The Thesis Committee for Nikita Anirudha Pangarkar
Certifies that this is the approved version of the following thesis:

Language Dominance in Urdu-English Bilinguals: A Comparison of Subjective and Objective Measures

APPROVED BY
SUPERVISING COMMITTEE:

Supervisor:

Li Sheng

Lisa Bedore

Language Dominance in Urdu-English Bilinguals: A Comparison of Subjective and Objective Measures

by

Nikita Anirudha Pangarkar, B.A.

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Abstract

Language Dominance in Urdu-English Bilinguals: A Comparison of Subjective and Objective Measures

Nikita Anirudha Pangarkar, M.A.
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Supervisor: Li Sheng

The purpose of this study is to investigate the ability of Urdu-English bilinguals to accurately identify their proficiency in both English and Urdu, extent of bilingualism, and dominance. In addition, this study explores how cumulative language exposure and current language use are associated with measures of proficiency and dominance. Forty-six young adults participated in this study and completed a language questionnaire, proficiency interview, adapted naming tests, and a standardized naming measure for English. Self-ratings of oral proficiency were compared to objective measures including examiner rated proficiency based on conversational fluency, performance on an examiner-designed naming test, and a standardized measure of English receptive vocabulary. Language dominance and bilingual index scores were calculated to evaluate degree of bilingualism and dominance. The results revealed that self-ratings were significantly correlated with examiner ratings and naming tests in each language as well

as with dominance and bilingual index scores. Cumulative exposure measures were correlated with several proficiency measures but amount of current language use was not correlated with any proficiency measures. Findings suggest that Urdu-English bilinguals are able to identify their language proficiency in both languages, extent of bilingualism, and language dominance. This was consistent with findings from previous research on Mandarin-English (Sheng et. al., 2014) and Spanish-English bilinguals (Gollan et. al., 2012). In addition, the positive correlations between the examiner-designed naming test and subjective and objective measures of proficiency and between the naming test and cumulative exposure measures suggest that the naming test is a promising tool that can be further improved to address the needs of a prominent bilingual group.

Table of Contents

List of Tables

List of Figures

INTRODUCTION

As the immigrant population in the United States grows, bilingualism and its practical implications are a hot topic of discussion. The demand for bilingual specialists in multiple disciplines continues to increase as services are required to cater to the diversifying population. This is especially the case in the field of speech-language pathology, where the importance of cultural and linguistic awareness as well as access to assessment and intervention materials is considered imperative to effectively provide services (Kohnert, 2013). Therefore, accurate measures of assessing bilingualism that work across bilingual groups are needed. Bilingual therapists must be able to have a certain level of proficiency in the language in order to ethically serve their target population. Furthermore, it is also important to accurately identify degree of proficiency and bilingualism for individuals who may need these services to make sure they are receiving optimum care. However, such assessment and intervention materials are limited for many language groups.

This is especially true for Urdu speakers in the United States. Urdu is an Indo-European language mutually intelligible to Hindi that is spoken predominantly in Western India and Pakistan. Currently, there are over 100 million L1 and L2 speakers of Urdu in the world of which 373,851 are living in the United States (Ryan, 2013). However, there has been limited research on this language group especially in regards to assessments of language proficiency. Currently, there are no standardized measures to evaluate areas of intervention for Urdu. Therefore, if an Urdu speaker experiences brain

injury such as a stroke or traumatic accident, there is currently no normed, structured method to evaluate his or her current vocabulary and word retrieval skills to set treatment goals to target this language.

However, creating these measures is highly complex. There are different methods to evaluate language proficiency and dominance in individuals including self-report as well as more objective measures such as conversational samples or picture naming tests. In addition, multiple factors influence language dominance and proficiency. There are different modalities of language in which one can be proficient. These include reading, speaking, listening and writing (Kohnert, 2013). In addition, level of proficiency depends on exposure and use in each of these areas. For example, students studying a language academically can be highly proficient in reading and writing, but have limited proficiency in conversational speaking. Similarly, an individual that has grown up speaking a certain language may have high level of proficiency in speaking and listening, but may not be able to transcribe or comprehend the written language. Therefore, there are multiple areas of assessment that are imperative to gather a holistic picture of language proficiency.

In addition, language dominance is a relative term. There are many different ways to assess dominance. In research, frequently percentages of language use or other indices of language dominance are calculated to determine degree of balanced bilingualism (e.g., Sheng et. al., 2014; Gollan et. al., 2012). The bilingual index, introduced by Gollan et al. (2012) is calculated by dividing level of proficiency in the non-dominant language by level of proficiency in the dominant language (Gollan et. al., 2012). Furthermore, language dominance can also be assessed by subtracting the score of one language from

another language on a particular measure to look at relative dominance (Gollan et. al., 2012). For example, subtracting Urdu scores from English scores on a certain measure will reveal the relative dominance of English for that individual and particular measure. However, the issue of dominance is further complicated by the fact that values can change based on measure. In addition, different types of tasks can elicit different categorizations of dominance (Bedore et. al., 2012).

Level of proficiency can be measured either by self-report, or certain experimental or standardized tasks. Based on a cutoff point, bilinguals can be categorized as balanced or dominant in one area. Subjective measures such as caregiver or self-report are frequently useful to determine level of language proficiency prior to brain injury for clinical purposes such as intervention and can provide informative and detailed description of language use. However, this type of self-report measure is not always accurate and may not always be feasible. A meta-analysis by Ross (1998) reveals how accuracy in self-assessment of language skills is variable and was influenced by episodic memory of language use. Similarly, Matsuno (2009) revealed how Japanese students in an English writing class exhibited biases in evaluating their own writing relative to peer rater and teacher raters. In addition, cultural and linguistic differences can cause differences in response to self-report measures and therefore need to be considered (e.g., Beaton et. al., 2000). Furthermore, caregivers may not always have all the information on language use before brain injury to provide accurate responses.

Detailed language questionnaires that ask participants to report and describe current amount of use and context of use for each language can mitigate some of these

limitations (e.g., Birdsong, Gertken, Amengual, 2015; Marian, Blumenfeld, and Kaushanskaya, 2007; Li, Sepanski, and Zhao, 2006). These measures ask individuals to report when they speak each language (e.g., days of the week, weekend), how long, in what environment (e.g., academic, home), and in which contexts (i.e., writing, reading, speaking, hearing). In addition, questions about previous exposure of each language including amount and age of exposure are frequently included as well to obtain a more cumulative measure of language use. This creates indices of current and cumulative language experience and gives a more thorough perspective of a person's language profile and extent of bilingualism as it describes these measures over time. Previous research has exemplified the reliability and validity of such measures (i.e., Marian, Blumenfeld, and Kaushanskaya, 2007; Ping Li, Sepanski, and Zhao, 2006). However, previous studies have not evaluated the efficacy of such a measure specifically for Urdu-English bilinguals.

On the other hand, objective measures are frequently used in research to determine language proficiency level and are also easier to compare relative to performance of other individuals. Measures frequently evaluate level of expertise in different areas of language such as semantics, morphosyntax, and vocabulary to assess level of proficiency and language dominance (e.g., Bedore et. al, 2012). One such task that measures vocabulary is picture naming. Picture naming tests evaluate verbal intelligence or vocabulary knowledge in each language and are frequently used to assess language proficiency in research (e.g., Sheng et. al., 2014; Gollan et. al., 2012, Cutting and Scarborough, 2006). Standardized naming tests for bilingual groups are emerging

(e.g., Sheng et. al., 2014; Gollan et. al., 2012), but research and development of naming test for Urdu is in preliminary stages (Panjwani, 2012).

Another measure that can be used as an objective measure of language proficiency is conversational samples or interviews evaluated by a native speaker of the language. One such protocol is exemplified by the oral proficiency interview (OPI), which is based on *American Council of Teaching Foreign Languages* (ACTFL) guidelines. ACTFL guidelines for OPI are a standardized procedure designed to categorize proficiency in multiple languages (Swender, Conrad, Vicars, 2012). OPI consists of a set of questions that are presented in interview format and are designed to require increasingly complex syntactic forms and elicit detailed language knowledge as the interview progresses (e.g., present tense to analytical thinking). These measures can be adapted to the language of interest and be effective as language proficiency measures; however, they have not been evaluated in detail or compared quantitatively to subjective measures in previous research for Urdu.

Previous studies have focused on other bilingual groups and evaluated the convergence of self-report and objective measures of proficiency and language dominance in each language. One such study by Gollan et. al. (2012) assessed fifty-two Spanish-English bilinguals (age range=19-36) and compared self-report spoken proficiency scores to scores on naming tests and OPI in order to evaluate convergence between these measures. OPI was self-rated on a 10 point scale from Novice Low (1) to Superior High (10) as per the ACTFL guidelines. The OPI was used in order to evaluate spoken language proficiency adapted from the guidelines of ACTFL, which was rated by

one bilingual and one multilingual rater. Finally, the Multilingual Naming Test (MINT) was developed and used in addition to the Boston Naming Test (BNT; Kaplan, Goodglass & Weintraub, 1983) in both languages as an objective measure of language proficiency (Gollan et. al., 2012).

Gollan et al. (2012) found that Spanish-English bilinguals were better at rating their Spanish proficiency than English proficiency when self-rating was pitted against the OPI and naming test scores. They were best at rating language dominance and were not as good at evaluating the degree they were balanced in both languages. Finally, young bilinguals were more objectively English dominant than objectively balanced or Spanish-dominant. Overall, Spanish-English bilinguals were able to determine their level of proficiency and degree of dominance to a significant degree; however, not perfectly (Gollan, et. al., 2012).

Another study by Sheng et. al. (2014) investigated Mandarin-English bilinguals and evaluated the convergence of self-ratings with objective measures in Mandarin and English using the MINT (Gollan et. al., 2012), OPI, and BNT (Kaplan, Goodglass & Weintraub, 1983). Sixty-two Mandarin-English bilinguals with a mean age of 21.14 years participated in the study and were asked to complete a language questionnaire similar to Gollan et. al. (2012) as well as the MINT in English and Mandarin, and the BNT in English and Mandarin. OPI was adapted to Mandarin and conducted in both languages with a Mandarin-English speaking experimenter. They found that Mandarin-English bilinguals were best at rating their language dominance and were similar in their ability to identify proficiency in English and Mandarin. They were not as effective at identifying

how balanced they were in both languages; however, bilingual index scores for self-rating were still significantly correlated with objective measures.

These studies have provided a descriptive framework for evaluating convergence of subjective and objective measures for other bilingual groups to fill gaps in research and begin to investigate implications for the clinical context. The current study parallels analysis of college age Spanish-English bilinguals by Gollan et. al. (2012) and Mandarin-English bilinguals by Sheng et. al. (2014) using similar types of measures and comparisons. The OPI was adapted to Urdu and a naming test was developed for Urdu and English as an objective measure to parallel the MINT (Gollan et. al., 2012). The findings of this study are based on data of 31 participants included in Panjwani (2012) and additional 15 participants collected after her graduation. Her thesis focused on presenting a naming test for Urdu-English bilinguals and validating it preliminarily.

The aim of this study is to expand upon the research by Gollan et. al. (2012) and Sheng et. al. (2014) to investigate the degree to which Urdu-English bilinguals are able to assess their proficiency and language dominance by comparing subjective measure of proficiency and dominance (i.e., self-reported oral proficiency level) to objective measures (i.e., naming tests and oral proficiency interviews). Specifically, this study aims to investigate how self-reported proficiency aligns with objective measures in English and Urdu; how self-report measures of language dominance and degree of bilingualism compare with corresponding objective measures for Urdu-English bilinguals; and finally, how cumulative language experience and current language use measures relate to objective and subjective measures of proficiency in Urdu-English bilinguals.

METHODS

Participants

A total of 46 bilingual (Urdu-English) young adults participated in the study. Data from thirty-one participants were incorporated from Panjwani (2012) and the remaining participants were recruited after her graduation in order to widen sample to include balanced and Urdu-dominant bilinguals. Participants were recruited through flyers posted around University of Texas at Austin that advertised for bilinguals who are proficient in both Urdu and English and announcement to student organizations and local professional organizations that have Urdu-speaking members. Participants who self-identified as Urdu-English bilinguals emailed the researcher to participate in the study. All participants presented with normal hearing, normal or corrected-to-normal vision, and no cognitive impairment. Participants received 15 dollars compensation for participation in the study.

Participants ranged from 18 to 29 years of age with a mean age of 20.87. Based on self-report on the language questionnaire, participants consisted of five balanced bilinguals, eight Urdu-dominant bilinguals, and 33 English-dominant bilinguals. Urdu-dominant speakers rated themselves as higher in speaking Urdu than English, balanced bilinguals had equivalent speaking scores, and English-dominant speakers rated themselves as higher in speaking English than Urdu. Average OPI English scores ranged from 5 to 10, and average OPI Urdu scores ranged from 3 to 10. Most participants (excluding five) reported using more English than Urdu in current day to day life. All participants reported speaking and listening to Urdu to some degree as they were growing up but fifteen participants had no experience reading Urdu. Finally, raw scores on the

English Peabody Picture Vocabulary Test- fourth edition (Dunn and Dunn, 2007) ranged from 174 to 217 (standard score= 79 to 123) with a mean score of 199.46 or standard score of 99.57. Participant's characteristics are detailed in Table 1.

Table 1. Participant Characteristics

Note. PPVT=Peabody Picture Vocabulary Test.

	M	SD	Min	Max
Age	20.8696	2.37214	18.00	29.00
Percentage English Use	.7613	.15315	.30	1.00
Percentage Urdu Use	.2389	.15335	0.00	.70
PPVT	199.4565	10.59498	174.00	217.00
English Naming Test (% correct)	49.7391	2.46247	44.00	53.00
Urdu Naming Test (% correct)	33.3913	8.70882	13.00	50.00
OPI English	8.1630	1.17404	5.00	10.00
OPI Urdu	7.6522	1.76342	3.00	10.00
English Self-rating	9.2283	1.00944	6.00	10.00
Urdu Self-rating	7.2283	1.72468	1.00	10.00
Cumulative English Hearing	46.6197	18.19552	8.33	96.43
Cumulative English Speaking	46.6701	17.62734	10.71	95.83
Cumulative English Reading	86.4704	16.37480	32.14	100.00
Cumulative Urdu Hearing	53.3803	18.19552	3.57	91.67
Cumulative Urdu Speaking	53.3299	17.62734	4.17	89.29
Cumulative Urdu Reading	13.5296	16.37480	0.00	67.86

Materials

Language History Questionnaire

This instrument consisted of questions about the participant's cumulative and current use of Urdu and English adapted from Kastenbaum et. al. (2015). To generate estimates of cumulative language use, participants answered questions on the percentage of each language they spoke in contexts of hearing, reading, and speaking from birth to present in three-year increments (e.g., 0-3 years, etc.) and had to select from among five choices: 100%English/0%Urdu, 75%English/25% Urdu, 50%English/50%Urdu, 25%English/75%Urdu, and 0%English/100%Urdu.

To generate estimates of current language use, participants were asked to list and describe activities they engaged in during a typical weekend day and weekend by hour and report what languages they heard and spoke during that time. As part of the questionnaire, participants rated their own proficiency level based on a 10 point scale modified from the American Council of Teaching of Foreign Languages, which included the distinctions: Superior (10), Advanced High (9), Advanced Low (7), Intermediate High (6), Intermediate Mid (5), Intermediate Low (4), Novice High (3), Novice Mid (2), and Novice Low (1). The extended guidelines can be accessed on the ACTL website under publications. Finally, the language questionnaire was provided in English.

Oral Proficiency Interview (OPI)

The oral proficiency interview is designed to assess conversational or speaking ability in a particular language by eliciting a variety of tenses and syntax. Based on the

format used in ACTFL, two sets of questions (one for each language) were used to conduct the OPI in Urdu and English. The question sets included six questions and excluded novice levels 1-3 as a certain level of proficiency was required for bilingual status and participation in this study. The first question assessed conversational ability using present tense. The second question involved describing a picture that was presented to the participant. The third and fourth questions involved conversing using past and future tenses. Finally, the last two questions involved higher level reasoning and included questions that required taking a stance and providing support. The assignment of question sets was counterbalanced.

Naming Test

The English naming test consisted of 53 items obtained from normed picture targets from International Picture-Naming Project database, which consists of 520 normed picture items (Bates et. al., 2000). The test items were different than items on the MINT (Gollan et. al., 2012). Preliminary inclusion criteria were as follows: words with 1-2 translations in each language and words with single word equivalents in both languages were included. Cognates of both languages were excluded. Three bilingual raters evaluated familiarity with words in each language using a 7 point scale (1=never; 7=very often) on an original set of 85 picture items. Based on average scores of raters, the items were arranged in the order of least familiar to most difficult. Pictures were presented on a computer using E-prime software, and participants were asked to name the picture that was presented.

Of the 85 items administered to participants, certain words were excluded to

create a psychometrically stronger test. Pictures/words with multiple incorrect responses from participants and with incorrect responses from individuals with high PPVT scores were excluded. Included and excluded words as well as percentage accuracy are provided in Appendix A and Appendix B. English naming test was validated against PPVT-fourth edition (Dunn and Dunn, 2007), which is a norm referenced, valid and reliable measure of verbal intelligence. On the PPVT participants are asked to select the picture out of four choices that correspond to the word stated by the examiner. The English naming test was significantly correlated with this measure ($r=.49$, $p<.001$). The Urdu naming test comprised of the same 53 items as the English naming test.

Procedure

Testing lasted from 1 to 1.5 hours and all testing for one language was conducted before switching to the other language. The order of testing language was counterbalanced across participants. After testing one language, an optional break was provided before moving on to the other language. The English testing session consisted of the OPI, followed by the PPVT, and finally the English naming test. The OPI was coded by an English rater and then a multilingual rater. The Urdu testing session consisted of the OPI followed by administration of the Urdu naming test. The OPI was coded by two multilingual raters, who spoke English, Urdu, Hindi, Kachchi and Gujrati, and English, Urdu, Hindi and Spanish, respectively. Both multilingual raters had near-native proficiency in Urdu. Proficiency ratings by English and multilingual raters were on a similar scale as the self-report on the Language Questionnaire (10 point scale). The inter-

rater correlations were high and significantly correlated for English for English ($r=.82$, $p<.001$) and Urdu ($r=.94$, $p<.001$). The average of two raters was used in data analysis. The Language Questionnaire was provided at the end of the sessions and was always presented in English.

Naming accuracy was recorded during administration of the naming test. Response was determined as correct if participant provided: alternate correct responses (e.g., "nail" for "screw"), correct responses with additional words (e.g., "paper bag" for "bag"), or phonologically related responses (e.g., "vell" for "well"). Alternate correct responses were accepted due to the similarity in visual representation of certain items. In addition, phonologically related responses were accepted because they are consistent with accent or pronunciation differences between Urdu and English speakers. The sessions were audio recorded.

RESULTS

Table 2 shows the mean and standard deviation scores in each language for three subgroups: English-dominant, balanced, and Urdu-dominant bilinguals. There were a total of 33 English-dominant, eight balanced, and five Urdu-dominant bilinguals. As expected, English-dominant bilinguals performed better on English objective measures than Urdu objective measures. Balanced bilinguals and Urdu-dominant bilinguals also performed higher on average in English rather than Urdu on the naming test. However, the discrepancy between the English and Urdu naming tests decreased for these two groups and was the smallest for Urdu-English bilinguals.

Table 2. Mean (M) and standard deviation (SD) of self-ratings, oral proficiency interview ratings, and naming tests in each language for each subgroup of bilinguals.

	Self-Rated Proficiency				**Oral Proficiency Interview**				**Naming Test**				**PPVT (raw)**	
Self-Rated Dominance	English		Urdu		English		Urdu		English		Urdu		English	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Urdu-dominant	7.6	0.89	9	0	6.5	1.12	9.6	0.55	47.2	1.30	44	4.06	187.6	5.03
Balanced	9.13	0.64	9.13	0.64	7.62	0.88	8.88	0.58	50.75	2.05	38.75	5.80	196.25	4.33
English-dominant	9.50	0.87	6.5	1.47	8.54	0.98	7.06	1.71	49.88	2.47	30.45	7.99	202.03	8.85

Note. PPVT=Peabody Picture Vocabulary Test, fourth edition.

Relationships Between Self-Rated and Objective Measures of Proficiency

Pearson bivariate correlational analyses were conducted between English subjective and objective measures to assess degree of convergence. The results of the correlational analyses are provided in Table 3. Self-ratings were significantly correlated with OPI ratings ($r=.399$, $p<.001$) as well as English naming ($r=.355$, $p<.05$) and PPVT scores ($r=.564$, $p<.001$). The English naming test was significantly correlated with PPVT

providing validity for the English naming test (r=.492, p<.001). The English naming test was also significantly correlated with the OPI (r=.419, p<.001), which also confirmed its validity.

Table 3. Pearson bivariate correlations between self-report and objective measures of English proficiency.

		OPI_English	English_Naming	PPVT
Self_English	Pearson Correlation	**.399****	**.355***	**.564****
	Sig. (2-tailed)	.006	.015	.000
OPI_English	Pearson Correlation		**.419****	**.634****
	Sig. (2-tailed)		.004	.000
English_Naming	Pearson Correlation			**.492****
	Sig. (2-tailed)			.001

Note. Self-English=self-rating of proficiency in English. OPI_English=oral proficiency interview in English. English_naming=English naming test. PPVT=Peabody Picture Vocabulary Test, 4th edition.

Pearson bivariate correlational analyses were also conducted to assess convergence between subjective and objective measures in Urdu. Results revealed significant correlations between self-ratings of proficiency and objective measures of Urdu proficiency. Self-ratings were the most strongly correlated with OPI (r=.768, p<.001) followed by Urdu naming test (r=.694, p<.001). The objective measures (Urdu naming test and OPI) were also highly correlated with each other (r=.762, p<.001).

Table 4. Pearson bivariate correlations between self-report and objective measures of Urdu proficiency.

		OPI	Naming Test
Self-rating (U)	Pearson Correlation	**.768****	**.694****
	Sig. (2-tailed)	.000	.000
OPI (U)	Pearson Correlation		**.762****
	Sig. (2-tailed)		.000

Relationships Between Self-reported and Objective Measures of Bilingual Dominance and Degree of Bilingualism

Language dominance scores were calculated by subtracting scores in Urdu from English on each measure. Bivariate correlational analyses revealed that self-ratings of language dominance were significantly correlated with language dominance scores based on the OPI ($r=.774$, $p<.001$) and naming test ($r=.737$, $p<.001$). Dominance scores on the two objective measures, the OPI and the naming test, were also correlated with each other ($r=.771$, $p<.001$).

Table 5. Pearson bivariate correlations between for self-report and objective language dominance scores.

		OPI	Naming Test
Self-rating	Pearson Correlation	**.774****	**.737****
	p-value	.000	.000
OPI	Pearson Correlation		**.771****
	p-value		.000

Bilingual index scores were evaluated to determine participants' ability to evaluate their extent of balanced proficiency and were calculated by dividing the score of the non-dominant language by the dominant language for each measure. Correlational analyses revealed that self-rating of bilingual index was significantly correlated with OPI ($r=.582$, $p<.001$) and naming test index scores ($r=.614$, $p<.001$). Finally, the objective measures were also significantly correlated with each other ($r=.356$, $p<.05$). Bilinguals seemed to be able to identify their degree of balanced proficiency but not to the extent they could evaluate language dominance.

Table 6. Pearson bivariate correlations between self-report and objective bilingual index scores.

		OPI Index	Naming Test Index
Self-Rating Index	Pearson Correlation	**.582****	**.614****
	Sig. (2-tailed)	.000	.000
OPI Index	Pearson Correlation		**.356***
	Sig. (2-tailed)		.015

The degree of overlap between self-ratings of dominance and objective measures were further evaluated by examining the classifications of individuals into dominance groups. The results are presented in Table 7. Of the five bilinguals who self-rated as Urdu-dominant, 100% were objectively evaluated as Urdu-dominant by OPI and 20% were objectively rated as Urdu-dominant by the naming test. Of the eight bilinguals who classified themselves as balanced bilinguals, 0% were evaluated as balanced by OPI or naming test. Finally, of the 33 bilinguals who rated themselves as English-dominant, 73.7% were evaluated as English dominant on OPI and 100% were evaluated as English dominant on the naming test.

Table 7. Percentage of bilinguals whose self-report aligned or differed from objective measures of dominance.

	Self-rated as Urdu-dominant (n=5)		
	Objectively Urdu-dominant	Objectively balanced	Objectively English-dominant
OPI	100%	0%	0%
Naming Test	20%	0%	80%
	Self-rated as balanced (n=8)		
OPI	87.5%	0%	12.5%
Naming Test	0%	0%	100%
	Self-rated as English-dominant (n=33)		
OPI	27.3%	0%	73.7%
Naming Test	0%	0%	100%

Figure 1 shows average level of language dominance for each subjective and objective measure. Based on self-ratings of proficiency, 71.7% percent rated themselves

as English dominant. Oral proficiency interview ratings revealed 45.7% percent English dominance. Finally, performance on the naming tests resulted in 97.8% English dominance. English dominance for self-rated proficiency fell in between oral proficiency interview and naming test.

Figure 2 presents the average bilingual index scores for each measure. Bilingual index scores revealed overall level of bilingualism or extent to which individuals are balanced in proficiency in both languages. Based on index scores, self-rated proficiency revealed that individuals on average had a bilingual index score of .759 or were 75.9% balanced. Oral proficiency interview ratings resulted in an average bilingual index score of .774. The naming test resulted in an average bilingual index score of .670.

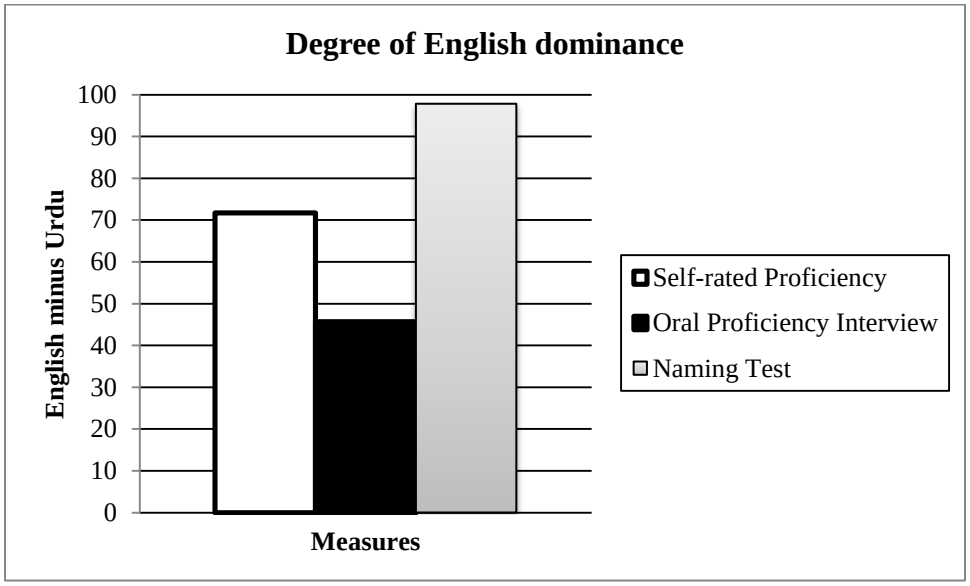

Figure 1. Average degree of dominance for subjective (self-report) and objective measures. Percentages were calculated by subtracting English scores from Urdu scores to obtain a percentage of English dominant participants.

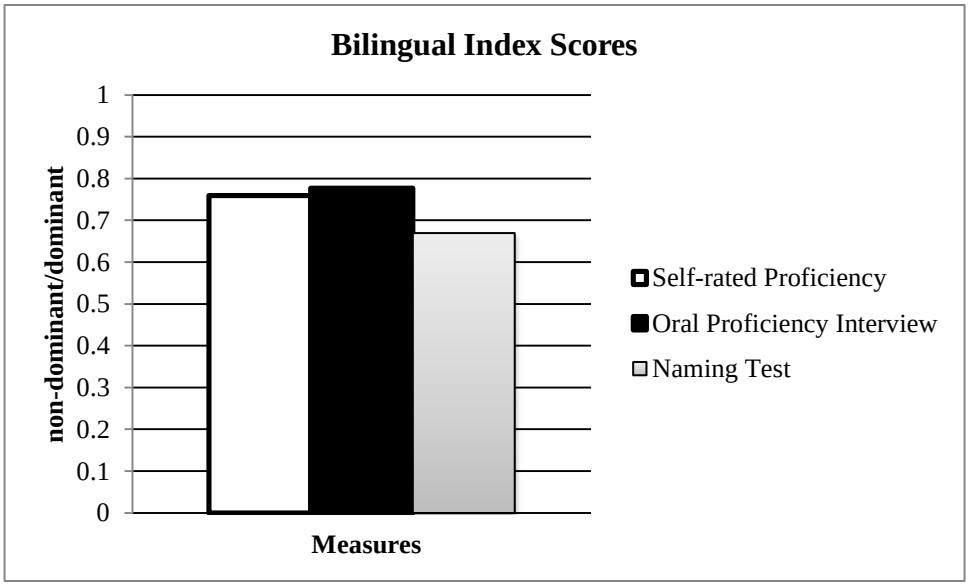

Figure 2. Average bilingual index scores for subjective (self-report) and objective measures. Bilingual index scores are calculated by dividing the score of the less proficient language over the score of the more proficient language.

Cumulative Exposure, Current Percentage Use Measures, and Proficiency Measures

To examine the relationship between cumulative and current language use and measures of proficiency, Pearson bivariate correlations were conducted. Results revealed that current English use was not significantly correlated with any objective or subjective measure. However, some cumulative exposure variables in English were significantly correlated with measures of proficiency particularly self-report and OPI. Self-report of English was significantly correlated with cumulative English hearing ($r=.333$, $p<.05$), cumulative English speaking ($r=.47$, $p<.01$), and cumulative English reading ($r=.536$, $p<.01$). Only cumulative English speaking and cumulative English reading were correlated with OPI in English ($r=.467$, $p<.01$; $r=.536$,$p<.01$) and PPVT ($r=.413$, $p<.01$;

r=.400, p<.01). Cumulative English reading was trending in the direction for English naming test (r=.279, p=.06).

Similarly for Urdu, current percentage use was not significantly correlated with proficiency measures. For cumulative exposure measures, cumulative Urdu hearing was not correlated with any of the objective measures. However, cumulative Urdu speaking was significantly correlated with Urdu naming test (r=.303, p<.05), and finally, cumulative Urdu reading was significantly correlated with self-report (r=.337, p<.05), OPI (r=.505, p<.01), and naming test (r=.503, p<.01).

Table 8. Pearson bivariate correlations on current use, cumulative exposure measures, subjective and objective measures in English.

		Self_English	OPI_English	English_Naming	PPVT
Current English Use	Pearson Correlation	.235	-.019	.003	-.107
	Sig. (2-tailed)	.116	.903	.986	.480
Cumulative English Hearing	Pearson Correlation	.333*	.210	.043	.285
	Sig. (2-tailed)	.024	.161	.778	.055
Cumulative English Speaking	Pearson Correlation	.467**	.413**	.058	.329*
	Sig. (2-tailed)	.001	.004	.700	.026
Cumulative English Reading	Pearson Correlation	.536**	.400**	.279	.339*
	Sig. (2-tailed)	.000	.006	.060	.021

Note. Self_English=self-rating of proficiency in English. OPI_English=oral proficiency interview in English. English_naming=English naming test.

Table 9. Pearson bivariate correlations on current use, cumulative exposure measures, subjective and objective measures in Urdu.

		Self_Urdu	OPI_Urdu	Urdu_Naming
Current Urdu Use	Pearson Correlation	.193	.217	.189
	Sig. (2-tailed)	.198	.148	.209
Urdu Cumulative Hearing	Pearson Correlation	.031	.079	.164
	Sig. (2-tailed)	.840	.601	.276
Urdu Cumulative Speaking	Pearson Correlation	.095	.143	.303*
	Sig. (2-tailed)	.530	.343	.041
Urdu Cumulative Reading	Pearson Correlation	.337*	.505**	.503**
	Sig. (2-tailed)	.022	.000	.000

Note. Self-Urdu=self-rating of proficiency in Urdu. OPI_Urdu=oral proficiency interview in Urdu. Urdu_naming=Urdu naming test.

DISCUSSION

When evaluating their proficiency levels in English and Urdu, Urdu-English bilinguals were relatively competent in evaluating their Urdu proficiency, level of dominance, and degree of bilingualism. Although not at the same level of competency, they were also able to provide valid estimates of their proficiency in English. When looking at correlations between self-report and objective measures, the r values are the largest for dominance score (.737 and .774) and Urdu proficiency (.694, .768), followed by the bilingual index scores (.582 and.614), and the smallest for English proficiency scores (.355, .399, .564).

Sheng et. al. (2014) found higher r values for language dominance (.81 and .83) followed by Mandarin proficiency (.68 and .65). These were followed closely by r values for bilingual index scores (.62 and .64) and English proficiency (.67, .58, .67). Finally, Gollan et. al. (2012) similarly found highest r values for language dominance (.585 and .605) followed by Spanish proficiency (.425 and .520) and closely by English proficiency (.281, .460, .504). Bilingual index scores for Spanish-English bilinguals were small and did not reach significance (.268, p=.055 and .265, p=.067). Overall, similar trends were seen with these three bilingual groups.

Measures of Proficiency

In terms of convergence of self-rated proficiency with objective measures of English and Urdu, results of this study found that there was a moderate but significant relationship between self-report with OPI and naming test in English. This suggests that

individuals were able to assess their level of proficiency in English to a moderate level. Results on Urdu objective and subjective measures suggest that they were even better at evaluating their language proficiency in Urdu based on significant and higher correlations on these measures for Urdu.

Many of these trends were similar to Sheng et al. (2014) where self-rated measures were significantly correlated with all objective measures in Mandarin and English. In addition, Urdu-English bilinguals had stronger correlations for Urdu proficiency measures similar to the trend in Mandarin. Gollan et. al. (2012) had similar trends with Spanish-English bilinguals for the self-rated and objective measures for English and Spanish including higher correlations for Spanish measures. It is possible that bilinguals are more aware of their lack of ability in heritage language as they do not use it as frequently. In addition, they may overestimate their ability in English perhaps because it may be used more frequently in daily life in the United States and perception of relative fluency may be inflated due to relatively lower proficiency in Urdu.

Measures of Language dominance and Degree of Bilingualism

Urdu-English bilinguals seemed to perform within the range of objective measures with their self-rating for language dominance. However, when English dominance was separated by measure, English dominance was highest for English naming test, followed by self-rating, and then by OPI. This suggests a bias for English dominance in the naming test. Sheng et. al. (2014) found similar results with a higher percentage for English dominance on the MINT, followed by self-rating, and finally OPI. Gollan et. al. (2012) similarly found that there was more of an English dominance in the

MINT; however, it was followed by OPI, and then self-rating suggesting that Spanish-English bilinguals were categorized as more English dominant on both objective measures as compared to self-report.

Sheng et. al. (2014) proposed some possible reasons for this bias. Firstly, naming may be a task that individuals perform better in their language of immersion (English) as dominance may change for this single-word task first. In addition, individuals may have lexical representations for words more available to them in the language of immersion (Sheng et. al., 2014). Bilinguals may be more attentive to and focused on mapping vocabulary in the language of immersion. Furthermore, fluency is a more difficult skill than picture naming, so picture naming may not holistically evaluate language proficiency to the same sensitivity as language interviews (Sheng et. al., 2014).

Based on average bilingual index scores by measure, participants were evaluated as more balanced in both languages based on the oral proficiency interview followed closely by self-ratings of proficiency. They were least balanced based on the naming test. This was consistent with the results of Gollan et. al. (2012). However, these findings were not consistent with Sheng et. al. (2014), who found that index scores were higher in self-ratings followed by OPI, and finally, MINT. However, the difference between the scores was very minimal suggesting level of balanced bilingualism did not vary significantly between measures for Mandarin-English bilinguals.

When pitted against objective measures, Urdu-English bilinguals were highly and significantly able to evaluate their language dominance. They were also significantly able to evaluate the degree to which they were bilingual, but to a lesser extent. These results

were also consistent with the results of Sheng et. al. (2014), who found strong and high correlations for language dominance for Mandarin-English bilinguals suggesting they are able to identify their language dominance to a high degree. Similarly, they also found lower but significant correlations for subjective and objective index scores. However, Gollan et al. (2012) found moderate significant correlations for language dominance for Spanish-English bilinguals and low, insignificant correlations for index scores. Perhaps due to the more pronounced differences in phonology and language structure between English and the second language (Urdu or Mandarin), participants were better able to distinguish their extent of bilingualism and language dominance in Urdu and Mandarin versus Spanish.

Evaluation of validity of self-ratings based on measures of dominance revealed that self-rated Urdu dominant and self-rated balanced bilinguals were more objectively Urdu dominant with OPI rather than naming test, which evaluated them as English dominant. However, Mandarin-dominant bilinguals were more objectively Mandarin dominant on both OPI and naming tests (Sheng et. al., 2014), and Spanish dominant bilinguals were categorized as more balanced. Despite this, all three bilingual groups trended towards higher English proficiency for the naming test more so than OPI in all three studies suggesting that there was a trend towards English bias on naming measures particularly for Mandarin-English and Urdu-English bilinguals. For self-rated balanced bilinguals, Sheng et. al. (2014) and Gollan et. al. (2012) found similar results where self-rated balanced bilinguals were evaluated as more English dominant on both objective measures. Finally, Urdu-English bilinguals who self-rated as English dominant were

more objectively English dominant on both measures, which was consistent with findings for Mandarin-English (Sheng et. al., 2014) and Spanish-English bilinguals (Gollan et. al., 2012).

Cumulative Language Experience and Proficiency Measures

Comparisons of percentage use, cumulative exposure, and proficiency measures suggested that cumulative reading exposure in a language is the best indicator of proficiency when compared to other cumulative measures (speaking and hearing). This is consistent with the idea that reading is a higher level language skill as language concepts have to be decoded in another domain. Cumulative speaking experience was related to proficiency in English for three measures (self-rating, OPI, PPVT) but only for naming test in Urdu; however, cumulative hearing exposure was less associated with proficiency in English (only for self-report) and not at all associated for Urdu proficiency measures. This is consistent with the idea that hearing experience is much less indicative of proficiency as it requires less language knowledge than speaking as phonological retrieval and formulating sentences is not required in hearing.

Interestingly, current percentage use is not a good indicator of proficiency. It was not associated with proficiency measures at a level of significance. Current use may be more reflective of the demands of the participants' current linguistic environment. Participants may experience a drastic change in their language use patterns upon moving to a new country or leaving home to attend college. Therefore, it is possible to use less of a language in daily life at a certain point, but still be highly proficient in the language. On

the other hand, lifetime exposure is more representative of one's proficiency in a language as it is developed over time.

Exposure variables also seemed to validate Urdu naming measures specifically reading and speaking. Surprisingly, Urdu speaking and Urdu reading were significantly negatively correlated with PPVT. This is likely due to the fact that with increased exposure or knowledge of Urdu, the likelihood that the individual is English dominant theoretically decreases. Finally, based on the validity of the English and Urdu naming test, this study can also propose a naming test that caters to this prominent language group. This will be discussed in more detail in the next section.

Efficacy of Self-Report

This study highlights the importance of multiple measures of language dominance and language proficiency in order to obtain a holistic reflection of an individual's language abilities. Although objective measures were highly and significantly correlated in many cases with self-report and between each other, there are some instances of clear bias and discrepancies between these scores. Furthermore, self-report measures provide descriptive perspectives of language use in multiple contexts as well as exposure, which are aspects to consider especially for clinical purposes such as brain injury. Individuals who experience chronic aphasia experience an increased quality of life when able to communicate and therefore participate in meaningful activities which may require both languages (Kohnert, 2013).

Finally, naming tests for children who speak Urdu and English are needed to evaluate specific language impairment and distinguish with second language learners.

Bilingual children who are not impaired frequently perform similarly to children with language impairment especially when evaluated in their second language (Kohnert, 2013), which for these children would be English. Therefore, holistic measures of proficiency in heritage languages are essential when trying to cater to the functional needs of the individual with brain injury as well as children with language disorders.

FUTURE DIRECTIONS

An important extension and contribution of this study is the proposal of a potential naming test for English and Urdu bilinguals. Similar to many other languages, there are limited number of tests that accurately evaluate bilinguals, and they frequently have to rely on translators and other less reliable methods of evaluation that decrease efficacy of the measure (e.g., Peña, 2007; Vijver and Hambleton, 1996). This is particularly problematic during times of duress and in the presence of clinical difficulties or brain injury such as stroke or TBI when both language areas need to be rehabilitated. In order to ethically treat bilinguals, it is essential to treat both languages, so they can functionally communicate in areas of their life that require Urdu (e.g., communicating with friends, cultural activities, religious gatherings).

Although psychometrically still developing, this test can be used as a framework in order to develop a comprehensive and normed test for Urdu speakers. Currently, the naming test does reveal a moderate level of validity when compared to the PPVT ($r=.492$, $p<.001$). To further strengthen this measure psychometrically, a larger sample size would be required in order to evaluate its validity in the larger spectrum. In addition, validity could be further evaluated by comparing to other measures such as assessments of verbal intelligence (e.g., Hodapp and Gerken, 1999). Furthermore, the test would need to be conducted on only Urdu speakers as well as more Urdu-dominant speakers. The population evaluated in this study was more skewed to English-dominant speakers. In addition, a more detailed psychometric analysis of responses would be required and the

test may need to be further adjusted in order to more reliably evaluate naming skills.

This test also has meaningful implications for the pediatric population. Children exhibiting language impairment, who have grown up speaking Urdu in the United States, similarly do not have access to these assessment tools. In addition, children learning English can often be confused with children struggling with language skills as bilingual children tend to perform similarly to children with specific language impairment when tested in their second language (e.g., Paradis and Crago, 2000). False diagnosis is exacerbated when compared to a monolingual standard (e.g., Peña, Iglesias, and Lidz, 2001). Standardized tests normed on bilingual populations will yield more accurate diagnosis when assessing bilingual children (Peña, Gutiérrez-Clellen, Iglesias, Goldstein, and Bedore, 2014).

Furthermore, the naming test can be a useful measure to evaluate vocabulary knowledge and assess areas or needs for intervention. In fact, children with SLI do not develop 50 word to 100 word vocabulary at milestone for typically developing children (Girolametto, Wiigs, Smyth, Weitzman, and Pearce, 2001). Since low vocabulary skills are a key distinguisher of SLI, a standardized naming measure would be particularly valuable for assessment of Urdu-English bilingual children. In addition, this will efficiently distinguish children with specific language impairment from bilinguals who are still learning English, which is frequently an area of concern especially in highly diverse schools.

Although in its preliminary stages, the current English and Urdu naming test provides a basis for creating a larger scale naming test that caters to Urdu speakers. Not

only will this be beneficial to evaluate level and area of deficit in individuals who have clinical needs, but it will also be useful for treatment purposes and targeting goals for individuals with such language deficits. In fact, MINT (Gollan et. al., 2012) has been shown to accurately identify language deficits in Alzheimer's dementia (Ivanova, 2013). Such studies can be conducted in order to modify and evaluate this naming test on individuals with Alzheimer's dementia, stroke, and Traumatic Brain Injury, and for SLI in children. These findings can also be further expanded to other areas where assessment of language proficiency levels are crucial such as travel abroad programs, ESL teaching, or careers in language testing.

APPENDIX A

Words included in Naming Test and Percent Accuracy:

English Word	Percent Correct	Urdu Word	Percent Correct
arrow	100	teer	34.7826087
bag	95.65217391	theela	36.95652174
beard	91.30434783	bhaari	76.08695652
bone	100	haddi	80.43478261
box	100	dabba	86.95652174
bride	97.82608696	dulhaan	76.08695652
cane	82.60869565	chaari	26.08695652
car	100	gaari	97.82608696
castle	93.47826087	quila	10.86956522
chain	91.30434783	zanjeer	28.26086957
cheese	97.82608696	paneer	39.13043478
chest	89.13043478	seenha	47.82608696
clock	97.82608696	gharee/ghanta	82.60869565
comb	95.65217391	kangi	89.13043478
crab	78.26086957	kekra	28.26086957
donkey	89.13043478	gadha	65.2173913
drum	100	dhol	58.69565217
egg	100	andaa	97.82608696
elephant	97.82608696	haathi	84.7826087
fan	100	paankha	84.7826087
feather	82.60869565	par	26.08695652
fire	97.82608696	aag	97.82608696
fish	100	machi/machhli	86.95652174
girl	97.82608696	larki	86.95652174
hair	97.82608696	baal	95.65217391
kite	100	patang	69.56521739
lamp	100	chaargh	2.173913043
letter	91.30434783	khat	71.73913043
microscope	73.91304348	khurdbeen	4.347826087
mouse	95.65217391	chooha	82.60869565
nail	82.60869565	kheel	50
paper	93.47826087	kaaghaz	76.08695652

parrot	95.65217391	toota	63.04347826
pillow	95.65217391	takiya	69.56521739
present	95.65217391	tohfa	80.43478261
rain	93.47826087	baarish	97.82608696
Road	95.65217391	sarhak	78.26086957
rock	95.65217391	patthar	76.08695652
rope	100	rasi	63.04347826
salt	95.65217391	namak	73.91304348
screw	80.43478261	painch-kass	10.86956522
stairs	97.82608696	seehri	82.60869565
swing	95.65217391	jhoola	80.43478261
tear	97.82608696	anshoo	84.7826087
telescope	89.13043478	durbeen chaari	21.73913043
thumb	100	angtha	71.73913043
tiger	86.95652174	sher	47.82608696
volcano	100	aatish-fishaan	13.04347826
well	93.47826087	kunwah	47.82608696
whistle	93.47826087	seethe	78.26086957
window	97.82608696	khirkhi	89.13043478
witch	86.95652174	churail	60.86956522
wood	76.08695652	lakhri	63.04347826

APPENDIX B

Words removed from Naming Test with Original Percent Accuracy:

star	86.9565	seterah/tarah	71.7391	scissors	97.8261	qainchi	73.913
roof	78.2609	chaat	71.7391	monkey	95.6522	bandhar	78.2609
mirror	97.8261	aina	95.6522	wheat	34.7826	gandum	13.0435
floor	63.0435	zameeni	89.1304	broom	93.4783	jaarhu	84.7826
boy	78.2609	larka	69.5652	bird	91.3043	parinda	73.913
towel	82.6087	tolia	69.5652	walnut	67.3913	akhroot	43.4783
teeth	82.6087	daant	97.8261	squirrel	95.6522	gulhari	21.7391
stove	93.4783	choolah	67.3913	city	84.7826	shehr	76.087

butter	91.3043	maakni	65.2174	leaf	93.4783	patta	65.2174
bucket	93.4783	baalti	65.2174	ghost	97.8261	bhoot	73.913
balloon	95.6522	bughaara	50	curtains	89.1304	pardah	56.5217
needle	65.2174	sui	73.913	queen	80.4348	rani	78.2609
soldier	65.2174	sephai	34.7826	lizard	82.6087	chipkali	80.4348
peas	80.4348	matar	58.6957	king	95.6522	badshaah	82.6087
mountain	84.7826	pahaarh	69.5652	handcuffs	84.7826	hathkari	52.1739
magnet	93.4783	maqnaatis	17.3913	camel	95.6522	oont	63.0435

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