1. PROJECT

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Title: Verbal fluency in Bengali-English bilinguals with aphasia and bilingual healthy controls

Dates: September 2014- September 2017

Funding organisation: The Felix Trust, UK

2. DATASET

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Title: Verbal fluency in Bengali-English bilinguals with aphasia and bilingual healthy controls

**Description:** We investigated the contribution of linguistic and executive control processes in verbal fluency performance for Bengali-English bilinguals with aphasia and bilingual healthy controls. We collected verbal fluency data, executive control data and linguistic background measures to characterize each participant. This dataset contains the verbal fluency data from 8 Bengali-English bilinguals with aphasia and 8 bilingual healthy controls. The data from the verbal fluency task was collected using audio recorder, later transcribed orthographically. Demographic information and linguistic background measures were collected using paper and pen tasks. Executive control tasks were assessed using paper and pencil task, and/or computer-based tasks. The computer tasks were programmed and delivered using E-Prime.

These data could be used by future researchers to answer their specific questions regarding the lexical and cognitive underpinnings of verbal fluency performance in bilinguals with aphasia population.

This data is reported in the published article:

[Patra, A.](http://centaur.reading.ac.uk/view/creators/90008018.html) , [Bose, A.](http://centaur.reading.ac.uk/view/creators/90003713.html) and [Marinis, T.](http://centaur.reading.ac.uk/view/creators/90000477.html) (2020) [Lexical and cognitive underpinnings of verbal fluency: evidence from Bengali-English bilingual aphasia.](http://centaur.reading.ac.uk/93301/) Behavioral Sciences, 10 (10). 155. ISSN 2076-328X doi: <https://doi.org/10.3390/bs10100155>

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3. TERMS OF USE

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4. CONTENTS

The dataset consists of datasheets detailed below, with their contents:

1. <Means>: Contains individual level demographic details for each participant (age, sex, education); aphasia type and severity for participants with aphasia; bilingual language background measures (language acquisition history, language use, language dominance, language proficiency, instruction of education); performance on executive control tasks (Stroop, Trail Making Test, and backward digit span), and mean performance across different verbal fluency variables.
2. <Means-codes>: Contains the codes for each of the variables (i.e., columns) included in <Means>.
3. <Verbalfluency>: Contains verbal fluency data for each condition for every trial for each individual participant in each language.
4. <Verbalfluency-codes>: Contains the codes for each of the variable (i.e., columns) included in <Verbalfluency>.

5. METHOD and PROCESSING

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The dataset was generated using orthographic transcription of audio files of verbal fluency data, pen and paper data from the background measures, and reaction time (RT) data for the verbal fluency data and, executive control measures.

Details of methods:

**Trials and Procedures for Verbal Fluency**

All participants completed two verbal fluency conditions − semantic and letter – in both languages. Participants never performed the task in both languages on the same day and order of language was counterbalanced across participants. The conditions were counter balanced across participants, that is, half of the participants performed the semantic fluency condition first and the other half performed the letter fluency condition first. After familiarizing themselves with the task, participants were asked to produce as many words as possible in 60 seconds when the tester said “start”. The “start” prompt provided a definitive starting point for each trial. In the semantic fluency condition, participants produced words in two categories− *animals*, and *fruits and vegetables*. In the letter fluency condition, participants were asked to produce words that start with the letters *F, A,* and *S* for the English language and letters *P, K,* and *M* for the Bengali. The instruction for the Bengali letter fluency task was different from the English letter fluency task because of the phonology of Bengali language. In the Bengali letter fluency task, participants were asked to name words that start with the sound (e.g., /p/) rather than the letter (e.g., *P*).

**Executive Control Measures**

*Inhibitory control (Stroop test)*: The computerized Stroop Task used in this study was adapted from Scott and Wilshire (Scott & Wilshire, 2010). Participants were assessed on two conditions, neutral and incongruent. In the neutral condition, participants named a series of 50 colour rectangles and in the incongruent condition a series of colour words were presented with a different font colour (e.g., RED word in green font colour). Participants were asked to name the font colour (e.g., green) of the colour word (e.g., RED). Reaction Times (RT) were measured for the correct trials to calculate the Stroop difference (Equation 1) and the Stroop ratio (Equation 2). The Stroop ratio (Equation 2) was used as a dependent variable to account for the overall slower response speed in the BWA compared to the BHC (Faroqi-Shah et al., 2018; Patra et al., 2020). A smaller Stroop difference and Stroop ratio indicates better inhibitory control. Please refer to Patra et al. 2020 for a detailed description of the task and analysis procedure.

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| $Stroop difference= RT\_{INCONGRUENT TRIAL} - RT\_{NEUTRAL TRIAL}$ (1) |
| $Stroop ratio= \left[\frac{RT\_{INCONGRUENT TRIAL} - RT\_{NEUTRAL TRIAL}}{\frac{RT\_{INCONGRUENT TRIAL}+ RT\_{NEUTRAL TRIAL}}{2}}\right] X100$ (2) |

*Shifting between task-sets (Trail Making Test)*: The Trail Making Test (TMT, Reitan, 1986), one of the most widely used neuropsychological tests, was used to assess mental set shifting (Sánchez-Cubillo et al., 2009). The test consists of two parts, A and B. On part A, participants are asked to connect 25 circled numbers (e.g. 1, 2, 3, 4, etc.) distributed on a paper using a pen/pencil. On part B, participants need to connect the circles but alternating between circled numbers and letters (e.g. 1, A, 2, B, 3, C, etc.). All participants completed both parts of the test. We measured the total time in seconds for both parts of the test, therefore, achieving two scores, TMT-A and TMT-B. The dependent variables were: the TMT difference score (B -A) which has been shown to be the best indicator of task switching ability of the TMT test (Sánchez-Cubillo et al., 2009), and the TMT ratio (B/A) which has shown to control perceptual speed to some extent (Salthouse, 2011).

*Working memory (Backward digit span test)*: Working memory was assessed using the backward digit span test from Wechsler Memory Scale (WMS 3, Wechsler, 1997). In this test, participants were verbally presented an increasingly longer series of digits from two to nine with a rate of presentation of one digit per second. Participants were asked to repeat the sequence of the digits in reverse order. The test ended when the participants failed on two consecutive trials at any one span size or when the maximum trial size was reached. The backward digit score was the total number of lists reported correctly in the backward digit span test.

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