.47, p < .001
  - BAAHigh: F(1, 23) = 1.78, p < .001
  - BAALow: F(1, 7) = 20.88, p < .001

- Significant main effects of task complexity:
  - NHBA: F(1, 38) = 1.60, p < .001
  - BAAHigh: F(1, 23) = 2.05, p < .001
  - BAALow: F(1, 7) = 3.54, p < .001

- Significant main effects of language:
  - NHBA: F(1, 38) = 1.47, p < .001
  - BAAHigh: F(1, 23) = 1.78, p < .001
  - BAALow: F(1, 7) = 20.88, p < .001

- Significant main effects of 2-way interaction:
  - NHBA: F(1, 38) = 41.74, p < .001
  - BAAHigh: F(1, 23) = 3.54, p < .001
  - BAALow: F(1, 7) = 3.05, p < .001

Note: The congruency effect is evaluated on congruent and incongruent RT and the language experience covariate is included in the ANOVAs.