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**Generative Naming in Vietnamese-English Bilingual Speakers**

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**Generative Naming in Vietnamese-English Bilingual Speakers**

**by**

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**Thesis**

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## **Dedication**

This thesis is dedicated to my loving family. Especially to my parents, Tan and Tuyet-Hoa, and my siblings, Tin and Thuy, whose unconditional love, care, and support has shaped my values and has encouraged me to conquer my goals.

I also dedicate this work to my wonderful friends and cohort for their companionship and motivation. The memories that I have made with you all will be cherished for a lifetime.

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## **Abstract**

### **Generative Naming in Vietnamese-English Bilingual Speakers**

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The University of Texas at Austin, 2015

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This study examined generative naming in Vietnamese-English bilingual adults with three specific objectives: 1) to compare the total number of items generated by Vietnamese-English bilingual speakers in each language in the categories of *food*, *clothes*, and *animals*, 2) to examine the relationship between language proficiency and the participants' performance on the generative naming tasks, and 3) to evaluate the effect of language proficiency levels on the total number of overlapped items named in each category and across categories. Thirty Vietnamese-English bilingual adult speakers named as many items as possible in Vietnamese and English in three categories (*food*, *clothes*, and *animals*) given 60 seconds per category. Results indicated that the participants generated significantly more items in English than in Vietnamese for all categories. Findings suggested that the language used affected the performance in the category of *clothes*, but not in the categories of *food* and *animals*. No category effects on the total number of items generated in English and Vietnamese were found, suggesting that the participants named a similar number of items across all categories in each

language. Data analysis did not reveal significant correlations between language proficiency ratings and participants' performances on category fluency tasks. Future studies may consider using more sensitive language proficiency measures for bilingual speakers.

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## INTRODUCTION

The Vietnamese population in the United States is 1,548,449, which represents 0.5% of the total population (Nguyen, 2011). The Vietnamese population is the 4<sup>th</sup> largest among the Asian population groups in the U.S. and increased 37.9% between the years 2000 to 2010. Projections indicate that an additional 3.4 million adults will have had a stroke by 2030, which is a 20.5% increase in prevalence from 2012 (Oybiagele, Goldstein, Higashida, Howard, Johnston, Khavjou, Lackland, Lichtman, Mohl, Sacco, Saver, & Trogdon, 2013). The combination of the increase of Vietnamese-English bilinguals and the increased prevalence of cerebrovascular incidents produce a significant number of Vietnamese-English speaking adults with aphasia in the U.S. Thus, there is a demand for valid assessments and treatment options for this population. Vietnamese-English speakers may refuse to seek health services due to factors including lack of translator available, fear of not being understood by health care providers, and fear of not being able to understand written and verbal instructions by providers (D'Avanzo, 1992). Vietnamese-English individuals with aphasia tend to be an underserved population in regards to speech language therapy due to the scarcity of research in the area of Vietnamese-English language disorders and the lack of Vietnamese-English aphasics seeking treatment.

Speech-language pathologists often work with bilingual clients. Understanding language disorders in bilingual speakers is important knowledge for clinicians to have in order to develop effective assessment procedures, provide the best treatment options, and to identify factors to determine prognosis. Valid and reliable assessments of Vietnamese-English bilinguals are vital for identifying language disorders in the Vietnamese

population; however, literature investigating Vietnamese-English speakers with language impairment is scarce.

### **LINGUISTIC FEATURES OF VIETNAMESE**

Vietnamese is a syllable timed-language in which each syllable follows a similar pattern and duration to the next syllable whereas English is a stress-based language where stressed syllables occur at intervals (Ngo & Tran, 2001). Additionally, Vietnamese is a tonal language in which word meaning is differentiated by pitches or contour signals marked by diacritics in the writing (/ \ ? ~ .). These diacritics are placed above certain vowels except “.” which is placed below the vowel. In Vietnamese, pitches influence the meaning of words whereas in English pitch is used primarily when formulating questions.

Vietnamese lexicon is mostly made up of simple words, which are monosyllabic (Ngo & Tran, 2001). Reduplication, the process of creating a new word by repeating either a whole word or part of a word, is often used in Vietnamese to create new meanings. Reduplication is frequently used to intensify or weaken an adjective. Reduplicated words are composed by phonetic reduplication (e.g: trắng/white - trắng trắng/whitish). Compound words are composed by semantic coordination (e.g: quần/pants, áo/shirts = quần áo/clothes). Complex words are phonetically transcribed from foreign languages (e.g: cà phê/ coffee from the French *café*).

Vietnamese is an isolating language, which means that it lacks morphological marking of case, gender, number, and tense (Ngo & Tran, 2001). For instance, English has different verb tenses while in Vietnamese, a word is added to the verb or a different verb is used to indicate the tense. The English language typically indicates plurality by adding an “s” to the end of the word. Vietnamese uses various adjectives or a number before the noun to indicate plurality.

## **APHASIA**

Aphasia is a neurogenic disorder caused by lesions in the brain that regulate the reception and expression of language. Various language functions become disordered or limited depending on the location and severity of the injured area of the brain. Naming deficits are a universal language deficit for individuals with aphasia. Word production and comprehension are critical processes necessary for effective communication. Word finding involves the understanding of lexical semantic processing (Abhishek & Rao, 2013). Semantic organization is the way that knowledge about the world is represented with words, and lexical retrieval is the process by which words are accessed (Hillis, 2001). Word finding difficulties, also known as anomia, may occur when semantic and lexical systems are disordered in aphasia.

## **GENERATIVE NAMING**

Generative naming, also referred to as semantic fluency or category fluency, is a common method of assessing semantic and lexical retrieval in individuals with aphasia. Abhishek & Rao (2013) defined generative naming tasks as spontaneous elicitation of names in a particular semantic category. The test administrator names a specific semantic category and the participant is asked to name items in the category. Individuals with aphasia typically find generative naming to be a more difficult task because the speaker is constrained to a semantic category whereas in confrontation naming the speaker labels a specific item in response to a picture (Abhishek & Rao 2013).

Generative naming tasks frequently are used to assess semantic knowledge in individuals with acquired neurological disorders such as dementia, traumatic brain injury or aphasia. For example, the Western Aphasia Battery (WAB) includes a task where the participant is asked to list as many animals as they can in 120 seconds. The Boston Diagnostic Aphasia Examination (BDAE) (Goodglass, Kaplan, & Barresi, 2001)

includes a similar naming task in the semantic category of animals. Other assessments that involve generative naming tasks include the Arizona Battery for Communication Disorders in Dementia (Bayles & Tomoeda, 1991), the Scales of Cognitive Ability for Traumatic Brain Injury (SCATBI) (Adamovich & Henderson, 1992), and the Cognitive Linguistic Quick Test (CLQT) (Helms-Estabrooks, 2001).

To determine a framework that can be used to evaluate the degree of impairment in bilingual speakers, a premorbid baseline representing generative naming in neurologically normal bilingual speakers is needed. Studies have investigated generative naming in different normal bilingual populations. Roberts & Le Dorze (1998) investigated semantic verbal fluency in French-English bilingual adults. Pena, Bedore, Zlantic-Giunta (2002) examined category fluency in English-Spanish bilingual children. Selezneva (2009) studied generative naming in Russian-English speaking individuals and Kim (2010) studied generative naming in Korean-English bilingual adults. Results from studies have indicated that verbal and category fluency for bilingual speakers is similar in the native language and second language (Roberts & Le Dorze, 1998; Pena et al., 2002).

Language proficiency level and dominance is expected to influence category fluency of bilingual speakers (Edmonds & Kiran, 2004; Gutierrez-Clellen & Kreiter, 2003). The higher the proficiency is in a specific language, the more semantic items the person is able to generate in that language. Additionally, the greater the equivalence of proficiency in each language, the greater the number of overlapped items within semantic categories is expected. The overlap between languages for adult bilinguals ranged from 44% to 60% (Roberts & Le Dorze, 1998), whereas the overlap between languages for bilingual children was 28% (Pena et al., 2002). A possible explanation for the low frequency of doublets (i.e., word forms represented in both languages, also known as translation equivalents or cross-language synonyms) produced by children could be that

at a young age the emphasis is on acquiring unique words with a developmental shift toward accumulating more doublets (Pena et al., 2002). Additional research investigating the relationship between category fluency, language proficiency, and degree of item overlap is needed to better understand the influence of language proficiency on category generation.

## **PURPOSE**

Understanding the nature of bilingualism will help speech-language pathologists better serve the increasing bilingual population in the United States. Additionally, generative naming in Vietnamese-English bilingual adults has not yet been examined. The purpose of this study was to investigate generative naming in Vietnamese-English bilingual adult speakers to establish a framework that could be used as diagnostic measures for neurologically impaired adults within this population. The study aimed to 1) compare the total number of items generated by Vietnamese-English bilingual adults in each language in three categories (*food, clothes, and animals*), 2) examine the relationship between language proficiency and the participants' performance on the generative naming tasks, and 3) evaluate the effect of language proficiency levels on the total number of overlapped items named in each category and across categories.



## **METHODOLOGY**

### **PARTICIPANTS**

Thirty Vietnamese-English bilingual adults (16 females and 14 males) between 18 and 27 years of age participated in the study (Mean=20.83, SD=2). Participants were primarily students attending college or employed in the Austin, Houston or Dallas area. Two participants were born in Vietnam and 28 participants were born in the United States. The mean years of education was 16.23 years (SD=1.87) with participants reporting at least 12 years of education. Participants had been exposed to English for more than 10 years, were able to speak both Vietnamese and English, and did not report a history of cognitive or language disorders, brain damage, or other neurological deficits.

**Table 1. Demographic and language proficiency characteristics of Vietnamese-English bilingual participants**

ID	Age	Gender	Country of Origin	Overall Vietnamese Proficiency	Overall English Proficiency	More than 10 yrs Exposure to English	Years of Education
1	23	F	United States	3	5	Yes	18
2	22	M	Vietnam	4	5	Yes	18
3	21	M	United States	3	5	Yes	16
4	20	F	United States	4	5	Yes	17
5	20	F	United States	2	5	Yes	15
6	22	F	United States	3	5	Yes	17
7	18	F	United States	2	5	Yes	14
8	18	F	United States	3	5	Yes	12
9	19	F	United States	2	5	Yes	14
10	21	F	United States	4	5	Yes	16
11	22	F	United States	2	5	Yes	17
12	21	M	United States	2	5	Yes	15
13	18	M	United States	2	5	Yes	18
14	19	F	United States	2	5	Yes	14
15	21	M	United States	3	5	Yes	16
16	18	M	United States	3	5	Yes	14
17	20	M	United States	3	5	Yes	14
18	20	M	United States	3	5	Yes	16
19	20	M	United States	1	4	Yes	16
20	23	F	United States	3	5	Yes	19
21	22	M	United States	3	5	Yes	19
22	19	F	United States	5	5	Yes	15
23	21	M	United States	4	5	Yes	18
24	27	F	Vietnam	3	5	Yes	17
25	21	M	United States	4	5	Yes	16
26	22	F	United States	3	5	Yes	17
27	24	F	United States	4	5	Yes	20
28	22	M	United States	3	5	Yes	17
29	19	F	United States	3	5	Yes	14
30	22	M	United States	4	5	Yes	18

## **PARTICIPANT LANGUAGE PROFICIENCY**

Participants' bilingual status and language proficiency level in Vietnamese and English were measured using the Language Use Questionnaire (Munoz, Marquardt, & Copeland, 1999) (see Appendix A). Brown (2001) defined questionnaires as “any written instruments that present respondents with a series of questions or statements to which they are to react either by writing out their answers or selecting from among existing answers” (p. 6). Questionnaires are a common data collection method in second language research because they are simple to construct, easily adaptable, and capable of gathering a large amount of information in a form that is ready for immediate processing (Dörnyei & Taguchi, 2009). Additionally, they are cost effective and are efficient in regards to researcher time and effort. Research suggests that self-assessments, self-ratings scales, and questionnaires are generally valid and reliable methods for obtaining language histories accurately and efficiently (Dörnyei & Taguchi, 2009; Ross, 1998). The Language Use Questionnaire used in the present study included participants' language proficiency ratings in both languages, self-reports of their daily use of each language, and years of education.

In the language proficiency section of the Questionnaire, participants rated their Vietnamese and English proficiency level based on a scale from 1 (non-native fluency) to 5 (native fluency). Self-rated participant responses on the Vietnamese proficiency scale ranged from two to five (mean=3, SD=0.87) and responses on the English proficiency scale ranged from four to five (mean=4.97, SD=0.18). The ratings for sub-domains in language proficiency (speaking and listening in casual conversation, speaking and listening in formal conversation, reading and writing) are shown in Table 2. The averages of ratings for Vietnamese were lower than for English in all categories of language proficiency.

**Table 2. Participants' average language proficiency in sub-domains**

	Speaking (Casual)	Listening (Casual)	Speaking (Formal)	Listening (Formal)	Reading	Writing
Vietnamese Average	3.13	3.6	2.37	2.70	1.87	1.67
Vietnamese SD	1.11	1.10	1.03	1.26	1.14	1.03
English Average	5	5	4.87	4.93	4.97	4.83
English SD	0	0	0.43	0.25	0.18	0.46

## PROCEDURES

Each participant was asked to complete category generation tasks. The categories included *food*, *clothes*, and *animals* in Vietnamese and English. Table 3 includes examples of each category. Participants were asked to name as many different items as possible in a minute in each of the three categories. The order in which languages and categories were presented was randomized across participants to control for order effects. Instructions for each task were presented in the same language as the task (i.e., instructions for Vietnamese naming of *animals* was presented in Vietnamese).

**Table 3: Items in the category fluency task**

Category	English	Vietnamese
Food	Tell me all the foods you know. You have one minute. Are you ready? Start now.	Em nói cho chị mấy cái đồ ăn mà em biết. Em có một phút thôi. Ready? Bắt đầu.
Clothes	Tell me all of the clothes you can think of. You have one minute. Are you ready? Start now.	Em nói cho chị mấy cái quần áo mà em biết. Em có một phút thôi. Ready? Bắt đầu.
Animals	Tell me all the animals you can think of. You have one minute. Are you ready? Start now.	Em nói cho chị mấy cái động vật mà em biết. Em có một phút thôi. Ready? Bắt đầu.

\*The administrator used alternative pronouns (“Em”, “Chị” or “Anh”) to address participants depending on the participant’s age and gender. In Vietnamese, “em” is used when speaking to someone younger than you, “chi” is used when speaking to an older female, and “anh” is used when speaking to an older male.

Twenty of the test sessions were conducted by a Vietnamese-English bilingual student in the speech language pathology program at the University of Texas at Austin.

This investigator (Investigator 1) was a 21-year-old female who was born in the United States and had lived there her entire life. Ten of the test sessions were conducted by a different Vietnamese-English bilingual graduate student in the speech language pathology program at the University of Texas at Austin. This investigator (Investigator 2) was a 24-year old female who was born in Vietnam and had lived in the United States for 22 years. The administrators completed the same questionnaire used to determine language proficiency for the participants in order to establish their own proficiency rating. Investigator 1 had a self-rated overall Vietnamese proficiency of 3 and overall English proficiency of 5. Investigator 2 had a self-rated overall Vietnamese proficiency of 3 and overall English proficiency of 5.

Participants participated in two sessions up to an hour long on two separate days, ranging from six to 14 days apart. General instructions for test tasks were explained in English and instructions for each category task were explained in the same language as the specific task. The instructions were repeated, if requested by the participant, to ensure complete understanding of the task. Additionally, each participant practiced an example task using a category of *colors* to ensure knowledge of the procedures. Participants were encouraged to continue responding with verbal cues or prompts (e.g. “You have more time”) or visual prompts (e.g. nodding) if they stopped naming before 60 seconds. An example of the task procedures is provided in Appendix B. Participants’ responses were audio-recorded on Microsoft Word (audio notes tool) using the microphone from a Macbook Pro laptop. Participants were paid \$15 dollars for each session after signing a study consent form and an individual receipt for the distributed funds. Responses from participants were recorded and transcribed for later analysis of results.

## **DATA ANALYSIS**

### **RELIABILITY**

Participants' responses on the generative naming tasks were transcribed, translated, and coded in Microsoft Word 2011 by Investigator 2 and two Vietnamese-English bilingual undergraduate assistants. Investigator 2 entered participants' performance on the tasks in Microsoft Excel. To calculate intrajudge reliability, responses of three randomly selected participants were re-translated and re-transcribed. Percentage of matched words was calculated by subtracting the number of word disagreements from the total number of word agreements and then dividing that amount by the total number of words in each coding. Intrajudge reliability of transcriptions and codes was 100%.

To establish interjudge reliability, Investigator 2 re-transcribed data from four randomly selected participants from participant data assigned to the undergraduate coders (2 from each undergraduate coder). Investigator 2 compared her transcriptions with original transcriptions entered by the undergraduate assistants. Transcription reliability was computed for approximately 13% of the data and was 98% for Vietnamese and 100% for English.

### **WORD CATEGORY ASSIGNMENTS**

Responses from participants were transcribed verbatim. Vietnamese words were translated into English to allow direct comparison of the number of items produced in each category. Online dictionaries and resources were used to translate Vietnamese items into English equivalents in order to determine the optimum translation equivalence. *Google Translate* and *Vdict.com* were used for references. *Google Search Engine* was used to compare the correct definition of the labels. All translations were determined

based on the researcher's judgment in order to identify corresponding American-English terms.

Homogenization rules were utilized to assign variations of common semantic concepts into a single term in order to standardize the concepts within and between participants (See Table 4). The homogenization rules for lexical and semantic items were based on the rules described by Selezneva (2008) and Kim (2010). All the rules from Selezneva were preserved for the Vietnamese-English responses except the adjective reduction rule, which preserved only the noun when a lexical item included a qualitative adjective in the *food* category. Participants named many specific menu meal items in addition to ingredients and thus, these items were considered as separate semantic concepts. For example, if a participant named “canh chua (sour soup)” and “canh bi (winter melon soup),” these two items were counted as different lexical items. Category membership rules from Selezneva (2008) were also used to facilitate category item assignment.

After identification and application of inclusionary criteria, exclusionary criteria and category error assignments were applied. Two error codes, inaccuracy codes and redundancy codes, described in Selezneva (2008) were implemented to assess the responses from the Vietnamese-English participants (See Table 5). The inaccuracy codes included language error, non-word error, and category error. Responses were considered incorrect if participants code-switched to the non-target language, named non-existent words, and responded to non-category items. Responses were considered a redundancy if an item was repeated or an item was a superordinate term followed by subordinate terms. For example, if the participant named ‘chicken, grilled chicken, fried chicken, and baked chicken,’ the term ‘chicken’ was considered a superordinate and was removed from the data. The present study removed a minor section of the Superordinate Category Code rule



used in the Selezneva (2008) study, which stated that an item is assumed to be a superordinate trigger “only if that item is a superordinate category name, and it is followed by the subordinate category within the next 2 item names” (p. 19). The presence of any subordinate items following a superordinate, regardless of the distance between them, resulted in removal of the superordinate item in the present study.

**Table 4. Summary of the rules for translation, homogenization, and category membership**

<b>Rule</b>	<b>Description</b>	<b>Examples</b>
<i>Translation</i>		
Vietnamese to English language	All translations were made based on the researcher's judgment of common American-English labels for all semantic concepts taken from the above listed sources.	In Vietnamese: "áo thun" was translated as "T-shirt" (American-English dialect).
<i>Homogenization</i>		
Plurality marking	All subordinate lexical items that were named in plural form(s) were changed into their singular form(s). This rule did not apply to the superordinate items named.	In English: "dogs" became "dog." In Vietnamese: this rule was applied after the items named in Vietnamese were translated to English language, thus it did not apply to the Vietnamese items.
Gender marking	ANIMALS: Items in English were transcribed as male, female, or genderless animal labels. Items in Vietnamese which had gender marking inflections were translated as male and female forms and transcribed as two separate semantic items. Items in Vietnamese which lacked gender marking were transcribed as the English genderless equivalent. Note: Only cats were not distinguished by gender. <i>food</i> : All gender marking forms were collapsed into the semantic concept they represented. CLOTHES: This rule did not apply to this category.	ANIMALS: In English: form-"rooster" (male), "hen" (female), "chicken" (neutral label). In Vietnamese: "gà trống" (rooster), "gà mái" (hen), "gà" (chicken). <i>food</i> : All "chicken, hen, and rooster" were collapsed into "chicken."
Diminutive reduction	All items containing diminutive forms were reduced to their uninflected noun form.	In English: "Kitties" was reduced to "cat." In Vietnamese: "bướm bướm" (diminutive form of butterfly) was reduced to "con bướm" (butterfly).

**Table 4. Summary of the rules for translation, homogenization, and category membership (continued)**

Word order	Items that were longer than one word and contained qualitative descriptions of the whole item itself, were transcribed with (1) the description of the item, then (2) the main item; however, if the descriptor words were describing a part of the main item, the word order was switched to state the (1) main item, (2) the word “with,” (3) the part of the main item the description was attributed to, and (4) the descriptor words.	Main item description: The item “mini skirt” was transcribed as “mini skirt” because the word “mini” describes the main item- “skirt.” A part of the main item description: the item “ <i>long sleeve shirt</i> ” was changed to “ <i>shirt with long sleeves</i> ” because the word “long” is describing not the main item, which is “shirt,” but a part of the main item- “sleeves.”
Word variants	Lexical items, named in either language, that portrayed a clear semantic concept but did not match the common term for that concept, were given a commonly used lexical label for the corresponding semantic concept.	In English: “ <i>training wear</i> ” was changed to a “ <i>sports wear</i> ”.
Semantic completion	If an item, named in either language, was followed by one or more feature descriptions of that item (without stating the main item along with the descriptions), all descriptions were attributed to the item named immediately before the stated features. The named features were then transcribed with the initial item label added to the feature description	In English: “ <i>long, short pants</i> ” were changed to “ <i>long pants, short pants.</i> ”
Reduction of non-content words	Utterances accompanying the main items (content word) that did not contribute to the meaning or description of the main item were deleted.	In English: “ <i>all kinds of vegetables</i> ” was reduced to “ <i>vegetables.</i> ” In Vietnamese: “ <i>tất cả các loại trái cây</i> ” (all kinds of fruit) was changed to “ <i>trái cây</i> ” (fruit).

**Table 4. Summary of the rules for translation, homogenization, and category membership (continued)**

<i>Category Membership</i>		
	<b>Examples of Included Items</b>	<b>Examples of Excluded Items</b>
Food	All raw and cooked food items (e.g. potato, French fries), recipe ingredients and condiments (e.g. ketchup), names of prepared dishes (e.g. Pho/Vietnamese noodle soup), and superordinate food category labels (e.g. seafood) were accepted.	Chinese buffet
Clothes	Categories of undergarments, outerwear, casual wear, formal wear, and shoes were included. This category also included clothing garments from any time period, cultural clothing items, belts, and headwear. Active wear and swimwear such as bathing suits, swim trunks, and flip-flops were accepted.	Accessories such as glasses, jewelry, hair care, and bags. Gear such as space gear, diving gear (including footwear), beach accessories (e.g. towel, sunscreen), and specific weather related accessories (e.g. umbrella, sunglasses) were excluded.
Animals	All animal labels (including “ <i>people</i> ” and “ <i>apes</i> ”). Adult and child forms of the same animal type (cat, kitten or cow, calf) were counted as separate semantic concepts. “Dragon” was included because of its high reference as an animal in both cultures and its existence in the Vietnamese zodiac.	Mythological creatures (e.g. “ <i>leprechaun</i> ”) and proper names (e.g. “ <i>Shamu</i> ”) were excluded.

**Table 5. Summary of error codes**

<b>Error Codes</b>	<b>Description</b>	<b>Example</b>
<i>Inaccuracy Codes</i>		
Language error (LE)	Use of the wrong language in a category (code-switching).	Naming Vietnamese items when asked to name items in English and vice versa. “Pho” was accepted in both languages since most people use the label “pho” rather than “noodle soup” in English.
Non-Word error (NE)	A non-existent word (neologism)	“ <i>Tapiaci</i> ” in the food category.
Category error (CE)	An item in the target language that does not belong in the target category.	“ <i>Necklace</i> ” (an accessory) as a clothing item.
<i>Redundancy Codes</i>		
Repeated Word (RW)	Repetitions of an already named item within a category.	“ <i>Cat, dog, horse, cat.</i> ” The repetition of the word “ <i>cat</i> ” is a repeated word error.
Superordinate Category (SC)	The superordinate category named to trigger the subordinate items in that category.	Naming a superordinate and one or more subordinates in a single category (e.g. “ <i>meat, chicken, beef, steak, pork</i> ” in the food category). “ <i>Meat</i> ” is considered an error. However, if “ <i>meat</i> ” was named with no subordinates, then “ <i>meat</i> ” would not be an error and is counted as correct.

## RESULTS

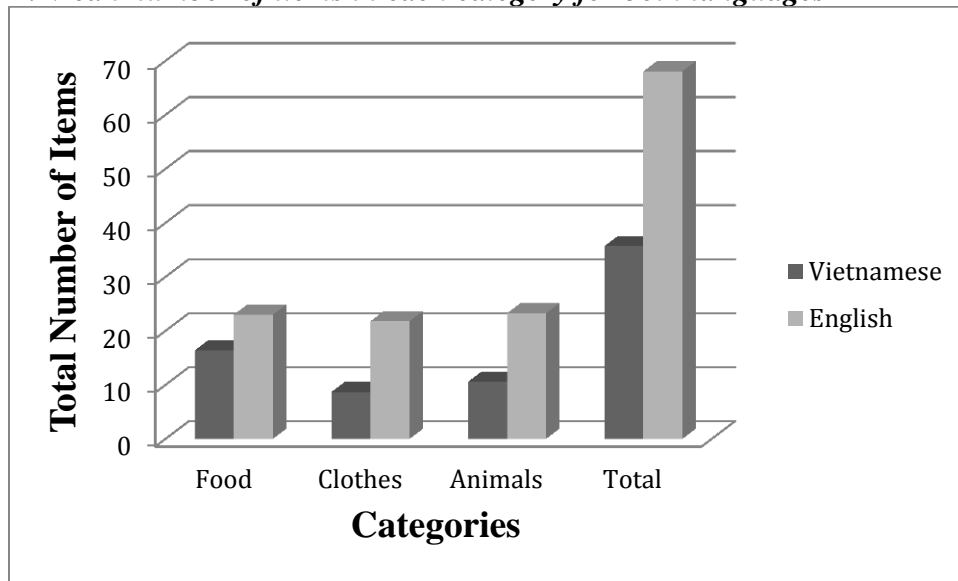
The total number of items produced in each of the three categories in Vietnamese and English by the participants is shown in Table 6.

**Table 6. Total number of items named by participants across categories and languages**

ID	Vietnamese				English			
	Food	Clothes	Animals	Total	Food	Clothes	Animals	Total
1	16	13	16	45	29	21	25	75
2	12	8	13	33	17	22	25	64
3	17	8	5	30	27	24	27	78
4	18	8	15	41	17	22	17	56
5	22	11	10	43	21	24	25	70
6	19	14	12	45	34	25	23	82
7	17	4	8	29	27	17	20	64
8	15	7	6	28	25	18	20	63
9	16	3	7	26	21	23	18	62
10	19	12	18	49	28	26	30	84
11	12	5	9	26	26	18	24	68
12	14	9	13	36	22	18	25	65
13	10	3	9	22	17	14	21	52
14	22	18	11	51	35	27	30	92
15	6	0	4	10	14	15	26	55
16	13	5	11	29	18	17	18	53
17	9	2	2	13	11	20	15	46
18	20	10	12	42	24	30	23	77
19	19	12	17	48	25	32	23	80
20	16	3	6	25	17	23	20	60
21	13	7	14	34	28	20	28	76
22	24	18	22	64	20	24	15	59
23	16	11	9	36	18	19	22	59
24	27	17	14	58	30	27	26	83
25	20	7	11	38	13	21	17	51
26	8	9	11	28	23	18	22	63
27	18	11	9	38	32	24	33	89
28	18	11	9	38	23	24	24	71
29	13	6	10	29	28	20	26	74
30	23	9	5	37	20	21	30	71
Mean	16.4	8.7	10.6	35.7	23	21.8	23.27	68.07
SD	4.87	4.62	4.43	11.94	6.16	4.20	4.60	11.90

The first objective of this study was to examine the relationship between the total number of items produced by Vietnamese-English bilingual adults in each language in the categories of *food*, *clothes* and *animals*. A preliminary comparison of the datasets above revealed that participants produced more items in English than Vietnamese across all the categories. The mean number of total items named in Vietnamese was 35.7, the mean number of total items in English was 68.07. The category with the most named items was *food* in Vietnamese (mean = 16.4) and *animals* in English (mean = 23.27). The *clothes* category had the least number of items named in both Vietnamese (mean = 10.6) and English (mean = 21.8) (See Table 6 and Figure 1).

**Figure 1. Mean number of items in each category for both languages**



Pearson product-moment correlation coefficients were calculated to determine the relationship between the total number of items produced in Vietnamese and English

for the three categories: *food*, *clothes*, and *animals* (See Table 7). The correlation between the total number of items named in Vietnamese and the total number of items named in English across all categories was statistically significant ( $r = 0.565$ ,  $p = 0.001$ ). Correlation analyses for each category found a significant correlation for the *food* and *clothes* categories ( $r = 0.380$ ,  $p < 0.05$  and  $r = 0.641$ ,  $p < 0.05$  respectively), but not the *animals* category ( $r = 0.005$ ,  $p > 0.05$ ).

**Table 7. The Pearson product moment correlation coefficients for the total number of items produced in Vietnamese and English**

	Food	Clothes	Animals	Total
Correlation between Vietnamese and English	0.380 ( $p < 0.05$ )	0.641 ( $p < 0.05$ )	0.005 ( $p > 0.05$ )	.565 ( $p < 0.05$ )

Pearson product moment correlation coefficients also were computed for the number of concepts named in each category for the two languages: *food* and *clothes*, *food* and *animals*, and *clothes* and *animals* (See Table 8). The correlation analysis in Vietnamese displayed significant correlations between the total number of items generated for *food* and *clothes*, *food* and *animals*, and *clothes* and *animals*. However, correlation analysis between the categories in English revealed significant correlations between the numbers named in the categories of *food* and *clothes* and *food* and *animals*. However, the categories of *clothes* and *animals* were not found to demonstrate a significant correlation.



**Table 8. Pearson product moment correlation coefficients for the number of items produced for the three main categories in each language**

Correlation	Food/Clothes	Food/Animals	Clothes/Animals
Vietnamese	.740 (p<0.05)	.407 (p<0.05)	.661 (p<0.05)
English	.413 (p<0.05)	.612 (p<0.05)	.230 (p>0.05)

Two-way analyses of variance with repeated measures were used to examine the effects of language and category on the total number of items generated and the interaction between language and category. The results of the two-way ANOVA revealed significantly more words named in English than in Vietnamese, which suggests that there is a language effect on the number of concepts produced regardless of category ( $F=222.22$ ,  $df=1$ ,  $p<0.05$ ). The results also revealed significant effects for category on the total number of items named regardless of language ( $F=12.85$ ,  $df=2$ ,  $p<0.05$ ). There also was a significant interaction between the factors of language and category ( $F=8.41$ ,  $df=2$ ,  $p<0.05$ ), indicating that one or more combinations of language and category also have a significant effect on participant performance.

Post-hoc one-way ANOVAs were used to explore differences in the number of items named within categories for Vietnamese and English and between categories within each language (See Table 9). The first analysis compared the number of items in Vietnamese and the number of items in English within each category. The analysis revealed a significant difference in the category of *clothes* ( $F=5.589$ ,  $p<0.05$ ), but not in the categories of *food* ( $F=0.942$ ,  $p>0.05$ ) and *animals* ( $F=0.562$ ,  $p>0.05$ ). Thus, significantly more words were produced in English than in Vietnamese for *clothes*; however, there was not a significant difference between Vietnamese and English for the

number of items named in *food* or *animals*. The results suggest that language affects participant performance in the category of *clothes*, but not *food* or *animals*. A possible explanation for this phenomenon would be that since all of the participants have lived in the United States for most or all of their lives, they have had more exposure to different types of American clothing items. Thus, their knowledge of clothing items in English is more diverse and extensive than their knowledge of clothing items in Vietnamese. For example, participants named trendy and modern clothing items such as, “crop top,” “jeggings” and “romper” in English whereas no translational equivalents for these items were produced in Vietnamese. The participants are more familiar with *food* and *animals* category vocabulary in both languages in comparison to clothing items. Further examination of the influential variables on the category of *clothes* (i.e. word frequency, item familiarity, and item functionality) in various cultures may provide further explanation for this finding. Because the categories of *food* and *animals* were not affected by language, these categories would be good measures to include in future generative naming studies.

The second post-hoc one-way ANOVA compared the total number of items generated in Vietnamese and English for the following generative naming category groupings: *food* and *clothes*, *clothes* and *animals*, and *animals* and *food*. The analysis revealed no significant difference between any of the category combinations in both Vietnamese and English. However, the significance value for the categories *food* and *clothes* in Vietnamese approached significance ( $p=0.077$ ). These post-hoc results suggest that the participants produced a similar number of concepts in all three categories in both

languages. However, the number of items produced in the categories *food* and *clothes* in Vietnamese may have a larger difference than the other category combinations. A possible explanation for the larger difference between *food* and *clothes* in Vietnamese could be related to frequency of use and amount of different concepts. Food items are more frequently used in daily life and participants were able to name a high number of different Vietnamese food items by mainly naming different main dishes, entrees, and specific snacks (i.e. thick Vietnamese noodle soup, shaking beef with rice, sour soup), whereas clothing items are less variable and less frequently used.

**Table 9. Post-hoc comparisons for categories in Vietnamese and English**

Factor combinations		<i>F</i> value	<i>P</i> value
Vietnamese Food to	English Food	0.942	0.552
Vietnamese Clothes to	English Clothes	5.589	<b>0.001</b>
Vietnamese Animals to	English Animals	0.562	0.850
Vietnamese Food to	Vietnamese Clothes	2.178	0.077
Vietnamese Clothes to	Vietnamese Animals	1.289	0.326
Vietnamese Animals to	Vietnamese Food	0.844	0.631
English Food to	English Clothes	1.340	0.290
English Clothes to	English Animals	1.855	0.121
English Animals to	English Food	1.347	0.283

\*Significant *P* values are bolded on this table.

The second objective of this study was to examine the effect of language proficiency ratings on the total number of items generated in each category for each language. A participant would be expected to name more concepts in a language the more proficient he or she is in that language. A preliminary analysis of the self-rated overall language proficiencies showed that the participants demonstrated higher overall language

proficiency ratings in English than Vietnamese. Thus, a prediction could be hypothesized that the analysis will reveal a significant correlation between overall language proficiency scores in each language and the participants' performance in the generative naming tasks.

Pearson product moment correlation coefficients were utilized to examine the relationship between the participants' overall language proficiency in Vietnamese and the total number of concepts named in Vietnamese in each of the three categories: *food*, *clothes*, and *animals* (See Table 10). The correlation analysis revealed that Vietnamese proficiency did not show significant correlation with the number of items produced in the categories: *food*, *clothes*, and *animals* ( $r = 0.187, 0.214, 0.206$ ). Pearson product moment correlation coefficients also were used to explore the relationship between the participants' overall language proficiency in English and the total number of concepts named in English in each of the three categories: *food*, *clothes*, and *animals*. Correlation analysis revealed that the *food* and *animals* categories demonstrated no significant correlation with the number of items produced in the *food* and *animals* categories ( $r = -0.061, r = 0.011$  respectively); however, the *clothes* category had a significant correlation with English language proficiency ( $r = -0.459$ ). Taken altogether, these results are contradictory to the proposed hypothesis that language proficiency will have an effect on the number of items produced in that language. An explanation for the lack of correlation between language proficiency scores and participant performance values is that the self-rated language proficiency ratings may not validly reflect participants' language proficiency.

**Table 10. Pearson product moment correlation coefficients for overall language proficiency and the number of items produced in each category**

Proficiency	Food	Clothes	Animals
Vietnamese	0.187 (p>0.05)	0.214 (p>0.05)	0.206 (p>0.05)
English	-0.061 (p>0.05)	-0.459 (p<0.05)	0.011 (p>0.05)

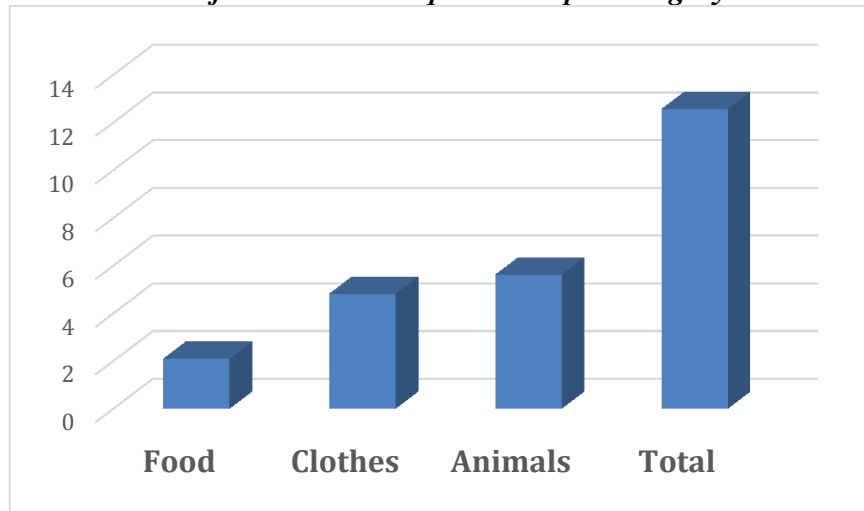
The third objective of this study was to examine the effect of the difference between Vietnamese and English language proficiency on the total number of identical items (doublets) named in each category. Participants are expected to generate more numbers of doublets within a category if they have a smaller difference in language proficiency between Vietnamese and English. Doublets for each category were calculated by summing the number of translation equivalents. Doublet was defined as an item named both in Vietnamese and its translational equivalent in English. Doublets (translation equivalents) were words that described the same semantic concepts. For instance, if a participant named “bread, soup, rice” in Vietnamese and “soup, cheese, pasta” in English within the *food* category, the number of doublets would equal 1 because the participant named “soup” in both languages. The total number of doublets was the sum of the number of doublets in all three categories of *food*, *clothes*, and *animals* (See Table 11).

In order to obtain a difference score between the Vietnamese and English overall proficiencies, the Vietnamese overall proficiency score was subtracted from the English overall proficiency score for each participant. Participants all rated higher scores in English than Vietnamese. Thus, all of the difference scores were positive.

**Table 11. Number of doublets in each category**

ID	Overlap			Total
	Food	Clothes	Animals	
1	5	8	6	19
2	0	6	5	11
3	5	3	5	13
4	1	2	9	12
5	1	6	7	14
6	1	7	8	16
7	3	3	6	12
8	4	5	4	13
9	1	1	3	5
10	2	5	11	18
11	1	4	6	11
12	1	6	5	12
13	0	3	8	11
14	1	11	11	23
15	0	0	3	3
16	4	4	4	12
17	1	0	1	2
18	3	6	6	15
19	6	8	8	22
20	0	2	3	5
21	6	2	6	14
22	2	8	8	18
23	1	3	6	10
24	2	11	2	15
25	3	4	5	12
26	1	3	3	7
27	2	6	6	14
28	1	6	3	10
29	3	4	6	13
30	2	8	5	15
Mean	2.1	4.833333333	5.633333333	12.56666667
SD	1.748891274	2.841603886	2.428044954	4.931834193

**Figure 2. Mean number of translational equivalents per category**



Pearson product moment correlation coefficients were calculated to examine the relationship between the proficiency difference scores and the total number of doublets produced in each category and for the combined categories (See Table 12). The correlation analysis revealed no significant correlations between proficiency difference scores and the total number of doublets produced across all categories. Three out of four of the correlations were negative. The results from this analysis do not support the hypothesis that the participants would produce more doublets if the difference between their language proficiency levels were smaller. An explanation for this result is the lack of sensitivity of the language proficiency measures used in this study. Thus, future research may consider incorporating other measures of proficiency such as standardized vocabulary assessments, age of second language acquisition, educational history, more in-depth self-ratings, and ratings from family members to corroborate information provided by participants.

*Table 12. Pearson product moment correlation coefficients for the participants' proficiency differences and the number of category doublets*

	Food	Clothes	Animals	Total
Proficiency	0.027 (p>0.05)	-0.048 (p>0.05)	-0.059 (p>0.05)	-0.047 (p>0.05)



## SUMMARY & CONCLUSION

### SUMMARY

The purpose of this study was to examine semantic knowledge of Vietnamese-English bilingual adults on the basis of generative naming tasks and to investigate the relationship between the participants' semantic knowledge and language proficiency.

The first goal of this study was to examine the relationship between the total number of items generated by Vietnamese-English bilingual adults in each language in three categories (*food*, *clothes* and *animals*). The data revealed that the participants produced more items in English than Vietnamese across all three categories. Participants produced more items in English possibly due to prolonged residential exposure to American culture and higher language proficiency in English. However, participants were able to name a high number of different Vietnamese food items by mainly naming different main dishes, entrees, and specific snacks (i.e. thick Vietnamese noodle soup, shaking beef with rice, sour soup) whereas food items in English were more general (i.e. noodles, beef, soup). In both languages, the participants named fewer items in the category of *clothes* than in the categories of *food* and *animals*, which suggests that naming clothing items was more difficult than naming various foods or animals. However, participants' generation of animals (mean = 10.6) in Vietnamese was just slightly above their production of clothing items (mean=8.7), whereas generation of food items was much higher (mean = 16.4). In English, generation of clothing items (mean = 21.8) was lower compared to generation of food (mean = 23) and animal (mean = 23.27) items, which shared averages that were numerically more similar.

Additionally, the results suggested that the language used affects the performance in the category of *clothes*; however, the language used does not affect the performance in the *food* and *animals* category. Although participants produced the least items in the

*clothes* category for both languages, they produced notably fewer items for clothes in Vietnamese. Thus, there was a significant difference between the numbers of items for *clothes* produced in Vietnamese versus English. This finding suggests that the categories of *food* and *animals* might be good measures to include in future generative naming studies because these categories were not affected by language. A possible explanation for this result would be because the participants' knowledge of clothing items in English is more diverse and extensive than their knowledge of clothing items in Vietnamese. Bilingual individuals may generate different items in certain categories across languages based on the amount of exposure they have to items as a result of their various experiences (Pena, Bedore, & Zlantic-Giunta, 2002). The participants are more familiar with *food* and *animals* category vocabulary in both languages in comparison to clothing items. Further examination of the influential variables on the category of *clothes* (i.e. word frequency, item familiarity, and item functionality) in various cultures may provide further explanation for this outcome.

Findings also suggest no category effect on the total number of items generated in English and Vietnamese. Thus, the participants generated a similar number of items across all the categories of *food*, *clothes* and *animals* in English and also across all three categories in Vietnamese.

The second goal of the current study was to investigate the relationship between language proficiency and the participants' performance on the generative naming tasks. The Vietnamese-English bilingual participants reported higher language proficiency in English than Vietnamese and generated more items in English than Vietnamese across all categories. Thus, this supports the validity of the self-rated proficiency scales on the questionnaire completed by each participant. However, the correlations between Vietnamese language proficiency and the total number of items named in Vietnamese in

each category were not significant. The correlations between English language proficiency revealed an unexpected negative correlation in the *clothes* category and a lack of correlation in the *food* and *animals* categories. Overall, these results imply that the proficiency measure used in this study appeared to be an insufficient measure used to predict the participants' performance on the category naming tasks.

The third goal of this study was to investigate the correlation between language proficiency and the total number of overlapped items (doublets) named in each category and across categories. The smaller the difference between a participant's language proficiency levels, the more doublets they would be expected to generate. The correlation analysis found no significant relationship of the proficiency difference scores and the total number of doublets produced in each category across all categories (*food*, *clothes* and *animals*). This finding suggests that the proficiency difference scores may not be a reliable reflection of the actual difference between the two languages' proficiency levels.

## CONCLUSION

The present study first examined semantic knowledge in Vietnamese and English of Vietnamese-English bilingual adults in the United States. The results of the study provide useful evidence about semantic knowledge in neurologically normal individuals who speak Vietnamese and English. Three main findings include: 1) On average, participants named more items in English than Vietnamese, 2) a similar number of items were generated across all the categories of *food*, *clothes* and *animals* in English and also across all three categories in Vietnamese, and 3) the categories of *food* and *animals* might be good measures to include in future generative naming studies to control for the effect of language.

This study's major limitation was the use of language proficiency measures with inadequate sensitivity. The self-rating scales of the Language Use Questionnaire used in the present study were not perceptive enough to capture the performance differences in generative naming tasks. Future research may use more extensively divided rating scales that may more accurately capture an estimate of language proficiency. For example, future studies may incorporate rating scales with a wider range from 1 (non-native) to 20 (native). Edmonds & Kiran (2006) recognized the limitations of self-reporting and suggested inclusion of interviewing a family member familiar with the participant's language history in order to validate information provided by participants. Luo, Luk, & Bialstok (2010) also indicated that subjective self-report proficiency measures are not sensitive enough to detect the differences revealed by objective, standardized measures of proficiency. Standardized assessments to measure an individual's language proficiency may include the *Peabody Picture Vocabulary Test-Third Edition (PPVT-3)*, Dunn & Dunn, 1997) and the *Expressive Vocabulary Test-Second Edition (EVT-2)*, Williams, 2007). Gray & Kiran (2013) suggest that all language studies on bilingual individuals should include thorough language history questionnaires detailing the participant's language patterns across their entire life. The present study relied solely on self-ratings of language proficiency. Further research may incorporate standardized language proficiency assessments in addition to supplementary information provided in the Language Use Questionnaire (i.e. educational history, age of second language acquisition and use of languages in daily life) to describe participants' language proficiencies.

The data obtained in the present study may be extended to other studies related to bilingual Vietnamese-English speakers and generative naming tasks. Comparison of individuals with aphasia and neurologically normal individuals with a comparable language acquisition history is necessary to determine how language history influences

the interpretation of language loss in bilinguals (Muñoz and Marquardt, 2003). Thus, further research on generative naming in Vietnamese-English bilinguals with aphasia is warranted in order to expand our understanding of semantic processing in Vietnamese-English bilinguals. A better understanding of language processing in Vietnamese-English speaking adults will assist in the development of valid assessments and treatment options for neurologically impaired individuals in addition to helping speech-language pathologists better serve the Vietnamese-English speaking community.

## APPENDIX A: LANGUAGE USE QUESTIONNAIRE

### Language Use Questionnaire

This questionnaire is related to the amount of English and your other language (specify) \_\_\_\_\_ you have been exposed in your life. Please cross the box that best describe the percentage of the other language or English you have been exposed in the given age range. If you were exposed only to one language in a specific age range, please select the 100% box for that language.

**Directions:** From the following age ranges please select which language you heard, spoke and read the most. For example, if you indicate you heard English 75% of the times between the age range 6-9, it means that you heard the other language the remaining 25% of the times.

Age	L A N G U A G E Y O U H E A R D T H E M O S T				
	Other language 100%	25 English/75 other	50/50	75 English/25 other	English 100%
<b>0-3</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>3-6</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>6-9</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>9-12</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>12-15</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>15-18</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>18-21</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>21-24</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>24-27</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>27-30</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>30 and up</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<b>L A N G U A G E Y O U <b>S P O K E</b> T H E M O S T</b>					
	<b>Other language 100%</b>	<b>25 English/75 other</b>	<b>50/50</b>	<b>75 English/25 other</b>	<b>English 100%</b>
<b>Age</b>					
<b>3-6</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>6-9</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>9-12</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>12-15</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>15-18</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>18-21</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>21-24</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>24-27</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>27-30</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>30 and up</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>L A N G U A G E Y O U <b>R E A D</b> T H E M O S T</b>					
	<b>Other language 100%</b>	<b>25 English/75 other</b>	<b>50/50</b>	<b>75 English/25 other</b>	<b>English 100%</b>
<b>Age</b>					
<b>3-6</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>6-9</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>9-12</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>12-15</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>15-18</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>18-21</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>21-24</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>24-27</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>27-30</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>30 and up</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Directions:** . From the following age ranges please indicate which language gave you the most confidence when speaking, hearing and reading it. Confidence does not mean the language you used the most. It means the language that gave you the most self-confidence when speaking, listening or reading. For example, it might be possible that between 9-12 years of age you heard English at school and your other language at home. However, you felt more self-confident when hearing your other language than English. If you were exposed to only one language in a specific age, answer for the exposed language only.

		<b>CONFIDENCE IN HEARING</b>				
		Not confident	25% confident	50% confident	75% confident	Strong confident
Age	Language					
3-6	English	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6-9	English	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9-12	English	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12-15	English	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15-18	English	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18-21	English	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21-24	English	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24-27	English	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27-30	English	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30 and up	English	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



		<b>CONFIDENCE IN SPEAKING</b>				
		Not confident	25% confident	50% confident	75% confident	Strong confident
<b>Age</b>	<b>Language</b>					
<b>3-6</b>	<b>English</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>Other</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>6-9</b>	<b>English</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>Other</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>9-12</b>	<b>English</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>Other</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>12-15</b>	<b>English</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>Other</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>15-18</b>	<b>English</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>Other</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>18-21</b>	<b>English</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>Other</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>21-24</b>	<b>English</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>Other</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>24-27</b>	<b>English</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>Other</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>27-30</b>	<b>English</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>Other</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>30 and up</b>	<b>English</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>Other</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

		<b>CONFIDENCE IN READING</b>				
		Not confident	25% confident	50% confident	75% confident	Strong confident
<b>Age</b>	<b>Language</b>					
<b>6-9</b>	<b>English</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>Other</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>9-12</b>	<b>English</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>Other</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>12-15</b>	<b>English</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>Other</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>15-18</b>	<b>English</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>Other</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>18-21</b>	<b>English</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>Other</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>21-24</b>	<b>English</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>Other</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>24-27</b>	<b>English</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>Other</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>27-30</b>	<b>English</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>Other</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>30 and up</b>	<b>English</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>Other</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Directions:** For activity, include what you are engaged in (e.g., breakfast, work, etc). For partners, include who is interacting with you in the given activity (e.g., mother, grandfather, siblings, etc.). For language(s), use **O** for Other language, **E** for English, **B** for both.

Home Language Profile/Routine: During Week

Time	Activity	Conversation Partner(s)	Language(s)	
			Partner	Participant
7am			O E B	O E B
8am			O E B	O E B
9am			O E B	O E B
10am			O E B	O E B
11am			O E B	O E B
12pm			O E B	O E B
1pm			O E B	O E B
2pm			O E B	O E B
3pm			O E B	O E B
4pm			O E B	O E B
5pm			O E B	O E B
6pm			O E B	O E B
7pm			O E B	O E B
8pm			O E B	O E B
9pm			O E B	O E B
10pm			O E B	O E B
11pm			O E B	O E B

**Directions:** For activity, include what you are engaged in (e.g., breakfast, work, etc). For partners, include who is interacting with you in the given activity (e.g., mother, grandfather, siblings, etc.). For language(s), use **O** for Other language, **E** for English, **B** for both.

Home Language Profile/Routine: Weekend

Time	Activity	Conversation Partner(s)	Language(s)	
			Partner	Participant
7am			O E B	O E B
8am			O E B	O E B
9am			O E B	O E B
10am			O E B	O E B
11am			O E B	O E B
12pm			O E B	O E B
1pm			O E B	O E B
2pm			O E B	O E B
3pm			O E B	O E B
4pm			O E B	O E B
5pm			O E B	O E B
6pm			O E B	O E B
7pm			O E B	O E B
8pm			O E B	O E B
9pm			O E B	O E B
10pm			O E B	O E B
11pm			O E B	O E B

**Directions:** Write the age intervals (in years) when your parents have lived in the countries stated below. If they have lived all their life in one country please indicate which country.

	<b>Father</b>	<b>Mother</b>
<b>United States</b>		
<b>Other country</b> (specify the country)_____		
<b>All their life in</b> (specify the country)_____		
<b>Not applicable</b>		

Please rate the ability of the following people in each language. Specify the other language\_\_\_\_\_.

		<b>Proficiency rating</b>				
		<b>Not confident</b>	<b>25% confident</b>	<b>50% confident</b>	<b>75% confident</b>	<b>Strong confident</b>
	<b>Language</b>					
<b>Mother</b>	<b>English</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>Other</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Father</b>	<b>English</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>Other</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Siblings</b>	<b>English</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>Other</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**II. Educational History:**

How many years of education have you had? \_\_\_\_\_

<i>What was the language you used at school during:</i>	<b>Other</b>	<b>English</b>	<b>Both</b>
Elementary?	1	2	3
High school?	1	2	3
College?	1	2	3
<i>Which language did you prefer to speak at school during:</i>			
Elementary?	1	2	3
High school?	1	2	3
College?	1	2	3
<i>What language did other students speak at school during:</i>			
Elementary?	1	2	3
High school?	1	2	3
College?	1	2	3

Were you taught in any additional languages?      YES   NO

If so, which language(s)?

Have your language use patterns changed in the last five years? If yes, How?

## Language Ability Rating

I would like to understand how comfortable you are in English and your other language. Please circle the number that best represents your ability to communicate in each speaking and listening situation. Numbers range from **1** (non-fluent, only know several words or a few simple sentences) to **5** (fluent, completely comfortable with skills like a native speaker).

<b><u>English</u></b>	Non- fluent			Native Fluency	
Overall ability	1	2	3	4	5
Speaking in casual conversations	1	2	3	4	5
Listening in casual conversations	1	2	3	4	5
Speaking in formal situations	1	2	3	4	5
Listening in formal situations	1	2	3	4	5
Reading	1	2	3	4	5
Writing	1	2	3	4	5

<b><u>Other language</u></b>	Non- fluent			Native Fluency	
Overall ability	1	2	3	4	5
Speaking in casual conversations	1	2	3	4	5
Listening in casual conversations	1	2	3	4	5
Speaking in formal situations	1	2	3	4	5
Listening in formal situations	1	2	3	4	5
Reading	1	2	3	4	5
Writing	1	2	3	4	5

## APPENDIX B: EXAMPLE OF TASK PROCEDURES

### Session 1

Thanks for volunteering for our study. This is the first session and it will take about forty minutes.

We're studying vocabulary and language and so the tasks include vocabulary tasks. The task is to name all of the items you can think of in a certain category. You will have one minute. If the instructions are in Vietnamese, please respond with items in Vietnamese. If the instructions are in English, please respond with items in English. All your responses will be audiotaped. Do you have any questions?

First, let's go through an example. Name all of the colors you can think of. You will have one minute. Are you ready? (*Wait for response.*) Start now.

Do you have any questions? Now let's begin.

Language	Task
English	Tell me all the foods you know. You have one minute. Are you ready? Start now.
Vietnamese	Em nói cho chị mấy cái quần áo mà em biết. Em có một phút thôi. Ready? Bắt đầu.
English	Tell me all the animals you can think of. You have one minute. Are you ready? Start now.

Those are all the tasks for today. Thanks again for your participation.



## Track 1 – Session 2

Thanks for volunteering for the study. This session should take no more than twenty minutes.

The task is to name all of the items you can think of in a certain category. You will have one minute. Let's begin.

Language	Task
Vietnamese	Em nói cho chị mấy cái đồ ăn mà em biết. Em có một phút thôi. Ready? Bắt đầu.
English	Tell me all of the clothes you can think of. You have one minute. Are you ready? Start now.
Vietnamese	Em nói cho chị mấy cái động vật mà em biết. Em có một phút thôi. Ready? Bắt đầu.

That completes the tasks for this study. Thanks again for your participation.  
*Pay them.*

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