

Evaluating Speech Usage in Daily Activities in Typical Adults

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## TABLE OF CONTENTS

<b>ACKNOWLEDGEMENT</b> .....	<b>5</b>
<b>ABSTRACT</b> .....	<b>6</b>
<b>INTRODUCTION</b> .....	<b>7</b>
<b>Literature Review</b> .....	<b>7</b>
<b>Purpose of the Study</b> .....	<b>13</b>
<b>METHODS</b> .....	<b>15</b>
<b>Participants</b> .....	<b>15</b>
<b>Data Collection Procedures</b> .....	<b>16</b>
<i>Questionnaire</i> .....	<b>16</b>
<i>Analysis</i> .....	<b>17</b>
<i>Secondary Analysis</i> .....	<b>21</b>
<b>RESULTS</b> .....	<b>21</b>
<i>Participant Demographics</i> .....	<b>21</b>
<i>Research Question 1 Findings</i> .....	<b>23</b>
<i>Research Question 2 Findings</i> .....	<b>26</b>
<i>Secondary Analyses</i> .....	<b>27</b>
<b>DISCUSSION</b> .....	<b>32</b>
<b>CONCLUSION</b> .....	<b>37</b>
<b>REFERENCES</b> .....	<b>38</b>
<b>APPENDIX A: Levels of Speech Usage Scale</b> .....	<b>41</b>
<b>APPENDIX B: Additional Questions Used in this Study</b> .....	<b>42</b>
<b>APPENDIX C: Geographic Regions Selected for Craigslist Postings</b> .....	<b>51</b>

**APPENDIX D: Notes Regarding Separate Analyses.....52**  
**APPENDIX E: Additional Demographic Information.....53**  
**APPENDIX F: Additional Information Regarding Codes for Data Analysis.....54**  
**APPENDIX G: Pearson Correlations for Variables Used in Regression Analysis.....55**  
**APPENDIX H: Spearman Correlations for Variables Used in Regression Analysis.....57**  
**APPENDIX I: Histogram and P-Plot of Residuals.....59**  
**APPENDIX J: Participant work rankings grouped by Level of Speech Usage.....61**

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**Abstract**

Evaluating Speech Usage in Daily Activities in Typical Adults

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‘Speech usage’ refers to what people want or need to do with their speech to meet communication demands in life roles. Documenting speech usage is critical in clinical work to plan relevant intervention goals for clients. It is also an important research variable for studying relationships between communication disorders and quality of life. The Levels of Speech Usage is a self-report scale to rate speech usage. The purpose of this study was to examine data from a normative sample of adults without communication disorders as part of the validation of the Levels of Speech Usage scale. 258 participants completed the Levels of Speech Usage scale and additional demographic questions in an online questionnaire in order to examine factors that predict speech usage. The data revealed a normal distribution of speech usage across the sample. The results suggest that employment is a major contributor to self-rated speech usage, but weak correlations with an occupational voice scale and considerable variance left unaccounted for in the regression models suggest that determinants of speech usage, and the relationship between speech usage and employment, are not yet fully defined.

## INTRODUCTION

The World Health Organization's (WHO) International Classification of Functioning, Disability, and Health (ICF), revised in 2001, listed three categories to describe an individual's level of functioning and health (WHO, 2001): "Body Functions and Structures," "Activities," and "Participation." The first, "Body Functions and Structures," involves how the body is working both anatomically and physiologically. The second, "Activities," includes the physical tasks that the body can complete. Lastly, the "Participation" category includes how an individual is involved in his or her environment and how he or she fulfills various life roles.

Under the ICF, an individual's health condition and Contextual Factors interact dynamically to make up an individual's functioning and disability. Contextual Factors within the ICF comprise two components: "Environmental Factors" and "Personal Factors." "Environmental Factors" refer to all aspects of the external world of an individual's life that may have an impact on his or her functioning. "Personal Factors" involve "features of the individual that are not part of the health condition," including gender, age, and coping styles (WHO, 2001). These various individual characteristics are all factors to be taken into consideration by the speech-language pathologist (SLP) working with a given client.

ASHA's *Preferred Practice Patterns for the Profession of Speech-Language Pathology* (ASHA, 2004) recommended that speech-language pathologists' (SLPs) conduct be in line with the 2001 ICF and ASHA's scope of practice. SLPs should therefore address all categories of the ICF, including "Participation" and "Contextual Factors," in assessing and developing treatment appropriate for a client's communication needs.

One factor that can affect how well people with communication disorders participate in their daily roles is the particular communication needs of each client as determined by the

personal and environmental factors unique to each individual. Gray, Baylor, Eadie, Kendall, and Yorkston (2012) noted that life roles can be highly variable from one person to the next, and that this variability can be just as marked for the communication requirements for these different roles. Clinically, it is important for SLPs to understand a given client's communication needs in order to address participation goals a client may have. Baylor, Yorkston, Miller, and Amtmann (2008a) defined speech usage as what people want or need to do with their speech within the context of their life roles. Vocation, living situation, hobbies, and preference for social interactions are some factors that may determine a person's speech usage (Gray, Eadie, Kendall, Baylor, and Yorkston, 2012).

Speech usage, and the broader topic of communication needs, can be measured in a variety of ways, the most common of which relates to frequency of communication. The area of Augmentative and Alternative Communication (AAC) has provided several examples of methods to examine communication needs and frequency of communication acts with regards to implementing AAC devices (e.g., Allaire et al., 1991; Culp et al., 1986; Jinks & Sinteff, 1994; Blackstone & Hunt-Berg, 2003). While the AAC literature provides examples of how to evaluate frequency of communication, this body of literature does not specifically address speech usage due to the focus on augmentative devices, and the measurement strategies used in these studies may not apply specifically to understanding the communication needs and patterns of adults who rely primarily on speech for communication.

More specific to speaking demands, recent research has involved the use of ambulatory phonation monitors (APM): portable, wearable devices designed to objectively document the key phonatory behaviors of an individual over a period of time (Morrow and Connor, 2011). APMs can yield a time history record of a set observational period, measuring the amount of time an

individual phonated, tracking exact times when phonation occurred, and estimating an individual's average vocal intensity and fundamental frequency for all voiced activity. APMs have been used to collect data regarding the voice use of teachers during the regular workday (Franca, 2013; Gaskill et al., 2012; Morrow and Connor, 2011; Morrow, 2011). While such monitors permit an objective assessment of typical speech usage, the devices may not be practical for broad clinical use. Additionally, the recorded amount of speech usage may not correlate with how an individual perceives their speech usage, particularly in terms of personal importance of speech usage. In a retrospective review of 100 patients with benign vocal fold lesions, Behrman, Sulica, and He (2004) noted that patient perception of dysphonia appeared to be an important element in the assessment of the effects of a benign vocal fold lesion and “critical to therapeutic decision-making.” Ambulatory phonation monitors, therefore, may provide additional useful information for assessing speech usage; however, their clinical feasibility may be limited, as well as their ability to provide a full picture of how individuals perceive their speech usage.

Subjective reports of speech usage are probably the most common assessment technique currently used in clinics. Many of these evaluations focus extensively on rating the demands placed on speech and/or voice by occupational roles. For example, the amount of talking required of teachers in their job has received considerable attention (e.g. Gotaas et al, 1993; Roy et al., 2004; Smith et al., 1997; Verdolini and Ramig, 2001; Russell, Oates, and Greenwood, 1998; Smith et al., 1998). Beyond the teaching profession, other rating scales have also focused on classifying speech demands largely based on job requirements. Table 1 presents a summary of three such measures found in the voice literature. Baylor et al. (2008a) highlighted several limitations of these rating scales, presented in Table 1, indicating why they might not be ideal

measures of an individual's level of speech usage. First, these scales were developed for use with voice clients, and the use of voice terminology does not necessarily represent speech characteristics in either normative populations or populations with communication disorders other than voice disorders. Second, these scales focus on voice demands within occupations (e.g. teaching), which does not permit individuals to report activities outside the workplace that are important to them and which may require higher levels of speech usage. Third, many rating scales categorize individuals based on occupation, but there may be variations of speech usage within a single job title as described by Baylor et al. (2008a).

**Table 1.** Examples of existing voice-demand rating scales (from Baylor et al., 2008a)

<b>Koufman &amp; Blalock (1991)</b>		<b>Vilkman (2000)</b>		<b>Behrman et al, (2004)</b>	
<b>Level I: Elite vocal performer</b>	actor; singer	<b>High Quality / High Load</b>	actor; singer	<b>Professional</b>	singer, actor, radio personnel, vocal performance students
<b>Level II: Professional voice user</b>	clergyman, lecturer	<b>High Quality / Moderate Load</b>	radio and TV personalities	<b>High</b>	teachers, sales, tech support, mothers of young children, construction or factories with background noise, social "big talkers"
<b>Level III: Nonvocal professional</b>	teacher, lawyer	<b>Moderate Quality / High Load</b>	teacher; telemarketer	<b>Routine</b>	everyone else
<b>Level IV: Nonvocal nonprofessional</b>	laborer, clerk	<b>Moderate Quality / Moderate Load</b>	business personnel, physicians, lawyer, nurse		
		<b>Low Quality / High Load</b>	factory workers, machinists in background noise		

This review of existing literature suggests that the issue of measuring communication needs and extent of speech usage has received attention, but the focus appears somewhat limited

to specialty populations (AAC) or just one aspect of life roles such as is reflected in the occupation-focused voice demand scales. In an effort to develop a rating scale that would be applicable across a wider range of roles and populations, and would capture the viewpoint of the individual with the communication disorders regarding their own speech usage, Baylor et al. (2008a) developed the Levels of Speech Usage Rating Scale.

The first section of the Levels of Speech Usage is a categorical rating scale consisting of five categories used to efficiently code levels of speech usage for both research and clinical purposes. Clients are asked to consider the frequency, type, amount, and importance of speaking situations that they might encounter on a day-to-day basis and then choose an appropriate category: “Undemanding,” “Intermittent,” “Routine,” “Extensive,” or “Extraordinary” speech usage. Following each category name is a brief description clarifying the qualifications for that category (See Appendix A). This rating system permits clients to quickly and easily categorize their self-perceived usage requirements, aiding clinicians and researchers in more effectively understanding the client’s perspective. Clinicians can then individualize their treatment plans to meet the needs of a given client, and researchers may use the scale to more specifically code speech usage for use as a research variable providing information about the clients’ perspective. The second section of the Levels of Speech Usage consists of 53 items addressing typical speech activities, for which participants rate importance of that activity to them and frequency with which they engage in that activity (e.g., participation in small group discussions). Section B can provide a more detailed exploration of speech usage in specific situations. The second section of the Levels of Speech Usage may be found in Appendix B.

At present, the Levels of Speech Usage has been used to assess the speech usage of 200 individuals with spasmodic dysphonia (Baylor et al., 2008a). Participants’ self-reported speech

usage and demographic variables such as age, gender, education level, and employment status were analyzed using cross tabs to explore associations. Age, education, and work status were the only variables found to be significantly associated with speech usage levels: speech usage appeared to decline with age, and, with regard to education, “people with high school education levels were concentrated more in the undemanding speech usage category compared to the other categories,” with the extraordinary usage category consisting largely of individuals with bachelors or graduate college degrees. The less demanding speech usage categories were found to have proportionally more people who were not working for pay, while the extensive and extraordinary speech usage categories were dominated by people who were working full-time. An informal examination of participant-reported occupations in each of the speech usage categories “contained participants whose job titles might be expected in that category based on existing voice demand scales;” however, there were also many exceptions (e.g., a participant working as a tailor reported extraordinary speech usage). Study results suggested that speech usage might be related to work status, age, and education, although the self-reported job titles of participants did not necessarily adhere to stereotypical speech demand expectations.

The same 200 participants in Baylor et al.’s 2008(a) study also completed the second section of the Levels of Speech Usage. An exploratory factor analysis of the 53 items was conducted in order to examine the factor structure of the scale (Baylor et al., 2008b). 46 items remained after 7 items were removed due to more than 25% of participants reporting that the activity was both “not at all important” and never done. Results demonstrated a 5-factor structure, with the highly dominant factor labeled “handling complex situations” (i.e., leadership or other situations demanding a “heavy load” in terms of complexity, speed, or simultaneous cognitive demands). The other factors included “Casual situations,” “Physically demanding

situations, “Situations requiring pleasing speech characteristics, and “Emotionally demanding situations.”

While the Levels of Speech Usage was designed to be a self-report instrument, prior research has explored its potential as a proxy-report instrument. Section A of the Levels of Speech Usage rating scale was used to compare the self-ratings of clients with a variety of speech/language disorders with SLP ratings (Grey et al., 2012). The results showed that the percentage of SLP ratings in exact agreement with client self-ratings was 44.9%, with agreement being the lowest for less-demanding speech usage categories and highest for the most demanding speech usage categories.

While the studies described above have provided preliminary information about how people respond to the Levels of Speech Usage instrument, one limitation of the existing literature on this instrument is that there is no normative data from people who do not have communication disorders. Having a ‘normative’ sample of data may be highly valuable in future research and clinical work in terms of interpreting the responses of people with communication disorders to the Levels of Speech Usage scale. For example, a logical assumption might be that people with communication disorders would have more limited speech usage than people without communication disorders, but without a normative reference, these comparisons cannot be made.

### ***Purpose of the study***

The purpose of this study was to examine speech usage in a normative population, and to continue psychometric development of the Levels of Speech Usage Scale through analysis of a normative sample. This study explored questions related to speech use in occupational (if applicable) and recreational activities. The first research question was:

*For individuals who self-report that they currently work for pay, what is the strength and direction of the relationship between the Levels of Speech Usage and level of vocal use as categorized by Koufman and Isaacson's four levels of vocal usage?*

*Expected Findings:* Given the prevalence of occupation in the speech usage literature, the predicted result was that speech usage levels would go up (more demanding speech usage) with occupations with higher vocal demands (lower levels on Koufman and Isaacson's occupational voice usage scale). While Koufman and Isaacson's scale relies primarily on occupation, participants may estimate their speech usage on the Levels of Speech Usage scale using experiences including work status as well as a variety of other factors. Therefore, a moderate negative correlation between self-reported level of speech usage and level of vocal use was predicted.

The second research question was:

*What demographic variables, such as age, gender, employment status, activities other than occupation, or current health status are significantly associated with speech usage?*

*Expected Findings:* Baylor et al. (2008a) found a significant negative correlation between age and level of speech usage. Therefore, we expected a decrease in level of speech usage with an increase in age. Similarly, we expected an increase in level of speech usage with an increase in years of education, as previously found in Baylor et al. (2008a). We did not expect a significant correlation between current self-reported health status and level of speech usage or gender and level of speech usage, reflecting findings in Baylor et al. (2008a). Given the general emphasis of occupation in voice literature, we expected working status to be a significant predictor of speech usage in that individuals who self-reported that they were currently employed

would report higher levels of speech usage than individuals who self-reported that they were currently not working for pay.

## METHODS

This study was a survey design asking adults without communication disorders to complete a battery of questionnaires about their speech usage. All procedures for this study were approved by the Institutional Review Board at the University of Washington under application #43832 with Category #2 exempt status. A detailed description of the participants, data collection procedures, and analyses follows.

### *Participants*

Adults 25 years of age and older were recruited to participate in this study. This study aimed to target working-age adults due to the particular focus of studying associations between speech usage and occupation; therefore, the study sought individuals who were older than the traditional age range for students of 18-24 years; however, students 25 years of age and older were included in the study. Participants needed to be proficient in English in order to complete the questionnaire. Participants self-reported whether they had any speech or language disorder(s) at the time of participation in the study. Participants under 25 years of age (n=11) or who self-reported the presence of a speech or language impairment at the time they completed the questionnaire (n=6) were excluded from data analysis.

To recruit a sample of adults representing a broad range of age and other demographic characteristics for a richer normative sample, a range of recruitment sites and strategies were used. Online recruitment notices were placed in the *Stranger* publication, a popular publication in Seattle, and on Craigslist for a variety of geographic regions (Appendix C). In order to specifically target older adults who may not frequent these online resources, paper questionnaire

packets were delivered to activities directors at senior centers and retirement homes around Washington State for them to make available to their residents.

### ***Data Collection Procedures***

#### *Questionnaire*

The questionnaire was posted online in a WebQ survey through Catalyst tools, available at the University of Washington. The survey may be viewed in Appendices A and B. Appendix A contains the Levels of Speech Usage, and Appendix B contains additional questions used in this study (Sections C-E, described below). The beginning of the WebQ survey (Section A) included the Levels of Speech Usage Scale (Baylor et al., 2008a)). Participants were asked to select the category that best described their speech usage. Section B included questions from the second half of the Levels of Speech Usage which is described in the introduction. Data collected from Section B will be stored for future analysis in other studies and will not be discussed further here. Questionnaire sections C-E were created for this study and were intended to provide additional information about how participants used their speech in various life activities, and how they ranked the importance of speech in different activities. Specifically, the third section (Section C) asked participants a variety of questions about their occupation (if applicable). Following a general question about current work status (e.g. working full-time for pay, volunteering, attending school), participants were given the option to skip items related to work if they were not currently working for pay. In Section D, all participants were asked to generate up to three non-employment activities that were important to them (e.g. family or community responsibilities; social and leisure activities). They then were asked questions pertaining to their speech use in each activity, such as the percent of time spent speaking in those situations and the importance of speech to fulfilling those activities. The conclusion of Section D prompted

participants to rank their occupation (if applicable) and their other (up to) three activities based on how much of an impact any problems with speaking would have on that activity. Section E asked the participants a variety of demographic questions (e.g. age, gender). Excerpts of this data most relevant to the thesis questions will be presented in this paper. The remaining data will be used in future analyses, and not included in this document.

Participants were informed in the information statement that all questions were optional. There were no time limitations on the survey, and the WebQ survey permitted participants to save their responses and return to the questionnaire at a later time. Participants could complete the questionnaire at a time, pace, and location which was convenient for them. They were informed that the questionnaire would take approximately 15 minutes to complete. Participants in retirement homes or senior centers that received the paper questionnaire packets could complete the questionnaires and return them in the pre-stamped envelope without any additional contact with the researchers. Any participants who saw a flier or online notice and wanted a paper version of the questionnaire instead of doing it online could contact the researchers to have the form mailed to them.

### *Analysis*

Data from WebQ were immediately available in an Excel download, and data from paper questionnaires were entered into Excel using a double entry method to ensure data reliability. Paper questionnaire data were entered by the primary author into Excel upon conclusion of data collection. Four weeks later, the data were re-entered into a second Excel spreadsheet by the primary author, and the documents were compared for reliability of data entry. During data entry for the paper questionnaires, the researchers discovered that the item asking participants if they had any current communication disorder was not included in the paper questionnaires. Because

absence of a communication disorder, a key inclusion criterion, could not be confirmed, these participants (n=16) were not included in the analyses to be discussed below. Notes regarding separate analyses of data from these participants are presented in Appendices D and E. Analyses of the data collected via WebQ are described below. All analyses were conducted using SPSS version 17.0, Excel, and Tableau 8.0 Professional (SPSS, 2008; Tableau, 2013).

### *Inter-Rater Reliability*

Some questionnaire items required write-in responses. These items included the following: self-reported percentage of time spent talking at work and in each of the three non-occupational activities, estimated number of people participants talked to when at work, and how work was ranked compared to other non-occupational activities (for participants who reported that they were currently working). Participants provided a variety of responses (i.e., when reporting the estimated number of people they talked to at work, responses included specific numbers such as “6,” as well as ranges, such as “varies – 1 to 80 people daily”). To summarize the data, these responses were categorized into ranges (e.g., 0-5 people; 6-10 people, etc.) Please see Appendix F for additional information regarding data coding for these questionnaire items. The primary author entered all participant responses into their categories and corresponding SPSS codes for analysis. Two volunteer undergraduate and post-baccalaureate students re-coded 25% (n=65) of participant responses for each of the above questionnaire items, and 100% inter-rater reliability was found.

*Research Question #1: Level of Speech Usage and Level of Vocal Use:*

*For individuals who self-report that they currently work for pay, what is the strength and direction of the relationship between level of speech usage and level of vocal use as categorized by Koufman and Isaacson's levels of vocal usage?*

Koufman and Isaacson's scale for occupational voice demands has been used in a variety of studies in the voice literature (e.g. Van et al., 2012; Sataloff, 2001; Wingate et al., 2007; Capucho, Escada, & Madeira, 2007), and for that reason was chosen as part of this study for validating the Levels of Speech Usage. Koufman and Isaacson (1991) listed four levels of vocal usage, categorized by occupation. The *Elite Vocal Performer* (Level I) is "a person in whom even a slight aberration of voice may have dire consequences," such as a singer or actor. The *Professional Voice User* (Level II) is "a person in whom moderate vocal dysfunction would prevent adequate voice performance," such as "most clergy, lecturers, and telephone operators." Level III, the *Nonvocal Professional*, may be a "teacher, doctor, lawyer, businessman, or receptionist, i.e., those who could not perform their work properly if suffering from a severe dysphonia. Level IV, the *Nonvocal Nonprofessional*, may be a "laborer, clerk," or other similar occupation.

For this study, the occupations of individuals who self-reported that they were currently working for pay were categorized into Koufman and Isaacson's levels of occupational vocal demands for data analysis purposes. Three volunteer undergraduate and post-baccalaureate students not otherwise involved with the study were recruited to categorize participants' self-reported occupations into Koufman and Isaacson's four levels of occupational vocal demands. The volunteers were trained by the primary author to rate occupations using the levels, and 100% inter-rater reliability was established among the volunteers and the primary author on 10 sample

participants during training. In order to prevent bias from additional participant information such as age, work status (e.g. part time, full-time), or hours worked per week, volunteers were provided with only participants' WebQ-coded identification numbers and their self-reported work titles. For reliability purposes, 50% of the responses were coded by a second volunteer to compare with the first volunteer's rating, and 98% inter-rater reliability was observed. Occupations which had been rated differently between two volunteer raters (n=5) were coded by the third rater, and the level of vocal usage identified by two of the three raters was used.

After converting the occupations to the Koufman and Isaacson scale, the association between the Koufman and Isaacson scale and the Levels of Speech Usage was examined using a Spearman correlation. A Spearman correlation was used because both instruments are ordinal categorical rating scales.

#### *Research Question #2: Level of Speech Use and Demographic Information*

*What demographic variables, such as age, gender, employment status, activities other than occupation, or current health status are significantly associated with speech usage?*

A backwards-stepwise linear regression analysis was used to identify demographic variables significantly associated with level of speech usage. Speech usage level was the dependent variable. Twelve variables were entered as predictors. Age was a continuous variable. Gender, living situation, current health status, hearing loss, vision problems, work status, marital status, whether participants reported that they were working as a homemaker, whether participants reported that they were working primarily as a volunteer, and whether participants were currently caring for one or more children were coded as nominal categorical variables. Health status was reported using a binary code based on whether or not a given participant

indicated that they had any other health concerns besides vision, hearing loss, or a current communication disorder. Educational background was coded as an ordinal categorical variable.

### *Secondary Analysis*

In addition to the two primary questions described above, two additional secondary analyses were completed to further explore the relationship of work to self-rated speech usage.

For individuals who self-report that they currently work for pay, the relative importance of talking for their work as compared to other self-reported activities was explored descriptively. First, participants were sorted into their self-rated speech usage category. Then within each category, the percentage of participants who ranked work first, second, third, or fourth in terms of importance of talking for each activity was reported.

In another secondary analysis, the difference in self-reported speech usage levels between participants who work for pay and those who do not was tested with the Mann-Whitney U-test. A non-parametric test was chosen due to differences in group sizes between participants who self-report that they were currently employed ( $n=211$ ) and those who self-reported that they were currently not working ( $n=47$ ); a parametric  $t$ -test would therefore have been inappropriate, as parametric assumptions had been violated. Additionally, the variable being analyzed (i.e. the Levels of Speech Usage scale) was ordinal and not an interval or ratio scale as is required for the parametric  $t$ -test.

## **RESULTS**

### *Participant Demographics*

Two hundred fifty-eight adults met the inclusion criteria and completed the online questionnaire. The average age of participants was 39.98 years ( $SD = 13.46$ ) with a range of 25-79 years. The majority of participants were female (79.07%), white/Caucasian (88.75%), and

college graduates (87.98%). Additional characteristics are that 61.24% reported that they were currently married or in a committed relationship, 67.83% reported that they were currently living with family members, 74.03% of participants noted that they were responsible for caring for one or more children, and 81.4% participants reported that they were currently working for pay.

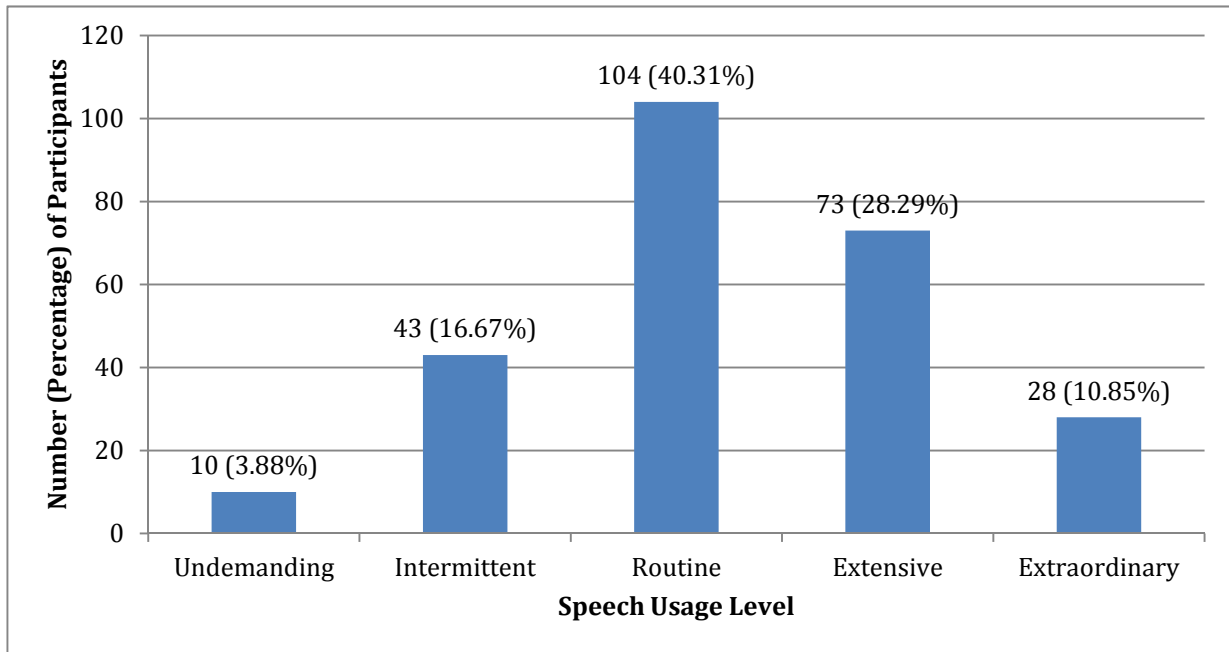
Please see Table 2, below, for additional participant demographic information.

**Table 2.** Demographic information for WebQ-only participants

<b>Category</b>	<b>Items within each category</b>	<b>Percent of overall sample, with standard deviation</b>
Mean Age		39.98 (SD=13.46)
Sex	Female	79.07% (204/258)
	Male	19.38% (50/258)
	No response	1.55% (4/258)
Highest Degree	Post-graduate	52.71% (136/258)
	College graduate	35.27% (91/258)
	Some college	8.91% (23/258)
	Vocational/technical school	1.94% (5/258)
	High school graduate	0.78% (2/258)
	No response	0.39% (1/258)
Ethnic/Racial Group	American Indian/Alaskan Native	0.38% (1/258)
	Asian	1.16% (3/258)
	Black or African American	0.38% (1/258)
	Hispanic or Latino	1.55% (4/258)
	White/Caucasian	88.75% (229/258)
	More than one ethnic/racial group	6.97% (18/258)
	No response	0.78% (2/258)
Marital Status	Single/divorced/widowed	38.76% (100/258)
	Married/committed relationship	61.24% (158/258)
Living Situation	Living alone	17.44% (45/258)
	Living with family	67.83% (175/258)
	Living with friends/roommate	10.85% (28/258)
	Living in an assisted living facility	0% (0/258)
	Other	0.78% (2/258)
	More than one response	2.32% (6/258)
Responsible for Caring for Children	Yes	25.97% (67/258)
	No	74.03% (191/258)
Presence of Hearing Loss	Yes	10.08% (26/258)
	No	89.53% (231/258)
	No Response	0.39% (1/258)
Health Status	No current health concerns	88.37% (228/258)
	Current health concerns	11.63% (30/258)

Figure 1 shows the distribution of participants across the five levels of speech usage. Participant's self-reported Levels of Speech Usage broadly approximated a normal curve, with the most commonly chosen category being "Routine" speech usage (104, or 40.31%).

**Figure 1.** Participant-reported speech usage levels by number and percentage of total sample



***Research Question #1: Correlation between Level of Speech Usage and Level of Occupational Vocal Use***

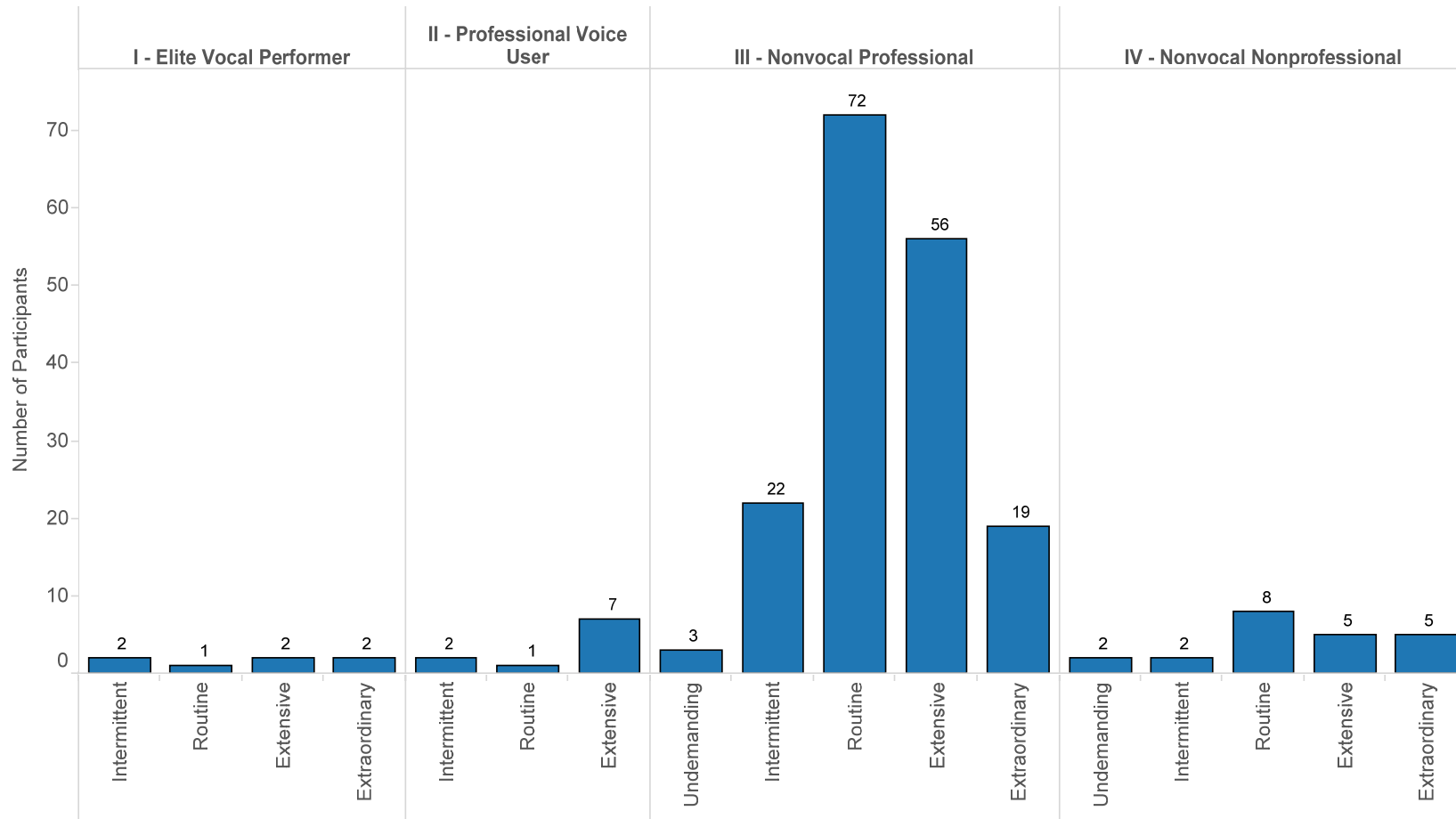
A correlation of -0.023 was found between the Levels of Speech Usage scale and Koufman and Isaacson's occupational voice demand scale indicating a weak negative correlation. The Levels of Speech Usage were coded such that a lower number reflected a lower (e.g. "Undemanding") level of speech usage. However, in Koufman and Isaacson's scale, higher vocal usage levels are assigned lower numbers (i.e. from Level I, "Elite Vocal Performer," to Level IV, "Nonvocal Nonprofessional"). A negative correlation therefore suggests that as speech usage goes up, occupational voice demands also increase.

Table 3, below, lists the distribution of participants' self-reported Level of Speech Usage, grouped by levels in Koufman and Isaacson's occupational voice demand scale (for participants who were working for pay). A graph illustrating this information is also below, in Figure 2.

**Table 3.** Distribution of Level of Speech Usage in each of Koufman and Isaacson's Levels of Vocal Usage

<b>Koufman &amp; Isaacson scale</b>	<b>Level of Speech Usage</b>	<b>Number of Participants</b>	<b>Percentage (per level)</b>
<b>I - Elite Vocal Performer</b>	Intermittent	2	28.57%
	Routine	1	14.29%
	Extensive	2	28.57%
	Extraordinary	2	28.57%
<b>II - Professional Voice User</b>	Intermittent	1	11.11%
	Routine	1	11.11%
	Extensive	7	77.78%
<b>III - Nonvocal Professional</b>	Undemanding	2	1.25%
	Intermittent	21	13.13%
	Routine	68	42.50%
	Extensive	52	32.50%
	Extraordinary	17	10.63%
<b>IV - Nonvocal Nonprofessional</b>	Undemanding	2	9.09%
	Intermittent	2	9.09%
	Routine	8	36.36%
	Extensive	5	22.73%
	Extraordinary	5	22.73%

**Figure 2.** Distribution of Level of Speech Usage in each of Koufman and Isaacson's Levels of Vocal Usage



***Research Question #2: Associations between Level of Speech Usage and Demographic Information***

Twelve independent variables were entered into the regression analysis. Please see Appendix G for Pearson correlations among level of speech usage and the twelve independent variables. SPSS bases regression on Pearson correlations, which were used to generate the chart in Appendix G. Spearman correlations, however, are preferable for this data set due to the ordinal nature of some variables. For this reason, Spearman correlations have been included in a separate chart that may be found in Appendix H. All twelve proposed independent variables were entered into the regression analyses because the correlation table suggested that the correlations were low enough to minimize the risk of multicollinearity. Variables were removed in the backwards-stepwise linear regression in the following order: marital status, volunteer status, age, whether or not a participant indicated that they were a homemaker, living situation, vision problems, health status, hearing loss, gender, and childcare. The final model included work status (i.e., whether or not a participant reported that they were currently working for pay) and education. For this final set of variables, the adjusted  $R^2$  was .125 with a significance level of .000 (work status  $\beta = .277$ ; educational background  $\beta = -.199$ ). This indicates that work status was the variable most strongly associated with speech usage, and educational background was the next strongest. The multivariate regression coefficients and significance levels for the variables included in the final model are included in Table 4, below.

**Table 4.** Regression coefficients and results of significance tests for final regression model.

		Coefficients <sup>a</sup>				
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	3.077	.192		16.024	.000
	WORKY/N	.709	.151	.277	4.701	.000
	EDUBKGRND	-.248	.074	-.199	-3.368	.001

a. Dependent Variable: LVLSPUSE

Two additional analyses were conducted to explore the quality of this regression model. First, a histogram of the residuals, found in Appendix I, shows an approximately normal distribution of residuals, which is desirable in the regression model. Second, the presence of possible outliers was assessed using the graph in Appendix I. Based on this graph, four participants were identified as possible outliers. These outliers were removed from the data set and the regression analysis was repeated. Variables were removed in the same order as the original backwards-stepwise linear regression, and the final model also contained work status and educational background. For this model, the adjusted  $R^2$  was .132 with a significance level of  $p = .000$  ( $\beta = .277$ ) for work status and  $p = .001$  ( $\beta = -.199$ ) for educational background. Because the regression analyses yielded the same final variables with and without the four outliers, these outliers have been included in final data analysis.

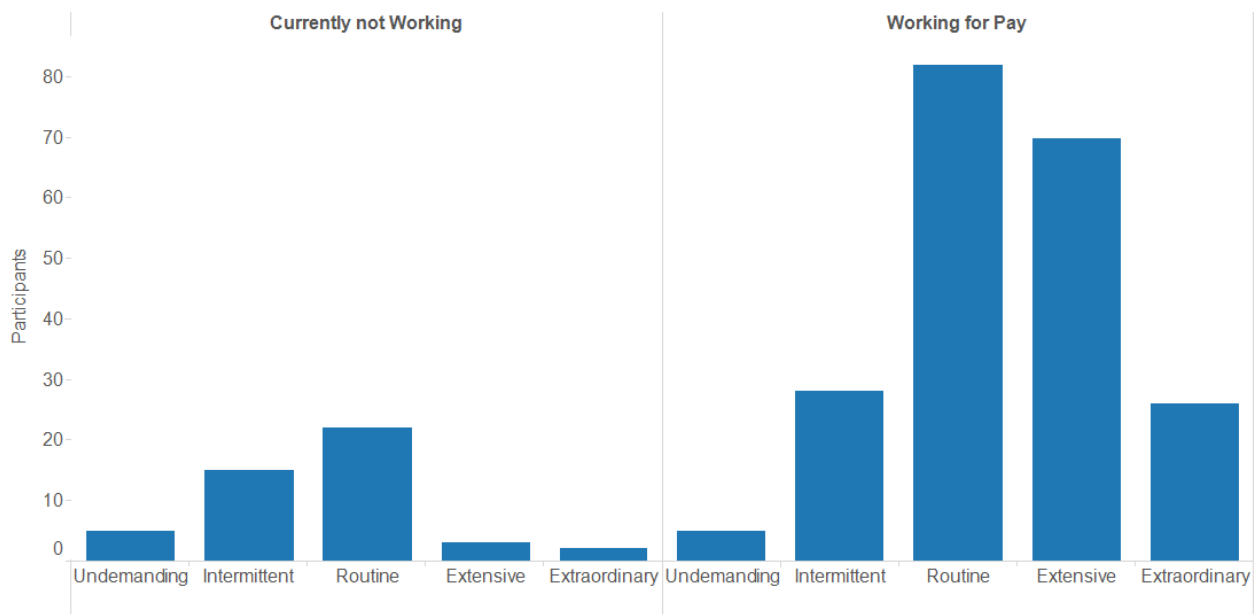
In summary, the variables that were significantly associated with level of speech usage were work status and educational background.

### ***Secondary Analyses***

Additional analyses were completed to provide more detail about the issues that may influence speech usage ratings, particularly related to employment. Figure 3, below, provides

additional information regarding the distribution of Levels of Speech Usage based on whether or not participants reported that they were currently working for pay. The distribution of speech usage levels broadly approximates a normal curve in each group; however, trends between the two groups may be noted. Participants in the “Working for Pay” group tended to report higher levels of speech usage in general, whereas the “Currently not Working” group tended to report lower levels of speech usage. “Routine” speech usage was the most commonly reported speech usage level in both groups.

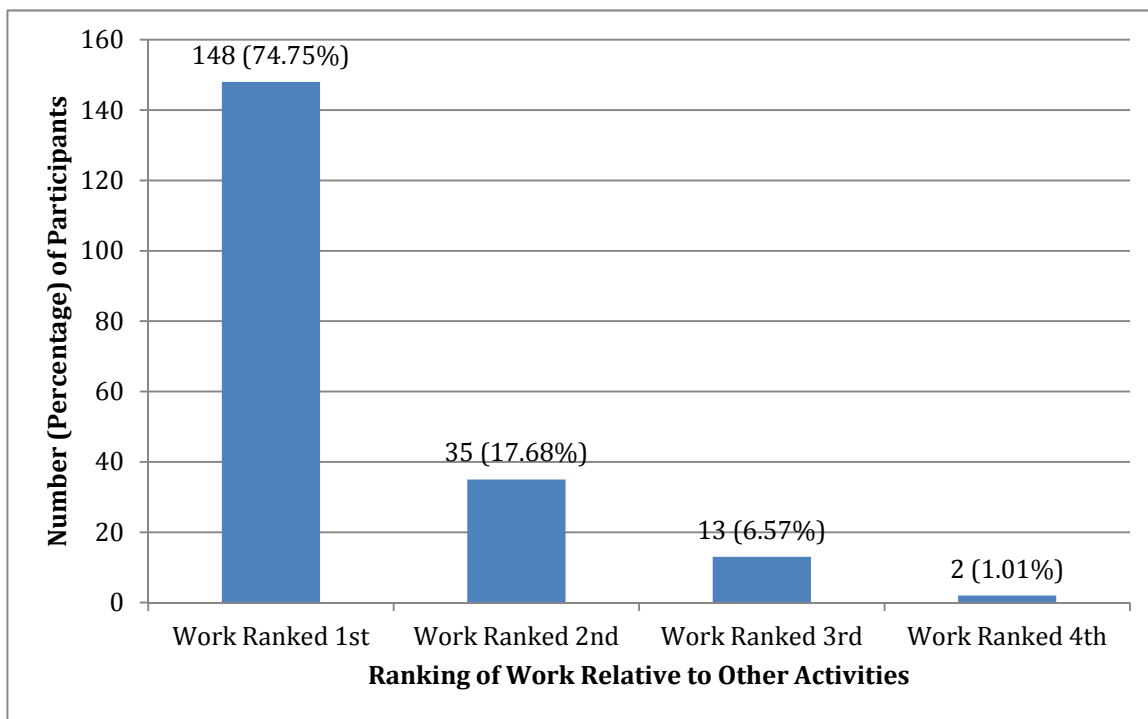
**Figure 3.** Distribution of speech usage levels in participants who are and are not currently working for pay



A Mann-Whitney *U*-test indicated that there was a significant difference in speech usage between participants who reported that they were currently working for pay and those who reported that they were not currently working for pay ( $U=2771.500$ ,  $p=.000$ ). There tended to be more people with higher speech demands among participants who reported that they were currently working for pay compared to those who reported that they were currently not working for pay.

Participants were asked to rank the importance of speech to various activities. Those who worked for pay were asked to rank work relative to self-described non-work activities in terms of relative importance of speech. Examples of other non-work activities that people reported included “socializing with friends,” “family time,” “singing,” “work on the computer,” “working out,” and “gardening.” Of the 211 participants who worked for pay, 198 participants provided a ranking of work compared other non-occupational activities. 148 (74.75%) ranked work first when compared to up to three other non-occupational activities, 35 (17.68%) of working participants ranked work second, 13 (6.57%) of working participants ranked work third, and 2 (1.01%) working participant ranked work fourth (Figure 4). In a follow-up to this analysis, participants who work were sorted into their speech usage categories, and the relative ranking of work compared to non-work activities was examined for each category. Please see Figure 5, below, for a summary of participant work rankings when grouped by speech usage level. A table presenting this information may be found in Appendix J. Within each speech usage level, the highest proportion of participants ranked work as the first priority for speech usage.

**Figure 4.** Distribution of work rankings for participants who worked for pay (n=198)



**Figure 5.** Participant work rankings compared to other activities when grouped by speech usage level

(n=198)

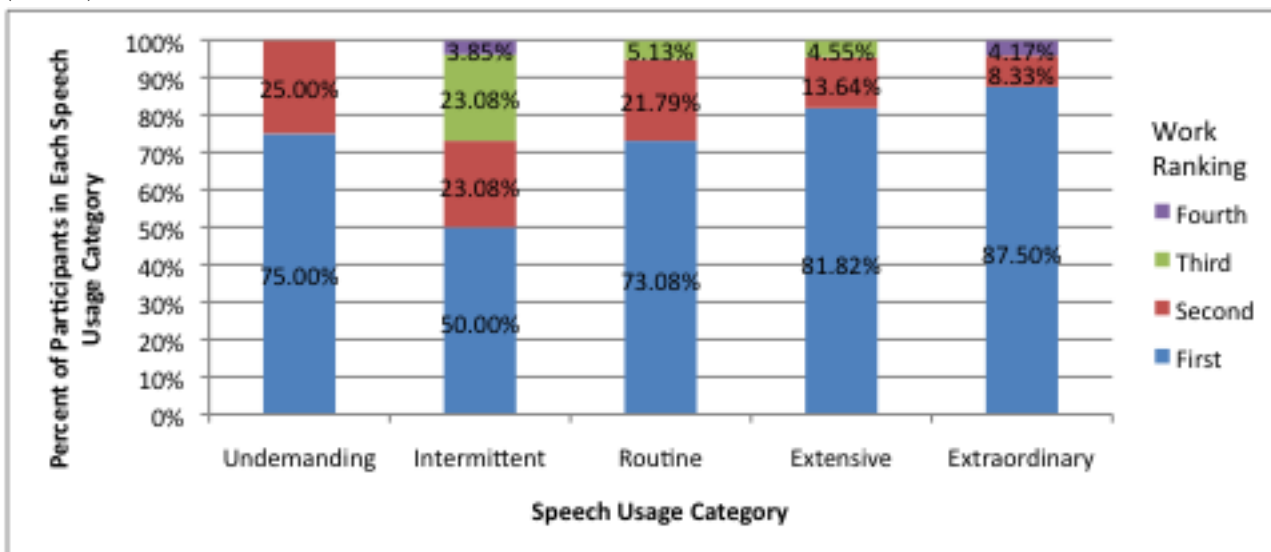


Table 5, below, lists the distribution of how participants ranked work compared to other non-occupational activities when grouped by Koufman and Isaacson’s occupational voice demands scale. Individuals with higher occupational voice demands (i.e. “Elite Vocal Performers” and “Professional Voice Users”) only ranked work first or second when compared to other non-occupational activities. However, for participants with lower occupational voice demands (i.e. “Nonvocal Professionals” and “Nonvocal Nonprofessionals”), while work was most often ranked first, participants ranked work as low as fourth when compared to up to three non-occupational activities. The opposite was observed when examining work rankings compared to other activities when grouped by speech usage level (Figure 5, above). Here, participants who rated themselves as having “Extraordinary” speech usage ranked work as low as fourth when compared to up to three non-occupational activities; participants with the lowest (i.e. “Undemanding”) speech usage ranked work either first or second.

**Table 5.** Distribution of work ranking by Koufman and Isaacson’s levels of vocal usage

<b>Koufman and Isaacson Levels</b>	<b>Work ranking (if applicable)</b>	<b>Number of Participants</b>	<b>Percentage of Each Level</b>
<b>I - Elite Vocal Performer</b>	1	6	85.71%
	2	1	14.29%
<b>II - Professional Voice User</b>	1	8	88.89%
	2	1	11.11%
<b>III - Nonvocal Professional</b>	1	119	74.38%
	2	30	18.75%
	3	10	6.25%
	4	1	0.63%
<b>IV - Nonvocal Nonprofessional</b>	1	15	68.18%
	2	3	13.64%
	3	3	13.64%
	4	1	4.55%

In order to understand the variables that predicted speech usage just within participants who work for pay, an additional backwards-stepwise linear regression examined associations between levels of speech usage and a variety of variables for participants who reported that they were currently working for pay. Variables included in the regression were the following: marital status, childcare, gender, hearing loss, whether a participant reported that he or she was working full-time, whether a participant reported that he or she was working part-time, age, occupational vocal usage rating (Koufman and Isaacson), living situation, vision status, health status, educational background, and percent of time spent talking at work. Variables were removed from the model in the following order: marital status, childcare, gender, hearing loss, working part-time, working full-time, age, occupational vocal usage rating (Koufman and Isaacson), living situation, vision, health status, and educational background. The only variable in final model was the percent of time spent talking at work. For this variable, the adjusted  $R^2$  was .295 with a significance level of .000 ( $\beta=.543$ ), indicating that percent of time spent talking was the variable most strongly associated with level of speech usage for participants who reported that they were currently working for pay. The range of participants' self-reported percent of time spent talking at work was 0-100% (mean=51.27%, SD=27.09%).

## **DISCUSSION**

The primary purpose of this study was to add to the evidence regarding the psychometric properties of the Levels of Speech Usage scale by collecting data from a sample of individuals without communication disorders. A normative sample of speech usage in adults without communication disorders may aid clinicians and researchers in interpreting future use of the Levels of Speech Usage scale with people with communication disorders. In addition, a

normative sample provides useful information for further understanding the impact of communication disorders on speech usage. In this study, a relatively normal distribution of participants was seen across all speech usage levels. Similar findings were found in Baylor et al.'s (2008a) study involving participants with spasmodic dysphonia.

In addition to collecting data from a normative sample, this study was designed to provide further validation of the Levels of Speech Usage by examining the strength and direction of the relationship between the Levels of Speech Usage Scale and Koufman and Isaacson's ratings of occupational vocal usage. The results showed a weak negative correlation between Level of Speech Usage and Koufman and Isaacson's scale; however, as noted under "Results," this correlation indicates that while level of speech usage increases, so does occupational vocal usage. This study was also designed to identify demographic variables that were significantly associated with speech usage. Results showed that working for pay and educational background were the variables significantly associated with speech usage. Participants who do work for pay typically ranked work first when compared to other non-occupational activities with regards to prioritizing activities according to importance of speech. Also for the participants who work for pay, the amount of time spent talking at work was the only variable significantly associated with levels of speech usage among the variables tested. Previous studies examining the association between the Levels of Speech Usage scale and other factors have found similar associations between speech usage, employment, and educational background (e.g., Gray, Eadie, Kendall, Baylor, and Yorkston, 2012; Baylor et al., 2008a). In addition, findings from this study indicating employment as a significant predictor of speech usage are similar to the existing emphasis on employment in the voice literature (e.g., Gotaas et al, 1993; Roy et al., 2004; Smith

et al., 1997; Verdolini and Ramig, 2001; Russell, Oates, and Greenwood, 1998; Smith et al., 1998).

The results of this study suggest that employment plays a key role in how people regard the importance of speech in daily activities. Based on this study, however, interpreting individuals' speech usage based primarily on occupation should still be done with caution. While work status was the variable most strongly associated with speech usage, work status and educational background explained only 12.5% of the variance in Levels of Speech Usage reported by participants. For individuals who reported that they were currently working for pay, regression analysis indicated that percent of time spent talking at work was the variable most strongly associated with speech usage, but it explained only 29.5% of the variance in self-reported speech usage levels. The relatively limited ability of work status and educational background (for all participants) or percent of time spent talking at work (for working participants) to predict speech usage, as well as findings from examining other variables, suggest the possibility of a more complex relationship between personal variables and predicting speech usage. There may be additional variables important for understanding speech usage that have not yet been identified, such as type of non-occupational activities with which a participant is involved or other participant characteristics.

The weak correlation between Koufman and Isaacson's (1991) Levels of Vocal Usage and the Levels of Speech Usage raises additional questions about the variables that influence self-rated speech usage. If employment is indeed the primary determinant of speech usage, this correlation would have been expected to be stronger. A few factors may have contributed to this weak correlation. First, while the Levels of Speech Usage were self-rated by participants, levels of Koufman and Isaacson's occupational voice usage scale were rated by volunteers otherwise

uninvolved with this study. It is possible that using two different raters (i.e., volunteer raters and the participant himself or herself) for these two rating scales may have impacted the relationship between the two variables, particularly because the volunteer raters had no other knowledge about activities or priorities of the participants – only the type of job the participants did. The slightly different nature of the two rating scales may also have contributed to this weak correlation. The Levels of Speech Usage scale prompts participants to rate their overall speech usage across all life activities, whereas the Koufman and Isaacson scale relies only on occupational voice use. An additional reason for the weak correlation between speech usage level and the Koufman and Isaacson scale may be the disproportionate number of participants who were rated as being “Nonvocal Professionals” in the latter scale (160, or 75.83% of the 211 participants who reported that they were working for pay).

There are several questions related to this study that might be explored in future research. The design of this study required participants to self-report their Levels of Speech Usage; however, the ratings for the Koufman and Isaacson scale were coded by raters not otherwise involved with the study. In the original Koufman and Isaacson study (1991), the scale was used by participants to self-report their own occupational voice use. Future research should examine if permitting participants to rate their own occupational voice use with the Koufman and Isaacson scale affects the relationship between Levels of Speech Usage and Koufman and Isaacson’s vocal usage scale, and whether the latter variable better predicts Level of Speech Usage in participants. In addition, future research should examine the Levels of Speech Usage in participants with more diverse educational and ethnic/racial backgrounds and a broader age range. This is a key limitation of this study, since most participants were female, highly educated, and white/Caucasian, and the mean age was 39.98. Baylor et al. (2008a) found that

age, in addition to employment and education, predicted speech usage in participants with spasmodic dysphonia. It is unclear whether the relatively low mean age of participants impacted any predictive relationship between age and speech usage. Future studies may examine speech usage in an older population or broader age range in order to further clarify any relationships between age and speech usage. An additional limitation of this study is the disproportionate number of speech-language pathologists in the sample ( $n=43$ , or 16.67% of total sample), which may have influenced overall findings.

While this study provided useful information regarding the self-rated importance of work compared to non-occupational activities, additional qualitative examination of participant responses may provide additional information for clinicians and researchers. When completing the questionnaire, participants were prompted to list up to three non-occupational activities (e.g. sports, hobbies, socializing) that were important to them. The relative ranking of work compared to these non-occupational activities was examined in the secondary analyses. However, a qualitative examination of the other types of activities that participants were involved in and how they ranked the importance of speech in these activities may provide valuable insight into additional predictors of participant speech usage. It is currently unclear whether certain types of non-occupational activities are ranked more highly by participants when compared to either work (in those situations in which work was not ranked as the first speech priority) or other non-occupational activities. Possible additional analyses could examine whether specific activities such as participation in social activities (e.g. spending time with friends, team sports) are significantly associated with Levels of Speech Usage ratings. Additional data yet to be analyzed includes participant ratings of the relative importance of speech usage for each non-occupational activity, as well as their estimated percentage of time spent talking for each activity. Further

examination of these data may provide valuable information for clinicians and researchers when interpreting responses of people with communication disorders to the Levels of Speech Usage scales and in designing appropriate clinical services to meet their communication needs.

## **CONCLUSION**

In conclusion, this study consisted of an analysis of data on the Levels of Speech Usage scale from adults who do not have communication disorders. The data revealed a normal distribution of speech usage across the sample as might be anticipated. The results suggest that employment is a major contributor to self-rated speech usage, but weak correlations with an occupational voice scale and considerable variance left unaccounted for in the regression models suggest that determinants of speech usage, and the relationship between speech usage and employment, are not yet fully defined.

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## APPENDIX A

### What are your speech needs?

While communication is important to everyone, different people use their speech in different ways. Think of how you typically need to use your speech day to day. Mark the category below that best describes you.

#### Undemanding:

**Quiet** for long periods of time **almost every day**

**Almost never:**

- talk for long periods
- raise your voice above a conversational level,
- participate in group discussions, give a speech or other presentation

#### Intermittent:

**Quiet** for long periods of time on **many days**

Most talking is **typical conversational speech**

**Occasionally:**

- talk for longer periods
- raise voice above conversational level
- participate in group discussions, give a speech or other presentation

#### Routine:

**Frequent** periods of talking on **most days**

Most talking is **typical conversational speech**

**Occasionally:**

- talk for longer periods
- raise voice above conversational level
- participate in group discussions, give a speech or other presentation

#### Extensive:

Speech needs **consistently go beyond everyday conversational speech.**

**Regularly:**

- talk for long periods
- talk in a loud voice
- participate in group discussions, give presentations or performances

**Although the demands on your speech are often high, you are able to continue with most work or social activities even if your speech is not perfect.**

#### Extraordinary:

**Very high speech demands**

**Regularly:**

- talk for long periods of time
- talk with loud or expressive speech or
- give presentations or performances.

**The success of your work or personal goals depends almost entirely on the quality of your speech and voice.**

## APPENDIX B

**This appendix contains the second section of the Levels of Speech Usage as well as the other sections of the questionnaire used in this study.**

### Levels of Speech Usage

**Instructions:** We are interested in learning about how you use your speech in your daily activities. How much do you talk in various activities, and how important is your speech to being successful and satisfied with your daily activities? The questions that follow will ask you about different life activities and how you use your speech in them. There are no right or wrong answers to the questions. Answer them in the way that best describes you. You do not have to answer any questions you do not want to answer.

#### SECTION A (Section A is the Levels of Speech Usage in Appendix A)

#### SECTION B

	How <u>important</u> is it for you to do this?					How <u>often</u> do you need to do this?				
	Not at all	A little	Quite a bit	A lot	Extremely	Never	Rarely	Sometimes	Often	Almost always
1. Talk using devices that have poor sound quality (e.g., cell phones with poor reception, speaker phones, intercoms)										
2. Talk in emotionally-charged situations										
3. Talk with people you are responsible for supervising or coordinating in paid or volunteer work										
4. Talk with people who make you feel uncomfortable										
5. Sing for personal enjoyment										
6. Talk in stressful situations										

7. Talk with people who cannot see you while you are talking (e.g., dark room, not facing the other person )										
8. Talk with people you do not know well										
9. Talk with people you feel are not good listeners										
10. Talk with people who do not know why your speech is different										
11. Talk with people who supervise or coordinate your activities in paid or volunteer work										
12. Talk in social situations										
13. Talk in noisy places										
14. Talk in situations where you need to think on your feet										
15. Talk in situations where you need to convey a lot of information										
16. Have speech that is easy to understand										
17. Be able to change your speech for different situations										
18. Have consistent, dependable speech										
19. Talk with a wide variety of people										
20. Talk in situations when you have to respond quickly to what is going on around you										
21. Talk while doing physical activities such as walking, lifting or exercising										
22. Talk over distances outdoors										
23. Shout to get someone's attention (e.g., across a room or outdoors)										

24.	Talk in confrontational situations																			
25.	Talk loudly when needed (e.g., to be heard over noise or in a group of people)																			
26.	Have speech that is pleasant to listen to																			
27.	Talk with people you know well																			
28.	Talk in situations where there is just one other person																			
29.	Speak in situations that require concentration or mental focus																			
30.	Talk for long periods of time																			
31.	Talk in situations when you are tired																			
32.	Talk in large rooms using a microphone																			
33.	Talk in a car or on a bus																			
34.	Sing in public																			
35.	Have very expressive speech																			
36.	Talk on the telephone																			
37.	Have casual conversations																			
38.	Talk in situations when your role is to be an expert or leader																			
39.	Talk in places with air pollutants or irritants																			
40.	Participate in small group discussions																			
41.	Talk in fast-moving conversations																			
42.	Talk in quiet places																			
43.	Give presentations or speeches																			
44.	Be spontaneous with your speech																			

45. Talk in situations when you are physically uncomfortable (e.g., sitting in an uncomfortable chair or posture, standing all day)										
46. Talk with people who are hard of hearing										
47. Lead small group discussions										
48. Talk in uncomfortably hot or cold places										
49. Have speech that does not call attention to itself										
50. Talk with people who do not fluently speak the same language as you do										
51. Talk with people who are in a hurry										
52. Talk in large rooms without a microphone										
53. Talk with young children										

1. What is your current work status? (Check all that apply):
  - a. Working full-time for pay outside the home
  - b. Working part-time for pay outside the home
  - c. Working for pay in a home-based business
  - d. Volunteer (Volunteer work is your main occupation)
  - e. Working at home as a homemaker, stay-at-home parent, or care-giver
  - f. Attending school or job training
  - g. Retired
  - h. Not working for other reasons
  
2. (WEBQ VERSION) If you currently work in any job for pay, click “yes” to be directed to additional questions about your work. If you do not currently work in any job for pay, click “no” to be directed to questions about your other activities.  
Yes/No

(PAPER VERSION) If you currently work in any job for pay, continue with this section to answer additional questions about your work. If you do not currently work in any job for pay, please go to Section C now.

3. What is your job? (*Example: First grade teacher*) \_\_\_\_\_
4. How many hours per week do you work? \_\_\_\_\_
5. Approximately what percentage of your time at work do you spend talking? (*Example: 20% of my work time is spent talking.*) \_\_\_\_\_
6. Please describe how you typically use your speech at work. (*Example: I talk to 20 students in a classroom all day.*) \_\_\_\_\_
7. How important is the use of your speech to participation in your job?
  - a. Extremely important – Participation in my job depends entirely on my speech. If I had problems with my speech (e.g. due to laryngitis), I could not do my job at all.
  - b. Very important – My speech is necessary for my job, but I am still able to do my job if my speech is not normal (e.g. due to laryngitis)
  - c. A little important – My job would be a little harder to do if I had speech problems (e.g. laryngitis) but speech problems would not have much impact on how well I did my job
  - d. Not at all important – If I had problems with my speech, it would have almost no impact on how well I did my job

**SECTION C.** Please choose up to three non-employment activities that are most important to you. These activities might include family or community responsibilities (caring for children or volunteer work) or social and leisure activities (hobbies, sports, or recreation). For each of these, we will ask you a series of questions. (Program WebQ – if only one or two listed, redirect to section C)

**What is the first non-work activity that is important to you?** \_\_\_\_\_

1. Approximately how often do you participate in this activity? For example, how many hours per week, or does this occur less frequently (for example once per month)?
2. Of the time that you spend in this activity, approximately what percentage of that time involves talking? (*Example: 20%*) \_\_\_\_\_
3. How important is the use of your speech to participation in this activity?
  - a. Extremely important – My participation in this activity depends entirely on my speech. If I had problems with my speech (e.g. due to laryngitis), I could not do this activity at all.
  - b. Very important – The use of my voice is necessary for part of this activity, but I am still able to participate if my speech is not normal (e.g. due to laryngitis)
  - c. A little important – This activity would be a little harder to do if I had speech problems (e.g. laryngitis) but would not have much impact on how well I could participate

- d. Not at all important – If I had problems with my speech, it would have almost no impact on my participation in this activity

**What is the second non-work activity that is important to you? \_\_\_\_\_**

1. Approximately how often do you participate in this activity? For example, how many hours per week, or does this occur less frequently?
2. Of the time that you spend in this activity, approximately what percentage of that time involves talking? (*Example: 20%*) \_\_\_\_\_
3. How important is the use of your speech to participation in this activity?
  - a. Extremely important – My participation in this activity depends entirely on my speech. If I had problems with my speech (e.g. due to laryngitis), I could not do this activity at all.
  - b. Very important – The use of my voice is necessary for part of this activity, but I am still able to participate if my speech is not normal (e.g. due to laryngitis)
  - c. A little important – This activity would be a little harder to do if I had speech problems (e.g. laryngitis) but would not have much impact on how well I could participate
  - d. Not at all important – If I had problems with my speech, it would have almost no impact on my participation in this activity

**What is the third non-work activity that is important to you? \_\_\_\_\_**

1. Approximately how often do you participate in this activity? For example, how many hours per week, or does this occur less frequently?
2. Of the time that you spend in this activity, approximately what percentage of that time involves talking? (*Example: 20%*) \_\_\_\_\_
3. How important is the use of your speech to participation in this activity?
  - a. Extremely important – My participation in this activity depends entirely on my speech. If I had problems with my speech (e.g. due to laryngitis), I could not do this activity at all.
  - b. Very important – The use of my voice is necessary for part of this activity, but I am still able to participate if my speech is not normal (e.g. due to laryngitis)
  - c. A little important – This activity would be a little harder to do if I had speech problems (e.g. laryngitis) but would not have much impact on how well I could participate
  - d. Not at all important – If I had problems with my speech, it would have almost no impact on my participation in this activity

In this questionnaire you have described your work (if you work for pay), and up to three other responsibilities and/or activities that are important to you. Below, please rank “work” and your other three activities based on how much of an impact problems with speaking would have on that activity. For example, the activity for which there would be the most serious consequences for you (that would be most affected) if you had problems with your speech should be rated as #1, the activity affected most after that should be ranked #2 and so forth. If you are not currently working for pay, list the three other activities that you described and the last line will be blank.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

**SECTION D. Background and Demographics**

4. Age: \_\_\_\_\_ years.
5. Do you consider yourself fluent in any other language(s?) besides English? Yes/No
  - a. If so, please list here: \_\_\_\_\_
6. Gender: \_\_Male \_\_Female
7. Marital status:
  - a. Married/Committed Relationship
  - b. Single/Divorced/Widowed
8. Your ethnic/racial group (check all that apply):
  - a. American Indian/Alaskan Native
  - b. Asian
  - c. Native Hawaiian or Other Pacific Islander
  - d. Black or African American
  - e. White (Caucasian)
  - f. Hispanic or Latino
  - g. More than one ethnic/racial group
  - h. Other
9. Your educational background (check one):
  - a. Post-graduate (Master’s, Ph.D.)
  - b. College graduate
  - c. Some college

- d. Vocational or technical school
  - e. High school graduate
  - f. Some high school
  - g. Elementary or junior high school
10. If you live in the United States, in which state do you live?
11. If you live outside of the United States, in which country do you live?
12. In what type of housing do you live?
- a. A house or apartment
  - b. A retirement or senior housing community
  - c. An assisted living or adult family home where I receive help with my daily care and activities
  - d. Other
13. With whom do you currently live? (Check all that apply):
- a. I live alone
  - b. I live with family (spouse or domestic partner, children, parents, other relatives)
  - c. I live with friends/roommate
  - d. I live in an assisted living or similar facility with other residents of the facility
  - e. **Other. Please describe:** \_\_\_\_\_
14. Are you responsible for caring for one or more children in your household?
- \_\_\_\_ Yes
- \_\_\_\_ No
15. Do you have a hearing loss? Yes/No
16. Do you have problems with vision not currently corrected by glasses or contacts? Yes/No
17. Do you have any CURRENT communication disorders? Yes/No
- Please specify (check all that apply):
- a. Stuttering
  - b. Speech or language problems due to stroke
  - c. Speech or language problems due to head injury
  - d. Speech or language problems due to degenerative conditions (e.g. Parkinson's Disease, Amyotrophic Lateral Sclerosis (ALS), Multiple Sclerosis)
  - e. Voice injuries or voice problems
  - f. Cleft lip and/or palate
  - g. Speech or language problems that began in childhood
  - h. Other (please specify)

18. Do you have any other medical conditions that, in your opinion, affect how much you interact with other people? If yes, please describe: \_\_\_\_\_.

**This is the end of the questionnaire.  
Thank you for your help with this study!  
We appreciate your time.**

**APPENDIX C**  
**Geographic Regions Selected for Craigslist Postings**

Butte, Montana  
Gainesville, Florida  
New Orleans, Louisiana  
Muskegon, Michigan  
Atlanta, Georgia  
Kansas City, Missouri  
Birmingham, Alabama  
Montgomery, Alabama  
Fairbanks, Alaska  
Greenville, South Carolina  
Scottsbluff, Nebraska  
Fredericksburg, Virginia  
Pittsburgh, Pennsylvania  
Hawaii  
Memphis, Tennessee  
New York, New York  
Chicago, Illinois  
Las Vegas, Nevada  
Los Angeles, California  
Jackson, Mississippi  
Tampa Bay, Florida  
Louisville, Kentucky  
Seattle, Washington  
Dallas, Texas  
Albany, New York

**APPENDIX D**  
**Notes Regarding Separate Analyses of WebQ and Paper Questionnaire Data**

A backwards-stepwise linear regression analysis was used to identify demographic variables significantly associated with level of speech usage for all participants (e.g. participants who completed either the WebQ version of the questionnaire or the paper version; n=269). Level of speech usage was the dependent variable. The same twelve variables as the original regression (i.e. WebQ only) were entered: marital status, age, volunteer status, homemaker status, living situation, vision, health status, hearing loss, gender, whether or not the participant was caring for one or more children, work status, and educational background. Variables were removed from the regression in the same order as the original regression, and the final model included work status and education. For this set of variables, the adjusted  $R^2$  was .125 with a significance level of .000 (work status ( $\beta = .277$ ; educational background  $\beta = -.199$ ). These findings for all participants are identical to that of the regression with all participants, indicating that work status and educational background were the variables most strongly associated with speech usage.

**APPENDIX E**  
**Additional Demographic Information**

Demographic information for all participants (WebQ and paper version)

Mean Age		41.75 (SD=14.98)
Sex	Female	78.26% (216/276)
	Male	20.29% (56/276)
	No response	1.45% (4/276)
Highest Degree	Post-graduate	50.36% (139/276)
	College graduate	33.70% (93/276)
	Some college	10.51% (29/276)
	Vocational/technical school	2.54% (7/276)
	High school graduate	2.17% (6/276)
	No response	0.72% (2/276)
Ethnic/Racial Group	American Indian/Alaskan Native	0.36% (1/276)
	Asian	1.09% (3/276)
	Black or African American	0.72% (2/276)
	Hispanic or Latino	1.45% (4/276)
	White/Caucasian	88.77% (245/276)
	More than one ethnic/racial group	6.52% (18/276)
	No response	1.09% (3/276)
Marital Status	Single/divorced/widowed	40.94% (113/276)
	Married/committed relationship	59.06% (163/276)
Living Situation	Living alone	19.57% (54/276)
	Living with family	68.48% (189/276)
	Living with friends/roommate	10.51% (29/276)
	Living in an assisted living facility	0% (0/276)
	Other	1.81% (5/276)
	No response	0.36% (1/276)
	More than one response	2.17% (6/276)
Responsible for Caring for Children	Yes	24.64% (68/276)
	No	75.36% (208/276)
Presence of Hearing Loss	Yes	10.51% (29/276)
	No	89.13% (246/276)
	No Response	0.36% (1/276)
Health Status	No current health concerns	82.61% (228/276)
	Current health concerns	11.23% (31/276)
	No response	6.16% (17/276)

## **APPENDIX F**

### **Additional Information Regarding Codes for Data Analysis**

As described in the body of the text above, some variables were recoded into categories for data analysis. This section provides the codes used for the re-coded variables.

1. Estimated percentage of time spent talking at work or in other non-occupational activities (e.g. “Approximately what percentage of your time at work do you spent talking?”)

0-25%: SPSS Code 1  
26-50%: SPSS Code 2  
51-75%: SPSS Code 3  
76-100%: SPSS Code 4

2. Estimated number of people participants talk to on average at work or in other non-occupational activities (e.g. “Please describe how you typically use your speech at work.”)

0-5 people: SPSS Code 1  
6-20 people: SPSS Code 2  
21-50 people: SPSS Code 3  
51-100 people: SPSS Code 4  
More than 100 people: SPSS Code 5

Participants who themselves listed a range of amounts of people were coded for the highest amount provided. For example, a participant who noted that they talked to “10-50 people” would be coded as talking to 50 people and entered into the range of “21-50 people.”

3. Ranking of work as compared to up to three other non-occupational activities (e.g. “Below, please rank “work” and your other three activities based on how much of an impact problems with speaking would have on that activity.”)

For this item, in both (paper and WebQ) versions of the questionnaire, participants were prompted to write-in each non-occupational activity and work (if applicable), ranking each activity based on how much of an impact problems with speaking might have on that activity. Formatting limitations of the WebQ program did not enable participants to provide a ranking (from 1 to up to 4) for each of their activities; instead, their responses were entered next to a ranking already programmed into the questionnaire (from 1 to 4). Participant responses therefore were viewed in WebQ as a variety of activities and work (if applicable), and were converted into rankings from “first” to “fourth” for the purpose of data analysis:

Work ranked first: SPSS Code 1  
Work ranked second: SPSS Code 2  
Work ranked third: SPSS Code 3  
Work ranked fourth: SPSS Code 4  
Not applicable (i.e., participant reported that they were not currently working): SPSS Code 0

**APPENDIX G**  
**Pearson Correlations for Variables Used in Regression Analysis**

	<b>Level of Speech Usage</b>	<b>Work Status</b>	<b>Health Status</b>	<b>Vision Concerns</b>	<b>Hearing Loss</b>	<b>Childcare</b>	<b>Living Situation</b>
<b>Level of Speech Usage</b>	1.000	.306	.016	-.039	.001	.157	.048
<b>Work Status</b>	.306	1.000	-.042	.045	-.108	.096	.030
<b>Health Status</b>	.016	-.042	1.000	.238	.193	.027	-.021
<b>Vision Concerns</b>	-.039	.045	.238	1.000	.093	-.056	-.017
<b>Hearing Loss</b>	.001	-.108	.193	.093	1.000	-.029	-.021
<b>Childcare</b>	.157	.096	.027	-.056	-.029	1.000	-.034
<b>Living Situation</b>	.048	.030	-.021	-.017	-.021	-.034	1.000
<b>Education</b>	-.316	-.137	.148	.116	.081	-.055	-.048
<b>Gender</b>	.139	-.006	-.054	-.074	-.030	.122	.030
<b>Marital Status</b>	-.111	-.119	.071	.066	-.046	-.305	.071
<b>Age</b>	-.096	-.179	-.045	-.052	.191	.030	.027
<b>Homemaker Status</b>	-.069	-.197	-.036	.055	-.035	.218	-.015
<b>Volunteer Status</b>	-.146	-.330	.227	.034	.131	-.129	-.018

**APPENDIX G**  
**Pearson Correlations for Variables Used in Regression Analysis**

	Education	Gender	Marital Status	Age	Homemaker Status	Volunteer Status
<b>Level of Speech Usage</b>	-.316	.139	-.111	-.096	-.069	-.146
<b>Work Status</b>	-.137	-.006	-.119	-.179	-.197	-.330
<b>Health Status</b>	.148	-.054	.071	-.045	-.036	.227
<b>Vision Concerns</b>	.116	-.074	.066	-.052	.055	.034
<b>Hearing Loss</b>	.081	-.030	-.046	.191	-.035	.131
<b>Childcare</b>	-.055	.122	-.305	.030	.218	-.129
<b>Living Situation</b>	-.048	.030	.071	.027	-.015	-.018
<b>Education</b>	1.000	-.140	.078	.232	.180	.212
<b>Gender</b>	-.140	1.000	-.073	-.048	.082	-.077
<b>Marital Status</b>	.078	-.073	1.000	-.164	-.080	.054
<b>Age</b>	.232	-.048	-.164	1.000	.155	.308
<b>Homemaker Status</b>	.180	.082	-.080	.155	1.000	.229
<b>Volunteer Status</b>	.212	-.077	.054	.308	.229	1.000

**APPENDIX H**  
**Spearman Correlations for Variables Used in Regression Analysis**

	<b>Level of Speech Usage</b>	<b>Work Status</b>	<b>Health Status</b>	<b>Vision Concerns</b>	<b>Hearing Loss</b>	<b>Childcare</b>	<b>Living Situation</b>
<b>Level of Speech Usage</b>	1.000	0.310	0.017	-0.050	-0.002	0.146	0.047
<b>Work Status</b>	0.310	1.000	-0.042	0.045	-0.108	0.096	-0.016
<b>Health Status</b>	0.017	-0.042	1.000	0.238	0.193	0.027	0.048
<b>Vision Concerns</b>	-0.050	0.045	0.238	1.000	0.093	-0.056	-0.030
<b>Hearing Loss</b>	-0.002	-0.108	0.193	0.093	1.000	-0.029	0.012
<b>Childcare</b>	0.146	0.096	0.027	-0.056	-0.029	1.000	0.080
<b>Living Situation</b>	0.047	-0.016	0.048	-0.030	0.012	0.080	1.000
<b>Education</b>	-0.315	-0.149	0.176	0.083	0.104	-0.083	0.028
<b>Gender</b>	0.133	-0.006	-0.054	-0.074	-0.030	0.122	-0.030
<b>Marital Status</b>	-0.109	-0.119	0.071	0.066	-0.046	-0.305	-0.164
<b>Age</b>	-0.019	-0.118	-0.040	-0.051	0.189	0.137	-0.126
<b>Homemaker Status</b>	-0.070	-0.197	-0.036	0.055	-0.035	0.218	0.023
<b>Volunteer Status</b>	-0.118	-0.330	0.227	0.034	0.131	-0.129	-0.050

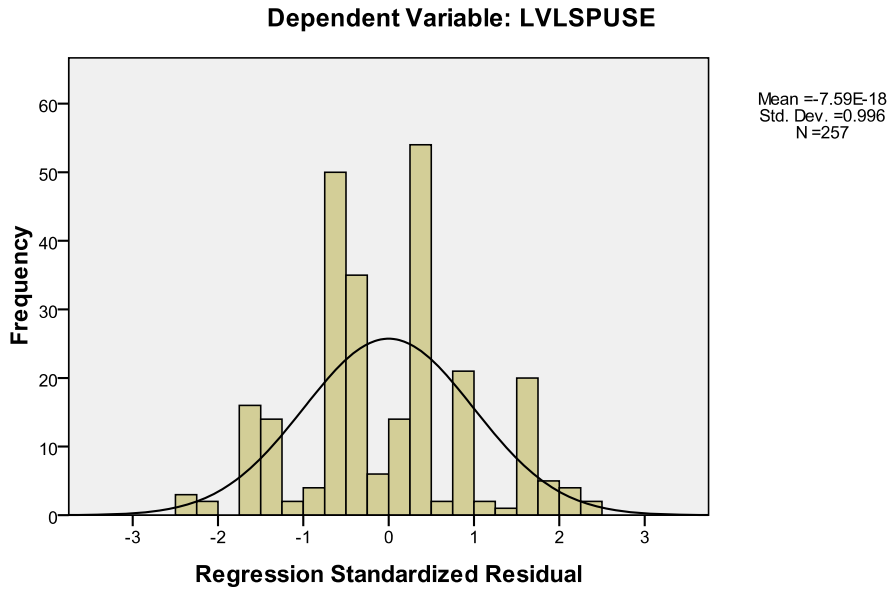
**APPENDIX H**  
**Spearman Correlations for Variables Used in Regression Analysis**

	<b>Gender</b>	<b>Marital Status</b>	<b>Age</b>	<b>Homemaker Status</b>	<b>Volunteer Status</b>
<b>Level of Speech Usage</b>	0.133	-0.109	-.019	-.070	-.118
<b>Work Status</b>	-0.006	-0.119	-.118	-.197	-.330
<b>Health Status</b>	-0.054	0.071	-.040	-.036	.227
<b>Vision Concerns</b>	-0.074	0.066	-.051	.055	.034
<b>Hearing Loss</b>	-0.030	-0.046	.189	-.035	.131
<b>Childcare</b>	0.122	-0.305	.137	.218	-.129
<b>Living Situation</b>	-0.030	-0.164	-.126	.023	-.050
<b>Education</b>	-0.127	0.078	.091	.135	.186
<b>Gender</b>	1.000	-0.073	-.037	.082	-.077
<b>Marital Status</b>	-0.073	1.000	-.211	-.080	.054
<b>Age</b>	-0.037	-0.211	1.000	.144	.230
<b>Homemaker Status</b>	0.082	-0.080	.144	1.000	.229
<b>Volunteer Status</b>	-0.077	0.054	.230	.229	1.000

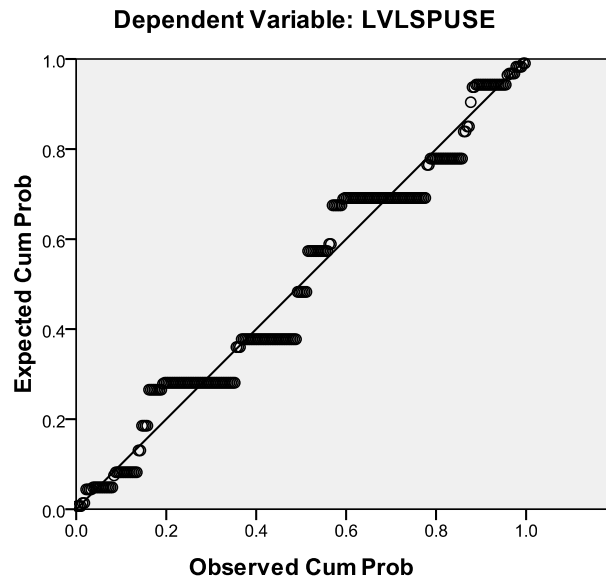
# APPENDIX I

## Histogram, P-P Plot of Residuals, and Graph of Possible Outliers from Regression Analysis

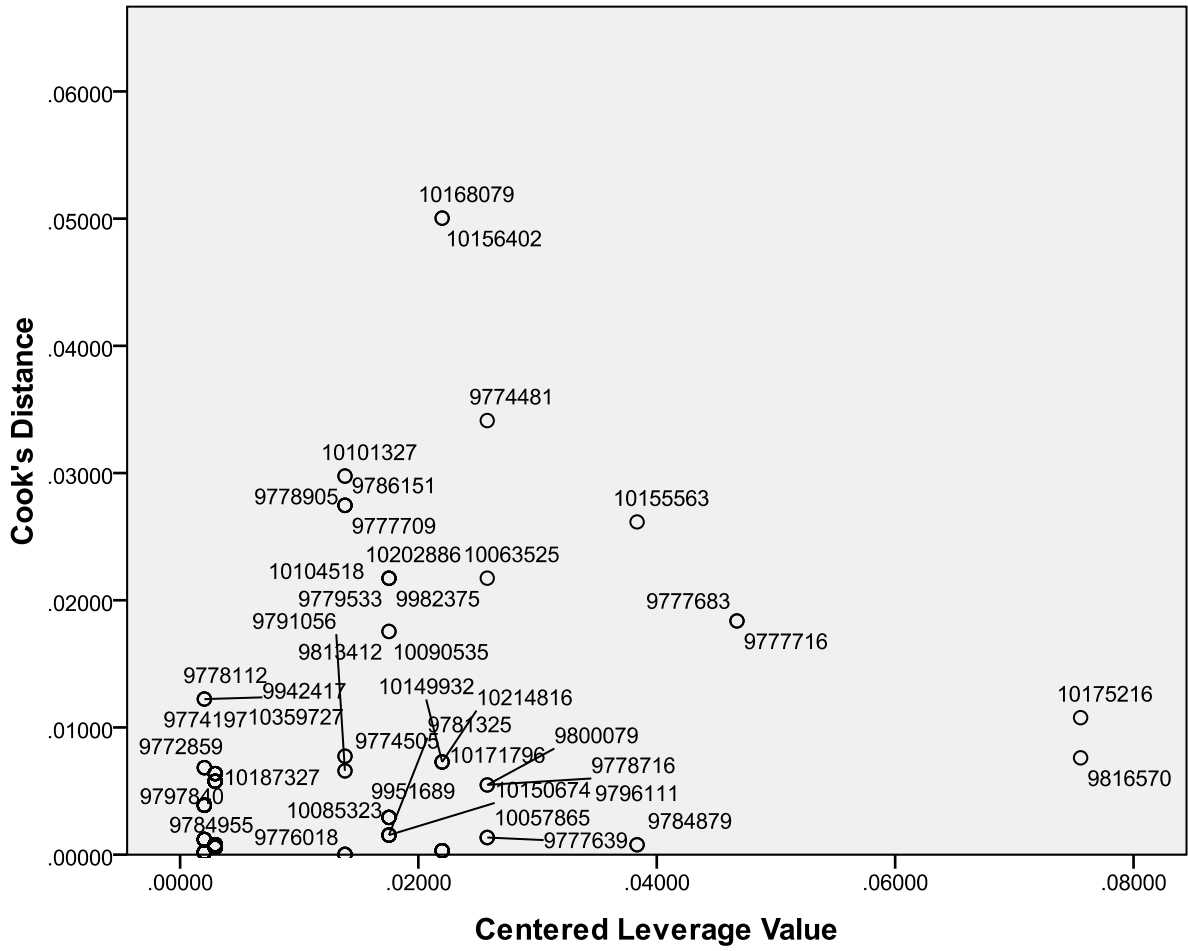
### Histogram



### Normal P-P Plot of Regression Standardized Residual



Graph of Possible Outliers from Regression Analysis



**APPENDIX J**  
**Participant work rankings grouped by Level of Speech Usage**

<b>Level of Speech Usage</b>	<b>Work ranking (if applicable)</b>	<b>% of Participants in Speech Usage Category</b>	<b>% of Total Number of Working Participants</b>
Undemanding	1	75.00%	1.52%
	2	25.00%	0.51%
Intermittent	1	50.00%	6.57%
	2	23.08%	3.03%
	3	23.08%	3.03%
	4	3.85%	0.51%
Routine	1	73.08%	28.79%
	2	21.79%	8.59%
	3	5.13%	2.02%
Extensive	1	81.82%	27.27%
	2	13.64%	4.55%
	3	4.55%	1.52%
Extraordinary	1	87.50%	10.61%
	2	8.33%	1.01%
	4	4.17%	0.51%