

# EVALUATION OF DEMOGRAPHIC AND LANGUAGE PREDICTORS OF MAIN CONCEPT PRODUCTION IN SPANISH/ENGLISH BILINGUAL DISCOURSE USING NICOLAS AND BROOKSHIRE STIMULI

## INTRODUCTION

Hispanics are the fastest growing minority group in the US, and stroke incidence for Hispanics is higher than that of non-Hispanic caucasians (Dong et al., 2012). Since stroke is the leading cause of aphasia, and the majority of Hispanics are bilingual Spanish/English speakers, there is a growing need for appropriate assessment methods for bilingual aphasia.

One challenge in assessing bilinguals is their diverse language backgrounds, including differences in proficiency and use across languages. Previous studies have reported correlations between variables such as frequency of use and self-rated proficiency and performance in language tasks such as picture-naming accuracy (Edmonds & Donovan, 2012; Gollan et al. 2007), verbal fluency (Muñoz & Marquardt, 2008, Langdon et al., 2005; Elgamal et al., 2011), and discourse informativeness (Edmonds, 2013).

In a study investigating discourse in 83 English/ Spanish bilingual adults, Edmonds (2013) reported varied patterns of correlations for informativeness and efficiency measures (WPM, %CIUs, CIUs/min ) in English and Spanish. Naming accuracy and overall proficiency were significantly correlated with all measures of informativeness regardless of language; whereas, percent usage and age of exposure varied across languages (Edmonds, 2013).

The metric of %CIU is often used to evaluate informativeness in discourse, but %CIU does not address the completeness of the discourse. I.e., one can achieve high %CIUs by providing correct information on half the picture, thus, targeting only half of the main concepts (MC). Alternatively, many MCs can be discussed with lower %CIU due to repetitions, circumlocutions and reformulations. In order to understand this dynamic better in bilinguals with varying degrees of proficiency across languages, we adapted Nicholas and Brookshire's (1993, 1995) MC analysis to this population. Our research questions were:

- 1) Is there a relationship (correlation) between %CIUs and MCs?
- 2) What self-reported participant variables (e.g., proficiency ratings, usage) and tested language variables (discourse variables, confrontation naming) correlate to English and Spanish MCs?
- 3) Of the significantly correlated variables, which contribute most to regression models of MCs in English and Spanish?

## METHODOLOGY

*Participants.* Eighty three Spanish-English bilingual young adults (51 females) from diverse backgrounds were recruited from Gainesville and Miami, FL. No history of language disorders

or neurological disorders was reported, and all participants reported the ability to communicate functionally in English and Spanish in most situations. Demographic and language information was attained through a questionnaire (modified from Muñoz, Marquardt, & Copeland, 1999) (Table 1).

*Procedure.* Participants completed all discourse elicitation stimuli from Nicholas and Brookshire (1993) (4 pictures scenes, 2 picture sequences, 2 personal, and 2 procedural prompts). Participants also named all items on An Object and Action Naming Battery (OANB: Druks & Masterson, 2000), and their scores were analyzed using Rasch analysis (Edmonds and Donovan, 2012) which resulted in 4 psychometrically sound naming hierarchies (English and Spanish nouns and verbs).

A Spanish/English bilingual research assistant completed the testing, which was conducted in separate sessions of English and Spanish 5-7 days apart. Language of testing and noun and verb testing (OANB) were counterbalanced across participants. Responses were audio-recorded for analysis.

*Transcription.* All discourse samples were transcribed by trained research assistants using the Systematic Analysis of Language Transcripts (SALT: Miller & Iglesias, 2006). Reliability was conducted on 30% of the transcripts and >90% reliability was achieved for both languages.

*Main Concept Procedure.* Two pictures (the Birthday (single picture) and the Argument (sequence)) were used to measure the main concepts. Pictures are more reliable for MCs than personal/procedural information, and these pictures represented a range of MCs and lexical concepts. (We also plan to analyze the Cat in Tree and Farmer sequence picture before CAC). Criteria from Nicholas and Brookshire (1995) were used to score concepts as well as 3 additional criteria that captured many of the concepts produced in this group.

Nicholas and Brookshire (1995):

Concepts must:

- 1) be related to the information portrayed in the pictures or the sequences
- (2) contain only one main verb

Additional criteria:

Concepts may:

- (3) express motivation or intent of the animate objects (e.g., The mom wanted to hit the dog).
- (4) express the affect of animate entities (e.g., The mom was angry at the dog).
- (5) describe the setting or event (e.g., There was a birthday party).

Utterances that provided no salient information related to the main idea of the picture were excluded (e.g., There is a tree outside). The presence of a concept was counted only once for each participant.

All transcripts (n=83) were scored to determine the presence, accuracy, and completeness of MCs represented in the discourse samples. The targeted main concepts were averaged for both stimuli to create a composite MC average for each participant in each language.

## RESULTS

Pearson correlations were conducted to identify significant correlations between the number of MCs (the dependent variable) and participant reported variables (demographics, proficiency ratings, usage information) and language variables (confrontation naming from Rasch OANB lists and other discourse variables (e.g., #CIU, %CIU)). (See Tables 1 and 2).

A number of significant ( $p < .05$ ) variables were identified for MCs in English and Spanish. (See Table 3). In order to understand which variables most contributed to MCs in each language, we entered all significant variables into separate stepwise regressions to determine a model for English and Spanish MCs. Results of the model for English resulted in a higher adjusted  $R^2$  (.467) than Spanish MC (.263). See Table 4 for details.

## DISCUSSION

We found that informativeness at the word level (%CIU) does not correlate to the comprehensiveness of MCs expressed in either language. Thus, both measures should be considered when evaluating bilingual discourse on these stimuli. Further, there were different correlation patterns across languages, as several participant variables correlated to English MCs, but no robust correlations were observed for Spanish. Though we had a range of proficiency and usage patterns represented in this group, there was more variability in Spanish use and proficiency, which may contribute to the lack of correlations.

However, there were more correlations between experimentally gathered language variables (e.g., naming, discourse) for English and Spanish MCs, though there were still more in English. Similarly, the regression model was more robust for English MCs with the retained variables of English verb naming, #CIUs in English, and Use of Spanish in current home (negative correlation). English verb naming, which contributed most to the model, was also highly predictive of %CIUs (Edmonds, 2013), highlighting the importance of verb retrieval abilities in English. However, amount of output (#CIU) and language usage (less Spanish at home) were also important variables. For the Spanish MC model, #CIUs was retained in both languages, which may indicate that a higher level of ability in both languages is important for Spanish MCs. Spanish noun naming was retained in the model rather than Spanish verb naming, which was unexpected given the English findings and previous findings with this group (Edmonds, 2013).

These findings suggest that measured language variables may be more useful for predicting MCs in discourse in bilinguals, and both word-level and more global measures are necessary to capture the discourse abilities in bilingual adults.

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